



# WEROC Inc Board Meeting

Wednesday 26 February 2020

Kellerberrin Recreation and Leisure Centre  
Connelly Street Kellerberrin

## MINUTES

Commencing at 1.29pm

CONTENTS

|           |  |           |
|-----------|--|-----------|
| <b>1.</b> | <b>OPENING AND ANNOUNCEMENTS (ATTACHMENT)</b> .....  | <b>4</b>  |
| <b>2.</b> | <b>ELECTIONS</b> .....   | <b>4</b>  |
| <b>3.</b> | <b>RECORD OF ATTENDANCE AND APOLOGIES</b> .....  | <b>7</b>  |
| 3.1       | Attendance.....  | 7         |
| 3.2       | Apologies.....   | 7         |
| 3.3       | Guests.....  | 7         |
| <b>4.</b> | <b>DECLARATION OF INTEREST</b> .....   | <b>7</b>  |
| <b>5.</b> | <b>PRESENTATIONS/MEETINGS</b> .....  | <b>8</b>  |
| 5.1       | Ms Ana Farla, Account Manager Synergy (1.30pm).....  | 8         |
| 5.2       | Mr Steve Mason, CEO Innovation Central Midlands WA Inc (2.30pm).....   | 9         |
| <b>6.</b> | <b>MINUTES OF MEETINGS</b> .....   | <b>10</b> |
| 6.1       | Minutes from the Wheatbelt Communities Inc Annual General Meeting held Wednesday 30 October 2019 (Attachment).....   | 10        |
| 6.2       | Minutes from the Wheatbelt Communities Inc Meeting held Wednesday 30 October 2019 (Attachment).....  | 10        |
| 6.3       | Minutes from the WEROC Council Meeting held Thursday 28 November 2019 (Attachment).....  | 10        |
| 6.4       | Minutes from Special General Meeting of Wheatbelt Communities Inc held via Teleconference on Tuesday 17 December 2019 (Attachment).....  | 11        |
| 6.5       | Decisions made by WEROC/WCI via a Flying Email Dated Wednesday 15 January 2020   | 11        |
| 6.6       | Decisions made by WEROC Inc via a Flying Email Dated Friday 31 January 2020  | 12        |
| 6.7       | Business Arising – Status Report as at 16 February 2020.....   | 13        |
| 6.8       | Matters for Noting (Attachment).....   | 14        |
| <b>7.</b> | <b>Associations Incorporations Act 2015</b> .....  | <b>15</b> |
| 7.1       | Complying with the <i>Associations Incorporation Act 2015</i> – Self-Check (Attachment)  | 15        |
| 7.2       | Complying with the <i>Associations Incorporation Act 2015</i> – Lodgment of Wheatbelt Communities Inc Annual Information Statement for the 2018/2019 Financial Year  | 15        |
| <b>8.</b> | <b>WEROC FINANCE</b> .....   | <b>16</b> |
| 8.1       | WEROC Council Finance Report as at 31 January 2020.....  | 16        |
| 8.2       | List of Accounts – WEROC Council.....  | 18        |
| 8.3       | List of Accounts – Wheatbelt Communities Inc.....  | 20        |
| 8.4       | WEROC Inc’s Banking Requirements and Appointment of Signatories.....   | 21        |
| 8.5       | Appointment of an Auditor.....   | 23        |
| <b>9.</b> | <b>MATTERS FOR DECISION</b> .....  | <b>25</b> |
| 9.1       | Engagement of the WEROC Inc Executive Officer (Attachment).....  | 25        |
| 9.2       | WEROC Inc Common Seal.....   | 29        |
| 9.3       | Insurance for WEROC Inc.....   | 30        |
| 9.4       | Development of a Confidentiality Statement for WEROC Inc.....  | 32        |
| 9.5       | Development of a File Numbering System for WEROC Inc.....  | 33        |
| 9.6       | Renewal of Memorandum of Understanding between the Shire of Merredin, WEROC and the Shires of Cunderdin and Tammin for Visitor Servicing and Regional Promotion through the Central Wheatbelt Visitor Centre (Attachment)..... | 34        |
| 9.7       | Partnering Agreement for the Provision of Mutual Aid for Recovery during Emergencies (Attachment).....   | 36        |
| 9.8       | Wheatbelt Medical Students Immersion Project (WMSIP) (Attachments).....  | 37        |

|            |  |           |
|------------|--|-----------|
| 9.9        | Curtin Wheatbelt Community Health Study (Attachment) .....   | 39        |
| 9.10       | Funding to Support and Mentor Local Governments to Assist in the Development of Public Health Plans.....                       | 40        |
| 9.11       | Records Management in Local Government (Attachment) .....  | 42        |
| 9.12       | Discussions and Decisions arising from WEROC Inc's Meeting with Ms Ana Farla, Account Manager Synergy.....                     | 44        |
| 9.13       | Discussions and Decisions arising from WEROC Inc's Meeting with Steve Mason, CEO Innovation Central Midlands WA Inc (ICM)..... | 45        |
| <b>10.</b> | <b>EMERGING ISSUES.....</b>  | <b>46</b> |
| 10.1       | Failure of Telecommunications Systems during Emergencies.....  | 46        |
| <b>11.</b> | <b>OTHER MATTERS .....</b>   | <b>46</b> |
| 11.1       | Regional Elector Member Training .....   | 46        |
| 11.2       | Container Deposit Scheme.....  | 46        |
| <b>12.</b> | <b>FUTURE MEETINGS .....</b>   | <b>47</b> |
| <b>13.</b> | <b>CLOSURE .....</b>   | <b>47</b> |

# WEROC Inc

## Wheatbelt East Regional Organisation of Councils Inc

An In-person Board Meeting held in the Kellerberrin Recreation and Leisure Centre, commencing at 1.29pm

# MINUTES

## 1. OPENING AND ANNOUNCEMENTS (ATTACHMENT)

The Chair Mr Ram Rajagopalan opened the meeting at 1.29pm and welcomed all Board Members and guests.

As there are a number of presentations it was proposed to move to these before considering the meeting agenda.

The Chair welcomed Ms Ana Farla, Account Manager Synergy, Mr Fabian Le Gay Brereton, New Energy Consultant Synergy and Mr Piero Truini, Product Manager Synergy and invited the representatives of Synergy to make their presentation.

The Department of Mines, Industry Regulation and Safety advised on Thursday 30 January 2020 that Wheatbelt Communities Inc's request to change its name to Wheatbelt East Regional Organisation of Councils (WEROC) Inc and the newly adopted constitution had been accepted.

A copy of the correspondence received forms an attachment to the meeting agenda.

A copy of the new constitution was sent under separate cover on Tuesday 11 February 2020.

## 2. ELECTIONS

The Annual General Meeting for Wheatbelt Communities Inc was held ahead of the Department of Mines, Industry Regulation and Safety approval for its name to be changed to Wheatbelt East Regional Organisation of Councils (WEROC) Inc and approve its new constitution.

With the Department's approval for both changes it is necessary to conduct elections for the positions of Deputy Chair and Board members.

Clause 14 of the WEROC Inc Constitution states:

### 14.1 Elections at Annual General Meeting

- (a) Elections for Chair, Deputy Chair, Secretary/Treasurer and Board members will take place at the Annual General Meeting of WEROC where the Chair will declare all positions vacant.
- (b) The Chair and Deputy Chair must be from a different Local Government.
- (c) Subject to Rule 14.2, a Board member's term will be from his or her election at an annual general meeting until the election at the next annual general meeting after his or her election, but he or she is eligible for re-election to membership of the Board.

### 14.2 Where a vacancy on the Board occurs after 31 March in any year:



**RECOMMENDATION:**

That WEROC Inc endorse those Board members as nominated by their respective local government to the Board of WEROC Inc until the next Annual General Meeting.

**Noted**

**Appointment of Committees to WEROC Inc**

**Executive Officer Comment:**

Clause 13 of the WEROC Inc Constitution covers committees of the Board, stating:

13. COMMITTEES OF THE BOARD

13.1 Committees Appointed

*The Board may appoint committees to provide advice to the Board consisting of at least 4 Members, to consider any specific matters. Any 3 Members or at least 51% of Members, whichever is greater, of the committee, will constitute a quorum.*

The Executive Officer believes that the previous WEROC Executive Committee comprising the CEOs from each of the five member WEROC Councils will need to be re-established as per the WEROC Inc Constitution.

Because the WEROC Inc Constitution has no clauses covering delegation of authority it will also be necessary for the WEROC Inc Board to establish Terms of References which will guide the committee in any work it may undertake. This work should be undertaken as soon as practicable.

**RECOMMENDATION:**

That WEROC Inc Board:

1. Appoint a Committee of Chief Executive Officers from each of the Shires of Bruce Rock, Kellerberrin, Merredin, Westonia and Yilgarn to consider any matters considered relevant by the WEROC Inc Board, with the Committee to be known as the WEROC Inc CEO Committee; and
2. Develop Terms of Reference to guide the work undertaken by the WEROC Inc CEO Committee.

**RESOLUTION:**

**Moved: Peter Clarke**

**Seconded: Wayne Della Bosca**

---

**That WEROC Inc Board:**

1. Appoint a Committee of Chief Executive Officers from each of the Shires of Bruce Rock, Kellerberrin, Merredin, Westonia and Yilgarn to consider any matters considered relevant by the WEROC Inc Board, with the Committee to be known as the WEROC Inc CEO Committee; and
2. Develop Terms of Reference to guide the work undertaken by the WEROC Inc CEO Committee.

**CARRIED**

### 3. RECORD OF ATTENDANCE AND APOLOGIES

#### 3.1 Attendance

Mr Ram Rajagopalan (Chair)  
Mr Peter Clarke  
Ms Karin Day  
Mr Wayne Della Bosca  
Ms Julie Flockart

Ms Kate Dudley (proxy and voting delegate for Mr Raymond Griffiths)  
Mr Stephen Strange (proxy and voting delegate for Mr Darren Mollenoyux)  
Ms Jasmine Geier (proxy and voting delegate for Jamie Criddle)

Ms Helen Westcott, Secretary/Treasurer and WEROC Inc Executive Officer

#### 3.2 Apologies

Mr Jamie Criddle  
Mr Rod Forsyth  
Mr Raymond Griffiths  
Mr Darren Mollenoyux

Dr Andrew Harper, Adjunct Clinical Professor Curtin Medical School

#### 3.3 Guests

Mr Mark Dacombe, Acting CEO Shire of Merredin  
Ms Andrina Prnich, Deputy CEO Shire of Merredin  
Mr Bryan Close

Mr Bruce Wittber, BHW Consulting

Ms Rebekah Burges, Secretary/Treasurer and WEROC Inc Executive Officer designate

Ms Ana Farla, Account Manager Synergy (left the meeting at 2.31pm)  
Mr Fabian Le Gay Brereton, New Energy Consultant Synergy (left the meeting at 2.31pm)  
Mr Piero Truini, Product Manager Synergy (left the meeting at 2.31pm)

Mr Steve Mason, CEO Innovation Central Midlands WA Inc (joined the meeting at 2.25pm and left the meeting at 3.25pm)

**RESOLUTION:** Moved: Peter Clarke                      Seconded: Karin Day

That Ms Jasmine Geier be appointed as a proxy for Jamie Criddle for this meeting only.

**CARRIED**

### 4. DECLARATION OF INTEREST

As Members are aware, the WEROC Inc Constitution is largely a rewrite of the Warren-Blackwood Alliance of Councils Constitution which does not contain any clauses to cover the disclosure of any conflict of interest. This means that by default the clause on disclosing a conflict of interest contained within the *Associations Incorporation Act 2015* (the Act) will apply. The relevant clause, clause 42, states:

**42. Disclosure of material personal interest**

- (1) A member of the management committee of an incorporated association who has a material personal interest in a matter being considered at a management committee meeting must, as soon as the member becomes aware of the interest, disclose the nature and extent of the interest to the management committee.

*Penalty: a fine of \$10 000.*

- (2) A member of the management committee of an incorporated association who has a material personal interest in a matter being considered at a management committee meeting must disclose the nature and extent of the interest at the next general meeting of the association.

*Penalty: a fine of \$10 000.*

- (3) Subsections (1) and (2) do not apply in respect of a material personal interest —

(a) that exists only because the member —

(i) is an employee of the incorporated association; or

(ii) is a member of a class of persons for whose benefit the association is established;

or

(b) that the member has in common with all, or a substantial proportion of, the members of the association.

- (4) If a member of the management committee of an incorporated association discloses a material personal interest in a contract or proposed contract in accordance with this section, and the member has complied with section 43(1) or the member's interest is not required to be disclosed because of subsection (3) —

(a) the contract is not liable to be avoided by the association on any ground arising from the fiduciary relationship between the member and the association; and

(b) the member is not liable to account for profits derived from the contract.

- (5) A disclosure of a material personal interest required by subsection (1) or (2) must give details of —

(a) the nature and extent of the interest; and

(b) the relation of the interest to the activities of the incorporated association.

- (6) The details referred to in subsection (5) must be recorded in the minutes of the meeting of the management committee at which the disclosure is made.

It should be noted that clause 43 of the Act covers how voting on a contract should be undertaken where a management committee member declares an interest.

It should also be noted that a copy of the Act was provided to members ahead of the meeting under separate cover in an email on Tuesday 11 February 2020.

## **5. PRESENTATIONS/MEETINGS**

### **5.1 Ms Ana Farla, Account Manager Synergy (1.30pm)**

Following its meeting with the Innovation Central Midlands WA Inc (ICM) CEO, Mr Steve Mason, on ICM's involvement with BSC Energy, Power Ledger and others in developing sources of renewable energy on Tuesday 27 August 2019, WEROC Council resolved as shown below:



**RESOLUTION:** *Moved: Cr Rajagopalan* *Seconded: Mr Criddle*

---

**That WEROC:**

1. *Initiate discussions with BSC Energy and Power Ledger seeking the conduct of a pre-feasibility study in respect to developing a micro-grid system across the WEROC geographic area; and*
2. *Extend an invitation to Steve Mason to meet with WEROC Council in 2020 to provide an update on Innovation Central Midlands WA Inc's renewable energy project.*

**CARRIED**

Work on preparing a pre-feasibility study is underway (refer also to Agenda Item 6.7).

An invitation was also extended about this time to representatives from energy provider Synergy to meet with WEROC to discuss ways in which it could work with Member Councils to reduce their power costs.

Ms Ana Farla and Mr Patrick Whitfield from Synergy met with the WEROC Council at a meeting held Thursday 28 November 2019 (refer also to Agenda Item 3.1).

Since that meeting Synergy has been looking at ways in which WEROC's Members can reduce their power costs. Today's presentation and ensuing discussions will focus on how this can be achieved.

2.31pm Ms Farla, Mr Le Gay Brereton and Mr Truini left the meeting and did not return

A copy of the PowerPoint presentation used by the representatives from Synergy will be provided under separate cover as Synergy has requested that it be treated as a confidential document.

## **5.2 Mr Steve Mason, CEO Innovation Central Midlands WA Inc (2.30pm)**

Following its meeting with Steve Mason, CEO Innovation Central Midlands WA Inc (ICM), on ICM's involvement with BSC Energy, Power Ledger and others in developing sources of renewable energy on Tuesday 27 August 2019, WEROC Council resolved as shown below:

**RESOLUTION:** *Moved: Cr Rajagopalan* *Seconded: Mr Criddle*

---

**That WEROC:**

3. *Initiate discussions with BSC Energy and Power Ledger seeking the conduct of a pre-feasibility study in respect to developing a micro-grid system across the WEROC geographic area; and*
4. *Extend an invitation to Steve Mason to meet with WEROC Council in 2020 to provide an update on Innovation Central Midlands WA Inc's renewable energy project.*

**CARRIED**

Mr Steve Mason has accepted WEROC Inc's invitation to meet again to discuss the further progress of ICM's renewable energy project.

2.25pm Mr Steve Mason entered the meeting

3.25pm Mr Steve Mason left the meeting and did not return

3.25 pm the meeting adjourned for afternoon tea

3.40pm the meeting resumed following afternoon tea

## **6. MINUTES OF MEETINGS**

### **6.1 Minutes from the Wheatbelt Communities Inc Annual General Meeting held Wednesday 30 October 2019 (Attachment)**

Presenting the Minutes from the Wheatbelt Communities Inc (WCI) Annual General Meeting held Wednesday 30 October 2019

Whilst the minutes from WCI Annual General Meeting held Wednesday 30 October will not be presented for adoption until the WEROC Inc AGM scheduled for later in the year, with the changes currently under the way (ie change in the organisation's name and the engagement of a new Executive Officer) the Executive Officer considered it appropriate that the minutes should be received in order that a record of them having been completed is available to Board members.

#### **RECOMMENDATION:**

That the Minutes of the Wheatbelt Communities Inc Annual General Meeting held Wednesday 30 October 2019 be received.

**EN BLOC RESOLUTION:**                      **Moved: Julie Flockart**                      **Seconded: Wayne Della Bosca**

**That the Minutes of the Wheatbelt Communities Inc Annual General Meeting held Wednesday 30 October 2019 be received.**

**CARRIED**

### **6.2 Minutes from the Wheatbelt Communities Inc Meeting held Wednesday 30 October 2019 (Attachment)**

Minutes from the Wheatbelt Communities Inc Meeting held Wednesday 30 October 2019 have previously been circulated.

#### **RECOMMENDATION:**

That the Minutes of the Wheatbelt Communities Inc Meeting held Wednesday 30 October 2019 be confirmed as a true and correct record.

**EN BLOC RESOLUTION:**                      **Moved: Julie Flockart**                      **Seconded: Wayne Della Bosca**

**That the Minutes of the Wheatbelt Communities Inc Meeting held Wednesday 30 October 2019 be confirmed as a true and correct record.**

**CARRIED**

### **6.3 Minutes from the WEROC Council Meeting held Thursday 28 November 2019 (Attachment)**

Minutes of the WEROC Council Meeting held Thursday 28 November 2019 have previously been circulated.

#### **RECOMMENDATION:**

That the Minutes of the WEROC Council Meeting held Thursday 28 November 2019 be confirmed as a true and correct record.

**EN BLOC RESOLUTION:**                      **Moved: Julie Flockart**                      **Seconded: Wayne Della Bosca**

**That the Minutes of the WEROC Council Meeting held Thursday 28 November 2019 be confirmed as a true and correct record.**

**CARRIED**

**6.4      Minutes from Special General Meeting of Wheatbelt Communities Inc held via Teleconference on Tuesday 17 December 2019 (Attachment)**

Minutes of the Special General Meeting of Wheatbelt Communities Inc held via teleconference on Tuesday 17 December 2019 have previously been circulated.

**RECOMMENDATION:**

That the Minutes of the Special General Meeting of Wheatbelt Communities Inc held via teleconference on Tuesday 17 December 2019 be confirmed as a true and correct record.

**EN BLOC RESOLUTION:**                      **Moved: Julie Flockart**                      **Seconded: Wayne Della Bosca**

**That the Minutes of the Special General Meeting of Wheatbelt Communities Inc held via teleconference on Tuesday 17 December 2019 be confirmed as a true and correct record.**

**CARRIED**

**6.5      Decisions made by WEROC/WCI via a Flying Email Dated Wednesday 15 January 2020**

Members received an email from the Executive Officer dated Wednesday 15 January 2020 requesting agreement via a “flying email” to commence development of a process and timeframe for the transfer of all funds from the WEROC accounts to the WCI account. The recommendation for this to occur and detailed within the “flying email” is detailed below:

*That the Executive Officer be given approval to transfer all bank funds all bank accounts held in the name of the Wheatbelt Regional Organisations of Councils to the bank account held in the name of Wheatbelt Communities Inc before 31 January 2020.*

Responses to the above recommendation were requested to be with the Executive Officer by close of business on Monday 20 January 2020.

At this time responses had been received from:

- Ram Rajagopalan;
- Darren Mollenoyux;
- Rod Forsyth;
- Julie Flockart;
- Karin Day;
- Wayne Della Bosca; and
- Peter Clarke.

As this constituted a majority of members, the recommendation could be accepted, with work on implementing the resolution now completed.

For recording purposes, the decision is presented for endorsement.

**RECOMMENDATION:**

That the decision made by the WEROC Council via a “flying email” on Wednesday 15 January 2020 be endorsed.

**EN BLOC RESOLUTION:**                      **Moved: Julie Flockart**                      **Seconded: Wayne Della Bosca**  

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**That the decision made by the WEROC Council via a “flying email” on Wednesday 15 January 2020 be endorsed.**  
**CARRIED**

**6.6            Decisions made by WEROC Inc via a Flying Email Dated Friday 31 January 2020**

Board members received an email from the Executive Officer dated Friday 31 January 2020 requesting agreement via a “flying email” on the appointment of WEROC Inc’s new Executive Officer. The recommendation contained in the “flying email” is shown below:

*That WEROC Inc endorses the appointment of Rebekah Burges from 150Square to the position of WEROC Executive Officer based on a 2 year contract commencing on the 1<sup>st</sup> March 2020 and that the Bruce Rock CEO undertake the preparation of agreement between the two parties in line with the Expression of Interest received and the terms of the position description presented.*

Responses to the above recommendation were requested to be with the Executive Officer by close of business on Tuesday 4 February 2020.

At this time responses had been received from:

- Ram Rajagopalan;
- Darren Mollenoyux;
- Jamie Criddle;
- Rod Forsyth;
- Julie Flockart;
- Karin Day; and
- Peter Clarke.

As this constituted a majority of members, the recommendation could be accepted, with work on finalising the appointment of a new Executive Officer able to commence.

Wayne Della Bosca responded to the Executive Officer’s email on Wednesday 5 February 2020.

For recording purposes, the decision is presented for endorsement.

The matter will also be considered in Agenda Item 9.1.

**RECOMMENDATION:**

That the decision relating to the appointment of the WEROC Inc Executive Officer made via a “flying email” on Friday 31 January 2020 be endorsed.

**EN BLOC RESOLUTION:**                      **Moved: Julie Flockart**                      **Seconded: Wayne Della Bosca**  

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**That the decision relating to the appointment of the WEROC Inc Executive Officer made via a “flying email” on Friday 31 January 2020 be endorsed.**  
**CARRIED**

## 6.7 Business Arising – Status Report as at 16 February 2020

### WEROC Executive Meeting Wednesday 29 May 2019

#### 5.4 Participation by WEROC in Renewable Energy Projects

Discussions with renewable energy companies BSC Energy, Power Ledger and others in developing sources of renewable energy commenced in mid-2019, with WEROC Council resolving as shown below on Tuesday 27 August 2019:

*RESOLUTION: Moved: Cr Rajagopalan Seconded: Mr Criddle*

*That WEROC:*

- 5. Initiate discussions with BSC Energy and Power Ledger seeking the conduct of a pre-feasibility study in respect to developing a micro-grid system across the WEROC geographic area; and*
- 6. Extend an invitation to Steve Mason to meet with WEROC Council in 2020 to provide an update on Innovation Central Midlands WA Inc's renewable energy project.*

*CARRIED*

Work on preparing a pre-feasibility study is well underway.

The Executive Officer will provide a verbal report to the meeting.

**It was agreed to defer this matter until the next WEROC Inc Board Meeting.**

### WEROC Council Meeting Wednesday 30 October 2019

#### 6.3 Ongoing Development of the WEROC App and Website

*RESOLUTION: Moved: Mr Mollenoyux Seconded: Cr Forsyth*

*That WEROC:*

- 1. Terminate its contract with go2GUIDES and in doing so seek clarification on ownership for both the WEROC App and website (including content and intellectual property); and*
- 2. Seek quotations from suitably qualified organisations for the further development and management of the WEROC website.*

*CARRIED*

The Executive Officer has been advised by Steven Peacock from go2GUIDES that WEROC retains ownership of all pictures and information it provided during the establishment of both the App and website. It also owns the WEROC domain name and a number of other similarly sounding domain names purchased by go2GUIDES on WEROC's behalf to protect the "WEROC" name.

Information for both the WEROC website and App has been returned to WEROC. The incoming Executive Officer will be able to use this information as WEROC looks to establish its new website.

The Executive Officer has yet to seek quotes to undertake part 2 of the resolution.

This will therefore be a task for the incoming Executive Officer.

**WEROC Council Meeting Thursday 28 November 2019**

**6.4 Request for a Letter of Support from Crisp Wireless for a Digital Farm Grants Application**

*RESOLUTION: Moved: Mr Mollenoyux Seconded: Cr Della Bosca*

*That WEROC provide a letter of support to Crisp Wireless for its application to the Department of Primary Industry and Regional Development's Digital Farm Grant Round 2.*

**CARRIED**

A letter of support for CRISP's application for funding from the Digital Farm Grants Program was provided on 2 December 2019. As yet the Executive Officer has not received any advice from CRISP as to the success or otherwise of its funding application.

**RECOMMENDATION:**

That the Status Report for February 2020 be received.

**RESOLUTION: Moved: Julie Flockart Seconded: Peter Clarke**

**That the Status Report for February 2020 be received.**

**CARRIED**

**6.8 Matters for Noting (Attachment)**

- Ministerial media release on the Western Australian Rail Access Regime rail reform released 5 February 2020

<https://www.mediastatements.wa.gov.au/Pages/McGowan/2020/02/Rail-access-reforms-full-steam-ahead.aspx>

- Email from the Department of Mines, Industry Regulation and Safety dated 6 February 2020 regarding "man in the middle" scams – a copy of the email forms an attachment to the meeting agenda

**RECOMMENDATION:**

That the matters listed for noting be received.

**RESOLUTION: Moved: Julie Flockart Seconded: Peter Clarke**

**That the matters listed for noting be received.**

**CARRIED**

## **7. Associations Incorporations Act 2015**

### **7.1 Complying with the Associations Incorporation Act 2015 – Self-Check (Attachment)**

The Department of Mines, Industry Regulation and Safety publishes a self-check for incorporated bodies such as WEROC Inc.

The purpose of the self-check is to assist in determining whether a group such as WEROC Inc is complying with each section of the *Associations Incorporation Act 2015*.

A copy of the self-check forms an attachment to the meeting agenda.

In relation to record keeping, the Executive Officer will have available for inspection at each in-person meeting of Wheatbelt the following records:

- A copy of the certificate of incorporation;
- A copy of the WEROC Inc Constitution;
- The Members Register; and
- The Record of Office Bearers.

These records are available for inspection at this meeting.

The Executive Officer has also contacted all WEROC Inc Board members to confirm their preferred contact details, with all contact details updated.

**No action is required.**

### **7.2 Complying with the Associations Incorporation Act 2015 – Lodgment of Wheatbelt Communities Inc Annual Information Statement for the 2018/2019 Financial Year**

The Executive Officer has completed and lodged the group's annual information statement for the 2018/2019 financial year.

Completion of the annual statement is required under the *Associations Incorporation Act 2015 s 156 Associations Incorporation Regulations 2016 r 15*.

**No action is required.**

**8. WEROC FINANCE**

**8.1 WEROC Council Finance Report as at 31 January 2020**

**Author:** Helen Westcott, Executive Officer

**Disclosure of Interest:** Nil

**Date:** 18 February 2020

**Attachments:** Nil

**RECOMMENDATION:**

**That the WEROC Council Financial Report for the period ending 31 January 2020 be received.**

**Executive Officer’s Report:**

Presenting the WEROC Council Statement of Receipts and Payments for the period ending 31 January 2020.

**Note this is the financial statement for WEROC Council and not WEROC Inc.**

An explanation for each of the notes is provided below.

|                |  |
|----------------|--|
| <b>Note 1</b>  | All 2019/2020 annual subscriptions have been paid.   |
| <b>Note 2</b>  | WEROC Council interest to date   |
| <b>Note 3</b>  | This allocation covers the expenditure on Executive Services   |
| <b>Note 4</b>  | This allocation covers the expenditure on travel and accommodation   |
| <b>Note 5</b>  | This is a new account to cover the costs involved in advertising for a new Executive Officer   |
| <b>Note 6</b>  | This allocation covers the expenditure on Financial Services   |
| <b>Note 7</b>  | This account covers the cost of expenditure on the 2018/2019 Audit. Funds have also been provided for the final audit of WEROC Council   |
| <b>Note 8</b>  | This allocation includes payment to Accingo for the Asset Management project, costs associated with Dr Andrew Harper for Curtin Wheatbelt Medical Project, Australian Golden Outback - contribution to Eastern Wheatbelt self-drive feature, distribution of regional travel maps and Information Enterprises Australia - consulting services review of record keeping |
| <b>Note 9</b>  | This allocation covers the costs incurred this financial year in respect to the WEROC app and website  |
| <b>Note 10</b> | Catering expenses for WEROC Council Meetings   |
| <b>Note 11</b> | Cost of lodging the application for incorporation of WEROC Inc   |
| <b>Note 12</b> | Total of funds transferred to Wheatbelt Communities Inc in preparation for the winding up of WEROC Council   |

**Consultation:** Nil

**Financial Implications:** WEROC Council adopted Budget for 2019/2020

**Voting Requirement:** Simple Majority

**RESOLUTION:** **Moved: Karin Day** **Seconded: Wayne Della Bosca**

**That the WEROC Council Financial Report for the period ending 31 January 2020 be received.**

**CARRIED**



WEROC Inc Board Meeting Wednesday 26 February 2020 - Minutes

| Wheatbelt East Regional Organisation of Councils (WEROC) |   |                   |                       |                           |
|--|---|-------------------|-----------------------|---------------------------|
| ABN 28 416 957 824                                       |   |                   |                       |                           |
| 1 July 2019 to 31 January 2020                           |   |                   |                       |                           |
|  |   | Budget 2019/2020  | Actual to             | Notes                     |
| <b>Income</b>  |   |                   |                       |                           |
| 0501   | General Subscriptions WEROC                         | \$ 60,000         | \$ 60,000.00          | 1                         |
| 504.01   | Consultancy & Project Reserve                       |                   |                       |                           |
| 0575   | WE-ROC Interest received                            | \$ 900            | \$ 132.25             | 2                         |
| 584  | Other Income  |                   |                       |                           |
|  | GST Output Tax                                      |                   | \$ 6,000.00           |                           |
|  | GST Refunds   |                   | \$ 5,740.00           |                           |
|  | <b>Total Receipts</b>                               | <b>\$ 60,900</b>  | <b>\$ 71,872.25</b>   |                           |
| <b>Expenses</b>  |   |                   |                       |                           |
| 1545   | WEROC Bank Fees & Charges                           | \$ 100            | \$ -                  |                           |
| 1661.01  | WEROC Executive Services Professional Services      | \$ 55,000         | \$ 26,438.53          | 3                         |
| 1661.02  | WEROC Executive Officer Travel and Accommodation    | \$ 8,000          | \$ 2,861.98           | 4                         |
| 1661.03  | WEROC Executive Officer Recruitment                 | \$ -              | \$ 781.06             | 5                         |
| 1687   | WEROC Financial Services Accounting                 | \$ 7,000          | \$ 1,698.41           | 6                         |
| 1687.03  | WEROC Financial Services Audit                      | \$ 3,750          | \$ 2,507.85           | 7                         |
| 1585   | WEROC Consultant Expenses                           | \$ 30,000         | \$ 37,559.11          | 8                         |
| 1850   | WEROC Management of WE-ROC App                      | \$ 5,000          | \$ 1,021.92           | 9                         |
| 1801   | WEROC Meeting Expenses                              | \$ 500            | \$ 449.26             | 10                        |
| 1851   | WEROC Insurance                                     | \$ 5,000          | \$ -                  |                           |
| 1852   | WEROC Legal Expenses                                | \$ 2,000          | \$ -                  |                           |
| 1853   | WEROC Incorporation Expenses (including legal fees) | \$ 15,000         | \$ 69.00              | 11                        |
| 1930   | WEROC Sundry  | \$ 500            | \$ 102.27             |                           |
| 3384   | GST Input Tax                                       |                   | \$ 7,106.44           |                           |
|  | Ato Payments  |                   | \$ 2,515.00           |                           |
|  | Suspense Account                                    |                   | \$ -                  |                           |
|  | <b>Total Payments</b>                               | <b>\$ 131,850</b> | <b>\$ 83,110.83</b>   |                           |
|  | <b>TRANSFER OF FUNDS WEROC INC</b>                  |                   | <b>-\$ 139,669.45</b> | <b>12</b>                 |
|  | Net Position  | -\$ 70,950        | -\$ 11,238.58         |                           |
|  | OPENING CASH 1 July                                 | \$ 160,927        | \$ 150,919.05         |                           |
|  | CASH BALANCE 31 January 2020                        | \$ 89,977         | \$ 11.02              |                           |
|  | Westpac One   |                   | \$ 0.30               |                           |
|  | Westpac Reserve                                     |                   | \$ 10.72              |                           |
|  |   |                   | <b>\$ 11.02</b>       | <b>TRF TO WEROC INC c</b> |

**8.2 List of Accounts – WEROC Council**

**Author:** Helen Westcott, Executive Officer

**Disclosure of Interest:** Nil

**Date:** 18 February 2020

**Attachments:** Nil

**RECOMMENDATION:**

**That the Accounts Paid by WEROC Council for the period 1 November 2019 to 3 February 2020 totalling \$174,231.23 be approved.**

**Executive Officer’s Report:**

Accounts paid during the period 1 November 2019 to 3 February 2020 from the WEROC Council bank account. The 3 February 2020 is the date that the final funds were transferred from the WEROC Council to Wheatbelt Communities Inc.

The list of accounts paid is submitted to each WEROC Council Meeting. This will continue with WEROC Inc.

**Accounts Paid:**

| Cheque/EFT | Date   | Payee                             | For  | Amount incl GST |
|------------|--------|-----------------------------------|--|-----------------|
| EFT        | 111119 | BHW Consulting                    | Professional Services, Accommodation and Travel October 2019                 | 5,073.89        |
| EFT        | 111119 | AMD Chartered Accountants         | 2018/2019 Audit  | 2,739.00        |
| EFT        | 111119 | Up to Date Accounting             | Accounting Services October 2019   | 211.20          |
| EFT        | 111119 | Hayley Billing                    | Catering WEROC Executive Meeting morning tea and lunch 25 September 2019     | 220.00          |
| EFT        | 211119 | Shire of Merredin                 | Postage for distribution of Regional brochures – regional marketing campaign | 288.95          |
| EFT        | 261119 | Information Enterprises Australia | Consulting Services Review of Record Keeping                                 | 1,584.00        |
| EFT        | 101219 | BHW Consulting                    | Professional Services, Accommodation and Travel November 2019                | 4,890.77        |
| EFT        | 111219 | Information Enterprises Australia | Consulting Services Review of Record Keeping                                 | 4,059.00        |
| EFT        | 111219 | Up to Date Accounting             | Accounting Services November 2019  | 132.00          |
| EFT        | 231219 | Information Enterprises Australia | Consulting Services Review of Record Keeping                                 | 9,405.00        |
| EFT        | 301219 | Shire of Bruce Rock               | Reimbursement cost of advertising Executive Officer position                 | 859.17          |
| EFT        | 301219 | Australian Golden Outback         | Contribution to Self Drive Holiday Planner                                   | 665.00          |

**WEROC Inc Board Meeting Wednesday 26 February 2020 - Minutes**

|              |        |  |   |                     |
|--------------|--------|--|---|---------------------|
| EFT          | 060120 | BHW Consulting                           | Professional Services, Accommodation and Travel December 2019                                 | 4,203.60            |
| EFT          | 060120 | Up to Date Accounting                    | Accounting Services December 2019   | 132.00              |
| EFT          | 060120 | Redback Conferencing                     | Cost of teleconference meeting adoption of new constitution                                   | 18.18               |
| Cheque 69    | 130120 | Department of Mines, Industry Regulation | Cost of lodgement of WEROC Inc Constitution   | 69.00               |
| EFT          | 290120 | Wheatbelt Communities Inc                | Transfer of funds from WEROC Council to Wheatbelt Communities Inc                             | 139,669.45          |
| EFT          | 030220 | Wheatbelt Communities Inc                | Transfer of interest on WEROC Council account from WEROC Council to Wheatbelt Communities Inc | 11.02               |
| <b>Total</b> |        |  |   | <b>\$174,231.23</b> |

**Consultation:** Nil

**Financial Implications:** WEROC Council adopted a Budget for 2019/2020

**Voting Requirement:** Simple Majority

**RESOLUTION:** Moved: Stephen Strange      Seconded: Peter Clarke

**That the Accounts Paid by WEROC Council for the period 1 November 2019 to 3 February 2020 totalling \$174,231.23 be approved.**

**CARRIED**

**8.3 List of Accounts – Wheatbelt Communities Inc**

**Author:** Helen Westcott, Executive Officer

**Disclosure of Interest:** Nil

**Date:** 18 February 2020

**Attachments:** Nil

**RECOMMENDATION:**

**That the Accounts Paid by Wheatbelt Communities Inc for the period 1 November 2019 to 31 January 2020 totalling \$737.00 be approved.**

**Executive Officer’s Report:**

Accounts paid during the period 1 November 2019 to 30 January 2020 from the Wheatbelt Communities Inc bank account. The accounts include payments from the Wheatbelt Communities account until the approval of the new constitution and change of name to WEROC Inc. It does not include any payments made from the WEROC Inc bank account.

The list of accounts paid is submitted to each Wheatbelt Communities Inc/WEROC Inc Meeting.

**Accounts Paid:**

| Cheque/EFT | Date   | Payee                     | For   | Amount incl GST       |
|------------|--------|---------------------------|---|-----------------------|
| EFT        | 111119 | AMD Chartered Accountants | 2018/2019 Audit for Wheatbelt Communities Inc | 605.00                |
| EFT        | 111119 | Up to Date Accounting     | Accounting Services October 2019              | 132.00                |
|            |        |                           |   | <b>Total \$737.00</b> |

**Consultation:** Nil

**Financial Implications:** WEROC Council adopted a combined Wheatbelt Communities Inc/WEROC Council Budget for 2019/2020

**Voting Requirement:** Simple Majority

**RESOLUTION:** Moved: Peter Clarke Seconded: Julie Flockart

**That the Accounts Paid by Wheatbelt Communities Inc for the period 1 November 2019 to 31 January 2020 totalling \$737.00 be approved.**

**CARRIED**

#### 8.4 WEROC Inc's Banking Requirements and Appointment of Signatories

**Author:** Helen Westcott, Executive Officer

**Disclosure of Interest:** Nil

**Date:** 18 February 2020

**Attachments:** Nil

##### RECOMMENDATION:

That the WEROC Inc Board approve of the following banking arrangements:

1. That the current Community Solutions One bank account be retained with the Westpac Bank and no new account be opened at this time;
2. That the bank signatories be Mr Ramesh Rajagopalan (Chair), Ms Rebekah Burges (Secretary/Treasurer) and Mr Darren Mollenoyux (Board Member);
3. That Ms Rebekah Burges become the administrator for all bank accounts held by WEROC Inc;
4. That Ms Helen Westcott and Mr Bruce Wittber be removed as signatories from all WEROC Inc bank accounts; and
5. That all payments require the authorisation of any two of the signatories.

##### Executive Officer's Report:

With the adoption and approval of the new Constitution and change of name from Wheatbelt Communities Inc to Wheatbelt East Regional Organisation of Councils Inc (WEROC Inc) together with the appointment of a new Executive Officer it is appropriate to determine banking requirements and signatories. Clause 5(a)(vi) of the Constitution provides that WEROC Inc has the power to *(vi) To conduct bank accounts that are deemed necessary by WEROC.*

WEROC Inc currently has one bank account (Community Solutions One) with Westpac into which all funds are deposited. This account only pays a minimal interest.

The current signatories are Helen Westcott (administrator), Bruce Wittber, Onida Truran (as the previous Chair for Wheatbelt Communities Inc) and Darren Mollenoyux.

The payment arrangements are for all payments, which are mostly paid by EFT, to be approved by two signatories.

It would be prudent to formalise the banking arrangements, decide what accounts are required and to determine who will be the signatories for the bank accounts. An administrator for any bank accounts WEROC Inc decides to operate must also be determined. Currently Helen Westcott is the administrator.

The current Community Solutions One account with Westpac is specially designed for not-for-profit organisations, with no monthly service fee and is used for all day to day payments. It has a current interest rate of 0.10%. The "companion" bank account is a *Community Solutions Cash Reserve savings account* and appears to have an interest rate of 0.10% on balances of \$10,000 or more. It would seem that there is no urgency to establish a new account given the poor level of interest being paid. The WEROC Inc Board may decide to invest funds that may be surplus to current needs.

In respect to signatories as the Executive Officer is the Secretary/Treasurer it would be appropriate for the person holding that position to be appointed as one signatory and administrator. Previously the Wheatbelt Communities Inc Chair was also a signatory, so the current Chair could also be appointed. To ensure that there will always be two signatories available it would be appropriate to retain Darren Mollenoyux as a signatory.

The current banking arrangements provide for two signatories to approve payments. It is recommended that this arrangement continue with WEROC Inc payments.

## **WEROC Inc Board Meeting Wednesday 26 February 2020 - Minutes**

|                                |  |
|--------------------------------|--|
| <b>Consultation:</b>           | Nil  |
| <b>Financial Implications:</b> | WEROC Council adopted a Budget for 2019/2020 |
| <b>Voting Requirement:</b>     | Simple Majority                              |

**RESOLUTION:**                      **Moved: Peter Clarke**                      **Seconded: Karin Day**

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**That the WEROC Inc Board approve of the following banking arrangements:**

1. That the current Community Solutions One bank account be retained with the Westpac Bank and no new account be opened at this time;
2. That the bank signatories be Mr Ramesh Rajagopalan (Chair), Ms Rebekah Burges (Secretary/Treasurer) and Mr Darren Mollenoyux (Board Member);
3. That Ms Rebekah Burges become the administrator for all bank accounts held by WEROC Inc;
4. That Ms Helen Westcott and Mr Bruce Wittber be removed as signatories from all WEROC Inc bank accounts; and
5. That all payments require the authorisation of any two of the signatories.

**CARRIED**

## 8.5 Appointment of an Auditor

**Author:** Helen Westcott, Executive Officer

**Disclosure of Interest:** No interest to disclose

**Date:** 15 February 2020

**Attachments:** Nil

### RECOMMENDATION:

1. That the WEROC Inc Executive Officer seeks quotes from the following accounting firms to undertake the 2019/2020 audit for WEROC Inc, with the audit to be undertaken as per the *Associations Incorporation Act 2015*:
  - a) AMD Chartered Accountants;
  - b) Butler Settineri Chartered Accountants;
  - c) Byfields Business Advisers; and
  - d) Moore Stephens.
2. The appointment of an auditor to undertake the 2019/2020 audit be completed as soon as practical so the audit costs can be included in the 2020/2021 budget process for WEROC Inc.

### Executive Officer's Report:

At the Annual General Meeting Wheatbelt Communities Inc held Wednesday 30 October 2019 it was noted that no action be taken to appoint an auditor until after the new constitution and change in the group's had been adopted and approved.

With adoption and approval of its new name and constitution, WEROC Inc must now give consideration to the appointment of an auditor to undertake the audit of the WEROC Inc's financial Statement for the 2019/2020 financial year as provided in the WEROC Inc Constitution.

Clause 22 states:

#### 22. AUDIT

*WEROC must comply with all financial reporting obligations imposed under the Act.*

##### 22.1 Auditor's Access to records

*The auditor must audit the accounts of WEROC once a year and is entitled to full and free access to all accounts, records, documents and papers of WEROC relating directly or indirectly to the receipt and payment of monies or to the acquisition, receipt, custody or disposal of assets by WEROC.*

##### 22.2 Auditor's Report

*Before the Annual General Meeting the Auditor will examine the accounts and records of WEROC for the previous financial year and report on whether the accounts and records give a true and fair view of the financial affairs of WEROC, and on any other matters arising out of the records that the Auditor considers should be reported to the Members.*

Clause 23 of the new constitution covers the matter of the auditor's appointment, stating:

23. APPOINTMENT OF AUDITOR

WEROC will, at each Annual General Meeting, appoint an Auditor for a period of one year, who is not a Member of WEROC. The Auditor will be eligible for reappointment by WEROC and WEROC Board has the power to fill any temporary vacancy in the office of Auditor.

Of importance to the WEROC Inc Board in considering the appointment of an auditor is that:

1. The new constitution requires WEROC Inc to comply with all financial reporting obligations imposed under the *Associations Incorporation Act 2015* (the Act). This differs from the Wheatbelt Communities Inc (WCI) constitution. The WEROC Inc Board and incoming Executive Officer will need to familiarise themselves with the audit requirements as prescribed in the Act prior to seeking expressions of interest for the conduct of the 2019/2020 audit;
2. The new constitution allows only for the appointment of an auditor on an annual basis. This differs from the WCI constitution which had flexibility with respect to the appointment of an auditor, allowing for an appointment to run for three years; and
3. The appointment of an auditor to undertake the 2019/2020 audit should be completed as soon as practical as the audit costs will be required to be included in the 2020/2021 budget process for WEROC Inc.

The recommendation developed for consideration by the WEROC Inc Board lists a number of well-established accounting firms from whom WEROC Inc could request quotations to undertake the 2019/2020 WEROC Inc audit.

**Consultation:** Nil

**Financial Implications:** Cost of audit to be included in the WEROC Inc 2020/2021 Budget.

**Voting Requirement:** Simple Majority

**RESOLUTION:** Moved: Julie Flockart                      Seconded: Wayne Della Bosca

1. That the WEROC Inc Executive Officer seeks quotes from the following accounting firms to undertake the 2019/2020 audit for WEROC Inc, with the audit to be undertaken as per the *Associations Incorporation Act 2015*:
  - a) AMD Chartered Accountants;
  - b) Butler Settineri Chartered Accountants;
  - c) Byfields Business Advisers; and
  - d) Moore Stephens.
2. The appointment of an auditor to undertake the 2019/2020 audit be completed as soon as practical so the audit costs can be included in the 2020/2021 budget process for WEROC Inc.

CARRIED



## 9. MATTERS FOR DECISION

### 9.1 Engagement of the WEROC Inc Executive Officer (Attachment)

**Author:** Helen Westcott, Executive Officer

**Disclosure of Interest:** Nil

**Date:** 19 February 2020

**Attachments:** WEROC Executive Officer Consultant Brief

#### RECOMMENDATION:

##### That:

1. The Bruce Rock CEO finalise the contract between WEROC Inc and 150Square Pty Ltd no later than close of business on 28 February 2020;
2. The contract between WEROC Inc and 150Square Pty Ltd include all duties as prescribed in Clause 16 and the relevant subclauses of Clause 17 of the WEROC Inc Constitution which cover the role and duties of Executive Officer;
3. The contract between WEROC Inc and 150Square Pty Ltd include any duties detailed in the "Consultants Brief" not contained within the WEROC Inc Constitution, with these duties to reflect the requirements of both the WEROC Inc Constitution and the *Associations Incorporation Act 2015*;
4. The contract between WEROC Inc and 150Square Pty Ltd include the following conditions:
  - a) The Hourly Rate for Executive Officer Services is \$67.00 (inc GST)
  - b) The Hourly Rate for Project Specific Work is \$90.00 (inc GST)
  - c) Mileage is at \$0.75 per kilometre based from Meckering
  - d) No other costs unless for accommodation – overnight accommodation will not be required for WEROC Inc meetings
  - e) Office costs associated with the position covered under the hourly rate unless significant printing/copying costs incurred; and
5. WEROC Inc Board by way of "flying email" review the contract drafted between itself and 150Square Pty Ltd relating to the engagement of Ms Rebekah Burge as its Executive Officer.

#### Executive Officer's Report:

With the resignation of BHW Consulting as the WEROC Executive Officer in November 2019, WEROC Council resolved as shown below:

*RESOLUTION: Moved: Cr Day Seconded: Cr Della Bosca*

*That the Shire of Bruce Rock, as current Chair of WEROC, prepare a position description, information package and commence the advertising process for the recruitment of Executive Officer services for WEROC, with applications closing 2 January 2020.*

CARRIED

Board members received an email from the Executive Officer dated Wednesday 15 January 2020 requesting agreement via a "flying email" on the appointment of the new Executive Officer. The recommendation contained in the "flying email" is shown below:

*That WEROC Inc endorses the appointment of Rebekah Burges from 150Square to the position of WEROC Executive Officer based on a 2 year contract commencing on the 1<sup>st</sup> March 2020 and that the Bruce Rock CEO undertake the preparation of agreement between the two parties in line with the Expression of Interest received and the terms of the position description presented.*

Endorsement for the decision was received with a record of the flying email covered earlier in the meeting agenda (refer to Agenda Item 6.6).

All unsuccessful applicants to the position of Executive Officer have been notified.

Clause 16 of the WEROC Inc Constitution lays out the instructions by which its Executive Officer is appointed and a number of the duties required to be performed by the Executive Officer.

Clause 16 states:

16. *EXECUTIVE OFFICER*

16.1 *Executive Officer Appointed*

*The Board is empowered to appoint an Executive Officer for a contract period not exceeding five years or to remove an Executive Officer from WEROC and to decide upon his or her remuneration and duties. The contract of an Executive Officer so appointed may be renewed from time to time at the discretion of the Board.*

16.2 *Executive Officer's role*

*The Executive Officer will act as Secretary/Treasurer of WEROC and non-voting member of the Board and will:*

- (a) Receive all monies on behalf of WEROC, give receipts thereof on the official receipt form of WEROC, and pay such monies into such account or accounts at such bank as the Board may, from time to time, decide upon. These accounts shall be operated upon generally for the good conduct of the affairs of WEROC in such a manner as the Board shall, from time to time, determine.*
- (b) Keep the accounts of WEROC and shall make up an annual statement of accounts and balance sheet of WEROC to June 30 in each year, which shall, after audit, be circulated amongst the Members of WEROC with the notice of the Annual General Meeting. The Executive Officer*
- (c) shall also prepare a statement of receipts and expenditure for each meeting of the Board.*
- (d) Maintain a Register of Members.*
- (e) Unless the Members resolve otherwise at a general meeting, have custody of all books, documents, records and registers of WEROC.*
- (f) Compile Minutes, Grant applications and acquittals, arrange Guest Speakers and collective Board Member training.*
- (g) Undertake all other duties as directed by the Board.*

It should be noted that as part of their role the WEROC Executive Officer is also the WEROC Inc Secretary/Treasurer and a non-voting member of the WEROC Inc Board (see clause 16.2).

Clause 17 of the WEROC Inc Constitution also details a number of financial tasks that are the responsibility of the WEROC Inc Executive Officer as the group's Secretary/Treasurer. Clause 17 is set out below with the sub-clauses relevant to the WEROC Inc Executive Officer highlighted.

17. *FINANCE*

17.1 *The financial year for WEROC will be as detailed in Rule 2.1(g).*

17.2 *The Board will ensure sound financial management;*

17.3 *The Board will prepare and approve the annual budget at least 1 month before the end of the financial year.*

## WEROC Inc Board Meeting Wednesday 26 February 2020 - Minutes

- 17.4 Any operating expense or capital expenditure not included in the budget must be approved by the Board prior to being incurred.
- 17.5 The Executive Officer will be responsible for arranging the keeping of a correct and up to date accounting record with full details of all receipts and expenditure connected with the work of WEROC.
- 17.6 The Executive Officer will present to each meeting of the Board, a true and correct financial statement comparing actual to budget for the period up to the end of the prior month.
- 17.7 The financial statement, or summary of the financial statement, will form a part of the minutes of the meeting at which it is presented.
- 17.8 The financial statement of WEROC may be published from time to time as the Board determines or otherwise made available to Members.

A copy of the consultant brief which contains the relevant information relating to the role, hours and duties and used in the selection process for the position of WEROC Executive Officer forms an attachment to the meeting agenda.

It should be noted that some of the tasks detailed in consultant brief are based on what was required for WEROC Council and not WEROC Inc. For example, the brief details a number of tasks that refer to Member Shires, such as the compiling and forwarding timely notice of meetings to the CEOs of Member Shires. This is not how notices of meetings for an incorporated body such as WEROC Inc are made. All Board members must be individually notified of meetings.

The contract for the position of WEROC Inc's Executive Officer should reflect the WEROC Inc Constitution and the organisation's responsibilities under the *Associations Incorporation Act 2015*.

The initial contract for the incoming Executive Officer will be for two years, with the following conditions applied:

- The Hourly Rate for Executive Services is \$67.00 (inc GST);
- The Hourly Rate for Project Specific Work is \$90.00 (inc GST);
- Travel is \$0.75c per kilometre based from Meckering;
- No other costs unless for accommodation – overnight accommodation will not be required for WEROC Inc meetings; and
- Office costs associated with the position covered under the hourly rate unless significant printing/copying costs incurred.

At the time of preparing the meeting agenda a contract between 150Square Pty Ltd had not been prepared.

Given that not all aspects of the WEROC Inc Executive Officer's duties as outlined in the WEROC Inc Constitution were covered in the consultant brief, most notably being the requirement for the Executive Officer to act as the Secretary/Treasurer and the inclusion of additional responsibilities not contained within the Constitution, the Executive Officer believes the Board should review and "sign off" on the contract before it is presented to 150Square Pty Ltd for signing.

The contract should also be prepared without delay.

The recommendation is written with the above comments in mind.

The outgoing Executive Officer will arrange a date and time to commence handover on all aspects of the Executive Officer position.

**Consultation:** Nil

**Financial Implications:** WEROC Council adopted Budget for 2019/2020

**Voting Requirement:** Simple Majority

**RESOLUTION:**

**Moved: Karin Day**

**Seconded: Stephen Strange**

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**That:**

- 1. The Bruce Rock CEO finalise the contract between WEROC Inc and 150Square Pty Ltd no later than close of business on 28 February 2020;**
- 2. The contract between WEROC Inc and 150Square Pty Ltd include all duties as prescribed in Clause 16 and the relevant subclauses of Clause 17 of the WEROC Inc Constitution which cover the role and duties of Executive Officer;**
- 3. The contract between WEROC Inc and 150Square Pty Ltd include any duties detailed in the "Consultants Brief" not contained within the WEROC Inc Constitution, with these duties to reflect the requirements of both the WEROC Inc Constitution and the *Associations Incorporation Act 2015*;**
- 4. The contract between WEROC Inc and 150Square Pty Ltd include the following conditions:**
  - a) The Hourly Rate for Executive Officer Services is \$67.00 (inc GST)**
  - b) The Hourly Rate for Project Specific Work is \$90.00 (inc GST)**
  - c) Mileage is at \$0.75 per kilometre based from Meckering**
  - d) No other costs unless for accommodation – overnight accommodation will not be required for WEROC Inc meetings**
  - e) Office costs associated with the position covered under the hourly rate unless significant printing/copying costs incurred; and**
- 5. WEROC Inc Board by way of "flying email" review the contract drafted between itself and 150Square Pty Ltd relating to the engagement of Ms Rebekah Burge as its Executive Officer.**

**CARRIED**

## 9.2 WEROC Inc Common Seal

**Author:** Helen Westcott, Executive Officer

**Disclosure of Interest:** Nil

**Date:** 16 February 2020

**Attachments:** Nil

### RECOMMENDATION:

#### That:

1. The WEROC Inc Executive Officer have a Common Seal made; and
2. The custody of the WEROC Inc Common Seal be the responsibility of the WEROC Inc Executive Officer.

### Executive Officer's Report:

Clause 20 of the WEROC Inc Constitution covers matters pertaining to the WEROC Inc Common Seal. It states:

#### 20. COMMON SEAL

##### 20.1 Custody of Seal

*WEROC will have a Common Seal, which will be in the custody of the Executive Officer at the office for the time being of WEROC.*

The Common Seal used when the group was known as Wheatbelt Communities Inc is no longer appropriate.

A Common Seal for the renamed organisation will need to be made, with the WEROC Inc Executive Officer to have custody of the Common Seal.

**Consultation:** Nil

**Financial Implications:** WEROC Council adopted Budget for 2019/2020

**Voting Requirement:** Simple Majority

**RESOLUTION:** Moved: Wayne Della Bosca      Seconded: Kate Dudley

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#### That:

1. The WEROC Inc Executive Officer have a Common Seal made; and
2. The custody of the WEROC Inc Common Seal be the responsibility of the WEROC Inc Executive Officer.

**CARRIED**

### 9.3 Insurance for WEROC Inc

**Author:** Helen Westcott, Executive Officer

**Disclosure of Interest:** No interest to disclose

**Date:** 15 February 2020

**Attachments:** Nil

#### **RECOMMENDATION:**

1. That the WEROC Inc Executive Officer obtain quotes for the following forms of insurance cover:
  - a) Public and professional indemnity insurance;
  - b) Officers and directors insurance;
  - c) Workers compensation;
  - d) Voluntary workers Insurance; and
  - e) Cyber/internet insurance.
2. That WEROC Inc look to appoint its insurer for a period of three (3) years with a review of its insurance requirements in the third year.

#### **Executive Officer Comment:**

With WEROC Council's decision to move away from working as a voluntary regional organisation of councils under a Memorandum of Understanding and become an incorporated under the *Associations Incorporation Act 2015* the group cannot rely on coverage provided by the Shires from which WEROC Inc's Board members come. WEROC Inc is considered as a not-for-profit organisation and as such needs to ensure that it has appropriate and effective levels of insurance cover.

The Executive Officer believes that consideration should be given to taking out insurance for the following:

1. Public and professional indemnity insurance;
2. Officers and directors insurance;
3. Cyber/internet insurance;
4. Workers compensation – required by law if you are hiring any workers, regardless whether casuals/subcontractors; and
5. Voluntary workers insurance – other than position of Secretary/Treasurer, which will be undertaken by the WEROC Inc Executive Officer, all of WEROC Inc's Board members are volunteers. This insurance would cover all other members of the WEROC Inc Board against accidental death/disablement and provide for a weekly injury benefit should a Board member be injured during the course of undertaking any duties as a Board member of WEROC Inc.

There is funding within the current WEROC Council Budget to cover the cost of obtaining the above insurances.

Provision should be made for insurance coverage in future WEROC Inc Budgets.

Given that WEROC Inc has yet to specifically determine how it will fulfil its mission and objectives, the Executive Officer is unable to specifically advise as to what level of insurance cover should be sought.

When determining who it will take insurance cover with, the Executive Officer suggests that WEROC Inc also give consideration to appointing an insurer for more than just a 12-month period. A three (3) year engagement is seen as an appropriate period of engagement during which time WEROC Inc can monitor its insurance requirements, seeking changes as required.

**Consultation:** Nil

*WEROC Inc Board Meeting Wednesday 26 February 2020 - Minutes*

**Financial Implications:** Unknown at this time

**Voting Requirement:** Simple Majority

**RESOLUTION:** **Moved: Peter Clarke** **Seconded: Stephen Strange**

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**That the matter be referred to the Committee of Chief Executive Officers.**

**CARRIED**

#### 9.4 Development of a Confidentiality Statement for WEROC Inc

**Author:** Helen Westcott, Executive Officer

**Disclosure of Interest:** No interest to disclose

**Date:** 15 February 2020

**Attachments:** Nil

#### **RECOMMENDATION:**

##### **That:**

1. **WEROC Inc develop a Confidentiality Statement for use by its Board members and where appropriate require contractors to sign the same agreement but with “member” amended to “contractor”; and**
2. **All documents for confidential consideration be watermarked “Confidential”.**

#### **Executive Officer Comment:**

Whilst the WEROC Council Executive Officer was required to sign a confidentiality clause as part of contractual requirements for the position of Executive Officer, a similar requirement was not required for councillors elected to WEROC, with the *Local Government Act 1995* and any Council specific rules around this issue applying.

With WEROC Inc bound by the *Associations Incorporation Act 2015* (the Act) the Executive Officer considers it prudent that WEROC Inc to consider the use of information. Clause 47 of the Act states:

#### **47. Use of information**

*A person who obtains information because the person is, or has been, an officer of an incorporated association must not improperly use the information to —*

- (a) gain an advantage for the person or another person; or*
- (b) cause detriment to the association.*

*Penalty: a fine of \$10 000.*

Because the Act does not specifically refer to the use of “confidential information” the Executive Officer considers it prudent for WEROC Inc to develop a statement of confidentiality for its use, both by WEROC Inc Board members and more specifically its contractors, including the incoming Executive Officer.

Where a proxy attends a meeting, the confidentiality statement is of relevance only a confidential item is listed for discussion and decision.

WEROC Inc could look to developing a statement similar to that used by the Central East Care Aged Alliance Inc.

It is also recommended that all documents for confidential consideration be watermarked “Confidential”.

**Consultation:** Nil

**Financial Implications:** Unknown at this time

**Voting Requirement:** Simple Majority

**RESOLUTION:** **Moved: Peter Clarke** **Seconded: Kate Dudley**

---

**That the matter be referred to the Committee of Chief Executive Officers.**

**CARRIED**



**9.5      Development of a File Numbering System for WEROC Inc**

**Author:** Helen Westcott, Executive Officer

**Disclosure of Interest:** No interest to disclose

**Date:** 17 February 2020

**Attachments:** Nil

**RECOMMENDATION:**

**That WEROC Inc develop a file number system to replace the system previously used by both Wheatbelt Communities Inc and the Wheatbelt East Regional Organisation of Councils.**

**Executive Officer Comment:**

With the coming together of Wheatbelt Communities Inc and the Voluntary Regional Organisation of Councils Wheatbelt East Regional Organisation of Councils the file numbering for projects and other matters should be reviewed. The current file numbering system has not been reviewed for a good number of years and it would be appropriate to review and develop a system that recognises the changed circumstances of both the group and the various organisations it will deal with from hereon.

It may be appropriate to engage a specialist records management consultant to assist in the process.

**Consultation:** Nil

**Financial Implications:** Unknown at this time

**Voting Requirement:** Simple Majority

**RESOLUTION:**                      **Moved: Karin Day**                      **Seconded: Wayne Della Bosca**

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**That the matter be referred to the Committee of Chief Executive Officers.**

**CARRIED**

**9.6 Renewal of Memorandum of Understanding between the Shire of Merredin, WEROC and the Shires of Cunderdin and Tammin for Visitor Servicing and Regional Promotion through the Central Wheatbelt Visitor Centre (Attachment)**

**Author:** Helen Westcott, Executive Officer

**Disclosure of Interest:** Nil

**Date:** 17 February 2020

**Attachments:** Memorandum of Understanding between the Shire of Merredin, WE-ROC and the Shires of Cunderdin and Tammin for Visitor Servicing and Regional Promotion through the Central Wheatbelt Visitor Centre

**RECOMMENDATION:**

**That WEROC Inc:**

- 1. Advise the Central Wheatbelt Visitor Centre of the recent changes in name and organisational structure; and**
- 2. Allocate sufficient funds in its 2020/2021 Budget for any subscription fees etc required as a signatory to the MOU.**

**Executive Officer Comment:**

WEROC considered ongoing joint participation in visitor servicing and regional promotion through the Central Wheatbelt Visitor Centre when it met on Wednesday 2 May 2018 at which time it resolved as shown below:

*RESOLUTION: Moved: Cr Day Seconded: Mr Griffiths*  
*That the Memorandum of Understanding between the Shire of Merredin, WE-ROC and the Shires of Cunderdin and Tammin for Visitor Servicing and Regional Promotion through the Central Wheatbelt Visitor Centre be approved for a three (3) year period.*

**CARRIED**

A copy of the Memorandum of Understanding (MOU) forms an attachment to the meeting agenda.

The MOU expires on 30 June 2021. It is therefore likely that a review of the MOU will take place in early 2021.

Until this time the WEROC Inc Board needs to ensure that there are sufficient funds allocated in its 2020/2021 Budget for any subscription fees etc required as a signatory to the MOU.

It would also be prudent for WEROC Inc to advise the Central Wheatbelt Visitor Centre of the change in the organisation's status, ie from a voluntary grouping of Councils to an incorporated body under the *Associations Incorporation Act 2015*.

**Consultation:** Nil

**Financial Implications:** Unknown at this time

**Voting Requirement:** Simple Majority

**RESOLUTION:**                      **Moved: Peter Clarke**                      **Seconded: Wayne Della Bosca**

---

**That WEROC Inc:**

- 1. Advise the Central Wheatbelt Visitor Centre of the recent changes in name and organisational structure; and**
- 2. Allocate sufficient funds in its 2020/2021 Budget for any subscription fees etc required as a signatory to the MOU.**

**CARRIED**

**9.7 Partnering Agreement for the Provision of Mutual Aid for Recovery during Emergencies (Attachment)**

**Author:** Helen Westcott, Executive Officer  
**Disclosure of Interest:** Nil  
**Date:** 17 February 2020  
**Attachments:** Partnering Agreement for the Provision of Mutual Aid for Recovery during Emergencies

**The matter is presented for discussion and consideration by the WEROC Inc Board.**

**Executive Officer Comment:**

In February last year the five Member Councils of WEROC signed a “Partnering Agreement for the Provision of Mutual Aid for Recovery during Emergencies”.

A copy of the agreement forms an attachment to the meeting agenda.

Whilst originally intended to have the agreement in place for three years it was determined that a year-long agreement would be best, with the expiration date chosen on the basis that a new governance structure for the organisation would be in place and any agreements currently in place could be reviewed in the 2019/2020 financial year ahead of the mutual aid agreement’s termination date (30 June 2020).

It is the Executive Officer’s view this MOU is now outside the direct involvement of the WEROC Inc Board and it has no role other than to bring the parties together to sign the MOU.

If the Board agrees with this view it must decide how it wishes to progress the MOU and more particularly its future given it expires on 30 June 2020.

**Consultation:** Nil  
**Financial Implications:** Unknown at this time  
**Voting Requirement:** Simple Majority

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**RESOLUTION:** **Moved: Peter Clarke** **Seconded: Stephen Strange**  
**That the matter be referred to the Committee of Chief Executive Officers.**

**CARRIED**

## 9.8 Wheatbelt Medical Students Immersion Project (WMSIP) (Attachments)

|                                |   |
|--------------------------------|---|
| <b>Author:</b>                 | Helen Westcott, Executive Officer   |
| <b>Disclosure of Interest:</b> | Nil   |
| <b>Date:</b>                   | 17 February 2020  |
| <b>Attachments:</b>            | Action Sheet from the WMSIP Meeting held Thursday 7 November 2019<br>Action Sheet from the WMSIP Meeting held Thursday 19 December 2019<br>2020 Transport Plan<br>Draft Town Itineraries<br>Staff Allocations |

### RECOMMENDATION:

**That the Executive Officer's report be received.**

### Executive Officer's Report:

At the WEROC Executive Meeting held Wednesday 13 April 2016 the Shire of Kellerberrin raised the issue of the cessation of visits to the Wheatbelt by first year medical students from the University of Notre Dame Australia's Fremantle Campus. At that time the Executive resolved as shown below:

*RESOLUTION: Moved: Raymond Griffiths Seconded: Greg Powell*

*That the Executive Officer prepare a report on the cessation of visits to the Wheatbelt by first year medical students from the University of Notre Dame Australia's Fremantle Campus.*

*CARRIED*

Following considerable effort, the program was introduced across all of WEROC's communities in March 2018, with medical students from Notre Dame and Curtin Universities participating in what has become known as the "Wheatbelt Medical Student Immersion Program" (WMSIP).

Agencies involved in re-establishing the WMSIP include:

- Rural Health West;
- WA Primary Health Network (WAPHA);
- Notre Dame University Australia;
- Curtin University; and
- WEROC.

A second group of students visited the region during the week commencing Monday 12 March 2019.

A third group of students will be visit during the week commencing Monday 9 March 2020, with students visiting the Shires of Bruce Rock, Kellerberrin, Merredin, Westonia and Yilgarn from Tuesday 10 March to Friday 13 March.

The 2020 visit marks the third and final group of students to visit under the current agreement between each of five local governments. A review of the program and its continuation will be undertaken later in the year.

Since the last meeting of WEROC Council in late November 2019 there have been a number of WMSIP Planning Group meetings, with meetings held on:

- Thursday 19 December 2019;
- Thursday 30 January 2020; and
- Friday 14 February 2020

## *WEROC Inc Board Meeting Wednesday 26 February 2020 - Minutes*

A team building day was also held at Curtin University on Monday 2 December 2019.

The action sheet from the meeting held in December forms an attachment to the meeting agenda, as does the action sheet from the Planning Group Meeting held Thursday 7 November 2019. An action sheet from the meeting held Thursday 30 January 2020 was not distributed and the action sheet from the meeting held Thursday Friday 14 February is not yet available.

A number of other documents are attached for Board members' information, including:

- Transport Plan;
- Draft Town Itineraries; and
- Staff Allocations.

Each of these documents was tabled at the Planning Group Meeting held Friday 14 February.

It should be noted that there will be a change in the academic staying in Westonia as Dr Andrew Harper is no longer able to participate in this year's visit program due to injuring himself in a recent accident.

Dr Harper will be replaced by Mr Keith McNaught, a Curtin academic. A replacement for Keith McNaught in Southern Cross has yet to be announced.

A further meeting of the WMSIP Planning Group is scheduled for Thursday 27 February.

**Consultation:** Nil

**Financial Implications:** WEROC Council adopted Budget for 2019/2020

**Voting Requirement:** Simple Majority

**Noted**

## 9.9 Curtin Wheatbelt Community Health Study (Attachment)

**Author:** Helen Westcott, Executive Officer  
**Disclosure of Interest:** Nil  
**Date:** 19 February 2020  
**Attachments:** Initial Report on "Curtin Wheatbelt Community Health Study"

**The matter is presented for discussion and decision by the WEROC Inc Board.**

### **Executive Officer's Report:**

As Board members are aware, WEROC Council funded a pilot research project undertaken by Dr Andrew Harper, Adjunct Clinical Professor at the Curtin Medical School in the second half of 2019, with the report on the project tabled at the WEROC Meeting held Thursday 28 November 2019.

Following consideration of the project report WEROC Council resolved as shown below.

**RESOLUTION:** *Moved: Cr Day* *Seconded: Cr Forsyth*  
*That WEROC agree to participate in any project that looks to extend the pilot study entitled "Curtin Wheatbelt Community Health Study: An exploratory research proposal" across all five WEROC Councils, utilising existing WEROC project funds to facilitate funding for the project.*

**CARRIED**

A copy of Dr Harper's report again forms an attachment to the meeting agenda.

An invitation for Dr Harper to meet and discuss with the Board the next phase of the project was extended for this meeting but due to the injuries he received in a recent accident he is unable to attend.

A report from Dr Harper will be tabled at the meeting. The report will assist the Board in determining whether any further action on this matter is required at this time.

**Consultation:** Nil  
**Financial Implications:** WEROC Council adopted Budget for 2019/2020  
**Voting Requirement:** Simple Majority

**RESOLUTION:** *Moved: Karin Day* *Seconded: Peter Clarke*  
*That the Executive Officer's report be noted and that Dr Harper be requested to arrange the next round of visits for the "Curtin Wheatbelt Community Health Study" so that they occur before or after seeding.*

**CARRIED**

## 9.10 Funding to Support and Mentor Local Governments to Assist in the Development of Public Health Plans

**Author:** Helen Westcott, Executive Officer

**Disclosure of Interest:** Nil

**Date:** 17 February 2020

**Attachments:** Nil

**The matter is presented for discussion and decision by the WEROC Inc Board.**

### **Executive Officer Comment:**

At the WEROC Executive Meeting held Wednesday 25 September 2019 it was resolved as shown below:

*RESOLUTION: Moved: Darren Mollenoyux Seconded: Greg Powell*

*That the WEROC Executive recommend to the WEROC Council that:*

- 1. WEROC write to the WA Local Government Association (WALGA) requesting that it prepare a local health plan template based on the Salaries and Allowances Tribunal four band classification model to assist in the preparation of local health plans that meet the needs of small rural and remote local governments; and*
- 2. If WALGA is unable to assist in preparing a template to assist in the preparation of local health plans WEROC look to creating its own template from which Member Councils can prepare individual local health plans.*

*CARRIED*

A request for WALGA to assist resulted in the WEROC Council being advised by the WALGA CEO, Mr Nick Sloan, that this assistance could not be provided.

This advice was received in time for the WEROC Council Meeting held Thursday 28 November 2019 at which time the Executive Officer advised that a draft should be available for consideration in early 2020.

In late January there was discussion between the Executive Officer and the WEROC CEOs as to whether preparation of a draft health plan should be delayed until after a regional health officers meeting in late February.

Whilst at the time it was agreed that work on the draft plan should continue, a further email suggesting a different course of action was received by the Executive Officer from the Shire of Bruce Rock on Tuesday 11 February. Darren Mollenoyux, the Shire's CEO forwarded an email from the Shire's Environmental Health Officer (EHO) suggesting another way in which development of a local health plan could be prepared. The text from the Shire's EHO is provided below:

*Hi Darren, spoke in length to Llew Withers who is X DoHWA (was my refence for the BK EHO Job). He now does public health plans for local governments and did a presentation for the Goldfields-Esperance LGs organised by Dave Haddon the EHO out there that was referenced in the email recently sent through. Llew is very aware of the eventual reporting requirements for a plan and focuses on what we already do without sticking your neck out. He is old school like John was but worked in State Government. What he says is in keeping with data used in city plans that I have read.*

*His plans read well and he undertakes the research of the local population which is essential given the stats we are getting off government do not paint a true picture. Its done in three stages. Working with the Public health Unit in Merredin to get those government stats.*



## WEROC Inc Board Meeting Wednesday 26 February 2020 - Minutes

*Llew said he would be willing to come up and give a '101' presentation at the next WEROC meeting or even just to our Council of what he does, what is expected and the best way forward given the State has deliberately given little to no guidance on this process or even funded it.*

*His presentation for Menzies, Leonora, Laverton and Wiluna went down well with Council Presidents and the CEOs of those Goldfields-Esperance LGs. After his talk they asked him to do theirs, he has also picked up Gnowangerup and a couple of others.*

*Is this a possibility for Llew to give a presentation given his dealings with smaller LGs and what he has found works best for?*

Darren Mollenoyux has asked if the matter could be listed for discussion to gain the view of other Board members regarding a presentation to the WEROC Inc Board by Llew Withers.

**Consultation:** Nil

**Financial Implications:** Unknown at this time

**Voting Requirement:** Simple Majority

**RESOLUTION:** Moved: Peter Clarke                      Seconded: Julie Flockart

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**That WEROC Inc extend an invitation to Mr Llew Withers to a future WEROC Inc Board Meeting.**

**CARRIED**

### 9.11 Records Management in Local Government (Attachment)

**Author:** Helen Westcott, Executive Officer

**Disclosure of Interest:** Nil

**Date:** 10 February 2020

**Attachments:** Wheatbelt East Regional Organisation of Councils Record Keeping Policies and Procedures Review of Member Councils - Summary Report Prepared by Information Enterprises Australia

**The matter is presented for discussion and decision by the WEROC Inc Board.**

#### **Executive Officer's Report:**

Following its review of the Western Australia's Auditor General report on the topic of records management in Local Government, the WEROC Executive resolved as shown when it met on Wednesday 29 May 2019:

*RESOLUTION: Moved: Greg Powell Seconded: Jamie Criddle*

*That the WEROC Executive recommend to the WEROC Council that WEROC seek quotations from suitably qualified records management consultants to undertake a review of Member Councils' recordkeeping policies and procedures to ensure they adequately support their respective Record Keeping Policies.*

*CARRIED*

Records management consultants Enterprises Australia Pty Ltd (IEA) were successful in obtaining the project. The project covered only four (4) of the five (5) WEROC Member Councils – the Shires of Kellerberrin, Merredin, Westonia and Yilgarn.

Just prior to the Christmas break IEA provided the Executive Officer with Council specific reports and a summary report. The Shires of Kellerberrin, Merredin, Westonia and Yilgarn each received a copy of their Council specific report and a copy of the summary report. The Shire of Bruce Rock received only a copy of the summary report.

A copy of the summary report forms an attachment to the meeting agenda.

At the time of distributing the reports, the Executive Officer sought feedback from each of the CEOs. Only the CEOs from Bruce Rock and Yilgarn provided comment.

The comments provided by Peter Clarke, CEO Shire of Yilgarn, received in an email on Tuesday 14 January 2020 are as follows:

*The Report/s do not surprise me and I thought that we would all be deficient in some, if not in all areas of Record Keeping. I believe that firstly WEROC should engage someone, and if not WEROC, the individual Councils, to develop compliant RKP's with appropriate Policies and Procedures as a start. Following the development of the RKP's, training be implemented for appropriate staff to adhere to the Plan, Procedures and Policies. In the past we have merely complied with the State Records Act by producing an RKP. Small LG's that don't have dedicated record keeping staff do find it difficult to comply and do the best that they can in respect to record management.*

Comments provided by Darren Mollenoyux, CEO Shire of Bruce Rock, on Thursday 23 January are as follows:

*Apologies for the delay in replying I was waiting to meet with other staff who are involved in this area and our person assisting in our review etc.*

*I have read through the summary report provided and there is probably nothing in there that surprises me and there are certainly some comparatives to what we identified through our processes via the Project Aware Program.*

*I think it boils down to what appetite there is from all Council's and the level of compliance that each Council wishes to achieve. Are we happy just meeting compliance? Are we happy to just tick the box? Do we want to be the best? What systems do we want to have electronically (who is switching from Synergy to Altus and when) How much money, time and resources does each Council have to commit to this?*

*I think unless we all employed a Records Management Officer, we would never meet the highest of levels but we certainly need to look at either a group or individual approach that will assist us in meeting the minimum.*

*I think there are some define benefits of doing some of the framework, policies, procedures and training opportunities together, however the major question is that what we have been made aware of and what the WEROC Report has reiterated is that the State Records Office new Framework is due out in early 2020, which could change our approach.*

*I am not convinced about a Regional Retention and Disposal Facility, however I think that is probably a discussion for another time as we have a long way to go to reach that point.*

*In regards to the Higher Level Monitoring and Record Keeping Service, again not sure where I sit on the matter we all obviously need support and assistance to some degree with moniting and training from how and from whom?*

*I think that it would be best to put this as an item to be discussed at the meeting, however perhaps we recommend that we write to the Director of State Records to seek clarification on the new Framework and the proposed timeframe for its release.*

The matter is presented for discussion and consideration by the WEROC Inc Board.

Should the Board decide to fund further work this project should be included in any discussions ahead of preparing the 2020/2021 WEROC Inc Budget.

**Consultation:** Nil  
**Financial Implications:** WEROC Council adopted Budget for 2019/2020  
**Voting Requirement:** Simple Majority

**RESOLUTION:** Moved: Wayne Della Bosca      Seconded: Kate Dudley

**That the matter be referred to the Committee of Chief Executive Officers.**

**CARRIED**

**9.12 Discussions and Decisions arising from WEROC Inc's Meeting with Ms Ana Farla, Account Manager Synergy**

**Author:** Helen Westcott, Executive Officer

**Disclosure of Interest:** Nil

**Date:** 17 February 2020

**Attachments:** Nil

**The matter is presented for discussion and decision by the WEROC Inc Board.**

**Executive Officer's Report:**

Following its discussions with Ana Farla, Account Manager Synergy it may be appropriate for the WEROC Inc Board to consider what, if any, further action is required on this issue.

**Consultation:** Nil

**Financial Implications:** Unknown at this time

**Voting Requirement:** Simple Majority

**Noted**

**9.13 Discussions and Decisions arising from WEROC Inc’s Meeting with Steve Mason, CEO Innovation Central Midlands WA Inc (ICM)**

**Author:** Helen Westcott, Executive Officer

**Disclosure of Interest:** Nil

**Date:** 17 February 2020

**Attachments:** Nil

**The matter is presented for discussion and decision by the WEROC Inc Board.**

**Executive Officer’s Report:**

Following its discussions with Steve Mason, CEO Innovation Central Midlands WA Inc (ICM) it may be appropriate for the WEROC Inc Board to consider what, if any, further action is required on this issue.

**Consultation:** Nil

**Financial Implications:** Unknown at this time

**Voting Requirement:** Simple Majority

**RESOLUTION:** **Moved: Karin Day** **Seconded: Julie Flockart**

**That WEROC Inc write to Innovation Central Midlands WA Inc seeking to have ongoing discussions around its renewable energy project.**

**CARRIED**

## 10. EMERGING ISSUES

### 10.1 Failure of Telecommunications Systems during Emergencies

The recent bushfires across Australia have highlighted the fragility of effective communications during emergencies and clearly articulated in an online ABC News article published on 13 January 2020. The article can be read by following the link shown below:

<https://www.abc.net.au/news/rural/2020-01-13/are-australias-telecommunication-up-to-the-new-kind-of-megafire/11860238>

Whilst it is noted that WALGA is working on this issue, the matter of loss of telecommunications during an emergency is a longstanding one for some communities in the Wheatbelt. The importance of the Wheatbelt, indeed all of regional Western Australia, being heard cannot be emphasised enough. It should be loud and clear that regional Western Australia should not be excluded from any funding made available to improve communications, both under normal circumstance and during emergencies.

The Executive Officer has recommended previously, without success, that in certain circumstances the assistance of political lobbyists should be sought for issues where normal actions have proved ineffective.

The use of a political lobbyist was pivotal in the Central East Aged Care Alliance Inc gaining access to the Minister for Regional Development in its efforts to retain funding for its aged housing project. It could be the same for this issue as well.

The Executive Officer believes that the WEROC Inc Board should investigate how a lobbyist might help ensuring that its communities are not deprived of funding to improve telecommunications during emergencies.

**Whilst there was no formal agreement as to future action on this matter, it was agreed that the matter continue to be listed for discussion at future WEROC Inc Board meetings.**

## 11. OTHER MATTERS

### 11.1 Regional Elector Member Training

Karin Day raised the issue of elected member training and enquired whether it may have been practical to undertake the training on a regional basis.

### 11.2 Container Deposit Scheme

Kate Dudley advised that the Shire of Kellerberrin had been successful in being appointed as an operator of a refund point for the new container deposit scheme which is due to commence on 2 June 2020. It is likely to cost about \$200,000 to set up a refund point but there may be an option to establish a mobile facility at a lesser cost of around \$60,000.

The Shire of Kellerberrin was looking to determine whether other Councils may have been interested in being part of the scheme.

**It was agreed to that the matter be referred to the Committee of Chief Executive Officers.**

**12. FUTURE MEETINGS**

Meetings of the WEROC Inc Board are covered by clause 15 of the WEROC Inc Constitution, which states:

15. PROCEDURES OF BOARD MEETINGS

15.1 Meetings

*The Board will, unless otherwise determined by WEROC in general meeting, meet at least four times a year, on a day that the Board determines from time to time. Special Board meetings may be convened by the Chair, or in their absence the Deputy Chair, or by any 4 other Board members.*

The Executive Officer believes it would be prudent for the WEROC Inc Board to set meeting dates for the balance of the 2020 calendar year.

**It was agreed that the next meeting would be following the Great Eastern Country Zone Meeting on Thursday 30 April 2020.**

**13. CLOSURE**

Prior to closing the meeting, the Chair noted that this was the last meeting for Helen Westcott and Bruce Wittber as Executive Officers for WEROC Inc. He extended WEROC Inc’s thanks and wished them well.

There being no further business the Chair closed the meeting at 4.43pm

DECLARATION

These minutes were confirmed by the WE-ROC Inc Board at the meeting held \_\_\_\_\_

Signed \_\_\_\_\_  
Person presiding at the meeting at which these minutes were confirmed

40TH PARLIAMENT



Economics and Industry Standing Committee

Report 8

TAKING CHARGE: WESTERN AUSTRALIA'S TRANSITION TO A  
DISTRIBUTED ENERGY FUTURE

*Final Report*

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Presented by  
Ms J.J. Shaw, MLA  
February 2020



## *Committee Members*

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|                 |   |
|-----------------|---|
| Chair           | Ms J.J. Shaw, MLA<br>Member for Swan Hills  |
| Deputy Chair    | Hon D.T Redman, MLA<br>Member for Warren-Blackwood  |
| Members         | Dr D.J. Honey, MLA<br>Member for Cottesloe<br>(from 28 November 2019)<br><br>Mr Y. Mubarakai, MLA<br>Member for Jandakot<br><br>Mr S.J. Price, MLA<br>Member for Forrestfield |
| Co-opted Member | Mr S.K. L'Estrange, MLA<br>Member for Churchlands<br>(Co-opted Member from 28 November 2019)<br>(Deputy Chair until 28 November 2019)   |

## *Committee Staff*

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|                            |   |
|----------------------------|---|
| Principal Research Officer | Ms Suzanne Veletta, LLB<br>(from 19 August 2019)<br><br>Dr David Worth, PhD, MBA<br>(until 23 August 2019)                |
| Research Officer           | Ms Franchesca Walker, BA (Hons), Dip (MPD)<br>(from 25 March 2019)<br><br>Mr Lachlan Gregory, BA<br>(until 22 March 2019) |

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## Economics and Industry Standing Committee

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# Taking Charge: Western Australia's transition to a distributed energy future

Inquiry into the emergence and impact of microgrids and  
associated technologies in Western Australia

*Final Report*

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Report No. 8

Presented by

**Ms J.J. Shaw, MLA**

Laid on the Table of the Legislative Assembly on 20 February 2020



## Chair's Foreword

Significant changes are underway in Western Australia's energy industry. More than any other State, we have embraced distributed energy technologies — particularly at the household level — and are now witnessing the most fundamental shift in our energy production model since electrification. Western Australian consumer's energy supply choices are challenging old industry structures, regulatory frameworks and market mechanisms.

The Interim Report for this inquiry noted the extraordinary pace of change, the extent of our world-leading innovation and the opportunities along the value chain arising from the emergence of microgrids and associated technologies. In the intervening period between the tabling of that document and this Final Report, change has continued unabated and a raft of new projects, policies and initiatives have commenced. The pace of change in the rapidly evolving energy sector has affected the nature and scope of the findings and recommendations in this report.

In March 2019, the State Government launched its *Energy Transformation Strategy* and a number of work streams are now underway, developing initiatives to support Western Australia's transition to a distributed energy future. In November 2019, the Government also introduced legislation to begin the process of energy market reform.

Due to the State Government's impressive progress on energy reform, this report is necessarily different to one the Committee would have written only a few months ago. For example, the Committee need no longer recommend that the Government develop a whole of system plan, as this initiative has been announced and a plan is being drafted. This Final Report therefore seeks to complement the work underway in the *Energy Transformation Strategy*.

The Committee has found that microgrids offer a range of potential benefits to Western Australia's power systems. Working in conjunction with traditional generation and network assets, microgrids can act as reliable, dispatchable energy resources; supply essential services to the system; and act as a load-shed or over-generation balancing resource. Microgrids and distributed energy resources (DER) can also reduce total system costs by deferring, reducing or entirely removing the need to invest in costly pole and wire replacement programs. Their ability to provide these benefits depends, however, on market and regulatory frameworks.

The interplay between the electricity system, market structures and regulatory frameworks is remarkably complex and is increasingly challenged by the emergence of microgrids and associated technologies. Western Australia's regulatory and market structures no longer reflect the physical realities of our electricity system and are not sending efficient signals for asset development and system operations. This affects total system costs and prices for end

users and, left unaddressed, could have long-term implications for system security and supply reliability.

A number of key themes emerged in the evidence to this inquiry. First, microgrids and associated technologies present a range of technical challenges. DER are having operational impacts on the system, causing traditional assets to operate differently and affecting electricity demand patterns. As penetration increases, system operations and optimisation will become heavily dependent on the operator's ability to see and control microgrids and DER. The Committee has recommended the introduction of a DER Register for the South West Interconnected System and is aware that this is currently under consideration as part of the *Energy Transformation Strategy*.

Smart meters and the telecommunications infrastructure required to access real-time data and control assets are also essential to support microgrids and facilitate the successful transition to distributed energy systems. They will be integral to the successful implementation of new retail products and services and can greatly assist consumers to understand and manage their energy requirements. The Committee notes that the Economic Regulation Authority prevented Western Power from recovering the costs of information and communications technology (ICT) associated with smart metering. The Committee considers that Government and regulatory agency support for advanced metering infrastructure is essential to evolve Western Australia's energy systems, facilitate system security and encourage efficient asset development and utilisation. It is vital that regulatory agencies allow network and system operators to innovate. The industry is no longer in 'business as usual' mode and a rigid, ultra-conservative approach to economic regulation will hinder our ability to harness the benefits offered by microgrids and DER.

The technical standards development and system-wide planning exercises underway as part of the *Energy Transformation Strategy* will also be vital to its success. The Committee is aware that the Minister for Energy will shortly release a 'DER Roadmap' under the auspices of the Strategy. Evidence to the Committee suggested a lack of clarity regarding the roles, functions and accountabilities between the system and network operators. The Committee considers it essential that the Minister for Energy address these concerns, and particularly clarify responsibility for system planning over the long term.

In terms of market and regulatory reform, it is important to note that no government has undertaken a significant, meaningful reform process to restructure markets or adapt regulatory frameworks since the Carpenter Government established the Wholesale Electricity Market in 2006. The emergence of microgrids and associated technologies presents the State Government with an opportunity to both facilitate new technologies and commercial models, and also address a range of long-standing structural issues in the market.

The overwhelming weight of evidence to this inquiry supports reform and urges action. There is also a high degree of consistency on the key principles that should underpin any reform process. The Committee observes that the *Energy Transformation Strategy's*

objectives are to maintain a secure and reliable electricity supply, ensure affordable electricity for households and businesses, reduce energy sector emissions, transition affected workers in the Collie region, and promote local jobs and growth. These are important and legitimate objectives.

A range of other core principles also emerged from the evidence. Witnesses considered that the policy framework must be flexible and capable of adapting and encouraging technological change over time and that energy policy should provide clear direction and certainty for industry. Energy solutions should also be selected on a technologically neutral, economically efficient and cost effective basis, with the private sector playing a key role in the energy supply chain. There was strong support for wholesale energy pricing and tariff reform, to promote more efficient and cost effective energy supply. Finally, a number of witnesses stressed the importance of appropriate licensing frameworks and consumer protections.

The Committee was encouraged to consider approaches that are measured, practical and deliverable. Witnesses stressed the importance of ensuring that the perfect is not the enemy of the good, and suggested that the State Government prioritise its reform program to shore-up system operations, deliver 'quick win' cost savings and then tackle more complex matters (particularly complex regulatory or market reforms) over the longer term.

Witnesses also emphasised the universal and essential nature of electricity supply, the many years of investment that Western Australians have made in the electricity system (both through their payment of electricity bills and State subsidies) and the need to ensure that the total benefits to the Western Australian community are considered, particularly when considering the role of the Government Trading Enterprises (GTEs). As our energy system transitions to a more distributed energy model, unless markets and regulatory frameworks are restructured appropriately, there is a risk that any benefits flowing from reform will be concentrated and not shared amongst all customers.

The Committee considers that these broad principals form a solid foundation for the progression of energy market reform in Western Australia. The evidence suggested four areas where policy, market or regulatory action would be beneficial:

- Roles: as microgrids and associated technologies continue to affect the Western Australian energy market, what are the roles for market participants, both now and in to the future?
- Rules: how could *Wholesale Electricity Market Rules* (WEM Rules) recognise and accommodate the changes triggered by microgrids and enable them to contribute towards more affordable and reliable electricity supply?
- Regulations: does the current electricity network regulatory regime help or hinder the evolution of microgrids and the evolution of the energy market?
- Rates: what role do network and retail prices play in the rollout of microgrids and associated technologies?

A range of witnesses to the inquiry identified issues surrounding the roles of the three GTEs, Western Power, Synergy and Horizon. The Committee observed that there is considerable scope for duplication and overlap between them, and received evidence that there may be inefficient duplication of effort. We have recommended that the Minister for Energy provide clear and unequivocal direction regarding the roles and accountabilities of the GTEs. We have noted that Western Australian taxpayers have invested considerably to develop capacity within the GTEs on microgrids and DER over many years — it is reasonable to expect that they exchange knowledge and collaborate in the interests of supplying all WA energy customers with the most cost-effective energy supply solutions.

Equally, it is vital that the space exists for the private sector to participate in energy markets. The private sector has demonstrated its capacity to innovate and supply a range of energy technologies and services. Partnerships between private providers and the GTEs to develop microgrids and supply DER have been very successful to date. We have observed that private sector participation could also facilitate access to finance for the deployment of microgrids and associated technologies, at a time when the State budget faces constraints and remains under repair. Significant opportunity also exists for the GTEs and the private sector to develop a Western Australian industry focussed on the delivery of microgrids and associated technologies. The Committee considers it essential that the GTEs' procurement processes drive the lowest possible cost for consumers, provide opportunity for private sector participation and ensure competitive pressures deliver cost-effective and efficient services.

Beyond partnering or participating in GTE procurement processes, there are a number of potential new business models that could emerge around microgrids and associated technologies. The Committee has discussed virtual power plants, blockchain technologies and community energy cooperatives in this report, but a range of other commercial opportunities exist — particularly associated with the provision of essential system services. The private sector has a vital role to play and competition between private sector entities in asset procurement and operations can drive considerably lower system costs, for the benefit of all Western Australians. It is vital that scope is provided for the private sector to operate assets to provide other market and system support services and that appropriate provisions are put in place to both facilitate this and prevent Western Power from inappropriately participating in the Wholesale Electricity Market.

The viability of any business — public or private — will depend on the signals sent through markets, and it is here that the market rules are material. Without accurate market signals, it will be extremely difficult to optimise the operation of new and traditional assets and ensure the efficient supply of essential system services. On the evidence presented to the Committee, it is obvious that electricity market price signals should align with system reliability and security requirements and that the price of electricity traded through Wholesale Electricity Market mechanisms should reflect the true costs of production.

However, the evidence to this inquiry has demonstrated that Western Australia's market structures are increasingly ill suited to the emerging distributed energy model. Market and

regulatory structures are sending inefficient, blunt signals and contain skewed incentives that drive uneconomic generation and network asset configuration and utilisation. This likely imposes a range of additional costs onto Western Australian taxpayers and electricity customers and over the longer term could present challenges to energy system security.

Electricity market reform is extremely complex, and the Committee has therefore chosen to limit its market rules discussion to three aspects that are relevant to microgrids and DER: the availability of essential system services; microgrid participation in market structures; and the role of battery technologies.

As microgrids and DER increasingly affect system operations, there is a clear need to ensure that mechanisms exist to procure the energy services essential to system security. The *Energy Transformation Strategy* recognises this fact and a number of important reforms are being developed. Proposed reforms intend to send efficient signals through the electricity market, encourage the entry of new technologies and market participants, whilst ensuring secure and reliable electricity supply. The forms of competition and market signals contemplated in the market reform proposals recognise the depth and scale of Western Australia's energy market. They create complex and/or real-time structures where the scale and depth of the Wholesale Electricity Market is sufficient to support them, but also allow for the incorporation of market forces into longer term central procurement processes, in instances where real-time or shorter term markets may lead to gaming, abuse of market power, or discourage the entry of more appropriate forms of new technology. Consistent with the view that markets should be technologically neutral, the Committee considers that market rules should allow microgrids to participate and notes that the Strategy is considering rule modifications to facilitate this.

Batteries are a particularly exciting technology associated with the emergence of microgrids. Grid-scale batteries are rapidly evolving and demonstrating their capacity to assist with secure and reliable system operations, complement renewable technologies and reduce both system-wide and consumer energy costs. Opportunities exist on both the transmission and distribution system and in a range of market and network contexts. Assets can be developed through partnerships between the GTEs and private sector, and as market reforms are introduced, opportunities also exist for discreet battery-based services from other market participants. The Committee has found that grid-scale batteries offer a range of benefits for both individual consumers and the whole energy system. They can help consumers to reduce energy costs by facilitating the storage and draw-down of photovoltaic (PV)-generated electricity and defer or reduce the need for traditional investments in the distribution network. Evidence suggested batteries can improve distribution system operations, particularly in areas with high household PV penetration and can also operate at the transmission level to provide a range of essential system services. At a grid-scale, batteries also provide economies of scale, are lower cost, more visible and easier to operate, for both system and network operators, than individual household-scale batteries. The State Government has announced a number of battery trials, including Australia's first trial of a



community battery in the established area of Ellenbrook, and has introduced legislative changes to facilitate wider-scale rollouts.

The Committee also considered the extent to which electricity network regulation operates to encourage microgrids and associated technologies. A number of witnesses observed that economic regulation currently acts as a barrier and does not incentivise efficient asset development or utilisation. Currently, strong regulatory signals exist to expand network assets, rather than consider alternative technologies. The Committee has recommended that the Minister for Energy ensure that reforms to the *Electricity Networks Access Code 2004* expand the role of incentive-based mechanisms, to encourage more cost-effective alternatives to traditional ‘poles and wire’ solutions.

Evidence also suggested that the administration of the regulatory process is problematic and the Regulator’s application of the framework is ‘ultra conservative’. The Committee agrees there is scope for better consultation and collaboration through the development of Access Arrangements and notes the genuine need, at this time of radical transformation, for more innovative approaches to network regulation that acknowledge the importance of investing in innovation, research and new technologies.

The price signals sent through electricity markets and regulatory frameworks operate to incentivise particular asset configurations and operations. The inquiry received a significant volume of evidence indicating that network and retail tariffs should be reviewed. Electricity tariff construction is complex. Debates around market reform can often lead to confusion, when network tariffs, consumer tariffs and the application of subsidies and tariff policies for particular market segments are poorly understood.

Witnesses to the inquiry frequently raised issues surrounding electricity ‘tariffs’, but maintained the vital distinction between ‘network tariffs’, which are set through network regulation processes, and ‘retail tariffs’, which are the prices offered to end users, set either by commercial negotiation (for contestable customers) or government policy (for a range of consumers, including small-use customers). Witnesses stated that network tariffs no longer incentivise efficient investment, and that retail tariffs for small use customers do not reflect the actual costs of electricity supply. They maintained that tariff reform — both network and retail — is essential if the full benefits of microgrids and associated technologies are to be passed on to consumers.

The Committee agrees that ‘time of use’ and locational pricing sent through network tariffs would provide signals about the impact of electricity consumption patterns and the costs of supply at particular points across the South West Interconnected System. More accurate signals would encourage more efficient asset use and development, encouraging microgrids and DER at specific points in the network where they can deliver greatest benefit. We have recommended that network tariff reform be included in the Energy Transformation Taskforce’s scope of works.

The situation is more complex with respect to retail tariffs. Successive Western Australian governments, of different political persuasions, have upheld the application of the Uniform Tariff Policy, whereby metropolitan and regional small use customers pay the same retail

tariff for electricity, irrespective of the actual supply cost. For decades, metropolitan energy consumers have subsidised the extremely high costs to serve customers in the regional areas of the South West Interconnected System and in Horizon Power's service area. To the extent that microgrids and associated technologies reduce electricity costs, the Uniform Tariff Policy will also operate to ensure that all Western Australian energy customers share these benefits.

The Committee received evidence that time-of-use electricity retail tariffs could influence electricity consumption, drive efficient asset utilisation and lower system-wide costs and notes Horizon Power's retail tariff trials. However, Horizon Power's trials were undertaken in areas with very different operational environments and demographic profiles to the South West Interconnected System. There were also unforeseen consumer impacts. Synergy's customers may respond differently to signals sent through alternative tariff structures. The Committee has recommended that the Minister for Energy direct Synergy to undertake tariff trials for small use customers, to determine whether signals sent through retail tariff structures would change consumer behaviours and promote more secure, reliable and affordable electricity supply in the South West Interconnected System.

A number of submissions to the inquiry commented on broader structural issues associated with the retail market, particularly retail contestability thresholds. Support for changes to contestability thresholds came from existing and potential private sector electricity retailers. Opposition centred on the impacts on regional customers and concerns about market structures and anti-competitive conduct.

A range of studies and publications over the past two years cast doubt over the benefits of full retail contestability in the National Electricity Market. They have highlighted the additional costs associated with retailing, such as duplicated overhead, call centres and advertising spend — all of which add little value to the actual production and delivery of electrons. A succession of studies have shown that end costs to National Electricity Market consumers are higher than the costs of electricity production, unlike Western Australia, where the cost of electricity to small use customers is currently below the actual cost of production.

This inquiry has received evidence emphasising the positives inherent in existing retail arrangements, particularly given the small scale of Western Australia's market. The Australian Energy Market Operator suggested that the focus should be on sending the right signals through the market to the owners of DER, including small use consumers, and fostering competition behind the meter, rather than altering contestability thresholds.

This Report and the Interim Report have identified a range of existing and future opportunities for private sector participation in Western Australia's electricity market, associated with microgrids. This inquiry has highlighted the benefits of competition at particular points in the energy value chain, where private sector participation in microgrids and associated technologies are driving lower costs, to the benefit of all users. Both reports have highlighted the need to avoid needless, inefficient duplication and overlap of effort and function.

The ability to capture the system-wide benefits offered by microgrids and associated technologies is not dependent on alterations to contestability thresholds and, based on the experience in the National Electricity Market, it is not clear that a reduction in thresholds will automatically deliver consumer benefits. There are a broad range of opportunities for the private sector to contribute to the delivery of a more secure, reliable, affordable and sustainable energy system, that can be delivered through the reforms discussed in this Report and the *Energy Transformation Strategy*.

Competition is an important driver of innovation and can promote efficient asset development and utilisation, lowering system wide costs and placing downward pressure on prices. It undoubtedly works at a number of points in the electricity supply chain and should be fostered. The east coast experience demonstrates, however, that it is highly questionable whether loading consumers up with the additional costs associated with retail advertising campaigns, call centres and other retail overheads actually contributes to a more secure, reliable, sustainable and — importantly — *affordable* energy system. The Federal Government has recognised issues in the National Electricity Market and is attempting to respond through its ‘Big Stick’ reform package.

Western Australia’s retail market is small. Any changes to contestability thresholds should only be introduced where it can be clearly and unequivocally demonstrated that this will place downward pressure on prices and deliver system-wide benefits that can be equitably shared.

Western Australia has a number of unique advantages over other Australian jurisdictions. Our physical and regulatory separation from the National Electricity Market provides the ability to reform market structures and regulatory processes to suit Western Australia’s specific circumstances. The Western Australian Government does not need to negotiate with the Commonwealth and State Governments for energy market reform. It can proceed, despite the energy and climate policy toxicity and dysfunction displayed at the Commonwealth level, and untrammelled by the need to negotiate with the competing interests and priorities of other State Governments. Western Australia can also observe the adverse consequences of elements of the National Electricity Market’s own reform processes, now manifest and increasingly acknowledged, and take prudent steps to avoid them. Moreover, the State’s ownership of the GTEs enables the Government to pursue broader public policy objectives and facilitate the changes underway in the sector, by directing the corporations’ activities and their forms of participation in energy markets.

Irrespective of the technical challenges, operational issues and complexities around regulation and market structures, microgrids and associated technologies are emerging because of consumer’s energy choices. The evidence consistently demonstrated that the changes underway in the energy industry are customer-driven. Whereas consumers tended previously to be passive end-users, increasingly people are taking control of their energy supply requirements, installing their own electricity generation and storage technologies.

An increasingly customer-centric energy system, however, raises a number of complex regulatory and policy challenges. Access to technologies is not equitable and energy poverty continues to challenge policy makers. Consumers may also be vulnerable to anti-competitive

conduct. Moreover, electricity is an inherently dangerous — indeed deadly — commodity that must be delivered safely to households and businesses.

The evidence to this inquiry demonstrates that socioeconomically disadvantaged households are less likely to be able to afford DER and reside in forms of housing that are less energy efficient. The social impacts of this inequitable access are significant, given that low income households tend also to consume more energy. Whilst recent electricity retail tariff increases have been limited to CPI, the significant rises over the past decade have had a negative impact on the cost of living and quality of life for vulnerable households and individuals. Electricity market reform is essential to support the transition to a more cost-effective and efficient energy system. However, reform should be accompanied by a wholesale review of the supports and concessions provided to vulnerable households, with the aim of alleviating energy poverty in Western Australia.

Beyond mechanisms specifically targeting microgrids and associated technologies, there are many other energy and housing policy initiatives that the State Government could consider as part of an overall strategy to alleviate energy poverty, including free or subsidised energy auditing; assistance for access to higher-cost, high-return energy efficient appliances; and assistance for owner-occupiers to invest in energy efficient home improvements. Much can be done to alleviate energy poverty by considering the homes that vulnerable people occupy. The Committee acknowledges the range of energy initiatives the State Government has introduced through social and affordable housing. We have recommended that the State Government instruct the Department of Communities to proactively identify and undertake energy efficiency improvements on public housing stock constructed prior to 2003, where it is practical and cost-effective to do so.

Beyond measures taken to assist the most vulnerable members of our community, all energy consumers require some degree of consumer protection. Electricity supply is surrounded by a complex web of energy-specific consumer protections — particularly for supply to small use customers — recognising the ‘essential service’ characteristic of electricity supply, its traditionally monopolistic industry structure, the significant disparity in bargaining power and sophistication between provider and customer, and the extreme danger inherent in energy supply. In the Committee’s view, microgrid operators should be subject to the State’s electricity licensing regime and required to ensure their customers have access to appropriate consumer protections.

The State Government should also ensure that customer voices are heard in energy policy processes and that they are aware of the significant changes underway in the electricity sector. The State Government’s introduction of specific funding to support energy consumer advocacy is a welcome step. Consumer support for the reforms required to facilitate change will be central to a successful transition to a more sustainable, affordable, secure and reliable model. The Committee has recommended that the State Government undertake a community engagement campaign, to explain the changes underway in the energy industry, communicate the need for reform, outline the benefits offered and seek consumer’s views on proposed changes.

Microgrids and associated technologies offer Western Australia a range of broader opportunities. First and foremost, as energy cost profiles shift and increasing volumes of renewable energy are delivered at low-to-zero marginal cost, there is an obvious opportunity to attract industries with complementary load profiles into the State. Although outside the scope of the current inquiry, the State Government could leverage the changing dynamics of our energy economy to encourage new industries, attract inbound capital investment and develop new employment opportunities.

There are also implications for our workforce. Whereas traditionally, electricity utility company's field workforces comprised power station workers operating large scale plant or linespeople who build and maintain poles and wires, the increasing volume of distributed renewable energy resources and associated complex ICT systems are changing the nature of work and the demand for traditional and new skills sets. The State Government and the GTEs have started to address the future skills and workforce transition requirements triggered by the emergence of microgrids and associated technologies. The Committee has recommended that the GTEs develop comprehensive workforce capability plans, aimed at building existing employee's skills and capabilities and appropriately recruiting new staff to develop, operate and maintain microgrids and distributed energy resources.

The people of Western Australia own highly valuable assets in the form of microgrid-related intellectual property and the delivery capability possessed by the GTEs. These valuable assets could be readily developed and marketed, in partnership with a range of private sector local companies and research institutions, providing the people of Western Australia with a direct return on the substantial investments they have made into the GTEs and academic institutions over many years. Demand exists, both in Australia and overseas, for microgrids and associated technologies. This demand is likely to increase considerably as neighbouring nations throughout the region develop and electrify their rural communities and adopt ambitious carbon-abatement and renewable energy policies. The intellectual property and delivery capability possessed by the GTEs could be commercialised and marketed into other jurisdictions, generating opportunities for a range of partner private companies that currently do not possess the requisite scale. This would provide the State with a return on its investment in microgrid technologies, generate commercial opportunities for Western Australian industry and deliver overall benefit to all Western Australians. Moreover, Western Australia could leverage its considerable knowledge and experience in microgrids and harness the technology, expertise, capability, and thought leadership of recognised energy and microgrid leaders through the establishment of an Advanced Microgrid Centre of Excellence.

Microgrids offer Western Australia the opportunity to benefit economically in terms of optimising our electricity systems and exporting our valuable intellectual property. The efficient deployment of microgrids and associated technologies can also reduce our carbon intensity. As nations around the world electrify, announce ambitious carbon reduction targets and demand more sustainable forms of electricity production, Western Australia has a demonstrated and world-leading capacity to meet the market. The opportunity exists to build a thriving industry, leveraging the knowledge and benefits gained through our own transition to a more sustainable energy economy.

The changes underway in Western Australia’s energy industry are significant. The evidence to this inquiry consistently demonstrates that, more than any other time, there is a need for government, its trading enterprises, industry, academia and the broader community to work together to understand and benefit from a distributed energy future.

Of all states and territories, Western Australia is uniquely positioned to take charge of its energy future. Our industry’s dynamism and independence from the National Electricity Market, coupled with our abundance of renewable resources, means we can develop and implement policies that encourage energy market outcomes for the public good: more efficient capital investment in our networks; a reconceptualization of value in network assets; a mix of technologies and fuel sources to optimise supply and manage risk; producing natural restraints on costs for consumers and placing downward pressure on prices.

Working in partnership, government and industry can deliver a more secure, reliable, affordable and sustainable electricity system. Together, we can create commercial opportunities that encourage innovation, new market entrants and new industries, whilst moving to a more sustainable energy economy and facing the challenges presented by climate change.

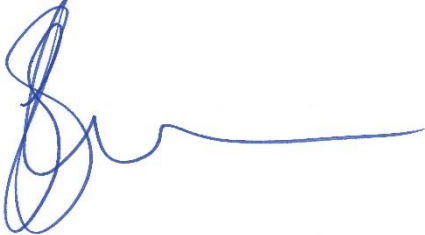
I would like to take this opportunity to acknowledge the contribution to this inquiry of my fellow committee members Deputy Chair, Hon. Terry Redman MLA; Dr David Honey MLA; Mr Yaz Mubarakai MLA; Mr Stephen Price MLA; and Mr Sean L’Estrange MLA, who remained with the Committee to finalise this Report.

This inquiry has been technically challenging and has involved some very complex and potentially sensitive issues. The level of collaboration and constructive engagement throughout this process has been remarkable. The production of a consensus report with findings and recommendations on a number of key issues will hopefully contribute to a constructive debate on Western Australia’s energy future.

The Committee has consulted widely throughout Western Australia and other jurisdictions for this inquiry. I would like to thank those organisations who have provided submissions and attended hearings. Special thanks go to those organisations who briefed us in Western Australia: the Australian Energy Market Operator and Western Power in Perth; Nickel West at its Kwinana refinery; and Horizon Power at its Carnarvon depot. I would particularly like to thank the 17 US agencies in San Francisco, Sacramento and New York who allowed their staff time away from their work to brief us for this inquiry.

I would like to acknowledge the contribution of Mr Matthew Bowen of Jackson McDonald Lawyers. The Committee engaged Mr Bowen at various points throughout the course of this inquiry, to provide advice on regulatory and market issues. His input to this inquiry was invaluable — all members benefitted greatly from his knowledge and insights and I greatly appreciated the ability to test ideas and concepts with him as the report developed.

Finally, I would also like to thank the Committee's Principal Research Officer, Dr David Worth, and Research Officer, Mr Lachlan Gregory for their assistance throughout the first phase of this inquiry. I particularly acknowledge Dr Worth's retirement at the end of a distinguished career in the public service. Thanks are also due to Ms Suzanne Veletta, the Committee's newly appointed Principal Research Officer and Ms Franchesca Walker, Research Officer, for their assistance in the final stages of this inquiry.

A handwritten signature in blue ink, consisting of a large, stylized initial 'S' followed by a long horizontal line.

MS J.J. SHAW, MLA  
CHAIR

# Contents

|  |           |
|--|-----------|
| Chair’s Foreword   | i         |
| Ministerial Response   | xvii      |
| Findings and Recommendations   | xix       |
| <br>   |           |
| <b>1 Introduction</b>  | <b>1</b>  |
| <hr/>  |           |
| An Inquiry in a time of change   | 1         |
| State Government action in 2019  | 2         |
| An Inquiry interrupted   | 4         |
| Committee consultation   | 4         |
| The Final Report   | 5         |
| <br>   |           |
| <b>2 The Characteristics of Electricity and Benefits of Microgrids</b> | <b>7</b>  |
| <hr/>  |           |
| The physical properties of electricity and system dynamics             | 7         |
| Operability attributes   | 8         |
| Dispatchability  | 8         |
| Predictability   | 9         |
| Technical attributes   | 10        |
| Resource adequacy  | 11        |
| Frequency management   | 12        |
| Voltage management   | 12        |
| System strength  | 12        |
| System restoration   | 12        |
| The potential benefits of microgrids and associated technologies       | 13        |
| Electricity supply risk  | 14        |
| Grid support services  | 14        |
| Network capacity   | 15        |
| Bushfire readiness and extreme weather event response                  | 16        |
| Success will depend on technical and regulatory change                 | 17        |
| <br>   |           |
| <b>3 A Complex Regulatory Environment</b>                              | <b>19</b> |
| <hr/>  |           |
| Western Australia’s unique regulatory context                          | 19        |



|  |    |
|--|----|
| Electricity Industry Act 2004  | 20 |
| Electricity Corporations Act 2005  | 21 |
| Electricity Networks Access Code 2004  | 23 |
| Electricity licensing  | 26 |
| Consumer protection  | 27 |
| Electricity pricing  | 28 |
| Participants, actors and stakeholders  | 29 |
| The Regulator  | 29 |
| The Operators  | 30 |
| The Suppliers  | 31 |
| New Market Participants  | 32 |
| Consumers and ‘prosumers’  | 33 |
| Large consumers — greater than 160MWh per annum  | 33 |
| Small-use contestable consumers — from 50 to 160MWh per annum                                | 33 |
| Franchise customers  | 33 |
| Rural and ‘fringe of grid’ consumers   | 33 |
| ‘Prosumers’  | 33 |
| Vulnerable consumers   | 34 |
| The State Government   | 34 |
| <br>   |    |
| 4     The Interplay between Systems, Markets and Economic Regulation                         | 35 |
| <hr/>  |    |
| The Wholesale Electricity Market   | 35 |
| The history of the Wholesale Electricity Market  | 35 |
| The Wholesale Electricity Market objectives  | 36 |
| The Wholesale Electricity Market Rules and structure   | 36 |
| A system in transition   | 39 |
| Changing demand patterns: the Duck Curve   | 39 |
| Traditional asset performance and market behaviours  | 40 |
| Does the Wholesale Electricity Market provide economic incentives to ensure system security? | 42 |
| Economic regulation and network access pricing   | 45 |
| Frameworks and structures are not reflecting market changes                                  | 46 |
| Western Australia’s unique advantages  | 46 |

|   |  |     |
|---|--|-----|
| 5 | Technical and Operational Factors  | 49  |
|   | Emerging operational challenges  | 49  |
|   | Microgrid and distributed energy resource visibility and control             | 49  |
|   | Distributed energy resource registration                                     | 52  |
|   | Advanced metering infrastructure   | 53  |
|   | Technical rules and standards  | 56  |
|   | Whole of system planning   | 58  |
|   | Planning in the South West Interconnected System                             | 61  |
|   | DER Roadmap  | 64  |
|   | Ensuring system security   | 66  |
| 6 | Policy, Market and Regulatory Reform   | 69  |
|   | General principles   | 70  |
|   | Market roles   | 73  |
|   | The Government Trading Enterprises   | 73  |
|   | New business models and private sector participation                         | 83  |
|   | Creating the space for cost-effective solutions                              | 94  |
|   | Market rules   | 96  |
|   | Essential system services  | 98  |
|   | Participation of microgrids technologies in the Wholesale Electricity Market | 101 |
|   | Battery technologies   | 103 |
|   | Other market issues  | 110 |
|   | Network regulation   | 111 |
|   | Network regulation as a barrier  | 111 |
|   | Administrative and cultural issues?  | 116 |
|   | Electricity rates  | 119 |
|   | Network tariffs  | 120 |
|   | Retail tariffs   | 127 |
| 7 | Customers  | 137 |
|   | Energy poverty in Western Australia  | 137 |
|   | Increasing cost of living pressures  | 140 |
|   | The role of smart technologies   | 143 |

|  |     |
|--|-----|
| Recent State Government initiatives  | 145 |
| Other mechanisms to address energy poverty   | 146 |
| Consumer protection  | 148 |
| Supplier of Last Resort obligations  | 151 |
| Current licensing requirements   | 153 |
| Energy safety  | 157 |
| Listening to customer voices: engagement and consultation                            | 158 |
| A consumer voice in the policy process?  | 159 |
| Community consultation at the fringes of the grid                                    | 161 |
| Retailer engagement  | 163 |
| Consumer education   | 165 |
| <br>   |     |
| 8 Broader Opportunities  | 167 |
| <hr/>  |     |
| ‘Zero cost energy’: an economic opportunity  | 167 |
| Opportunities for workforce development  | 168 |
| Showcasing, developing and profiting from Western Australia’s microgrid capabilities | 172 |
| Sustainable energy production and climate change                                     | 178 |
| Taking charge of our energy future   | 179 |
| <br>   |     |
| Appendices   | 181 |
| <hr/>  |     |
| 1 Committee’s functions and powers   | 181 |
| 2 Inquiry terms of reference   | 183 |
| 3 Submissions received   | 185 |
| 4 Briefings  | 187 |
| 5 Public hearings  | 191 |
| 6 Closed hearing   | 197 |
| 7 Required system services and technologies to provide them                          | 199 |
| 8 Glossary   | 201 |

## **Ministerial Response**

In accordance with Standing Order 277(1) of the Standing Orders of the Legislative Assembly, the Economics and Industry Standing Committee directs that the Premier, Minister for Energy and Minister for Housing report to the Assembly as to the action, if any, proposed to be taken by the Government with respect to the recommendations of the Committee.



# Findings and Recommendations

## Chapter 2 – The Characteristics of Electricity and Benefits of Microgrids

### Finding 1

Page 15

Microgrids and associated technologies have the potential to offer a range of benefits to Western Australia’s power systems. They can act as a reliable, dispatchable energy resource; supply ancillary and essential system services to the system; and act as a load-shed or over-generation balancing resource.

### Finding 2

Page 15

Microgrids and distributed energy resources can reduce total system costs by deferring, reducing or entirely removing the need to invest in costly pole and wire replacement programs. In regional and remote communities, this often also leads to improved supply reliability and power quality.

### Finding 3

Page 16

Microgrids have an important role to play in bushfire mitigation, incident management and post-event recovery. They can considerably enhance a community’s individual resilience and ability to respond to a range of natural disasters, particularly in remote and regional areas of Western Australia.

## Chapter 3 – A Complex Regulatory Environment

### Finding 4

Page 23

Under the *Electricity Corporations Act 2005*, the three electricity Government Trading Enterprises (Western Power, Synergy and Horizon Power) are empowered to operate and maintain a broad range of assets potentially within the same class and footprint, provide ancillary services, provide services to one another under regulation and act to develop commercial opportunities. There is considerable scope for duplication, overlap and competition between them.

### Finding 5

Page 25

Currently, the services and revenue structures developed through the *Electricity Networks Access Code 2004* reflect the traditional industry model, where electricity is generated centrally and transported to distant customers. The *Electricity Networks Access Code 2004* processes send direct signals into the electricity market regarding the location, configuration and operation of energy assets, and can thereby encourage or discourage particular asset configuration and operational outcomes.

### Finding 6

Page 34

Through its policy, licensing and regulatory functions, asset ownership and control, and range of commercial and customer relationships, the State Government has a crucial role to play in the development of microgrids and roll-out of distributed energy resources.

## Chapter 4 – The Interplay between Systems, Markets and Economic Regulation

### Finding 7

Page 38

While there is a market for some Load Following Ancillary Services in the South West Interconnected System, markets do not currently exist for a range of other essential energy services.

### Finding 8

Page 39

The Wholesale Electricity Market in the South West Interconnected System was designed to reflect the traditional electricity production and consumption model. It did not contemplate the emergence of microgrids and distributed energy resources.

### Finding 9

Page 42

Distributed energy resources are having an operational impact on the power system, causing traditional generation assets to operate differently. There may be effects on the value and operating costs of traditional assets that are not recoverable through existing market structures.

### Finding 10

Page 42

Microgrids and distributed energy resources are affecting electricity demand patterns, system operations and the participation of traditional generators in the electricity market. Left unaddressed, these changes may increase inefficiencies and costs in the electricity market.

### Finding 11

Page 45

Traditional synchronous thermal generation assets provide a range of system support services that have an increasing importance and inherent value to the electricity system. The value and costs of these system support services are often not realisable through existing market structures.

### Finding 12

Page 45

Whilst the Wholesale Electricity Market may not currently operate to ensure the most economically efficient provision of system services, the Australian Energy Market Operator can intervene through non-market processes to ensure the supply of direct and indirect system services and maintain supply security.

### Finding 13

Page 45

Electricity market price signals should align with system reliability and security requirements. The price of electricity traded through the various Wholesale Electricity Market mechanisms should reflect the true costs of production.

### Finding 14

Page 46

Western Australia's regulatory and market structures no longer reflect the physical realities of Western Australia's electricity system and may not operate to send the most efficient signals for asset development and system operations.

**Finding 15****Page 48**

Western Australia's physical and regulatory separation from the National Electricity Market is a unique and advantageous feature, providing it with the ability to reform its market structures and regulatory processes to suit its specific circumstances. Moreover, State ownership of the Government Trading Enterprises (Western Power, Synergy and Horizon Power) enables the Government to pursue public policy objectives and facilitate the changes underway in the sector, by directing the corporations' activities and their forms of participation in energy markets.

**Chapter 5 – Technical and Operational Factors****Finding 16****Page 51**

Microgrids and some classes of distributed energy resources must be visible and controllable to system and network operators. This will support system security and maximise power system efficiencies.

**Finding 17****Page 51**

The Australian Energy Market Operator does not currently have visibility or control of microgrids or distributed energy resources at the sub-transmission level on the South West Interconnected System.

**Recommendation 1****Page 52**

The Minister for Energy introduce regulatory changes to provide system and network operators with appropriate levels of sub-transmission visibility and the authority to control microgrids and associated technologies, to support the operational stability of the South West Interconnected System.

**Finding 18****Page 53**

A Distributed Energy Register has been established for the National Electricity Market, imposing an obligation on network service providers to provide technical information about small scale generation and battery assets.

**Recommendation 2****Page 53**

The Minister for Energy introduce a Distributed Energy Resources Register for the South West Interconnected System.

**Finding 19****Page 55**

Smart meters, and the telecommunications infrastructure required to access real-time data and control assets, are essential to support microgrids and facilitate the successful transition to distributed energy systems. They will also be integral to the successful implementation of new retail products and services and can greatly assist consumers to understand and manage their energy requirements.



**Finding 20****Page 55**

Decisions made by the Economic Regulation Authority have prevented Western Power from recovering the installation costs for the advanced metering infrastructure essential to support microgrids and facilitate the successful transition to distributed energy systems.

**Finding 21****Page 56**

Government and regulatory agency support for advanced metering infrastructure is essential to evolve Western Australia's energy systems, facilitate system security and encourage efficient asset development and utilisation.

**Finding 22****Page 58**

Common technical standards for grid connected equipment are integral to the development of microgrids and management of distributed energy resources.

**Finding 23****Page 62**

System-wide planning is essential to ensure long term reliable, secure, sustainable and affordable energy supply, facilitate the emergence of microgrids and transition towards a distributed energy future.

**Finding 24****Page 63**

A system-wide plan for the South West Interconnected System will provide a strong evidentiary base for energy policy development in Western Australia and should inform future market and regulatory reforms aimed at promoting secure, reliable, sustainable and affordable energy supply.

**Finding 25****Page 64**

Based on the evidence presented to the Committee, it is not clear that the Whole of System Plan for the South West Interconnected System will specifically consider the implications that microgrids might have for the development of the system.

**Recommendation 3****Page 64**

The Minister for Energy instruct the Energy Transformation Taskforce to specifically address the role of microgrids in the Whole of System Plan.

**Finding 26****Page 66**

Based on the evidence presented to the Committee, it is not clear whether the DER Roadmap for the South West Interconnected System will specifically consider the role of microgrids as a discreet form of distributed energy resource.

**Recommendation 4****Page 66**

The Minister for Energy instruct the Energy Transformation Taskforce to specifically address any issues associated with the development of microgrids, as part of the DER Roadmap.

**Finding 27****Page 67**

Although the increasing penetration of distributed energy resources presents both operational and technical challenges on the South West Interconnected System, the Australian Energy Market Operator possesses sufficient powers to ensure secure and reliable system operations.

**Chapter 6 – Policy, Market and Regulatory Reform****Finding 28****Page 79**

If passed, the *Electricity Industry Amendment Bill 2019* will enable Western Power to operate stand-alone power systems and distribution-connected batteries as an adjunct to its network operator function in the South West Interconnected System.

**Recommendation 5****Page 80**

The Minister for Energy should provide clear and unequivocal direction to Synergy and Western Power regarding their roles and accountabilities and ensure that there is not overlap or duplication of effort between them with respect to the development of microgrids and associated technologies. This is consistent with Western Power's role as a network asset operator and Synergy's retail function.

**Finding 29****Page 80**

Horizon Power has led the market in developing microgrids and associated technologies and is well-positioned to transfer knowledge to Western Power. Closer collaboration between these two publicly-owned entities on the development of microgrids and associated technologies could deliver considerable benefit to Western Australian tax payers and electricity customers.

**Recommendation 6****Page 81**

The Minister for Energy consider formalising a mechanism for knowledge transfer and collaboration between Western Power, Synergy and Horizon Power for the development of microgrids and associated technologies.

**Finding 30****Page 82**

The Energy Transformation Taskforce is a temporarily-appointed entity tasked with developing the first Whole of System Plan, in conjunction with the Australian Energy Market Operator and Western Power. No announcement has yet been made about longer term responsibility for the system planning function in the South West Interconnected System.

**Recommendation 7****Page 83**

The Minister for Energy ensure that the Energy Transformation Strategy clarifies the roles and accountabilities of the Australian Energy Market Operator and Western Power and delivers a structure for long term accountability for Whole of System Planning in the South West Interconnected System.

**Finding 31****Page 85**

Partnerships between private providers and the Government Trading Enterprises could leverage private sector finance for the deployment of microgrids and associated technologies. Significant opportunity also exists for the Government Trading Enterprises and the private sector to develop a Western Australian industry focussed on the delivery of microgrids and associated technologies.

**Finding 32****Page 86**

In February 2019, the State Government sent a clear signal into the energy market that it supports partnerships between the Government Trading Enterprises and the private sector, with the procurement model to deliver the first round of the stand-alone power system rollout.

**Finding 33****Page 93**

Whilst there are a range of potential new business models arising from the emergence of microgrids and associated technologies, some technologies are in trial phase and some proposed business models rely on existing inadequate market and regulatory frameworks that do not send cost-reflective, efficient signals.

**Finding 34****Page 96**

Western Power has a vital role in leading the technical and operational deployment of microgrids and associated technologies in the South West Interconnected System. However, its procurement processes must drive the lowest possible cost for consumers, provide opportunity for private sector participation and ensure competitive pressures deliver cost-effective and efficient services.

**Finding 35****Page 96**

The Government has indicated that the passage of the *Electricity Industry Amendment Bill 2019* would trigger amendments to Western Power's procurement and business case development frameworks and the Access Arrangement process under the *Electricity Networks Access Code 2004*, to ensure that third party solutions are considered for the provision of microgrids and associated technologies.

**Finding 36****Page 101**

The proposed changes to essential system service procurement in the Wholesale Electricity Market are intended to send more efficient signals through the electricity market, encourage the entry of new technologies and market participants, whilst ensuring secure and reliable electricity supply.

**Finding 37****Page 103**

The Energy Transformation Strategy will consider modifications to Wholesale Electricity Market structures to facilitate new technologies, including microgrids.

**Finding 38****Page 106**

Grid Scale batteries offer a range of benefits for both individual consumers and the whole energy system. They can:

- help consumers to reduce energy costs by facilitating the storage and draw-down of photovoltaic (PV)-generated electricity;
- defer or reduce the need for traditional investments in the distribution network;
- improve distribution system operations, particularly in areas with high household PV penetration;
- operate at the transmission level to provide a range of essential system services; and
- provide economies of scale, are lower cost, more visible and easier to operate, for both system and network operators, than individual household-scale batteries.

**Finding 39****Page 108**

The Energy Transformation Strategy, particularly through the Whole of System Plan and DER Roadmap, contemplates the integration of battery technologies in the South West Interconnected System, Wholesale Electricity Market and across the State. The Strategy intends to facilitate battery technologies to contribute to the delivery of more secure, reliable, affordable and sustainable energy supply.

**Finding 40****Page 109**

It is appropriate that the proposed reforms with respect to storage devices contained in the *Electricity Industry Amendment Act 2019*:

- limit Western Power to providing network services and installing batteries in response to an identified need in its primary network; and
- not allow Western Power to use battery technologies to participate in the Wholesale Electricity Market.

**Finding 41****Page 110**

The Energy Transformation Strategy's proposed amendments for the provision of essential system services — in particular, those that encourage technologically neutral service definitions and create new markets — foster a range of commercial opportunities for other market participants to deploy and commercialise battery technologies. The Government Trading Enterprises have also partnered with the private sector to deploy batteries across the State.

**Finding 42****Page 111**

The Energy Transformation Strategy has a broad range of activities aimed at reforming the Wholesale Electricity Market. The work completed through the Energy Transformation Taskforce will enable new technologies to participate more fully in Western Australia's electricity supply and ensure essential system security services are provided at the lowest sustainable cost.

**Finding 43****Page 114**

The current regulatory framework governing electricity networks in Western Australia acts as a barrier to the development of microgrids and associated technologies and no longer incentivises the most efficient development and utilisation of network assets.

**Finding 44****Page 116**

The Energy Transformation Strategy intends to amend the *Electricity Networks Access Code 2004*.

**Recommendation 8****Page 116**

The Minister for Energy ensure that reforms to the *Electricity Networks Access Code 2004* expand the role of incentive-based mechanisms to ensure that assets are developed and operated on a technologically neutral basis, driven by overall cost efficiency.

**Recommendation 9****Page 118**

The Minister for Energy ensure that a revised *Electricity Networks Access Code 2004* will require the Economic Regulation Authority to consider the need to facilitate innovation, research, and development of new technologies when approving Access Arrangements for covered networks.

**Recommendation 10****Page 118**

The Minister for Energy ensure that a revised *Electricity Networks Access Code 2004* provides mechanisms that would promote a more collaborative approach to developing Access Arrangements, aimed at ongoing issues identification and resolution.

**Finding 45****Page 123**

Time of use and locational pricing sent through network tariffs would provide signals about the impact of electricity consumption patterns and the costs of supply at particular points across the South West Interconnected System.

More accurate signals would encourage more efficient asset use and development, encouraging microgrids and distributed energy resources at specific points in the network where they can deliver greatest benefit.

**Recommendation 11****Page 123**

The Minister for Energy direct the Energy Transformation Taskforce, in conjunction with Western Power, to include network tariff reform as part of its scope of work.

**Finding 46****Page 125**

Changes may be required to capital contribution policies developed under the *Electricity Networks Access Code 2004* to ensure that unnecessary excess capacity is avoided and microgrids and associated technologies are not unfairly disadvantaged.

**Finding 47****Page 127**

The continued growth of microgrids and associated technologies will require innovative, progressive approaches to network regulation and tariff setting, to ensure that the costs and benefits are equitably distributed.

**Finding 48****Page 129**

The Uniform Tariff Policy ensures that Synergy and Horizon Power's small use customers pay the same retail electricity tariff. Through this policy, metropolitan customers have cross-subsidised the high cost of electricity supply to regional areas for decades.

To the extent that microgrids and associated technologies reduce electricity costs, the Uniform Tariff Policy will also operate to ensure that all Western Australian energy customers share these benefits equitably.

**Finding 49****Page 131**

Electricity retail tariffs that incorporate time-of-use signals have the potential to influence consumer choices regarding electricity consumption and could drive more efficient asset utilisation and lower system-wide costs.

**Finding 50****Page 131**

Horizon Power's retail tariff trials were undertaken in areas with very different operational environments and demographic profiles to the South West Interconnected System. Synergy's customers may respond differently to signals sent through alternative tariff structures.

**Recommendation 12****Page 132**

The Minister for Energy direct Synergy to undertake tariff trials for small use customers to determine whether signals sent through retail tariff structures would change consumer behaviours and promote more secure, reliable and affordable electricity supply in the South West Interconnected System.

**Finding 51****Page 135**

The ability to capture the system-wide benefits offered by microgrids and associated technologies is not dependent on alterations to contestability thresholds. Any changes to contestability thresholds should only be introduced where it can be clearly and unequivocally demonstrated to deliver system-wide benefits that can be equitably shared.

**Chapter 7 – Customers****Finding 52****Page 140**

Access to distributed energy resources and other energy saving technologies is not equitable. Socioeconomically disadvantaged households are less likely to be able to afford distributed energy resources and reside in forms of housing that are less energy efficient. The social impacts of this inequitable access are significant, given that low income households tend also to consume more energy.

**Finding 53****Page 141**

Whilst recent electricity retail tariff increases have been limited, the significant rises over the past decade have had a negative impact on the cost of living and quality of life for vulnerable households and individuals.

**Finding 54****Page 143**

There are a range of alternative retail tariff structures (including those that have been trialled in Horizon Power's microgrids), but some may render vulnerable households liable to peak pricing, with limited ability to reduce their exposure. Certain electricity retail tariff structures and real-time signals may also result in unintended behavioural outcomes, or be ineffective in assisting vulnerable customers to manage their electricity use.

**Finding 55****Page 143**

Electricity market reform is essential to support the transition to a more cost-effective and efficient energy system. However, reform should be accompanied by a wholesale review of the supports and concessions provided to vulnerable households, with the aim of alleviating energy poverty in Western Australia.

**Recommendation 13****Page 143**

The Minister for Energy consult with other relevant Ministers to ensure that any electricity market reform process is accompanied by a review of the supports and concessions provided to vulnerable households with respect to electricity supply.

**Finding 56****Page 145**

'Smart technologies' can assist with system and household-level energy optimisation, but are not a complete answer to energy poverty in Western Australia.

**Finding 57****Page 146**

The State Government is trialling a series of innovative programs to understand how it can use new housing projects, regional development initiatives, microgrid and associated technologies to alleviate cost of living pressures for vulnerable households.

**Finding 58****Page 147**

Beyond mechanisms specifically targeting microgrids and associated technologies, there are many other energy and housing policy initiatives that the State Government could consider as part of an overall strategy to alleviate energy poverty, including free or subsidised energy auditing; assistance for access to higher-cost, high-return energy efficient appliances; and assistance for owner-occupiers to invest in energy efficient home improvements.

**Recommendation 14****Page 147**

The Minister for Housing instruct the Department of Communities, as part of its general property condition assessment and management processes, to proactively identify and undertake energy efficiency improvements on public housing stock constructed prior to 2003, where it is practical and cost-effective to do so.

**Finding 59****Page 151**

Microgrid operators should be subject to the State's electricity licensing regime and required to ensure their customers have access to appropriate consumer protections.

**Finding 60****Page 153**

Supplier of Last Resort provisions are an integral part of electricity supply regimes. The State Government should urgently address the appropriate application of Supplier of Last Resort provisions to microgrids in the South West Interconnected System.

**Recommendation 15****Page 153**

The Minister for Energy ensure that appropriate Supplier of Last Resort provisions extend to relevant customers in new microgrid-based business models in the South West Interconnected System.

**Finding 61****Page 154**

The recently announced review of the regulatory framework for retail electricity licensing and exemption activities will be vital to ensure that customers maintain access to appropriate consumer protections. Given that the current framework is unsuitable and there may be significant changes to current licensing structures following the review, it is appropriate that the Minister for Energy halts the consideration of exemption applications.

**Recommendation 16****Page 156**

The Minister for Energy avoid an approach to electricity licensing based on exemptions for new business models and instead introduce a new class of licence, aimed at facilitating new business models, whilst achieving appropriate consumer protections, social and economic policy outcomes.

As a minimum, licensing arrangements for new business models should ensure that consumers in relevant classes retain access to:

- the Energy and Water Ombudsman;
- supply based on Economic Regulation Authority approved contracts;
- supply provided under regulated tariffs, fees and charges;
- access concessions;
- coverage afforded under the *Code of Conduct for the Supply of Electricity to Small Use Customers 2018*;
- guaranteed access for life support customers; and
- the obligation for the retailer to supply electricity.



**Finding 62****Page 157**

Given their position in the market and existing licensing obligations to ensure consumer protections, any review of the regulatory framework for retail electricity licensing and exemption activities should not prevent the Government Trading Enterprises (Western Power, Synergy and Horizon) from continuing to pursue the opportunities offered by microgrids and associated technologies, including through partnerships with private sector entities.

**Recommendation 17****Page 158**

The Minister for Energy review the operation and funding of the energy safety inspection function to ensure:

- that consumers supplied through microgrids enjoy the same level of protection as traditionally supplied customers; and
- the costs of any alterations to inspection or safety regimes are appropriately recovered from 'causers' and not inappropriately cross-subsidised.

**Finding 63****Page 161**

It is vital that consumer voices are heard in the development of energy policy. The State Government's introduction of specific funding to support energy consumer advocacy is a welcome step. However, any consultation on the DER Roadmap must specifically provide for small use customer engagement.

**Finding 64****Page 161**

Consumer behaviours are driving the changes underway in Western Australia's energy industry. Their awareness of and support for the reforms required to facilitate change will be central to a successful transition to a more sustainable, affordable, secure and reliable model.

**Recommendation 18****Page 161**

The Minister for Energy undertake a community engagement campaign, as part of the Energy Transformation Strategy and the market reform process, to explain the changes underway in the energy industry and the need for reform, outline the benefits offered and seek consumer's views on proposed changes.

**Finding 65****Page 163**

Specific consultation and consent processes may be required when individual communities are identified as viable candidates for microgrid solutions, particularly in regional areas at the fringes of the South West Interconnected System.

**Finding 66****Page 164**

The Government Trading Enterprises (Western Power, Synergy and Horizon) play a key role in engaging small use customers to understand, respond and advocate for their needs and support the energy sector's transition towards a distributed energy future.

**Finding 67****Page 166**

Consumer education can enable customers to benefit from the opportunities offered by microgrids and associated technologies. Whilst some education is undertaken through the Government Trading Enterprises (Western Power, Synergy and Horizon Power), there is scope for a more proactive campaign — particularly for vulnerable customers.

**Chapter 8 – Broader Opportunities****Finding 68****Page 171**

The Government Trading Enterprises have begun addressing the future skills and workforce transition requirements triggered by the emergence of microgrids and associated technologies.

**Recommendation 19****Page 171**

The Minister for Energy ensure that the Government Trading Enterprises have comprehensive workforce capability plans, aimed at building existing employee’s skills and capabilities and appropriately recruiting new staff to develop, operate and maintain microgrids and distributed energy resources.

**Finding 69****Page 174**

Demand exists, both in Australia and overseas, for microgrids and associated technologies. This demand is likely to increase considerably as neighbouring nations throughout the region develop and electrify their rural communities and adopt ambitious carbon-abatement and renewable energy policies.

**Finding 70****Page 174**

The intellectual property and delivery capability possessed by the Government Trading Enterprises could be commercialised and marketed into other jurisdictions, generating opportunities for a range of partner private companies that currently do not possess the requisite scale. This would provide the State with a return on its investment in microgrid technologies, generate commercial opportunities for Western Australian Industry and deliver overall benefit to all Western Australians.

**Recommendation 20****Page 174**

The relevant Minister develop a strategy to commercialise and maximise the value delivered to Western Australia, arising from the intellectual property and microgrid delivery capability developed in the Government Trading Enterprises.

The commercialisation strategy should identify target interstate and overseas markets — particularly in India and South East Asia — and specifically consider ways to partner with the private sector to deliver scale and generate additional growth opportunities.

**Finding 71****Page 178**

Western Australia could leverage its considerable knowledge and experience in microgrids and harness the technology, expertise, capability, and thought leadership of recognised energy and microgrid leaders through the establishment of an Advanced Microgrid Centre of Excellence.

**Recommendation 21****Page 178**

The relevant Minister investigate the establishment of a Centre of Excellence for Advanced Microgrids in Western Australia, to coordinate research and development, intellectual property commercialisation, and new skills development.

**Finding 72****Page 179**

In addition to system optimisation benefits, microgrids and associated technologies have a vital role to play in reducing the carbon intensity of electricity systems, assisting communities to adapt and mitigating the impacts of climate change.

**Finding 73****Page 179**

Microgrid technologies offer Western Australia new opportunities to build a thriving export industry, leveraging the knowledge and benefits gained through our own transition to a more sustainable energy economy.

# Chapter 1

## Introduction

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**Technological change in the energy sector is happening at a rapid pace worldwide. In Western Australia, we're blessed with world-class solar and wind resources, abundant gas supply, a wealth of battery metals, and a highly skilled workforce. We have a genuine opportunity to lead the way in establishing a cleaner, brighter and more resilient energy supply for decades to come.**

Hon Bill Johnston MLA, Minister for Energy<sup>1</sup>

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### **An Inquiry in a time of change**

On 21 February 2018, the Economics and Industry Standing Committee commenced its inquiry to investigate and report on the emergence and impact of microgrids and associated technologies in Western Australia (Inquiry).

This Final Report concludes Phase Two of the Inquiry. The Committee's *Implications of a Distributed Energy Future: Interim Report*, tabled on 11 April 2019 (Interim Report),<sup>2</sup> concluded Phase One of the Inquiry.

The Interim Report provides context and background to this Final Report, including information on Western Australia's current electricity framework, the network challenges of the South West Interconnected System (SWIS), and the development and deployment of microgrids and distributed energy resources (DER) across Western Australia.

The Inquiry's Terms of Reference (see Appendix Two) capture a range of matters related to the emergence and impact of electricity microgrids and associated technologies in Western Australia. This includes stand-alone power systems (SAPS), DER, electric drive vehicles (EVs) and the State's lithium mining and future battery industry. The Interim Report canvassed the potential benefits and opportunities presented by these technologies, EVs and the rapid growth in the State's lithium mining industry. The Interim Report provided a snap shot of the above as at early 2019.

The pace of change in Western Australia's energy sector is extraordinary. In a remarkably short period of time, microgrids and DER (in particular, solar photovoltaic (PV) panels) have moved from being marginal technologies to being a key part of our energy mix, fundamentally changing the way we produce and consume electricity. As Western Power noted, Western Australia's 'future electricity network will look very different to how it has historically ... and we must now look at solutions outside of traditional network

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1 Hon Bill Johnston MLA, Minister for Energy, [McGowan Government launches Energy Transformation strategy](#), media release, 6 March 2019.

2 Economics and Industry Standing Committee, [Implications of a Distributed Energy Future: Interim Report](#), April 2019.

investments'.<sup>3</sup> Industry warmly welcomed this Inquiry, appreciating the spotlight being placed on the opportunities presented by innovative technologies and an evolving energy sector.

While only a few years ago microgrids and DER were more marginal topics of discussion in political discourse, today governments are responding to the challenges and opportunities presented by these new technologies. For example, at the Commonwealth level, in October 2019 the Morrison Government launched a \$50 million fund to support the development of off-grid and fringe-of-grid SAPS around Australia.<sup>4</sup>

### **State Government action in 2019**

State Government action in 2019 reflects the pace of change in the energy sector. Western Australia is seizing the opportunity to plan and deliver a new energy future.

In March 2019, the State Government launched its *Energy Transformation Strategy: A brighter energy future*<sup>5</sup> (Energy Transformation Strategy). The Energy Transformation Strategy is the Government's work program to ensure the delivery of secure, reliable, sustainable and affordable electricity to Western Australians for years to come.<sup>6</sup> The reasons for energy reform noted in the Energy Transformation Strategy reflect a number of findings in the Interim Report.

The Energy Transformation Strategy aims to improve the way Western Australia plans and accesses the power system, while embracing new generation technologies and storage systems.<sup>7</sup> Microgrids are an element of this energy reform, as is resolving how to regulate to send the right signals to the market to harness DER.<sup>8</sup>

The Energy Transformation Taskforce (Taskforce), established in May 2019, is responsible for delivering the Energy Transformation Strategy. The Taskforce is supported by Energy Policy WA, a sub-department of the Department of Mines, Industry Regulation and Safety established in September 2019.<sup>9</sup> The Taskforce is responsible for delivering a two year program of work across three interrelated areas:

- whole of system planning;
- DER — a DER Roadmap is being delivered; and

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3 Submission 4, Western Power, p. 1.

4 Hon Angus Taylor MP, Minister for Energy and Emissions Reduction, Australian Government, *Call for community microgrid feasibility studies*, media statement, 11 October 2019.

5 Government of Western Australia, Department of Treasury, *Energy Transformation Strategy: A brighter energy future*, 2019.

6 Energy Policy WA, *Energy Transformation Strategy*, accessed 17 October 2019, <[www.wa.gov.au/organisation/energy-policy-wa/energy-transformation-strategy](http://www.wa.gov.au/organisation/energy-policy-wa/energy-transformation-strategy)>.

7 Department of Treasury, *Energy Transformation Strategy: A brighter energy future*, 2019, p. 2, Foreword by Hon Bill Johnston MLA, Minister for Energy.

8 See Mr Stephen Edwell, Chair, Energy Transformation Taskforce, *Transcript of Evidence*, 8 November 2019, pp. 1, 10.

9 The Energy Transformation Implementation Unit, overseen by Energy Policy WA, supports the Taskforce. The Public Utilities Office no longer exists.

- foundation regulatory frameworks — improving access to the SWIS and delivering the future power system.

The Taskforce and Energy Policy WA, working with the Australian Energy Market Operator (AEMO), Western Power and other stakeholders, are developing plans and roadmaps at a fast pace. The Taskforce delivered the DER Roadmap to the Minister for Energy, Hon Bill Johnston MLA, for his consideration in late December 2019. The Whole of System Plan (WOSP) will be reported to the Minister in around October 2020.<sup>10</sup>

Energy reform will involve legislative change. For example, the Government recently tabled the *Electricity Industry Amendment Bill 2019*.<sup>11</sup> This Bill amends the *Electricity Industry Act 2004* to implement reforms relating to SAPS and electricity storage, and reforms to the regulation of the electricity network in the Pilbara.

Further detail on the Energy Transformation Strategy and its delivery is provided in Chapters Four, Five, Six and Seven.

The energy sector is complex. Its reform to enable and manage the transition to microgrids and DER involves resolving a number of often interdependent regulatory and technical issues. The Government's reform agenda includes critical changes to network connection and market arrangements to improve access to the SWIS, and technical changes such as implementing advance metering to improve the visibility of network operations.

Despite the level of detail involved in delivering energy reform, Mr Stephen Edwell, Chair of the Taskforce, advised the Committee that:

We should never lose sight of the fact, in my view, that what we are on about is keeping electricity costs low for consumers. It is all about, in my view, reliable power at low cost.<sup>12</sup>

The Committee endorses that view. The consumer-oriented energy future is further discussed in Chapter Seven of this Final Report.

As noted in the Interim Report, the Committee is of the view that given the significant operational, consumer and economic development potential posed by microgrids and DER, it is vital that Western Australia does all it can to ensure that these technologies bring lower power prices to consumers and maximise economic development opportunities, while providing high levels of security, reliability and consumer protection to Western Australians.<sup>13</sup>

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10 Mr Stephen Edwell, Energy Transformation Taskforce, *Transcript of Evidence*, 8 November 2019, pp. 1, 10.

11 *Electricity Industry Amendment Bill 2019*, tabled in the Legislative Assembly on 27 November 2019.

12 *ibid.*, p. 11.

13 Economics and Industry Standing Committee, *Implications of a Distributed Energy Future: Interim Report*, April 2019, pp. 6, 90.

## **An Inquiry interrupted**

Phase Two of the Inquiry was interrupted by the Committee's Inquiry into Short-Stay Accommodation (Short-Stay Inquiry). This was not the straight-forward, short inquiry anticipated. The Short Stay Inquiry, which commenced on 1 November 2018, was finalised on 29 September 2019 when the Committee tabled its report, *Levelling the Playing Field: Managing the impact of the rapid increase in Short-Term Rentals in Western Australia*.

The Short-Stay Inquiry generated a record number of submissions for any Inquiry completed by the Committee since 2000, with the Committee receiving 278 submissions and 14 supplementary submissions. To investigate the complex issues raised, the Committee conducted 31 hearings with 62 witnesses and four deposition sessions with 28 witnesses in Perth and Margaret River between October 2018 and June 2019.

The Committee also commenced an inquiry into Western Australia's economic relationship with the Republic of India (India Inquiry) on 15 August 2019. The timing of the India Inquiry enabled the Committee to obtain evidence from witnesses in 2019 while the Committee finalised the Inquiry into microgrids and associated technologies. It also allows the Committee to conduct hearings and complete the India Inquiry in 2020, the last sitting year of this 40<sup>th</sup> Parliament.

## **Committee consultation**

The Inquiry into microgrids and associated technologies generated interest from a diverse range of stakeholders. The Committee received 41 submissions and nine supplementary submissions. Submissions received during both phases of the Inquiry are noted at Appendix Three.

During Phase One of the Inquiry, the Committee held eight briefings with 14 witnesses (see Appendix Four), 23 public hearings with 48 witnesses (see Appendix Five), and a closed hearing with Tesla Motors Australia Pty Ltd. Public hearings were held in Perth and Carnarvon, and hearings were held via videoconference with interstate witnesses.

During Phase Two of the Inquiry the Committee focused on the market and regulatory aspects of energy reform. In August 2018, the Committee invited key stakeholders to provide a further submission specifically addressing factors that may inhibit the take-up of microgrids and DER, including regulatory or technical issues. The Committee received ten submissions during Phase Two of the Inquiry.<sup>14</sup>

In October and November 2018, the Committee held a second round of hearings with a range of key stakeholders focusing what could be done to overcome the existing barriers to the greater uptake of microgrids and DER. The Committee heard from 14 stakeholder organisations and 33 witnesses (see Appendix Five), including:

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<sup>14</sup> The nine supplementary submissions noted as an A or B submission in Appendix Three, and the submission from the Australian Energy Market Commission (submission 36).

- key government agencies — the (then) Public Utilities Office, AEMO, Australian Energy Council (AEC), the Australian Energy Market Commission (AEMC) and Australian Energy Regulator;
- the three Western Australian energy sector Government Trading Enterprises — Western Power, Synergy and Horizon Power (GTEs);
- private sector industry participants — ATCO Australia and Perth Energy; and
- industry participants with a focus on sustainable and renewable energy — Tersum Energy and Power Ledger.

In September 2018, the Committee travelled to California and New York to be briefed on new and innovative regulatory approaches to support microgrid technologies in these jurisdictions.

The Committee held briefings with 17 agencies and 39 witnesses in San Francisco, Sacramento and New York (see Appendix Four). It was useful to travel to California and New York given their different regulatory approaches to the technical and regulatory challenges presented by a move towards microgrids. The evidence obtained from leading experts in this field added to the Committee's understanding of what may be achieved in Western Australia and how to achieve a greater uptake of DER.

In November 2019, the Committee held a public hearing with Mr Stephen Edwell, Chair of the Taskforce, and Ms Kate Ryan, Acting Executive Director of Energy Policy WA and a Member of the Taskforce, to update the Committee on the progress of the Energy Transformation Strategy and clarify aspects of energy reform in Western Australia.

Transcripts of all public hearings are available on the Committee's website at <https://bit.ly/2qM2IAh>.

The Committee thanks all stakeholders who made a submission to the Inquiry or appeared as a witness before the Committee. Your contribution to the Inquiry is appreciated.

## **The Final Report**

This Final Report canvasses the complex regulatory and market frameworks in the energy sector, the challenges, barriers and enablers to expanding microgrids and DER, and related policy matters.

This Final Report makes findings and recommendations for the Taskforce and Government to consider as part of its energy reform process.

The pace of change in the rapidly evolving energy sector has impacted on the nature and scope of the findings and recommendations in this report. Due to the progress made towards energy reform, this report is necessarily different to one the Committee would have written only a few months ago. For example, the Committee need no longer recommend that the Government develop a whole of system plan, as this initiative has been announced and a plan is being drafted.



The Final Report is divided into two parts.

Chapters Two to Five provide context to findings and recommendations in later chapters.

They canvass:

- the characteristics of electricity and benefits of microgrids;
- the complex regulatory environment of the energy sector;
- the interplay between systems, markets and economic regulation in the sector; and
- technical and operational factors relevant to energy reform.

Chapters Six to Eight set out the Committee's views on:

- policy market and regulatory reform;
- the consumer-oriented energy future and the pivotal needs and role of consumers in this new energy world; and
- the broader opportunities of energy reform including 'zero cost energy', opportunities for workforce development, and moving towards sustainable energy production.

## Chapter 2

# The Characteristics of Electricity and Benefits of Microgrids

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**While the power system is being transformed, the laws of physics that determine electrical flows do not change. To maintain a secure and reliable system, a range of interdependent technical and operational needs must be met at all times.**

Australian Energy Market Operator<sup>15</sup>

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### The physical properties of electricity and system dynamics

The Interim Report for this Inquiry provided an overview of the basic features of electricity systems. A more comprehensive discussion about the role of microgrids and associated technologies requires a greater level of detail regarding the physical properties of electricity, an understanding of system dynamics and an outline of the role that these technologies can play in Western Australia's evolving energy industry.

As outlined in the Interim Report, in traditional power systems, electricity is produced by large thermal generators and then transported along transmission and distribution networks, to largely passive end users.

The Australian Energy Market Operator (AEMO) notes that power systems worldwide are being transformed from systems dominated by large thermal power stations, to systems that include a multitude of power generation resources and technologies of various sizes. Consumers are also engaging with their electricity supply in new ways. This 'energy transformation' involves a move from:

- homogenous to diverse supply resources;
- synchronous to non-synchronous generation;
- a centralised to a decentralised system; and
- passive to active consumers.<sup>16</sup>

These trends all act to increase the variability of the power system, presenting challenges to system operations.

Power systems are extremely complex and dynamic. The physical properties of electricity dictate that connected assets constantly interact with one another and can instantaneously affect each other. Power system operations therefore involve a 'continuum of decisions'.

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<sup>15</sup> Australian Energy Market Operator, [Power System Requirements](#), March 2018, p. 4.

<sup>16</sup> *ibid.*

Operators need to know what is happening in real time, and anticipate what is likely to occur, from seconds through to decades ahead. Power system operation requires the continuous matching of supply with demand and the constant provision of essential voltage and frequency management services, ensuring sufficient reserves so the system is robust enough to cope with unexpected events and will stay within the system's operational design limits.<sup>17</sup>

Power system operators require two key elements to provide a secure, reliable supply of electricity: operability and a set of technical attributes *and* the essential services needed to maintain them.

### **Operability attributes**

Electricity is produced and consumed instantaneously — ideally, at all times in a power system, electricity supply ('generation') and demand ('load') should be in balance.

There are millions of 'loads' connected to power systems, including households, small and medium businesses and large scale industrial facilities. The vast majority of loads do not have visibility of the system, have very little knowledge of power system fundamentals and cannot be centrally controlled by the system operator.

However, these issues have not traditionally existed with respect to generation assets. Electricity generators have traditionally been large scale thermal units, operated by highly skilled power system technicians and engineers. They can be centrally controlled and can provide a range of essential energy management services to the power system. They have therefore been key to maintaining power system stability.

### **Dispatchability**

At the most fundamental level, power system operations (on any scale) depend on the central operator's ability to manage electricity production and configure power system services. Operators use the term 'dispatch' to describe the instructions they issue to generators to produce electricity at a certain output. The first prerequisite of operability is therefore '**dispatchability of the power system** [emphasis added].'<sup>18</sup>

Dispatchability depends on 'controllability' and traditional thermal generation assets are the most 'controllable' generation asset class. Increasingly, system operators can also call on some types of 'dispatchable loads' to reduce their consumption and some types of batteries to store excess energy. Equally, there are other types of generation that are less controllable by a central operator, such as wind turbines and large scale solar photovoltaic (PV) and other types that are completely uncontrollable by a central operator, such as small scale solar PV systems (as discussed in the Interim Report). AEMO notes 'rooftop PV simply feeds any surplus energy into the grid, irrespective of the needs of the power system at the time.'<sup>19</sup>

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17 *ibid.*

18 *ibid.*, p. 5.

19 *ibid.*, p. 6.

Operators also need to know that, when called upon, assets can be relied upon to perform as instructed. This is referred to as 'firmness'. An operator's knowledge of the firmness of the portfolio of resources allows them to efficiently and effectively orchestrate the balance of supply and demand in real time and identify the need for new investment in the future. It also allows operators to understand how much reserve capacity they need to respond to system events.<sup>20</sup>

The system must also be flexible and able to respond to rapid changes in supply and demand. An asset's flexibility is determined by the extent to which its output can be adjusted and by:

- its speed of response to a signal to start up and shut down;
- the rate at which it can 'ramp up' or 'ramp down' to meet demand; and
- its operational range (i.e. does it have a minimum operating level? What is its maximum output?).

### **Predictability**

Operators also need to know what is happening on the system at any point in time, and anticipate what is likely to happen. They require the ability to:

- measure or derive accurate data on energy demand, power system flows, and generation output across numerous timeframes, as key inputs into planning and operational decision making; and
- forecast upcoming power system conditions and have confidence in how the system will perform.<sup>21</sup>

The second prerequisite for power system operability is therefore '**predictability of the power system** [emphasis added].'<sup>22</sup> AEMO observes that 'historically, demand followed a predictable pattern, and supply was dispatched to meet demand. This is no longer the case, because both supply and demand are affected by a more diverse range of factors'.<sup>23</sup> AEMO lists weather patterns and the increased penetration of rooftop solar PV systems as factors affecting predictability.<sup>24</sup>

AEMO notes that, in order to ensure the effective, efficient planning and operation of the electricity system, both power system and network operators (i.e. itself, Western Power and Horizon Power in Western Australia) must be able to:

- measure power system security and stability in real time;
- accurately forecast demand and variable generation;

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20 *ibid.*

21 *ibid.*, p. 5.

22 *ibid.*

23 *ibid.*, p. 7.

24 *ibid.*

- model economically efficient solutions to power system congestion;
- quantify the behaviour of the power system when it is subjected to disturbances, and therefore the level of system services required to keep the system secure and reliable to defined system performance standards and place limitations on network transfer capability;
- determine suitable performance standards for generation and loads intending to connect to the network, defining how generation must perform under different system conditions; and
- ensure the necessary power system services are provided in real time.<sup>25</sup>

Chapter Four describes how Western Australia’s Wholesale Electricity Market (WEM) ensures ‘Operability.’

### Technical attributes

Power systems also require certain technical attributes in order to operate reliably, as outlined in Table 2.1. This section does not intend to go into great detail regarding the physical properties of each technical attribute. Rather, it aims to identify their importance to power system operations. Chapter Four will discuss how existing market and regulatory structures facilitate their provision and the impact microgrids and associated technologies are having on them.<sup>26</sup> More detailed information on technical attributes is available in AEMO’s *Power System Requirements*.

**Table 2.1: Technical attributes of the power system and the services required to deliver them<sup>27</sup>**

| System attribute and section of report where addressed   | Requirement  | Service(s) needed to meet requirement   |
|--|--|---|
| <b>Resource adequacy and capability</b><br>• There is a sufficient overall portfolio of energy resources to continuously achieve the real-time balancing of supply and demand. | Provision of sufficient supply to match demand from consumers            | Bulk energy<br>Strategic reserves   |
|  | Capability to respond to large continuing changes in energy requirements | Operating reserves  |
|  | Network transport capability   | Transmission and distribution services  |
|  |  |   |
| <b>Frequency management</b><br>• Ability to set and maintain system frequency within acceptable limits.  | Ability to set frequency   | Grid formation  |
|  | Frequency within limits  | Inertial response<br>Primary frequency control<br>Secondary frequency control<br>Tertiary frequency control |
| <b>Voltage management</b><br>• Ability to maintain voltages on the network within acceptable limits. (See Section 3.3)   | Voltage within limits  | Slow response voltage control<br>Fast response voltage control  |
|  |  | <b>System strength</b>  |
| <b>System restoration</b><br>• Ability to restart and restore the system in the unlikely event of a major supply disruption.   | Ability to restore the system  | System restart services   |

<sup>25</sup> *ibid.*, p. 8.

<sup>26</sup> *ibid.*, p. 9.

<sup>27</sup> *ibid.*

### Resource adequacy

Resource adequacy is primarily dependent on having a sufficient portfolio of resources available to balance supply and demand. It requires both real-time management and long-term planning and depends upon having a mix of generation capacity, demand response and sufficient network capacity.

Resource adequacy also requires a consideration of the need for ‘spare’ capacity to respond to particular events, such as the outage of a major power station on the system or major fluctuations in loads. Table 2.2 provides an overview of the key attributes of resource adequacy and capability requirements and resources.<sup>28</sup>

**Table 2.2: Overview of resource adequacy and capability requirements and services<sup>29</sup>**

| Requirement   | Description   |
|---|---|
| <b>Provision of sufficient supply to match demand from consumers</b>            | <ul style="list-style-type: none"> <li>Capacity adequacy – ability of the energy resource mix to achieve balance at a single point in time. The most onerous requirements are typically:                             <ul style="list-style-type: none"> <li>– <b>Maximum demand</b> conditions – highest plausible system demand, even if it occurs infrequently<sup>10</sup>.</li> <li>– Rare dispatch conditions – outside the norm for the given time of year and time of day. Examples include: periods of low variable renewable generation during a particularly warm or cold night, when demand is high; and periods when a key energy resource is unavailable or has reduced capability, such as the extended outage of an interconnection to a neighbouring region, or gas supply disruptions.</li> </ul> </li> <li>Energy adequacy – ability of the energy resource mix to achieve balance over a period of time. This includes fuel source adequacy (having enough capacity to meet energy balancing needs over the longer term, typically over a season or year).</li> </ul>  |
| <b>Capability to respond to large continuing changes in energy requirements</b> | The overall generation supply mix must have sufficient flexibility to ensure the power system can respond to significant changes in energy requirements over a wide range of time periods. Sufficient flexible capability is necessary to continue to balance supply and demand over these periods.   |
| <b>Network transport capability</b>   | <p>The ability to deliver sufficient power to consumers when and where it is required. This includes provision of sufficient network services. Well-planned transmission networks<sup>11</sup> contribute to resource adequacy by enabling the dispatch of a geographically diverse range of energy sources, allowing:</p> <ul style="list-style-type: none"> <li>• Access to the best quality fuel resources and economic dispatch of low-cost resources, which can be constrained by network congestion.</li> <li>• Guarding against disruptions that might impact the price or availability of any one resource, especially critical during long-term, unplanned outages of large generation units.</li> <li>• Firming of the overall, aggregated output of disperse variable resources, reducing dependence on potentially more expensive generators with firm and flexible capabilities.</li> </ul> <p>Power transfer across the network must be within the secure <b>technical envelope</b> of the system. Flows can be constrained to maintain power system security. Provision of security services can, therefore, improve network transport capability.</p> |

In the South West Interconnected System (SWIS), the WEM operates to procure many of these services, but importantly, and as AEMO notes ‘in some cases, there is no current framework for procuring the relevant service, as historically these services have been provided as a by-product of sufficient size of in-service synchronous generators’ or traditional, thermal generation plant.<sup>30</sup> In regional microgrids, Horizon Power is responsible for ensuring their provision in the systems it operates.

28 *ibid.*, p. 10.

29 *ibid.*

30 *ibid.*, p. 9.

## Frequency management

The electricity system must be operated at a frequency of 50 hertz (Hz). Frequency rises when network supply is greater than demand at an instant in time, and falls when supply is less than demand. Frequency services are needed in order to inject electricity into the system or remove power from the grid, in order to restore balance. There are a number of different types of frequency services, outlined in Table 2.3. The WEM procures some (but importantly, not all) of these services in the SWIS. Horizon Power is responsible for providing them on the systems it operates.

**Table 2.3: Overview of frequency management services<sup>31</sup>**

| Service                            | Description  |
|------------------------------------|--|
| <b>Grid formation</b>              | Ability to set the frequency to which the rest of the system is able to be synchronised.   |
| <b>Inertial response</b>           | A rapid and automatic injection of energy to suppress rapid frequency deviations, slowing the rate of change of frequency.   |
| <b>Primary frequency control</b>   | <b>Active power<sup>A</sup></b> controls act in a proportional manner to respond quickly to measured changes in local frequency and arrest deviations.   |
| <b>Secondary frequency control</b> | Automatic generation controls and manual dispatch commands act to restore frequency to 50 Hz and relieve providers of primary frequency control.   |
| <b>Tertiary frequency control</b>  | Active power controls, such as the start-up of new units or set point changes on already operating units, act to replace depleted secondary frequency control resources to ensure the system continues to remain within its normal operating band. |

A. Instantaneous rate at which electrical energy is consumed, generated, or transmitted.

## Voltage management

Electricity systems must also be maintained at a particular voltage. Voltage is a complex concept, but is managed through balancing the production or absorption of reactive power.<sup>32</sup> Reactive power is sourced from generation and network assets located across the network. The WEM does not have a discreet market to assist in maintaining voltage.

## System strength

AEMO refers to ‘system strength’ as a suite of interrelated factors that together contribute to power system stability, or its ability to return to a stable operating condition following a physical disturbance.<sup>33</sup> It is primarily dependent on protection equipment and the presence of sufficient generation assets on the system that can support system synchronisation.

Power systems also rely on the provision of inertia, also traditionally sourced from thermal generation assets.<sup>34</sup> There is currently not a discreet market for inertia in Western Australia.

## System restoration

Sometimes (albeit rarely) major system disturbances occur that lead to cascading equipment failure and loss of supply to portions of the network. These events are called ‘black system’

31 *ibid.*, p. 10.

32 *ibid.*

33 *ibid.*, p. 17.

34 *ibid.*, p. 18.

events. When these occur, at least one generator on the system needs to be able to start itself and begin to re-energise the system. This 'black start' unit then assists to restore power and the reconnection of other assets back onto the system.<sup>35</sup> System restart services are a discreet service procured by the SWIS system operator, AEMO.

### **The potential benefits of microgrids and associated technologies**

A number of jurisdictions have considered the benefits microgrids and distributed energy resources (DER), such as rooftop solar and wind-generated power, can offer to their power systems.

The California Public Utilities Commission (CPUC) has observed that microgrids can serve as a 'multi-function grid resource' with the ability to provide a reliable, dispatchable energy resource, an ancillary service resource, a load-shed resource, and/or a consumption resource to handle over-generation.<sup>36</sup>

CPUC notes that microgrids can be designed and operated at specific points on the network to assist with the management of conditions on the broader system:

Individual distributed energy resources that comprise the microgrid, along with controllable load, can be dispatched to serve local load and generator output conditions, while appearing as an aggregate resource to the [system operator]. This will allow the [system operator] to use the microgrid as a resource for the macrogrid conditions, without being concerned with the details of operation or having visibility into the internal operation of the microgrid.<sup>37</sup>

Western Power Chief Executive Officer, Mr Guy Chalkley, noted the ability of microgrids and DER to offer more resilience to the electricity network:

It safeguards the reliability standards in the sense that you can utilise it with local power generation and you can bring it on with new renewables. I think it will reduce electricity costs. If we look at it as an incumbent ... It is something much more localised. We still see it improves capacity and safety. We can actually see that it gives us a broad spectrum of not just the affordability, but the safety and reliability balanced with it as well.<sup>38</sup>

In 2017, Victoria's Essential Services Commission (VESC) released a report titled *The Network Value of Distributed Generation*, which detailed the outcomes of an inquiry into the opportunities offered by microgrids and DER. It found that there are four major areas where microgrids and DER offer value: network support, electricity supply risk, grid support services and environmental and social benefits (see Figure 2.1).<sup>39</sup>

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35 *ibid.*, p. 19.

36 Christopher Villarreal, David Erickson and Marzia Zafar, *Microgrids: A Regulatory Perspective*, California Public Utilities Commission, April 2014, p. 10.

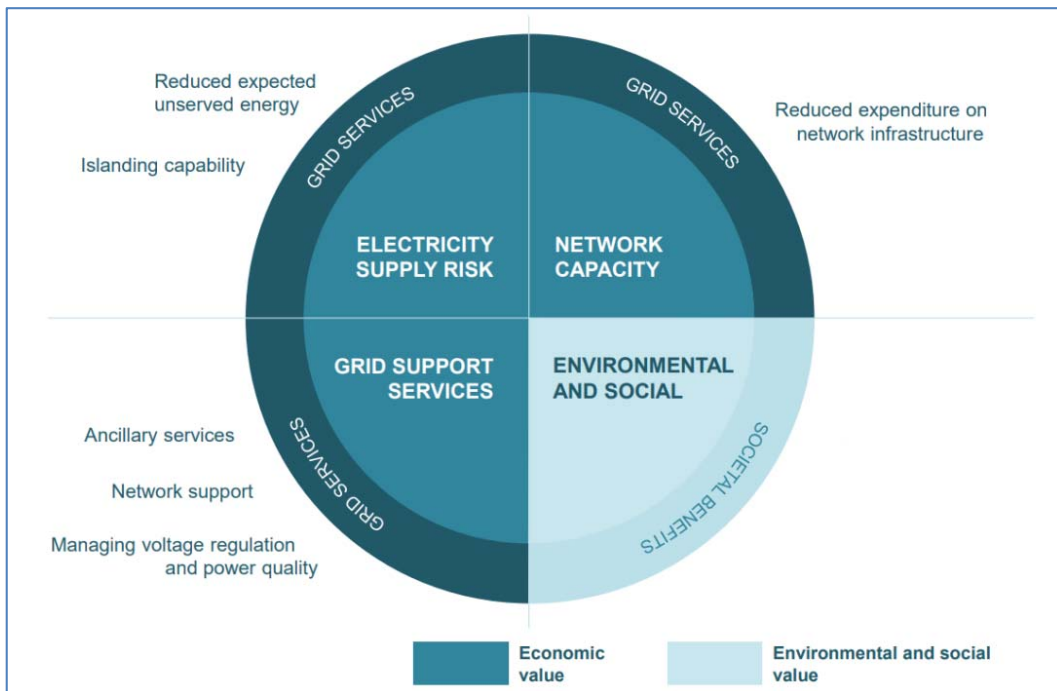
37 *ibid.*

38 Mr Guy Chalkley, Chief Executive Officer, Western Power, *Transcript of Evidence*, 11 April 2018, p. 1.

39 Government of Victoria, Essential Services Commission, *The Network Value of Distributed Generation: Distributed Generation Inquiry Stage 2 Final Report*, February 2017, pp. 17-18.



Figure 2.1: Network benefit categories of distributed energy resources<sup>40</sup>



### Electricity supply risk

There are two ways in which DER can address electricity supply risk. First, it can generate electricity during peak times, to reduce the amount of expected unserved energy in a particular part of the network. Second, it can provide islanding capability in the event of a system-wide issue, essentially disconnecting from the main grid and locally maintaining supply to customers, while the broader network issue is addressed by the operator.<sup>41</sup>

### Grid support services

The previous section has outlined a number of services required to maintain power system security. VESC states that dispatchable distributed generation can be contracted by a network business to provide ancillary services (also known as essential system services), such as frequency control or ‘black start’.<sup>42</sup>

VESC also notes that during peak periods, network service providers (NSPs) sometimes purchase generation from back-up facilities (such as diesel engine generators) and notes that DER could potentially avoid or reduce the costs of such system support.

Finally, VESC observes that network businesses operate equipment and conduct maintenance to regulate voltage levels through the network. The operation of the network is also impacted by power quality, which can be impacted by fluctuations in voltage and harmonics. Distributed generation may assist with voltage regulation, either through exported energy into the grid or via control of its network interfacing equipment (such as

40 *ibid.*, p. 18.

41 *ibid.*, p. 17.

42 *ibid.*

inverters). Certain DER technologies could provide benefit by working with the network to manage issues such as those related to power quality.<sup>43</sup>

### **Network capacity**

VESC recognises that DER offers the ability to reduce expenditure on network infrastructure. It notes that as networks reach the limits of their capacity to supply sufficient electricity during peak demand periods, network businesses will typically simply build or replace infrastructure to relieve the congestion. Distributed generation can relieve congestion by reducing peak demand or increasing supply at specific points on the network, deferring the need to invest in upgrades.<sup>44</sup>

Western Power told the Committee that microgrids and DER are particularly valuable in the outer reaches of the SWIS, where 52% of their assets serve only 3% of its customers. Mr Sean McGoldrick outlined that, whereas for decades since the 1940s pole and wire connections were the only feasible way to electrify remote rural communities, those assets are now reaching the end of their life:

The question becomes: what do you replace them with? ... Certainly, with the way technology has now developed, [DER] gives us an alternative option. ... we have an opportunity through standalone power systems—nanogrids and microgrids—to service that community out there. They are our customers and we are very happy to service them. We will just service them in a different manner. ... we fundamentally believe that that will be a safer, more reliable and more economic way to do it. That is the only reason we are doing this. We want to service those customers but we just want to do it better.<sup>45</sup>

#### **Finding 1**

Microgrids and associated technologies have the potential to offer a range of benefits to Western Australia's power systems. They can act as a reliable, dispatchable energy resource; supply ancillary and essential system services to the system; and act as a load-shed or over-generation balancing resource.

#### **Finding 2**

Microgrids and distributed energy resources can reduce total system costs by deferring, reducing or entirely removing the need to invest in costly pole and wire replacement programs. In regional and remote communities, this often also leads to improved supply reliability and power quality.

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43 *ibid.*, p. 18.

44 *ibid.*, p. 17.

45 Mr Seán McGoldrick, Executive Manager, Asset Management, Western Power, *Transcript of Evidence*, 11 April 2018, p. 3.

### **Bushfire readiness and extreme weather event response**

VESC noted that DER can reduce bushfire risk by reducing the need to build poles and wires, thereby improving amenity and aesthetic; and empower customers in the production and consumption of their own energy. VESC considers this to be a significant environmental and social benefit.<sup>46</sup>

The Committee's Interim Report outlined that Western Australia's initial microgrid trials were undertaken in response to a bushfire in Esperance that destroyed an entire community's electrical infrastructure. The trials delivered better quality and more cost effective electricity supply to that community and prompted a more expansive set of trials.

The Department of Fire and Emergency Services (DFES) provided evidence to the Committee that microgrids offer a range of other noteworthy benefits in the context of bushfire prevention, response and recovery.

DFES noted that microgrids enable network operators to better manage line voltage, reducing the incidence of power spikes and asset failures that can ignite bushfires. They also allow operators to decommission lengthy distribution lines that can often constitute ignition sources, particularly in densely forested areas. DFES stated that these benefits were particularly relevant in fringe of grid communities:

With the establishment of microgrid power services, the retirement of these long, interconnecting power lines would remove the possibility of objects like vegetation, animals and tree branches hitting powerlines which may create sparks that can fall to the ground and ignite dry grass.<sup>47</sup>

DFES also noted the ability for microgrids — and particularly storage batteries — to aid in fire response, given that telecommunications infrastructure and water pumps rely on continuous power supply. Microgrids' ability to deliver power in the event of main network failure helps both first responders and individual property owners to protect lives and homes and remain informed on fire status. Supply continuity to town sites during bushfire events, where the town's distribution connection had been destroyed, was also listed as a benefit, in addition to the contribution that continuous supply can have to a community's recovery efforts after a fire event.<sup>48</sup>

#### **Finding 3**

Microgrids have an important role to play in bushfire mitigation, incident management and post-event recovery. They can considerably enhance a community's individual resilience and ability to respond to a range of natural disasters, particularly in remote and regional areas of Western Australia.

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46 Government of Victoria, Essential Services Commission, *The Network Value of Distributed Generation: Distributed Generation Inquiry Stage 2 Final Report*, February 2017, p. 18.

47 Submission 37, Department of Fire and Emergency Services, p. 2.

48 *ibid.*, pp. 3-4.

## **Success will depend on technical and regulatory change**

Although a number of studies and trials are now demonstrating the capacity for microgrids and DER to provide a range of benefits to power systems, it is important to emphasise that the technologies are still deployed on a trial basis and will depend on a range of technical and regulatory factors for successful implementation at scale.

AEMO notes that:

efficient policy frameworks will take a portfolio approach to sourcing system services, making optimal use of the capabilities of all assets in the power system, which, when used in combination, should be capable of providing the same or better system performance than in the past.<sup>49</sup>

AEMO has developed a matrix showing the linkages and patterns between different services and the technologies that can provide the services (see Appendix Seven).

Chapter Four discusses the extent to which market and regulatory frameworks are also functioning to encourage efficient power system operations and Chapter Five discusses the technical factors influencing the use of microgrids and DER.

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49 Australian Energy Market Operator, [Power System Requirements](#), March 2018, p. 20.



## Chapter 3

### A Complex Regulatory Environment

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[It] is quite a complex regulatory arrangement that we have in WA, which now unfortunately means that one regulation might say ‘yes’ and then the other one says ‘no’. Then the lawyers get involved and say, well, the computer says no. There is a lot to be done.

Mr Cameron Parrotte, Australian Energy Market Operator<sup>50</sup>

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#### Western Australia’s unique regulatory context

The regulatory environment surrounding electricity is complex — and for good reason. Electricity is a deadly product, an essential service and the traditional model used to produce and transport it is inherently monopolistic.

Western Australia’s regulatory regime aims to ensure that electricity is delivered safely, is available to the vast majority of Western Australians, produced cost-effectively and sold in a manner that prevents rent-seeking behaviours and abuse of market power.

The Wholesale Electricity Market (WEM) is Western Australia’s main electricity market. It is structured with a number of objectives in mind and the legislation regulating the Government Trading Enterprises (Western Power, Synergy and Horizon Power) (GTEs) is intended to control their behaviours in that market. Less prescriptive features regulate electricity markets in regional and remote Western Australia.

Western Australia is in a unique situation relative to other Australian States in that, due to the large distances involved, none of its networks are connected to the national electricity system. As outlined in the Interim Report, Western Australia’s markets are also separately regulated by the State and are independent of the National Electricity Market (NEM). Western Australian system operators therefore cannot access the NEM’s electricity generation resources of 54.5 gigawatts to support their power system operations.<sup>51</sup>

Microgrids present challenges to traditional regulatory frameworks and market structures. Prior to discussing these, it is useful to outline the major Acts, subsidiary instruments and other mechanisms relevant to the regulation of electricity markets, and by extension, microgrids and distributed energy resources (DER) in Western Australia. It is also helpful to identify the major actors who influence the electricity industry.

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50 Mr Cameron Parrotte, Executive General Manager, Western Australia, Australian Energy Market Operator, *Transcript of Evidence*, 21 November 2018, p. 12.

51 Australian Energy Market Operator, *National Electricity Market*, accessed 25 July 2019, <[www.aemo.com.au/Electricity/National-Electricity-Market-NEM](http://www.aemo.com.au/Electricity/National-Electricity-Market-NEM)>.

### **Electricity Industry Act 2004**

The *Electricity Industry Act 2004* (EIA) implemented the Gallop Government's energy reform agenda and creates the overarching framework governing the Western Australian electricity industry. Its provisions are to:

- create a Wholesale Electricity Market (WEM) in the South West Interconnected System (SWIS) and allow for the development of market rules;<sup>52</sup>
- provide for an electricity network infrastructure access framework, currently only applicable in the SWIS but capable of application to other networks across the State;<sup>53</sup>
- establish a licensing regime for the generation, transmission, distribution and retailing of electricity, applicable across the State;<sup>54</sup>
- establish the Tariff Equalisation Fund, providing for tariff equality between regional and metropolitan Western Australia;<sup>55</sup>
- grant the heads of power to develop measures to protect customers;<sup>56</sup> and
- establish an Electricity Ombudsman Scheme.<sup>57</sup>

The objectives set for the WEM under the EIA are to:

- promote the economically efficient, safe and reliable production and supply of electricity and electricity related services in the SWIS;
- encourage competition among generators and retailers in the SWIS, including by facilitating efficient entry of new competitors;
- avoid discrimination in that market against particular energy options and technologies, including energy options and technologies such as those that make use of renewable resources or that reduce overall greenhouse gas emissions;
- minimise the long-term cost of electricity supplied to customers from the SWIS; and
- encourage the taking of measures to manage the amount of electricity used and when it is used.<sup>58</sup>

A number of codes created under the EIA address specific aspects of the industry, including:

- *Code of Conduct for the Supply of Electricity to Small Use Customers 2018*;

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52 *Electricity Industry Act 2004*, ss. 122-129.

53 *ibid.*, ss. 102-118.

54 *ibid.*, ss. 4-39A.

55 *ibid.*, ss. 129A-129J.

56 *ibid.*, ss. 47-59.

57 *ibid.*, ss. 90-101.

58 *ibid.*, s. 122(2).

- *Electricity Industry Customer Transfer Code 2016;*
- *Electricity Industry (Metering) Code 2012;*
- *Electricity Industry (Network Reliability and Quality of Supply) Code 2005;* and
- *Electricity Networks Access Code 2004 (ENAC).*

### **Electricity Corporations Act 2005**

The *Electricity Corporations Act 2005* (ECA) outlines the functions and governance arrangements for the State's electricity GTEs.

The ECA amended the *Electricity Corporations Act 1994* to provide for the restructure of the previously vertically integrated Western Power into three separate entities for the production, transportation and sale of electricity in the SWIS:

- Electricity Generation Company (trading as Verve Energy);
- Electricity Retail Company (trading as Synergy); and
- Electricity Networks Corporation (trading as Western Power).

The ECA also established a Regional Power Corporation (trading as Horizon Power) for the supply of electricity in areas outside of the SWIS. Unlike the SWIS-based GTEs (and as discussed in the Interim Report), Horizon Power is vertically integrated and can generate, transmit, distribute and retail electricity.

The ECA was amended in 2013 to implement a Barnett Government energy reform initiative, and on 1 January 2014 Verve Energy was merged with Synergy to form a single generation-retail business for the SWIS. The new entity retained the name 'Synergy', and is the single largest generator/retailer in the Western Australian energy market.

The ECA defines the 'Principal Functions' that the GTEs can perform and also defines the operational footprint for the performance of these principal functions, for each company, by reference to the SWIS.

Broadly (and relevant to this Inquiry), Synergy is empowered to perform the following 'Principal Functions':

- generate, purchase or otherwise acquire electricity;
- acquire, develop, operate and supply energy efficient technologies;
- supply electricity to consumers;
- provide ancillary services; and



- provide a range of services to Horizon Power, including consultative and advisory services, generation plant or equipment operations and maintenance or retail support services.<sup>59</sup>

Western Power's 'Principal Functions' are to:

- manage, plan, develop, expand, enhance, improve and reinforce the electricity transmission and distribution systems and provide and improve electricity transmission and distribution services;
- do anything it is required to do under Part 8 of the EIA (relating to network access) and Part 9 (relating to the operation of the WEM);
- provide services that improve the efficiency of electricity supply and the management of demand;
- provide ancillary services;
- provide operations and maintenance services to Horizon Power; and financial services to Synergy and Horizon Power; and
- undertake, maintain and operate any works, system, facilities, apparatus or equipment required for any purpose mentioned above.<sup>60</sup>

Prima facie, both Synergy and Western Power undertake their 'Principal Functions' within the SWIS. However, regulations can be made authorising Synergy<sup>61</sup> and Western Power<sup>62</sup> to perform functions outside of the SWIS.

Reflecting its vertical integration, Horizon Power's 'Principal Functions' are an amalgam of those ascribed to Synergy and Western Power. It is authorised to:

- generate, purchase or otherwise acquire electricity;
- manage, plan, develop, expand, enhance, improve and reinforce transmission and distribution systems;
- supply electricity to consumers and services which improve the efficiency of electricity supply and the management of demand;
- acquire, develop, operate and supply energy efficient technologies;
- provide ancillary services; and
- provide a range of operations and maintenance services to Synergy.<sup>63</sup>

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59 *Electricity Corporations Act 2005*, s. 35.

60 *ibid.*, s. 41.

61 *ibid.*, s. 37(5).

62 *ibid.*, s. 43(3).

63 *Electricity Corporations Act 2005*, s. 50.

The ECA states that Horizon Power is to perform its 'Principal Functions' outside of the SWIS, although the legislation contemplates the creation of regulations allowing Horizon Power to operate within the SWIS.<sup>64</sup>

The three GTEs are also all granted 'Other Functions' that centre on commerciality and building value within their businesses, namely to:

- use their expertise and resources to provide consultative, advisory or other services for profit;
- develop and turn to account technology, software or other intellectual property;
- manufacture and market any product that relates to their functions; and
- use or exploit for profit their fixed assets.<sup>65</sup>

Unlike the 'Principal Functions', these 'Other Functions' would not appear to have the same geographical limitations placed upon their performance.

The structural separation of the GTEs was intended to ensure 'the transparency and independence of the respective businesses' operations. These functional and geographic distinctions were intended to preserve competitive neutrality between the utilities (and other market participants).<sup>66</sup>

Notably, however, under the ECA (and despite their notional separation by operational asset class and footprint) the GTEs can operate and maintain a broad range of assets, provide ancillary services, provide services to one another under regulation, operate in each other's territories under regulation, and act to develop commercial opportunities. There is, therefore, considerable scope for duplication, overlap and competition between the GTEs, covered further in Chapter Six.

#### **Finding 4**

Under the *Electricity Corporations Act 2005*, the three electricity Government Trading Enterprises (Western Power, Synergy and Horizon Power) are empowered to operate and maintain a broad range of assets potentially within the same class and footprint, provide ancillary services, provide services to one another under regulation and act to develop commercial opportunities. There is considerable scope for duplication, overlap and competition between them.

#### **Electricity Networks Access Code 2004**

The *Electricity Networks Access Code 2004* (ENAC) is established under Part 8 of the EIA and provides a framework for the independent regulation of 'covered' transmission and distribution networks. The ENAC's objective is to promote the economically efficient

64 *ibid.*, s. 52(4).

65 *ibid.*, Synergy s. 36; Western Power s. 42 and Horizon Power s. 51.

66 Submission 22A, Synergy, p. 2.

investment in, and operation and use of, networks and services of networks in Western Australia to promote competition in markets upstream and downstream of the networks.<sup>67</sup>

The ENAC expressly states that it 'covers' the SWIS<sup>68</sup> and provides a mechanism for other Western Australian networks to also be covered through the application of certain criteria.<sup>69</sup>

Importantly, the ENAC requires that covered networks possess an Access Arrangement,<sup>70</sup> which contains the terms and conditions under which third parties may use the network. Access Arrangements also govern the conditions for network investment and the basis upon which the network owner can recover operational costs and achieve a return on and of capital.<sup>71</sup>

Access Arrangements are developed by the network owner (Western Power in the SWIS) and submitted periodically to the Economic Regulation Authority (ERA) for approval.

The ENAC is based on a 'call and response' model, whereby Western Power proposes the services it will provide, the terms and conditions for those services, the ways it should derive revenue and the prices it will charge. The ERA then considers this proposal and provides a response based on whether it considers that Western Power's proposal meets the ENAC's objectives and complies with other specific requirements.

Access Arrangements must contain:

- at least one Reference Service that a customer (typically an electricity retailer or large scale industrial user) can use to inject, transport or withdraw electricity through the network;
- a standard Access Contract that outlines the terms and conditions for the reference service;
- Service Standard Benchmarks for provision of services;
- price controls, methodologies and a price list for services;
- an applications and queuing policy, to outline the process, timeframes and technical assessment steps required to provide a new network connection and how their applications will be treated relative to other competing applications for access to services on the network;
- a contributions policy, which outlines the circumstances under which end users are required to contribute to the capital costs of network assets required to provide their network service, and the form that contribution should take;

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67 *Electricity Networks Access Code 2004*, s. 2.1.

68 *ibid.*, s. 3.1.

69 *ibid.*, s. 3.2.

70 In this section of the report, terms defined by legislation are capitalised.

71 *ibid.*, Chapter 4.

- a transfer and relocation policy, governing how a customer's services are to be relocated if they move to another point on the network; and
- efficiency and innovation benchmarks.<sup>72</sup>

The ENAC also outlines a dispute resolution process if conflict arises between the network operator and an applicant for access or network user.<sup>73</sup>

The ENAC is significant for DER and microgrids because it defines the grid services that can be performed by Western Power and determines the revenues Western Power should receive for providing these services, and owning, operating, developing and investing in the network.

By defining the services Western Power can provide, allowing certain forms of investment into certain types of assets and determining the charges Western Power can levy its customers, the Access Arrangement process sends direct signals into the electricity market regarding the location, configuration and operation of energy assets and can thereby encourage or discourage particular outcomes.

The current Access Arrangement framework does not adequately contemplate the 'reverse flow' of energy caused by DER, the role that DER assets might play in supporting the network, or the use by microgrids of the broader network as a form of back-up or exchange/service provision platform.

#### **Finding 5**

Currently, the services and revenue structures developed through the *Electricity Networks Access Code 2004* reflect the traditional industry model, where electricity is generated centrally and transported to distant customers. The *Electricity Networks Access Code 2004* processes send direct signals into the electricity market regarding the location, configuration and operation of energy assets, and can thereby encourage or discourage particular asset configuration and operational outcomes.

The ENAC also stipulates that networks must have technical rules, binding both operators and users. Under Chapter 12 of the ENAC, the technical rules' objectives are that they:

- are reasonable;
- do not impose inappropriate barriers to entry to a market;
- are consistent with good electricity industry practice; and
- are consistent with relevant written laws and statutory instruments.<sup>74</sup>

<sup>72</sup> *Electricity Networks Access Code 2004*, Chapter 5.

<sup>73</sup> *ibid.*, Chapter 10.

<sup>74</sup> *ibid.*, Chapter 12.

## Electricity licensing

In addition to complying with the obligations contained in the overarching legislation, electricity industry participants — generators, network operators and retailers — are also required to be licensed unless they are specifically exempted.<sup>75</sup> Licensing applies across the entire State.

The licensing function in Western Australia is performed by the ERA. It is responsible for:

- issuing electricity licences to entities generating, transmitting, distributing or retailing electricity in Western Australia that are not exempt from the requirement to hold a licence (outside of the SWIS an integrated regional licence can apply to a party involved in one or more of these activities);
- approving standard form contracts and the review and amendment of the *Code of Conduct for the Supply of Electricity to Small Use Customers*;
- monitoring and reporting to the Minister for Energy on the operation of the licensing scheme, and compliance by licensees with their licences by arranging for regular performance audits and asset management system reviews; and
- monitoring the performance of electricity licensees through the annual collection of performance data, which is also used to prepare reports on the performance of electricity retailers and electricity distributors.<sup>76</sup>

Licensing provides for regulator intervention where there is market failure. According to the ERA, market failure occurs where a licensee cannot be relied upon to produce outcomes that are in the long-term interests of consumers. The common sources of market failure relevant to utility licensing are natural monopoly characteristics and asymmetric information,<sup>77</sup> both of which are present in Western Australia's electricity markets.

The ERA argues that, if industries with natural monopoly elements are not regulated, it can lead to suboptimal outcomes such as suppliers providing poor levels of service, charging high prices, using obsolete technology and not maintaining existing infrastructure or operating systems. Licensing is also said to reduce the risk of supply disruptions and can ensure minimum standards are met.<sup>78</sup>

The ERA states that asymmetric information occurs where parties to a transaction cannot make fully informed decisions due to a lack of information, which often exists when one party has substantial market power. Usually the seller has better information of the costs of electricity than the buyer and regulation can help to protect the under-informed party.

Asymmetric information is the justification for licensing organisations that do not have natural monopoly characteristics but may have a degree of market power, such as

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<sup>75</sup> *Electricity Corporations Act 2005*, s. 7.

<sup>76</sup> Economic Regulation Authority, *Electricity Licensing*, accessed 13 March 2019, <[www.erawa.com.au/electricity/electricity-licensing](http://www.erawa.com.au/electricity/electricity-licensing)>.

<sup>77</sup> Economic Regulation Authority, *Best Practice Utility Licensing*, January 2007, p. 6.

<sup>78</sup> *ibid.*

organisations providing electricity generation and retailing services. Licensing in this manner can ensure that customers, particularly small-use customers, are treated fairly and efficiently through the application of a customer protection regime.<sup>79</sup>

Parties, such as office buildings and shopping centres, that ‘on-supply’ electricity to consumers are generally exempt from licensing requirements. ‘On sellers’ source electricity from a licensed retailer to a metered point and then sell that electricity to other parties.<sup>80</sup>

Microgrids and associated DER have the potential to create new forms of monopoly and do — to a significant extent — often involve asymmetrical information. They therefore present significant challenges to the traditional licensing model.

### Consumer protection

The electricity licensing regime is accompanied by a consumer protection framework geared towards protecting the small user. ‘Small use customers’ consume less than 160 megawatt hours (MWh) per annum.<sup>81</sup> Key consumer protection measures for them include:

- small use standard form contracts;<sup>82</sup>
- supply obligations for certain categories of customer;<sup>83</sup>
- access to general consumer complaints mechanisms;<sup>84</sup> and
- access to the Water and Energy Ombudsman scheme<sup>85</sup> (notably not available to embedded network customers).<sup>86</sup>

The overwhelming majority of network-connected small use customers consume less than 50MWh per annum and are therefore non-contestable. They can only obtain their supply from Horizon Power and Synergy (the only exceptions being several small mining towns that possess licences).

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79 *ibid.*, p. 10.

80 Economic Regulation Authority, *Exempt retailers and distributors*, accessed 13 March 2019, <[www.erawa.com.au/electricity/switched-on-energy-consumers-guide/exempt-retailers-and-distributors](http://www.erawa.com.au/electricity/switched-on-energy-consumers-guide/exempt-retailers-and-distributors)>.

81 Economic Regulation Authority, *Electricity Small Use Customers*, accessed 13 March 2019, <[www.erawa.com.au/electricity/electricity-licensing/code-of-conduct-for-the-supply-of-electricity-to-small-use-customers/electricity-small-use-customers](http://www.erawa.com.au/electricity/electricity-licensing/code-of-conduct-for-the-supply-of-electricity-to-small-use-customers/electricity-small-use-customers)>.

82 Economic Regulation Authority, *Standard Form Contracts*, accessed 13 March 2019, <[www.erawa.com.au/electricity/electricity-licensing/standard-form-contracts](http://www.erawa.com.au/electricity/electricity-licensing/standard-form-contracts)>.

83 Economic Regulation Authority, *Contracts*, accessed 13 March 2019, <[www.erawa.com.au/electricity/switched-on-energy-consumers-guide/contracts](http://www.erawa.com.au/electricity/switched-on-energy-consumers-guide/contracts)>.

84 Economic Regulation Authority, *Complaints and service standards*, 6 November 2018, accessed 13 March 2019, <[www.erawa.com.au/electricity/switched-on-energy-consumers-guide/complaints-and-service-standards](http://www.erawa.com.au/electricity/switched-on-energy-consumers-guide/complaints-and-service-standards)>.

85 *ibid.*

86 Department of Treasury, *On-supply of electricity*, nd, p. 3.

Larger electricity consumers are 'contestable' and can source their electricity from any of the retailers licenced by the ERA.<sup>87</sup> Depending on their consumption, they can either purchase standard services from Synergy or source electricity under bilaterally negotiated contracts.

Large users are assumed to be more sophisticated and capable of negotiating terms and mediating disputes through the mechanisms contained within negotiated supply contracts with large retailers, or on-sellers, or accessing the dispute provisions under the ENAC (for network access). Small use protections are not extended to them.

Insofar as embedded networks potentially change the nature of the relationships with the GTEs and introduce new forms of commercial arrangements with 'on-suppliers', again microgrids present challenges to traditional customer protection frameworks, considered further below.

### **Electricity pricing**

Small use customers consuming less than 50MWh per annum are supplied by Synergy and Horizon Power at the same price, set annually by the State Government. Small use tariffs do not currently reflect the true cost of producing electricity, although recent tariff adjustments are bringing prices closer towards cost reflectivity.<sup>88</sup> The State also sets Synergy and Horizon Power's prices for some larger customer classes.<sup>89</sup>

Western Australia also maintains a Uniform Tariff Policy, whereby Synergy and Horizon Power's small use customers are all charged the same tariffs, irrespective of the considerably higher costs to serve regional and remote customers.<sup>90</sup> The extra costs of supplying electricity to these areas are funded by the Tariff Equalisation Contribution (applied through electricity network charges in the SWIS).

Customers in the SWIS consuming over 50MWh per annum are contestable and can choose their retailer. If they consume up to 160MWh per annum, they can choose either the tariff offered by Synergy, or can be supplied by Synergy or another retailer at negotiated prices.<sup>91</sup>

Customers within an embedded network are currently in a more complex position with respect to electricity pricing. On-sellers must apply for licence exemptions and are typically required to provide electricity based on a fixed and variable component. The position varies depending on whether the end-user is a residential or commercial customer.

For residential customers of exempt on-sellers:

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87 Economic Regulation Authority, *Contacts and more information*, accessed 13 March 2019, <[www.erawa.com.au/electricity/switched-on-energy-consumers-guide/contacts-and-more-information](http://www.erawa.com.au/electricity/switched-on-energy-consumers-guide/contacts-and-more-information)>.

88 Synergy, *2018 Annual Report*, p. 46.

89 Department of Treasury, *Electricity pricing*, accessed 1 July 2019, <[www.treasury.wa.gov.au/Public-Utilities-Office/Household-energy-pricing/Electricity-pricing/](http://www.treasury.wa.gov.au/Public-Utilities-Office/Household-energy-pricing/Electricity-pricing/)>.

90 *ibid.*

91 *ibid.*

- If the on-seller buys electricity from Synergy or Horizon Power, a residential customer may not be charged more for electricity consumption than a residential customer of Synergy or Horizon Power would be charged.
- If the on-seller buys electricity from a retailer other than Synergy or Horizon Power, the restriction on charging no more than the amount Synergy or Horizon Power is allowed to charge its residential customers (for electricity consumed) does not apply.
- For the daily fixed supply charge, all residential customers of exempt on-sellers within Synergy or Horizon Power's licence area are entitled to be charged no more than a residential customer of Synergy or Horizon Power would be charged (this includes on-sellers that buy their electricity from a retailer other than Synergy or Horizon Power).
- If the on-seller generates its own electricity, the residential customer of the on-seller may not be charged more for the electricity than the cost the on-seller incurs in generating that electricity.<sup>92</sup>

For commercial customers of exempt on-sellers, the licence exemptions do not include any requirements relating to the amount the on-seller can charge for electricity. Commercial customers in embedded networks therefore have fewer controls placed around their relationship with an on-seller and restricted access to consumer protection mechanisms available to residential customers.

## **Participants, actors and stakeholders**

A range of participants, actors and stakeholders influence or have direct or indirect interests in the development of microgrids and DER in Western Australia's electricity industry.

### **The Regulator**

#### ***Economic Regulation Authority***

The ERA is Western Australia's independent economic regulator, established under the *Economic Regulation Authority Act 2003*.

The ERA performs a range of functions in the electricity market, including licensing, market monitoring, and regulating access to the transmission and distribution systems. It can also undertake investigations at the instruction of the Treasurer.

According to its most recent Annual Report, the ERA aims to ensure the delivery of water, electricity, gas and rail services in Western Australia is in the long-term interests of consumers. It makes its decisions independently from industry, government and other interests, and is not subject to government or ministerial direction in carrying out its

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<sup>92</sup> Economic Regulation Authority, *Exempt retailers and distributors*, accessed 25 July 2019, <[www.erawa.com.au/gas/switched-on-energy-consumers-guide/exempt-retailers-and-distributors](http://www.erawa.com.au/gas/switched-on-energy-consumers-guide/exempt-retailers-and-distributors)>.



regulatory functions. Its functions are designed to maintain a competitive, efficient and fair commercial environment.<sup>93</sup>

The ERA comprises an independent Chair, two part-time members and is supported by a secretariat.

## **The Operators**

### ***Australian Energy Market Operator***

The Australian Energy Market Operator (AEMO) is responsible for operating Australia's largest gas and electricity market and power systems, including the NEM and WEM. It also provides advice to the Western Australian Government to ensure that markets are responsive to energy sector needs, with the objective of supporting the long-term interests of consumers.<sup>94</sup>

AEMO is a national body, but operates the Western Australian system and market separately from the NEM. It assumed this role in November 2015, after Western Australia's stand-alone Independent Market Operator (IMO) was dismantled as part of the then-Government's electricity industry reforms.<sup>95</sup>

AEMO dispatches generation into the electricity system, based on the rules set for the market. It also is responsible for the real-time management of power flows and system stability. It also has a role in system planning and forecasting. In many respects, AEMO's roles and functions overlap with Western Power's, discussed below.

AEMO states that its role includes ensuring that the power system achieves reliability and security levels that customers value now and in the future as the energy system transitions to a more dispersed variable supply. The role also includes making day-to-day assessments of the adequacy of the power system to deliver supply within system limits and making longer term forecasts of adequacy.<sup>96</sup> AEMO also supports the ERA in monitoring the effectiveness of the market by undertaking analysis of market data and providing information on market behaviour.<sup>97</sup>

### ***Western Power and Horizon Power***

As has been noted above and in the Committee's Interim Report, Western Power operates the transmission and distribution networks in the SWIS. It is essentially responsible for the transportation of electrons from the point of generation to the point of consumption and provides a series of 'services' aimed at keeping the network stable. Its operational and planning functions can overlap with AEMO's.

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93 Economic Regulation Authority, *Annual Report 2018/19*, p. 11.

94 Submission 19, Australian Energy Market Operator, p. 5.

95 Hon Mike Nahan MLA, Minister for Energy, *Electricity reform gains momentum*, media release, 30 September 2015.

96 Submission 19, Australian Energy Market Operator, p. 5.

97 Australian Energy Market Operator, *Monitoring the Effectiveness of the Market*, accessed 13 March 2019, <[www.aemo.com.au/Electricity/Wholesale-Electricity-Market-WEM/Data/Monitoring-the-Effectiveness-of-the-Market](http://www.aemo.com.au/Electricity/Wholesale-Electricity-Market-WEM/Data/Monitoring-the-Effectiveness-of-the-Market)>.

In line with its vertical integration, and as canvassed in the Interim Report, Horizon Power has complete responsibility for system and network planning and operations.

## **The Suppliers**

### ***The Government Trading Enterprises***

This report and the Interim Report have both covered Synergy's role as an energy supplier — it both generates and sells electricity into the WEM, purchases electricity from the WEM and retails it to customers. Similarly, Horizon Power generates, purchases and retails electricity in its various networks.

Western Power and Horizon Power also supply a range of services that are essential to a stable and reliable network.

All three entities have evolved from the previously vertically integrated Western Power (and prior to that State Energy Commission of Western Australia (SECWA)). They are all owned by the State Government and accountable to the Minister for Energy in the performance of their role. This provides a major point of distinction between them and private operators, who are accountable to their private owners. Despite being corporatised and legislatively required to act commercially, the GTEs pursue profit, build value and are ultimately accountable to the people of Western Australia.

Microgrids have the potential to blur the lines between these services and functions, creating regulatory and operational challenges that are explored further below.

### ***'Traditional' private market generators***

A number of 'Independent Power Producers' (IPPs) operate in Western Australia. These private corporations own large-scale thermal and renewable generation assets connected to networks across the State. The assets represent significant capital investments and are typically underwritten by high-value, long-term contracts that provide for both capacity and energy. The WEM provides the framework through which these contracts are mediated in the SWIS.

In some cases, the contracts include variable costs, such as fuel. In other cases, they are 'tolling' arrangements, where the major customer/s provide the fuel for conversion into electrons. IPPs may also trade smaller volumes of electricity through the Short Term Energy Market (STEM) and also provide ancillary services through the small markets established for their procurement.

On account of the significant investments required to develop and operate large-scale generation assets, IPPs typically rely on high levels of certainty, stable markets and predictable policy frameworks. Microgrids and DER are challenging the IPP's traditional business models.

### ***'Traditional' private market retailers***

As outlined previously, Synergy and Horizon Power are the major retailers in their respective markets, serving both 'contestable' and 'non-contestable' customers. There are, however, a

number of other private retailers operating in Western Australia who sell electricity to contestable customers. A list of existing retailers can be found on the ERA's website.<sup>98</sup>

Traditionally, IPPs or large energy users have obtained retail licences to sell the electricity they produce (often alongside gas). They typically operate at the wholesale energy level and utilise existing market mechanisms. There have also been a small number of retail players that have traded electricity and gas through existing market structures. Microgrids and DER have given rise to a series of new retail models that challenge existing retail businesses, as outlined in the Interim Report. Similar to IPPs, many traditional retailers are seeking to adapt their business models to pursue new opportunities offered by this technology.

### **New Market Participants**

PricewaterhouseCoopers has observed that the same forces that are pushing traditional electricity businesses to change are opening up new avenues for companies that, until now, have been only tangentially connected to the power industry, or that are newcomers entirely:

History teaches us that the majority of business model innovations are introduced by newcomers. And the barriers to entry into the distributed energy market are much lower now than ever before. The market, currently worth tens of billions of dollars, covers a wide spectrum of opportunities, including energy controls and demand management activities, local generation, large-scale storage and regional supergrids, and software that encourages behaviour change.<sup>99</sup>

The Interim Report provided an overview of the broad range of emerging DER and microgrid business models. Potential new participants include, but are not limited to:

- DER equipment vendors, who sell DER assets to entities such as the GTEs;
- DER asset owners and operators, who own and operate assets under contract to entities such as the GTEs;
- private microgrid operators and community energy cooperatives, who intend to own, operate and sell electricity behind a metered network connection point; and
- virtual power plant (VPP) operators and other commercial entities such as 'blockchain' platform providers.

The new business models proposed by a number of these entities challenge existing market structures, but many are also dependent on existing market structures (particularly market and pricing signals) for viability, discussed further in Chapters Four and Six. They also challenge traditional commercial relationships with existing industry participants and also raise a series of questions around retail relationships and consumer protections.

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98 Economic Regulation Authority, *Licence Holders*, accessed 25 July 2019, <[www.era.gov.au/electricity/electricity-licensing/licence-holders](http://www.era.gov.au/electricity/electricity-licensing/licence-holders)>.

99 Norbert Schweiters and Tom Flaherty, 'A Strategists Guide to Power Industry Transformation', *Strategy+Business Magazine*, Issue 80, Autumn 2015, p. 7.

## **Consumers and ‘prosumers’**

Customers are engaged mainly on the demand side of the electricity market. The previous sections of this chapter have discussed the segregation of customer classes and the differing abilities that they have to procure electricity from retailers, the different prices available from the market and the various measures in place to protect them. Customers can also be considered in a number of other often overlapping sub-groups. The below discussion highlights some of their major characteristics that can both influence broader market trends and affect the roll-out of microgrids and DER.

### **Large consumers — greater than 160MWh per annum**

Large electricity users typically operate industrial-scale facilities, such as mining or processing operations. They usually either possess or are able to access expert technical assistance to manage their electricity needs and have the capacity and resources to negotiate often highly complex supply deals with electricity suppliers and specific network access agreements with network operators. They are often positioned to invest in their own DER and microgrids.

### **Small-use contestable consumers — from 50 to 160MWh per annum**

Typically, luxury households and small and medium enterprises (SMEs) fall into the ‘small-use’ category. They often lack the time, resources or commercial capacity to manage complex electricity requirements and are more likely to buy simpler retail solutions. They would likely be target clients for energy aggregators or DER installers.

### **Franchise customers**

These customers are the very small (less than 50MWh per annum) residential and small business consumers who are only able to purchase grid-sourced energy from Synergy or Horizon Power. The tariffs they pay for their electricity are not cost-reflective. For this customer group, microgrids can be associated with community energy initiatives, new property developments/subdivisions and are attractive for economic, environmental or self-determination reasons.

### **Rural and ‘fringe of grid’ consumers**

Both this report and the Interim Report have discussed the particular challenges presented by customers at the fringes of the grid. They typically live in areas that experience lower-quality service and are far more expensive to serve than urban area customers. They nonetheless receive the same electricity tariffs as all small use customers, under the auspices of the Uniform Tariff Policy. Microgrids and DER trials in these areas are proving highly successful in delivering cheaper, more secure, reliable and sustainable electricity supply.

### **‘Prosumers’**

As discussed in the Interim Report, ‘prosumer’ is a term derived from ‘producer’ (through onsite photovoltaic (PV) panels) and ‘consumer’. Prosumers are driving the emergence of microgrids and DER — evidenced by the emergence of more than a gigawatt of PV panels

now installed on rooftops across the SWIS.<sup>100</sup> Many prosumers are small use customers and are unlikely to be expert in the technical complexities of electricity systems or the interplay of energy regulations and markets.

### **Vulnerable consumers**

There is a significant portion of the Western Australian community who are experiencing significant cost of living pressures and are currently unlikely to possess the personal means to participate in microgrids, DER and batteries. They are protected by a range of measures (outlined previously and discussed in more detail below) that are currently challenged by the emergence of microgrids and DER. Ensuring that their interests are considered, and that they are neither left behind nor subsidising the choices of others, are core considerations in this topic and discussed at greater length in Chapter Seven.

### **The State Government**

The State Government has an extraordinarily broad range of interests in the energy market.

- Through its two GTEs, Synergy and Horizon Power, it is Western Australia's largest owner and operator of generation capacity.
- By virtue of the GTEs' commercial relationships with a number of IPPs, the State also has an interest in privately-owned large scale generation assets.
- Through Western Power and Horizon Power it owns and operates the vast majority of transmission and distribution assets in the State.
- It is a wholesale buyer and seller of gas and electricity.
- Through Synergy and Horizon Power it also holds the vast majority of retail relationships with households and businesses across the State.
- It established and administers the Acts governing the electricity industry and enables various regulatory agencies to perform their oversight functions.
- It grants licences and exemptions and sets electricity pricing for a range of customer classes.
- It has a number of additional policy objectives to mediate around energy safety, consumer protection, ensuring the protection of vulnerable customers and distributing system-wide costs and benefits.

#### **Finding 6**

Through its policy, licensing and regulatory functions, asset ownership and control, and range of commercial and customer relationships, the State Government has a crucial role to play in the development of microgrids and roll-out of distributed energy resources.

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100 Australian Energy Market Operator, *Western Australia's evolving power system*, accessed 25 July 2019, <<https://energylive.aemo.com.au/News/The-evolving-power-system-in-Western-Australia>>.

## Chapter 4

# The Interplay between Systems, Markets and Economic Regulation

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Chapter Two outlined that, at the most fundamental level, power systems require sufficient quantities of dispatchable and controllable energy resources, and a number of other ancillary and essential system services to maintain stability and supply, including frequency control, voltage management, inertial response and system restoration services.

Regulations, technical rules and market structures in Western Australia have been designed to ensure that these features are available to the system operator, but have been based heavily on the traditional power system structure.

Western Australia's electricity market was designed to reflect and facilitate the physical asset characteristics and power system dynamics outlined in the Interim Report and Chapter Two. It was structured with the intent to procure the elements that are fundamental to system operations and supply electricity to end-users in the most economically efficient way possible.

The following chapter outlines how the market and regulatory frameworks operate to supply electricity, and the ways in which those frameworks are now being challenged by microgrids and associated technologies.

### **The Wholesale Electricity Market**

Western Australia has a number of electricity markets. The Wholesale Electricity Market (WEM) is the largest and covers the South West Interconnected System (SWIS). It has a number of participants and is governed by a complex system of rules and regulations.

Horizon Power operates a far less liquid and unregulated market in the North West Interconnected System (NWIS), and a series of small towns that have licensing arrangements, but no formal market structures. Throughout regional Western Australia there are also a range of privately owned and operated networks that primarily supply mining projects and are not subject to any market rules.

### **The history of the Wholesale Electricity Market**

The SWIS has only recently had a wholesale electricity market. Previously, the industry was structured around the government-owned, vertically integrated monopoly utility, the State Energy Commission of Western Australia (SECWA), which became Western Power.

In 2006, following the disaggregation of Western Power into separate entities for the generation, transmission and retailing of electricity, the WEM commenced operation and opened Western Australia's electricity up to a broader range of participants.

The Independent Market Operator (IMO) was established to manage the market and stated that the WEM 'facilitates greater competition and private investment and allows generators and wholesale purchasers of electricity (such as retailers) greater flexibility as to how, and with whom, they sell or procure electricity.'<sup>101</sup> The market included mechanisms that were intended to:

- ensure that adequate generation and demand-side management capacity is available to satisfy the demand for electricity;
- allow Market Participants (large generators, large consumers and retailers) to adjust their contractual positions through a day-ahead Short Term Energy Market (STEM);
- facilitate trade around 'on the day' differences between contractual positions and physical outcomes, through a competitive balancing market; and
- ensure the competitive supply of Load Following Ancillary Services (LFAS).<sup>102</sup>

### **The Wholesale Electricity Market objectives**

The objectives of the WEM, as stipulated by the *Wholesale Electricity Market Rules* (WEM Rules), are to:

- promote the economically efficient, safe and reliable production and supply of electricity and electricity-related services in the SWIS;
- encourage competition among generators and retailers in the SWIS, including by facilitating efficient entry of new competitors;
- avoid discrimination in the market against particular energy options and technologies, including sustainable energy options and technologies such as those that make use of renewable resources or reduce overall greenhouse gas emissions;
- minimise the long-term cost of electricity supplied to customers from the SWIS; and
- encourage the taking of measures to manage the amount of electricity used and when it is used.

### **The Wholesale Electricity Market Rules and structure**

The WEM is governed by a complex set of rules made by a Rule Change Panel. The WEM Rules establish and govern the operations of three basic trading mechanisms:

- Reserve Capacity Mechanism (RCM)

The RCM ensures that there is adequate generation and Demand Side Management capacity available each year to meet peak system demand, including a reserve

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101 Independent Market Operator, [Wholesale Electricity Market Design Summary](#), 24 October 2012, p. 1.

102 *ibid.*

margin. The actual volume of the total system requirement is set by the Australian Energy Market Operator (AEMO) two years ahead.

Large scale facilities are certified as having a certain volume of capacity available to sell through the RCM, under strict criteria. Each large Market Customer is required to contract for Capacity Credits to cover their share of capacity procured to cover the total system requirement. If the system requires additional capacity, the rules allow for an auction. However, the WEM is yet to forecast a capacity shortfall, particularly since the increased take-up of household scale solar PV.

- **Bilateral Contracts**

Bilateral trades of energy and capacity occur between Market Participants and AEMO has no interest in how these trades are formed. However, Market Participants are required to inform AEMO of their bilateral energy transactions so that the transactions can be scheduled and the generation dispatched accordingly.

- **The Short Term Energy Market (STEM)**

The STEM is a daily forward market for energy that allows Market Participants to trade around their bilateral energy position, producing a Net Contract Position.

Each Scheduling Day, AEMO collects half hour bilateral schedule data from each Market Generator, describing bilateral energy trades between them and Market Customers for each Trading Interval of the following Trading Day.

AEMO calculates each Market Participant's net bilateral position for each Trading Interval from this data. Each Scheduling Day, Market Participants also provide AEMO with supply and demand curves for each Trading Interval of the Trading Day.

AEMO uses these supply and demand curves to determine STEM Offers and STEM Bids for each participant relative to its net bilateral position for each Trading Interval. A STEM Offer is an offer to increase the net supply of energy beyond the net bilateral position, while a STEM Bid is a bid to decrease the net supply of energy relative to that position. A STEM auction is run for each Trading Interval of the next Trading Day, determining a STEM clearing price and clearing quantities. The combined net bilateral position and STEM position of a Market Participant describes its Net Contract Position.

Market Participants are only permitted to bid into the STEM based on their short run marginal cost. It is assumed that long run costs are recovered through bilateral contracts and the RCM.

AEMO operates the market and the system around resource plans provided to it by the generators, which specify the output of each facility. Generators must also provide AEMO with a bid price to provide balancing around their resource plans. AEMO then issues dispatch instructions to facilities for each trading interval.



### **Ancillary services**

AEMO is also responsible for ensuring the provision of the ancillary services required to maintain electrical system stability.

There is a market for the provision of Load Following Ancillary Services (LFAS). This is the primary real-time mechanism to ensure supply and demand are balanced. LFAS accounts for the difference between the energy that has been dispatched, actual load and intermittent generation. Load following resources must have the ramping capability to pick up the load ramp between dispatch steps, as well as maintain the system frequency for other variations.<sup>103</sup>

Markets do not currently exist for:

- Spinning Reserve Ancillary Services (SRAS)

Spinning Reserve is online capacity that is able to respond rapidly should another unit experience a forced outage. The capacity can include online generation capacity, dispatchable loads and interruptible loads (loads that respond automatically to frequency drops);

- Load Rejection Reserve Ancillary Services (LRRAS)

LRRAS requires that generators be maintained in a state where they can rapidly decrease their output should a system fault result in the loss of load. This service is particularly important overnight, when most generating units in the system are operating at minimum loading and have limited capability to decrease their output in the timeframe required.

- Dispatch Support Service (DSS)

DSS ensures voltage levels around the power system are maintained, and includes other services required to support the security and reliability of the power system that are not covered by other balancing or Ancillary Services.

- System Restart Service (SRS)

SRS allows parts of the power system to be re-energised by black start equipped generation capacity following a full (or partial) black out. Unlike other generators, black start equipped generators can be started up without requiring a supply of energy from the transmission network.

#### **Finding 7**

While there is a market for some Load Following Ancillary Services in the South West Interconnected System, markets do not currently exist for a range of other essential energy services.

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103 Australian Energy Market Operator, *Ancillary services*, accessed 25 July 2019, <[www.aemo.com.au/Electricity/Wholesale-Electricity-Market-WEM/Security-and-reliability/Ancillary-services](http://www.aemo.com.au/Electricity/Wholesale-Electricity-Market-WEM/Security-and-reliability/Ancillary-services)>.

The State Government has recognised the need for major reform ‘to address material inefficiencies in the provision of energy and ancillary services in the WEM and to improve transparency and competition’.<sup>104</sup>

Microgrids and distributed energy resources (DER) do not participate in any of these market mechanisms and do not appear as dispatchable, controllable resources to AEMO. AEMO notes ‘as [microgrids and DER] are connected to the distribution network, they are currently below AEMO’s authority to coordinate.’<sup>105</sup> Mr Cameron Parrotte of AEMO has noted the implications of the emergence of microgrids and DER on traditional market structures:

I think the key point is the regulations were set up for a one-way flow of energy, large scale. That is what it was designed to do and it did a good job, here and in the NEM and in other markets around the world, but that has now changed, and now you’re getting the computer saying no more and more often.<sup>106</sup>

#### **Finding 8**

The Wholesale Electricity Market in the South West Interconnected System was designed to reflect the traditional electricity production and consumption model. It did not contemplate the emergence of microgrids and distributed energy resources.

### **A system in transition**

As discussed in the Interim Report, the single largest source of generation on the SWIS is now small scale solar PV installed on the rooves of Western Australian homes. These resources perform differently to traditional large scale resources, are not visible to the system operator and are changing consumption patterns across the State.

These types of assets do not ‘fit’ in the traditional energy market and do not respond in the same way as traditional assets and participants to the signals sent through that market.

#### **Changing demand patterns: the Duck Curve**

The Committee received considerable evidence demonstrating that electricity demand patterns on networks throughout Western Australia are fundamentally changing, giving rise to the ‘Duck Curve’ phenomena.

The Duck Curve effect refers to declining day-time demand, as solar PV supplies energy requirements ‘behind the meter’ and increasingly also exports power onto the grid. As the sun sets, system demand then rapidly escalates as solar PV resources no longer meet ‘behind the meter’ demand. This leads to a ‘duck’ shaped electricity demand curve on the SWIS, as shown in Figure 4.1.

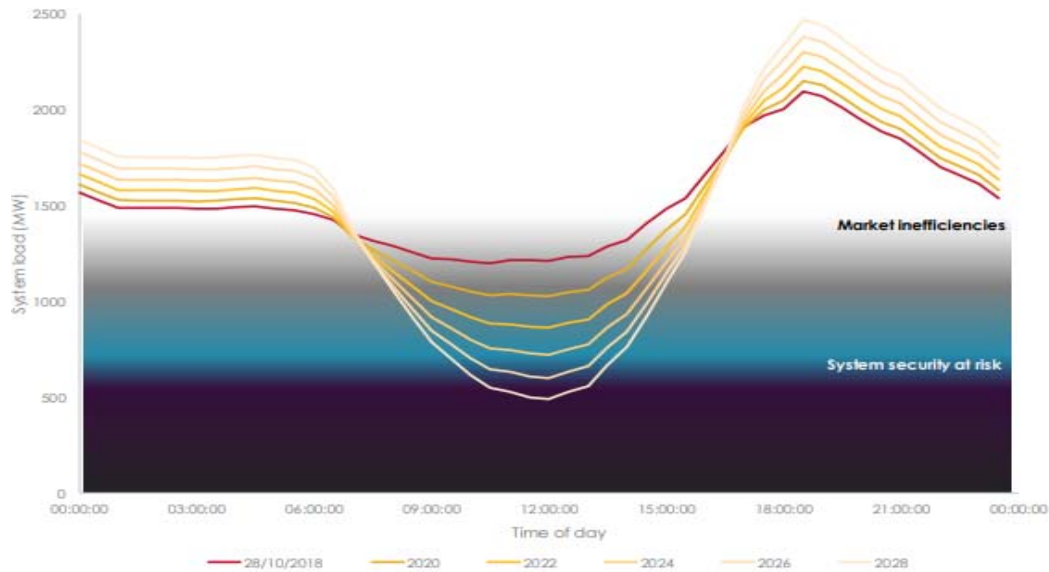
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104 Department of Finance, Public Utilities Office, *Position Paper: Design Recommendations for Wholesale Energy and Ancillary Service Market Reforms*, March 2016, p. viii.

105 Submission 19, Australian Energy Market Operator, p. 10.

106 Mr Cameron Parrotte, Australian Energy Market Operator, *Transcript of Evidence*, 21 November 2018, p. 12.

**Figure 4.1: AEMO’s analysis on the shape of the load curve on the minimum demand day, 2018 actuals forecast to 2028<sup>107</sup>**



Low demand periods are challenging for the system operator. Reduced total demand leads to reduced supply from traditional generation sources. AEMO claims that this affects the availability of system essential services that are provided by traditional synchronous generation.<sup>108</sup>

### Traditional asset performance and market behaviours

The rise of DER has led traditional generation assets to operate differently, in turn causing their owners to participate differently in the WEM. AEMO has observed changes in the way that traditional assets are operated and impacts on market dynamics as solar assets ‘force out higher marginal cost synchronous plant as the result of competition to supply the remaining operational demand.’<sup>109</sup>

AEMO has identified a number of market inefficiencies potentially arising from changes in the electricity demand curve, including:

- Design limitations and increased costs for traditional generation sources. Baseload plant is designed for relatively steady, constant operation, and not for fast ramping or cycling (switching ‘on’ and ‘off’) which is becoming a feature of the SWIS. Constant ramping or cycling will cause mechanical and thermal stress to equipment in the long run, is costlier than ‘steady’ operations and may compromise cost efficiency and reliable asset operation.

<sup>107</sup> Australian Energy Market Operator, *Integrating Utility-scale Renewables and Distributed Energy Resources in the SWIS*, March 2019, p. 27. AEMO’s analysis is based on the PV forecasts in AEMO’s *WEM Electricity Statement of Opportunities (ESOO)*.

<sup>108</sup> Australian Energy Market Operator, *Integrating Utility-scale Renewables and Distributed Energy Resources in the SWIS*, March 2019, p. 23.

<sup>109</sup> *ibid.*, p. 25.

- Cost pass-through into the market. Increased costs for existing generators would be expected to eventually be passed on to consumers. Moreover, while the SWIS has a relatively high proportion of gas peaking plant that can respond appropriately, peaking plant are higher cost than baseload coal-fired and combined cycle gas plant.

Synergy confirmed that the advent of grid connected large and small-scale renewables has changed WEM operations and reduced demand on aspects of the traditional fleet.<sup>110</sup>

Generation assets are required to be more flexible and agile, and control systems are required to be more sophisticated:

Whereas once upon a time you would run your coal plants pretty flat and you would provide the system flexibility with gas turbines, we are now trying to share the flexibility requirement between coal and gas. As a result, through... a change in some control systems, some engineering and a different approach to operating the plant, we are now a lot more flexible in the way we operate. That is all about changing our business to adapt to this new future, which I do not see abating any time soon.<sup>111</sup>

Synergy confirmed that these operational changes had cost implications, increasing some short run marginal costs, but also changing the ability to recover long-term fixed costs, given the reduced volumes of energy over which capital costs can be recovered.<sup>112</sup> Over time, Synergy stated that this will particularly affect the economics of coal-fired generation.<sup>113</sup>

Perth Energy, one of the few Independent Power Producers (IPPs) to appear before the Committee, also confirmed that they now operate their Kwinana Power Station in a different manner, following the rising proportion of DER in the grid. Perth Energy's assets operate more frequently on overcast days, ascribable to the increased penetration of solar PV.<sup>114</sup> The operational changes were described as:

Massive—absolutely massive changes. Three years ago when I first started with Perth Energy, the power station was probably only getting a capacity factor of 2%, so for 2% of the year, it was running. We are now sitting at 20% to 25%.<sup>115</sup>

When asked about the changes underway in the energy market and the impact on power station operations and costs, Perth Energy confirmed there has been a slight change in costs, associated with an increasing number of turbine starts<sup>116</sup> for which they do not receive start fees. Although their asset's start costs are not as substantial as for coal or closed cycle gas turbines, they nonetheless were unrecoverable.<sup>117</sup> The ERA has been considering the recovery of short run marginal costs, and has identified some costs applicable to certain

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110 Mr Jason Waters, Chief Executive Officer, Synergy, *Transcript of Evidence*, 9 May 2018, p. 4.

111 *ibid.*

112 *ibid.*

113 *ibid.*

114 Ms Elizabeth Aitken, General Manager Operations, Perth Energy, *Transcript of Evidence*, 10 October 2018, p. 4.

115 *ibid.*

116 *ibid.*

117 *ibid.*

types of technologies, however ‘it is a framework that has been put in place that is very much biased towards older technology, not towards any new technology at all.’<sup>118</sup>

AEMO observed impacts on both system operations and market behaviours.

[Operationally] on days, especially mild days and weekends, we see a huge excess energy from rooftop PVs. That affects the baseload generation because these are the generators that we need to keep running all the time. We find ourselves in a situation where we have to decommit some of them and it is not environmentally effective. It is not efficient from an economic perspective.<sup>119</sup>

Given that the costs of decommitting, stopping and starting traditional assets are often not recoverable, these operational outcomes are having market effects.

AEMO told the Committee that, at times of peak demand, rather than receiving revenue for producing energy, market participants are ‘bidding negatively’ or paying for the ability to keep their traditional assets operating:

to make sure that they ride through some of those solar troughs or the high solar outputs and then they can stay on for the afternoon peaks. That is a market responding. How long that construct can stay and provide the signals that it needs to with a market flowing onto mums and dads and others with DER and batteries is the really interesting one that is going to have to start to pan out.<sup>120</sup>

**Finding 9**

Distributed energy resources are having an operational impact on the power system, causing traditional generation assets to operate differently. There may be effects on the value and operating costs of traditional assets that are not recoverable through existing market structures.

**Finding 10**

Microgrids and distributed energy resources are affecting electricity demand patterns, system operations and the participation of traditional generators in the electricity market. Left unaddressed, these changes may increase inefficiencies and costs in the electricity market.

**Does the Wholesale Electricity Market provide economic incentives to ensure system security?**

Chapter Two outlined that power systems require a number of characteristics in order to maintain stable, secure operations including inertia, voltage support and flexible dispatch. These characteristics are not specifically procured through the existing ancillary service mechanisms within the WEM, primarily because traditional generation assets have automatically provided these services by virtue of their inherent physical characteristics.

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118 *ibid.*

119 Mr Dean Sharafi, General Manager System Management, Australian Energy Market Operator, *Transcript of Evidence*, 9 May 2018, p. 7.

120 Mr Cameron Parrotte, Australian Energy Market Operator, *Transcript of Evidence*, 9 May 2018, p. 6.

Evidence to the Inquiry indicated that, insofar as microgrids and associated technologies affect total system demand, supply from traditional synchronous generation sources, and the operational stability of energy systems, they will increase demand for a broader range of ancillary and system stability services and will challenge the traditional constructs of the electricity market.

AEMO stated that in the past, many of the systems and processes used to manage power system security were available as a natural by-product of investments in traditional generation plants and ancillary services, such as:

- the inherent characteristics of synchronous generating plant (which provide inertia and droop);
- network design requirements (which provided for redundancy and protection systems); and
- technical requirements.

However, with increased DER:

We see new things emerging that require our attention and actions, like lack of inertia in the system. Previously, with conventional generators, inertia and system and strength came with the generation, but now because the new technology does not provide this, we will see ourselves reaching those limits very quickly so we need to take action.<sup>121</sup>

Synergy noted:

Microgrids are likely to have impacts on the Wholesale Electricity Market ... for example, under a scenario whereby there is an increasing penetration of microgrids disconnected from the broader network, either for short or long periods, the amount or energy traded through existing regulated markets will likely decrease and the importance and cost of ancillary services will be increased.<sup>122</sup>

A number of other witnesses commented on the capabilities and operational changes underway for traditional generation. Synergy confirmed that it provided system stability services from its traditional fleet.<sup>123</sup>

Other witnesses confirmed that traditional assets are being called upon to provide grid support and stabilisation services, such as inertia and voltage control, to support higher levels of DER. As the proportion of DER increases, system stability services are increasingly required as discreet factors, but market signals do not exist for their procurement.

Australian Energy Market Commissioner Michelle Shepherd noted:

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121 Mr Dean Sharafi, Australian Energy Market Operator, *Transcript of Evidence*, 9 May 2018, p. 10.

122 Submission 22A, Synergy, p. 3.

123 Submission 22, Synergy, p. 5.

As we have seen the energy mix evolving and changing and a number of coal-fired power stations close and more intermittent generation, we have seen the need for different sorts of security that were just inherently supplied previously.<sup>124</sup>

Market participants observed to the Committee that the support services they provide to the system are not appropriately recognised or valued in current market structures. Perth Energy stated:

We certainly believe that we are offering ancillary services which are not being properly recognised at the moment ... for example, where sometimes we might be called to run for 10 minutes and then stop and then asked to run again. A major thermal plant just simply cannot do that. I guess the other thing is that because renewables are coming on, thermal plant is being taken off over the weekends. Two weekends ago Collie tried to restart and was unavailable for three or four days. So the fact that we are there to be able to be at call all the time is something that we are not really fully compensated for in our opinion.<sup>125</sup>

Perth Energy confirmed that it was not allowed to recover the costs for providing these forms of support, despite the considerable value they delivered to the system, relative to supply from other forms of generation:

What is quite interesting is, by our calculations, we have saved the Western Australian consumer more than \$25 million in the last 12 months just from coming in and capping off those prices for those short periods when otherwise we would be stretching Collie into its overrun for 15 or 20 minutes. We are able to come in and cap that off at a price that is less than their effective cost to reach that. But we are not really compensated for being able to undertake that.<sup>126</sup>

Over time, if technical structures are not present to ensure the provision of stability services or if market signals do not exist to procure them, they may decrease in availability. AEMO notes:

The outcome of the reduction in operational demand is expected to result in rapid escalation in the proportion of trading intervals that have negative prices that are frequently and persistently below the short run marginal cost of synchronous generators. The result of this is that synchronous generation will have no economic incentive to be online, and, if not remaining online for other reasons such as expectation of higher prices over the peak, will not provide the essential services required to sustain system security and reliability.<sup>127</sup>

The system operator may then be forced to intervene, outside of market constructs, to ensure the security of the system. AEMO has powers to intervene in the system to address

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124 Ms Michelle Shepherd, Commissioner, Australian Energy Market Commission, *Transcript of Evidence*, 23 November 2018, p. 9.

125 Mr Patrick Peake, General Manager EMR Regulation, Perth Energy, *Transcript of Evidence*, 10 October 2018, p. 4.

126 Ms Elizabeth Aitken, Perth Energy, *Transcript of Evidence*, 10 October 2018, p. 4.

127 Australian Energy Market Operator, [Integrating Utility-scale Renewables and Distributed Energy Resources in the SWIS](#), March 2019, p. 28.

security issues, but has nonetheless flagged a longer term risk to the SWIS and identified a discreet category of market failure:

Market failure occurs when the market is effectively sidelined or bypassed because price signals have become misaligned from system reliability/security requirements and the price of electricity does not reflect the true value of services directly or indirectly arising from its supply. In the instance of this market failure, a non-market process determines the supply of these direct and indirect services, because the price mechanism is unable to sustain their economic provision.<sup>128</sup>

**Finding 11**

Traditional synchronous thermal generation assets provide a range of system support services that have an increasing importance and inherent value to the electricity system. The value and costs of these system support services are often not realisable through existing market structures.

**Finding 12**

Whilst the Wholesale Electricity Market may not currently operate to ensure the most economically efficient provision of system services, the Australian Energy Market Operator can intervene through non-market processes to ensure the supply of direct and indirect system services and maintain supply security.

**Finding 13**

Electricity market price signals should align with system reliability and security requirements. The price of electricity traded through the various Wholesale Electricity Market mechanisms should reflect the true costs of production.

## **Economic regulation and network access pricing**

Electricity that is produced and traded through the WEM must be transported through the network for consumption at customer premises. Network connection can also make DER and microgrids more cost-effective and supply more reliable and secure. However, price signals for network connection and utilisation may also no longer reflect true costs or incentivise the most cost efficient energy supply solutions and asset configurations.

The Public Utilities Office recognised that the network access regime is not operating to adequately incentivise Western Power to develop microgrids and maximise the opportunities presented by DER:

Arguably, from a regulatory standpoint [Western Power] does not currently have incentives to pursue this sort of investment as an alternative to traditional poles and wires for asset replacement purposes or expansion. So, the currently regulatory system does not support it as an option.<sup>129</sup>

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128 *ibid.*

129 Mr Aden Barker, Acting Director Retail and Consumer Policy, Public Utilities Office, *Transcript of Evidence*, 14 February 2018, p. 3.



The role of network access charges, customer connection charges, costs of supply and economic regulation is discussed in Chapter Six.

### **Frameworks and structures are not reflecting market changes**

The Australian Energy Market Commission (AEMC) has recognised that Western Australia’s regulatory and market structure no longer reflect the physical realities of Western Australia’s electricity system and may not operate to send the most efficient signals — particularly to network owners/operators. Commissioner Michelle Shepherd stated:

Whoever is paying the cost has a signal to them, so if it is in this case the network owner, they make a decision whether they want to continue to maintain a line or upgrade a line, or they have a choice as to whether to implement a standalone power system solution, or some other technological solution. At the moment the regulatory framework does not allow them the freedom to make that choice, based on the price signals that they are seeing, and so what we would like to achieve is that we get a more sensible outcome where the distributor is making a choice based on costs that ultimately are borne by all consumers.<sup>130</sup>

#### **Finding 14**

Western Australia’s regulatory and market structures no longer reflect the physical realities of Western Australia’s electricity system and may not operate to send the most efficient signals for asset development and system operations.

### **Western Australia’s unique advantages**

Despite some emerging difficulties with respect to market and regulatory structures, Western Australia nonetheless still possesses distinct advantages over other jurisdictions that position it well to respond to the challenges in the energy sector.

Western Australia’s energy market is completely separate from the east coast of Australia, in both a statutory and physical sense. The eastern states networks are physically interconnected and nationally regulated. Major changes must be negotiated between jurisdictions (often with competing aims) and also through a national body.

Moreover, of the large number of separate, but interconnected, networks on the east coast, very few are publicly owned, creating an additional layer of complexity. East coast regulatory and market frameworks must mediate between the interests of multiple competing private network owners, driven by the individual commercial imperatives of Australian and increasingly foreign private shareholders, and often also the different State and Commonwealth governments often competing broader public policy objectives. In terms of delivering the State Government’s Energy Transformation Strategy, Mr Stephen Edwell, Chair of the Energy Transformation Taskforce (Taskforce), noted that ‘having more

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130 Ms Michelle Shepherd, Australian Energy Market Commission, *Transcript of Evidence*, 23 November 2018, p. 6.

condensed ownership helps, so [working with] one network business rather than what we are doing over east, where there would be about 10. That helps.<sup>131</sup>

Microgrids and associated technologies are emerging in a very unique regulatory and market environment in Western Australia. We are both physically and statutorily separate from the rest of the nation, and therefore can develop policy and regulatory solutions without the need to negotiate with a national regulator or other States. Witnesses to this Inquiry emphasised Western Australia's advantageous position. The Clean Energy Council stated:

WA has a unique opportunity. Because WA is not constrained by the rule changes determined by the AEMC, it is able to innovate and proceed in advance of the Eastern states of Australia ... the ability of WA to innovate outside of the rules of the National Electricity Market (NEM) is an advantage that can be leveraged for economic and social benefits of all Western Australians.<sup>132</sup>

The structure of the Government Trading Enterprises (Western Power, Synergy and Horizon) (GTEs) and their market roles is also an advantage. The Committee's Interim Report noted the benefits arising from Horizon Power's vertical integration, which provides it with visibility and control over the complete energy value chain. Horizon Power's control over the power system enables it to manage generation and network assets, it has direct relationships with customers and has demonstrated its ability to form commercial relationships to roll-out microgrids and associated technologies.<sup>133</sup>

In the SWIS, although Synergy and Western Power have been disaggregated into generation/retail and networks businesses respectively, nonetheless both remain publicly owned and the State Government can retain a level of visibility along the value chain.

As the sole shareholder of both businesses, the State Government can also drive the behaviours of the GTEs. The Interim Report observed that the GTEs have successfully partnered with a range of private sector entities to trial microgrid and DER solutions, creating opportunities for the emergence of new market participants.<sup>134</sup> The GTEs are statutorily required to operate on a commercial basis. However, being State-owned, they can also be directed to simultaneously pursue public policy objectives and facilitate market changes. Ms Audrey Zibelman, Chief Executive Officer and Managing Director of AEMO noted '[o]ne advantage that Western Australia has over the NEM is the fact that you have state-owned utilities; they are very public minded.'<sup>135</sup>

The specific roles of the GTEs are discussed in Chapter Five (technical and operational aspects) and Chapter Six (market and regulatory aspects).

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131 Mr Stephen Edwell, Energy Transformation Taskforce, *Transcript of Evidence*, 8 November 2019, p. 4.

132 Submission 9, Clean Energy Council, p. 3.

133 Economics and Industry Standing Committee, *Implications of a Distributed Energy Future: Interim Report*, April 2019, Finding 3, p. 28.

134 *ibid.*, Finding 5, p. i.

135 Ms Audrey Zibelman, Chief Executive Officer and Managing Director, Australian Energy Market Operator, *Transcript of Evidence*, 21 November 2018, p. 13.

**Finding 15**

Western Australia's physical and regulatory separation from the National Electricity Market is a unique and advantageous feature, providing it with the ability to reform its market structures and regulatory processes to suit its specific circumstances. Moreover, State ownership of the Government Trading Enterprises (Western Power, Synergy and Horizon Power) enables the Government to pursue public policy objectives and facilitate the changes underway in the sector, by directing the corporations' activities and their forms of participation in energy markets.

# Chapter 5

## Technical and Operational Factors

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**A power system is a power system and the physics is the physics. That does not change, but the way that we can keep the power system secure or the sources and way we can do that is changing over time.**

Mrs Anne Pearson, Australian Energy Market Commission<sup>136</sup>

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### Emerging operational challenges

Microgrids and distributed energy resources (DER) are challenging traditional operational models across Western Australia. In Horizon Power's microgrid systems, the increased penetration of DER has created a number of operational challenges that, over the longer term, are also anticipated to have an effect on larger grids.

Horizon Power's former Chief Executive Officer Mr Frank Tudor noted that on its microgrids, Horizon Power has had to curtail distributed energy because it has seen issues with protection, power quality, reserve capacity or:

things that have occurred on our systems which we have needed to take account of to make sure that we can run them reliably. We are dealing with some of the challenges that we expect to see on the bigger grids in due course.<sup>137</sup>

This chapter discusses a number of technical and operational challenges presented by microgrids and proposes actions which could be taken to address them.

### Microgrid and distributed energy resource visibility and control

As stated previously, the existing electricity system was designed to manage large, rotating generators with controllable and stable output. The addition of greater volumes of intermittent resources can present operational, planning and integration challenges for operators — particularly where system and network operators cannot see or control the assets affecting system operations, but must nonetheless manage their impacts.

Several witnesses to this Inquiry noted the challenges presented by a lack of DER visibility. In its submission to the Inquiry, the Australian Energy Market Operator (AEMO) stated that a significant operational issue may arise if rooftop solar photovoltaic (PV) output reaches a level that requires it to constrain DER output for system security, and it does not have sufficient visibility or the authority and ability to coordinate it.<sup>138</sup> The Commonwealth

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136 Ms Anne Pearson, Chief Executive, Australian Energy Market Commission, *Transcript of Evidence*, 23 November 2018, p. 9.

137 Mr Frank Tudor, Chief Executive Officer, Horizon Power, *Transcript of Evidence*, 11 April 2018, p. 2.

138 Submission 19, Australian Energy Market Operator, p. 7.

Scientific and Industrial Research Organisation (CSIRO) and Energy Networks Australia, in the comprehensive *Electricity Network Transformation Roadmap*, similarly observed:

Demand at transmission connection points is volatile, and AEMO has very little visibility of the potential size and changeability of this for operational purposes. This results in the power system and market operations becoming increasingly more difficult to manage efficiently.

To resolve this issue, frameworks and systems aimed at providing improved real time information and forecast future behaviour are essential at the interface between the transmission system operator and the distribution system.<sup>139</sup>

Microgrid control systems can increasingly be configured to effectively manage local generation — particularly the intermittency of renewable assets — through the coordination of storage and demand, and can present to network and system operators as single, controllable units in a broader grid. Chapter Three of the Interim Report detailed a range of systems, in both regional and metropolitan projects that have these characteristics.

The California Public Utilities Commission (CPUC) has identified the key feature of microgrid energy management systems as being the ability to simultaneously coordinate:

- reductions in customer premise demand using automated demand response technology;
- battery storage and charge and discharge operations; and
- renewable generation output.<sup>140</sup>

Microgrids have to rapidly monitor and control these variables, on an hourly to millisecond timescale. The CPUC notes that in some contexts this can be more effectively accomplished at the microgrid level than at the system operator level, from both an operational and cost perspective.

The CPUC considers that microgrids can be viewed as a fundamental building block to creating the twenty-first century ‘smart’ electricity grid, where microgrids essentially function as ‘cells’ in a matrix of interconnected DER and customer loads, all controlled by the interaction between the microgrid operator and the system or network operator.<sup>141</sup> The entire system benefits through this configuration because discreet microgrids are capable of backing one another up, increasing reliability and security:

The potential future architecture of massively distributed energy resources and intelligence with hierarchical controls can deliver higher reliability, through resource redundancy and local resource management targeted with meeting critical customer needs. At the same time, the microgrid can provide valuable grid

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139 Commonwealth Scientific and Industrial Research Organisation (CSIRO) and Energy Networks Australia *Electricity Network Transformation Roadmap: Final Report*, April 2017, p. 56.

140 Christopher Villarreal, David Erickson and Marzia Zafar, *Microgrids: A Regulatory Perspective*, California Public Utilities Commission, April 2014, p. 8.

141 *ibid.*, p. 9.

services and resources to the macrogrid. Furthermore, microgrid controls and communications can contribute not only to the optimisation of the generation and load in the microgrid, but with the distribution grid as well.<sup>142</sup>

The CPUC envisages a collection of networked microgrids ‘sharing distributed, renewable energy production and storage, based on an interaction among control systems that manage supply and demand on micro and macro levels.’<sup>143</sup>

In the Western Australian context, Perth Energy observed that, because they are potentially transmission connected, or able to affect system operations, microgrids must:

be able to contribute to the stability of the transmission network as a whole, which means that it would therefore be required, at least at the gate point, to be accountable to the system management operator for its security and reliability constraints.<sup>144</sup>

**Finding 16**

Microgrids and some classes of distributed energy resources must be visible and controllable to system and network operators. This will support system security and maximise power system efficiencies.

Currently, AEMO has remote visibility of most transmission connected equipment in the South West Interconnected System (SWIS). Its visibility, however, does not generally extend to equipment outside of the high voltage network.<sup>145</sup> AEMO notes that with increasing levels of localised, individual and relatively unpredictable generation coming into the power system at the distribution level, the continued safe, secure and reliable supply of electricity to consumers will become increasingly dependent on the visibility of smaller scale and consumer assets as a generation source.<sup>146</sup> Currently, there is no general head of power that authorises either Western Power or AEMO to exercise coordination and control of consumer assets in order to maintain system security.<sup>147</sup>

**Finding 17**

The Australian Energy Market Operator does not currently have visibility or control of microgrids or distributed energy resources at the sub-transmission level on the South West Interconnected System.

Recent advances in information and communications technology (ICT) considerably improve the potential for visibility and control at the sub-transmission/distribution system level. There is also increased potential for visibility at either an individual consumer/asset owner level or at the microgrid or embedded network level.

142 *ibid.*

143 *ibid.*

144 Ms Nicole SanGregory, Manager, Wholesale Risk and New Products, Perth Energy, *Transcript of Evidence*, 10 October 2018, p. 2.

145 Submission 19, Australian Energy Market Operator, p. 16.

146 Australian Energy Market Operator, *Answers to Questions on Notice*, 9 May 2018, p. 1.

147 *ibid.*

AEMO notes that it does not necessarily need control or visibility of individual assets located at consumer premises, but would need visibility, control and coordination at an aggregated level (i.e. at the microgrid or embedded network level).<sup>148</sup> Whilst a visibility level threshold is not suggested, AEMO does state 'it is important that the Technical Rules and WEM Rules address the respective functions and powers of Western Power (as the network operator) and AEMO in managing system security'. AEMO suggests obtaining visibility through a number of avenues:

- AEMO to receive sufficient asset data, at the time of connection, to support its system management function;
- Western Power to notify AEMO when the performance of a connected asset (e.g. a microgrid) would affect the system management function;
- AEMO to issue instructions to Western Power regarding the operation of a connected asset (e.g. a microgrid); and
- Western Power and AEMO to document processes that support the day-to-day coordination or activities on transmission and distribution networks.<sup>149</sup>

#### **Recommendation 1**

The Minister for Energy introduce regulatory changes to provide system and network operators with appropriate levels of sub-transmission visibility and the authority to control microgrids and associated technologies, to support the operational stability of the South West Interconnected System.

#### **Distributed energy resource registration**

Following a Rule Change Request from the Council of Australian Governments (COAG) Energy Council to the Australian Energy Market Commission (AEMC) in 2017,<sup>150</sup> in December 2019 AEMO will launch a distributed energy database for the National Electricity Market (NEM), following amendments to the National Electricity Rules.

All network service providers (NSPs) on the national grid will now be required to provide technical information about every small generating or battery system (0-30 megawatts (MW)) within 20 days of system commissioning or activation.<sup>151</sup> NSPs will also be required to provide any information they have about existing installations.<sup>152</sup> AEMO states that the NEM DER Register will enable it to:

- forecast, plan and operate the grid more efficiently, ensuring the system and market can deliver energy at an efficient price for all customers;

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148 Australian Energy Market Operator, Answers to Questions on Notice, 9 May 2018, p. 2.

149 *ibid.*

150 COAG Energy Council, *Rule change request to establish a register of distributed energy resources*, October 2017.

151 Australian Energy Market Operator, *What is AEMO's DER Register*, Fact Sheet, 2019, p. 1.

152 *ibid.*

- be more prepared for major disruptions to the system with a greater understanding of how DER assets will behave during these events;
- prepare the grid for major innovations with DER such as virtual power plants (VPPs), and enable customers to consider and participate in new markets with their DER; and
- allow networks to make better informed decisions about network investment options in the future as demand changes and DER increases.<sup>153</sup>

**Finding 18**

A Distributed Energy Register has been established for the National Electricity Market, imposing an obligation on network service providers to provide technical information about small scale generation and battery assets.

Energy Policy WA has acknowledged the challenges presented by limited DER visibility in the SWIS. It advised that, as a first step toward improving the information available to both Western Power and AEMO for operational and planning purposes, it is developing a DER registration framework, in consultation with industry stakeholders.<sup>154</sup> The introduction of a registration system would considerably improve operations on the SWIS.

**Recommendation 2**

The Minister for Energy introduce a Distributed Energy Resources Register for the South West Interconnected System.

**Advanced metering infrastructure**

Visibility, controllability and the ability to capture the benefits presented by microgrids and DER depend directly on enabling technologies — particularly ‘Smart’ technologies. Evidence to the Committee demonstrated broad industry agreement on the particular importance of smart meters and the telecommunications infrastructure required to enable and operate them.

Smart meters digitally measure energy use and can be configured to send information back to an operator or retailer. They can deliver real time information to consumers, network and system operators, and can also be used to remotely control energy supply without the need for a technician.<sup>155</sup> Smart meters are distinguishable from analogue, accumulation-based ‘dumb’ meters.

Horizon Power provided evidence that microgrids and DER have the capacity to reduce operating costs — particularly in regional communities that are highly reliant on diesel-fuelled base load — through the implementation of smart grid technology:

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153 *ibid.*

154 Ms Kate Ryan, Acting Executive Director, Energy Policy WA, *Transcript of Evidence*, 8 November 2019, p. 5.

155 Australian Energy Regulator, *Smart meters*, accessed 3 August 2019, <[www.aer.gov.au/consumers/my-energy-service/smart-meters](http://www.aer.gov.au/consumers/my-energy-service/smart-meters)>.



First of all, smart meters, to the distribution energy management systems and to other types of systems—outage management systems, SCADA [supervisory control and data acquisition] monitoring systems—all of those come to bear to improve the operation of the grid, lowering the operating cost because we are not now spending so much money on diesel, but also we are encouraging a benefit to the customer with more and more customers implementing their solar rooftop and other types of personal generation.

Horizon Power also stated that smart metering will gain increased significance, should tariffs move towards real-time price signalling or other steps are taken to incentivise different consumption behaviours.<sup>156</sup>

Mr Dean Sharafi of AEMO noted that smart meters are key components of a smart grid, stating ‘by selecting the right smart meters, we can get visibility, we can get predictability and probably controllability of this large amount of distributed energy resources. In overview, smart meters can play a key role in giving us visibility and control.’<sup>157</sup>

Western Power stated that advanced metering infrastructure is integral to successful microgrid implementation.<sup>158</sup> Synergy observed that VPPs require advanced metering and interval data for successful operation<sup>159</sup> and that advanced metering infrastructure was a key enabler, and in many cases a pre-requisite, for the optimisation of microgrids and DER, noting that ‘dumb’ accumulation meters do not provide data that allows for time of use or dynamic pricing to account for the true market value of electricity.<sup>160</sup> ATCO Australia stated:

advanced metering is an enabler of electricity microgrids as advanced meters provide data and control capabilities. A broad rollout of advanced meters in the SWIS is critical to promoting efficient energy use, empowering consumers, and lowering the cost of providing energy services.<sup>161</sup>

Dr GM Shafiullah of Murdoch University underscored the importance of securing access to data — particularly from advanced metering infrastructure at the premises or sub-transmission level:

Precise data and information is really needed if we want to develop an optimised and controlled system, because renewable energy is intermittent and subject to cloud and other things. We do not know the exact maximum generation from solar or wind. If utilities want to develop dispersed energy systems or operating systems for dispersal, we need information for our research as well to identify that control.<sup>162</sup>

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156 Mr Frank Tudor, Horizon Power, *Transcript of Evidence*, 11 April 2018, p. 2.

157 Mr Dean Sharafi, Australian Energy Market Operator, *Transcript of Evidence*, 9 May 2018, p. 13.

158 Submission 4A, Western Power, 4 October 2018, p. 7.

159 Submission 22, Synergy, p. 6.

160 *ibid.*, p. 8.

161 Submission 13, ATCO Australia, p. 11.

162 Dr GM Shafiullah, Lecturer, School of Engineering and Information Technology, Murdoch University, *Transcript of Evidence*, 18 June 2018, p. 7.

When questioned on the importance of data availability, communications platforms and DER operability, Dr Farhad Shahnia similarly noted that communications platforms were very important, in terms of information gathering and analysis, development of demand responses and subsequent system management:

Without that, of course we can do it at a more aggregated level, but the results are not going to be as effective and as efficient as having much more detailed information. Simply, that rolling out of smart grids is providing us with much more flexibility and control over the system. Every bit of information becomes much more visible for us in terms of if you want to control something, what is available and how much, if you change them, it is going to benefit us.<sup>163</sup>

**Finding 19**

Smart meters, and the telecommunications infrastructure required to access real-time data and control assets, are essential to support microgrids and facilitate the successful transition to distributed energy systems. They will also be integral to the successful implementation of new retail products and services and can greatly assist consumers to understand and manage their energy requirements.

Western Power recognised the centrality of smart technologies in its 2018 Access Arrangement submission to the Economic Regulation Authority (ERA) under the *Electricity Networks Access Code 2004* (ENAC) and sought to recover costs associated with advanced metering infrastructure as part of its AA4 application. However, the ERA did not approve Western Power recovering the costs for this essential information technology. The role of economic regulation in the development of the network and roll-out of DER technologies is discussed in more detail in Chapter Six.

**Finding 20**

Decisions made by the Economic Regulation Authority have prevented Western Power from recovering the installation costs for the advanced metering infrastructure essential to support microgrids and facilitate the successful transition to distributed energy systems.

After the ERA refused to allow Western Power to recover smart grid technology costs, the State Government announced its support for the deployment of advanced metering infrastructure, with funding for the installation of 238,000 meters in the SWIS and the communications infrastructure required for monitoring and control.<sup>164</sup>

The meters are being rolled out as part of Western Power’s aging meter replacement program and for all new installations. The Government listed a range of benefits for Western Power associated with the roll-out, including:

- improved visibility of power flows on the network;

163 Dr Farhad Shahnia, Senior Lecturer, School of Engineering and Information Technology, Murdoch University, *Transcript of Evidence*, 18 June 2018, p. 8.

164 Hon Bill Johnston MLA, [Advanced meters to unlock more efficient, safer electricity network](#), media release, 24 April 2019.

- improved efficiency and reliability of operations and services Western Power provides to customers; and
- substantial safety benefits by enhancing Western Power's ability to detect safety issues on its network, such as neutral faults.

The Government stated that advanced metering infrastructure will also facilitate the development of new retail products and services that will enable Western Australian homes and businesses to have greater visibility and control of their energy use, including managing rooftop solar electricity systems and batteries.<sup>165</sup>

**Finding 21**

Government and regulatory agency support for advanced metering infrastructure is essential to evolve Western Australia's energy systems, facilitate system security and encourage efficient asset development and utilisation.

### Technical rules and standards

Beyond communications infrastructure and telemetry, power system stability also depends on connected equipment operating within the same predictable technical parameters.

In the absence of technical standardisation, a proliferation of microgrids presents a risk that multiple operational and technical standards could emerge, impacting system operations. The CPUC has acknowledged this issue, observing '[t]here is a need to develop appropriate standards and requirements to ensure that microgrids interconnect and interact with the distribution grid in a reliable and safe manner'.<sup>166</sup>

In the Western Australian context, AEMO has stated that the performance standards for smaller-scale distribution-connected generation should align with those of transmission-connected generation. AEMO's role depends on its ability to predict, with a high level of certainty, how DER and loads will respond to particular systemic conditions:

Minimum connection standards are required to ensure that distribution-connected generation capability, including disturbance ride-through ability, aligns with power system needs. This capability will become critical for system security as distribution-connected generation systems begin to dominate certain operational periods.<sup>167</sup>

AEMO states that improved accuracy and confidence in its simulation models, delivered through common technical standards for generation assets, would allow the system to be run in a less conservative manner (for example, holding less energy or frequency control reserves), leading to more efficient outcomes for consumers:

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165 Hon Bill Johnston, Minister for Energy, *Advanced meters to unlock more efficient, safer electricity network*, media release, 24 April 2019.

166 Christopher Villarreal, David Erickson and Marzia Zafar, *Microgrids: A Regulatory Perspective*, California Public Utilities Commission, April 2014, p. 125.

167 Australian Energy Market Commission, *Power System Requirements*, March 2018, p. 8.

Without knowledge of how DER and loads respond to faults, constraints and interconnector transfer, limits may be too conservative (underutilising network capacity), or too optimistic (risking system security).<sup>168</sup>

The CSIRO and Energy Networks Australia highlighted the importance of technical standards and regulations in the final report for the *Electricity Network Transformation Roadmap*. As part of this project, Standards Australia was commissioned to determine the current state of Australian standardisation in the sector, identify urgent priorities and needs for further coordination and identify timeframes for standards development priorities.<sup>169</sup> Standards Australia's key findings were that:

- The standards framework for the future of distributed electricity should support innovation in product, system and network renewal whilst maintaining appropriate levels of safety, system security and reliability.
- Inter-operability and harmonisation of solutions were key themes. This should be managed not through vertical development groups but by way of an overarching plan.
- Emerging themes like energy and data security must also be managed at both a technical and policy level to ensure the viability of the grid as it transforms.
- International standards participation will ensure that Australia's perspectives are incorporated at this level, thus facilitating the national uptake of international standards, which were identified by stakeholders as key resources supporting the transformation of the grid.<sup>170</sup>

AEMO provided an illustrative example of the importance of technical standards, noting that before October 2016 rooftop solar PV systems were not required to be manufactured to a specific standard for responses to system frequency events.<sup>171</sup> AEMO noted that, following the introduction of AS4777.2-2015, all rooftop systems must now be capable of zero-export to maintain frequency and be capable of remaining connected within a frequency range. These new technical standards will ensure that assets will be able to provide support to the system and will also be less likely to adversely (and unpredictably) affect system operations.

In March 2019, the State Government launched an *Energy Transformation Strategy* to deliver cleaner, more affordable and reliable energy. One of the major work activities under this Strategy is the 'DER Roadmap'.<sup>172</sup> The DER Roadmap was presented to the Minister for Energy for his consideration in December 2019. Its scope includes revisions to network connection requirements and performance standards for distributed energy technologies.

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168 *ibid.*

169 Commonwealth Scientific and Industrial Research Organisation (CSIRO) and Energy Networks Australia *Electricity Network Transformation Roadmap: Final Report*, April 2017, p. 87.

170 Standards Australia, *Roadmap for Standards and the Future of Distributed Electricity*, May 2017, p. 5.

171 Submission 19, Australian Energy Market Operator, p. 17.

172 Hon Bill Johnston MLA, *McGowan Government launches Energy Transformation Strategy*, media release, 6 March 2019.

Energy Policy WA told the Committee that it was examining connection requirements and obligations on large scale generators as part of reforms to the WEM, ‘making sure that all the connections are occurring in a way that is understood and helps manage system security elements.’<sup>173</sup> Western Power’s role in developing technical rules was also referred to by Energy Policy WA.<sup>174</sup>

For smaller-scale assets — particularly at the individual customer level — both Energy Policy WA and the Energy Transformation Taskforce (Taskforce) noted that the technology is far less mature:

We are still definitely in the trial and learning phase on that front. There are lots of different pieces of software and technology that have to talk to each other. There is no end-to-end platform. We are kind of working this out as we go. The experience to date has been that even where, for example, an appliance has been installed and we know it is meeting a certain standard and it should behave in a certain way when it sends a signal, but it does not. A lot of time has been spent in understanding why that is not happening as often as it would be expected to happen, and whether the settings in the appliance have been set up wrong out of the manufacturer and all those kinds of things. What we have taken from that, and we are still working through what that means for the road map, is that there is great potential there but there is still a lot of learning to do.<sup>175</sup>

Ms Ryan stated that more trials and pilots might be required to fully understand the technology and how communication flows from a control centre to individual appliances and then translates into responses that operators can rely upon.<sup>176</sup> Mr Edwell also observed that there can be considerably different views within industry regarding technological preferences and specifications.<sup>177</sup>

The role of economic regulation in facilitating the research and development required to fully realise the benefits offered by microgrids and DER is discussed in Chapter Six.

**Finding 22**

Common technical standards for grid connected equipment are integral to the development of microgrids and management of distributed energy resources.

**Whole of system planning**

On 7 October 2016, the COAG energy ministers agreed to an independent review of the NEM, to take stock of its current security and reliability and provide advice to governments on a coordinated national reform blueprint. Dr Alan Finkel AO, Australia’s Chief Scientist, conducted the review in conjunction with an independent Expert Panel (Finkel Review).

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173 Ms Kate Ryan, Energy Policy WA, *Transcript of Evidence*, 8 November 2019, p. 6.

174 *ibid.*

175 *ibid.*

176 *ibid.*

177 Mr Stephen Edwell, Energy Transformation Taskforce, *Transcript of Evidence*, 8 November 2019, p. 6.

The Expert Panel consulted widely, visiting regulators and operators across Europe and the United States and commissioning a review of best practices from the International Energy Agency. In Australia, the Expert Panel held public and private consultations in every region of the NEM, undertaking over 120 individual meetings and receiving over 390 written submissions.<sup>178</sup>

The document produced by the review, titled *Independent Review into the Future Security of the National Electricity Market* and colloquially known as the Finkel Report, is now a seminal reference point for electricity sector reform across the nation.

The Finkel Report sets out a vision for the NEM’s future, with four key outcomes:

- increased security
- future reliability
- rewarding consumers
- lower emissions.

The vision will be enabled by three key pillars:

- an orderly transition
- stronger governance
- system planning.<sup>179</sup>

System-wide planning was a central component of the Finkel Report and many of the observations about planning in NEM are also very pertinent to the SWIS.

Dr Finkel’s analysis begins by identifying the need to align networks with future generation needs, noting the need to accommodate renewable technologies and avoid crowding out technologies that provide alternatives to network infrastructure, such as DER.

The Finkel Report states that electricity sector reforms undertaken over past decades on the east coast, disaggregating and privatising many previously state-owned enterprises, make this task challenging. Coordination between generators and transmission network service providers (NSPs) in the NEM is difficult to achieve, as their interests do not necessarily align.<sup>180</sup>

The Finkel Report notes the ‘critical difference’ between the current structure of the NEM and the State-based systems of the past, where responsibility for planning and investment

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178 Dr Alan Finkel AO, Karen Moses FAICD, Chloe Munro, Terry Effenev and Professor Mary O’Kane AC, [\*Independent Review into the Future Security of the National Electricity Market: Blueprint for the Future\*](#), June 2017.

179 *ibid.*

180 *ibid.*, p. 110.

decision making is now distributed between market institutions, networks and market participants rather than centralised within vertically integrated, state-owned monopolies:

When planning was undertaken by vertically integrated, state-owned monopolies and the range of energy technologies was more limited, electricity suppliers were able to determine how much new generation capacity they required and optimise its location based on proximity to fuel resources and the cost of connection to the transmission network.

The Finkel Report urges a more strategic approach to network planning, noting that investments made today will shape the network of the future. In the fragmented NEM, investments are currently made based on the next marginal investment required, but the Finkel Report finds that this approach is 'unlikely to produce the best outcomes for consumers or for the system as a whole over the long term or support a smooth transition.'<sup>181</sup>

The Finkel Report finds that proactively planning key elements of the network now, in order to create the flexibility to respond to changing technologies and preferences, has the potential to reduce the cost of the system over the long term. Similarly, Energy Networks Australia and CSIRO have also found that:

Without a well-planned approach to navigate this transformation, Australia's energy system will be unable to efficiently and securely integrate the diverse technologies, large-scale renewable energy sources and customer owned distributed energy resources. This will potentially result in the costly duplication of energy investments.<sup>182</sup>

Stakeholders to the Finkel Review listed a number of whole-of-system benefits that can be realised through greater strategic infrastructure planning, including:

- Creating more options for reliability through the development of a diverse mix of large-scale generation capacity in a range of locations through the grid, including the development of new renewable energy zones.
- By enabling the connection of large-scale renewables and large-scale backup generation and storage, such as gas, grid-scale batteries and pumped hydro, the transmission system can be a critical enabler of significant emissions reductions.
- Ensuring the transmission system is able to contribute to the preservation of network security and stability, including through inter-regional provision of security services.
- Ensuring reactive power control, and in future by procuring necessary inertia and fast frequency response.

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181 *ibid.*, p. 112.

182 Energy Networks Australia and Commonwealth Scientific and Industrial Research Organisation (CSIRO), [Electricity Network Transformation Roadmap: Key Concepts Report](#), December 2016, p. i.

- Increasing affordability by ensuring consumers are able to access the benefits of a competitive wholesale market.<sup>183</sup>

The CPUC has also noted the importance of system-wide planning to accommodate the changes underway in the energy sector. In the first instance, it notes that planning will need to consider the impact of different consumption patterns on existing traditional assets and the increasing number of large scale renewable assets:

Transmission planning scenarios will need to adapt to reduced need for both existing fossil central station generation, as well as new utility-scale renewable generation resources.<sup>184</sup>

Importantly, the CPUC also discusses the importance of system-wide planning to facilitate microgrids and the transition toward a more distributed energy system:

State regulators and energy policymakers need to analyze the distribution grid statewide and assess the potential for microgrid deployment based on favourable grid conditions in areas throughout the system. Sites should be identified that can support cost-effective development of microgrids, based on a consistent set of criteria including cost, grid benefits, and availability of resources. Indeed, locating microgrids in areas where reliability is an issue can provide a higher quality of service to those customers, including an increase in resiliency in response to some catastrophic event.<sup>185</sup>

### **Planning in the South West Interconnected System**

The SWIS does not currently have a single entity responsible for planning the power system. AEMO undertakes a forecasting function for generation needs and Western Power is responsible for planning the development of the transmission and distribution networks.

Witnesses to this Inquiry noted the recommendations of the Finkel Review and voiced strong support for a system-wide plan for the SWIS. AEMO noted:

It was actually a Finkel recommendation to produce an integrated system plan to provide advice to the industry in terms of what is changing and where the opportunities might be, which will include interconnection, whether there is a need for more power and what sort of power might be needed, whether it is batteries or storage, gas turbines or whatever it might be. There is no such role in Western Australia ... I think you need a central planner, a system plan, to provide advice. Then you decide which components get mandated and built either through a regulatory construct—the government says, tick, build it—or you leave it to the

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183 Dr Alan Finkel AO, Karen Moses FAICD, Chloe Munro, Terry Effeney and Professor Mary O’Kane AC, *Independent Review into the Future Security of the National Electricity Market: Blueprint for the Future*, June 2017, p. 112.

184 Christopher Villarreal, David Erickson and Marzia Zafar, *Microgrids: A Regulatory Perspective*, California Public Utilities Commission, April 2014, p. 10.

185 *ibid.*, p. 12.



market to respond. We have to work through that, but if you do not have a plan, you cannot even decide which components fall into that category.<sup>186</sup>

Similarly, Perth Energy stated that a study of regional generation and network requirements, allied with regional network pricing, is a prerequisite for achieving cost reflectivity, equitable third-party access, and a secure and affordable energy supply for Western Australia:

To achieve cost reflectivity, it is important to accurately identify what the cost of service is and how to provide that service as efficiently as possible. We believe a detailed study that identifies the optimum generation type, location, technical network limitations (including network constraints), and maps these requirements to loads and customer requirements is a prerequisite for effective market reform and an efficient third-party access regime.<sup>187</sup>

**Finding 23**

System-wide planning is essential to ensure long term reliable, secure, sustainable and affordable energy supply, facilitate the emergence of microgrids and transition towards a distributed energy future.

In March 2019, the State Government announced that it would commission a Whole of System Plan (WOSP) as part of its Energy Transformation Strategy. The WOSP is scheduled for completion in 2020 and will:

- identify the best options for investment in the SWIS, to maintain security and reliability at the lowest sustainable cost;
- assist in the transition to a lower-emissions power system by guiding the efficient integration of renewable generation and identifying opportunities for energy storage, which will play an increasing role in meeting our essential electricity needs; and
- provide guidance to regulators and industry regarding efficient power system investment, and to policy-makers on the future needs of the power system.<sup>188</sup>

The WOSP involves comprehensive economic modelling of the power system and network and will produce 10 and 20 year outlooks under a ‘business as usual’ scenario and then four scenarios projecting different rates of renewable energy uptake and system demand. The Taskforce states that each scenario is credible and predictable and represents potential future demand, and technological developments that will impact the supply of, and demand for, grid-connected electricity in the next 20 years.<sup>189</sup>

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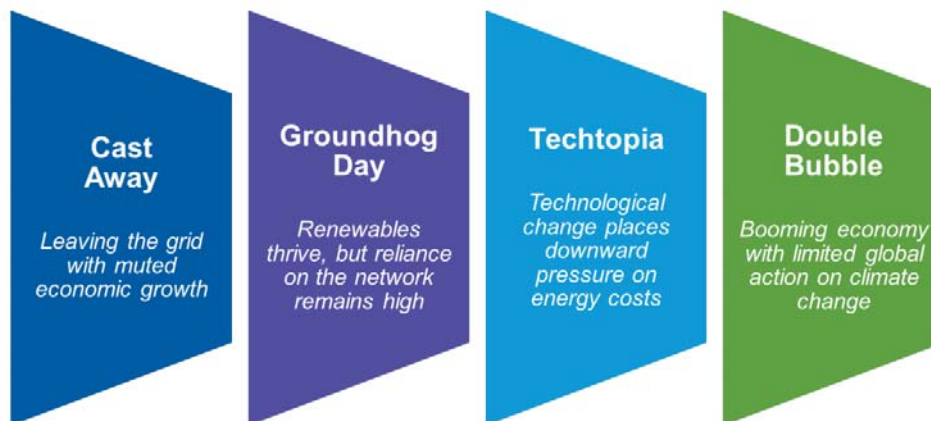
186 Mr Cameron Parrotte, Australian Energy Market Operator, *Transcript of Evidence*, 9 May 2018, p. 13.

187 Submission 20B, Perth Energy, p. 2.

188 Energy Policy WA, *Energy Transformation Strategy*, accessed 5 September 2019, <[www.wa.gov.au/organisation/energy-policy-wa/energy-transformation-strategy](http://www.wa.gov.au/organisation/energy-policy-wa/energy-transformation-strategy)>.

189 Energy Transformation Taskforce, *Whole of System Plan Modelling Scenarios: Information Paper*, August 2019, p. 2.

Figure 5.1: Whole of system modelling scenarios<sup>190</sup>



The WOSP is being undertaken by the Taskforce in conjunction with AEMO and Western Power.

The four scenarios were presented to stakeholders at an Industry Forum in Perth on 12 July 2019. The Taskforce subsequently held a number of one-on-one meetings with interested parties, to hear their views on the four scenarios and understand what factors are important to them when developing the WOSP.<sup>191</sup> The Taskforce is currently finalising the modelling inputs and intends to release a consultation draft to industry in March or April of 2020.<sup>192</sup> The final plan is targeted for delivery in May to August 2020.<sup>193</sup> Taskforce Chair Mr Stephen Edwell told the Committee that it ‘will be an important piece of work for the government to use in terms of policy decisions and policy direction.’<sup>194</sup>

**Finding 24**

A system-wide plan for the South West Interconnected System will provide a strong evidentiary base for energy policy development in Western Australia and should inform future market and regulatory reforms aimed at promoting secure, reliable, sustainable and affordable energy supply.

Whilst the WOSP program of work clearly anticipates the impact of DER, such as solar PV and battery technologies, it is not clear on the evidence available to the Committee whether the WOSP will consider the role that microgrids might play in the development of the SWIS.

Evidence presented to the Committee (detailed in the Interim Report) suggested that there are proposals for ‘community energy’ microgrid projects in certain geographical locations at the outer reaches of the SWIS, such as Geraldton.

<sup>190</sup> *ibid.*

<sup>191</sup> *ibid.*, pp. 2-3.

<sup>192</sup> Mr Stephen Edwell, Energy Transformation Taskforce, *Transcript of Evidence*, 8 November 2019, p. 3.

<sup>193</sup> Energy Transformation Taskforce, *Whole of System Plan Modelling Scenarios: Information Paper*, August 2019, pp. 2-3.

<sup>194</sup> Mr Stephen Edwell, Energy Transformation Taskforce, *Transcript of Evidence*, 8 November 2019, p. 3.

Evidence also suggested that some fringe of grid communities could be well served by microgrid solutions, with the retention of ‘skinny’ back-up feeder connections to the SWIS. As has been discussed, connected microgrids could present to the macrogrid as dispatchable entities in their own right and, depending on operations behind the point of coupling, could appear as load, generation or ‘nil’ demand to the system and network operators.

As discussed previously, Western Power is also expanding its stand-alone power system (SAPS) trials to an additional 60 sites, with scope for up to 15,000 additional sites, which could significantly impact demand on the outer reaches of the SWIS, should ‘pole and wire’ electricity supply be replaced by SAPS.

Much as the large scale generation mix and network development outcomes are likely to have differential cost and technical implications under the different scenarios, so too could the likely emergence and relative efficiencies of microgrid solutions differ. The WOSP should specifically consider the macro-level role that microgrids could play in system development under the selected scenarios. This would complement the work being undertaken in the DER Roadmap program of work.

**Finding 25**

Based on the evidence presented to the Committee, it is not clear that the Whole of System Plan for the South West Interconnected System will specifically consider the implications that microgrids might have for the development of the system.

**Recommendation 3**

The Minister for Energy instruct the Energy Transformation Taskforce to specifically address the role of microgrids in the Whole of System Plan.

**DER Roadmap**

Many of the technical and operational issues canvassed in this chapter are being considered as part of the Energy Transformation Taskforce’s DER Roadmap. As previously noted, the Taskforce delivered the DER Roadmap to the Minister for Energy for his consideration in late December 2019.

The DER Roadmap’s stated focus is on managing individual assets or the aggregate impact of DER on the broader system. It expressly considers the individual and cumulative impacts of:

smaller-scale devices that can either use, generate, or store electricity and form a part of the local distribution system, which serves homes and businesses. DER can include renewable generation, energy storage, electric vehicles, and controlled appliances, such as air conditioners and pool pumps.<sup>195</sup>

The Roadmap’s objective is to ensure ‘we can integrate growing levels of DER into the State’s electricity systems in a safe and secure way and to make sure customers can

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195 Energy Policy WA, *Energy Transformation Strategy*, accessed 15 November 2019, <[www.wa.gov.au/organisation/energy-policy-wa/energy-transformation-strategy](http://www.wa.gov.au/organisation/energy-policy-wa/energy-transformation-strategy)>.

continue to benefit from solar PV and other new technologies.<sup>196</sup> It will do this by recommending changes to policies, regulations, technical requirements and customer protections to support the integration of DER over the short, medium and longer term. The Roadmap will also provide guidance on how DER can be integrated with the operation of the power system and WEM.<sup>197</sup>

Given that many embedded networks and other forms of microgrid may contain DER, they are obviously touched by the scope of the project. However, much as for the WOSP, it is not clear, based on the evidence provided to the Committee, whether the DER Roadmap project specifically contemplates microgrids as a *form* of DER.

Microgrids can be located throughout the SWIS. They are clearly not traditional forms of large-scale generation, but can present as dispatchable entities, are potentially capable of providing a range of system stability and ancillary services and can affect network operations in much the same way as both transmission-connected large scale assets, and aggregations of DER — particularly in local areas.

Microgrids may not be operated by a macro-level system operator (such as AEMO) or network operator (such as Western Power). The Interim Report provided examples where microgrid projects are configured to manage generation, storage and load internally (potentially by private operators) and can simply present to the macro-operator as a single load or generation source at the point of network connection.

Moreover, microgrids may be located at the distribution level: previously, this chapter discussed microgrids as functioning like ‘cells’ in a matrix of interconnected DER and customer loads, all controlled by the interaction between the microgrid operator and the system or network.

This chapter has discussed revisions to network connection requirements and performance standards for distributed energy technologies encompassed in the DER Roadmap project. Insofar as microgrids themselves constitute DER, their interface with technical standards and operational requirements should also be considered.

The DER Roadmap’s scope considers the transition to dynamic, real-time monitoring of DER, to enable distribution level services and distribution level operations to harness and aggregate DER. Given their potential to internally manage generation and load, and ‘present’ to the network, microgrids could constitute a technically and operationally efficient ‘bridge’ to macro-level operators in this regard.

The above section questioned whether the WOSP will consider microgrids as a discreet issue to be addressed as part of the evolution of the energy system. Similarly, the Committee considers that it is important that the DER Roadmap contemplates how microgrid configurations themselves may be considered as a valuable form of DER.

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196 Energy Policy WA, *Energy Transformation Strategy*, then select *Distributed Energy Resources*, accessed 15 November 2019, <[www.wa.gov.au/organisation/energy-policy-wa/energy-transformation-strategy](http://www.wa.gov.au/organisation/energy-policy-wa/energy-transformation-strategy)>.

197 *ibid*.

**Finding 26**

Based on the evidence presented to the Committee, it is not clear whether the DER Roadmap for the South West Interconnected System will specifically consider the role of microgrids as a discreet form of distributed energy resource.

**Recommendation 4**

The Minister for Energy instruct the Energy Transformation Taskforce to specifically address any issues associated with the development of microgrids, as part of the DER Roadmap.

The technical and operational interface of microgrids is vital to an understanding of how both they, and DER more broadly, might participate in markets and be accommodated in regulatory structures. Chapter Six discusses these matters. Chapter Seven considers consumer-oriented issues associated with the emergence of microgrids and associated technologies.

**Ensuring system security**

Technical and operational issues are paramount to the successful integration of microgrids and associated technologies into Western Australia’s energy systems. Despite the rapid pace of change and growing need to address technical and operational factors, it is important to emphasise that the SWIS currently has sufficient capacity to continue to operate securely and reliably. Mr Cameron Parrotte of AEMO told the Committee:

We are quite fortunate in this state that we have a lot of gas turbines that are quick to respond both to get onto the system and then ramp up or down. That enables a lot of flexibility that my colleagues on the east coast do not necessarily have at their disposal. It is also part of the reason we are not facing some of the issues and challenges that they have got over there.<sup>198</sup>

Energy Policy WA also holds the view that AEMO currently possesses sufficient powers to maintain the security and reliability of the energy system:

The Chair: I just want to be very careful about managing the perception that some might choose to put out there that the sky is about to fall in. AEMO sits there; in your view, do they have a sufficient level of powers and ability to intervene in the market to ensure that we nonetheless maintain a secure and reliable system at the moment?

Ms RYAN: I think, at the moment, the information AEMO has shared with us is very consistent with that conclusion, so they do have options. They might not be the most efficient options, but they can control which power stations generate, and how much, to the point where they can keep the lights on in the SWIS at the moment. The challenge we have is probably two or three years down the track, when system demand is so low, when PV output is high, that they might not have

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198 Mr Cameron Parrotte, Australian Energy Market Operator, *Transcript of Evidence*, 9 May 2018, p. 6.

enough demand on the system to actually run enough generation. We are not at that point yet, though.<sup>199</sup>

**Finding 27**

Although the increasing penetration of distributed energy resources presents both operational and technical challenges on the South West Interconnected System, the Australian Energy Market Operator possesses sufficient powers to ensure secure and reliable system operations.

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<sup>199</sup> Ms Jessica Shaw MLA, Chair, Economics and Industry Standing Committee, and Ms Kate Ryan, Energy Policy WA, *Transcript of Evidence*, 8 November 2019, p. 11.



## Chapter 6

### Policy, Market and Regulatory Reform

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One of the key things to comprehend with regard to the nature of this transformation is that it is a holistic transformation, not just incremental change. The deployment of all of these different DER technologies in, if you like, a chaotic uptake of technologies without a deliberate approach to the architecture and the orchestration, will not actually result in all of the good things that we all talk about. We often think and frame these thing[s] around, if all of these technologies are deployed, how big will the benefits be? The benefits may actually [be] negative if they are not approached in an architectural and whole system approach.

Mr Mark Paterson, Horizon Power<sup>200</sup>

The objective of any microgrid-related reform should ... be to facilitate a broad range of opportunities in regard to new business models and technologies, market development, and new approaches to power system and market operation and planning. The potential benefits of getting this right are significant. Any benefits, however, will be far outweighed by consequences of not managing the adverse impacts of this new technology to the security and reliability of the power system, and to market effectiveness.

Australian Energy Market Operator<sup>201</sup>

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The emergence of microgrids and associated technologies presents a range of technical, operational and market challenges in Western Australia. Since the establishment of the Wholesale Electricity Market (WEM) in the mid-2000s, no government has undertaken a significant reform process to restructure markets or adapt regulatory frameworks. The changes underway present government with an opportunity to both facilitate new technologies and commercial models, and also address a range of long-standing structural issues in the market.

The overwhelming weight of evidence presented to the Committee supported reform to the electricity industry and urged timely action. There was also a high degree of consistency on the key principles that should underpin the reform process.

The evidence clearly identified a number of specific market and regulatory issues that have direct implications for microgrids and associated technologies. There were also a number of other issues of broader significance to the Western Australian energy market — some of which were contested — and all of which affect the wide array of existing and new business models and technologies.

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200 Mr Mark Paterson, General Manager Consumer Energy, Horizon Power, *Transcript of Evidence*, 11 April 2018, p. 7.

201 Submission 19, Australian Energy Market Operator, p. 3.



A number of recommendations were presented to the Committee, including a number of often complex suggestions for specific changes to market and regulatory structures and rules. Many of the more detailed proposals would have significant potential impacts on the energy market and therefore require detailed analysis and more extensive community consultation. The Committee is unfortunately not equipped with the resources to undertake the detailed analysis required to assess the impact of many of the changes that were suggested.

We note, however, that since the initiation of this Inquiry, the State Government has announced its Energy Transformation Strategy and there are now several processes underway to conduct consultation and analyse a range of very detailed and complex aspects of energy policy reform. With this in mind, the Committee has made findings and recommendations at a more general level that it hopes will also feed in to the policy development processes underway in Government.

### **General principles**

The Council of Australian Governments (COAG)-sponsored Independent Review into the Future Security of the National Electricity Market, led by Dr Alan Finkel AO (Finkel Review), outlined the four key outcomes it intended to facilitate for the National Electricity Market (NEM):

- increased security;
- future reliability;
- rewarding consumers; and
- lower emissions.

The evidence presented to this Inquiry consistently reiterated the importance of these four principles in the Western Australian context. Regulators, public and private sector entities all repeatedly emphasised the importance of secure, reliable, affordable and sustainable electricity supply when discussing technical, operational and market issues.

The State Government has adopted the 'Finkel Four' and added two other objectives to underpin its Energy Transformation Strategy. The Strategy's objectives are to:

- maintain a secure and reliable electricity supply;
- ensure affordable electricity for households and businesses;
- reduce energy sector emissions;
- transition affected workers in the Collie region; and

- promote local jobs and growth.<sup>202</sup>

In addition to the Finkel Four, a number of other core principals emerged from the evidence presented to the Committee:

- The policy framework must be flexible and capable of adapting and encouraging technological change over time.<sup>203</sup>
- Energy policy should provide clear direction and certainty for industry.<sup>204</sup>
- Energy solutions should be selected on a technologically neutral, economically efficient and cost effective basis.<sup>205</sup>
- It is important to maintain appropriate licensing frameworks and consumer protections.<sup>206</sup>
- The private sector has a role to play at different points in the energy supply chain.<sup>207</sup>
- Some form of wholesale energy pricing or tariff reform is required, to promote more efficient and cost effective energy supply.<sup>208</sup>

The Committee was encouraged to consider approaches that are measured, practical and deliverable. Witnesses emphasised the importance of ensuring that the perfect is not the enemy of the good, and suggested that the State Government prioritise its reform program to shore-up system operations, deliver ‘quick win’ cost savings and then tackle more complex matters (particularly complex regulatory or market reforms). Mr Cameron Parrotte from the Australian Energy Market Operator (AEMO) stated that government should not ‘try to fix everything’ but should decide what’s important and get those changes underway:

This is a journey we’re going to be on for the next five, 10, 20 years. We know that it needs to change. We could chuck the whole thing out, but then that is going to take many, many years and, to be honest, we will not get it right today anyhow,

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202 Government of Western Australia, Department of Treasury, [Energy Transformation Strategy: A brighter energy future](#), 2019, p. 5.

203 Submission 4A, Western Power; Submission 22, Synergy; Submission 27, Sustainable Energy Now; Submission 28, Curtin University; Submission 29, Power Ledger.

204 Submission 4A, Western Power; Submission 9, Clean Energy Council; Submission 20A, Perth Energy; Submission 29, Power Ledger.

205 Submission 9, Clean Energy Council; Submission 11, Tesla; Submission 12, Infrastructure Capital Group; Submission 20A, Perth Energy; Submission 22, Synergy; Submission 27, Sustainable Energy Now; Submission 29, Power Ledger.

206 Submission 4A, Western Power; Submission 9, Clean Energy Council; Submission 11, Tesla; Submission 12, Infrastructure Capital Group; Submission 20A, Perth Energy; Submission 22, Synergy; Submission 28, Curtin University; Submission 29, Power Ledger.

207 Submission 4A, Western Power; Submission 9, Clean Energy Council; Submission 11, Tesla; Submission 12, Infrastructure Capital Group; Submission 15, Alinta Energy; Submission 13, ATCO Australia; Submission 16, Australian Energy Council; Submissions 17A, B and C, Tersum Energy; Submission 20A, Perth Energy; Submission 22, Synergy; Submission 24, Sunrise Energy; Submission 26, S&C Electric Company; Submission 29, Power Ledger.

208 Submission 4A, Western Power, p. 5; Submission 20A, Perth Energy, p. 1; Submission 22, Synergy; Submission 29, Power Ledger.

because there will be some new technology tomorrow that means we have to think something different.<sup>209</sup>

Witnesses also emphasised the universal and essential nature of electricity supply, the many years of investment that Western Australians have made in the electricity system (both through their payment of electricity bills and State subsidies) and the need to ensure that the total benefits to the Western Australian community are considered, particularly when considering the role of the Government Trading Enterprises (GTEs):

The best way of thinking about the role of a utility such as Horizon Power is that we are fundamentally custodians of this shared asset on behalf of society. A lot of these dynamics, as I emphasised before, can play to either some very significant societal disbenefits, if they are managed poorly, or very significant societal benefits if we actually take a systemic approach [sic].<sup>210</sup>

As our energy system transitions to a more distributed energy model, unless markets and regulatory frameworks are restructured appropriately, there is a risk that the benefits of reform will be concentrated and not shared amongst all customers. As further discussed in Chapter Seven, there may also be disproportionate effects on vulnerable consumers. Energy Policy WA informed the Committee that it is very alive to these issues as it develops the Energy Transformation Strategy:

If we are replacing a traditional poles and wires service with a standalone power system, that does not mean that that individual customer gets the benefit of that. We do need to share that benefit and that saving in cost for Western Power across all Western Power customers, which is one of the reasons for continuing to keep Western Power in its patch, if you like, so that we can harness those opportunities. There is a bit of work to be done to make sure all those money flows work but the logic being that if it reduces the overall cost of supply, it reduces costs for everyone.<sup>211</sup>

Again, the Committee considers that these broad principals form a solid foundation for the progression of energy market reform in Western Australia. The evidence suggested four broad areas where policy, market or regulatory action would be beneficial:

- Roles: as microgrids and associated technologies continue to affect the Western Australian energy market, what are the roles for market participants, both now and in to the future?
- Rules: How could *Wholesale Electricity Market Rules* (WEM Rules) recognise and accommodate the changes triggered by microgrids and enable them to contribute towards more affordable and reliable electricity supply?

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209 Mr Cameron Parrotte, Australian Energy Market Operator, *Transcript of Evidence*, 21 November 2018, p. 12.

210 Mr Mark Paterson, Horizon Power, *Transcript of Evidence*, 11 April 2018, p. 11.

211 Ms Kate Ryan, Energy Policy WA, *Transcript of Evidence*, 8 November 2019, p. 16.

- Regulations: does the current electricity network regulatory regime help or hinder the evolution of microgrids and the evolution of the energy market?
- Rates: what role do network and retail prices play in the rollout of microgrids and associated technologies?

## Market roles

The Committee received evidence regarding overlap and ambiguity around the roles of various market actors, suggesting that the State Government needs to provide greater clarity on the roles and relationships between the GTEs, system and network operators, and existing and potential private sector market participants.

## The Government Trading Enterprises

Chapter Three noted that under the *Electricity Corporations Act 2005*, the three electricity GTEs (Western Power, Synergy and Horizon Power) are empowered to operate and maintain a broad range of assets potentially within the same class and footprint, provide ancillary services, provide services to one another under regulation and act to develop commercial opportunities. The Committee found that there is considerable scope for duplication, overlap and competition between them in the development of microgrids and associated technologies. In the Interim Report, the Committee also found that there is a distinct benefit in a single entity possessing a clear line of sight from point of electron production through to consumption<sup>212</sup> and noted that this provides Horizon Power with the ability to maximise the value inherent in delivering and operating microgrids in regional Western Australia.

In its submission, Sustainable Energy Now stated that the separation of responsibilities between generation, transmission and retailing, and between Synergy, Western Power and Horizon Power, has led to a situation where they cannot take best advantage of changes in technology. Sustainable Energy Now stated ‘urgent government action is needed to resolve these regulatory issues.’<sup>213</sup> It raised a number of complications around the functional definitions between the GTEs, including:

- Western Power is not legally able to install storage to resolve grid issues, because storage is classed as ‘generation’, and hence Synergy’s responsibility, under the law as it stands ...
- Horizon Power’s responsibility is with all government-owned power generation off the SWIS [South West Interconnected System]. If Western Power decides to replace a load on the network with a stand-alone system (e.g. Bremer Bay and Walpole, as discussed here), then these become Horizon’s responsibility under current rules.<sup>214</sup>

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212 See Economics and Industry Standing Committee, *Implications of a Distributed Energy Future: Interim Report*, April 2019, p. 25 and Finding 3, p. 28.

213 Submission 27, Sustainable Energy Now, p. 13.

214 *ibid.*

Similarly, EMC (Energy Made Clean) and Lendlease, who have established a private sector joint venture to develop microgrids, noted:

There are a number of regulatory barriers to the deployment of microgrids on the SWIS, due to idiosyncrasies of the legislative framework that established the GTEs. These include the statutory functions of the GTEs, the definition of the SWIS and its inclusion in subsidiary legislation, and associated instruments.<sup>215</sup>

The Economic Regulation Authority (ERA) considered the definitional issues surrounding the GTEs to constitute the ‘biggest impediment to any kind of inertia with regard to microgrids and stand-alone power systems’. The ERA observed that the legislative and regulatory framework:

is all predicated on having networks. Even with the Western Power pilots at the moment there is possibly a question of whether, under the *Electricity Corporations Act*, Western Power can actually supply a standalone system because it is virtually prevented by the act from being a generator or a retailer; it is simply a network operator. There is a serious question there, but it is a pilot and those systems that have been put in place so far are still connected to the grid, so technically they can be supplied from the grid. If they were to be a complete standalone system, there could well be some difficulties.<sup>216</sup>

Former Horizon Power Managing Director, Mr Frank Tudor, argued that the lines of demarcation between the GTEs, put in place 15 years ago where microgrids were not considered, should be challenged, alongside the suitability of the regulatory, pricing and technology frameworks.<sup>217</sup> He noted the degree of duplication and overlap between the GTEs, stating:

I think it does not make a lot of sense to duplicate capacity in your three utilities. We will learn the same mistakes and we will duplicate. The taxpayer will bear the cost of the duplicated capacity.<sup>218</sup>

### **Synergy**

Synergy recognised the role allocation issue in its submission, noting ‘the existing regulatory framework, which has been in place since disaggregation in 2006, may limit an individual utility’s ability to deliver microgrids or associated technologies in isolation.’<sup>219</sup> Synergy noted, however, that microgrids can be delivered through collaboration between the government utilities (and private sector market participants) performing their respective roles and responsibilities across the electricity supply chain without regulatory change.<sup>220</sup>

The Interim Report noted a range of examples, also outlined by Synergy in its submission, where the GTEs are collaborating with each other and private sector participants, including

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215 Submission 14, EMC (Energy Made Clean) and Lendlease, p. 6.

216 Mr Paul Kelly, Executive Director Regulation and Inquiries, Economic Regulation Authority, *Transcript of Evidence*, 20 June 2018, p. 3.

217 Mr Frank Tudor, Horizon Power, *Transcript of Evidence*, 11 April 2018, p. 13.

218 *ibid.*

219 Submission 22A, Synergy, p. 2.

220 *ibid.*

the Kalbarri microgrid, Alkimos and Mandurah utility scale battery trials, and the trial of stand-alone power systems in regional locations within the SWIS. Synergy referred the Committee to the Australian Energy Market Commission (AEMC) issues paper that highlighted the importance of dividing responsibilities and allocating risks to parties who are best positioned and incentivised to manage them.<sup>221</sup>

Synergy discussed the importance of considering which GTE is best placed to identify customers best suited to microgrid solutions, noting that currently the obligation to connect resides with Western Power, whereas the obligation to supply rests with it. Synergy noted its expertise in the design and operation of small scale thermal generation and energy storage assets and its billing systems, stating that ‘a collaborative, transparent approach between Western Power and Synergy is likely to best determine suitability.’<sup>222</sup> No further detail was provided on how a collaborative model would practically operate.

### ***Western Power***

Western Power told the Committee that the key barriers for it to deploy new technologies are the statutory definitions of its functions and the operation of the economic regulatory regime:

The SWIS is a physically interconnected network that (under current legislation) does not include non-interconnected microgrids and other equipment. Whilst there have been and will continue to be situations where Western Power can pursue a more efficient new technology solution, such as microgrids, Western Power has been and will continue to be unable to implement these solutions because they are not interconnected. Instead, to comply with current legislation, Western Power has had to implement more traditional network solutions at greater cost.<sup>223</sup>

In its supplementary submission, Western Power acknowledged the need for greater role clarity for all market participants<sup>224</sup> and stated that, as the incumbent network operator, it is best placed to construct and manage microgrids, stand-alone power systems (SAPS), and other emerging network technologies, as a regulated network activity within the SWIS:

Not only do we have the knowledge, experience, and existing core capability for designing, managing and maintaining associated grid infrastructure, but we also have the most compelling business case to utilise these alternative grid solutions to lower the cost of essential service provision and improve the customer experience.<sup>225</sup>

Western Power advanced a number of arguments in support of it being the lead GTE for microgrids. It stated that enabling it to invest in and manage microgrids in the SWIS would avoid capital expenditure on ageing infrastructure, keeping costs down while continuing to maintain reliability for customers. It also has an existing workforce, located throughout the

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221 Submission 22A, Synergy, p. 3.

222 *ibid.*, p. 4.

223 Submission 4A, Western Power, p. 4.

224 *ibid.*, p. 1.

225 *ibid.*, p. 6.

SWIS, that can be deployed to work on microgrids. It listed a number of other additional benefits, including:

- creating economies of scale;
- providing certainty of efficiency by using an independently regulated agency; and
- offering a safety net to customers by empowering a government owned entity to perform the task.<sup>226</sup>

### **Horizon Power**

As the Committee noted in its Interim Report, Horizon Power’s vertically integrated business model gives it a clear line of sight from electricity production down to the consumer premises, enabling it to avoid the challenges of functional disaggregation experienced by Synergy and Western Power — particularly with respect to customer/consumer engagement and interface. It does, however, experience challenges with regard to operational footprint. If a customer is connected to the SWIS and falls within Western Power’s footprint, despite Horizon Power’s ability to draw on its considerable practical experience and provide expertise and guidance, it has encountered difficulties doing so.

Mr Terry Mohn provided the Committee with an example where approaches to the interpretation of operational footprints contained in the *Electricity Corporations Act 2005* had limited Horizon Power’s ability to provide its expertise to a project:

We were actually invited by LandCorp to make a recommendation on a system that they wanted us to consider within Western Power’s service territory, and we went through some discussions with the PUO [Public Utilities Office] about the best way to approach LandCorp. LandCorp recognised us as experts in building microgrids. It really wanted a microgrid in this one facility that they wanted to construct, so we were willing to put a proposal in front of them. But because of the way in which the regulatory regime had been interpreted over many years, that same regulatory thinking went into the response back to us, which was, “That’s Western Power’s territory; don’t get involved.” They very gently let us down, saying, “No, you really don’t need to be involved in that.”

We have so much expertise that we can offer other parts of the state, but because of the interpretation of the current code we are prevented or restricted from participating. The outcome of that was we commented to LandCorp, “Listen, if you want us to help advise you on the design of a microgrid, we’re happy to do that. You have to get back to us and let us know.” But really their intent was, “Please help us design and build a microgrid, perhaps even own the assets on our behalf.” But, again, the interpretation of the code was, “That’s not your space, just don’t go there.”<sup>227</sup>

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226 Submission 4A, Western Power, p. 6.

227 Mr Terry Mohn, General Manager Advanced Microgrid Development, *Transcript of Evidence*, 31 October 2018, p. 9.

The Committee asked Horizon Power representatives to provide a view on the reasons for duplication, overlap and competition between the GTEs:

Mr Paterson: I think it is a very accurate observation, and it is something that we have been actively—and I say “actively”—seeking to break down. We are the small brother in this equation. Since coming to the state, I have had numerous meetings with the other GTEs in the spirit of seeking to advance some more collaborative —

The CHAIR: And efficient.

Mr Paterson: — and efficient, because the bottom line is the premise of your statement is the only reason any of us get paid is to provide services to the citizens of Western Australia: not our own little patches, not our own little fiefdoms, not stroking our little egos, but it is about the state of Western Australia. It is very notable to me how parochial some of those relationships have been. Again, I realise I am being politically incorrect. I will not name names, but there are a lot of sensitive male egos that need to be out of the way in this whole topic.

So the State Government should absolutely be expecting clear evidence—not just words but clear evidence—of your GTEs actively and dynamically collaborating and actively deciding who is leading on what topics, and not competing, because in the context where there is significant duplication, that often cannot be defended on the basis of it being intelligent duplication. ...

So I guess all I would say there is at the heart of duplication often is role confusion and lack of focus on particular and distinctive areas. There is no reason why we should be competing and having kind of sensitive egos.<sup>228</sup>

### ***Legislative reform and steps to provide role clarification***

The current delineation between the GTEs is a direct function of the industry model prevailing at the time when the Gallop government initiated electricity sector reform. As the evidence to this Inquiry has clearly demonstrated, the industry has evolved over subsequent decades and is currently experiencing profound change. Western Australia’s largest utilities are owned by the State. It is timely and necessary to reconsider their roles and functions. Former Horizon Power Managing Director, Mr Frank Tudor, argued:

If I was sitting as a simple shareholder with three utilities, I would have one focused on microgrid, I would have one focused on large-scale centralised thermal generation in the SWIS and also a significant job in actually retiring and remediation of power station sites.<sup>229</sup>

He argued that the issue ultimately centred on Western Power’s role and that it was vital for the government to consider the ‘end state’:

What does the end state look like? It does come down to the heart of the distribution business. It needs it to move from what it is currently doing to start to

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228 Mr Mark Paterson, Horizon Power, *Transcript of Evidence*, 31 October 2018, p. 10.

229 Mr Frank Tudor, Horizon Power, *Transcript of Evidence*, 11 April 2018, p. 16.



integrate planning for distributed energy. If you think about our past, it has all been sitting here, as a distribution operator seeing this stuff done to us. Now you want to get on the front foot and say, “How can we make it work for us?” Integrated planning becomes really critical.

The next level of that is to actually become the platform service provider that allows it to be implemented. This is where New York differs from California. New York has said that the distribution playout will actually become the platform service provider and that third parties will provide the DER. They will aggregate and they will actually work on top of the platform. In California, they have gone for a much more technically focused, utility-driven approach around DER. There are some real differences that need to be observed and you have to come back—my comment is: what does the end state look like?—and make your decisions in terms of the end state.<sup>230</sup>

Despite the ambiguity surrounding the roles of the GTEs, the State Government has nonetheless continued to roll out microgrid initiatives throughout 2018-19, often defining projects as ‘trials’ or ‘pilots’. In March 2018, Western Power commenced the roll out of 60 SAPS as a ‘demonstration project’ and announced a tender process to encourage private sector participation. The Government simultaneously announced that it was asking the Public Utilities Office to investigate legislative changes that would be required to allow greater use of SAPS as a low cost solution to poles and wires in delivering more reliable services in regional areas.<sup>231</sup>

In the final sitting week of the 2019 parliamentary year, the Minister for Energy introduced the *Electricity Industry Amendment Bill 2019*. If passed, the Bill will firmly position Western Power as the lead GTE for the development of SAPS solutions in the SWIS.

Under the proposed amendments to the *Electricity Industry Act 2004*, *Electricity Corporations Act 2005* and *Energy Operators (Powers) Act 1979*, Western Power will be enabled to provide SAPS and recover the costs through regulated network tariffs, as an adjunct to its network operator function.<sup>232</sup> Western Power will also be permitted to install and operate distribution-connected battery assets (discussed below).

The State Government has not released any detailed information on its view of the roles and functions of the GTEs with respect to the development and operation of other forms of microgrid. However, the Government has stated that the reforms it has introduced are not intended to enable Western Power to pursue new lines of business that are not associated with its network operator function (for example, using batteries for purposes unrelated to serving a network need).<sup>233</sup>

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230 *ibid.*

231 Hon Ben Wyatt MLA, Minister for Energy, *Stand-alone Power bring opportunities for WA companies*, media release, 15 March 2018.

232 Explanatory Memorandum, *Electricity Industry Amendment Bill 2019*, p. 20.

233 Explanatory Memorandum, *Electricity Industry Amendment Bill 2019*, p. 21.

**Finding 28**

If passed, the *Electricity Industry Amendment Bill 2019* will enable Western Power to operate stand-alone power systems and distribution-connected batteries as an adjunct to its network operator function in the South West Interconnected System.

Whilst the introduction of legislation enabling Western Power to operate SAPS at the fringes of the grid is a welcome step and will cater to circumstances where premises or communities are disconnected from the grid, the State Government is yet to detail its position with respect to which GTE will have overall leadership and accountability for the development of microgrids and associated technologies — particularly microgrids that retain a connection to the SWIS. The Committee remains concerned that, within and between Synergy and Western Power, there is considerable duplication of effort and potentially unconstructive competition between them for the operation and management of these technologies (particularly with regard to technical design and asset operations), resulting in waste and higher costs for Western Australian taxpayers.

As part of the DER Roadmap and Energy Transformation Strategy, the Minister for Energy should provide clear and unequivocal direction to Synergy and Western Power regarding their roles and accountabilities and ensure that there is not overlap or duplication of effort. This is consistent with Western Power's role as a network asset operator and Synergy's retail function.

Given the introduction of legislative reforms to empower Western Power to manage SAPS as an adjunct to its network function, its role as the network operator, accountability for network planning and development, responsibility for metering, visibility of the power system and existing workforce and internal capabilities, the Committee is of the view that Western Power has a vital technical and operational role in developing microgrids in the SWIS. The relationship between Western Power and the private sector in the development of SAPS and the role of battery technologies are both considered in more detail below.

The Committee acknowledges that currently, retail customer relationships sit with Synergy in the SWIS. It sells consumer products, issues bills and performs the retail customer relationship management function. Western Power also has a consumer-facing function for operational matters (e.g. power outages, line works, etc.), but its actual customers are large energy users or market retailers possessing Electricity Network Access Contracts.

The separation of the retail function in the SWIS has long been accepted as appropriate, although the Committee has observed in the Interim Report that in its microgrids, Horizon Power's vertical integration and direct retail relationship with customers has enabled it to adapt and innovate on microgrid and distributed energy resource (DER) technologies.

The successful implementation of the Energy Transformation Strategy in the SWIS will require that Synergy supports Western Power to ensure that customer needs are being met and consumer preferences are being accommodated. This will be particularly important where initiatives are aimed at modifying consumer behaviour or trialling new consumer products or billing structures.

**Recommendation 5**

The Minister for Energy should provide clear and unequivocal direction to Synergy and Western Power regarding their roles and accountabilities and ensure that there is not overlap or duplication of effort between them with respect to the development of microgrids and associated technologies. This is consistent with Western Power's role as a network asset operator and Synergy's retail function.

The Committee notes that outside of the SWIS, Horizon Power has owned and operated microgrids since disaggregation in 2006. It has also led the market in trialling new technologies, products and services and has developed a sophisticated approach to customer and community engagement (discussed in Chapter Seven). Although subject to licensing, Horizon Power's networks are also unregulated,<sup>234</sup> providing it with far greater ability to innovate.

Evidence presented to the Committee suggests that there is opportunity for greater collaboration between Western Power and Horizon Power. Collaboration and knowledge transfer between the two organisations would deliver considerable benefits to both entities, and the taxpayers of Western Australia, particularly given Horizon Power's experience undertaking retail, customer-facing functions in regional Western Australia and its demonstrated capacity to deploy SAPS into challenging operational environments throughout the State.

**Finding 29**

Horizon Power has led the market in developing microgrids and associated technologies and is well-positioned to transfer knowledge to Western Power. Closer collaboration between these two publicly-owned entities on the development of microgrids and associated technologies could deliver considerable benefit to Western Australian tax payers and electricity customers.

The DER Roadmap and Energy Transformation Strategy should consider opportunities to leverage Horizon Power's extensive knowledge, skills and experience and foster closer collaboration with Western Power. Chapter Three noted that the *Electricity Corporations Act 2005* grants the GTEs 'Other Functions'.<sup>235</sup> These centre on commerciality and building value within their businesses, namely to:

- use their expertise and resources to provide consultative, advisory or other services for profit;
- develop and turn to account technology, software or other intellectual property;
- manufacture and market any product that relates to their functions; and
- use or exploit for profit their fixed assets.<sup>236</sup>

234 Although this may change with respect to the North West Interconnected System, following the passage of the *Electricity Industry Amendment Bill 2019*.

235 *Electricity Corporations Act 2005*: Synergy s. 36; Western Power s. 42 and Horizon Power s. 51.

236 *ibid*.

The Committee is concerned by evidence that there may have been instances where the *Electricity Corporations Act 2005* has been invoked to prevent customers accessing appropriate expertise and advice. Through the payment of electricity rates and ongoing subsidies provided by the State Government, the Western Australian taxpayer has invested heavily in development of the GTEs' internal capabilities to deliver microgrids and associated technologies. It is reasonable to expect that they would work constructively together to arrive at least-cost energy solutions for consumers, irrespective of whether they live in regional or metropolitan Western Australia. Encouraging the GTEs — particularly Western Power and Horizon Power — to share and exchange knowledge would support the further development of these technologies and place downward pressure on costs, delivering benefit across the state.

#### Recommendation 6

The Minister for Energy consider formalising a mechanism for knowledge transfer and collaboration between Western Power, Synergy and Horizon Power for the development of microgrids and associated technologies.

#### Network and system operations

In addition to the lack of clear delineation between the GTEs, several witnesses noted a lack of clarity regarding the roles, functions and accountabilities between the system and network operators. Western Power expressed the hope that the Energy Transformation Strategy will result in 'clarification of roles and responsibilities within the regulatory framework, especially for Western Power and AEMO.'<sup>237</sup>

AEMO similarly stated that one of the first-order issues for any reform agenda should be to clarify the functional boundaries between Western Power and AEMO, on both the transmission and distribution systems. Reforms should focus on:

what the roles and responsibilities are of those two parties and to ensure that if there needs to be visibility of DER and microgrids that are being connected up, that there is sufficient notification and information flows.<sup>238</sup>

AEMO notes that on the east coast, it has a defined system planning function, positioning it 'above it all' and allowing it to 'forecast out at where the world is going.'<sup>239</sup> AEMO's positioning was based on a recommendation in the Finkel Review (discussed previously in Chapter Five).<sup>240</sup>

The appropriate delineation between system and network operators is a challenging issue. It requires a consideration of the roles and relationships between parties who:

- determine the location of microgrids and associated technologies (currently potentially within the scope of the Whole of System Plan exercise being undertaken

<sup>237</sup> Submission 4A, Western Power, p. 1.

<sup>238</sup> Dr Natalia Kostecki, Principal Policy and Market Development Analyst, Australian Energy Market Operator, *Transcript of Evidence*, 9 May 2018, p. 11.

<sup>239</sup> Mr Cameron Parrotte, Australian Energy Market Operator, *Transcript of Evidence*, 9 May 2018, p. 13.

<sup>240</sup> *ibid.*

by the Energy Transformation Taskforce, in consultation with AEMO and Western Power);

- install microgrids and associated technologies and assets (which can be done by the GTEs or other private microgrid/asset operators); and
- operate and dispatch assets both within the microgrids, and then the microgrids themselves as individually dispatchable cells within a macrogrid.

The Government has acknowledged that currently there is no single entity responsible for planning in the SWIS. AEMO forecasts generation needs, while Western Power is responsible for planning the development of its network. Whilst this worked under a centralised industry model, it is unlikely to be efficient in a distributed energy future. Energy Policy WA recognises:

This system has served us well-enough in the past. However, managing our power system through the transition to renewable and distributed electricity sources requires stronger coordination to provide clear information for investors and planners, and to guide the development of the power system of the future.<sup>241</sup>

The Energy Transformation Taskforce (Taskforce) is a temporarily-appointed entity, tasked with developing the first Whole of System Plan (WOSP) in conjunction with AEMO and Western Power. No announcement has yet been made about longer term responsibility for the planning function in the SWIS.

System planning is a remarkably complex exercise, requiring detailed economic modelling and technical capability. Whilst a specific-purpose taskforce may be allocated resources to produce a single deliverable like the WOSP, a general policy unit of a government agency or department would need to be appropriately and permanently resourced to undertake the task on an ongoing basis. The Committee notes that appropriate resources are likely to currently exist in AEMO and/or Western Power, given their market and network roles, and again notes the risk of duplication and overlap if capability were also then developed in another agency.

**Finding 30**

The Energy Transformation Taskforce is a temporarily-appointed entity tasked with developing the first Whole of System Plan, in conjunction with the Australian Energy Market Operator and Western Power. No announcement has yet been made about longer term responsibility for the system planning function in the South West Interconnected System.

The Committee agrees that, in addition to clarifying the roles and responsibilities of the GTEs in the SWIS, the Energy Transformation Strategy needs to clarify the relationship and demarcation between AEMO and Western Power in their respective system and network operator functions and provide for long-term planning and coordination. We do not have

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241 Energy Policy WA, *Energy Transformation Strategy*, then select *Whole of System Planning*, accessed 31 January 2020, <[www.wa.gov.au/organisation/energy-policy-wa/energy-transformation-strategy](http://www.wa.gov.au/organisation/energy-policy-wa/energy-transformation-strategy)>.

sufficient evidence or visibility of the granular operations of Western Power and AEMO to provide a detailed view on the appropriate ascription of roles and responsibilities between them, but this should be a key output of the Strategy. In Chapter Five, we have also recommended that the Minister for Energy introduce the changes necessary for both AEMO and Western Power to have appropriate visibility and control of microgrids and DER.

We observe that much of the work of the Taskforce – and particularly the WOSP program of work – should hopefully provide the Government with visibility of current roles, capabilities and points of duplication and overlap, to inform a final position on operator roles. The Committee notes that the Government’s long term intention is that the WOSP will be a living document and regularly updated. That being the case, it is vital that an entity is specifically tasked with long-term responsibility for the planning function in the SWIS.

### Recommendation 7

The Minister for Energy ensure that the Energy Transformation Strategy clarifies the roles and accountabilities of the Australian Energy Market Operator and Western Power and delivers a structure for long term accountability for Whole of System Planning in the South West Interconnected System.

### New business models and private sector participation

Around the world, electricity utilities are facing challenges to their business models. In a broad-ranging examination of the changes underway in global energy markets triggered by the rise of distributed energy, PricewaterhouseCoopers observed:

In defining future business models, utilities need to understand and challenge their company’s purpose and positioning in tomorrow’s markets. In the past, operating an integrated utility from generation through customer supply was well understood. Now, unbundling opportunities are extending deeper into the value chain and enabling greater participation by specialists. As a result, electric companies will need to rethink not just their roles and business models, but also their service and product offerings and approaches to customer engagement.<sup>242</sup>

Repeatedly through the course of the Inquiry, the Committee was presented with evidence regarding challenges to the GTEs’ business models and the potential roles for the private sector and other market participants.

Private market participant Alinta stated that the State Government has an important role to play in encouraging the rollout of microgrid technology, as well as removing any barriers to entry. Alinta observed that as the owner of the GTEs, the State Government also plays an important role as an energy investor.<sup>243</sup> It noted, however, the importance of private sector participation:

Private sector participation will be key to expanding microgrids in WA. In addition to the three government owned entities, there are over 30 private sector retail,

<sup>242</sup> Norbert Schweiters and Tom Flaherty, ‘A Strategists Guide to Power Industry Transformation’, *Strategy+Business Magazine*, Issue 80, Autumn 2015, p. 5.

<sup>243</sup> Submission 15, Alinta, p. 4.

generation and network businesses licenced to provide energy services in WA. In addition, there are a large number of solar PV providers in WA. All of these businesses have the potential to be key innovators and suppliers of efficient microgrid technologies.<sup>244</sup>

Tersum Energy is a potential private sector supplier of microgrids and associated technologies that has been working with the Geraldton community to establish a virtual power plant (VPP) and co-generation hub. Tersum stated 'there are many other parties that could and are willing to develop microgrids if enabled to do so. Private sector competition is vital if Western Australia is to realise the full benefits of microgrids.'<sup>245</sup>

A number of witnesses discussed the benefits of private sector investment in microgrids and associated technologies, particularly where constraints exist on the public purse that limit the capacity of the GTEs to invest. Power Ledger noted that promoting private sector involvement in microgrids would have the benefit of reducing economic pressures on government.<sup>246</sup> Perth Energy stated that allowing privately owned market participants to build and operate microgrids will:

Allow the associated commercial risk and debt financing to be borne by the private sector, which will reduce the debt burden of the Western Australian State Government.<sup>247</sup>

In the opinion of Infrastructure Capital Group (known as ICG), one of the major barriers to greater deployment of microgrids is the limited investment capability of the GTEs:

The speed and scale of deployment of Microgrids by [the GTEs] will also be constrained by utility balance sheets and capex/opex budgets [capital expenditure and operational expenditure budgets], as they must continue to operate on a sound commercial basis. Private investment for new projects should help to overcome inherent limits on public resources (both financial and personnel) if it can be introduced with broad political support.<sup>248</sup>

Infrastructure Capital Group recommended that the Government establish a policy to evaluate unsolicited or market-led proposals, to enable communities, technology providers and others to 'promote sensible solutions to utilities'.<sup>249</sup>

Sunrise Energy suggested that the Government should consider options that encourage private sector investment in microgrids and support the development of an entire industry in Western Australia centred on the design, build, installation, operation and maintenance of microgrids:

WA is well placed to take the lead in SPS [stand-alone power systems] nationally, but we believe it needs to bring together the strengths of the large incumbent

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244 *ibid.*

245 Submission 17, Tersum Energy, p. 3.

246 Submission 29, Power Ledger, p. 7.

247 Submission 20, Perth Energy, p. 2.

248 Submission 12, Infrastructure Capital Group, pp. 5-6.

249 *ibid.*, p. 7.

organisations with the strengths of small innovative nimble organisations to achieve real success. This is particularly the case if you want to create a large SPS industry with local manufacturing and SPS technology and IP that can be exported out of WA rather than just a domestic SPS deployment capability. Properly organised, this could be a new national and global industry led by WA based organisations.<sup>250</sup>

The Interim Report found that private sector entities have demonstrated significant capacity and interest in the development of microgrids and associated technologies, and noted the broad range of successful partnerships between the GTEs and private market participants.

**Finding 31**

Partnerships between private providers and the Government Trading Enterprises could leverage private sector finance for the deployment of microgrids and associated technologies. Significant opportunity also exists for the Government Trading Enterprises and the private sector to develop a Western Australian industry focussed on the delivery of microgrids and associated technologies.

The Interim Report for this Inquiry outlined a number of projects involving partnerships between the GTEs and private providers. In their evidence to this Inquiry, the GTEs acknowledged the importance of their role in fostering competition along the electricity value chain and assisting the private sector to participate in the development of microgrids. Synergy stated:

Broadly speaking, fostering competition in service provision should deliver outcomes that are in the long term interests of consumers, although assessment and evaluation at a whole of system level is important to ensure this is the case ... If it is more efficient to install a microgrid with distributed generation and storage, rather than replacing ageing, grid connected poles and wires, then it should not necessarily follow that the incumbent network operator should be given the monopoly to replace one with the other in its asset base. The long term interests of customers should be better served if microgrid investment can be delivered by fostering competition.<sup>251</sup>

Western Power acknowledged that the range of forms of microgrids in rural and metropolitan areas would likely attract investment and operational interest from the private sector:

In some instances, the economics of a microgrid will be sufficiently compelling to encourage private sector investment, while in others the business case will be based on avoided cost of re-investing in existing infrastructure for the entity with the obligation to maintain supply. The differing potential economics of microgrids underlines the importance of role clarity for market participants.<sup>252</sup>

250 Submission 24, Sunrise Energy Group, p. 7.

251 Submission 22A, Synergy, p. 4.

252 Submission 4A, Western Power, p. 6.



Western Power stated that energy and electricity stakeholders are seeking a framework that provides investment certainty with appropriate risk and reward, together with incentives and mechanisms that encourage investment in the right areas:

It would be beneficial for the Government to consider each individual issue related to microgrids and associated technologies and decide if it is a matter for the private sector, government, or both.<sup>253</sup>

The State Government has indicated its willingness to facilitate private sector investment and participation in microgrids. It sent a strong signal into the market in February 2019, requiring the GTEs to partner with the private sector for the deployment of SAPS. As part of the first round of the SAPS rollout, \$8.8 million in contracts were awarded to two local renewable energy companies, utilising local engineering and construction expertise. The vendors have a two-year period to install, commission, service and operate the SAPS units, which combine solar and battery technology with a backup generator. The State Government stated at the time that it anticipates that private sector servicing of the 57 SAPS units for their entire working life will save Western Power almost \$6 million, compared to traditional network refurbishment.<sup>254</sup>

**Finding 32**

In February 2019, the State Government sent a clear signal into the energy market that it supports partnerships between the Government Trading Enterprises and the private sector, with the procurement model to deliver the first round of the stand-alone power system rollout.

Beyond the provision of equipment or partnering arrangements, a number of new commercial arrangements and business models can be facilitated by the emergence of microgrids and associated technologies.

Perth Energy is one of Western Australia's 29 existing electricity retailers and is the third largest retailer in the contestable space. It currently supplies approximately 15% of the entire SWIS market, or approximately 30% of the contestable market.<sup>255</sup> Perth Energy told the Committee that there was considerable interest in the contestable market for participation in microgrid technologies, sufficient for it to form a partnership with private solar provider Infinite Energy. It has developed commercial structures based on combinations of grid-based and distributed energy supply:

There are quite a lot of tripartite booking arrangements that we are entering into where owners of warehouses and commercial buildings want to put solar on the roof. We need to then on bill on behalf of that landlord to the customers in order to then try to manage the differential between the solar and the cost of the solar that is being charged to the customer and to the grid electricity that has been brought in. We have a number of structures in place that will enable that. It is a

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253 *ibid.*

254 Hon Bill Johnston MLA, Minister for Energy, [WA companies to lead \\$8.8 million power system rollout](#), media release, 21 February 2019.

255 Ms Nicole SanGregory, Perth Energy, *Transcript of Evidence*, 10 October 2018, p. 3.

little bit of a complicated contractual relationship, but because the customer is contestable, we are able to facilitate that, and we do. We do not have a huge number of them, because from a WA perspective they are still fairly new, but we are certainly seeing an increase in the number of them that we are actually entering into now.<sup>256</sup>

### ***Virtual power plants***

The Interim Report noted that there are several trials examining virtual power plants (VPPs). As noted in the Interim Report, a VPP may include DERs located at multiple, disparate sites throughout the wider transmission and distribution networks. The individual DER assets are coordinated by an advanced supervisory control and data acquisition (SCADA) system and may present to the grid as a single, controlled system or ‘plant’ akin to traditional generation sources.<sup>257</sup>

The Australian Renewable Energy Agency (ARENA) provided the Committee with information regarding a range of VPP trials it is supporting across the nation, including the Alkimos and White Gum Valley projects in Western Australia.

ARENA’s VPP trials focus on an operator coordinating separate DER across entire networks or regions of a network, rather than a geographically confined and separable section of a network operated as a discreet entity. ARENA noted that, compared to large-scale generation resources, VPPs have the potential advantage of being able to address local network issues (such as thermal or voltage issues) as well as supply constraints in the broader market. It stated that trials are being developed to demonstrate how VPPs can dispatch energy within milliseconds, to provide power system security services. ARENA’s VPP and demand response trials are providing ‘useful industry experience around recruiting customers and rewarding them for the services they provide the power system’. ARENA is working to share the outcomes of these trials with energy market reform processes:

ARENA sees VPP discussions evolving rapidly and many alternative technology, commercial and regulatory models are being explored and debated.<sup>258</sup>

ARENA notes that VPPs could provide services to networks that would otherwise be provided by network-owned assets, creating a distinct commercial opportunity for the owners and operators of those assets. ARENA notes, however:

This has implications for the regulatory frameworks for network pricing (incentives for CAPEX vs. OPEX expenditure) as well as ring-fencing of network activities to support competitive neutrality in service delivery as well as consumer information and protections.<sup>259</sup>

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256 Ms Elizabeth Aitkin, General Manager Operations, Perth Energy, *Transcript of Evidence*, 10 October 2018, p. 9.

257 Economics and Industry Standing Committee, *Implications of a Distributed Energy Future: Interim Report*, April 2019, p. 20.

258 Submission 35, Australian Renewable Energy Agency, p. 4.

259 *ibid.*

ARENA states that VPPs could deliver the most value for customers when they are able to trade multiple services from a DER to multiple customers including networks, retailers and system operators. This can involve complex commercial trade-offs and an overall increase in system complexity. Neither the NEM nor Western Australia's WEM are structured to support this type of commercial activity. ARENA states:

A key focus for ARENA's VPP and related projects is how markets could evolve to help manage this complexity, delivering maximum value for consumers while providing appropriate levels of predictability and control to network and market operators.<sup>260</sup>

Synergy provided the Committee with an overview of the value and commercial opportunities VPPs could offer along the energy chain:

- At the wholesale market level, and assuming that market mechanisms existed to facilitate their participation, value could be realised through VPPs offering system management, wholesale market and generation fleet support (e.g. load following services, and voltage and frequency control).
- In the retail market, Synergy stated that retailers or aggregators could benefit by retaining a portion of the value customers receive for providing and maintaining a platform and trading system.
- Customers could benefit from VPPs through arbitrage opportunities, where they have the potential to make money from selling energy into the grid at a high price and buying it at a lower price.<sup>261</sup>

Synergy noted that where VPPs facilitate an overall ability to better align system-wide demand and supply, all customers would benefit from the reduced overall cost of electricity supply. Synergy considers that the structure of regulated retail electricity prices is the major impediment to realising these benefits. Current regulated electricity prices make 'the commercial proposition for VPPs challenging in the South West Interconnected System.'<sup>262</sup> However:

VPPs could play a role in the future if regulated tariffs were more reflective of true costs, and with the widespread adoption of necessary supporting technology, such as advanced metering infrastructure.<sup>263</sup>

### ***Blockchain enabled business models***

The Committee was also presented with evidence of blockchain based energy business models. Blockchain is an emergent technology with an ever-increasing range of potential applications. Western Australian companies have been trialling its utilisation in electricity markets.

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260 *ibid.*

261 Submission 22B, Synergy, p. 4.

262 *ibid.*

263 *ibid.*

A blockchain is essentially a type of ledger, or means to record transactions. Whilst ledgers have facilitated commercial transactions since ancient times, the New South Wales Parliamentary Research Service argues that blockchains are distinguished by being a ‘distributed ledger, an asset database that is shareable across a network of multiple sites, geographies and institutions.’<sup>264</sup>

Power Ledger has been trialling the application of blockchains to create a platform to facilitate peer-to-peer energy trading between network-connected consumers, allowing them to utilise DER installed on their premises. It states:

Blockchain technology provides a transparent, auditable and automated market trading and clearing mechanism for the benefit of producers and consumers. Our technology enables the sale of excess renewable energy generated at residential and commercial developments (including strata developments) connected to existing electricity distribution networks, or within micro-grids. Power Ledger puts the power to manage the energy economy into the hands of consumers, while maintaining the value of existing distribution networks.<sup>265</sup>

Power Ledger considers that distributed microgrid technologies, where energy systems are localised, dynamic, low-cost and low carbon, are a solution to the physical and economic limitations of existing energy systems but notes that in Western Australia there are regulatory, tariff and technical barriers preventing the maximisation of efficiencies and benefits, including the absence of smart meter technology.<sup>266</sup>

Several uncertainties have been identified with respect to blockchain technologies, linked to its status as a recent innovation. The World Economic Forum has identified blockchain as one of 12 key emerging technologies, but cautioned that some technological risks may only become apparent once blockchain is used on a wider scale.<sup>267</sup> CSIRO’s Data61 has reported that, to date, most existing proof of concept blockchain-based system deployments demonstrate ‘sunny day scenarios’ where no error or exception occurs. The agency has recommended that future trials demonstrate responses to ‘rainy day scenarios’ arising from both anticipated and unanticipated problems with these systems.<sup>268</sup> Key risks and issues arise in relation to: privacy and the use of personal information; lack of knowledge about how to deal with failures in the use of systems; the application in complex or ambiguous contractual arrangements; and assessing the economic costs/benefits of centralised versus distributed ledgers.<sup>269</sup> Given the ‘essential service’ characteristic of electricity and the often extremely complex commercial structures around electricity supply, it will be vital to understand how regulatory change, market structures and licensing could apply to this innovative approach to energy trading.

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264 Chris Angus, NSW Parliamentary Research Service, [Blockchain technology](#), June 2018, p. 1.

265 Submission 29, Power Ledger, p. 11.

266 *ibid.*, p. 10.

267 Chris Angus, NSW Parliamentary Research Service, [Blockchain technology](#), June 2018, p. 7.

268 Data61, *Risks and opportunities for systems using blockchain and smart contracts*, May 2017, p. 38, quoted in Chris Angus, NSW Parliamentary Research Service, [Blockchain technology](#), June 2018, p. 7.

269 Chris Angus, C, NSW Parliamentary Research Service, [Blockchain technology](#), June 2018, pp. 7-8.

Both VPPs and blockchain applications could offer a range of benefits. However, the Committee notes that they are in their early trial phase and the market and tariff structures do not currently exist to efficiently accommodate them (discussed further below). The Committee particularly notes the comments from Energy Policy WA about the maturity of proposals to aggregate and dispatch DER:

What we have heard from parties like Horizon Power, which is out there testing how to aggregate DER and use it at the moment, is that we are still definitely in the trial and learning phase on that front. There are lots of different pieces of software and technology that have to talk to each other. There is no end-to-end platform. We are kind of working this out as we go ... there is great potential there but there is still a lot of learning to do. Probably some more trials and pilots might be required.<sup>270</sup>

Similarly, the Chair of the Energy Transformation Taskforce Mr Steve Edwell, whilst supportive of these types of projects, noted:

I think it is fair to say—I use this from my Horizon Power experience—that the industry has probably engaged in a bit of over-reach in promoting what they can do. I think this is one area where we just need to creep up on, but it will be solved.<sup>271</sup>

Chapter Two emphasised the importance of ‘firmness’ to power system operations: operators need to know that, when called upon, assets can be relied upon to perform as instructed. As a first order issue, system and network operators need confidence that these new technologies will contribute to secure, reliable supply. Chapter Seven also discusses consumer protections and licensing, which would need to be factored into the rollout of new energy trading mechanisms.

If trials continue to demonstrate the firmness of VPPs and the roll-out of both VPPs and new energy exchange platforms can demonstrate that they deliver overall reduced costs across the energy system, then it may be appropriate to consider their broader roll out into the Western Australian energy market.

### ***Community energy cooperatives***

The Interim Report identified several proposals to establish community-based energy cooperatives. Tersum Energy and the Geraldton Community Energy Steering Committee provided the Committee with an overview of a proposal it had developed for a community energy project in Geraldton, north of Perth. The proposal would use community-based retailing (with an independent call centre and retail function) with capacity and energy supplied through a mix of small-scale (approximately 10MW) (megawatts) traditional thermal generation, rooftop solar photovoltaic (PV) and battery systems up to a scale of between 30 to 35MW.<sup>272</sup> The project would use the existing Western Power grid for the

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270 Ms Kate Ryan, Energy Policy WA, *Transcript of Evidence*, 8 November 2019, p. 7.

271 Mr Stephen Edwell, Energy Transformation Taskforce, *Transcript of Evidence*, 8 November 2019, p. 6.

272 Mr Rodney Littlejohn, Managing Director, Tersum Energy, *Transcript of Evidence*, 17 October 2018, pp. 2, 11.

transportation of energy and to ‘top up’ volumes of electricity that could not be supplied locally.

The Geraldton project’s major driver is the provision of local benefits to the region, including local employment opportunities, reducing local energy costs and reinvesting revenue back in to the local economy.<sup>273</sup> The intent is consistent with evidence the Committee received from Sunrise Energy, another community-based entity. Sunrise identified a number of ‘wide ranging purposes’ behind community energy initiatives — particularly in regional communities — including:

- generating renewable power cost-effectively for the whole community (socially fair, but just for those who can afford their own system);
- creating economic investment in renewable projects in their community (local economic stimulation);
- being more self-sufficient from an energy perspective, less reliant on the main network;
- having a high level of renewable generation and consumption across the community, to market the community as a ‘green’ community typically for tourism purposes;
- becoming a ‘net exporter’ of energy (typically renewable energy) from the community.<sup>274</sup>

Sunrise stated that community based microgrids have enormous relevance and value for Western Australia:

The sense of community in most rural towns in WA is strong. The need for local economic stimulation in these locations is critical for their long term survival. Many of these towns rely on tourism and agriculture as core drivers in the local economy, so a “green” outcome is also highly desirable.<sup>275</sup>

Infrastructure Capital Group noted that because microgrids, by their very nature, tend to be local and closely involve a relatively small number of customers, community-initiated solutions should be welcomed. Infrastructure Capital Group claims that the technical benefits of microgrids in particular locations will be well-understood by local consumers or communities which are affected by unreliable supply of electricity or wish to see more renewables deployed: ‘such solutions should be encouraged by Government if there is an overall public benefit.’<sup>276</sup>

Tersum outlined an additional benefit for Western Power associated with the Geraldton proposal, asserting that it would free up network capacity and defer network expenditure in

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273 Mr Murray Hadley, Chair, Geraldton Community Energy Steering Committee, *Transcript of Evidence*, 17 October 2018, p. 2.

274 Submission 24, Sunrise Energy Group, p. 3.

275 *ibid.*

276 Submission 12, Infrastructure Capital Group, p. 5.

the Mid West region, associated with the replacement of the transmission infrastructure between Three Springs and Geraldton:

There has been discussion for probably the best part of 10 years about the Mid West Energy Project stage 2. The numbers that you talk about there are anywhere between \$150 and \$400 million. This model takes that pressure off Western Power to spend that money in the short term, it frees up capacity to allow others to use that capacity and it gives them a chance to look at the model and say, “What’s the best outcome over the long term with DER and renewables et cetera coming into the market?” It is very much a case of us saying that Western Power is a part of this, and we are working closely with Western Power.<sup>277</sup>

The Committee explored a number of aspects of this model with Tersum and Geraldton Energy, including assumptions regarding the cost of energy and prices for consumers. In the hearing, witnesses confirmed that the model is based on the cooperative relying on Western Power’s continued operation of the distribution network assets and access to the broader system for top up volumes of energy and security, stating ‘we very much see transmission as necessary, even if it is just an insurance policy’.<sup>278</sup> Its business case is currently based on existing network tariff structures for the use of Western Power’s network:<sup>279</sup>

We have really focused on trying to develop a model that works within the current structure. We have not tried to hypothesise about tariff reform. We have really tried to just focus on a practical solution to drive a change in Geraldton.<sup>280</sup>

As discussed in this Report, network tariffs and wholesale electricity costs are currently based on an outdated industry model and no longer reflect the true costs of electricity production. It is doubtful that current market structures send accurate, efficient signals through the market to place downward pressure on prices across the system. Any changes to wholesale or network tariff structures could have flow-on implications for the business cases underpinning proposed new business models, such as the Geraldton Community Energy model.

The AEMC has considered mechanisms to support microgrids provided by non-distribution network service providers (NSPs) such as local councils, community groups or property developers. It notes that solutions provided by a distribution network service provider (DNSP) will be driven by economic efficiency objectives related to network or system capital and operational optimisation, whereas the drivers for third parties may be driven by environmental, social or other economic drivers.<sup>281</sup> The AEMC observes:

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277 Mr Rodney Littlejohn, Tersum Energy, *Transcript of Evidence*, 17 October 2018, p. 3.

278 Ms Erin Stone, Energy Economist, Tersum Energy, *Transcript of Evidence*, 17 October 2018, p. 3.

279 Mr Rodney Littlejohn, and Ms Erin Stone, Tersum Energy, *Transcript of Evidence*, 17 October 2018, p. 3.

280 Mr Rodney Littlejohn, Tersum Energy, *Transcript of Evidence*, 17 October 2018, p. 4.

281 Australian Energy Market Commission, *Issues Paper: Review of the Regulatory Frameworks for Stand-Alone Power Systems*, Sydney, September 2018, p. 57, Appendix to Submission 36.

This raises the question of whether it is appropriate for a third party to proceed with the transition of customers to a SAPS if there is a risk that the decision will have a negative impact of economic efficiency.<sup>282</sup>

Similarly, Infrastructure Capital Group noted that ‘replacement of perfectly functional equipment for altruistic, as opposed to financial or technical, reasons, is a political not an economic decision.’<sup>283</sup> The AEMC has flagged that the merits of including an efficiency precondition in transitional arrangements for third parties should be considered.

The AEMC has noted the role of economic regulation and the appropriateness of seeking regulatory consent, noting for instance that where asset costs for the smaller network are spread across a smaller number of customers, tariffs may actually need to increase.<sup>284</sup> The AEMC also considered consent, consumer protections and whether customers should have the right to reconnect to the grid or re-obtain supply from the DNSP (or Synergy) in the event that they are not satisfied with the third party.<sup>285</sup>

The Taskforce is alive to the significance of the issues associated with new business models and consumer protections, and the need to progress reform sequentially:

The CHAIR: When we were talking about opportunities for the private sector to get involved, there are a whole heap of people out there that would love the opportunity to set their own microgrid up, and then start participating in the market. I am getting the sense, though, that perhaps that is a longer term possibility.

Mr EDWELL: Yes; I think we need to be measured and grounded in the way we approach the future here, and not get ahead of ourselves, because, at the end of the day, if consumers are going to participate in markets either directly or through aggregators or through VPPs et cetera, there has got to be massive data exchange, there have got to be contracts, and one of the issues is going to be, before we end up in that world, we have got to have the appropriate mechanisms to protect consumers.<sup>286</sup>

These issues are further examined in Chapter Seven.

### **Finding 33**

Whilst there are a range of potential new business models arising from the emergence of microgrids and associated technologies, some technologies are in trial phase and some proposed business models rely on existing inadequate market and regulatory frameworks that do not send cost-reflective, efficient signals.

282 Australian Energy Market Commission, *Issues Paper: Review of the Regulatory Frameworks for Stand-Alone Power Systems*, Sydney, September 2018, p. 57, Appendix to Submission 36.

283 Submission 12, Infrastructure Capital Group, p. 5.

284 Australian Energy Market Commission, *Issues Paper: Review of the Regulatory Frameworks for Stand-Alone Power Systems*, Sydney, September 2018, p. 57, Appendix to Submission 36.

285 *ibid.*

286 Mr Stephen Edwell, Energy Transformation Taskforce, *Transcript of Evidence*, 8 November 2019, p. 12.



### **Creating the space for cost-effective solutions**

Secure, reliable, affordable and sustainable supply will depend upon the wide-scale deployment of proven and dependable technologies, incentivised by market and regulatory frameworks that encourage cost-efficient asset development and operation. Whilst there is an obvious high level of interest from the private sector in participating in microgrids and associated technologies, it is vital that the GTEs ensure that the appropriate space is created for private sector participation.

Whilst the discussion above suggests that the GTEs acknowledge the benefits of competition and their key role in partnering with the private sector to deliver microgrids and associated technologies, witnesses did raise concerns about service provision and procurement processes. Infrastructure Capital Group claimed that, in addition to capital constraints, the GTEs' procurement processes also operate as a barrier to microgrids and associated technologies. It stated:

Competitive procurement processes will also support the introduction of new technologies and best pricing. Clearly there has been strong demand, and competition, for any microgrid opportunity put out to tender by Western Power and Horizon Power - private capital is readily available, and only restricted by the rate at which new opportunities emerge from the planning and development departments of the utilities.<sup>287</sup>

There are also open questions about Western Power's provision of a broader range of services facilitated by DER, in potential competition with the private sector.

Perth Energy, a private retailer and operator of large scale generation assets, notes that the *Electricity Networks Access Code 2004* (ENAC) confines itself to an assessment of the network related services provided by Western Power.<sup>288</sup> As DER proves its capacity to perform a number of functions beyond energy storage, the definition and controls over those services become important.

As Perth Energy notes, the ENAC does not provide oversight of all forms of 'services' provided by a network service provider (NSP), the prices of services ancillary to regulated services or issues of competitive neutrality. Perth Energy raises concerns that there is no explicit consideration of those elements of Western Power's current operations and the services that could be procured competitively.<sup>289</sup>

This issue is particularly pertinent, given the introduction of reforms intended to enable Western Power to provide SAPS and operate batteries as an 'adjunct' to its network service operator function. Western Power has a wide range of potential commercial models available to it for the roll out of SAPS. Depending on the commercial arrangements entered into by Western Power, it could roll out SAPS (and potentially other forms of microgrid) in partnership, competition or as a client of the private sector.

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287 Submission 12, Infrastructure Capital Group, pp. 5-6.

288 Submission 20B, Perth Energy, p. 6.

289 *ibid.*

Perth Energy suggests that the services offered on a non-competitive basis by a monopoly NSP should be scrutinised. Each of those services that are able to be competitively delivered should:

- be competitively tendered to ensure that the service provider is delivering the services for the most efficient price;
- not be cross-subsidised by the NSP's regulated service; and
- be ring-fenced or, preferably, be delivered by separate entities.<sup>290</sup>

Perth Energy notes the range of trials Western Power is currently conducting, or facilitating with Synergy, including microgrids, utility scale batteries, SAPS, peer to peer trading and VPPs, and observes that none of these services are monopoly services and that Western Power has not established a ring-fenced entity, or the cost allocation mechanisms required to segregate the various businesses.<sup>291</sup> The Committee observes that many of these trials are being progressed in partnership with the private sector.

The Committee accepts that, given the pace of change underway in the energy market and the need for secure, reliable supply, Western Power must act swiftly to adapt its business model to accommodate microgrids and associated technologies. Given the introduction of legislative reforms to empower Western Power to manage SAPS as an 'adjunct' to its network function, its central role as the network operator, accountability for network planning and development, responsibility for metering, visibility of the power system and existing workforce and internal capabilities, it has a vital role in leading the technical and operational development of microgrids in the SWIS.

In so doing, however, it is vital that Western Power ensures that its procurement processes provide opportunity for the private sector to provide cost-effective solutions, on a competitive basis. There is considerable innovation, expertise and financing capacity within the private sector — competition between private sector entities can operate in asset procurement and operations to drive considerably lower system costs, for the benefit of all Western Australians.

Moreover, it is vital that scope is provided for the private sector to operate assets to provide other market and system support services and that appropriate provisions are put in place to both facilitate this and prevent Western Power from inappropriately participating in the WEM.

The Committee notes that the Explanatory Memorandum to the *Electricity Industry Amendment Bill 2019* explicitly provides:

The Government's policy is that Western Power should be enabled and permitted to deploy SPS [SAPS] and storage in response to an identified network need of its primary network business, to reduce network costs and improve the security and reliability of electricity supply to consumers. The Government does not intend that

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<sup>290</sup> Perth Submission 20B, Perth Energy, pp. 6-7.

<sup>291</sup> *ibid.*

Western Power will look to develop new lines of business in the provision of SPS and storage more generally.<sup>292</sup>

The Committee further notes that the Government has acknowledged the centrality of business case development processes and intends to amend the ENAC to require that Western Power develops business cases for the deployment of SAPS and storage works for submission to the ERA, as part of the access arrangement revision process:

The business case would address available alternatives, including procurement of an SPS [SAPS] or storage works solution to an identified network need from a third party as an operational rather than capital expense. The provision of SPS or storage works by Western Power itself would not be a forgone conclusion but would depend on the business case.<sup>293</sup>

**Finding 34**

Western Power has a vital role in leading the technical and operational deployment of microgrids and associated technologies in the South West Interconnected System. However, its procurement processes must drive the lowest possible cost for consumers, provide opportunity for private sector participation and ensure competitive pressures deliver cost-effective and efficient services.

**Finding 35**

The Government has indicated that the passage of the *Electricity Industry Amendment Bill 2019* would trigger amendments to Western Power's procurement and business case development frameworks and the Access Arrangement process under the *Electricity Networks Access Code 2004*, to ensure that third party solutions are considered for the provision of microgrids and associated technologies.

**Market rules**

The Committee has found that microgrids and associated technologies can offer a range of benefits to Western Australia's power systems, both in terms of their impact on wholesale market dynamics and their capacity to reduce electricity network costs. Irrespective of who supplies or operates the assets, their potential depends on how price signals are sent through both structures to encourage efficient, cost-reflective outcomes and place downward pressure on price.

ARENA observes that variable renewable energy technologies, such as solar photovoltaics and wind power, are now the lowest cost forms of new electricity generation and are likely to substantially increase their share in Western Australia's generation mix over the next decade.<sup>294</sup> The evidence to this Inquiry has shown that DER (particularly small scale PV) is increasing in the WEM. The increased penetration of both large scale renewables and DER is affecting system operations. Microgrids and associated technologies can potentially offer a range of benefits to the WEM as reliable, dispatchable resources that have the capacity to supply essential system services. It now behoves policy makers to ensure that market

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292 Explanatory Memorandum, *Electricity Industry Amendment Bill 2019*, p. 21.

293 *ibid.*, p. 23.

294 Submission 35, Australian Renewable Energy Agency, p. 2.

structures allow the realisation of the full range of benefits offered by microgrids and encourage the operational optimisation of the whole system.

The Committee has found that the WEM was designed to reflect traditional market structures and has not yet adapted to accommodate new technologies. However, our market is not alone. PricewaterhouseCoopers observes:

Markets are changing rapidly. In virtually every part of the world, electricity is a regulated industry, sometimes regulated at multiple levels. In many instances, the current market designs won't support the shift from a capacity-oriented system to a disaggregated, flexible power system without significant adaptations. However, because these designs need to evolve in the course of the transformation, we foresee the emergence of a number of new market models, which might appear alone or in combination within or across a region.<sup>295</sup>

Market reform is a complex process and the Committee observes that the State Government has initiated a wide range of reform activities under the auspices of the Energy Transformation Strategy, intended to deliver an ambitious broader market reform agenda for Western Australia's electricity sector.

The challenge for policy makers will be to strike a balance that ensures efficient signals come through the market, but avoids creating overly complex market structures that in themselves create barriers to participation, introduce additional costs and overhead, or facilitate forms of market gaming by existing participants — particularly in the WEM, that is smaller and shallower than the NEM. The Committee explored the approach to WEM reform with the Chair of the Energy Transformation Taskforce, who emphasised that lowering costs for consumers should be any reform program's ultimate aim, and outlined the importance of ensuring that the perfect does not become the enemy of the good:

I think the trick in all of this is, because it is such an interesting field, and we are privileged to be working in the sector at this time, it is easy to get caught up in the detail, and say "I'll have one of those, and I'll do this and I'll do that."

We should never lose sight of the fact, in my view, that what we are on about is keeping electricity costs low for consumers. It is all about, in my view, reliable power at low cost. I always try to discipline myself because I like talking about this stuff. I even say this to the guys who are talking about all this detail: "Guys, how will this put downward cost pressure on the sector?" If you cannot answer that question, you have to think about whether you go there or not. It is really a matter of there is a whole bunch of stuff we need to do now, but in a small market like WA, which we all know is a small market, we can over-engineer it and over-cost it. We have got to be conscious that what we end up with is fit for purpose.

The CHAIR: That is such an important point, I think, and, again, we can have very complex market structures to solve problems that do not necessarily need to be complicated by markets with complex registration and participation requirements.

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<sup>295</sup> Norbert Schweiters and Tom Flaherty, 'A Strategists Guide to Power Industry Transformation', *Strategy+Business Magazine*, Issue 80, Autumn 2015, p. 4.

It is about thinking about the points of competitive pressure that you need that are going to lead to the most economically efficient outcome that solves a technical problem, that follows the physics, so I think you are quite right; it is important to keep that in sight.

Mr EDWELL: Sometimes, near enough is good enough. We talk about 80–20; 100 per cent is good, but it costs you a whole bunch of money to get the extra 20 per cent, so we will settle for 80.<sup>296</sup>

Many work streams within the State Government’s energy reform agenda are likely to have indirect impacts on microgrids and associated technologies. The Committee has chosen to confine its discussion of WEM reform to three main aspects that are directly related to microgrids and associated technologies:

- the availability of essential system services;
- the participation of microgrids in market structures; and
- the role of battery technologies.

### **Essential system services**

Chapter Two noted that there are a range of services required to maintain energy system stability. As DER increases on the SWIS, these services are growing in importance. Chapter Four observed that markets and mechanisms currently exist to procure a limited range of ‘ancillary services’, that are defined under the current market rules and regulatory frameworks. However, markets do not currently exist for the broader range of services that are essential to maintain system stability, primarily because many services were automatically provided by traditional forms of generation.

Chapter Four also observed that changes in system operations are currently imposing additional costs on traditional generation sources which are not recoverable. Moreover, specific signals do not exist to procure essential system services from the most efficient providers. As the technology matures, microgrids and associated technologies could provide a range of system support services, but their capacity to do so may be limited by inadequate market structures or signals.

AEMO advised the Committee that in order to both support the system changes triggered by microgrids and ensure efficient market and system operations, the WEM needs:

- clearly defined ancillary services that are aligned with the reliability and security standards for power system operation;
- appropriate procurement mechanisms for those ancillary services, having regard to the potential for competition to lower costs for consumers; and

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296 Mr Stephen Edwell, Energy Transformation Taskforce, *Transcript of Evidence*, 8 November 2019, p. 11.

- efficient allocation of ancillary service costs to promote investment and behaviour that reduces total system cost.<sup>297</sup>

Perth Energy acknowledged the growing need for the market to recognise and ensure the provision of a broader range of essential system services. During its hearing, the Committee discussed a range of services that currently do not have a direct revenue stream for their provision:

Mr Peake: I think it is appropriate that those be identified, because if you look at different types of plant, they can offer different amounts. A large thermal plant can offer a lot of inertia. Ours, ironically, does not have a great deal of inertia, which is why it can run up so fast. But there are other [services] that our plant can provide. I think that as different types of plants come onto the system, the obligations which are in the technical rules are no longer appropriate. For example, our power station has what they call “governor droops” so that if the frequency falls, our machines are required to book out... In the eastern states that gets paid for. Again, if you have a wind farm and the frequency falls, they just slow down. They cannot provide that, but there may be other things that they can provide. I think you really need to say that there is a basket of things that are provided by different generators.<sup>298</sup>

ARENA advised the Committee that reform of energy and ancillary services markets and supporting regulatory frameworks are being progressed in the NEM to ensure generators and consumers are provided appropriate incentives to offer power quality services to support the system at the right time and in the right location.<sup>299</sup>

In the WEM, it has been an open question whether specific, granular markets for all essential services are required, or whether it is sufficient simply to make the provision of these energy supply characteristics a compulsory aspect of connection or participation in electricity markets. In some cases, it may also be appropriate to have mechanisms that are not complex, real-time markets, but nonetheless exert competitive pressure at some point in the procurement process, to encourage efficient outcomes. AEMC stated:

It is about identifying what those issues are and then how they are incentivised into the market. The value may be price. It may just be something that is required to be provided when you connect into the network; that is, new generators must also be able to operate in a certain manner. As [AEMC Chief Executive] Anne [Pearson] said, there are different ways of solving it; it is not necessarily about the price... There is no doubt that in order to keep the energy market secure for the provision of electricity, you need a range of services. How you incentivise and ensure that those services exist, there is probably a number of ways in which you can do that. We certainly recognise that you do need all those things to make a system work effectively.<sup>300</sup>

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297 Submission 19, Australian Energy Market Operator, p. 27.

298 Mr Patrick Peake, Perth Energy, *Transcript of Evidence*, 10 October 2018, p. 7.

299 Submission 35, Australian Renewable Energy Agency, p. 2.

300 Ms Michelle Shepherd, Australian Energy Market Commission, 23 November 2018, p. 10.

The Taskforce has recognised that market-based mechanisms are likely to procure a more efficient supply of a broader range of essential system services. Since the above evidence was presented to the Committee, the Taskforce has undertaken an extensive exercise to design new procurement mechanisms and has changed the terminology from 'Ancillary Services' to 'Essential System Services', underscoring their significance to the electricity system. In August 2019, the Taskforce released a series of papers outlining proposed changes to essential system service (known as ESS) procurement processes.<sup>301</sup>

The Taskforce specifically recognised that the current essential service mechanisms will not maintain power system security at the least sustainable cost and are incompatible with the WEM arrangements required to facilitate systemic change.<sup>302</sup> In particular, and consistent with the evidence presented to this Inquiry, the Taskforce acknowledged that current essential system service procurement mechanisms do not include explicit consideration of economic cost:

Inefficient costs may result from the exclusion of potential providers, overly conservative requirement quantities, unnecessary curtailment or displacement of lower-cost generation, or the presence of market power that drives up prices.<sup>303</sup>

The new essential services processes proposed in the discussion papers combine both real-time signals and longer term procurement processes that are intended to be cost-efficient, technologically neutral and encourage new entrants. They provide for the procurement of a broader range of energy services that are ubiquitous across the system and also location-specific. The changes will establish real-time optimisation markets for the supply of a frequency control essential service system, with the costs recovered from the participants who most directly increase the quantum of service required. Services will also have more open technical definitions to facilitate provision by the most efficient technologies (including microgrids and associated technologies).<sup>304</sup>

The existing Load Following Ancillary Service (LFAS) market will be replaced with a frequency regulation service, to manage differences between forecast dispatch and actual required dispatch in any trading interval. A new contingency reserve will replace spinning reserve to deal with lost active power during events such as the loss of power generation, demands of a large load or injection/offtake at multiple facilities affected by a single network event. AEMO will procure this service via an optimised dispatch engine. Finally, a rate of change of frequency market will be established to ensure sufficient system inertia. The services procured through previously defined 'Non-frequency ancillary services' will now be sourced through the application of constraint equations and are linked to the State Government's introduction of a constrained network access framework.

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301 Energy Policy WA, *Taskforce Publications*, accessed 31 January 2020, <[www.wa.gov.au/government/document-collections/taskforce-publications](http://www.wa.gov.au/government/document-collections/taskforce-publications)>.

302 Energy Transformation Taskforce, *Frequency Control Essential System Services: Acquisition, Cost Recovery and Governance: Information paper*, August 2019, p. 5.

303 *ibid.*

304 Energy Transformation Taskforce, *Frequency Control Technical Arrangements: Information paper*, August 2019.

The proposed changes intend to avoid creating unnecessarily complex market mechanisms. While it may be theoretically possible to construct a range of complex, real-time markets for multiple classes of service, in the Taskforce's view the benefits would be limited. For example, for the contingency reserve, the Taskforce stated:

Where services are provided from the same cost base (in the case of Contingency Reserve, the costs of having 1 MW of capacity reserved and ready to respond), increasing the number of Contingency Reserve classes introduces potential for inefficient offer construction, opportunities for gaming, and increases the complexity of market power monitoring and control ... This means that options with lower numbers of segments are likely to better support market power monitoring and mitigation and minimise the cost and complexity of operation of and participation in ESS.<sup>305</sup>

The Taskforce has also recommended the establishment of a supplementary mechanism to allow for a longer-term, centrally-managed procurement process for essential system services, where the creation of real-time markets would be inefficient:

Because of the relatively small size and level of market concentration of the WEM, and the partial disconnect that exists between the economic benefits and costs of ESS provision, the entry of more efficient and effective Frequency Control ESS providers under well designed real-time market arrangements alone is unlikely. There is a high risk of market failure in the form of inefficient pricing, and inefficient facility entry and exit signals.<sup>306</sup>

These proposed changes to WEM structures mark a significant step towards securing the supply of a broader range of essential system services and introduce mechanisms to encourage more cost-reflective and economically efficient supply. They create markets where the scale and depth of the WEM are sufficient to support them, but also allow for the incorporation of market forces into longer term central procurement processes, where a real-time or shorter term market may lead to gaming, abuse of market power, or may discourage the entry of more appropriate forms of new technology.

#### **Finding 36**

The proposed changes to essential system service procurement in the Wholesale Electricity Market are intended to send more efficient signals through the electricity market, encourage the entry of new technologies and market participants, whilst ensuring secure and reliable electricity supply.

### **Participation of microgrids technologies in the Wholesale Electricity Market**

Wholesale energy market reform should aim squarely at encouraging the most efficient possible configuration and utilisation of assets. The CEO of AEMO, Ms Audrey Zibelman stated that one of AEMO's objectives is to move towards 'a multisided platform for energy

<sup>305</sup> *ibid.*, p. 20.

<sup>306</sup> Energy Transformation Taskforce, *Frequency Control Essential System Services: Acquisition, Cost Recovery and Governance: Information paper*, August 2019, p. 10.



trading' where resources like microgrids and DER can be managed in order to respond to a price or dispatch signal, and then could be rewarded in much the same way as generation:

Because when you think about it, AEMO's job is to balance supply and demand. What we want to do is balance supply and demand in a way that first maintains the security in the system, because the system has to work, but also use the least cost combination of devices, so that in managing that balance, you are driving the greatest efficient value to consumers.<sup>307</sup>

Microgrids have the potential to participate in both essential service and broader energy and capacity markets in the SWIS. However, currently there are structural barriers to their participation. Synergy noted:

Changes to the WEM rules may be required to allow for the participation of microgrids and other new technology solutions. While current trials are still underway, utility scale solar and wind generation is expected to have an increasing prevalence in the SWIS. Consideration will need to be given to the role and services these generation sources can provide and how they can best participate in generation capacity, energy and future ancillary services markets, the latter of which are currently under development by the Department of Treasury. Given several of these intermittent generation assets will be located in remote areas, and may potentially be behind a microgrid connection point, further thought needs to be given to how to best plan and accommodate these resources under a potentially future 'modular' network.<sup>308</sup>

A number of market participants suggested to the Committee that the WEM rules should be amended to facilitate the participation of microgrids and associated technologies. ATCO recommended 'amending the *Wholesale Electricity Market Rules* to enable VPPs (the aggregation of the output of many small generators) to provide services to the Wholesale Electricity Market.'<sup>309</sup> Tersum suggested that the Geraldton community-based energy cooperative proposal could similarly provide locational system services (in addition to supplying its local customers):

Our proposal was that, in developing a DER model for Geraldton and making Geraldton independent or self-sufficient, you would not need to provide that [Network Control] Service ... We talk about deferring capital on the transmission line; that is another service that is paid for by consumers that might not be necessary going forward ... but there is no market at the moment ... In time, if there is an opportunity and an ancillary service market, then, sure, we would like to participate in it.<sup>310</sup>

The Committee notes that the DER Roadmap's scope of work includes:

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307 Ms Audrey Zibelman, Australian Energy Market Operator, *Transcript of Evidence*, 21 November 2018, p. 2.

308 Submission 22A, Synergy, p. 4.

309 Submission 13, ATCO Australia, p. 2.

310 Mr Rodney Littlejohn, Tersum Energy, *Transcript of Evidence*, 17 October 2018, p. 6.

- DER investment signals and options for pricing reform; and
- pathways to customer DER participation in markets and new business models.<sup>311</sup>

The 'Registration and Participation' work stream in the Taskforce's Future Market Design and Operation project will also will define the way individual facilities are able to participate in different aspects of the WEM, including the energy market, essential system services, and the Reserve Capacity Mechanism. This work package addresses deficiencies in the current framework with respect to the treatment of emerging technologies.<sup>312</sup>

#### **Finding 37**

The Energy Transformation Strategy will consider modifications to Wholesale Electricity Market structures to facilitate new technologies, including microgrids.

### **Battery technologies**

Battery technologies are a particularly exciting technology associated with the emergence of microgrids. Grid-scale batteries are rapidly evolving and demonstrating their capacity to assist with secure and reliable system operations, complement renewable technologies and reduce both system-wide and consumer energy costs. Opportunities exist on both the transmission and distribution system and in a range of market and network contexts. Assets can be developed through partnerships between the GTEs and private sector, and as market reforms are introduced, opportunities also exist for discreet battery-based services from other market participants.

Australia's first grid-scale battery was installed in 2017, in Hornsdale South Australia in conjunction with the connection of a new large-scale renewable energy generation project. It is Australia's largest battery at 100MW/129MWh (megawatt hours) and was installed in response to an energy supply incident in South Australia. The battery has out-performed industry expectations, being able to store excess electricity, provide electricity at times of power supply interruption and also provide system stability services. AEMO noted that the Hornsdale battery is:

Very responsive to the signals that the system sends to them. The battery can follow the signals much more responsively than regular and traditional generators, so a good performance there contributes to system security. Given the experience that we have had with South Australia, and maybe you have seen some graphs of how responsive the battery is, we have seen interest here in WA from proponents of new generation to also add batteries. There are currently some regulatory barriers to that, but they all show interest to add batteries to their solar generation, for example... The international experience also shows the performance of batteries can positively contribute to system resilience. I was reading a report from EirGrid in Ireland. They did a test on batteries and found it

<sup>311</sup> Energy Transformation Taskforce, *Energy Transformation Strategy: Program Implementation Plan*, October 2019, p. 9.

<sup>312</sup> *ibid.*, p. 15.

multiple times more effective in providing grid stability services than regular generators.<sup>313</sup>

AEMO did caution, however, that grid-scale batteries tended to almost 'over perform' and required supporting optimisation platforms and coordination technologies to deliver maximum benefits.<sup>314</sup>

In October 2018, the State Government announced an Australian-first trial to integrate bulk storage into an existing grid, with the installation of a 105kW (420Kwh) battery in the City of Mandurah, at a point in the distribution network serving a residential area with particularly high rooftop solar PV penetration.<sup>315</sup> Under the PowerBank trial, 52 households were provided with the opportunity to access the battery and store up to 8 Kwh of excess electricity produced by their solar panels during daylight hours for consumption at night, at a cost of \$1 per day.

In addition to demonstrating the distribution network uses for batteries, the trial examines the ability for grid-scale assets to allow consumers to maximise the value of their grid connection. Access to grid-scale assets removes the need for consumers to outlay the considerable upfront (and higher) costs associated with purchasing small-scale household scale batteries installed behind the meter. PowerBank trial participants have been given greater access to their usage patterns and daily storage data online via the Synergy website, while maintaining reliability of supply from their Western Power grid connection during overcast days.

Homes taking part in the trial are not locked into the program, allowing them continuing flexibility and choice in deciding how they meet their individual electricity needs. Customers receive quarterly activity statements advising of savings to date, using a system developed by Synergy.<sup>316</sup> Consumer response was overwhelmingly positive, with full subscription in less than two weeks, prompting the trial to launch three months ahead of schedule.<sup>317</sup>

Sustainable Energy Now supported the increased utilisation of grid-scale batteries in the SWIS, particularly to support renewable energy technologies:

There is compelling argument for installation of utility-scale batteries at electricity sub-stations and/or behind-the-meter, centrally-controlled batteries in urban areas. In addition to previous discussion about battery storage contributing to grid stability and frequency control, this can also assist in the transition to renewables from WA's aging coal-fired generators.<sup>318</sup>

Synergy emphasised the energy saving opportunities for consumers, demonstrated by its Alkimos trial, that can be delivered in addition to system-level benefits. For individual

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313 Mr Dean Sharafi, Australian Energy Market Operator, *Transcript of Evidence*, 9 May 2018, p. 4.

314 Mr Cameron Parrotte, Australian Energy Market Operator, *Transcript of Evidence*, 9 May 2018, p. 4.

315 Hon Ben Wyatt MLA, Minister for Energy, [PowerBank trial to revolutionise bulk battery storage in WA homes](#), media release, 17 October 2018.

316 *ibid.*

317 Hon Ben Wyatt MLA, Minister for Energy, [PowerBank trial goes live three months early after families snap up spots](#), media release, 5 November 2018.

318 Submission 27, Sustainable Energy Now, p. 9.

customers, behind the meter batteries represent a significant (and often prohibitive) cost. However, significant benefit can be gained from the installation of ‘community batteries’, where householders in a particular location are granted access to a local distribution system battery.

If the incentives are right and if the collaboration is right, and by “incentives” I mean therefore the regulatory incentives are right, I can envisage a world where there is a more greatly optimised potential between the distribution or the grid operation and the household on the basis of the installation of community-based facilities, as opposed to behind-the-meter household-based facilities.<sup>319</sup>

Synergy noted the shared benefit between the householder and system, and also the ‘economy of scale’ associated with procuring a larger grid-scale battery as opposed to lots of smaller household scale batteries.<sup>320</sup>

Western Power noted the benefits of grid-scale batteries for the distribution system, referencing the results from the PowerBank trial. Western Power considers that the PowerBank asset has been ‘working very effectively’, has deferred the need to make traditional network investments, allowed it to manage power quality in a segment of the distribution network with very high penetration of solar PV and represents a more cost-effective option than multiple household-scale batteries:<sup>321</sup>

We are obviously gaining the benefit of the alternative that we see in some of the issues of high penetration on people’s roofs coming into the network... Where does it take us? It is early days in the trial but it is certainly working as we thought it was going to work, which is a good start for us. We are already looking to other feeders in the distribution network that have those similarities—really high penetration of solar PV, and even nearby to Falcon, an obvious example that has a very high penetration. It is one of the solutions that will definitely solve some of the problems that we have seen in the distribution network, while also giving the customer a really good outcome. It is certainly cheaper from behind the battery meter. That is a much cheaper option to put in the community. It is working as expected.<sup>322</sup>

Beyond their ability to provide distribution network and consumer benefits, Western Power also noted the ability of grid scale batteries to provide system security services.<sup>323</sup>

Tersum also recognised that grid-scale battery assets could provide essential system services and outlined potential collaboration between private providers and the GTEs:

A potentially a larger-scale battery ... can sit there and either provide—I suppose maybe two batteries: one to take daytime generation and shift it to peak in the afternoon, because that is important, but also a battery that may be able to then

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319 Mr Jason Waters, Synergy, *Transcript of Evidence*, 9 May 2018, p. 8.

320 *ibid.*

321 Mr Guy Chalkley, Chief Executive Officer, Western Power, Assembly Estimates Committee B, *Hansard*, 23 May 2019, p. E480.

322 *ibid.*

323 *ibid.*

provide network control or fast-frequency response, those sorts of ancillary services that might be useful for Western Power. It could be that that second battery is Western Power's. It could be that it is jointly owned but would be operated, if you like, from a network services perspective. So, in time, we see that that mixed generation hub takes further pressure off the transmission line. It does not make it redundant. In fact, our view is the replacement of the line may ultimately be because you are shifting power from north to south as opposed to bringing power from south to north, but that will take time.<sup>324</sup>

ARENA informed the Committee that it had commissioned a study to compare renewable/battery electricity options with traditional forms of generation in a high-penetration renewable grid. The study results indicate that a range of storage technologies, combined with renewable generation, can compete to provide firming and peaking capacity with a range of 30 minutes to over 40 hours of storage. The estimates reflected technology costs in 2017, and can be expected to reduce over time with research development and demonstration (RD&D), global experience and manufacturing scale. ARENA states:

If power system services are appropriately valued, and with a supportive and predictable policy environment, we may see a competitive deployment of significant quantities of energy storage in wholesale markets in response to identified market opportunities.<sup>325</sup>

#### **Finding 38**

Grid Scale batteries offer a range of benefits for both individual consumers and the whole energy system. They can:

- help consumers to reduce energy costs by facilitating the storage and draw-down of photovoltaic (PV)-generated electricity;
- defer or reduce the need for traditional investments in the distribution network;
- improve distribution system operations, particularly in areas with high household PV penetration;
- operate at the transmission level to provide a range of essential system services; and
- provide economies of scale, are lower cost, more visible and easier to operate, for both system and network operators, than individual household-scale batteries.

#### **Barriers for batteries**

A number of witnesses commented on market and regulatory constraints preventing the efficient utilisation of grid-scale batteries. Perth Energy stated:

The current WEM was not designed to accommodate new technologies such as batteries. Amendments to the WEM Rules and associated IT systems will need to

<sup>324</sup> Mr Rodney Littlejohn, Tersum Energy, *Transcript of Evidence*, 17 October 2018, p. 6.

<sup>325</sup> Submission 35, Australian Renewable Energy Agency, p. 6.

be made. The WEM Rules will need to be reviewed to allow the registration and dispatch of new load and generation technologies.<sup>326</sup>

AEMO highlighted the ‘pretty unexciting tariff structures, which do not really enable maximum optimisation of battery storage and recovery of cost.’<sup>327</sup> Synergy commented on the delineation issues between it and Western Power (discussed previously), noting that a kind of ‘grey zone’ exists around consumer and customer interface and the categorisation of batteries as ‘generation’ or ‘network’ assets. Synergy stressed the need to collaborate and maintain a degree of flexibility, whilst the technologies were being rolled out and regulatory changes are being developed, to ensure network, customer and system wide impacts were understood:

In my mind, it is Synergy that represents the arrangements to the customer and is that interface, but it requires — and in fact the approach we are taking is — collaboration with Western Power to then also ensure that there is a network or a distribution optimisation available through that.<sup>328</sup>

In Synergy’s view, reform was required to create ‘regimes that enable us to be agile and open-minded in our approach’ because:

We are still working our way up the curve of where all this tech is going to land and how it is all going to actually play out. In some areas it may in fact just be too soon to replace one what may be relatively rigorous regulatory approach with a change to an equally rigorous but different approach that does actually enable still over time as things evolve flexibility for these things to play out. What I ultimately see potentially is a co-investment between the network or distribution operator and the retailer, and therefore a balanced representation between the customer’s interest from the retailer’s side and the network and distribution interest from the distributor’s side.<sup>329</sup>

S&C Electric Company also raised issues surrounding the categorisation of battery technologies and the implications this has for who can operate them in the WEM, claiming that currently, batteries are treated like generators for the purposes of market operations. This cuts across both the ability of battery technologies to provide broader system services, and also the operation of microgrids:

This may restrict a [network operator] from owning and operating a battery, which is essential to provide back-up in the absence of renewable generation (no wind or sunshine) or while a high carbon generator starts up. A battery is also essential for a “seamless” transition from wider grid supply to microgrid only supply. The battery supports the load until the high carbon generator starts up and is synchronised with the load. The battery again supports the load as the microgrid is synchronised with the electricity supply outside the grid and then reconnects to the wider grid supply. However, there are examples in other jurisdictions where the

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326 Submission 20, Perth Energy, p. 10.

327 Mr Cameron Parrotte, Australian Energy Market Operator, *Transcript of Evidence*, 9 May 2018, p. 3.

328 Mr Jason Waters, Synergy, *Transcript of Evidence*, 9 May 2018, p. 7.

329 *ibid.*

DNSP [distribution network service provider] does own and operate generation and does so under regulation and without issue (e.g. Queensland and the UK).<sup>330</sup>

This chapter has previously discussed the open questions about Western Power's provision of a broader range of services facilitated by DER, in potential competition with the private sector. Whilst distribution-connected grid scale batteries can provide network services and are directly related to Western Power's operator role, we note the role for the private sector with respect to transmission level assets and essential system services, and Perth Energy's comments (referred to above) regarding the service definitions, competitive tendering, cross subsidies and ring-fencing.

### ***Accommodating batteries***

The trials introduced by the State Government through Western Power and Synergy (and often in conjunction with the private sector as detailed above and in the Interim Report) have demonstrated the benefits batteries can deliver to both consumers and the wider system. The Energy Transformation Strategy has a number of work streams specifically addressing their incorporation into WEM structures.

As Chapter Five notes, the WOSP (Whole of System Plan) will expressly identify opportunities for energy storage across the SWIS, reflecting the Government's recognition that batteries will 'play an increasing role in meeting our essential electricity needs'.<sup>331</sup> The DER Roadmap will also guide the integration of solar PV and renewables, but makes particular mention of battery storage and energy management systems, to understand how these technologies can be utilised 'to operate our power system more efficiently and reliably'.<sup>332</sup>

#### **Finding 39**

The Energy Transformation Strategy, particularly through the Whole of System Plan and DER Roadmap, contemplates the integration of battery technologies in the South West Interconnected System, Wholesale Electricity Market and across the State. The Strategy intends to facilitate battery technologies to contribute to the delivery of more secure, reliable, affordable and sustainable energy supply.

The legislative reforms contained in the *Electricity Industry Amendment Bill 2019* include amendments relating to 'storage devices', focussing on their ability to absorb excess energy and release it when necessary 'to stabilise the system'.<sup>333</sup> It proposes to allow Western Power to operate these assets as an adjunct to its network operator functions and recover the costs of the assets (or a portion of them) through network tariffs, under the ENAC.<sup>334</sup>

When introducing the amendments, the Government was at pains to emphasise that the intent is not to enable Western Power to participate in the WEM using battery technologies. The amendments intend to set boundaries around the types of services it can provide

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330 Submission 26, S&C Electric Company, p. 4.

331 Energy Policy WA, *Energy Transformation Strategy*, accessed 5 September 2019, <[www.wa.gov.au/organisation/energy-policy-wa/energy-transformation-strategy](http://www.wa.gov.au/organisation/energy-policy-wa/energy-transformation-strategy)>.

332 *ibid.*, p. 8.

333 Explanatory Memorandum, *Electricity Industry Amendment Bill 2019*, p. 20.

334 *ibid.*, p. 21.

utilising batteries, with a view to enabling it to operate its existing business efficiently. Western Power will be limited to providing *network* services and installing batteries in response to an identified need in its primary network, to reduce network costs and improve the security and reliability of electricity supply to consumers. The Explanatory Memorandum expressly states:

The intention is not to create new lines of business for Western Power to compete with private sector SPS [SAPS] and storage providers ... The Government does not intend that Western Power will look to develop new lines of business in the provision of SPS and storage more generally.<sup>335</sup>

To deliver this outcome, the proposed reforms will restrict the provision of storage works to distribution-connected storage. Western Power will not be enabled to deploy transmission-connected storage as part of its regulated covered network in a way that would recover costs through regulated network tariffs. Western Power will also be prevented from using storage works for purposes that are unrelated to the primary purpose of serving a network need. The Government does not intend Western Power to use storage works to participate in the WEM, for example to provide essential system services or retail energy services to customers.<sup>336</sup>

#### **Finding 40**

It is appropriate that the proposed reforms with respect to storage devices contained in the *Electricity Industry Amendment Act 2019*:

- limit Western Power to providing network services and installing batteries in response to an identified need in its primary network; and
- not allow Western Power to use battery technologies to participate in the Wholesale Electricity Market.

Where Western Power is unable to recover the full asset costs from regulated tariffs, the Government has made provision for it to earn the unrecovered investment through other commercial structures, such as leasing the capacity of the asset to retailers or other WEM participants, for those parties to then participate in WEM structures or incorporate storage into retail products and services.<sup>337</sup>

The proposed amendments contained in the *Electricity Industry Amendment Bill 2019* intend to allow Western Power to optimise network operations. Insofar as they deliver this outcome, downward pressure will be placed on system-wide costs for all consumers. Assuming efficient market signals exist, other market participants will be able to install and utilise battery technologies at the transmission level, both for storage and essential system purposes, and can also enter into commercial arrangements with Western Power to lease batteries to provide other services and retail products.

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335 *ibid.*

336 *ibid.*

337 *ibid.*



The Committee notes that the Energy Transformation Strategy’s proposed amendments for the provision of essential system services — in particular, those that encourage technologically neutral service definitions and create new markets — foster a range of commercial opportunities for other market participants to also deploy and commercialise battery technologies. The Committee also notes that Western Power, Synergy and Horizon Power have formed partnerships with the private sector to install, own and operate battery assets across the SWIS and State-wide.

**Finding 41**

The Energy Transformation Strategy’s proposed amendments for the provision of essential system services — in particular, those that encourage technologically neutral service definitions and create new markets — foster a range of commercial opportunities for other market participants to deploy and commercialise battery technologies. The Government Trading Enterprises have also partnered with the private sector to deploy batteries across the State.

**Other market issues**

The Committee has chosen to focus on three aspects of market reform that are directly relevant to microgrids and associated technologies:

- the availability of essential system services;
- the participation of microgrids in market structures; and
- the role of battery technologies.

The breadth of the work of the Taskforce is considerable, and many of the market issues that arose in the initial phases of the Inquiry have subsequently been picked up as part of its scope of work. For example, Synergy raised a number of challenges that microgrids may present, including the emergence of temporary sub-markets, the potential for inefficient generation investment and the creation of monopolies or stranded assets and the inability to export energy during isolation incidents:<sup>338</sup>

In the absence of the more liquid regulated markets of the WEM, retailers in a microgrid may be exposed to the requirement to purchase electricity from a single generator within the microgrid, potentially creating a monopoly at times where the microgrid is isolated, while generators may have assets stranded when they would otherwise have exported energy to customers beyond the temporarily isolated microgrid.<sup>339</sup>

The Committee understands that these matters are within the scope of the Energy Transformation Strategy. As discussed at the beginning of this chapter, the Committee was presented with an array of often detailed recommendations regarding specific market changes, which are more appropriately addressed through the various Taskforce work streams, given its resources and targeted industry consultation processes.

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338 Submission 22A, Synergy, p. 3.

339 *ibid.*

**Finding 42**

The Energy Transformation Strategy has a broad range of activities aimed at reforming the Wholesale Electricity Market. The work completed through the Energy Transformation Taskforce will enable new technologies to participate more fully in Western Australia's electricity supply and ensure essential system security services are provided at the lowest sustainable cost.

**Network regulation**

The Committee has found that microgrids and associated technologies can reduce total electricity system costs by deferring, reducing or entirely removing the need to invest in costly pole and wire replacement programs. To capture these benefits, it is vital that the right signals are sent through the regulatory structures governing access to, and development of, electricity networks.

Chapter Three outlined that electricity networks are regulated under the ENAC (*Electricity Networks Access Code 2004*). By defining the services Western Power can provide, allowing certain forms of investment into certain types of assets and determining the charges Western Power can levy its customers, the Access Arrangement process established by the ENAC sends direct signals into the electricity market regarding the location, configuration and operation of energy assets and can thereby encourage or discourage particular asset configurations and operational outcomes.

Power Ledger told the Committee that defective regulatory structures increase the risk of grid-defection, or customers choosing to completely disconnect from the SWIS:

If we don't create a regulatory framework that incentivises both commercial and residential consumers to stay connected to the grid we'll be left with a fracturing of the system. It's not just the prospect of individual customers defecting from the grid, it's now the prospect of whole communities and towns.<sup>340</sup>

**Network regulation as a barrier**

A number of witnesses observed that economic regulation currently acts as a barrier to microgrids and associated technologies. Perth Energy observed that the third-party network access regime 'has not kept pace with the changing nature of services provided by Western Power and Synergy', and should be amended to ensure it covers the full range of monopoly or non-competitive services provided by State Government owned-entities.<sup>341</sup> In Perth Energy's view, the framework does not operate to encourage efficient outcomes:

There has been some progress in the development of microgrids in Western Australia over the past 3-4 years. However, this has been conducted in the absence of any formal framework to promote prudent and efficient pursuit of these technologies. A regulatory structure is urgently required to guide the development

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<sup>340</sup> Submission 29, Power Ledger, p. 10.

<sup>341</sup> Submission 20B, Perth Energy, p. 1.

of microgrids and associated technologies and provide a level of certainty for investors, industry participants and customers.<sup>342</sup>

A number of witnesses discussed the role of incentives in economic regulation. Currently, regulated networks earn a return based on the size of their asset base — they are incentivised to build more network, to generate more revenue. This can operate as a disincentive for a network operator to explore alternatives to poles and wire solutions that would not expand their asset base. Mr Frank Tudor told the Committee:

You somehow need to take the current regulatory framework, which in the mindset of a distribution business is, “How can I build out my network?” That increases my asset base, my revenue and my rate of return. You have to move it away from that: how do I incentivise the distribution business to actually deliver the lowest average cost where some of that means that distributed energy will be put onto the system by the customers and they will not have a role in that necessarily.<sup>343</sup>

Similarly, Mr Noel Schubert also observed the flaws with a ‘return on assets’ driver and observed that in the NEM, more pressure was applied to network operators to explore non-network alternatives:

It is often discussed that the network return-on-assets model has incentivised networks to build and own more assets rather than adopting alternative solutions that may result in a smaller asset base. The National Electricity Market (NEM) also has tighter regulatory requirements on network owners to investigate non-network solutions before augmenting the network than apply in WA.<sup>344</sup>

Synergy stated that the regulatory framework should be based around an incentive structure to encourage the network operator to make more cost-effective decisions, noting that incentives are currently weak:

The network operator does not necessarily have a financial incentive to offer a prudent discount for non-network solutions or assets when it would result in the network operator avoiding a capital investment on which it would otherwise earn a regulated return, subject to it meeting a new facilities investment test.<sup>345</sup>

ATCO Australia also raised issues with the new facilities investment test as it applies to non-network solutions. ATCO Australia observed that the ENAC has a process whereby Western Power must test the market to see if there is an alternative to a network solution once the project size is over a certain threshold. The purpose of the test is to ensure that Western Power delivers the lowest cost solution to resolving the network constraint, which may not always be to build additional capacity in the network. ATCO Australia expressed concerns regarding the threshold for application of the test:

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342 Submission 20, Perth Energy, p. 1.

343 Mr Frank Tudor, Horizon Power, *Transcript of Evidence*, 11 April 2018, p. 6.

344 Submission 21, Mr Noel Schubert, p. 2.

345 Submission 22A, Synergy, p. 4.

Currently, Western Power is only required to run this process where the project size is greater than \$12.2 million for distribution and \$36.7 million for transmission. ATCO submits that these thresholds should be tested in the context of microgrids, as they may be a barrier to the maximising the opportunities associated with the development of microgrids.<sup>346</sup>

The ERA (Economic Regulation Authority) has acknowledged that the changes underway in the electricity industry present real challenges for economic regulation. It provided the Committee with an example where the new facilities investment test had been applied to a major transmission line project extending north to Geraldton. That project went through a series of regulatory tests, was found to deliver sufficient benefits for customers and therefore included in Western Power's asset base. Hundreds of millions of dollars in assets are now guaranteed to deliver a rate of return to Western Power for the 40 or 50-year life of that asset:

That works fine if the model of the way the electricity system operates is going to be constant over the next 40 to 50 years and we can be sure that that asset is going to stay in service. But what happens if we no longer operate an electricity system in which we are moving energy from Collie to Geraldton and that asset is no longer fully utilised, or even in the extreme, no longer necessary at all, because all of those country towns and the City of Geraldton are generating enough electricity to satisfy themselves?<sup>347</sup>

The ERA stated that the regulatory framework does not currently contemplate what happens to redundant assets. There are open questions regarding whether the access regime would still remunerate Western Power for assets that are no longer required:

Would we draw on the poorly defined provisions under the access regime to make assets redundant and effectively remove them from the asset base and say, "Sorry, network service provider, your asset is no longer necessary. Why should consumers continue to pay for it? We are going to write down that asset value"? In which case, what consequences does that then have for rates of return that we provide Western Power, if all of a sudden their assets that have previously been regarded as a secure investment and, therefore, attracted a low rate of return of investment, become risky investments? Would they quite rightly demand a high rate of return or faster rates of depreciation of those assets? That really has not been thought through.<sup>348</sup>

The ERA observed that Western Australia's access regime reflected the traditional electricity model, and had not evolved to accommodate the technological transformation underway:

Our access regime was developed at a time when everybody thought that the old way of providing electricity would go on forever and, hence, provisions for making assets redundant if they are no long required or only partially utilised have not been well developed in the legislation and have never actually been enacted by

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<sup>346</sup> Submission 13, ATCO Australia, p. 16.

<sup>347</sup> Mr Paul Kelly, Economic Regulation Authority, *Transcript of Evidence*, 20 June 2018, p. 4.

<sup>348</sup> *ibid.*

regulators. I think regulators would require a lot of thinking if they were to draw on those provisions.<sup>349</sup>

The ERA considers that the changes underway in the industry challenge the conventional thinking about the role of network businesses and the mechanisms through which they derive income:

Western Power needs to start thinking about the value of the network services that it provides. It needs to say, “Okay, network-supplied energy is now in competition with household or consumer-supplied energy at the premises.” That is in competition with batteries and the like which will store energy and no longer require the network, and potentially in competition with people deciding not to connect or to disconnect from the network, and either having standalone premises or small microgrids of customers that are detached from the Western Power network. We certainly took the view that Western Power needs to start thinking about the value of the network services that it provides and Western Power needs to be out there demonstrating to customers the value of that connection ... we need to make sure that Western Power faces the right incentives to be responsive to customer needs and to be well aware of what value the network is to customers.<sup>350</sup>

**Finding 43**

The current regulatory framework governing electricity networks in Western Australia acts as a barrier to the development of microgrids and associated technologies and no longer incentivises the most efficient development and utilisation of network assets.

A range of proposals were suggested to the Committee for regulatory change.

Mr Frank Tudor suggested that the regulatory framework ‘needs to change from a rate-based approach which is driven by assets in place and the value of those assets, to one where everybody works in harmony to deliver the lowest average cost.’<sup>351</sup> Synergy emphasised that the regulatory structure needs to remain flexible and adaptable, to ensure it can accommodate new technologies:

Technology is evolving rapidly and the ‘best result’ for today is unlikely to be so for the future. This uncertainty should not delay a move towards microgrids where they provide benefits. Rather, regulatory arrangements should remain flexible to accommodate newly emerging energy solutions where these are demonstrably better.<sup>352</sup>

Perth Energy stated that, to facilitate a move to a distributed energy future (including microgrids), the network access regime should:

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349 *ibid.*

350 Dr Ray Challen, Governing Body Member, Economic Regulation Authority, *Transcript of Evidence*, 20 June 2018, p. 5.

351 Mr Frank Tudor, Horizon Power, *Transcript of Evidence*, 11 April 2018, p. 2.

352 Submission 22, Synergy, p. 2.

- be focussed on long term interests of customers;
- align incentives with long term customer value;
- be proportional and bounded by regulatory intervention; and
- be technology agnostic.<sup>353</sup>

Infrastructure Capital Group similarly supported a technologically neutral regulatory framework, driven by cost efficiency:

We would recommend the incumbent utility control the upgrade or replacement, to ensure the cost/benefit analysis is undertaken solely on an economic and technical grounds, rather than whether a utility's asset base is going to grow or shrink as a result.<sup>354</sup>

Regulatory reform is a very complex exercise — no government has attempted it since the introduction of the *Electricity Networks Access Code* in 2004. The Energy Transformation Taskforce has a dedicated 'Foundation Regulatory Frameworks' work program, with two subprojects:

- 'Improving Access to the SWIS': which considers the processes governing the connection of generation assets to the system, with a view to utilising network capacity more efficiently through the introduction of a 'constrained access' model; and
- 'Delivering the Future Power System': which will focus on market systems, standards, obligations and frameworks, including the ENAC.

The Energy Transformation Strategy recognises:

Unless we modernise the way the power system is regulated and managed, energy will not be dispatched at the least sustainable cost, the power system will be limited in its ability to accommodate growing levels of renewable generation and other new technologies (such as battery storage) while maintaining security and reliability, and signals for investment in the power system — at the right time and place — will be inadequate.<sup>355</sup>

The Project Implementation Plan for the Energy Transformation Strategy states that an exposure draft of the Electricity Networks Access Code was due for release in November 2019, with progressive consultation on, and implementation of, changes to ENAC to be undertaken from January to June 2020.<sup>356</sup> Changes to the ENAC can be delivered by Ministerial direction, and do not require specific legislative change, facilitating a far speedier

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353 Submission 20B, Perth Energy, p. 3.

354 Submission 12, Infrastructure Capital Group, p. 5.

355 Energy Policy WA, *Energy Transformation Strategy*, accessed 31 January 2020, <[www.wa.gov.au/organisation/energy-policy-wa/energy-transformation-strategy](http://www.wa.gov.au/organisation/energy-policy-wa/energy-transformation-strategy)>.

356 Energy Transformation Taskforce, *Energy Transformation Strategy: Program Implementation Plan*, October 2019, p. 18.

implementation. The Minister for Energy Hon Bill Johnston outlined the specific advantage Western Australia possesses in its capacity to deliver regulatory change:

In Western Australia, we are unique because we can do our own regulatory environment. The east coast has to go through all this rulemaking process. Here, Mr Khan can walk into my office with a thing, and I can sign it, and that is a new regulatory framework. We have a different set of issues here in Western Australia because we can make decisions that are in the interest of good outcomes.<sup>357</sup>

**Finding 44**

The Energy Transformation Strategy intends to amend the *Electricity Networks Access Code 2004*.

**Recommendation 8**

The Minister for Energy ensure that reforms to the *Electricity Networks Access Code 2004* expand the role of incentive-based mechanisms to ensure that assets are developed and operated on a technologically neutral basis, driven by overall cost efficiency.

**Administrative and cultural issues?**

Whilst there is undoubtedly a case for regulatory reform to facilitate microgrids and the broader changes underway in the electricity sector, evidence to the Inquiry suggests that the administration of the regulatory regime may also be problematic. Perth Energy, one of the only private market participants to provide detailed submissions to the Inquiry, raised several issues around consultation processes and culture, that were in addition to the content of the regime itself:

We do not believe the current regime and Electricity Network Access Code (the Access Code) requires a complete overhaul. While the current regime is far from perfect, we believe it is a reasonable platform to work with, and that in many cases it is the application of the regime that is at fault rather than the regime itself.<sup>358</sup>

Perth Energy emphasised that better collaboration and consultation in the regulatory process, particularly between the regulator and large network users, could considerably improve the efficiency of the regulatory process, arguing that regulatory engagement is currently conducted at arm's length, with little direct engagement with the holders of Electricity Transmission Access Contracts (i.e. retailers and generators).<sup>359</sup>

Perth Energy also raised concerns about the transparency of ERA decision-making, stating that in several recent access arrangement decisions, a number of reasonable (and in some cases critical) arguments had been ignored and inadequately dealt with by the regulator. It provided an example where Western Power had put forward (in consultation with third

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357 Hon Bill Johnston MLA, Minister for Energy, Assembly Estimates Committee B, *Hansard*, 23 May 2019, p. E462.

358 Submission 20B, Perth Energy, p. 3.

359 *ibid.*, p. 8.

parties) a series of proposals addressing shortcomings with transmission pricing structures, aimed at avoiding price shock:

However, in both the ERA's draft and final decisions, the ERA did not: 1. provide significant rationale or explanation of its decisions; 2. provide meaningful discussion on the several transmission pricing options presented to it by Western Power; or 3. demonstrate how it had addressed views provided by stakeholders. We were disappointed that the ERA did not consult directly on this critical issue with transmission customers and Western Power during its deliberations.<sup>360</sup>

Perth Energy was particularly critical of the ERA's 'ultra-conservative stance' with regard to the installation of smart meters. The Committee has observed that decisions made by the ERA have prevented Western Power from recovering the costs of the information and communication technology (ICT) essential to support microgrids, and that regulatory agency support for advanced metering infrastructure is essential to evolve our energy system. Perth Energy stated:

You cannot really have a microgrid unless you have a decent meter. It is the single most important enabling technology. As part of that decent meter, what you also need to have is a reasonable communications network and an appropriate IT framework that sits behind it that allows the information to come through to those people who need to use it on ... So, part of the challenge here is that there have been a number of proposals that have gone up by Western Power through the formal AO4 or AA process. So, they put it up both in AO3 and in AO4. They have been rejected both times by the ERA because the ERA has, quite frankly, taken an ultra-conservative stance in relation to the benefits of this type of enabling technology, and it is not going to be done unless the government actually gives some form of direction.<sup>361</sup>

Minister Johnston also characterised the ERA's stance on advanced metering infrastructure as one of a series of 'bad decisions that are costing consumers in this State and holding back the development of the system.'<sup>362</sup>As discussed in Chapter Five, in response to the ERA's decision, the Government nonetheless funded the roll-out of smart meter technologies across the State.

When energy systems, asset configurations and operations were predictable and a continuation of decades of 'business as usual', an 'ultra conservative' approach to network regulation was perhaps legitimate. The current pace of change in the electricity industry, and the technological innovation evidenced in this Inquiry, suggests that network and system operators must now be able to develop new technologies and recover the costs for doing so. Energy transformation will become almost impossible to achieve if regulators do not allow network and system operators to innovate and invest in the development of new and enabling technologies, systems and platforms.

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360 *ibid.*, p. 4.

361 Ms Elizabeth Aitkin, Perth Energy, *Transcript of Evidence*, 10 October 2018, p. 10.

362 Hon Bill Johnston MLA, Minister for Energy, Legislative Assembly, *Hansard*, 4 April 2019, p. 2117.



### Recommendation 9

The Minister for Energy ensure that a revised *Electricity Networks Access Code 2004* will require the Economic Regulation Authority to consider the need to facilitate innovation, research, and development of new technologies when approving Access Arrangements for covered networks.

In Perth Energy's view, there is an alternative to 'the oppositional, confrontational application of the Access Code,' based on regular meetings and workshops, where stakeholders identify issues and potential solutions. Appropriately facilitated and recorded, a structure incorporating a higher level of face-to-face engagement would also 'be an effective driver of accountability'.<sup>363</sup> Perth Energy described the operation of the Gas Market Reform Group under the National Gas Rules, which has a light-handed approach for information disclosure and arbitration for non-covered pipelines under the National Gas Rules and recommended that:

The Access Code includes further direction for the ERA and Western Power to collaborate (rather than consult) with all stakeholders including the State Government, the customer (as the party with a contract with the service provider) and the end-use customer during the access arrangement/revenue determination processes. Engagement could include an inquiry type process such as happens for Government budget estimate hearings or Standing Committee Inquiries. This approach would speed up the process and involve real-time dialogue so that issues could be resolved in the most effective way.<sup>364</sup>

The Committee notes that the Energy Transformation Strategy has an extensive and collaborative consultation process, but that it is being run by a temporarily appointed taskforce. Once the taskforce has delivered its various outputs, it will be vital that industry continues to collaborate.

The current Access Arrangement process relies on written submissions and responses. There is very limited scope for industry collaboration, issues identification and resolution. Given the pace of change, this will be increasingly problematic — particularly given the length of time between Access Arrangement processes (typically five years). Significant change can be delivered through the Access Arrangement process — it is vital that the regulator acts to facilitate change and works in step with industry.

### Recommendation 10

The Minister for Energy ensure that a revised *Electricity Networks Access Code 2004* provides mechanisms that would promote a more collaborative approach to developing Access Arrangements, aimed at ongoing issues identification and resolution.

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363 Submission 20B, Perth Energy, p. 9.

364 *ibid.*

## Electricity rates

The price signals sent through electricity markets and regulatory frameworks operate to incentivise particular asset configurations and operations. The final cost of electricity for individual consumers is the result of a combination of factors, including the costs of connection, network tariffs, wholesale market costs, retail overhead and the application of a range of subsidies and policies targeted at specific segments of the market. All of these factors also influence the development of microgrids and associated technologies.

The California Public Utilities Commission (CPUC) has observed that for microgrids, the cost of electricity paid by the customer will depend on a number of factors:

- the cost (levelized cost of electricity or LCOE) of the electricity produced by the DER supplying the microgrid, compared to the costs on the wholesale market or retail rates;
- the cost of distribution network services, set by the distribution operator;
- any additional costs associated with interconnection to the energy system;
- any additional revenues associated with services that the microgrid supplies to the macrogrid; and
- profit for the microgrid owner/operator.<sup>365</sup>

Electricity price construction is complex. Debates around market reform can often lead to confusion, when network tariffs, consumer tariffs and the application of subsidies and tariff policies for particular market segments are poorly understood.

Witnesses to the Inquiry frequently raised issues surrounding electricity ‘tariffs’, but maintained the vital distinction between ‘network tariffs’, which are set through ENAC’s Access Arrangement process, and ‘retail tariffs’, which are the prices offered to end users, set either by commercial negotiation (for contestable customers) or government policy (for a range of consumers, including small-use customers).

Witnesses consistently observed that network tariffs no longer incentivise efficient network investment, and that retail tariffs for small use customers do not reflect the actual costs of electricity supply. Tersum stated that the Committee needed to:

Consider what tariff reforms may be required in the future to help facilitate the uptake of DER and microgrid solutions. While we do not believe tariff reform is a prerequisite or a barrier to DER and microgrids, network and retail tariffs should be reviewed to ensure Western Power, Synergy and other retailers can offer competitive retail tariffs that more accurately reflect the cost of service.<sup>366</sup>

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365 Christopher Villarreal, David Erickson and Marzia Zafar, *Microgrids: A Regulatory Perspective*, California Public Utilities Commission, April 2014, p. 18.

366 Submission 17A, Tersum Energy, p. 8.

Perth Energy noted that tariff reform — both network and retail — is ‘essential if the full benefits of distributed energy solutions and microgrids are to be passed on to consumers.’ It observed that the current uniform network pricing arrangements in the SWIS do not reflect the cost of service.<sup>367</sup>

Similarly, Power Ledger observed that network and retail tariffs do not facilitate innovative new business models, such as peer-to-peer (P2P) energy trading:

Current Network and Retail tariff structures have fixed components, which in their current form do not accurately demonstrate the potential benefits and viability of local P2P markets. Under current frameworks P2P trading across the grid therefore requires bespoke network and retail tariff arrangements. To optimise DER at the distribution network level, comprehensive tariff reform will likely be required, to help create the necessary price signals for both DER owners and consumers to become active participants in future distributed energy markets.<sup>368</sup>

### **Network tariffs**

Network tariffs are determined through the Access Arrangement process and then charged by Western Power to large electricity users — usually retailers or large industrial users. They are intended to reflect the costs associated with electricity transportation and network operations. As part of its work undertaken for the Energy Networks Association, Energeia noted the signals that network tariffs send through the market, stating that the ‘key questions facing industry, consumers, policymakers and regulators alike is the impact of current and various proposed network pricing structures on the efficient uptake of SAPS and fringe-of-grid microgrids.’<sup>369</sup>

Western Power told the Committee that network tariff reforms and changes to incentivise investments in non-traditional solutions where they are more efficient and cost effective are important to ensure better customer outcomes and choice.<sup>370</sup> There were two main themes with respect to network tariffs that emerged from the evidence to this Inquiry:

- the limitations inherent in demand-based tariffs, versus time-of-use signals; and
- the benefits of locational signals.

The charges levied for new connections, although not network tariffs per se, also affect total electricity costs and can operate to drive particular asset configurations. Given that these costs are also regulated through the ENAC, they are discussed in this section.

### ***Demand and time-of-use network tariffs***

Demand-based network tariffs are set by the size of a customer’s connection and do not vary by consumption. They do not provide any form of signal or incentive for consumers to change their electricity consumption patterns to manage system peaks. Energy consultant

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367 Submission 20B, Perth Energy, p. 6.

368 Submission 29, Power Ledger, p. 4.

369 Energeia, *Roles and Incentives for Microgrids and Stand Alone Power Systems*, October 2016, p. 15.

370 Submission 4A, Western Power, p. 5.

Mr Noel Schubert noted that demand tariffs do not recognise or incentivise a developer's ability to move peak demand away from Western Power's network peak or avoid or defer network investment.<sup>371</sup>

The demand charges apply for the measured anytime maximum demand of customers in a rolling twelve months, or the customer's contract maximum demand that applies at all times and is not time-based. They are 'blunt instruments', but Mr Schubert claimed it would not be difficult to improve these network tariffs to make the demand charges time-based so they apply at times that matter to the network and provide price signals that stimulate more economically-efficient solutions to reduce the impact on the network and lower costs.<sup>372</sup> Sustainable Energy Now also recommended the introduction of time of use tariffs.<sup>373</sup>

### ***Locational pricing signals***

Witnesses suggested that there would be benefit in sending signals through the market about the value of energy solutions at particular points in the network. Tersum Energy noted that the SWIS network pricing model is currently structured on centralisation and uniform tariffs and that the current network tariffs paid by retailers act to the detriment of DER and prevent their benefits from being passed on to the consumer. They recommend a tariff structure that would enable Western Power to vary its standard tariffs at an exit point within certain regions of the SWIS.<sup>374</sup>

Regional pricing would mean that the network costs in some areas would be greater than others, however, as long as they reflect the actual cost of network provision, then pricing signals are available to attract DER and specific generation types to regions that value them most, which will help bring prices down.<sup>375</sup>

Tersum suggested that to allocate costs accurately (and achieve cost-reflective regional pricing) Western Power would need to disaggregate and allocate the value of its assets to regional regulated asset bases, and then determine the operating and maintenance costs for each region. It could then use the regional demand forecasts it already develops to determine prices for each of its services:

This is a reasonable and achievable task, as Western Power already plan and operate the network in regions.<sup>376</sup>

The Oil Malee Association observed that the averaging of all costs across the SWIS, inherent in current network tariffs, hides the differences in the cost of local electricity provision. It argued that more transparency is required on locational pricing, to ensure competitive supply arrangements can be developed:

Once the marginal cost of service is determined at key locations throughout the SWIS, a tender process could determine if any providers were capable of producing

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371 Submission 21, Mr Noel Schubert, p. 2.

372 Submission 21, Mr Noel Schubert, p. 2.

373 Submission 27, Sustainable Energy Now, p. 3.

374 Tersum Energy, Answers to Questions on Notice, 2 November 2018, p. 2.

375 *ibid.*, p. 3.

376 *ibid.*

electricity at less than this regional marginal cost. The current subsidy at different locations could be used to facilitate the capital establishment of new regional services, even if the cost was more than the average cost but lower than the marginal cost. Potential service providers could be informed that the support would be limited and be reduced over time.<sup>377</sup>

The Oil Malee Association noted that a cost reflective pricing policy based on location could recognise the positive impact of end of grid energy sources on line losses, as well as provide visibility of the realistic cost of maintaining grid connection over long distances. It recommended:

That transparency be required when addressing the cost of service delivery to specific regional centres and that locational pricing be adopted to facilitate the connection of additional mid and end of grid sources of generated electricity.<sup>378</sup>

Perth Energy noted that current network tariffs are reflective of the average cost of service in Western Power's transmission and distribution networks and stated that this was unlikely to incentivise the wide-spread uptake of distributed energy solutions. Perth Energy supported the introduction of regional or zonal wholesale energy and capacity prices, to ensure that the price paid is consistent with the actual cost to serve:

While we expect the disaggregation of assets and cost allocation between regions and/or groups of customers will not be an easy task, we consider it necessary at some point if Western Power believes it will eventually move to the disaggregated network configuration. We recommend amendments to the Access Code are made to make clear that regional prices, reflective of the cost to serve customers, are permissible and in fact necessary to facilitate the immediate uptake of distributed energy resources.<sup>379</sup>

It is important to highlight that locational signals sent through network tariffs would be shown to retailers and generation/ancillary service providers, and not necessarily to small use customers. A signal can be sent through the market at a macro scale, whilst simultaneously preserving legitimate policies aimed at energy price parity for the regions and the protection of vulnerable consumers (discussed further below and in Chapter Seven).

Power Ledger provided evidence to the Committee on 'Dynamic' network pricing and its own trials of new tariff models which aim to support the viability of peer-to-peer (P2P) trading and more accurately reflect the use of network assets. Consistent with other evidence presented to the Committee regarding the incentives inherent in network regulation, Power Ledger noted that current network pricing models incentivise networks to invest in expanding their asset base, which in turn grows their revenue.

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377 Submission 31, Oil Malee, p. 9.

378 *ibid.*, p. 10.

379 Submission 20, Perth Energy, p. 8.

Power Ledger suggested moving towards a tariff model which drives network utilisation, not capacity, arguing that it would create better outcomes for all participants in a distributed marketplace, including network operators:

A move towards possible models of dynamic pricing could mean:

- consumers are charged for the part of the network they actually use;
- the efficient deployment of DER will be further incentivised;
- there will be reduced investment in non-renewable assets; and
- NSPs will be incentivised to encourage P2P trading and utilisation of their distribution network.<sup>380</sup>

Under the proposed dynamic model, where new generation is required, pricing could incentivise the strategic installation of renewable generation on the parts of the grid which would benefit the most. Power Ledger states that a tariff model that reflects the value of network connection to consumers could provide a price for distributing energy, between locations or through voltages across the network:

For example, in a manner akin to energy wheeling on the transmission network, energy traded between neighbours across LV [low voltage] distribution networks could incur a cost that reflects the value of that tranche of the network.<sup>381</sup>

Power Ledger notes that dynamic pricing is more commonly employed in the supply of energy, but extending the concept to network pricing is becoming more common, and is currently being trialled in some European countries.<sup>382</sup>

The Committee notes that the WOSP (Whole of System Plan) is intended to chart asset configuration and costs to serve across the SWIS. The completion of that piece of work could provide a useful basis for considering alternative network tariff models, to incentivise more economically efficient asset development and operation.

#### **Finding 45**

Time of use and locational pricing sent through network tariffs would provide signals about the impact of electricity consumption patterns and the costs of supply at particular points across the South West Interconnected System.

More accurate signals would encourage more efficient asset use and development, encouraging microgrids and distributed energy resources at specific points in the network where they can deliver greatest benefit.

#### **Recommendation 11**

The Minister for Energy direct the Energy Transformation Taskforce, in conjunction with Western Power, to include network tariff reform as part of its scope of work.

<sup>380</sup> Submission 29, Power Ledger, p. 4.

<sup>381</sup> *ibid.*

<sup>382</sup> *ibid.*

### **Connection charges**

The charges that Western Power levies when connecting new premises were also raised as an issue affecting the take-up of microgrids and associated technologies. Western Power provided the Committee with information regarding its approach to recovering connection costs, both on the transmission and distribution network. Its position is governed by its Capital Contributions Policy, required under the ENAC.

On the transmission network, for new and increased large-scale connections, Western Power adopts a user pays approach to avoid larger users, who stand to commercially benefit from the network expansion, being subsidised by smaller customers. Western Power states that this approach also provides protection against developing under-utilised network assets at the cost of the tax payer, where the funding may have been better utilised by government elsewhere. Western Power acknowledged that there are instances where the costs for connection are extremely high and borne by the first mover:

On occasion there can be perverse economic outcomes for first movers at a transmission level. Meaning the first mover may build and pay for transmission infrastructure that other connections will then benefit from. This only occurs in certain network situations and generally only where network expansion is required.<sup>383</sup>

Western Power explained that its Connections Policy allows it to negotiate with the first contributor for a rebate structure, where a subsequent customer connects to assets.<sup>384</sup>

For distribution connections, customers are charged based on either the 'forecast cost' or 'capacity charge' methodology. For 'forecast cost' charging, the cost is calculated using the expected cost of materials, labour and fleet to deliver the work. This type of pricing is applied to capacity works that don't qualify for the Distribution Low Voltage Connection Scheme Mid Voltage (MV) and High Voltage (HV) connections, connection requests more than 25 kilometres from a Western Power zone substation, and large free-hold subdivisions, street lighting, relocations/removals and un-metered supplies.<sup>385</sup>

For the capacity charge methodology, the Distribution Low Voltage Connections Scheme (DLVCS) provides that customer charges are calculated based on the amount of new capacity requested, with each unit of kilovolt-amp (kVA) multiplied by a set rate. The DLVCS aims to remove perverse economic outcomes for first movers and more fairly distribute the costs and benefits. It is applied to all new or additional capacity requests within 25 kilometres of a Western Power zone substation including: survey strata — residential, built strata — residential, green title residential and commercial / industrial, residential connections above standard supply, commercial / Industrial building developments and mixed-use building

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383 Ms Megan Allen, Senior Government Relations Specialist, Western Power, email, 22 November 2019, attachment to email, p. 2.

384 *ibid.*

385 *ibid.*

developments. An economic test can also be applied, where the capacity charge methodology would produce unfair outcomes.<sup>386</sup>

When either methodology has been applied to produce a connection cost, Western Power then projects the expected network revenue from the connection and the customer pays the difference between the connection cost and the expected revenue.<sup>387</sup>

Mr Noel Schubert suggested that the connection and headworks charges and practises currently used by Western Power 'have a material impact on the viability of connection of microgrids or other developments to the network, or the decision for new developments to go stand-alone and not connect to the network.'<sup>388</sup>

Mr Schubert explained that the actual cost of the connection to the network, plus any headworks charges (levied to cover upstream augmentation of the network), are determined by reference to the electrical capacity being sought by the proponent. Western Power generally bases these charges on the estimated highest 'anytime' demand from the new development. Western Power requires that the connection assets of the new development be dimensioned to supply this anytime maximum demand.

Mr Schubert states that upstream network augmentations to supply the new development are calculated by reference to the new development's demand level at times of the day and year coincident with the highest demand on the total network. He observes that, for most of the rest of the year, the new development's actual demand level does not matter to the network, nor cause the need for any network augmentation, because there is spare capacity. Moreover,

Emerging technologies such as battery storage, ICT systems for aggregation and control of behind-the-meter equipment, and some generation sources can reliably shift a new development's peak demand to other times of the day that do not matter to the network in that the peak demand would not cause the need for any network augmentation.<sup>389</sup>

A development's reduced coincident demand should reduce Western Power headworks charges, but 'at present Western Power does not actively propose such options to developers'.<sup>390</sup> The cumulative result of this approach to calculating connection costs would substantially increase the charges levied to developers. Ignoring the potential value of microgrids and DER in shifting consumption patterns away from grid peaks also devalues and potentially disincentivises their installation.

#### **Finding 46**

Changes may be required to capital contribution policies developed under the *Electricity Networks Access Code 2004* to ensure that unnecessary excess capacity is avoided and microgrids and associated technologies are not unfairly disadvantaged.

386 *ibid.*

387 *ibid.*

388 Submission 21, Mr Noel Schubert, pp. 1-2.

389 *ibid.*, p. 2.

390 *ibid.*



The ERA has observed that the changes underway in the electricity industry will require network owners and operators to significantly rethink their approaches to generating revenue:

An example of the proposals that we are seeing and how we still think that network owners are in an old mindset is that they come forward with a proposal of wanting to increase fixed charges for connection to the network. Their main reason for that is that they want revenue stability. They say, “Okay, you have a connection to the network. You’re going to pay a fixed charge for that connection regardless of how much electricity you use. We want that because demand for network-supplied energy is at least static, or declining in some respects, and that does not accord with our view of the world where we want a return on our network investment.” In our view, that is an old way of thinking and it is not suited to a world where networks compete against other sources of energy supply and other models of energy delivery. It is not our role to think that the network should be doing different things. All we are saying is that the network should face the right regulatory incentives to be thinking about how we can create value for customers with network services.<sup>391</sup>

The CPUC has also observed that rationalising network costs, tariff and billing structures is a ‘key regulatory challenge’. It states that, for microgrids, there are several categories of cost that need to be addressed. The first is the cost of the engineering studies that the utilities require to interconnect significant amounts of distributed energy resources to the distribution grid. The second category of cost is the potential upgrades of the distribution grid that may be required to handle multi-way power flow from distribution connected resources. The CPUC also identifies a more fundamental issue associated with the way tariffs are constructed and then levied across all network users — particularly consumption-based tariffs:

As a microgrid consumes less electricity from the distribution utility, a question of equity rises since utility costs are recovered through rates. In other words, if the microgrid is purchasing less electricity from the distribution utility, either in total or as an off-set due to some tariff, similar to net-metering, these lost utility costs must be recovered by other customers ... Other means by which the utility can collect revenues may need to be considered by the utility and regulator.<sup>392</sup>

The CPUC suggests that, to the extent that microgrids can be located where they can provide benefits to the grid, the costs of network upgrades to support DER should be included in the network owner’s ‘rate case’ (the American equivalent of an Access Arrangement). This approach would take the burden of grid modernisation costs off the developer (and its customers) and allocate it towards all ratepayers that benefit from the presence of the microgrid.<sup>393</sup>

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391 Dr Ray Challen, Economic Regulation Authority, *Transcript of Evidence*, 20 June 2018, pp. 5-6.

392 Christopher Villarreal, David Erickson and Marzia Zafar, *Microgrids: A Regulatory Perspective*, California Public Utilities Commission, April 2014, p. 18.

393 *ibid.*

**Finding 47**

The continued growth of microgrids and associated technologies will require innovative, progressive approaches to network regulation and tariff setting, to ensure that the costs and benefits are equitably distributed.

**Retail tariffs**

The tariffs that consumers see in their regular billing statements include a network component, but also include generation and retail costs and, depending on the customer class, may also be influenced by subsidies and policy decisions.

***The Uniform Tariff Policy***

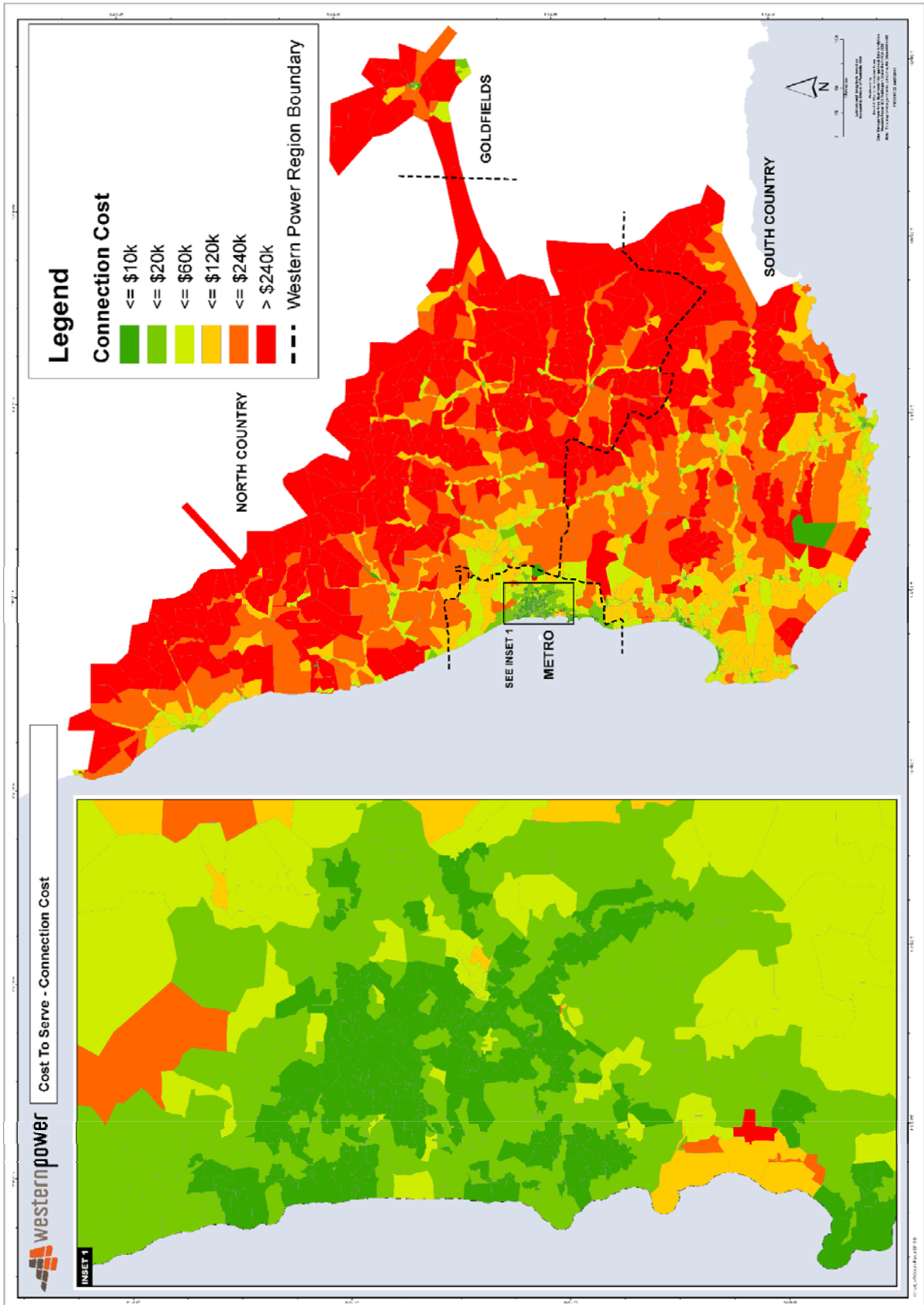
Successive Western Australian governments have held a key position with respect to electricity tariffs for small use customers: Synergy and Horizon Power's small use customers will pay the same retail tariff for electricity, irrespective of the actual supply costs in their particular location. For decades, metropolitan energy consumers have therefore subsidised the extremely high costs to serve customers in the regional areas of the SWIS and in Horizon Power's service area.

Western Power provided the Committee with a 'heat map' indicating the relative costs of metropolitan and regional connections (see Figure 6.1 below).<sup>394</sup> The 'cost' represents the expected 2019 distribution network build cost at 2019-20 asset replacement unit rates, plus expected operational expenditure over a 50 year period. The 'cost to serve' is calculated as the 'cost' for each maintenance zone divided by the number of customer meters at January 2019 (i.e. the number of connections) in each maintenance zone. The map indicates that in the metropolitan area, the average connection costs \$10,000 to \$20,000 to serve over a 50-year period (the areas in green in Figure 6.1), whereas in the outer metropolitan and regional areas of the SWIS, the 'cost to serve' is usually more than \$240,000 per customer (the areas in red in Figure 6.1).

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394 Hon Bill Johnston MLA, Minister for Energy, correspondence, 24 October 2019.

Figure 6.1: Cost to serve: connection costs in metropolitan and regional areas of the SWIS



The structure of Western Australia's uniform tariff policy and the operation the Tariff Equalisation Contribution (recovered from SWIS customers through network access charges and provided to Horizon Power as a subsidy) ensures that, much as metropolitan users have long supported regional customers, similarly, as microgrids and DER drive the costs to serve regional customers down, so the burden on metropolitan consumers should reduce. The (then) Public Utilities Office noted that, insofar as microgrids and DER drive down Horizon Power's costs, they deliver benefits to all electricity customers in the SWIS:

Because of the Uniform tariff Policy, the majority of Horizon Power customers are subsidised as well, so it is not only a saving for Horizon Power, it is a saving for customers in the rest of the State as well.<sup>395</sup>

Ms Erin Stone, appearing with the Geraldton community cooperative project, also noted the potential benefits for all Western Australian energy consumers associated with the emergence of microgrids:

I think that there is a perception that regional customers are more expensive to serve, which certainly is the case under the traditional centralised generation model and centralised network model, but I guess in the distributed energy world they are actually quite cheap to service. We are not saying that we need to move away from a uniform tariff policy or anything, but once you can get those regional customers' cost to serve down through things like distributed energy, you can actually get the large body, the average tariff, down by removing those expensive-to-serve customers under the traditional model by introducing something like distributed energy solutions where we think we can get the cost down by around 10 to 20%. That actually benefits metropolitan customers as well.<sup>396</sup>

#### **Finding 48**

The Uniform Tariff Policy ensures that Synergy and Horizon Power's small use customers pay the same retail electricity tariff. Through this policy, metropolitan customers have cross-subsidised the high cost of electricity supply to regional areas for decades.

To the extent that microgrids and associated technologies reduce electricity costs, the Uniform Tariff Policy will also operate to ensure that all Western Australian energy customers share these benefits equitably.

#### ***Retail tariff reform***

A number of submissions to the Inquiry suggested that retail tariff reform could be introduced to send consumers more efficient signals regarding their use of electricity. Tersum Energy stated:

We believe cost-reflectivity of the whole electricity cost stack is critical to a distributed energy future ... ensuring that the price of energy reflects the cost will improve the signal to producers, investors and consumers to change behaviours and/or decisions.<sup>397</sup>

<sup>395</sup> Mr Aden Barker, Public Utilities Office, *Transcript of Evidence*, 14 February 2018, p. 5.

<sup>396</sup> Ms Erin Stone, Tersum Energy, *Transcript of Evidence*, 17 October 2018, p. 7.

<sup>397</sup> Tersum Energy, Answers to Questions on Notice, 2 November 2018, p. 3.

Western Power observed that tariff structures will be a key element in ensuring access and affordability for all consumers. It stated:

Tariff structures should seek to implement the most efficient framework possible which requires tariffs to be more cost reflective.<sup>398</sup>

Mr Chris Pattas, General Manager Distribution with the Australian Energy Regulator, discussed the drivers behind consumers' electricity supply choices. Primarily, consumers are driven to install increasing volumes of solar PV to avoid rising electricity costs and may also be driven by environmental considerations:

But I think the importance of pricing in this case is that we want to make sure that if they decide they want to install solar panels or batteries, or the way they use their other equipment, whether it is about pool pumps or air conditioning or whatever it might be, we want to make sure they are using those sorts of things efficiently.<sup>399</sup>

Mr Pattas observed that the increasing use of air conditioning is particularly significant. Customers are not exposed to the actual costs of air conditioner use because retail tariff structures do not reflect the actual cost of use at particular times:

So, because of that problem, when you do not have a pricing framework which sends those signals, to use all of those things effectively and efficiently, we easily get a situation where air conditioners go on without customers paying the full cost; where solar panels go on without having full regard to the way they are used and the impact they have on the system; and where batteries go on where they may not be—whilst you can say batteries might be some form of a solution to some of these problems, if they are not properly operated, then they become part of the problem rather than part of the solution. So, in each of those cases what we want to see is that decisions are being made on the basis of effective price signals, and if that is the case, then what we will see in terms of an ultimate outcome is a more efficient outcome for all customers.<sup>400</sup>

Though the tariff setting process should strive for economic efficiency, Western Power acknowledges that some consumers will be disadvantaged by this approach.<sup>401</sup> WACOSS also raised important social equity issues with respect to tariff reform and flagged that vulnerable households may have a limited ability to respond to tariff signals aimed at reducing peak consumption. These issues are considered in Chapter Seven.

The Committee notes that retail tariff trials have been undertaken in Horizon Power's service area. In November 2017, the then Minister for Energy, Hon Ben Wyatt, announced the rollout of MyPower pricing plans for customers in Broome. The plans were an Australian-first and designed to give customers more control over their energy bills, by linking their use of electricity in the peak to a higher fixed charge spread over 12 months and a much lower

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398 Submission 4A, Western Power, p. 8.

399 Mr Chris Pattas, General Manager Distribution, Australian Energy Regulator, *Transcript of Evidence*, 21 November 2018, p. 5.

400 *ibid.*, p. 6.

401 Submission 4A, Western Power, p. 8.

variable or unit charge. Customers were able to earn rebates by adapting the way they use electricity to consume less during the peak. The pricing plans were designed to be used in conjunction with an app that enabled customers to monitor their energy use and provided notifications if they were nearing their peak allowance.<sup>402</sup>

Horizon Power's electricity retail tariff trials were undertaken in microgrids located in areas of the State that experience extreme weather conditions and have vastly different demographic and socioeconomic compositions from the Perth metropolitan area and other regions of the State. Seasonal and climatic factors (particularly around air conditioning use) could heavily affect consumer behaviours in these areas. The penetration and utilisation of distributed energy resources in these microgrids are also likely to vary considerably from asset configurations and utilisation patterns in the SWIS. Unanticipated outcomes associated with vulnerable communities are discussed further in Chapter Seven.

The CEO of AEMO, Ms Audrey Zibelman, noted that different retail products have been trialled in Western Australia and other jurisdictions to enable customers to reduce their bills and also reduce overall system costs. Ms Zibelman notes that microgrids and associated technologies offer the potential to take these benefits to the 'next level':

Retail products such as extreme peak demand pricing (agreement in advance for customers to reduce demand on request) and fixed pricing (set monthly fee for a defined service with cap to service levels or higher costs for above agreed usage — similar to internet pricing) have been implemented in other Australian jurisdictions with differing levels of success. Microgrids and DER, however, can take this innovation to the next level in providing an enhanced platform that is supportive of other technology.<sup>403</sup>

The Committee considers that retail tariff trials in the SWIS would demonstrate whether Synergy's customers in the south west of the State are as responsive as Horizon Power's in Broome and projected system-wide benefits could apply in the SWIS; and could also ascertain whether any unanticipated social consequences could arise.

#### **Finding 49**

Electricity retail tariffs that incorporate time-of-use signals have the potential to influence consumer choices regarding electricity consumption and could drive more efficient asset utilisation and lower system-wide costs.

#### **Finding 50**

Horizon Power's retail tariff trials were undertaken in areas with very different operational environments and demographic profiles to the South West Interconnected System. Synergy's customers may respond differently to signals sent through alternative tariff structures.

402 Hon Ben Wyatt MLA, Minister for Energy, [New energy pricing model demonstration benefiting consumers](#), media release, 15 November 2017.

403 Submission 19A, Australian Energy Market Operator, p. 28.

### **Recommendation 12**

The Minister for Energy direct Synergy to undertake tariff trials for small use customers to determine whether signals sent through retail tariff structures would change consumer behaviours and promote more secure, reliable and affordable electricity supply in the South West Interconnected System.

### ***Retail markets***

A number of submissions to the Inquiry commented on broader structural issues associated with the retail market. As outlined in Chapter Three, contestable customers (consuming more than 50MWh per annum) are able to choose from a number of retailers in Western Australia. Small use customers acquire their electricity from Synergy or Horizon Power. A number of submissions to the Inquiry discussed the implications of microgrids on retail arrangements. There are a range of both broader market and customer-specific aspects of the retail issue. The former is discussed in this chapter, the latter in Chapter Seven.

### ***Changes to contestability thresholds***

Support for changes to contestability thresholds in the retail market came from existing and potential private sector electricity retailers.

ATCO Australia recommended changing the current retail contestability framework and thresholds in Western Australia to increase the opportunities presented by microgrids.<sup>404</sup> Alinta, currently a gas retailer in Western Australia and an energy retailer in the NEM, believes the key barrier to private sector investment in microgrid technology in Western Australia is the absence of retail competition at the small business and household level.<sup>405</sup> Tersum Energy stated that the success and commercial viability of a microgrid (particularly in regional areas) is dependent on the microgrid owner being able to sell the electricity generated within its grid to the customers connected to it:

Unless greater retail contestability is permitted, no party other than Synergy would be able to have a relationship with a reasonable number of customers located sufficiently close to each other to be able to create a microgrid.<sup>406</sup>

Perth Energy, an existing electricity retailer in the WEM, stated that customers wishing to participate in a microgrid must be able to change retailers. Otherwise a sufficient cross-section of customers to make a microgrid solution viable would not be available to any retailer other than Synergy. In Perth Energy's view, 'full retail contestability, or at least more retail contestability, is the ideal.'<sup>407</sup>

Perth Energy advised the Committee that the Australian Competition and Consumer Commission (ACCC) has pointed out a number of cause and effect relationships within competitive markets in the NEM, where full retail contestability applies, that have had negative outcomes for consumers. These include the impacts of regulations, component

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404 Submission 13, ATCO Australia, p. 1.

405 Submission 15, Alinta, p. 4.

406 Submission 17, Tersum Energy, p. 3.

407 Submission 20, Perth Energy, p. 13.

costs of delivering energy to an end-point, depth of competition, and price increases. The ACCC found that there are inefficiencies within all of the above aspects, that if addressed, would likely go a long way to put downward pressure on prices in the NEM. Perth Energy notes that these aspects are all relevant to the WEM. Importantly, Perth Energy noted that whilst energy prices had dropped at the commencement of retail contestability in the NEM, over time, costs had crept up:

Price trends from the point of competition in various different East Coast markets demonstrates prices decreased significantly for 3-4 years before increasing again thereafter. The increases were caused by problems with the above aspects of the energy market. The common theme as espoused by the ACCC to the price increases was a lack of transparency. Therefore, if transparency is improved, price outcomes from customers will also be.<sup>408</sup>

Sunrise Energy expressed its support for the uniform tariff policy, but opposition to full retail contestability, noting that it may unfairly disadvantage rural and regional communities. For Sunrise, the emphasis should be on promoting competition between different energy solutions that would drive down the cost of supply, rather than between retailers:

Full retail contestability, in our opinion, is only going to expand the divide between those that can and those that cannot. And this will be further accentuated in rural communities, which will not be the focus on retailers, who inevitably will pursue the “low hanging fruit” predominantly in the metropolitan area. Microgrids on the other hand will introduce competition in to the parts of the network where it is most needed. Competition not in the form of a different retailer, but in the form of different solutions that will drive down the total cost of electricity supply – generation, network, retail and market costs collectively. Implemented correctly, this could allow the current subsidy within a microgrid to be “exposed” and then over time reduced and hopefully eliminated. That will reduce power bills for everyone else who currently contributes to these areas through the Uniform Tariff arrangements.<sup>409</sup>

The Clean Energy Council also raised concerns about the creation of mini monopolies and restriction of consumer choice within microgrids:

Consumers who are supplied their electricity via alternative energy supply models (such as a microgrid) might not be able to easily shop around, change providers and utilise competitive tension. Price controls might be necessary to ensure that consumers within stand-alone microgrids pay a fair price for their electricity where there is a lack of competitive tension. Prices could be regulated by an organisation within WA, possibly a licensing regime managed by an organisation such as the Public Utilities Office (PUO).<sup>410</sup>

AEMO emphasised the positives inherent in existing retail arrangements, particularly given the small scale of Western Australia’s market. AEMO suggested that the focus should be

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408 Submission 20A, Perth Energy, p. 4.

409 Submission 24, Sunrise Energy Group, p. 6.

410 Submission 9, Clean Energy Council, p. 5.



placed on sending the right signals through the market to the owners of DER, including small use consumers, and fostering competition behind the meter, rather than altering the contestability thresholds:

Owners of DER will need to be appropriately incentivized so that the benefit of DER for all consumers can be maximized. New technology is enabling customers to manually or automatically control their DER and energy usage, and therefore their overall import from and export to the network, while maintaining their lifestyles.

The SWIS, as a network of reasonable scale, with a single network owner and a single retailer of small consumers, is uniquely positioned to enable benefits from innovative retail arrangements. The remainder of Western Australia is similarly well-placed, with Horizon Power being the vertically integrated electricity utility. AEMO notes that Horizon Power has already undertaken significant work in this area.<sup>411</sup>

The CEO of AEMO highlighted the additional costs imposed through retail contestability, associated with marketing and sales overhead, and questioned the benefits of these additional costs in the small Western Australian market:

I think the experience around retail competition, or retail supply, the challenge is going to be the size of the market, and when you have a number of retailers coming in, each of whom [are] having to pay for a sales force and marketing, you have to wonder how much value you are going to get out of that and how much innovation, versus the ability for people to compete behind the meter. I think that would be an area that I would explore for Western Australia: the new innovation is happening really at the home, and how do we maximise that? That does not really require a structural change; it may just require a change in regulatory incentives.<sup>412</sup>

A range of studies and publications over the past two years have also cast doubt over the benefits of full retail contestability in the NEM, and have highlighted the additional costs associated with retailing that result from duplicated overhead, such as call centres and advertising spend.<sup>413</sup> A succession of studies have shown that end costs to consumers are higher than the costs of electricity production, unlike Western Australia where the cost of electricity to small use customers is currently below the cost of production.

Recognising the issues associated with retail market structures in the NEM, the Commonwealth Government introduced ‘big stick’ legislation into the parliament in September 2019, intended to lower the costs of electricity for small consumers. The

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411 Submission 19, Australian Energy Market Operator, p. 28.

412 Ms Audrey Zibelman, Australian Energy Market Operator, *Transcript of Evidence*, 21 November 2018, p. 8.

413 Grattan Institute, *Price Shock: Is the retail electricity market failing consumers?*, 2017; Professor John Thwaites, Terry Mulder and Patricia Faulkner AO, *Independent Review into the Electricity and Gas Retail Markets in Victoria*, 2017; Australian Energy Market Commission, *2017 AEMC Retail Energy Competition Review*, 2017, and *2018 Retail Energy Competition Review*, 2018; Australian Competition and Consumer Commission, *Restoring electricity affordability and Australia's competitive advantage: Retail Electricity Pricing Inquiry – Final Report*, 2018.

legislation introduces a range of mechanisms that severely penalise retailers for anti-competitive conduct.<sup>414</sup>

The issues surrounding changes to contestability thresholds are remarkably complex and the debate is often over-simplified. Whilst advocating for changes to retail thresholds, Perth Energy noted that:

Currently there are a number of viewpoints on full retail contestability/retail competition. In order to understand if competition is beneficial to the market all aspects of the energy market must be assessed. Singling out one aspect of the energy market is too simplistic.<sup>415</sup>

This Report and the Interim Report have identified a range of existing and future opportunities for private sector participation in the electricity market, associated with microgrids and associated technologies. This Inquiry has highlighted the benefits of competition at particular points in the energy value chain, where private sector participation in microgrids and associated technologies are driving lower costs, to the benefit of all users. Both reports have highlighted the need to avoid needless, inefficient duplication and overlap of effort and function. Chapter Seven highlights a range of additional issues associated with consumer protection, licensing and vulnerable consumers that could arise with microgrids and associated technologies.

The ability to capture the system-wide benefits offered by microgrids and associated technologies is not dependent on alterations to contestability thresholds and, based on the experience in the NEM, it is not clear that a reduction in thresholds will automatically deliver consumer benefits. There are a broad range of opportunities for the private sector to contribute to the delivery of a more secure, reliable, affordable and sustainable energy system in partnership with the GTEs, that can be delivered through the market reforms suggested in this Report and the Energy Transformation Strategy. Any changes to contestability thresholds should only be introduced where it can be clearly and unequivocally demonstrated to deliver system-wide benefits that can be equitably shared.

#### **Finding 51**

The ability to capture the system-wide benefits offered by microgrids and associated technologies is not dependent on alterations to contestability thresholds. Any changes to contestability thresholds should only be introduced where it can be clearly and unequivocally demonstrated to deliver system-wide benefits that can be equitably shared.

414 Jordan Hayne, ['The Federal Government's 'big stick' energy bill has been introduced, here's what it would do'](#), ABC New (web-based), 18 September 2019.

415 Submission 20A, Perth Energy, p. 4.



# Chapter 7

## Customers

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**I think the customer has come [out] really strong throughout in this. The choice that the customer has got is known to them. The choice that the customer has got is growing and, in some ways, the customer sometimes leads the conversation. It relies on a lot of customer engagement, but I think we are finally seeing it in its rightful place—the customer is first. We are not dictating what the solution is when they can see very different solutions that are out there.**

Mr Guy Chalkley, Western Power<sup>416</sup>

**Energy is an absolute essential to attain, and maintain, a basic quality of life. In managing the household budget, families strive for a roof over their heads, food on the table, healthcare, decent clothing for themselves and their children — and power. Energy provides a means by which people to heat their homes, prepare their meals, remain connected to their friends and communities, and access goods and services. So how do we make sure no one is left behind?**

Bankwest Curtin Economics Centre<sup>417</sup>

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The evidence to this Inquiry consistently demonstrated that the changes underway in the energy industry are customer-driven. Whereas consumers tended previously to be passive end-users, increasingly people are taking control of their energy supply requirements, installing their own electricity generation and storage technologies.

An increasingly consumer-centric energy system, however, raises a number of complex regulatory and policy challenges. Access to technologies is not equitable and energy poverty continues to challenge policy makers. Consumers may also be vulnerable to anti-competitive conduct. Moreover, electricity is an inherently dangerous — indeed deadly — commodity that must be delivered safely to households and businesses.

### **Energy poverty in Western Australia**

Electricity can be distinguished from other commodified goods and services in so far as it is an ‘essential service’. As the Australian Council of Social Service (ACOSS) has observed:

There is universal agreement that access to reliable and affordable electricity is a basic and essential human right. It is critical to the health, wellbeing, economic participation and social inclusion of all people.<sup>418</sup>

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416 Mr Guy Chalkley, Western Power, *Transcript of Evidence*, 11 April 2018, p. 1.

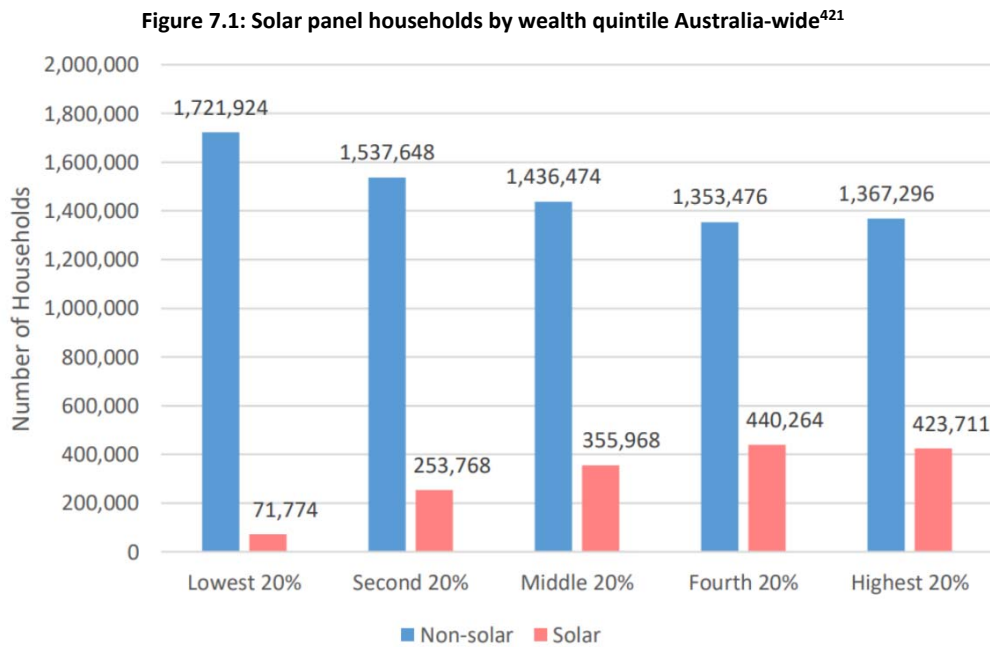
417 Bankwest Curtin Economics Centre, *Power to the People: WA's Energy Future*, April 2017, p. 60.

418 Australian Council of Social Service, Brotherhood of St Laurence and The Climate Institute, *Empowering disadvantaged households to access affordable clean energy*, 2017, p. 7.

That being the case, it is vital that any reforms or structural changes in the energy sector consider potential social consequences. A number of witnesses to the Inquiry emphasised the social impacts of changing energy market dynamics.

The Western Australian Council of Social Service (WACOSS) noted that, whilst Western Australian households have embraced roof top solar photovoltaic (solar PV), access to the technology is far from equal — particularly for those on low incomes or in rental accommodation.<sup>419</sup>

Synergy observed that, while owners of distributed energy resources (DER) may be able to directly leverage the benefits of virtual power plants (VPPs), those unable to access DER will be precluded from benefitting.<sup>420</sup> The following graph shows the distribution of solar panels by wealth quintile, across Australia and demonstrates the access inequity experienced by low income households.



WACOSS noted that Western Australia has one of the lowest levels of solar PV installations on dwellings occupied by those experiencing the highest levels of socioeconomic disadvantage in our community, as shown in Figure 7.2 below.

419 Submission 38, WACOSS, p. 1.

420 Submission 22, Synergy, p. 6.

421 ACOSS submission to the Commonwealth of Australia, Senate, Select Committee into Fair Dinkum Power; Submission 40, p. 7.

**Figure 7.2: Shares of suitable Western Australian dwellings with rooftop solar PV installed to June 2017 by jurisdiction and level of socioeconomic advantage<sup>422</sup>**

| Share of suitable dwellings with rooftop Solar PV installations<br>State or territory |       |       |       |       |       |       |       |
|---|-------|-------|-------|-------|-------|-------|-------|
| Level of disadvantage   | NSW   | Vic   | QLD   | SA    | WA    | Tas   | NT    |
| Decile 1 (most disadvantaged)   | 16.5% | 0.0%  | 4.2%  | 29.7% | 7.4%  | 21.2% | 0.0%  |
| Decile 2  | 20.6% | 14.0% | 36.1% | 30.4% | 16.0% | 11.0% | 12.7% |
| Decile 3  | 21.8% | 18.5% | 28.7% | 34.7% | 18.8% | 13.7% | 3.2%  |
| Decile 4  | 21.0% | 21.4% | 30.3% | 34.3% | 21.1% | 15.0% | 5.5%  |
| Decile 5  | 20.3% | 18.5% | 38.4% | 33.0% | 29.4% | 15.6% | 0.8%  |
| Decile 6  | 16.4% | 19.3% | 26.2% | 38.5% | 28.7% | 11.1% | 7.3%  |
| Decile 7  | 16.0% | 16.8% | 37.9% | 31.8% | 28.9% | 14.4% | 10.9% |
| Decile 8  | 12.0% | 19.8% | 35.5% | 62.2% | 28.9% | 13.6% | 18.1% |
| Decile 9  | 14.4% | 13.6% | 30.5% | 31.6% | 30.9% | 15.4% | 11.6% |
| Decile 10 (most advantaged)   | 11.6% | 10.7% | 0.7%  | 30.7% | 21.5% | 0.0%  | 5.8%  |
| All   | 16.8% | 16.2% | 33.7% | 33.2% | 27.3% | 14.0% | 12.3% |

In addition to having less access to DER, lower income households also tend to consume more energy. Socioeconomically disadvantaged individuals tend to reside in less energy efficient, poorer quality housing. Rental households in particular are dramatically less likely to be insulated, in both public and private rental stock.<sup>423</sup> Low income households also tend to have a higher proportion of ‘home-bound’ occupants, such as children, seniors, people with long-term health issues, or people living with disability. These households therefore tend to consume more electricity over the course of the day.<sup>424</sup>

WACOSS outlined in its submission that whilst more affluent households are able to invest in home improvements and the latest energy efficient appliances, for many low income households, there are few options available to increase energy efficiency and reduce consumption costs. People are increasingly resorting to not using heating or cooling, not cooking hot meals, going to bed early or confining themselves to one room.<sup>425</sup>

Particular concerns were raised about some suggestions, notably in the National Electricity Market (NEM), to introduce electricity price increases during peak demand events (which tend to coincide with heatwaves). There are significant risks, particularly where extreme heat events occur, to the health and wellbeing of vulnerable population groups which may be forced to curtail air conditioning in the face of expensive peak consumption pricing. These effects would be exacerbated by an increasing incidence of extreme climatic events.<sup>426</sup>

Private sector participants in Western Australia’s electricity market are also acutely aware of the social equity issues surrounding DER:

Without a doubt, the losers in the PV game are renters. It does not actually matter whether they are wealthy or they are poor, because they do not own the property

422 Submission 38, WACOSS, p. 1. Sourced from Bankwest Curtin Economics Centre, *Power to the People: WA’s Energy Future*, April 2017, p. 66. Calculations from Government of Western Australia Treasury, based on the charges and sources noted at Figure 38, p. 54 of the publication. Illustrative weekly residential household energy costs are calculated based on households consuming 15Kw/H on Tariff A1.

423 Submission 38, WACOSS, p. 4.

424 *ibid.*, p. 2.

425 *ibid.*, p. 3.

426 *ibid.*, p. 6.

they cannot do anything about the engagement in that sense. Unfortunately, until you can make it particularly beneficial for somebody who rents a house to actually install solar and then make it worth the tenants' while, it actually becomes quite difficult.<sup>427</sup>

**Finding 52**

Access to distributed energy resources and other energy saving technologies is not equitable. Socioeconomically disadvantaged households are less likely to be able to afford distributed energy resources and reside in forms of housing that are less energy efficient. The social impacts of this inequitable access are significant, given that low income households tend also to consume more energy.

**Increasing cost of living pressures**

Electricity retail tariff rises have been contentious in Western Australia for over a decade. In its comprehensive 2017 report *Power to the People: WA's Energy Future*, the Bankwest Curtin Economics Centre (BCEC) noted that from 2009-2017, for a typical 15kWh/d household, electricity costs rose from \$1,079 to \$1,791 in eight years, equivalent to a total (nominal) increase of 66%.

**Figure 7.3: Western Australian annual electricity costs<sup>428</sup>**



BCEC notes that costs have increased annually by more than 10% in four years — 2010, 2012, 2014 and 2017 — with the 2017 increase caused by the near doubling of the fixed charge component of the retail tariff.

Whilst in the most recent State budget, the State Government has limited electricity retail tariff rises to the consumer price index (CPI) rate, the significant increases in electricity prices over the past decade have taken their toll on vulnerable households, with both BCEC and

427 Ms Elizabeth Aitkin, Perth Energy, *Transcript of Evidence*, 10 October 2018, p. 8.

428 Illustrative Western Australian residential household costs, July 2009 to July 2017: Bankwest Curtin Economics Centre, *Power to the People: WA's Energy Future*, April 2017, p. 55.

WACOSS noting the significant increase in customers accessing the State’s Hardship Utility Grants Scheme (HUGS) and an increase in customer disconnections, following inability to pay.<sup>429</sup>

WACOSS observes that:

the increasing cost of energy disproportionately impacts households on the lowest incomes, as they spend a higher percentage of their disposable income on energy bills and have little if any capacity to absorb additional costs.<sup>430</sup>

BCEC also observes that low income households spend approximately 12.4% of their income on utility bills, versus 2.9% for high income households.<sup>431</sup> The 2017 increase to the fixed charge component of retail tariffs has been particularly problematic for low income households, as they are generally unable to avoid increases or mitigate impacts through changes in consumption patterns.

**Finding 53**

Whilst recent electricity retail tariff increases have been limited, the significant rises over the past decade have had a negative impact on the cost of living and quality of life for vulnerable households and individuals.

Whilst an increasing number of households have accessed the HUGS program, WACOSS states that additional investment in that program is not an ideal solution, given that the program is not intended to be an ongoing form of support for struggling households. HUGS was designed to help those who face temporary crises and is not sustainable as a long term income support measure.<sup>432</sup>

WACOSS notes that when the State Government announced its 2017-18 measures on tariffs, fees and charges, the (former) Public Utilities Office was concurrently tasked with undertaking a ‘narrow, rather than holistic’ review of concessions. In WACOSS’ opinion, the review did not consider the adequacy or targeting of concessions. WACOSS recommends that a review should be conducted that takes into account ‘the need for such a system to have clearly articulated outcomes, its adaptability to changing market developments and community needs, and how easily accessible [concessions] are to eligible persons or households’.<sup>433</sup> In the meantime, WACOSS recommends that Pensioner Concession Card and Health Care Card holders should be exempt from future utility price increases, together with an increase to existing concessions, including the Dependant Child Rebate and the Energy Assistance Payment.<sup>434</sup>

429 Submission 38, WACOSS, pp. 6-7; Bankwest Curtin Economics Centre, [Power to the People: WA’s Energy Future](#), April 2017, pp. 55-56.

430 Submission 38, WACOSS, p. 7.

431 Bankwest Curtin Economics Centre, [Energy Poverty in Western Australia: A Comparative Analysis of Drivers and Effects](#), June 2016, p. ii.

432 Submission 38, WACOSS. p. 7.

433 *ibid.*

434 *ibid.*



The overwhelming weight of evidence to this Inquiry has shown that the rise of microgrids and DER is fundamentally changing the cost of electricity production in Western Australia. The radical changes underway in the sector require a reconsideration of the way that signals are sent through energy markets in Western Australia. Electricity market reform is essential to facilitate the transition to a distributed energy future and ensure that appropriate signals are sent to promote the most efficient supply of energy possible and place downward pressure on prices.

However, any reform process must, as a matter of priority, consider the need to protect and provide relief to vulnerable households and ensure that the most vulnerable members of our society are not left subsidising those with a greater capacity to pay. Market reform should be conducted in concert with a review of HUGS and other concession schemes, to ensure that supports provided by the State are targeted appropriately and operating effectively.

Chapter Six discussed the need for the State Government to address various market mechanisms that determine the overall cost of electricity. It examined the important differences between network access tariffs and charges (set by regulators), and retail electricity tariffs (set by the State Government). Care must be taken to consider the indirect impacts of market reform. Whilst the evidence to the Committee strongly suggests that network tariff reform will send more efficient signals through the energy market and place downward pressure on prices, care should be exercised in undertaking retail tariff reform – particularly given that current small use retail electricity tariffs do not recover the full costs associated with supplying that customer class.

In a 2018 trial of alternative retail tariff structures conducted by Horizon Power and analysed by BCEC,<sup>435</sup> a range of behavioural issues were identified where vulnerable customers were required to take action in response to real-time alerts about their energy consumption that had implications for their electricity bills. The trial identified that:

- Up to one third of vulnerable customers participating in the trials could be worse off under alternative tariff structures;
- Some vulnerable customers suffered excessive discomfort when faced with real-time information about their energy use and managed appliance use during peak events in a manner that reduced amenity (e.g. turning air conditioning units off whilst cooking, during extreme weather);
- Some vulnerable customers reported replacing one source of anxiety (summer verses winter costs) for another source (real time anxiety in response to alerts about peak allowance exceedance);

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435 Bankwest Curtin Economics Centre, [Power Plans for Electricity: The Impact of tariff structure changes on energy vulnerable households](#), September 2018.

- Some vulnerable customers had a poor response or were unable to respond to alerts, potentially ascribable to other factors such as family conflict or overwhelming stress from the inability to cope with multiple financial demands.<sup>436</sup>

It should be noted that Horizon Power’s electricity retail tariff trials were undertaken in microgrids located in areas of the State that experience extreme weather conditions and have vastly different demographic and socioeconomic compositions from the Perth metropolitan area and other regions of the State. Seasonal and climatic factors (particularly around air conditioning use) could heavily affect consumer behaviours in these areas. The penetration and utilisation of distributed energy resources in these microgrids are also likely to vary considerably from asset configurations and utilisation patterns in the SWIS. Care should be exercised before transposing the results of electricity retail tariff studies in some of Horizon Power’s microgrids onto consumers in the SWIS or other regional locations.

#### **Finding 54**

There are a range of alternative retail tariff structures (including those that have been trialled in Horizon Power’s microgrids), but some may render vulnerable households liable to peak pricing, with limited ability to reduce their exposure. Certain electricity retail tariff structures and real-time signals may also result in unintended behavioural outcomes, or be ineffective in assisting vulnerable customers to manage their electricity use.

#### **Finding 55**

Electricity market reform is essential to support the transition to a more cost-effective and efficient energy system. However, reform should be accompanied by a wholesale review of the supports and concessions provided to vulnerable households, with the aim of alleviating energy poverty in Western Australia.

#### **Recommendation 13**

The Minister for Energy consult with other relevant Ministers to ensure that any electricity market reform process is accompanied by a review of the supports and concessions provided to vulnerable households with respect to electricity supply.

### **The role of smart technologies**

Chapters Two and Five noted that microgrids and associated technologies can enable highly localised and optimised energy management, facilitated by ‘smart technologies’ that can offer system-wide benefits. Beyond the energy system benefits, the potential to improve social outcomes should also be noted.

Dr Dev Tayal from Curtin University has observed that the rise of ‘smart’ energy technologies could considerably alleviate energy poverty, through facilitating consumer-level energy optimisation:

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<sup>436</sup> *ibid.*, pp. vi-vii.

These technologies will generate clean and renewable energy, provide ways to store it and, perhaps most importantly for households struggling with bills, automate its use in the most efficient and affordable way.<sup>437</sup>

He notes that this is particularly pertinent for individuals who may not have the time or capacity to analyse complex retail tariff structures:

instead of expecting all consumers to have an intricate awareness and understanding of their electricity consumption and the most economical tariff rates (namely those that give a discount for off-peak electricity use), optimisation algorithms will simply churn away in the background, leveraging the rapid advances in data analytics to optimally respond to the ever changing variables.<sup>438</sup>

Synergy's CEO, Mr Jason Waters, discussed the appetite for customers to be 'prosumers', as opposed to more passive consumers of energy and the role of smart technologies, in response to a question from the Committee on the ability of the 'mum in Ellenbrook' to participate in complex energy management strategies:

It is a much smaller group that actually wants to be the prosumers in that mix and actually want to be more actively engaged. My feeling is, however, that as we roll out advanced metering and we roll out the product suite that will sit behind the meter to automate production for the household, I think you will get greater take-up of those because you will not need to be a prosumer at that stage to be heavily involved in it. It will actually be able to go back to being a more sort of latent low involvement aspect of the household, because it will be largely automated.

I sort of envisage a home of the future having automated systems that are looking at market conditions, looking at the household demand, looking at panel production, looking at the levels of charge in your battery, and it is making decisions about: do I run the pool pump now or do I run the pool pump later based on all those conditions? I think that for me is where the majority of customers will trend in the longer term—you will not see them actively running around looking at price, looking at time of day, looking at power demand. It will largely be automated.<sup>439</sup>

The Committee notes that Horizon Power provided information with respect to premises-level energy optimisation trials, as detailed in the Interim Report. It may be the case that using smart technologies to automate energy optimisation, as opposed to relying on consumer responses to real-time signals, may address the issues identified by BCEC with respect to anxiety and capacity to actively manage exposure to costs. Importantly, however, Dr Tayal warns against viewing technological fixes as a total solution to energy inequality:

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437 Dr Dev Tayal, 'Energy sector must use new tech to ensure the vulnerable aren't left behind', *The Guardian* (web-based), 15 March 2018, accessed 7 January 2019, <[www.theguardian.com/sustainable-business/2018/mar/16/energy-sector-must-use-new-tech-to-ensure-the-vulnerable-arent-left-behind](http://www.theguardian.com/sustainable-business/2018/mar/16/energy-sector-must-use-new-tech-to-ensure-the-vulnerable-arent-left-behind)>.

438 *ibid.*

439 Mr Jason Waters, Synergy, *Transcript of Evidence*, 9 May 2018, pp. 2-3.

Technology will not solve the social equity issues. As seen with the uptake of solar and storage technologies, it is vulnerable customers who are left behind. They are likely to find it harder to finance energy saving services and smart appliances due to limited cash flow, a lack of credit history, negligible savings or a rational aversion to risk-taking – even if the payback periods are attractive.<sup>440</sup>

#### **Finding 56**

‘Smart technologies’ can assist with system and household-level energy optimisation, but are not a complete answer to energy poverty in Western Australia.

#### **Recent State Government initiatives**

Since the initiation of this Inquiry, the State Government has announced a range of initiatives that address energy poverty, alleviate cost of living pressures and aim to ensure that the benefits of microgrids and associated technologies are shared amongst all Western Australians.

Many of these initiatives are being trialled and/or delivered through the Government Trading Enterprises (GTEs) Western Power, Synergy and Horizon Power, in conjunction with the Department of Communities. The projects also involve partnerships with private sector entities, demonstrating that the State Government has considerable ability to lead energy sector transformation through its participation in energy markets and position as the State’s largest owner and developer of housing stock.

The Department of Communities currently owns and manages 51,620 properties and part owns (through shared equity) 4,904 properties.<sup>441</sup> Through the Housing and Energy portfolios, the State Government has the capacity to substantially improve the living standards of our most vulnerable citizens by alleviating household energy costs in the homes they occupy.

In July 2019, the State Government announced that the Department of Communities-led ‘Amble Estate’ urban infill project in Girrawheen would be the first green titled subdivision in Western Australia to provide a solar power system with every home.<sup>442</sup>

Under the arrangement, private provider Infinite Energy installs, owns and maintains each solar PV system. Home owners are therefore not required to pay the significant upfront cost of installing solar panels. Instead, they are charged for the solar-generated electricity they consume at a price 40% lower than grid-sourced electricity. Any additional electricity taken from the grid is charged at Synergy’s A1 retail tariff.<sup>443</sup> House and land packages on the

440 Dr Dev Tayal, ‘Energy sector must use new tech to ensure the vulnerable aren’t left behind’, *The Guardian* (web-based), 15 March 2018, accessed 7 January 2019, <[www.theguardian.com/sustainable-business/2018/mar/16/energy-sector-must-use-new-tech-to-ensure-the-vulnerable-arent-left-behind](http://www.theguardian.com/sustainable-business/2018/mar/16/energy-sector-must-use-new-tech-to-ensure-the-vulnerable-arent-left-behind)>.

441 Answer to Question on Notice 2614 asked in the Legislative Council by Hon Tim Clifford MLC, and answered by Hon Stephen Dawson MLC, Minister for Environment representing the Minister for Housing, *Hansard*, 28 November 2019, p. 9567.

442 Hon Peter Tinley AM MLA, Minister for Housing, *Solar scheme a winner for homebuyers at The Amble Estate*, media release, 2 July 2019.

443 The Amble Estate, accessed 3 January 2020, <<https://theambleestate.com.au/solar/>>.

estate range from \$300,000 to \$400,000 and are aimed at the 'affordable' housing market. The innovative power purchase agreement structure reduces the overall cost of energy to home occupants, thereby easing cost of living pressures in developments that are specifically targeted at low to medium income households.

In September 2019, the State Government announced an affordable housing trial, involving the construction of a \$415,000 3 bedroom, net zero energy home. The home will be built to an 8.4-star energy rating, taking into account various energy saving initiatives, including solar passive design and energy efficient appliances. Synergy will provide solar panels and a battery to further reduce the energy requirements of the home. The occupant family must be eligible to participate in the State Government's 'Keystart' affordable home ownership scheme. Over a 12 month period, the family's energy, water use and lifestyle will be monitored, to better understand the cost savings that can be achieved by living in an energy-efficient home.<sup>444</sup> Again, this initiative targets energy consumption as a mechanism to ease cost of living pressures.

In May 2018, the State Government announced \$500,000 to develop a proposal for a virtual power plant (VPP) in Kalgoorlie, whereby distributed rooftop solar and battery systems could be installed and then dispatched in a similar way to a centralised power station. The proposal considers the utilisation of public housing and the potential to reduce electricity bills for residents.<sup>445</sup>

**Finding 57**

The State Government is trialling a series of innovative programs to understand how it can use new housing projects, regional development initiatives, microgrid and associated technologies to alleviate cost of living pressures for vulnerable households.

**Other mechanisms to address energy poverty**

WACOSS suggested a range of additional ways that governments could address the issues associated with energy poverty, including:

- free energy audits, energy and appliance usage education for low income households;
- assistance for low income households to access higher-cost, but high-return energy efficient appliances; and
- assistance for owner-occupiers to invest in energy efficient home improvements.

WACOSS states that both the New South Wales and Tasmanian governments have demonstrated that there are low-cost, targeted and collaborative methods available to make many of these policy options feasible and affordable.<sup>446</sup> Options include offering three-year

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444. Hon Peter Tinley AM MLA, Minister for Housing, Hon Bill Johnston MLA, Minister for Energy, and Hon Rita Saffioti MLA, Minister for Planning, *Innovative housing affordability experiment launches in WA*, media release, 25 September 2019.

445 Hon Alannah MacTiernan MLC, Minister for Regional Development, and Hon Ben Wyatt MLA, Minister for Finance, *Pursuing innovative solar opportunities for the Goldfields*, media release, 31 May 2018.

446 Submission 38, WACOSS, p. 4.

interest free loans for efficient appliances, where the energy cost savings can be applied to repayments. WACOSS states that initiatives aimed at improving energy efficiency are a 'strong complementary solution to concessions reform'.<sup>447</sup>

WACOSS also views energy efficient home improvements to publicly-owned housing stock as a 'clear duty', given that tenants in these premises have little ability to move to alternative accommodation and limited options to modify housing themselves.<sup>448</sup>

In answer to a Question on Notice submitted in the Legislative Council, Minister for Housing Hon Peter Tinley advised in November 2019 that all State Government properties constructed over the next five financial years will be certified and meet the minimum standard of 6-star energy efficiency rating required in the *Building Code of Australia* for energy efficiency in residential buildings. If the *Building Code of Australia* energy efficiency provisions are enhanced or modified, the Department of Communities will comply with the new standards as required. All public housing stock developed between 2003 and 2019 currently meet 5 or 6 star ratings (20,694 dwellings or 40% of current stock). The Minister stated, however, that the Department of Communities has no specific plans to retrospectively upgrade the energy efficiency of existing housing stock, noting that the cost of such upgrades can be cost-prohibitive or practically impossible.<sup>449</sup>

Whilst many of these initiatives are beyond the scope of the current inquiry into microgrids and associated technologies, it would be worthwhile for the State Government to consider how they may assist in the pursuit of both energy and social policy objectives. In particular, the Committee perceives considerable benefit in pursuing energy efficiency improvements to pre-2003 public housing. Although perhaps cost-prohibitive or impractical in some instances, it is unlikely that the costs outweigh the benefits in all instances.

#### **Finding 58**

Beyond mechanisms specifically targeting microgrids and associated technologies, there are many other energy and housing policy initiatives that the State Government could consider as part of an overall strategy to alleviate energy poverty, including free or subsidised energy auditing; assistance for access to higher-cost, high-return energy efficient appliances; and assistance for owner-occupiers to invest in energy efficient home improvements.

#### **Recommendation 14**

The Minister for Housing instruct the Department of Communities, as part of its general property condition assessment and management processes, to proactively identify and undertake energy efficiency improvements on public housing stock constructed prior to 2003, where it is practical and cost-effective to do so.

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447 *ibid.*

448 *ibid.*

449 Answer to Question on Notice 2614 asked in the Legislative Council by Hon Tim Clifford MLC, and answered by Hon Stephen Dawson MLC, Minister for Environment representing the Minister for Housing, *Hansard*, 28 November 2019, p. 9567.

## Consumer protection

Beyond measures taken to assist the most vulnerable members of our community, all energy consumers require some degree of consumer protection, given the inherent nature of electricity production and consumption. There are a range of additional complexities surrounding microgrids and associated technologies that must also be considered — particularly in instances where customers disconnect from the main grid.

Electricity supply is surrounded by a complex web of energy-specific consumer protections — particularly for supply to small use customers — recognising the ‘essential service’ characteristic of electricity supply, its traditionally monopolistic industry structure, the significant disparity in bargaining power and sophistication between provider and customer, and the extreme danger inherent in energy supply. The Australian Energy Regulator emphasised the importance of existing consumer protections and their extension to microgrids in its evidence to the Committee: ‘We believe those customer protections should be received by all customers regardless of whether they are directly connected [to the network] or otherwise.’<sup>450</sup>

A range of consumer protection issues specific to microgrids were presented to the Committee. Perth Energy expressed concerns that recent microgrid project announcements create the risk of informal, unlicensed, quasi-retail relationships with customers:

While we support the de-regulation of industry, Perth Energy is concerned that there is a significant scope under the current licensing and consumer protection framework allowing un-licensed parties to retail energy to customers.

Retail licences and the customer protection scheme are in place to protect small-use and vulnerable customers. They impose obligations, compliance regimes and costs on electricity retailers. However, they are necessary to protect consumers from those seeking to exploit the opportunities and customers in the industry.<sup>451</sup>

In Perth Energy’s view, currently small customers and market participants are well protected from market power abuse by consumer regulations and initiatives such as financial hardship policies and building requirements. They were concerned that microgrid operator exemptions from these provisions, relaxed service standards, or conduct leading to consumer exploitation in the absence of appropriate consumer protection frameworks, would ‘sully the name of microgrids’ for example in instances where:

there is someone who develops a system and then something goes wrong— someone gets undercharged or overcharged or someone gets thrown off the system because they cannot pay.<sup>452</sup>

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450 Mr Chris Pattas, Australian Energy Regulator, *Transcript of Evidence*, 21 November 2018, p. 2.

451 Submission 20A, Perth Energy, p. 5.

452 Mr Patrick Peake, Perth Energy, *Transcript of Evidence*, 10 October 2018, p. 8.

Perth Energy also recommended that any intermediary participating in the trade of energy on behalf of another party must either have an electricity retail licence, or appropriate exemption from these requirements considered by the ERA.<sup>453</sup>

The Australian Energy Market Commission (AEMC) noted in its 2017 Final Determination on *Alternatives to Grid Supplied Network Services* that customers who move to off-grid supply should continue to receive appropriate energy-specific consumer protections, aligned with those of standard supply customers.<sup>454</sup>

Synergy, the only licenced retailer in the South West Interconnected System (SWIS) for customers consuming less than 160MWh per year, listed protections afforded by the Energy and Water Ombudsman, regulated tariffs and fees, regulated standard form contracts, concessions and coverage under the *Code of Conduct for the Supply of Electricity to Small Use Customers 2018*.<sup>455</sup> Synergy notes that, in the event that a small use customer receives supply through an embedded network in the SWIS, the energy provider is no longer obliged to provide these customer protections.<sup>456</sup>

In its discussion paper, *Review of the Regulatory Frameworks for Stand-Alone Power Systems*, the AEMC also notes that in New South Wales, Tasmania, South Australia and the Australian Capital Territory, customers who move off-grid similarly lose their energy-specific consumer protections. The Commission notes that consideration needs to be given to which energy-specific protections are appropriate for stand-alone power system (SAPS) supply, and whether different system sizes or ownership models impact the consumer protections that are required.<sup>457</sup> In the AEMC's view, a range of protections that grid-supplied customers receive would be appropriate in SAPS, including:

- accurate meter reading;
- regular billing;
- rights to access energy services and obligations to supply;
- informed consent requirements;
- dispute resolution;
- minimum contractual standards;
- billing, tariff and payment minimum requirements; and
- protections for vulnerable customers.<sup>458</sup>

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453 Submission 20A, Perth Energy, p. 5.

454 Submission 22A, Synergy, p. 3.

455 *ibid.*

456 *ibid.*

457 Australian Energy Market Commission, *Issues Paper: Review of the Regulatory Frameworks for Stand-Alone Power Systems*, Sydney, September 2018, p. 47, Appendix to Submission 36.

458 *ibid.*, p. 50.



The AEMC also notes that explicit consent may be required for SAPS or embedded network participation, to ensure that consumers understand the differences between living with grid-connected and disconnected supply.

The AEMC considers it likely to be reasonable that SAPS customers receive the same reliability, security and quality of supply standards as grid-connected customers.<sup>459</sup> In Western Australia, these factors are currently governed by licensing provisions issued and monitored by the Economic Regulation Authority (ERA). The AEMC also identified other State-level functions that require consideration, including whether safety requirements and monitoring regimes apply to and are appropriate for SAPS.

The AEMC's paper specifically discusses SAPS and has limited discussion about VPPs, embedded networks or microgrids in fringe-of-grid areas that retain a grid connection. Many of the concepts are, however, highly relevant to customers sitting within these forms of microgrid. It would be a perverse outcome if consumer protections were afforded to SAPS customers, and denied to customers in other types of microgrid purely on account of the grid connection status of the assets.

Synergy raised concerns with respect to the position of customers in embedded networks. If a customer sits in a network where the total load at the network connection point exceeds 160MWh per annum, they will not be eligible for protections including:

- access to the Energy and Water Ombudsman;
- supply based on regulated standard form contracts;
- supply provided under regulated retail tariffs, fees and charges set by the State Government by reference to a range of social and economic policy drivers;
- access to concessions and the renewable energy buyback scheme;
- coverage afforded under the *Code of Conduct for the Supply of Electricity to Small Use Customers 2016*;
- guaranteed access for life support customers; and
- the obligation for a retailer to supply electricity.<sup>460</sup>

Synergy noted that a recent AEMC review found that customers who move to off-grid supply to reduce distribution system costs should continue to receive appropriate energy-specific consumer protections aligned with those of standard supply customers.<sup>461</sup> In the Western Australian context, this can be maintained through requiring that Synergy or Horizon Power continue to hold the sole retail licences for small use customers, or requiring that other potential market entrants are subjected to the same licensing conditions.

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459 *ibid.*, p. 53.

460 Submission 22, Synergy, p. 6.

461 Submission 22A, Synergy, p. 3, referencing Australian Energy Market Commission, [Alternatives to grid-supplied network services, Final Rule Determination](#), December 2017.

The assets delivering SAPS and other microgrid configurations often have long lives, are high cost and complex to install and operate. If microgrids are rolled out in the absence of an appropriate licensing and consumer protection regime, it may be extremely difficult for customers to secure alternative supplies if they are unhappy with the level of service being provided. As the unit costs of electricity supply based on microgrids and associated technologies reduce over time, early movers may also find themselves locked in to higher cost arrangements and therefore disadvantaged over the long term. Referencing the Amble Estate initiative outlined above, where new home owners enter into a power purchase agreement with a private operator who installs, owns and operates the rooftop PV, Synergy raised these issues and stated that whilst occupants gain access to microgrids and associated technologies:

Our concern is that that ties those customers into a 10-year contract and there is a view about where this technology might be going and the cost of technology over time. Certainly, power purchase agreements at the local level is something that is worthy of consideration. Generally, however, the terms are so long that there is some concern that protection for those customers is an issue.<sup>462</sup>

Synergy submitted that microgrid owners or operators should be obliged to maintain customer protection provisions, ensuring equitable treatment of customers regardless of whether they are accessing traditional or non-traditional network solutions, unless the customer chooses otherwise.<sup>463</sup>

Perth Energy also agreed that microgrid operators should be required to obtain a licence to protect consumers:

Requiring a licensed retailer to participate in all microgrid projects will ensure sure that there are adequate consumer protections in place. Stricter penalties or enforcements may need to be put in place to ensure licensed retailers are participating.<sup>464</sup>

The Committee agrees that it is imperative, given the essential nature of electricity supply, that microgrid customers receive the same range of consumer protections afforded to non-microgrid customers.

#### **Finding 59**

Microgrid operators should be subject to the State's electricity licensing regime and required to ensure their customers have access to appropriate consumer protections.

#### **Supplier of Last Resort obligations**

The Supplier of Last Resort (SoLR) obligation is an important customer protection, intricately linked to the essential nature of electricity supply. It exists to ensure that, in the event that an energy supplier fails, their customers nonetheless can continue to receive electricity supply. SoLR obligations in the SWIS ensure that, in the event of a failure of a licenced

<sup>462</sup> Mr Allen Gerber, Manager Energy Solutions, Synergy, *Transcript of Evidence*, 9 May 2018, p. 6.

<sup>463</sup> Submission 22, Synergy, p. 3.

<sup>464</sup> Ms Nicole SanGregory, Perth Energy, *Transcript of Evidence*, 10 October 2018, p. 1.

retailer, Synergy will step in to ensure supply continuity. Through its GTEs, the State ultimately therefore holds the obligation to ensure secure and reliable power supply for its citizens.

The status of SoLR obligations in microgrid scenarios are unclear and are currently influenced by the nature of the licence or exemption granted to the supplier and the basis of the commercial relationship between supplier and customer. In its first hearing for this Inquiry, the Committee pursued this issue with the (then) Public Utilities Office, to identify the range of potential issues associated with Microgrids. The Public Utilities Office outlined three main scenarios that may present challenges.

First, where a microgrid operator has a retail licence exemption, no external connection or supply relationship to the wider grid, and ceases to supply, microgrid customers do not enjoy the benefits of SoLR provisions.<sup>465</sup> The Public Utilities Office advised that, in this instance, customer recourse is limited to contract and corporate law mechanisms.<sup>466</sup> The inadequacies under this scenario are clear — any customers ‘trapped’ behind a supply relationship with an exempt microgrid supplier would only have recourse to remedies pursued through the courts, under potentially complex contractual mechanisms. These could be costly and difficult to pursue (particularly for unsophisticated energy users), result in inordinate delay and contain no mechanisms to ensure that customers continue to receive electricity supply whilst they pursue legal action.

The second scenario arises where a microgrid operator has a retail exemption for the microgrid (i.e. behind the main grid connection point), and has a supply contract with a licenced retailer for electricity supply to the microgrid connection point (for example, to supplement any shortfall in internally-generated energy). The Public Utilities Office advised that, in the event of failure by the microgrid operator, the supply contract to the microgrid connection point remains on foot with the external (licensed) retailer. The legal successor to the failed microgrid company would inherit the contract with the retailer.<sup>467</sup> The Public Utilities Office did not provide a view regarding whom successor entities might be, how the rights existing microgrid customers hold would be transitioned and protected, and what arrangements exist to ensure supply continuity.<sup>468</sup>

In the third scenario outlined by the Public Utilities Office, a microgrid operator is connected to the SWIS and holds a retail licence. The SoLR scheme would apply in this instance, and in the event of failure, customers would receive supply from Synergy. Notably, in this scenario, the risk arising from the failure of a private microgrid operator is borne by Synergy, and therefore ultimately, the Western Australian taxpayer. The Public Utilities Office did not provide information on the costs, terms or conditions (for Synergy or the customer) that would apply to Synergy’s assumption of the supply obligation.

Given the essential nature of electricity supply — particularly for small use residential customers — it is not acceptable that microgrid customers could potentially be ‘locked’

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465 Public Utilities Office, Answers to Questions on Notice, 27 March 2018, p. 3.

466 *ibid.*

467 *ibid.*

468 *ibid.*

behind a microgrid and unable to secure power in the event of supplier failure. Equally, the Western Australian taxpayer's potential liability to bear the risk for private sector failure must be considered.

#### **Finding 60**

Supplier of Last Resort provisions are an integral part of electricity supply regimes. The State Government should urgently address the appropriate application of Supplier of Last Resort provisions to microgrids in the South West Interconnected System.

#### **Recommendation 15**

The Minister for Energy ensure that appropriate Supplier of Last Resort provisions extend to relevant customers in new microgrid-based business models in the South West Interconnected System.

### **Current licensing requirements**

A range of private microgrid proponents have applied to the Minister for Energy for exemption from licensing requirements for the operation of various forms of microgrids, arguing that their business models do not fit under traditional retail licence categories.

Licensing exemptions are not new to the Western Australian energy industry, but have typically been granted for relatively simple commercial arrangements, such as on-selling in strata buildings, apartment complexes and shopping centres.<sup>469</sup> However, the Public Utilities Office provided the Committee with an example of the increasingly complex issues surrounding licensing exemptions triggered by microgrids:

A development like Peel business park certainly has potential to be somewhat more complex in terms of the commercial arrangements that are put in place to facilitate, say, the siting of shared renewable energy assets, how the shares of those are managed by peer-to-peer trading or some other system of accountancy, the siting of it on land, access to roof space, access of the green title parties to energy from the grid and how that is facilitated by the microgrid manager. It is an order of magnitude more complex than the majority of the licence exemptions that are currently out there and so would require quite careful consideration if they were wanting to go down an exemption pathway.<sup>470</sup>

In May 2019, in response to this Inquiry's Interim Report, the State Government acknowledged the challenges associated with the current regime:

Innovative ways of generating, distributing and retailing electricity such as microgrids, embedded networks and solar power purchase agreements are not aligned with the licence categories and conditions applied in the current regulatory framework. This could pose risks for electricity consumers who may assume

<sup>469</sup> Mr Aden Barker, Public Utilities Office, *Transcript of Evidence*, 14 February 2018, p. 13.

<sup>470</sup> *ibid.*

continued enjoyment of protections that are generally available to traditional customer relationships ...<sup>471</sup>

To ensure that adequate consumer protections remain in place for the delivery of electricity supplies under new and emerging technologies and business models, the Minister for Energy, Hon Bill Johnston, has announced a review of the regulatory framework for retail electricity licensing and exemption activities. The intent of the review is to determine the most suitable form of regulation to ensure that all electricity consumers have adequate protections, regardless of the business model used for electricity supplies.<sup>472</sup>

Whilst the review is underway, the Minister has indicated that he will not consider any further applications for licence exemptions. Licences that have already been granted will remain on foot. The Committee considers that this is appropriate, given the importance of ensuring that consumers are adequately protected for the supply of an essential service.

**Finding 61**

The recently announced review of the regulatory framework for retail electricity licensing and exemption activities will be vital to ensure that customers maintain access to appropriate consumer protections. Given that the current framework is unsuitable and there may be significant changes to current licensing structures following the review, it is appropriate that the Minister for Energy halts the consideration of exemption applications.

Industry and the State Government have acknowledged that the current licensing regime does not suit emerging business models. Moreover, industry participants suggested to the Committee that regulatory uncertainty with respect to customer protections is limiting microgrid development.<sup>473</sup>

The Government should be cautious, however, of rushing a review or allowing a regime to emerge based on operation by licence exemption. Over time this could result in a patchwork of complex, inconsistent retail and licensing arrangements and lead to considerable inequalities between customers within classes. Moreover, the Public Utilities Office advised the Committee that ‘in the main there is very little in the way of reporting frameworks or resourcing for oversight of exemptions’, which will become increasingly problematic as commercial frameworks become more complex and projects more numerous.<sup>474</sup>

Evidence to the Committee did not clearly suggest that emerging business models should be subject to *exactly the same* licensing requirements as traditional retailers. There is debate in industry regarding whether new models should rise to meet full retail standards or full retail requirements should be relaxed. Energy Policy WA discussed the live debate in the sector and acknowledged the need for a new approach to licensing:

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471 Hon Bill Johnston MLA, Minister for Energy, [Ministerial Statement: Regulatory Framework Review Retail Electricity Licensing and Exemptions](#), 20 May 2019.

472 *ibid.*

473 Submission 29, Power Ledger, p. 6.

474 Mr Aden Barker, Public Utilities Office, [Transcript of Evidence](#), 14 February 2018, p. 13.

where we say, “Maybe full-blown licensing as per traditional retail licensing might be a bit heavy-handed; exemptions are probably too light-handed. We need something in the middle.” So it is about designing that, and it is exactly the things you talk about. What are the protections for customers, what are their rights, what is potentially the maximum tariff they can be charged, and can they access the Ombudsman? In some cases they probably should be able to, and all the other suite of customer protections. There is work underway. The solar power purchase agreement is the first problem to solve. The DER road map will identify the order and priority of other new business models that might be able to adopt a similar framework, so we are looking to move that forward for exactly those reasons.<sup>475</sup>

The Review will no doubt produce a series of detailed recommendations regarding the content of a new licensing regime, but it would seem that a new class of licence is warranted. The Committee also notes that the ERA has granted ‘Integrated’ licences outside of the SWIS that permit the holders to:

- construct and operate or operate existing generation; and/or
- construct and operate or operate existing transmission systems; and/or
- construct and operate or operate an existing distribution system; and/or
- sell electricity to customers.<sup>476</sup>

The evidence to this Inquiry indicates that there are a number of minimum requirements that suppliers should be required to meet in the SWIS, irrespective of the business model, including ensuring that relevant consumers retain:

- access to the Energy and Water Ombudsman scheme: to provide a dispute resolution mechanism outside of complex contractual mechanisms, that is timely, affordable and easy to access and utilise;
- access to supply based on ERA-approved contracts: to ensure that a minimum ‘safety net’ set of terms and conditions govern supply;
- access to supply provided under regulated tariffs, fees and charges: set by the State Government by reference to a range of social and economic policy drivers, including equity between regional and metropolitan areas and recognising the essential nature of electricity supply;

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<sup>475</sup> Ms Kate Ryan, Energy Policy WA, *Transcript of Evidence*, 8 November 2019, pp. 12-13.

<sup>476</sup> Electricity Integrated Regional Licence Alinta DEWAP Pty Ltd EIRL7; Electricity Integrated Regional Licence Alinta Energy Transmission (Chichester) Pty Ltd EIRL10; Electricity Integrated Regional Licence Alinta Energy (Chichester) Pty Ltd EIRL11; Electricity Integrated Regional Licence Alinta Energy Transmission (Roy Hill) Pty Ltd EIRL6; Electricity Integrated Regional Licence Regional Power Corporation (t/a Horizon Power) EIRL2; Electricity Integrated Regional Licence North Western Energy Pty Ltd, Pacific Hydro Group Two Pty Ltd & Energis Australia Pty Ltd (t/a Ord Hydro) EIRL4; Electricity Integrated Regional Licence Rottneest Island Authority EIRL3; Electricity Integrated Regional Licence TEC Hedland Pty Ltd EIRL9. All available from <[www.erawa.com.au/electricity/electricity-licensing/licence-holders#H](http://www.erawa.com.au/electricity/electricity-licensing/licence-holders#H)>.

- access to concessions: to target energy poverty and alleviate hardship;
- coverage afforded under the *Code of Conduct for the Supply of Electricity to Small Use Customers 2018*: to regulate and control the conduct of retailers, distributors and electricity marketing agents and protect the interests of customers who generally have little or no market power;
- guaranteed access for life support customers; and
- the obligation for a retailer to provide a supply of electricity.

Whilst new business models and modes of energy supply may provide consumers with better terms and conditions, these core features ensure that Western Australian small use customers retain access to an essential service at minimum standards and prices set by reference to both social and economic policy objectives.

#### **Recommendation 16**

The Minister for Energy avoid an approach to electricity licensing based on exemptions for new business models and instead introduce a new class of licence, aimed at facilitating new business models, whilst achieving appropriate consumer protections, social and economic policy outcomes.

As a minimum, licensing arrangements for new business models should ensure that consumers in relevant classes retain access to:

- the Energy and Water Ombudsman;
- supply based on Economic Regulation Authority approved contracts;
- supply provided under regulated tariffs, fees and charges;
- access concessions;
- coverage afforded under the *Code of Conduct for the Supply of Electricity to Small Use Customers 2018*;
- guaranteed access for life support customers; and
- the obligation for the retailer to supply electricity.

The Committee notes that, whilst retail licensing arrangements for new business models are under review, Synergy remains in the market, is fully licenced, holds the SoLR obligation in the SWIS and is already rolling out a number of innovative products and services based on microgrids and associated technologies.

Whilst the reform of retail licensing arrangements can facilitate the future participation of other market participants and new commercial models for contestable customers, it need not put a halt to innovation in the sector, nor prevent the continued trial of innovative energy supply arrangements by the GTEs, particularly given the pace of change underway in the sector.

Both Synergy and Western Power hold direct relationships with the vast majority of customers in the SWIS; have demonstrated their capacity to partner with private sector entities to encourage private sector market participation at a range of points in the energy supply chain; and through existing oversight and licensing arrangements and State ownership (ultimately with accountability to the Minister for Energy), have considerable scope to continue to roll out microgrids and associated technologies, whilst ensuring customer protections are maintained.

#### **Finding 62**

Given their position in the market and existing licensing obligations to ensure consumer protections, any review of the regulatory framework for retail electricity licensing and exemption activities should not prevent the Government Trading Enterprises (Western Power, Synergy and Horizon) from continuing to pursue the opportunities offered by microgrids and associated technologies, including through partnerships with private sector entities.

#### **Energy safety**

Electricity is an inherently dangerous product, and energy safety is an obvious and vital final aspect of consumer protection. The Clean Energy Council raised the importance of energy safety on microgrids:

The safety and reliability of the power supply should be maintained at the same or superior standards and the price of the electricity supplied should be no more expensive. The established DNSPs can be expected to maintain safety and reliability standards in line with their existing operations. In future, however, there might be private operators of microgrids, who will be responsible for ensuring that state electrical safety requirements are met. There might be a need therefore, for registration or licensing of microgrid operators to ensure that they can be held accountable for meeting reliability standards.<sup>477</sup>

The Building and Energy Division of the Department of Mines, Industry Regulation and Safety (DMIRS) (BED) raised issues with regard to technical and safety regulation, noting that with the changes underway in the energy sector, the legislative framework 'now runs the risk of not reflecting realities in the sector.'<sup>478</sup>

Particularly, DMIRS noted BED's energy safety inspection function, which is currently funded by a levy on major energy industry participants. It notes:

Successive Western Australian governments have insisted upon an appropriate level of inspections because electricity networks are delivering a potentially lethal product to users who generally cannot know whether or not their installation is safe.<sup>479</sup>

If the rise of microgrids and DER leads to customer disconnections from the grid and/or increased SAPS, it remains essential that government ensures the safety of stand-alone

<sup>477</sup> Submission 9, Clean Energy Council, p. 5.

<sup>478</sup> Submission 3, Department of Mines, Industry Regulation and Safety, p. 2.

<sup>479</sup> *ibid.*, p. 4.



electrical installations. BED suggested that a policy decision from government to maintain or increase safety inspections in the event of rising customer defections from network-based supply may require changes to the frequency of inspections and consideration of appropriate cost-recovery mechanisms. Given that levies are currently imposed on major energy industry participants, customers who remain connected will essentially cross-subsidise the inspections of disconnected customers.

BED notes that although there are unlikely to be any material impacts in the short to medium term, this is an economically inefficient and inequitable outcome and should be considered as part of the development of the DER Roadmap.

#### **Recommendation 17**

The Minister for Energy review the operation and funding of the energy safety inspection function to ensure:

- that consumers supplied through microgrids enjoy the same level of protection as traditionally supplied customers; and
- the costs of any alterations to inspection or safety regimes are appropriately recovered from 'causers' and not inappropriately cross-subsidised.

### **Listening to customer voices: engagement and consultation**

Many of the submissions and hearings presented to the Committee emphasised the need to engage consumers in energy sector reform. The overwhelming weight of evidence demonstrates that the changes underway are a direct result of the choices exercised by these same individual (and predominantly small use) customers. Yet the Committee was presented with no direct evidence from small use customers themselves. Submissions and witnesses were from private sector market participants, industry organisations, advocacy groups, regulatory agencies and community-based organisations.

Direct consumer engagement is one of the most challenging aspects of developing energy policy. Customers largely express their views through their purchasing and consumption decisions, rather than active participation in energy policy debates. Their consumption behaviours, however, are often in response to market signals, which Chapter Six has identified as currently unfit for purpose, producing inefficient outcomes that are costlier for all Western Australians in the long term.

Consumers require better information about the range of choices available to them, the impact of their decisions on both their individual circumstances and the overall energy system, and the various options available to our community to facilitate a transition to a more sustainable, affordable, reliable and secure energy system. Policy makers also need to ensure that they actively seek out the views of consumers, beyond merely observing energy market trends.

### **A consumer voice in the policy process?**

The Committee explored consumer engagement with a number of policy makers and regulatory entities. In response to questions about how it was ensuring that it listened to consumers, AEMC stated that its core objective is to improve outcomes for all consumers, and that the market-wide impacts of its activities are always front of mind. In addition to engagement with stakeholder groups. AMEC stated that they ‘run a number of reviews ... we undertak[e] fairly detailed consumer surveys annually. We have a fairly rich database of consumers’ views, expectations, the matters that concern them, and that is updated annually’.<sup>480</sup>

In Western Australia, AEMC undertook field visits to the Ravensthorpe trial and spoke to customers about their experiences with SAPS. It has also engaged with the Alternative Technologies Association and sent a survey out to their members to collect their views on microgrid solutions.<sup>481</sup> The AEMC stated that, on the east coast of Australia, the Energy and Water Ombudsman provided a rich source of information on consumer sentiment — particularly given that those schemes have now been extended to cover fringe of grid and off-grid microgrid projects:

They often deal with the issues that consumers experience at the edge of distribution networks to understand the problems that consumers have. They also get a fair bit of feedback from consumers who are dealing with new energy service providers. In the Eastern States, the Energy Ombudsman schemes have recently been extended to capture all of those new service providers as well. They provide us with a lot of information and data on consumers and their experiences. It is not the direct consumer experience, but it is pretty good information. They have very good databases.<sup>482</sup>

Western Australia’s ERA also has a number of mechanisms through which it seeks community feedback on electricity market issues, including seeking submissions on matters with respect to its regulatory and market oversight functions. In 2005, the ERA established a Consumer Consultative Committee that meets quarterly and includes representatives from a range of consumer and industry organisations, including the Chamber of Commerce and Industry of Western Australia, Chamber of Minerals and Energy Western Australia, Consumer Credit Legal Service (Western Australia), Ethnic Communities Council (Western Australia), Financial Counsellors' Association, Pastoralists and Graziers Association, Property Council of Australia (Western Australia), Regional Chambers of Commerce and Industry (Western Australia), UnionsWA, Western Australian Council of Social Service, Western Australian Farmers Federation, and Western Australian Local Government Association. The Department of Mines, Industry Regulation and Safety (Consumer Protection division) and the Energy and Water Ombudsman participate in the Committee as observers. Participation in the Committee allows members to inform the ERA about issues that affect both the

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480 Mrs Anne Pearson, Chief Executive, Australian Energy Market Commission, *Transcript of Evidence*, 23 November 2018, p. 3.

481 Mr Andrew Truswell, Director, Transmission and Distribution Networks, Australian Energy Market Commission, *Transcript of Evidence*, 23 November 2018, p. 3.

482 Mrs Anne Pearson, Australian Energy Market Commission, *Transcript of Evidence*, 23 November 2018, p. 3.

groups they represent and consumers more generally. In addition, the Committee is able to inform consumers about the work of the ERA.<sup>483</sup>

WACOSS noted in its submission, citing the Australian Energy Regulator, that Western Australia was the only state without funded consumer research and representation in its energy market, expressing concerns that without it 'WA's consumers cannot be confident that their interests are being protected at a time of significant developments in the way that we consider energy distribution, generation and regulation.'<sup>484</sup>

WACOSS notes that in Western Australia, the Minister for Water and Water Corporation provide funding for a part-time role for consumer research and representation, recognising the importance of skilled consumer representation in essential service markets. WACOSS stated:

Funding for consumer research and representation in energy markets in Western Australia can overcome barriers for unequal participation in policy and provide balance to the interests and claims of market participants. Maintaining a transparent flow of information and dialogue with consumer groups and frontline community services is necessary to ensure that providers are responsive to the needs of consumers.<sup>485</sup>

Recognising the importance of having a consumer voice to inform government policy processes, the State Government announced in May 2019 that it had allocated \$900,000 over three years for energy consumer advocacy. The funding would be used to employ a specialist energy consumer adviser at the Public Utilities Office and also provide financial support for advocacy on energy affordability and pricing and consumer representation. The funding will also support research that strengthens the focus on better outcomes for residential energy customers, including those on concessions and experiencing hardship, and customers in rural and regional areas.

Ms Kate Ryan from Energy Policy WA advised the Committee at its November 2019 hearing that the consumer advocate role had now been filled. Although it is 'early days' for the new appointee, Ms Ryan outlined that the Government had to make sure it is getting the customer voice from a broader range of stakeholders, who may not have typically possessed the resources to directly engage in such a complex sector. She outlined the two central aspects of the role:

We have a person who will be a great conduit for that information and is working to get across the various work streams of relevance at the moment and make those connections in the sector, so it is sort of an introduction phase. There is also a small amount of grant funding that that role will be administering, so it is also setting up a framework for making that funding available to, for example, other community organisations to do research, to participate in trials and to maybe do some surveys—various different things that can help us bring the customers' insights into

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483 Economic Regulation Authority, *Consumer Consultative Committee*, accessed 7 January 2020, <[www.erawa.com.au/about-us/consumer-consultative-committee](http://www.erawa.com.au/about-us/consumer-consultative-committee)>.

484 Submission 38, WACOSS, p. 6.

485 *ibid.*

the journey we are on, but also help us share information with customers and help us with that two-way flow, so there are two components of that role.<sup>486</sup>

The Committee notes that the consumer advocate role was filled shortly prior to the submission of the DER Roadmap to the Minister for Energy. There may not have been adequate opportunity for the appointee to consider and provide feedback on that document prior to its submission. The success of the Roadmap will depend, to a large extent, on consumer buy-in and it is therefore imperative that any consultation process on the Roadmap engages small users and also accommodates input from the consumer advocate.

#### **Finding 63**

It is vital that consumer voices are heard in the development of energy policy. The State Government's introduction of specific funding to support energy consumer advocacy is a welcome step. However, any consultation on the DER Roadmap must specifically provide for small use customer engagement.

From an electricity industry reform perspective, if the Government embarks on a process of market reform to facilitate the transition to a more affordable, sustainable, reliable and secure energy future, a public information and engagement campaign will also be required to communicate impacts and seek views on changes. It is vital that Western Australian taxpayers are aware of the costs associated with the current system, the benefits enabled by reform and the veracity of alternative proposals.

#### **Finding 64**

Consumer behaviours are driving the changes underway in Western Australia's energy industry. Their awareness of and support for the reforms required to facilitate change will be central to a successful transition to a more sustainable, affordable, secure and reliable model.

#### **Recommendation 18**

The Minister for Energy undertake a community engagement campaign, as part of the Energy Transformation Strategy and the market reform process, to explain the changes underway in the energy industry and the need for reform, outline the benefits offered and seek consumer's views on proposed changes.

### **Community consultation at the fringes of the grid**

The AEMC appended a discussion paper to its *Review of the Regulatory Frameworks for Stand-Alone Power Systems* that noted a particularly important aspect of consultation centring on microgrid participation and customer choice.

In cases where entire communities may be more efficiently served by a microgrid solution — particularly where complete disconnection from the grid is contemplated — issues may arise where some members of a community wish to remain grid connected. The AEMC identifies a range of reasons why consumers may wish to remain connected, despite market-wide

<sup>486</sup> Ms Kate Ryan, Energy Policy WA, *Transcript of Evidence*, 8 November 2019, p. 13.

economic benefit, including perceptions about reliability, concerns about home resale value and future access to retail offers (for contestable customers).<sup>487</sup>

The AEMC notes that a consent framework, or a prescribed set of minimum customer outcomes in lieu of consent, may be required — particularly if there are substantial differences between energy-specific consumer protections available to grid-connected and disconnected customers.<sup>488</sup>

The AEMC also observes that, where a local council is considering moving a community to an SAPS model, there are questions around whether the Council should be required to obtain consent from some or all of its constituents.<sup>489</sup> The AEMC also considers that consent requirements should likely be more stringent where third party microgrid providers are in contemplation (as opposed to being provided by the existing NSP), as the impact of the transition is likely to be larger and could be driven by broader considerations than economic efficiency alone.<sup>490</sup>

Murdoch University has undertaken considerable research into the social implications of a move towards a distributed energy future. Researchers have looked at projects across the world, including in New Zealand, Maldives and Bangladesh. Based on her experience, Dr Tania Urmee observed:

We think a comprehensive discussion with the community when we do something is always good, to involve everyone, so that everyone has a stake and they have ownership of the development of renewable technology. This is one of the things that is very important. If we can develop the ownership, everyone will think, “This is not a government thing; this is our thing.” If it works, it is good.<sup>491</sup>

The North Eastern Wheatbelt Regional Organisation of Councils (NEWROC) comprises six local government authorities, covering some two million hectares on the fringes of the SWIS. Their 2,600 residents and small business operators frequently experience power quality and reliability issues. Their submission to the Inquiry expressed support for Western Power’s fringe of grid trials, but noted:

It is imperative that power solutions that change the current delivery method be developed in close consultation with communities. As well as issues of reliability and ongoing cost, our communities are interested in being part of the conversation on matters such as timing, type of microgrid solution, type of energy source, and ongoing management and maintenance.<sup>492</sup>

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487 Australian Energy Market Commission, *Issues Paper: Review of the Regulatory Frameworks for Stand-Alone Power Systems*, Sydney, September 2018, p. 26, Appendix to Submission 36.

488 *ibid.*, p. 26.

489 *ibid.*, p. 57.

490 *ibid.*

491 Dr Tania Urmee, Senior Lecturer, School of Engineering and Information Technology, Murdoch University, *Transcript of Evidence*, 18 July 2018, p. 9.

492 Submission 30, North Eastern Wheatbelt Regional Organisation of Councils (NEWROC), p. 1.

**Finding 65**

Specific consultation and consent processes may be required when individual communities are identified as viable candidates for microgrid solutions, particularly in regional areas at the fringes of the South West Interconnected System.

**Retailer engagement**

In Western Australia, the contestability thresholds require that Synergy or Horizon Power supply electricity to small use customers. Western Power also has a key role to play — particularly in fringe-of-grid areas, where it assumes primary responsibility for the operation of SAPS and other embedded technologies and is highly visible to and perceived by consumers as the ‘supplier’, even where electricity bills are issued by Synergy (in its retail capacity).

Evidence to the Committee demonstrated that Synergy, Horizon Power and Western Power have all been proactive on consumer engagement and actively seek the views of their customers to facilitate the transition to a distributed energy future.

Synergy emphasised that its overarching ambition is to provide what is best for its customers over the long term, and that it had ‘gotten over’ the ‘old school thinking’ and disruption to its traditional business model, because ‘that is what the future requires’:

We had a pretty good run. But really the last sort of five to 10 years has changed dramatically. Retailers, in my view, now need to become totally customer-centric in operations, solutions focused and true advocates for the interests of customers going forward, which really requires you to let go of that past. Letting go does not mean getting rid of it all, because it still serves a very critical backbone to our system—the transmission grid and the large scale facilities we run—and they will do for a long time to come. But we certainly have progressed as an organisation based on this customer focus that if a customer or a business can now economically take advantage of new tech—it is not really new tech anymore, but solar panels right through to new tech like batteries and more advanced systems—that is certainly the future we need to embrace and represent those customers in the best way we can in regards to that take-up.<sup>493</sup>

The Committee explored the need for engagement on microgrids and SAPS in regional communities at the outer reaches of the SWIS with Western Power. Mr Guy Chalkley stated that Western Power went through ‘a big learning curve and a big bit of engagement’, but observed that its Kalbarri microgrid trial<sup>494</sup> had received awards, not for its technical solution, but for its community engagement:<sup>495</sup>

Kalbarri took a long time to get off the ground, but in a good way because it went through a really big community engagement perspective to their buy-in to what they wanted. That meant that they were an eco-tourist town. They did not want a

493 Mr Jason Waters, Synergy, *Transcript of Evidence*, 9 May 2018, pp. 8-9.

494 The Kalbarri microgrid trial is discussed in the Committee’s [Implications of a Distributed Energy Future: Interim Report](#), April 2019, at pp. 30-33.

495 Mr Guy Chalkley, Western Power, *Transcript of Evidence*, 23 November 2018, p. 5.

diesel generator. They did want to enhance and utilise what rooftop solar they had. That took a lot of time getting that across the line. Like every community engagement, not everyone agrees. But you have to listen to them and you have to make the effort to keep going up there. We consciously invested in that early, and invested probably long in terms of time to actually get that across. Again, if I then play that out to the pilot we did in Ravensthorpe for standalone power, that made the 60 for the next much easier because people had heard about that. People were coming to us for the next lot. We actually did not need to do anywhere near the engagement we had to do for the six because they had seen the success of the six and effectively the customer sold the six for us, not us. So the 60, we were oversubscribed from that perspective.<sup>496</sup>

Horizon Power leads the market in customer engagement. As outlined throughout both this Report and the Interim Report, it has worked across the state to develop microgrid solutions, trial new retail offerings and optimise assets at both the system and household level, in lock-step with its communities. Horizon Power stated in its submission that:

its vision for a successful and fair energy system is to develop, with the community, an energy system that is more affordable for all, reliable at all times and with sustainable commercial returns that reflect the true contribution to the system and risks carried by all participants.<sup>497</sup>

Horizon Power has developed a methodological approach to understanding its customers, based on load profiles and individual customer motivations, including tenancy status, disposable income, attitudes towards technologies and other demographic and behavioural factors.<sup>498</sup> Its approach is centred on commercial *and* social outcomes, specifically considering the equity issues associated with the emergence of microgrids and associated technologies.<sup>499</sup>

As highlighted in the Interim Report, Horizon Power's visibility of the energy supply chain, from electron production down to household appliance-level consumption gives it an invaluable and unique capacity to engage and respond to customer needs. Horizon Power provided a comprehensive submission to the Inquiry, outlining its approach to customer engagement. It also appeared before the Committee on three occasions, and during each hearing, consistently emphasised the centrality of customer engagement to their operations.

**Finding 66**

The Government Trading Enterprises (Western Power, Synergy and Horizon) play a key role in engaging small use customers to understand, respond and advocate for their needs and support the energy sector's transition towards a distributed energy future.

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496 *ibid.*

497 Submission 30, Horizon Power, p. 42.

498 *ibid.*, p. 44.

499 *ibid.*, pp. 45-46.

## Consumer education

There is a clear imperative to engage and assist all energy consumers to access and benefit from microgrids and associated technologies. Despite the clear advantages offered, many potential and existing customers are not equipped with the knowledge to maximise the cost and energy savings.

Equally, many consumers may not be aware of the hidden costs associated with their energy choices, the potential inequities associated with existing tariffs and concessions (particularly with respect to solar PV), the true costs of production for electricity, the often very legitimate subsidies within the sector, and the impacts of both current market structures and proposed reforms.

At a consumer-level, in May 2019, the State Government announced that Synergy would open a 'Smart Energy Hub' at Home Base Subiaco to educate customers on solar power and strategies to maximise solar returns when designing or renovating their homes, in addition to providing information on community-scale projects such as solar and battery trials (akin to microgrids).<sup>500</sup>

Synergy also holds 'Energy Tool Kiosks' in shopping centres across the Perth metropolitan area to assist consumers to understand more about their energy consumption, discuss hardship options, take inquiries on bills, appliances and payment options in locations such as Ellenbrook, Innaloo and Rockingham. Synergy also has an online tool available.<sup>501</sup>

Participation in an increasingly complicated electricity market may present challenges to many customers, and it is questionable whether consumers actually *want* or have the *capacity* to spend significant time and effort participating in processes to procure an essential service. The Australian Energy Regulator stated:

The customer, for their part, will want something that is straightforward, as uncomplicated as possible and is providing the kind of experience that they are getting today. They do not want something that poses undue risks to them. They do not want something that is overly complicated to them and they have to make various choices at different times about different suppliers. They want something that is pretty much as close as possible to the kind of experience that they are getting today, perhaps with better reliability because it is a localised system, and not at a higher cost but maybe at a lower cost. That is what the customers are expecting and that is understandable. That is the kind of aim we should all be trying to achieve here.<sup>502</sup>

Similarly, the BCEC study into Horizon Power's tariff trials (referenced above) noted that vulnerable households may be unable to participate in complex energy products that rely on

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500 Hon Bill Johnston MLA, [New Smart Energy Hub helps customers learn about energy](#), media release, 28 May 2019.

501 Synergy, *Energy tool*, accessed 8 January 2020, <[www.synergy.net.au/Our-energy/Energy-tool/](http://www.synergy.net.au/Our-energy/Energy-tool/)>.

502 Mr Chris Pattas, Australian Energy Regulator, *Transcript of Evidence*, 21 November 2018, p. 3.



real-time responses to alerts.<sup>503</sup> As outlined above, WACOSS identified the centrality of consumer education in assisting households experiencing energy poverty.

The Committee notes that the recently appointed consumer advocate is anticipated to occupy a ‘two-way’ role — both channelling information into the policy-making process and also providing a channel through which information about energy policy can be disseminated. There is also funding to support other organisations to improve energy literacy.

**Finding 67**

Consumer education can enable customers to benefit from the opportunities offered by microgrids and associated technologies. Whilst some education is undertaken through the Government Trading Enterprises (Western Power, Synergy and Horizon Power), there is scope for a more proactive campaign — particularly for vulnerable customers.

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503 Bankwest Curtin Economics Centre, *Power Plans for Electricity: The Impact of tariff structure changes on energy vulnerable households*, September 2018, pp. v-vi.

## Chapter 8

### Broader Opportunities

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The potential benefits offered by Western Australia's transition to a distributed energy future are significant. In addition to considering the industry-specific changes underway, the Committee also received evidence regarding broader economic opportunities that could arise from our new energy economy.

There are a range of opportunities to attract inbound capital investment in other industries, develop our workforce, leverage intellectual property and deployment capability and also address the impacts of climate change. However, all of these benefits – and those identified throughout this report – depend on government, industry and community working together to take charge of our energy future.

#### **'Zero cost energy': an economic opportunity**

First and foremost, as energy cost profiles shift and increasing volumes of renewable energy are delivered at low-to-zero marginal cost, there is an obvious opportunity to attract industries with complementary load profiles into the State. The Australian Energy Market Operator (AEMO) observed that the volume of energy spilling in to Western Australia's South West Interconnected System (SWIS) is 'not something to fear' but actually presents the State with opportunity:

What we have is zero-cost generation providing zero-cost energy. One thing to keep in mind is how we actually make the most of the fact that during the middle of the day, going forward on sunny days, there is going to be very cheap energy available for industry to use. From an economic point of view, certainly there are issues associated with managing the coal-fired power stations, which have to run so they bid at negative price to ensure they stay on, but there is also an opportunity there in: How do we make the most of that and how do we shift the use of that energy, which is actually very cheap, to another time where it is more valuable? How do we encourage industry usage at that time or is there an energy-intensive industry that we should be encouraging?

These are some of the questions that can be raised when we have these opportunities for very cheap power in the middle of the day.<sup>504</sup>

Although outside the scope of the current Inquiry, the State Government could leverage the changing dynamics of our energy economy to encourage new industries, attract inbound capital investment and develop new employment opportunities.

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<sup>504</sup> Mr Martin Maticka, Group Manager, Australian Energy Market Operator, *Transcript of Evidence*, 9 May 2018, p. 7.

## Opportunities for workforce development

The changes underway in Western Australia's energy industry have implications for our workforce. Whereas traditionally, electricity utility company's field workforces comprised power station workers operating large scale plant or linespeople who build and maintain poles and wires, the increasing volume of distributed renewable energy resources and associated complex information and communications technology (ICT) systems are changing the nature of work and the demand for traditional and new skills sets.

The Australian Services Union represents a significant portion of energy sector workers and provided evidence to the Committee that its workers were concerned about the nature of their future work and the types of jobs that would be available, noting the pace of technological change associated with microgrid technologies.<sup>505</sup>

Our members have expressed concern about keeping their skills up to date. They have expressed concern about how they would transition into the future. No-one has explained to me how it is being achieved.<sup>506</sup>

The Australian Services Union noted that both Synergy and Western Power have been 'relatively good' in making sure that workers are skilled and trained,<sup>507</sup> and that their workforces acknowledged and supported the changes underway:

Our view is that obviously from month to month there are new innovations; there are changes within this sector. We understand and accept that, and our members accept that. That is why they want to actively be involved in the just transition process. They do want to be part of the future ... What we need to take into account is that those members want to be part of that change. They want to be engaged in that process, but they want to be engaged in that process through the companies that they currently work for.<sup>508</sup>

The Electrical Trades Union of Australia has flagged issues associated with workforce development, noting in its submission to a Commonwealth Parliamentary inquiry into modernising Australia's electricity grid that, given the rapid deployment of new and developing technologies, any future plan for the energy sector must include plans for detailed skills mapping to ensure an adequate supply of suitably qualified labour.<sup>509</sup>

Private sector operators are keenly aware of potential skills gaps and the need to ensure the supply of skilled labour. EMC (Energy Made Clean) and Lendlease, who have established a private sector joint venture to develop microgrids, noted that, whilst existing skill sets in electrical power systems engineering, electrical and civil trades can be utilised for microgrid

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505 Mr Wayne Wood, Branch Secretary, Australian Services Union, *Transcript of Evidence*, 13 June 2018, p. 2.

506 *ibid.*, p. 4.

507 *ibid.*, p. 2.

508 Ms Jill Hugo, Assistant Branch Secretary, Australian Services Union, *Transcript of Evidence*, 13 June 2018, p. 6.

509 Electrical Trades Union of Australia submission to the Commonwealth of Australia, House of Representatives, Standing Committee on the Environment and Energy Inquiry into modernising Australia's electricity grid, [Submission 5](#), p. 6.

deployment, more specialised skills sets will be required over time — particularly for distributed energy resource (DER) integration and power systems control. It projected increased demand for skills associated with:

- industrial networking and security;
- supervisory control and data acquisition (SCADA), including knowledge of system software and hardware enabling local or remote process control and the monitoring, gathering and processing of real-time data;
- system operations, particularly associated with onsite and cloud based information processing to manage operations and maintenance cycles;
- front/backend development: developing client dashboards;
- control system engineering: to manage multi-layered interactions between different types of technologies;
- electricians, with suitable experience in renewable energy for onsite installation and support;
- electrical engineers skilled in protection, power and renewable energy; and
- regulatory and policy specialists.<sup>510</sup>

The Government Trading Enterprises (GTEs) also provided evidence to the Committee that they are aware of the impacts a distributed energy future may have on their work forces. Horizon Power has charted the future direction of its business model and identified its associated work force requirements. Former CEO Mr Frank Tudor outlined Horizon’s next steps:

The next level of work that we need to do, and we are doing, is looking at the skills of almost every individual in the business and basically profiling them and having an individual conversation about where people are at this point in time in their lives and whether they want to invest in themselves to be relevant to the business.<sup>511</sup>

The company has audited the baseline skills that exist in the business and is examining how to upskill its workforce considering, for example, whether linespeople can be recruited or upskilled with electrical qualifications to allow them to work on microgrids beyond their traditional poles and wires work.<sup>512</sup> Mr Laurie Curro, Horizon Power’s General Manager of Power System Services, told the Committee:

We have to do reskilling in some areas. When we employ a linesman, we go to dual trade these days, because we can see that we are going to need qualified electricians in a lot of places, but an electrician cannot do a linesman’s job. So it is

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<sup>510</sup> Submission 14, EMC (Energy Made Clean) and Lendlease, p. 7.

<sup>511</sup> Mr Frank Tudor, Horizon Power, *Transcript of Evidence*, 11 April 2018, pp. 13-14.

<sup>512</sup> *ibid.*

one of these things where we are sort of caught in the middle, but a lot of our staff are quite keen to be dual trained. Some of them are not, but we are taking the opportunities where we can to do that.<sup>513</sup>

Horizon Power prioritises local contractors for the installation of DER and has also begun a program whereby it trains local electricians and photovoltaic (PV) installers to understand the new technologies it is rolling out.<sup>514</sup>

Western Power also acknowledged that microgrids and DER are challenging workforce structures. CEO Mr Guy Chalkley observed changes in workforce activities, noting that ‘the 30 year career may still be there, but I think in your 30 year career you probably have to reinvent yourself 3 times.’<sup>515</sup> Western Power typically employs and develops highly specialised linespeople and jointers who apply their skills to the construction, operation and maintenance of transmission and distribution lines. It does not employ electricians. It is, however, increasingly seeing demand for a broader array of skills, particularly in other electrical trade qualifications, ICT and data analytics.

Western Power is a training provider in its own right and provides courses for jointers and linespeople, but notes that increasingly, employees will need additional skills:

What can you see? I think you are going to get much more analytical. You will still need the core, but you will need extra strings to your bow. I think there will be different types of the way you analyse data so that you can — it is sort of all the technology bits you are reading, but that is the shift that you are going to get. It is not a 100 per cent shift, but you can see that there has got to be something added to it as you transition people into a new type of role. The role is still there, but it is just different. But you do not want to get there and find out you do not have the skill set to do it. Today is a really important element in how you actually tackle that.<sup>516</sup>

As part of tackling workforce capacity, Western Power is developing new training courses at its Jandakot training school incorporating, for example, battery asset management. Western Power’s long-term vision is that it will fleet manage this asset class, so it is proactively taking steps to develop in-house capability:

We will retrain [staff] and we will recruit as necessary. As Guy said, you just cannot leave the traditional business, we will have “linies” and we will have jointers, and we will have all the courses and safety material for them to do their job effectively, but we will have new modules in the training school that will bring people up to speed about the battery, what its capability is, what its technical nature is, what its electrical characteristics are and how you operate in the change.<sup>517</sup>

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513 Mr Laurie Curro, General Manager Power System Services, Horizon Power, *Transcript of Evidence*, 4 April 2018, p. 5.

514 Mr David Edwards, Technical Visionary, Advanced Microgrid Development, Horizon Power, *Transcript of Evidence*, 4 April 2018, p. 3.

515 Mr Guy Chalkley, Western Power, *Transcript of Evidence*, 11 April 2018, p. 4.

516 *ibid.*, p. 9.

517 Mr Sean McGoldrick, Western Power, *Transcript of Evidence*, 11 April 2018, p. 9.

It is vital that the GTEs proactively engage with their workforces regarding the transition to a distributed energy future and ensure their professional development requirements are met. The GTEs should develop comprehensive workforce development plans and training programs to assist employees to develop their skills base and take up the employment opportunities associated with microgrids and associated technologies.

#### **Finding 68**

The Government Trading Enterprises have begun addressing the future skills and workforce transition requirements triggered by the emergence of microgrids and associated technologies.

Since the initiation of this Inquiry, the State Government has recognised the need to address re-skilling and training to support energy sector transition. The Minister for Energy Hon Bill Johnston informed the Parliament:

The energy sector has experienced rapid transformation — not just here in Western Australia, but also worldwide. It is important that we have a training system that responds to the needs of this transformation of the industry. Part of that is that we are rolling out standalone power systems in Western Australia. We are the centre of the globe for standalone power systems. These products are being manufactured here in Western Australia and we expect up to 20 000 of them to be rolled out in the next 10 years. We have to make sure that we have a workforce ready for that.<sup>518</sup>

In June 2019, the Minister for Energy and the Minister for Education and Training Hon Sue Ellery launched a training program to upskill Western Power staff at North Metropolitan TAFE's East Perth campus, providing workers with the opportunity to gain new skills and knowledge about stand-alone power systems (SAPS).

Two courses are available: SAPS familiarisation and repair and maintain SAPS. Both support the installation, maintenance and fault response for SAPS.<sup>519</sup> In November 2019, Minister Johnston advised the Parliament that 12 cable joiners and linesman were participating in the training to become trade-qualified electrical fitters.<sup>520</sup>

#### **Recommendation 19**

The Minister for Energy ensure that the Government Trading Enterprises have comprehensive workforce capability plans, aimed at building existing employee's skills and capabilities and appropriately recruiting new staff to develop, operate and maintain microgrids and distributed energy resources.

518 Hon Bill Johnston MLA, Minister for Energy, Legislative Assembly, *Hansard*, 14 November 2019, p. 8935.

519 Hon Sue Ellery MLC, Minister for Education and Training, and Hon Bill Johnston MLA, Minister for Energy, *Training package to upskill Western Power workers*, media release, 19 June 2019.

520 Hon Bill Johnston MLA, Minister for Energy, Legislative Assembly, *Hansard*, 14 November 2019, p. 8935.

## Showcasing, developing and profiting from Western Australia's microgrid capabilities

This Inquiry has considered a number of projects across Western Australia, trialling a range of microgrid and DER technologies and testing various asset configurations. The projects are being undertaken in areas that experience extreme climatic conditions: from the hot, humid and cyclonic conditions in the Kimberley and Pilbara regions; through the dry deserts of the Goldfields and in to the cold winter extremes of the Great Southern. The intellectual property and delivery capability developed within Western Australia on these projects is valuable and has applications around the world.

There are a number of potential markets for microgrids. Murdoch University observed potential interstate opportunities:

[Microgrids] are very suitable for WA, and WA's context, not only even in Western Australia but also the Northern Territory and parts of Queensland, especially in the north of Queensland. These are very good avenues for having microgrids.<sup>521</sup>

Further afield, considerable opportunity exists in Asia and Africa, as rural communities increasingly demand electrification and national governments announce ambitious renewable energy targets. Norbert Schweiters and Tom Flaherty contend that DER and microgrid technologies are perhaps more relevant to emerging economies, where basic access to electricity remains a challenge, than to advanced industrial nations.<sup>522</sup> In regions such as sub-Saharan Africa, DER is now providing communities with their first access to electricity, with significant implications for the evolution of the energy economy in the region:

Just as mobile telephony has proved to be a leapfrog technology in Africa, making the development of landlines unnecessary, local renewable energy systems have the potential to obviate centralized generation.<sup>523</sup>

The International Energy Agency noted in its 2018 *World Energy Outlook* 'a doubling of electricity demand in developing economies puts cleaner, universally available and affordable electricity at the centre of strategies for economic development and emissions reduction.'<sup>524</sup> It also observed the emergence of microgrid technologies, noting the electricity sector is experiencing its most dramatic transformation since its creation more than a century ago. The *Outlook* details a profound shift in energy consumption in Asia, with electricity increasingly becoming the 'fuel of choice.'<sup>525</sup>

Professor Mahesh Bhawe has observed the vital link between electrification and development throughout Asia — particularly in India, where 300 million people 'live by

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521 Dr Farhad Shahnia, Murdoch University, *Transcript of Evidence*, 18 June 2018, p. 6.

522 Norbert Schweiters and Tom Flaherty, 'A Strategists Guide to Power Industry Transformation', *Strategy+Business Magazine*, Issue 80, Autumn 2015, p. 3.

523 *ibid.*, p. 4.

524 International Energy Agency, *World Energy Outlook 2018*, 2018.

525 *ibid.*

flickering kerosene lights and cook using biomass.<sup>526</sup> Writing in 2016, Professor Bhave noted that poles and wires are no longer required for electricity and that microgrids ‘make sense for emerging economies and unelectrified regions.’<sup>527</sup> He stated, however:

The kind of industrial-grade microgrids we need do not exist ... The absence of microgrids R&D [research and development], let alone their deployment, is among the astonishing missing pieces in today’s electricity industry.<sup>528</sup>

Fast forward to 2020, and this is no longer the case. The Interim Report to this Inquiry demonstrated the world-leading innovation here in Western Australia and the demonstrated capacity within the GTEs and private sector to deliver, operate and maintain microgrids, across a range of climatic zones and in some of the most inhospitable operating conditions in the world. EMC and Lendlease stated that Western Australia has the opportunity to be a world leader in developing and delivering microgrids, noting that Western Australia’s GTEs and private sector operators ‘have significantly more experience than other States and Territories in developing this industry.’<sup>529</sup>

Horizon Power has noted that Western Australia is strategically positioned as the gateway to the Asia Pacific region, which represents more than 50% of the global microgrid market, estimated to top \$35 billion by 2020. It notes:

Western Australia, as a State, needs to seize the opportunity in this early stage of evolution in what is a fragmented microgrid market.<sup>530</sup>

EMC and Lendlease told the Committee that Western Australian intellectual property, based on the extensive research and development undertaken to date, is a valuable exportable commodity. Research and development opportunities exist in electrical engineering, power systems engineering and network planning, in addition to opportunities in related infrastructure and land-use planning and social research (for example, community co-investment opportunities, community experience and acceptance of microgrids):

This experience and knowledge in microgrids has the potential to be exported across Australia and overseas as this technology allows developing countries to leap-frog old centralised power system technology to decentralised systems, particularly in the South-East Asian, African and island regions that rely on diesel fuel.<sup>531</sup>

Sunrise Energy noted that Western Australia has access to world class universities, technology facilities and people who could develop and commercialise these and other technologies specific to SAPS:

If Western Australia were to become an early adopter of SPS [SAPS] in significant enough volumes, we believe it could attract this technology innovation in to WA.

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526 Professor Mahesh P Bhave, *The Microgrid Revolution*, ABC CLIO LLC, Santa Barbara, 2016, p. 43.

527 *ibid.*, p. 45.

528 *ibid.*

529 Submission 14, EMC (Energy Made Clean) and Lendlease, p. 5.

530 Horizon Power, *Advancing Microgrid Excellence*, 2018, p. 4.

531 Submission 14, EMC (Energy Made Clean) and Lendlease, p. 5.



This has the potential for export, especially if done in partnership with some of the large battery solution providers.<sup>532</sup>

However, Western Australia's window of opportunity to become a world leader in commercialising and exporting this technology is limited. Other jurisdictions are catching up and looking to exploit the intellectual property generated through their own microgrids research. The Committee asked researchers at Murdoch University about opportunities for collaboration between research institutions, government and industry. Dr Shahniah described a number of Danish and Chinese research projects currently underway, financed by the Government of China and observed that:

The Chinese Government is probably looking into commercialising those outcomes of that research into products which are going to be sold everywhere around the world. From an investment point of view that is a very, very good example.<sup>533</sup>

The intellectual property and delivery capability possessed by the GTEs are valuable assets that could be readily developed and marketed, in partnership with a range of private sector local companies and research institutions, providing the people of Western Australia with a direct return on the substantial investments they have made into the GTEs and academic institutions over many years.

**Finding 69**

Demand exists, both in Australia and overseas, for microgrids and associated technologies. This demand is likely to increase considerably as neighbouring nations throughout the region develop and electrify their rural communities and adopt ambitious carbon-abatement and renewable energy policies.

**Finding 70**

The intellectual property and delivery capability possessed by the Government Trading Enterprises could be commercialised and marketed into other jurisdictions, generating opportunities for a range of partner private companies that currently do not possess the requisite scale. This would provide the State with a return on its investment in microgrid technologies, generate commercial opportunities for Western Australian Industry and deliver overall benefit to all Western Australians.

**Recommendation 20**

The relevant Minister develop a strategy to commercialise and maximise the value delivered to Western Australia, arising from the intellectual property and microgrid delivery capability developed in the Government Trading Enterprises.

The commercialisation strategy should identify target interstate and overseas markets — particularly in India and South East Asia — and specifically consider ways to partner with the private sector to deliver scale and generate additional growth opportunities.

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532 Submission 24, Sunrise Energy Group, p. 9.

533 Dr Farhad Shahniah, Murdoch University, *Transcript of Evidence*, 18 June 2018, p. 5.

The evidence to this Inquiry suggests that the appetite for ongoing research and development into microgrids and associated is strong, and that government, academia and industry should continue to explore opportunities to further develop our capabilities.

Power Ledger stated that Western Australia should take advantage of ‘our status as world leaders in both the microgrid and blockchain energy space.’<sup>534</sup> It noted that each of Western Australia’s universities is already actively involved in sustainable research and development projects:

We could leverage this experience and transition our university campuses so that they run entirely on microgrids and renewables, turning them into innovation and sustainability hubs. A P2P [peer-to-peer] trading platform could be implemented, enabling the different faculties to trade energy between each other. Research from these projects would provide tangible results — as they could be set up to mirror that of a real community. This sort of initiative could be positioned to raise the international profile of our institutions and act as a drawcard for bright international minds, providing a boost to the higher education industry.

Power Ledger outlined its participation in the Commonwealth Government funded ‘Smart Cities’ project in the City of Fremantle, along with a consortium of members including government bodies, and researchers from Murdoch University, Curtin University and the University of Western Australia, all of whom provided submissions to this Inquiry. The project contains a number of microgrids, a solar farm, solar PV arrays and a community owned battery. The findings from this project will demonstrate how blockchain works with co-located renewable assets, and will trial how the technology can interface with water treatment systems, utilising excess on-site energy generation:

This project will produce world-first results, which could form the basis of highly exportable products.<sup>535</sup>

Curtin University has a Centre for Smart Grids and Sustainable Power Systems. It informed the Committee that it is conducting a range of research activities in smart and sustainable grid applications and technologies, pursuing a range of goals including:

- smart distribution, including automation and advance metering;
- utilising electric vehicles to increase grid reliability;
- renewable energy and distributed generation;
- diagnostics and monitoring of assets; and
- ICT enabled intelligent power systems.<sup>536</sup>

The Interim Report acknowledged the proposed partnership between government, industry and academia to establish the Future Battery Industries Cooperative Research Centre. In

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<sup>534</sup> Submission 29, Power Ledger, p. 5.

<sup>535</sup> *ibid.*

<sup>536</sup> Submission 28, Curtin University, p. 8.

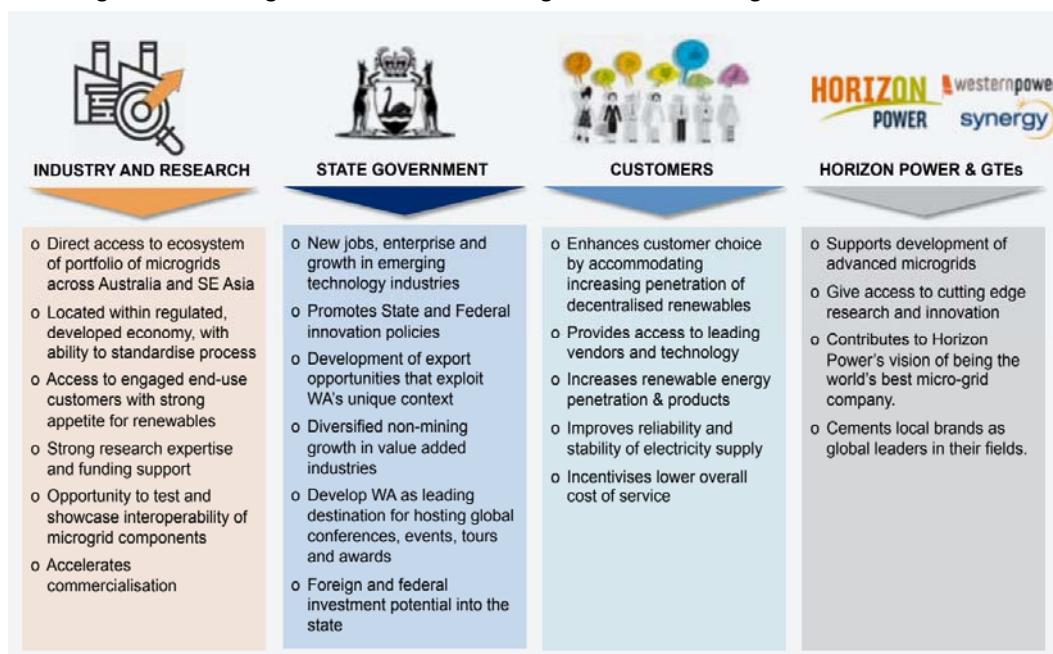
April 2019, federal approval was granted and Curtin University will now lead a national collaboration between 58 industry, government and research partners.<sup>537</sup>

Horizon Power recommended the establishment of an Advanced Microgrid Centre of Excellence, to lead the state’s microgrid strategy across industry, research, and the commercialisation of intellectual property and capabilities in new markets. The proposed Centre of Excellence would be a collaborative industry initiative that harnesses the technology, expertise, capability, and thought leadership of recognised energy and microgrid leaders to advance the state of the art in advanced microgrids.<sup>538</sup>

It fosters collaborative, cutting-edge research to develop world-class workforce training and education products, and to facilitate commercialisation of creative solutions, intellectual property, and microgrid technologies. This CoE [Centre of Excellence] would develop WA, Perth, and Technology Park in Bentley as a world-leading destination for advanced microgrid industry, conferences, study tours, international students, and professional skills training.<sup>539</sup>

Horizon Power outlined a range of benefits for industry and research institutions, the State Government, customers and the GTEs, shown in Figure 8.1 below. It also outlined a high-level process to establish a Centre, and stated that it has already embarked on developing relationships and arrangements consistent with its high-level process, for the purposes of accelerating the development of its own microgrids.<sup>540</sup>

**Figure 8.1: The range of benefits of establishing an Advanced Microgrid Centre of Excellence**



537 Curtin University, *WA home to \$135 million national battery research hub*, accessed 29 January 2020, <<https://research.curtin.edu.au/story/wa-home-to-135-million-national-battery-research-hub/>>.

538 Submission 30, Horizon Power, p. 39.

539 *ibid.*

540 *ibid.*

The Western Australian energy industry is engaged and focussed on facilitating the transition to a new energy economy. Western Australia is home to active and significant chapters of associations such as the Australian Institute of Energy and Clean Energy Council, both of which run multiple events and programs focussing on distributed energy.

The International Microgrid Association (IMA) was also established in August 2019 and is headquartered in Perth. Its vision is to unite organisations who are committed to building global microgrid capability by integrating emerging energy and information technologies to generate, distribute, and consume energy more efficiently, cleanly, and cost-effectively. The IMA's members are representatives from the global microgrid value chain, including microgrid designers, developers, utilities, technology providers, manufacturers, capital providers, project developers, research organisations and governments.<sup>541</sup>

The IMA's objectives are:

- to drive economic growth through the fostering of cross-sector collaboration across the global microgrid value chain;
- to enable a transformed electric power system through the education of key operational and technical stakeholders in the sector;
- to coordinate and provide education and information for members that improves the knowledge and capability of members in the provision and promotion of microgrid systems and technology;
- to increase the standing of microgrid technology through the provision of a single unified voice that advocates in the interests of the members to relevant stakeholders globally;
- to provide resources to members which help to ensure the safe, secure and reliable delivery of microgrid projects globally;
- to pursue commercial opportunities for the benefit of the IMA and its members; and
- to actively partner with other affiliated organisations with similar purposes to help unlock the future potential of microgrids.

The IMA will host the first International Microgrid Event in Perth from 31 March to 3 April 2020. The IMA's presence in Western Australia and its hosting of a global microgrid event again reflects the Western Australian industry's maturity, thought leadership and ability to attract world-leading innovators.

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541 International Microgrid Association, accessed 29 January 2020, <<https://internationalmicrogrids.org/>>.

**Finding 71**

Western Australia could leverage its considerable knowledge and experience in microgrids and harness the technology, expertise, capability, and thought leadership of recognised energy and microgrid leaders through the establishment of an Advanced Microgrid Centre of Excellence.

**Recommendation 21**

The relevant Minister investigate the establishment of a Centre of Excellence for Advanced Microgrids in Western Australia, to coordinate research and development, intellectual property commercialisation, and new skills development.

## **Sustainable energy production and climate change**

Climate change is a real and ever-pressing issue for Western Australians. In addition to the energy system optimisation and cost-reduction benefits offered by microgrids and associated technologies, many witnesses and submissions to this Inquiry emphasised the additional potential to reduce the carbon intensity of our economy, develop renewable technologies and assist communities to adapt and mitigate the impact of extreme climatic events.

Perth Energy noted that microgrids promote increased environmental sustainability when utilising renewable-based generation, like solar energy or wind power.<sup>542</sup> The ability to store solar-generated electricity in batteries, for consumption at night, also represents a sustainable alternative to supply from thermal generation sources. To the extent that system optimisation encourages the more efficient dispatch of existing thermal generation sources (likely to remain a feature of Western Australia’s energy system for some time), this can also reduce the carbon intensity of traditional forms of generation.

Sunrise Energy noted that microgrids have enormous relevance and value for Western Australia insofar as they deliver highly desirable ‘green outcomes’ to regional communities, and can play a part in the broader concept of an ‘Eco Town’:

There is a broader opportunity around the concept of an Eco Town. This extends some of the concepts in an electricity microgrid in to other utilities such as water, waste water and gas, as well as a broader sustainability solution which can include more self-sufficiency from fresh produce along with waste recycling. Eco Towns have a growing focus in developing countries, so the focus for WA should be around a potential leadership position in established towns in developed economies.<sup>543</sup>

Power Ledger observed that the mass global response to climate change is, and will continue to be, a major external driver in changing the way we supply energy and means that Australia’s policy decisions will continue to be shaped by global and domestic emissions reductions targets. Power Ledger noted the 2018 Climate Institute of Australia survey overwhelmingly indicated that Australians would prefer our primary energy source to be

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542 Submission 20, Perth Energy, p. 7.

543 Submission 24, Sunrise Energy Group, p. 4.

renewable, with backup support by either battery storage or fossil fuels. Power Ledger observed that defection from the grid is often driven by social and environmental concerns, not just economics and that wide-ranging support for more distributed energy microgrids across the SWIS could act as a social incentive for owners of DER to remain connected:

The survey also indicated a positive attitude towards the prospect of Australia being a world leader in pioneering the development and implementation of renewable energy technologies. This should motivate support for the move to become world leaders in both microgrid technology and associated technologies such as blockchain.<sup>544</sup>

Horizon Power’s first large-scale microgrid trial was in response to a bushfire event in Esperance – an active decision was taken to replace poles and wires with more innovative solutions. The Inquiry’s Interim Report and this Report have acknowledged the key role microgrids can play in bushfire mitigation, incident management and post-event recovery, observing that they can considerably enhance a community’s resilience and ability to respond to a range of natural disasters. The need for adaptation and resilience in response to extreme climatic events has been brought tragically into focus, following the catastrophic 2019-20 bushfire season.

Microgrids offer Western Australia the opportunity to benefit economically in terms of optimising our electricity systems. The efficient deployment of microgrids and associated technologies can also reduce our carbon intensity. As nations around the world electrify, announce ambitious carbon reduction targets and demand more sustainable forms of electricity production, Western Australia has a demonstrated and world-leading capacity to meet the market. The opportunity exists to build a thriving export industry, leveraging the knowledge and benefits gained through our own transition to a more sustainable energy economy.

#### **Finding 72**

In addition to system optimisation benefits, microgrids and associated technologies have a vital role to play in reducing the carbon intensity of electricity systems, assisting communities to adapt and mitigating the impacts of climate change.

#### **Finding 73**

Microgrid technologies offer Western Australia new opportunities to build a thriving export industry, leveraging the knowledge and benefits gained through our own transition to a more sustainable energy economy.

## **Taking charge of our energy future**

The changes underway in Western Australia’s energy industry are significant. The evidence to this Inquiry consistently demonstrates that, more than any other time, there is a need for government, its trading enterprises, industry, academia and the broader community to work together to understand and benefit from a distributed energy future.

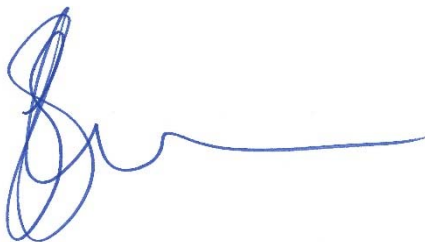
<sup>544</sup> Submission 29, Power Ledger, pp. 8-9.

Dr Dev Tayal from Curtin University observes that innovative market structures can provide the right signals to encourage efficient and fair electricity provision. He argues if all parties can be encouraged to use energy infrastructure more productively, energy efficiency measures can capture savings and these savings can in turn be redistributed between customers, investors (both government and private) and electricity utilities. He argues that sharing captured value with investors will also provide an incentive and capability to provide high-quality services to underprivileged populations:

Immediate benefits would go to participating customers via bill savings, and benefits would be realised by the wider community thanks to the avoided network expenditure — all the poles, wires and transformers that no longer need to be built and paid for. Private finance would be encouraged by an allocation of some of the financial value that is created from the investments, while customers and governments would reap the rewards of the substantial social value generated in closing the gap on service inequalities. Taxpayers would also benefit from the hardship grants, discount schemes, subsidies and essential service payments minimised once traditionally vulnerable customers have access to greater household energy optimisation.<sup>545</sup>

Of all states and territories, Western Australia is uniquely positioned to take charge of its energy future. Our industry's dynamism and independence from the National Electricity Market (NEM), coupled with our abundance of renewable resources, means we can develop and implement policies that encourage energy market outcomes for the public good: more efficient capital investment in our networks; a reconceptualization of value in network assets; a mix of technologies and fuel sources to optimise supply and manage risk; producing natural restraints on costs for consumers and placing downward pressure on prices.

Working in partnership, government and industry can deliver a more secure, reliable, affordable and sustainable electricity system. Together, we can create commercial opportunities that encourage innovation, new market entrants and new industries, whilst moving to a more sustainable energy economy and facing the challenges presented by climate change.

A handwritten signature in blue ink, consisting of a large, stylized initial 'S' followed by a long horizontal line.

MS J.J. SHAW, MLA  
CHAIR

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545 Dr Dev Tayal, 'Energy sector must use new tech to ensure the vulnerable aren't left behind', *The Guardian* (web-based), 15 March 2018, accessed 7 January 2019, <[www.theguardian.com/sustainable-business/2018/mar/16/energy-sector-must-use-new-tech-to-ensure-the-vulnerable-arent-left-behind](http://www.theguardian.com/sustainable-business/2018/mar/16/energy-sector-must-use-new-tech-to-ensure-the-vulnerable-arent-left-behind)>.

# Appendix One

## Committee's functions and powers

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The functions of the Committee are to review and report to the Assembly on:

- a) the outcomes and administration of the departments within the Committee's portfolio responsibilities;
- b) annual reports of government departments laid on the Table of the House;
- c) the adequacy of legislation and regulations within its jurisdiction; and
- d) any matters referred to it by the Assembly including a bill, motion, petition, vote or expenditure, other financial matter, report or paper.

At the commencement of each Parliament and as often thereafter as the Speaker considers necessary, the Speaker will determine and table a schedule showing the portfolio responsibilities for each committee. Annual reports of government departments and authorities tabled in the Assembly will stand referred to the relevant committee for any inquiry the committee may make.

Whenever a committee receives or determines for itself fresh or amended terms of reference, the committee will forward them to each standing and select committee of the Assembly and Joint Committee of the Assembly and Council. The Speaker will announce them to the Assembly at the next opportunity and arrange for them to be placed on the notice boards of the Assembly.





## Appendix Two

### Inquiry terms of reference

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The Economics and Industry Standing Committee will investigate and report on the emergence and impact of electricity microgrids and associated technologies in Western Australia, including:

- a) The potential for microgrids and associated technologies to contribute to the provision of affordable, secure, reliable and sustainable energy supply, in both metropolitan and regional Western Australia;
- b) Opportunities to maximise economic and employment opportunities associated with the development of microgrids and associated technologies, including (but not limited to):
  - i) Development of raw material resources/primary commodities
  - ii) Research and development
  - iii) Design, engineering and construction
  - iv) Advanced manufacturing
  - v) ICT
  - vi) Ongoing asset operations;
- c) Key enablers, barriers and other factors affecting microgrid development and electricity network operations, including:
  - i) Regulatory barriers
  - ii) Technical factors
  - iii) Workforce planning and development
  - iv) Social factors
  - v) Electric Vehicles; and
- d) Initiatives in other jurisdictions to facilitate the development, and maximise the value of, microgrids and associated technologies.



## Appendix Three

### Submissions received

| No.        | Name                        | Position  | Organisation  |
|------------|-----------------------------|---|---|
| 1          | Mr Chris Pattas             | General Manager,<br>Network Pricing, Policy<br>and Compliance | Australian Energy<br>Regulator                            |
| 2          | Ms Samantha<br>McGahan      | Business Development<br>Manager                               | VSUN Energy   |
| 3          | Mr Ken Bowron               | Executive Director,<br>Building and Energy                    | Department of Mines,<br>Industry Regulation and<br>Safety |
| 4/4A       | Mr Guy Chalkley             | Chief Executive Officer                                       | Western Power   |
| 5          | Mr Shaun Gregory            | Executive Vice<br>President, Exploration<br>and Technology    | Woodside  |
| 6          | Mr Donald Yates             | Chief Executive Officer                                       | Columbus Group  |
| 7          | Mr Chris Rodwell            | Chief Executive Officer                                       | Chamber of Commerce<br>and Industry (WA)                  |
| 8          | Mr David Karr               | Principal/Chief<br>Executive Officer                          | Interspatial Systems                                      |
| 9          | Mr Darren Gladman           | Director – Smart<br>Energy                                    | Clean Energy Council                                      |
| 10         | Mr Craig de Laine           | General Manager,<br>People and Strategy                       | Australian Gas<br>Infrastructure Group                    |
| 11         | Mr Mark Twidell             | APAC Director – Energy<br>Products                            | Tesla   |
| 12         | Mr Andrew Pickering         | Chairman and Chief<br>Investment Officer                      | Infrastructure Capital                                    |
| 13/13A     | Mr J.D. Patrick<br>Creaghan | Managing Director and<br>Chief Operating Officer              | ATCO Australia  |
| 14         | Mr Greg Locke               | General Manager,<br>Services and<br>Engineering, WA           | Lendlease   |
|            | Mr Greg Allen               | Executive General<br>Manager                                  | Energy Made Clean   |
| 15         | Mr Graeme Hamilton          | General Manager,<br>Government and<br>Regulatory Affairs      | Alinta Energy   |
| 16         | Mr Duncan MacKinnon         | Wholesale Policy<br>Manager                                   | Australian Energy<br>Council                              |
| 17/17A/17B | Mr Rodney Littlejohn        | Managing Director   | Tersum Energy   |
| 18         | Ms Shahana McKenzie         | Chief Executive Officer                                       | Bioenergy Australia                                       |
| 19         | Mr Cameron Parrotte         | Executive General<br>Manager, WA                              | Australian Energy<br>Market Operator                      |
| 20/20A/20B | Ms Elizabeth Aitken         | General Manager,<br>Operations                                | Perth Energy  |
| 21         | Mr Noel Schubert            |   |   |

Appendix Three

|            |   |   |   |
|------------|---|---|---|
| 22/22A/22B | Mr Jason Waters                             | Chief Executive Officer   | Synergy   |
| 23         | Mr Alan Bansemer                            | Chair   | WA Technology and Industry Advisory Council                                       |
| 24         | Mr Neil Canby                               | Executive Director  | Sunrise Energy Group Pty Ltd  |
| 25         | Dr Farhad Shahnia                           | Senior Lecturer, School of Engineering and Information Technology | Murdoch University  |
| 26         | Dr Jill Cainey                              | Global Applications Director                                      | S&C Electric Company  |
| 27         | Dr Rob Phillips, Mr Ben Rose, Mr Ian Porter |   | Sustainable Energy Now Inc.   |
| 28         | Professor Chris Moran                       | Deputy Vice-Chancellor, Research                                  | Curtin University   |
| 29/29A     | Mr David Martin                             | Managing Director and Co-founder                                  | Power Ledger  |
| 30         | Mr Frank Tudor                              | Chief Executive Officer   | Horizon Power   |
| 31         | Mr Lex Hardie                               | President   | Oil Mallee Association of Australia Inc.  |
|            | Mr Simon Dawkins                            | Director  |   |
| 32         | Professor Ray Wills                         | Managing Director   | Future Smart Strategies   |
| 33         | Mr Wayne Wood                               | Branch Secretary  | Australian Municipal, Administrative, Clerical and Services Union (ASU) WA Branch |
| 34         | Mr Warren Pearce                            | Chief Executive Officer   | Association of Mining and Exploration Companies                                   |
| 35         | Mr Jon Sibley                               | Principal Policy Advisor  | Australian Renewable Energy Agency  |
| 36         | Ms Anne Pearson                             | Chief Executive   | Australian Energy Market Commission   |
| 37         | Mr Darren Klemm<br>AFSM                     | Fire and Emergency Services Commissioner                          | Department of Fire and Emergency Services   |
| 38         | Ms Louise Giolitto                          | Chief Executive Officer   | Western Australian Council of Social Service                                      |
| 39         | Cr Quentin Davies                           | Chair   | North Eastern Regional Organisation of Councils                                   |
| 40         | Ms Suzanne Toumbourou                       | Executive Director  | Australian Sustainable Built Environment Council                                  |
| 41         | Mr Karl Raszyk                              | Chairman  | Esperance Community Power Project   |

## Appendix Four

### Briefings

| Date                                    | Name                 | Position  | Organisation                                    |
|---|----------------------|---|---|
| 14 February 2018                        | Mr Aden Barker       | Acting Director, Retail and Consumer Policy                         | Public Utilities Office, Department of Treasury |
|   | Ms Brooke Eddington  | Acting Project Leader, Energy Industry Development Division         |   |
| 1 March 2018                            | Ms Audrey Zibelman   | Chief Executive Officer   | Australian Energy Market Operator               |
|   | Mr Cameron Parrotte  | Executive General Manager Western Australia                         |   |
| 16 March 2018                           | Dr Michael Ottaviano | Chief Executive Officer and Managing Director                       | Carnegie Clean Energy/Energy Made Clean         |
|   | Mr Greg Locke        | General Manager, Energy and Technology Services                     | Lendlease                                       |
| 29 March 2018                           | Mr Guy Chalkley      | Chief Executive Officer   | Western Power                                   |
|   | Mr Seán McGoldrick   | Executive Manager Asset Management                                  |   |
|   | Ms Fiona Bishop      | Executive Manager of Change and Innovation                          |   |
| 4 April 2018<br>Carnarvon               | Mr Frank Tudor       | Chief Executive Officer   | Horizon Power                                   |
| 20 June 2018                            | Mr Matthew Bowen     | Partner   | Jackson McDonald                                |
|   | Ms Chloe D'Souza     | Solicitor   |   |
| 19 September 2018                       | Mr Matthew Bowen     | Partner   | Jackson McDonald                                |
|   | Ms Chloe D'Souza     | Solicitor   |   |
| 24 September 2018<br>San Francisco, USA | Mr Matt Lecar        | Principal, FERC and ISO Relations                                   | Pacific Gas and Electric Company                |
|   | Mr Mark Esguerra     | Director, Integrated Grid Planning, Grid Integration and Innovation |   |

Appendix Four

|                                      |                         |   |   |
|--------------------------------------|-------------------------|---|---|
|                                      | Mr Dean Weng            | Senior Project Engineer, Integration of Distributed Energy Resources Power Delivery and Utilization | Electric Power Research Institute       |
|                                      | Mr Haresh Kamath        | Senior Program Manager, Distributed Energy Resources Power Delivery and Utilization                 |   |
|                                      | Dr Tanguy F. Hubert     | Senior Project Engineer, Integration of Distributed Energy Resources Power Delivery and Utilization |   |
|                                      | Mr Nicholas Tumilocwicz | Principal Manager, Integration of Distributed Energy Resources Power Delivery and Utilization       |   |
|                                      | Mr Rajan Mutialu        | Senior Analyst, Policy and Planning Division  | California Public Utilities Commission  |
|                                      | Mr Andrew Schwartz      | Director, Policy and Electricity Markets  | SolarCity (Tesla Energy Operations Inc) |
|                                      | Mr Andrew Klinkman      | Business Development Energy Products  | Tesla                                   |
| 25 September 2018<br>Sacramento, USA | Mr David Hochschild     | Commissioner  | California Energy Commission            |
|                                      | Ms Laurie ten Hope      | Deputy Director, Research and Development Division  |   |
|                                      | Ms Rachel Huang         | Director, Energy Strategy, Research and Development   | Sacramento Municipal Utility District   |
|                                      | Mr David Brown          | Principal Distribution System Engineer, Grid Planning and Operations                                |   |

|                                    |                                    |   |   |
|------------------------------------|------------------------------------|---|---|
|                                    | Mr Timothy Tutt                    | Program Manager,<br>Legislative and<br>Regulatory Affairs                               |   |
|                                    | Dr Keith E. Casey                  | Vice President,<br>Market<br>Infrastructure<br>Development                              | California<br>Independent System<br>Operator<br>Corporation                                   |
|                                    | Mr John Goodin                     | Manager,<br>Infrastructure and<br>Regulatory Policy                                     |   |
|                                    | Mr Keoni Almeida                   | Manager,<br>Stakeholder and<br>Industry Affairs   |   |
|                                    | Mr Clyde Loutan                    | Principle,<br>Renewable Energy<br>Integration   |   |
|                                    |                                    |   |   |
| 27 September 2018<br>New York, USA | Dr Babak Enayati                   | Lead R&D Engineer,<br>National Grid   | Institute of Electrical<br>and Electronics<br>Engineers (IEEE)<br>Power and Energy<br>Society |
|                                    | Dr Aleksi Paaso                    | Manager, Emerging<br>Technology, ComEd  |   |
|                                    | Ms Sangeeta<br>Ranade              | Vice President,<br>Clean Energy<br>Business and<br>Market<br>Development                | New York Power<br>Authority   |
|                                    | Mr Dominick Luce                   | Vice President,<br>Energy Efficiency  |   |
|                                    | Mr Ben Cuozzo                      | Advanced<br>Renewables<br>Program Analyst   |   |
|                                    | Mr Damian Sciano                   | Director of<br>Distributed<br>Resource<br>Integration                                   |   |
|                                    | Mr Mark Torpey                     | Director, Research<br>and Development   | New York State<br>Energy Research and<br>Development<br>Authority                             |
|                                    | Mr David Crudele                   | Program Manager,<br>Smart Grid  |   |
|                                    | Mr Ted Kelly                       | Assistant Counsel   | New York State<br>Public Service<br>Commission  |
|                                    | Mr Andrew Owens                    | Electric Power<br>System Platform<br>Technology<br>Manager, New York<br>Power Authority |   |
|                                    | Ms Nicola Jones                    | Utility Engineer  |   |
|                                    | 28 September 2018<br>New York, USA | Ms Sarah McKinley   | Manager of State<br>Outreach, Office of<br>External Affairs                                   |



Appendix Four

|  |                           |   |                             |
|--|---------------------------|---|-----------------------------|
|  | Dr David Kathan           | Senior Economist,<br>Office of Energy<br>Policy and<br>Innovation |                             |
|  | Ms Christy Walsh          | Director, Division of<br>Policy Development                       |                             |
|  | Ms Valerie Teeter         | Manager, Division of<br>Policy Development                        |                             |
|  | Mr Ben Foster             | Senior Energy<br>Industry Analyst                                 |                             |
|  | Mr Richard L.<br>Kauffman | Chairman of Energy<br>and Finance for New<br>York                 | Office of Governor<br>Cuomo |
|  | Ms Victoria Harmon        | Senior Advisor to<br>the Chairman of<br>Energy and Finance        |                             |
|  | Ms Marlene Motyka         | US and Global<br>Renewable Energy<br>Leader                       | Deloitte                    |
|  | Ms Suzanna<br>Sanborn     | Senior Manager,<br>Market Insights,<br>Energy and<br>Resources    |                             |
|  | Mr Michael Cusick         | Chair, Energy<br>Committee  | New York State<br>Assembly  |

## Appendix Five

### Public hearings

| Date                      | Name                | Position  | Organisation                               |
|---------------------------|---------------------|---|--|
| 4 April 2018<br>Carnarvon | Mr Luke Vandeleur   | Vice President                                      | Carnarvon Chamber of Commerce and Industry |
|                           | Mr Kristan Pinner   | Committee Member                                    |  |
|                           | Mr Karl Brandenburg | President   | Shire of Carnarvon                         |
|                           | Mr Mark Dacombe     | Acting Chief Executive Officer                      |  |
|                           | Mr Laurie Curro     | General Manager, Power System Services              | Horizon Power                              |
|                           | Mr Terry Mohn       | General Manager, Advanced Microgrid Development     |  |
|                           | Mr David Edwards    | Technical Visionary, Advanced Microgrid Development |  |
| 11 April 2018             | Mr Frank Tudor      | Chief Executive Officer                             | Horizon Power                              |
|                           | Mr Laurie Curro     | General Manager, Power System Services              |  |
|                           | Mr Terry Mohn       | General Manager, Advanced Microgrid Developments    |  |
|                           | Mr Mike Houlahan    | General Manager, Commercial Services and Finance    |  |
|                           | Mr Mark Peterson    | General Manager, Consumer Energy                    |  |
|                           | Mr Guy Chalkley     | Chief Executive Officer                             | Western Power                              |
|                           | Mr Ben Bristow      | Acting Head of Grid Transformation                  |  |
|                           | Mr Seán McGoldrick  | Executive Manager, Asset Management                 |  |

Appendix Five

|              |                           |   |  |
|--------------|---------------------------|---|--|
| 9 May 2018   | Mr Jason Waters           | Chief Executive Officer   | Synergy  |
|              | Mr Allen Gerber           | Manager, Energy Solutions   |  |
|              | Mr Cameron Parrotte       | Executive General Manager Western Australia                                   | Australian Energy Market Operator                                    |
|              | Mr Martin Maticka         | Group Manager, WA Markets   |  |
|              | Mr Dean Sharafi           | General Manager, System Management  |  |
|              | Dr Natalia Kostecki       | Principal Policy and Market Development Analyst                               |  |
| 16 May 2018  | Professor Ray Wills       | Managing Director   | Future Smart Strategies  |
|              | Mr Warren Pearce          | Chief Executive Officer   | Association of Mining and Exploration Companies                      |
|              | Mr Neil van Drunen        | Policy Officer  |  |
|              | Mr Robert Klug            | Chief Commercial Officer  | Sandfire Resources   |
|              | Mrs Colleen Ferrier       | Sustainability Senior Advisor   |  |
|              | Mr Joe Ostojich           | Deputy Director General, Policy, Planning and Science                         | Department of Jobs, Tourism, Science and Innovation                  |
|              | Professor Lyn Beazley, AO | Member  | WA Technology and Industry and Advisory Council                      |
|              | Ms Michele Clement        | Manager Secretariat   |  |
| 13 June 2018 | Mr Wayne Wood             | Branch Secretary  | Australian Services Union (WA)                                       |
|              | Ms Jill Hugo              | Assistant Branch Secretary  |  |
|              | Ms Tristy Fairfield       | Microgrid Policy and Project Expert (New Projects and Stakeholder Engagement) | Energy Made Clean  |
|              | Mr Paul Azzalini          | Manager, Strategy and Development   | Lendlease  |
| 18 June 2018 | Dr Christopher Jones      | National Secretary  | Australian Electric Vehicle Association Inc                          |
|              | Dr Farhad Shahnia         | Senior Lecturer   | School of Engineering and Information Technology, Murdoch University |
|              | Dr Tania Urnee            | Senior Lecturer   |  |
|              | Dr GM Shafiullah          | Lecturer  |  |

|                 |                            |  |  |
|-----------------|----------------------------|--|--|
|                 | Mr Ian Learmonth           | Chief Executive Officer                            | Clean Energy Finance Corporation                             |
|                 | Ms Samantha Tough          | Non-Executive Director                             |  |
|                 | Mr Simon Brooker           | Executive Director, Corporate and Project Finance  |  |
|                 | Professor Peter Newman, AO | Professor, Sustainability                          | Curtin University  |
|                 | Professor Greg Morrison    | Professor, Sustainable Cities                      |  |
|                 | Mr Tim Walton              | Director Energy Research Initiatives               |  |
|                 | Mr Dermot Costello         | Regional Advisor WA                                | Clean Energy Council   |
|                 | Mr Greg Szozda             | Principal Consultant, Power Generation Engineering | Jacobs Group (Aust) Pty Ltd                                  |
|                 | Mr Jason Greeff            | Lawyer   | PricewaterhouseCoopers Australia                             |
| 20 June 2018    | Dr Ray Challen             | Governing Body Member                              | Economic Regulation Authority                                |
|                 | Mr Paul Kelly              | Executive Director, Regulation and Inquiries       |  |
| 22 August 2018  | Dr Brian Spak              | Leader, Grids and Renewable Energy Integration     | Commonwealth Scientific and Industrial Research Organisation |
| 10 October 2018 | Mr Patrick Creaghan        | Managing Director and Chief Operating Officer      | ATCO Australia   |
|                 | Mr Stevan Green            | President, Gas Division                            |  |
|                 | Mr Steven Lewis            | General Manager, Business Development              |  |
|                 | Ms Elizabeth Aitken        | General Manager, Operations                        | Perth Energy   |
|                 | Mr Patrick Peake           | General Manager, EMR, Regulation                   |  |
|                 | Ms Nicole SanGregory       | Manager, Wholesale Risk and New Products           |  |
| 17 October 2018 | Mr Rodney Littlejohn       | Managing Director                                  | Tersum Energy  |
|                 | Miss Erin Stone            | Energy Economist                                   |  |
|                 | Mr Murray Hadley           | Chair  | Geraldton Community Energy Steering Committee                |

Appendix Five

|                  |                      |  |                                     |
|------------------|----------------------|--|-------------------------------------|
|                  | Mr David Martin      | Managing Director                                | Power Ledger                        |
|                  | Ms Sarah Graham      | Policy Analyst                                   |                                     |
| 31 October 2018  | Mr Laurie Curro      | General Manager, Power System Services           | Horizon Power                       |
|                  | Mr Terry Mohn        | General Manager, Advanced Microgrid Development  |                                     |
|                  | Mr Mark Paterson     | General Manager, Consumer Energy                 |                                     |
| 21 November 2018 | Mr Chris Pattas      | General Manager, Distribution                    | Australian Energy Regulator         |
|                  | Mr Andrew Dillon     | Chief Executive Officer                          | Energy Networks Australia           |
|                  | Mr Stuart Johnston   | General Manager, Network Transformation          |                                     |
|                  | Ms Audrey Zibelman   | Chief Executive Officer                          | Australian Energy Market Operator   |
|                  | Mr Cameron Parrotte  | Executive General Manager Western Australia      |                                     |
|                  | Mr Martin Maticka    | Group Manager, WA Market Operations              |                                     |
| 23 November 2018 | Mr Guy Chalkley      | Chief Executive Officer                          | Western Power                       |
|                  | Mr Michael Crevola   | Chief Financial Officer                          |                                     |
|                  | Mr Seán McGoldrick   | Executive Manager, Asset Management              |                                     |
|                  | Mr Ben Bristow       | Manager, Distribution Grid Strategy              |                                     |
|                  | Mr David Markham     | Manager, DER and Networks Policy                 | Australian Energy Council           |
|                  | Mr Scott Davis       | Policy Advisor WA                                |                                     |
|                  | Ms Michelle Shepherd | Commissioner                                     | Australian Energy Market Commission |
|                  | Ms Anne Pearson      | Chief Executive                                  |                                     |
|                  | Mr Andrew Truswell   | Director, Transmission and Distribution Networks |                                     |
|                  |                      |  |                                     |
| 28 November 2018 | Mr Will Bargmann     | General Manager, Corporate Services              | Synergy                             |
|                  | Mr Jason Froud       | Manager, Policy                                  |                                     |
|                  | Mr Zaeen Khan        | Executive Director                               |                                     |

|                    |                      |  |  |
|--------------------|----------------------|--|--|
|                    | Mr Aden Barker       | Program Director,<br>Wholesale Energy<br>Markets | Public Utilities Office,<br>Department of Treasury |
| 8 November<br>2019 | Mr Stephen<br>Edwell | Chair  | Energy Transformation<br>Taskforce                 |
|                    | Ms Kate Ryan         | Acting Executive<br>Director                     | Energy Policy WA                                   |



## Appendix Six

### Closed hearing

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| Date         | Name            | Position                            | Organisation                   |
|--------------|-----------------|-------------------------------------|--------------------------------|
| 18 June 2018 | Mr Tony Stocken | Senior Business Development Manager | Tesla Motors Australia Pty Ltd |
|              | Ms Emma Fagan   | Energy Policy                       |                                |





# Appendix Seven

## Required system services and technologies to provide them<sup>546</sup>

| Service description              |  |                                      | Supply side           |                        |                          | Network                 |  |   | Demand side             |                 |   |
|----------------------------------|--|--------------------------------------|-----------------------|------------------------|--------------------------|-------------------------|--|---|-------------------------|-----------------|---|
| System Attribute                 | Requirement  | Service                              | Special level of need | Centralised generation | Transfer between regions | Transfer within regions | Stabilising devices                                  | Load                                      | Decentralised resources |                 |   |
|                                  |  |                                      |                       | Synchronous generator  | DC interconnection       | AC interconnection      | Grid reactor, grid capacitor, static VAR compensator | Large industrial, residential, commercial | Solar PV                | Battery storage |   |
| Resource adequacy                | Provision of sufficient supply to match demand from customers            | Bulk energy                          | System wide           | ●                      | ↑                        | ↑                       | ○  | ●   | ●                       | ●               |   |
|                                  | Capability to respond to large continuing changes in energy requirements | Strategic reserves                   | System wide           | 2a                     | ↑                        | ↑                       | ○  | ●   | 2b                      | 2b              |   |
| Frequency management             | Services to transport energy generated to customers                      | Operating reserves                   | System wide           | 2b                     | ↑                        | ↑                       | ○  | ●   | 2b                      | 2b              |   |
|                                  | Ability to set frequency   | Transmission & distribution services | Local                 | ●                      | ●                        | ●                       | ●  | ●   | 4                       | ●               | ● |
|                                  |  | Grid formation                       | Regional              | ●                      | 5                        | 5                       | ○  | ○   | ○                       | ○               | 5 |
|                                  | Voltage management   | Inertial response                    | Local response        | Regional               | ●                        | 6                       | 6  | ↑   | 7                       | ○               | 6 |
| Maintain frequency within limits |  | Primary frequency control            | Regional              | ●                      | 9                        | 9                       | ↑  | ○   | ○                       | 9               |   |
|                                  |  | Secondary frequency control          | Regional              | ●                      | 9                        | 9                       | ↑  | ○   | ○                       | 9               |   |
| System restoration               |  | Tertiary frequency control           | Regional              | ●                      | 9                        | 9                       | ↑  | ○   | ○                       | 9               |   |
|                                  | Fast response voltage control  | Local response                       | Local                 | ●                      | ○                        | ○                       | ○  | ○   | ○                       | ○               |   |
|                                  |  | Slow response voltage control        | Local                 | ●                      | ○                        | ○                       | ○  | ○   | ○                       | ○               |   |
|                                  | System strength  | Local                                | ○                     | ○                      | ↑                        | ○                       | ○  | ○   | ○                       | ○               |   |
| System restoration               | System restart services  | Local                                | ●                     | 10                     | 10                       | ↑                       | ○  | ○   | ○                       | 10              |   |
|                                  | Load restoration   | Local                                | ●                     | ○                      | ○                        | ○                       | ○  | ○   | ○                       | ○               |   |



Note: Qualifications are suggestive of the general ability of each technology type. The extent to which technologies can provide each service must be assessed for the specifics of each individual system.

1 This includes generation with ability to operate in synchronous condenser mode.  
 2a While many synchronous generators can provide energy reserves, some less than technologies like thermal or pumped hydro storage) will be limited by the amount of energy storage they include.  
 2b While many synchronous generators can provide energy reserves, some less than technologies like thermal or pumped hydro storage) will be limited by the amount of energy storage they include.  
 3a Limited by duration for which service can be delivered.  
 3b Limited by duration for which service can be delivered; existing controllability is limited.  
 4 The provision of local voltage support from generators and loads can improve the network transfer capability near their respective connection points.  
 5 Grid forming power electronic converters are available and have been proven on small power systems. Development of grid forming converters for large power systems is an emerging area of international research.  
 6 Some fast frequency response capabilities can provide emulated inertia response, but are not yet proven as a total replacement for synchronous inertia.  
 7 Static synchronous compensators with energy storage devices are being trialled as an emerging provider of inertial response.  
 8 Except for load relief.  
 9 Includes fast frequency response capabilities.  
 10 System restoration services from variable non-synchronous generators is an emerging area of international research, if they are grid capable, batteries are likely to provide some system restoration support.

546 Australian Energy Market Operator, *Power System Requirements*, March 2018, p. 21.



## Appendix Eight

### Glossary

| Term                           | Description  |
|--------------------------------|--|
| ACOSS                          | Australian Council of Social Service   |
| AEMC                           | Australian Energy Market Commission  |
| AEMO                           | Australian Energy Market Operator  |
| BCEC                           | Bankwest Curtin Economics Centre   |
| COAG                           | Council of Australian Governments  |
| CPUC                           | California Public Utilities Commission   |
| CSIRO                          | Commonwealth Scientific and Industrial Research Organisation   |
| DSS                            | Dispatch Support Service   |
| DER                            | distributed energy resource/s (e.g. solar PV panel)  |
| DNSP                           | distribution network service provider  |
| India Inquiry                  | Economics and Industry Standing Committee, Inquiry into Western Australia's economic relationship with the Republic of India   |
| ECA                            | <i>Electricity Corporations Act 2005</i>   |
| EIA                            | <i>Electricity Industry Act 2004</i>   |
| ENAC                           | <i>Electricity Networks Access Code 2004</i>   |
| Energy Transformation Strategy | Government of Western Australia, <i>Energy Transformation Strategy: A brighter energy future, 2019</i>   |
| ERA                            | Economic Regulation Authority  |
| EV                             | Electric drive vehicle/electric vehicle  |
| Finkel Report                  | Dr Alan Finkel AO, Karen Moses FAICD, Chloe Munro, Terry Effeney and Professor Mary O'Kane AC, <i>Independent Review into the Future Security of the National Electricity Market: Blueprint for the Future, June 2017.</i> |
| Finkel Review                  | The independent review of the NEM commissioned by COAG energy ministers. The review was conducted by Dr Alan Finkel AO, Australia's Chief Scientist, in conjunction with an independent Expert Panel.                      |
| GTE/s                          | Government Trading Enterprise/s  |
| the GTEs                       | Western Power, Synergy and Horizon Power   |
| Hz                             | hertz  |
| HUGS                           | Government of Western Australia, Hardship Utility Grants Scheme  |

| Term               | Description   |
|--------------------|---|
| ICT                | information and communications technology   |
| IMA                | International Microgrids Association  |
| IMO                | Independent Market Operator   |
| IPPs               | Independent Power Producers   |
| Interim Report     | Economics and Industry Standing Committee, <i>Implications of a Distributed Energy Future: Interim Report</i> , April 2019, tabled on 11 April 2019 |
| LFAS               | Load Following Ancillary Services   |
| LRRAS              | Load Rejection Reserve Ancillary Services   |
| MW                 | megawatt/s  |
| MWh                | megawatt hours  |
| NEM                | National Electricity Market   |
| NPS/s              | network service provider/s  |
| NWIS               | North West Interconnected System  |
| prosumer           | individual electricity consumer who also produces power back into the network   |
| PV                 | photovoltaic  |
| P2P                | peer-to-peer  |
| RCM                | Reserve Capacity Mechanism  |
| SAPS               | stand-alone power system/s  |
| SCADA              | supervisory control and data acquisition  |
| Short-Stay Inquiry | Economics and Industry Standing Committee, Inquiry into Short-Stay Accommodation  |
| SoLR               | supplier of last resort   |
| SRS                | System Restart Service  |
| SWIS               | South West Interconnected System  |
| Taskforce          | Government of Western Australia, Energy Transformation Taskforce  |
| VESC               | Government of Victoria, Essential Services Commission   |
| VPP/s              | virtual power plant/s   |
| WA                 | Western Australia   |
| WACOSS             | Western Australian Council of Social Service  |
| WEM                | Wholesale Electricity Market (WEM)  |
| WOSP               | Government of Western Australia, Whole of System Plan   |



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INNOVATION CENTRAL MIDLANDS WA

**WEROC**  
**KELLERBERRIN**

**RENEWABLE ENERGY**  
**AND**  
**DIGITAL CONNECTIVITY**

*26 FEBRUARY 2020*





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# “PROJECT WHEATBELT”

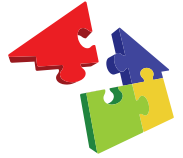
## Shires of Dandaragan, Dalwallinu, Moora, Victoria Plains and Wongan-Ballidu

**Deploying commercially attractive renewable energy solutions to prove up a new model for rural power supply provision that delivers rural economic development, improved consumer outcomes and community value that grows over time.**





# INTENDED OUTCOMES

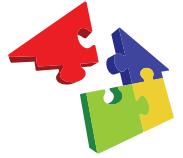


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- More **RELIABLE** energy
- **CHEAPER** energy
- **GREENER** energy
- **FINANCIAL RETURN** to the Association (and relevant communities)



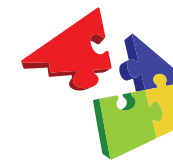
# STATUS



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- **Shell:**
  - Only working with ICM because of the representation and focus on three shires working together
    - Shires of Dalwallinu, Moora and Wongan-Ballidu.
  - Feasibility study – **in progress**
    - Considering the viability of creating an “embedded network” (behind the meter) in the shires of Dandaragan, Dalwallinu, Moora, Victoria Plains and Wongan-Ballidu
    - Proposed 17 sites for microgrids (solar and batteries)
- **Wongan Hills Trial: completed**
- **Western Power – slow progress**
  - Series of Parliamentary reviews underway
  - Require an “Exemption Order”





## Wongan Hills trial:

- Peer to peer trading
- Successful outcome and positive feedback from participants – **average savings of 27%**
- Great support from BSC Solar, Power Ledger, CleanTech Energy and Sonnen.

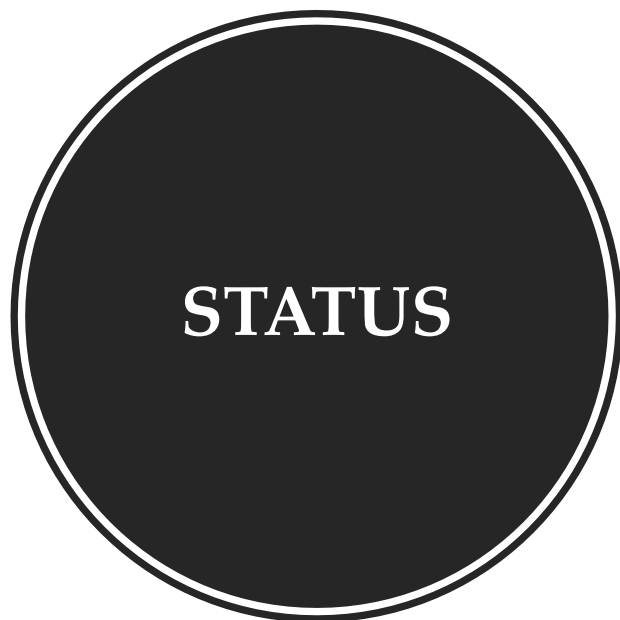
STATUS

| Customer      | Tariff Cost         | Actual Cost         | Savings             |
|---------------|---------------------|---------------------|---------------------|
| Wongan 1      | \$ 4,253.42         | \$ 3,464.22         | \$ 789.19           |
| Wongan 2      | \$ 8,288.91         | \$ 6,915.77         | \$ 1,373.14         |
| Wongan 3      | \$ 8,602.64         | \$ 7,122.09         | \$ 1,480.55         |
| Wongan 4      | \$ 1,865.63         | \$ 1,594.56         | \$ 271.07           |
| Wongan 5      | \$ 5,789.91         | \$ 4,479.79         | \$ 1,310.12         |
| Wongan 6      | \$ 8,217.00         | \$ 6,173.68         | \$ 2,043.32         |
| Wongan 7      | \$ 6,313.72         | \$ 3,800.60         | \$ 2,513.12         |
| Wongan 8      | \$ 7,573.23         | \$ 4,889.88         | \$ 2,683.34         |
| Wongan 9      | \$ 4,837.66         | \$ 3,416.35         | \$ 1,421.32         |
| Wongan 10     | \$ 8,972.56         | \$ 5,620.44         | \$ 3,352.11         |
| <b>TOTALS</b> | <b>\$ 64,714.67</b> | <b>\$ 47,477.38</b> | <b>\$ 17,237.29</b> |





## Lost opportunity/revenue:



| Customer  | kWh Lost to grid | Lost revenue (\$) |
|-----------|------------------|-------------------|
| Wongan 1  | 823.89           | 114.69            |
| Wongan 2  | 1730.21          | 240.85            |
| Wongan 3  | 888.93           | 123.74            |
| Wongan 4  | 1053.76          | 146.68            |
| Wongan 5  | 2295.78          | 319.57            |
| Wongan 6  | 3402.94          | 473.69            |
| Wongan 7  | 0.00             | 0                 |
| Wongan 8  | 0.00             | 0                 |
| Wongan 9  | 210.53           | 29.31             |
| Wongan 10 | 0.00             | 0                 |
| TOTALS    | 10,406.05        | 1,448.52          |

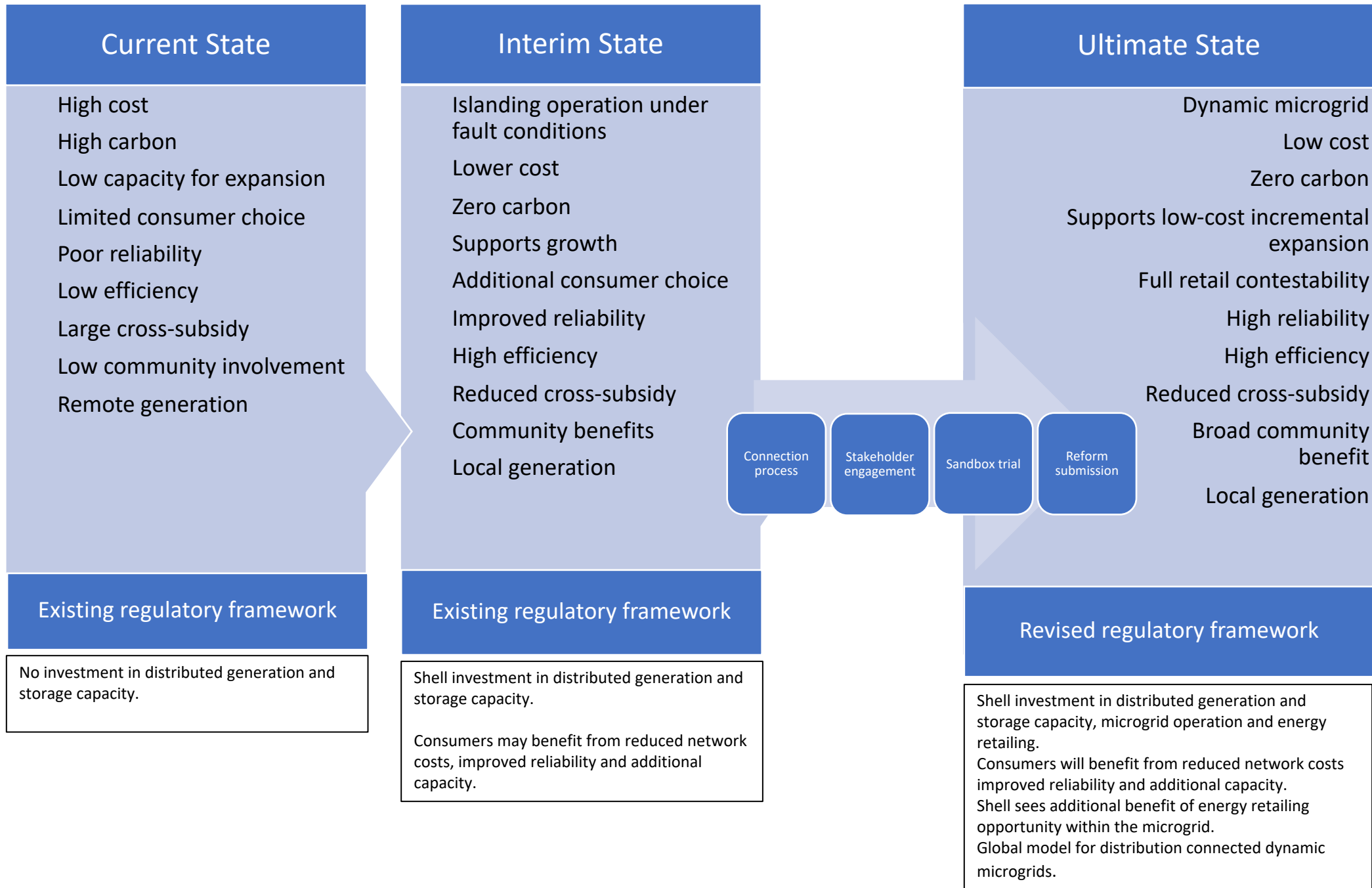


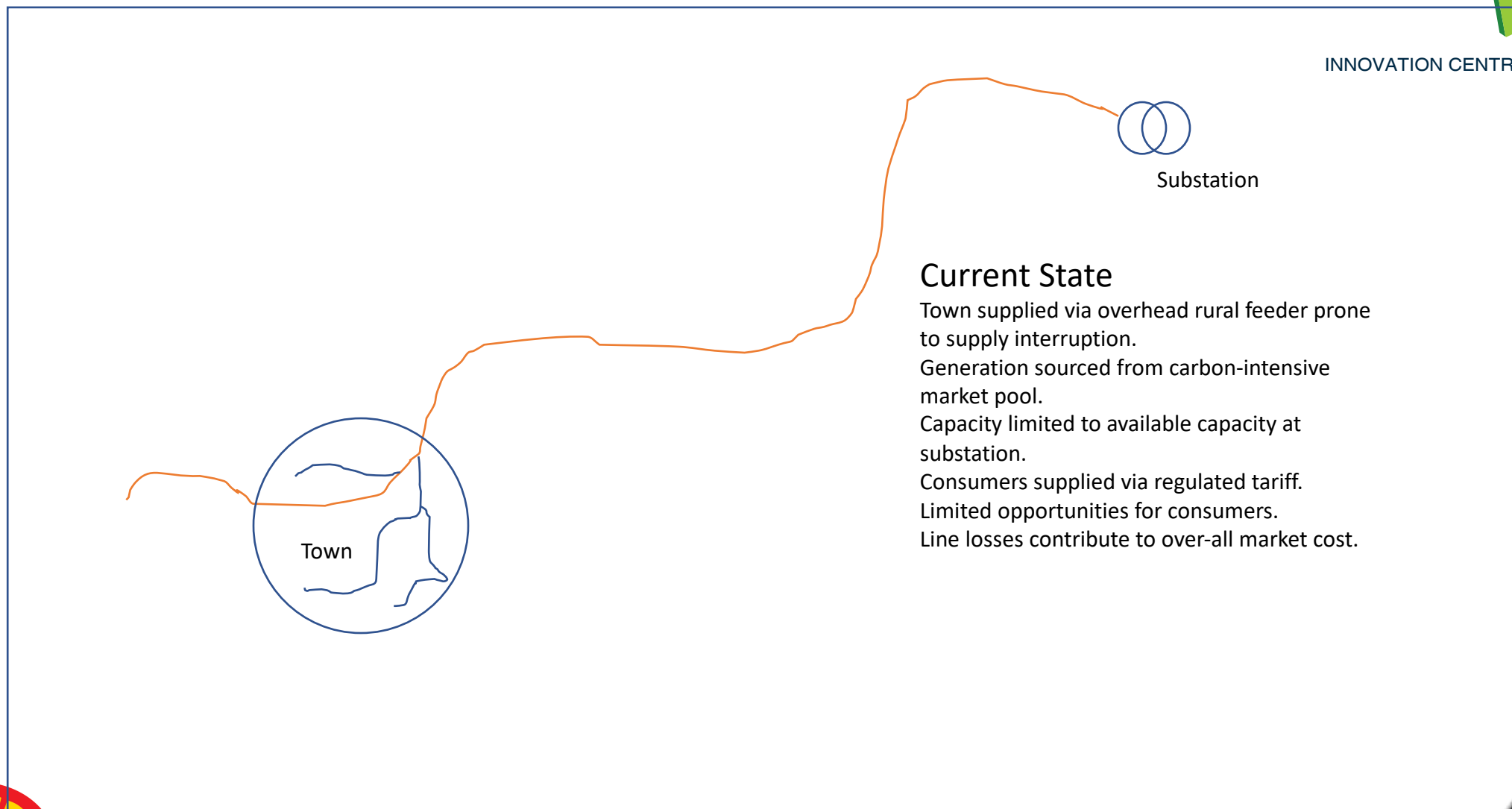


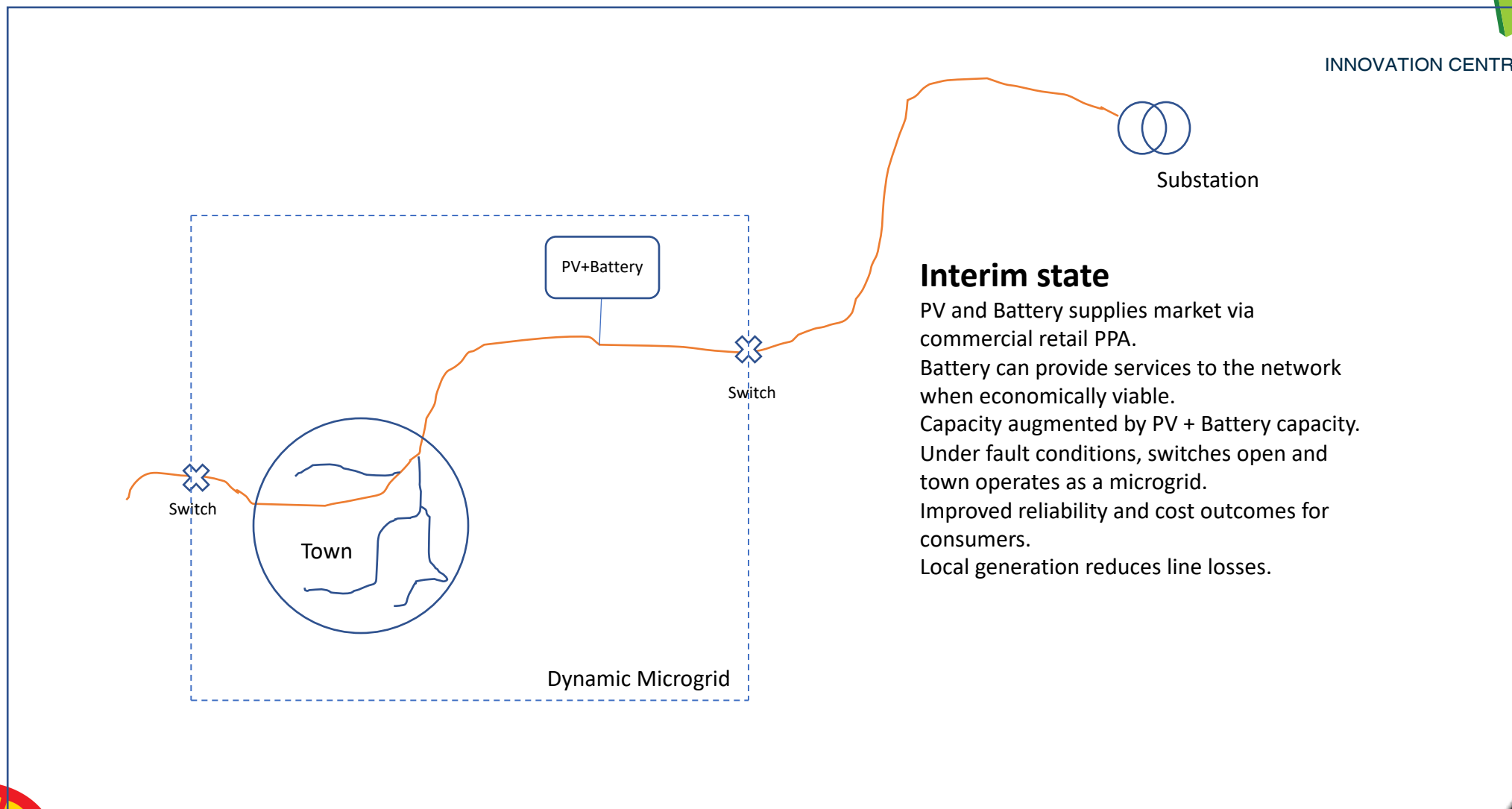
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# CURRENT STATE OF PLAY TO THE ULTIMATE SCENARIO/STATE







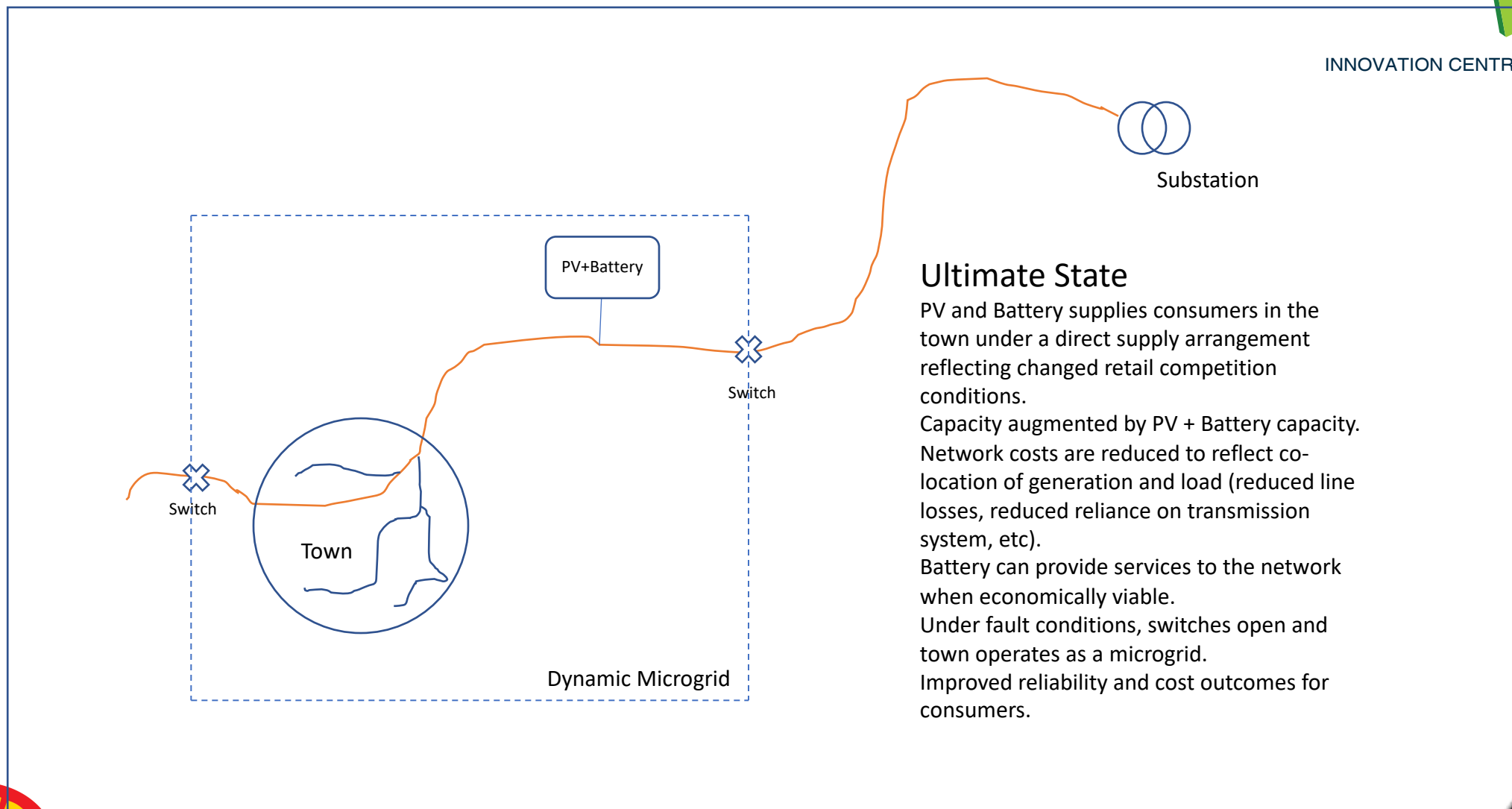


### Interim state

PV and Battery supplies market via commercial retail PPA.  
Battery can provide services to the network when economically viable.  
Capacity augmented by PV + Battery capacity.  
Under fault conditions, switches open and town operates as a microgrid.  
Improved reliability and cost outcomes for consumers.  
Local generation reduces line losses.



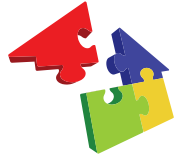




### Ultimate State

PV and Battery supplies consumers in the town under a direct supply arrangement reflecting changed retail competition conditions.  
Capacity augmented by PV + Battery capacity.  
Network costs are reduced to reflect co-location of generation and load (reduced line losses, reduced reliance on transmission system, etc).  
Battery can provide services to the network when economically viable.  
Under fault conditions, switches open and town operates as a microgrid.  
Improved reliability and cost outcomes for consumers.





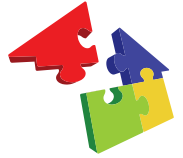
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# CURRENT “DIRECTION”

- Given the current legislation (and in the interests of timing and momentum), ICM has agreed (with Shell) to work on the viability of the “**Interim State**”.
  - Taking the Wongan Hills trial and expanding it to include the other shires (Shire of Dandaragan – includes the towns of Badgingarra and Dandaragan).



# CHANGES TO THE ENERGY ACT?



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- “Energy Transformation Strategy” – March 2019
- Economics and Industry Standing Committee – “Taking Charge: Western Australia’s Transition To a Distributed Energy Future” - microgrid inquiry:
  - Microgrids, embedded networks and solar PPAs are not aligned with the current regulatory framework.
  - Rooftop solar (in the city) is creating a “headache” for the Australian Energy Market Operator (AEMO).
  - The inquiry not addressed the issue of “pricing” (covers the cost of infrastructure).
  - Current regulatory framework is not supporting innovation and changing technology.
  - The Transformation Strategy is considering the changes required to support the market.





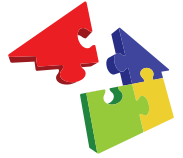
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# CHALLENGES

- Too many solar panels – disruption to the grid/“Incentive Scheme”
- Legislative change or exemptions from the Energy Minister.
- Synergy and other retailers – the need for competition
- Finding suitable affordable land for microgrids
- Making the financial numbers “stack up” e.g. “Project Wheatbelt”
- Contestability of businesses
  - Support from the businesses (to change) and eventually residential markets
  - **Which of your local government assets are contestable?**



# CHALLENGES



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- Lack of knowledge and understanding of the energy market
- Potential changes to the Energy Act and the Minister's reluctance to approve "exemptions".
- Changes to the electricity tariffs.
- Cost of batteries for storage
- The current "system" is not keeping pace with the rapid changes in technology.





INNOVATION CENTRAL MIDLANDS WA

# WA SuperNet

- **\$160M** project covering the Grainbelt.
- ICM led and supported by Arc Infrastructure (expenditure of **\$1.5M** + in-kind support).
- WA SuperNet Pty Ltd – not for profit company
- RFP due to DPIRD – 28 February 2020
- EOI to telcos – March 2020
- RFT – telcos and infrastructure providers – 2020
- Proposed Outcomes:
  - Faster Broadband, unlimited data, increased reliability, competition (last mile)
  - Mobile network/s to rival the incumbent

