



Public Utilities Office

Market Design and Operation Working Group - Meeting 1

DATE/TIME: 20 February 2019 – 9:30-11am

LOCATION: 2 Albert Facey House, 469 Wellington Street, Perth

Item no.	Agenda Item	By Whom	Time
ITEMS FOR DISCUSSION			
	<b>Ground Rules</b>		
1.	<b>WEM Reform Program Overview</b> <ul style="list-style-type: none"><li>Basis for reform</li><li>WEM Reform work streams and process</li></ul>	PUO	20 mins
2.	<b>Quantifying the benefits of Reform</b> <ul style="list-style-type: none"><li>Proposed benefits and costs</li><li>Modelling approach</li><li>Implementation</li></ul>	SAPERE	20 mins
3.	<b>Foundational market design features</b> <ul style="list-style-type: none"><li>Approach</li><li>Core and Complementary design proposals</li><li>Other market features</li></ul>	PUO	20 mins
4.	<b>Forward schedule for MDOWG papers</b>	PUO	10 mins



Government of **Western Australia**  
Department of **Treasury**

# Market Design and Operations Working Group

Meeting 1: 20 Feb 2019



# GROUND RULES

- There is a large amount of material to work through in the workshop today, and the session chair will try to keep us on time in order to have sufficient time for discussion
- Should it not be possible to get through all the material within the available workshop time, a second session may be scheduled depending on the amount of material remaining and availability of attendees, or alternatively feedback may be provided out of session
- We will attempt to capture all questions/answers discussed during the session today, for circulation after the workshop along with these slides
- Consultation papers are planned to be released following discussion process at working group meetings seeking industry feedback
- All feedback/discussion is relevant, if attendees do not have a chance to ask a question or raise an issue, please feel free to contact [marketdesign.wg@treasury.wa.gov.au](mailto:marketdesign.wg@treasury.wa.gov.au)

# **AGENDA ITEM 1**

## **WEM REFORM PROGRAM OVERVIEW**

**ADEN BARKER  
PROJECT DIRECTOR WEM REFORM**



Government of **Western Australia**  
Department of **Treasury**

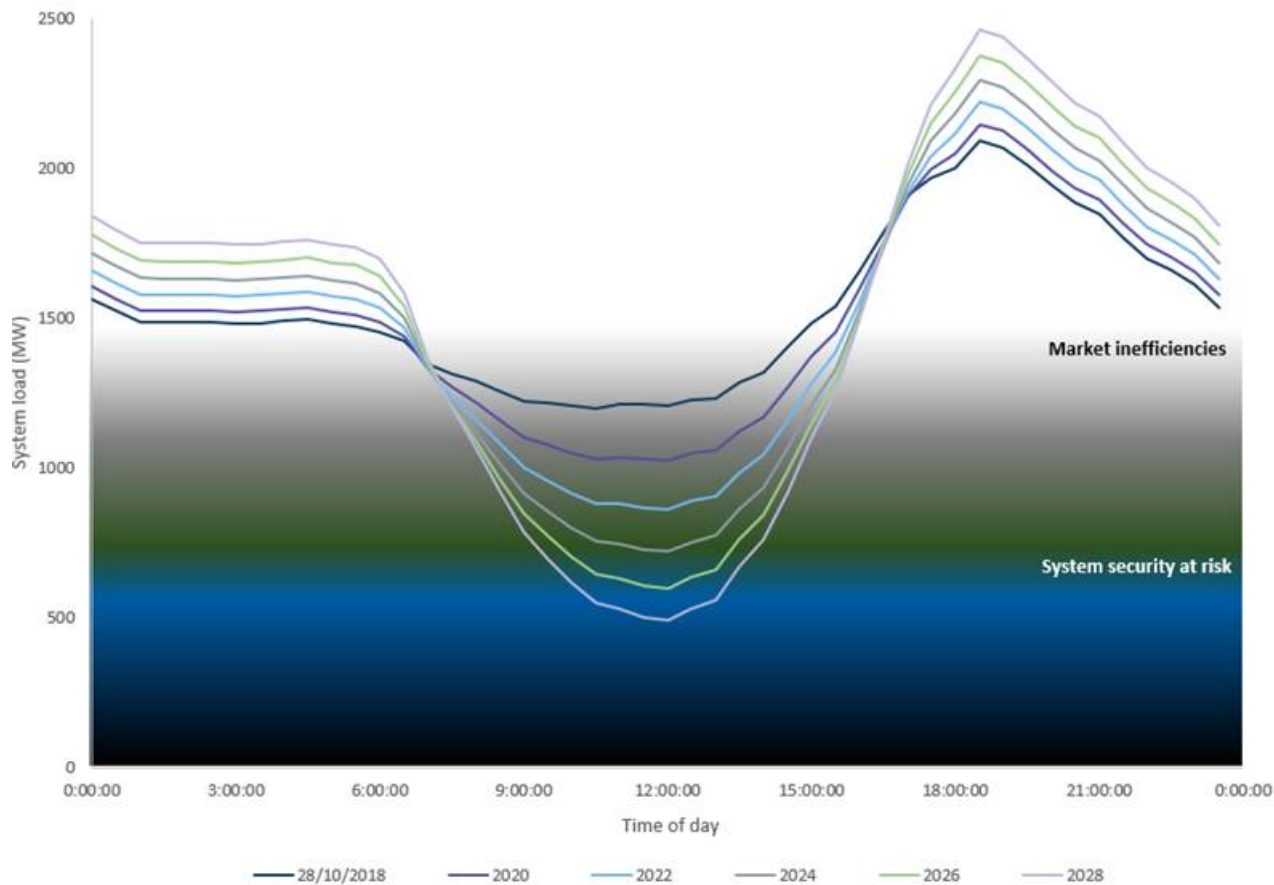
# Wholesale Electricity Market Reform Program Overview

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# WHY WEM REFORM?

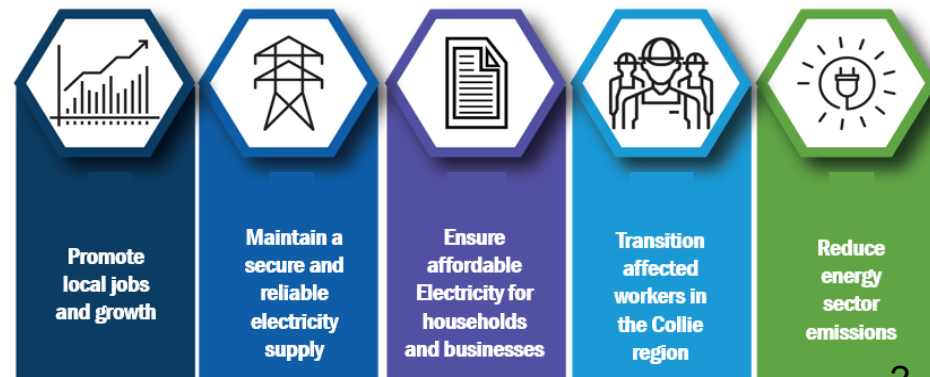
The power system is changing rapidly ...



# WHY WEM REFORM?

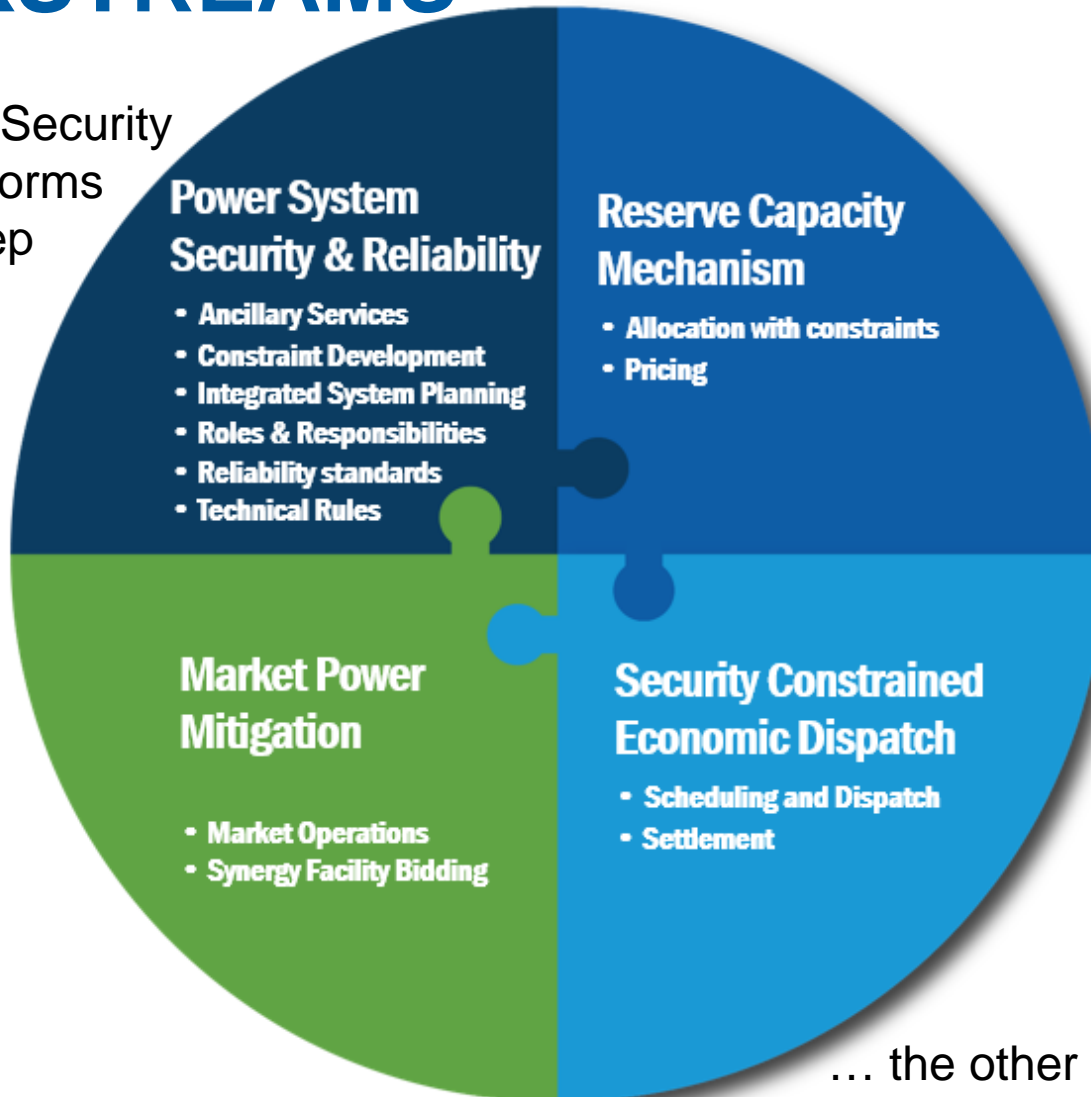
- Power system security and reliability standards, and the services and governance that support them, need to be redefined and updated.
- Over the medium-term, failure to enact timely reform poses a risk to:
  - Security and reliability of supply;
  - Reduced electricity sector emissions;
  - Customer choice to install solar PV and batteries; and
  - Electricity affordability.

Reform consistent with Government Energy Policy Framework ...



# WEM REFORM PROGRAM WORKSTREAMS

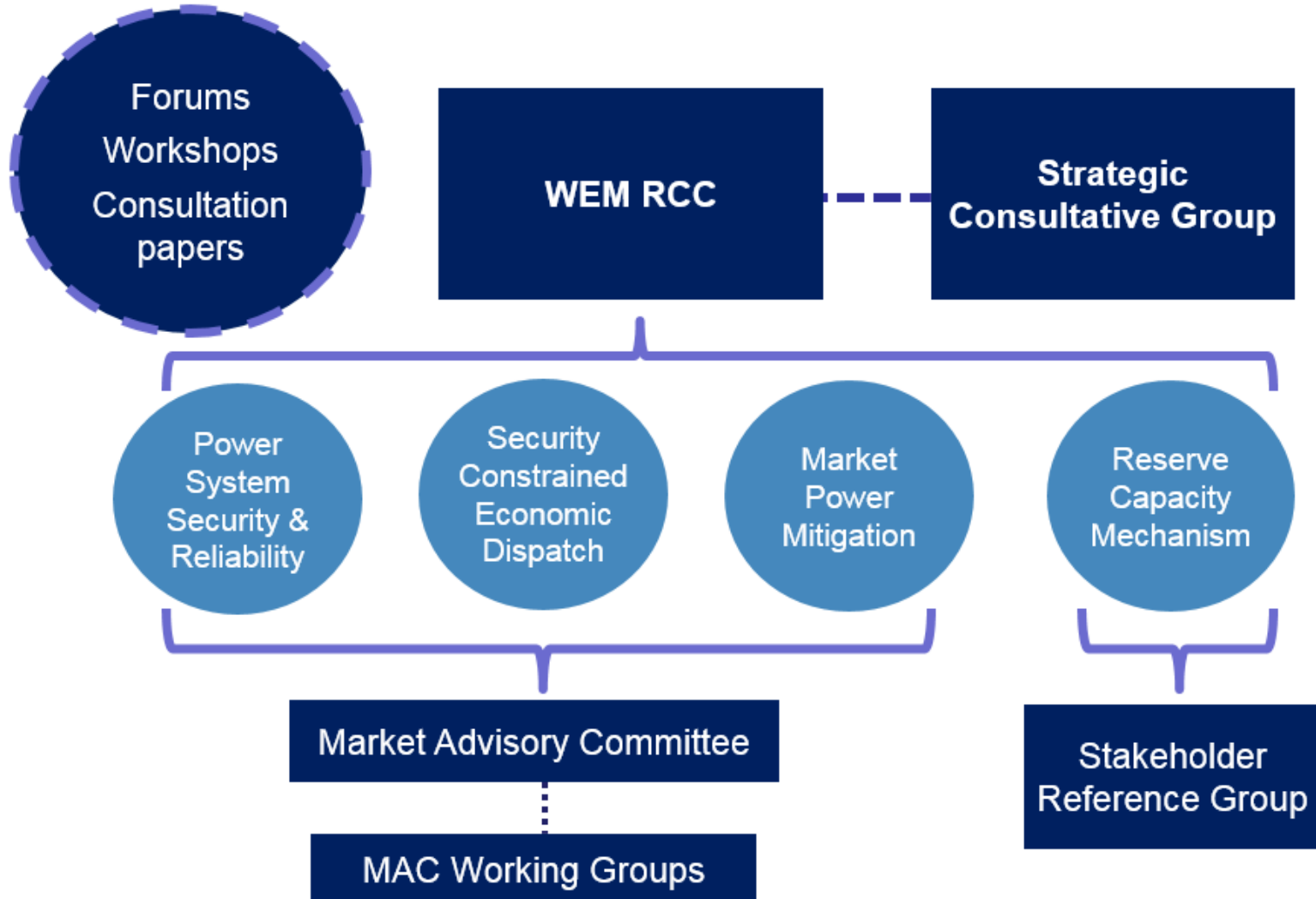
Power System Security  
& Reliability reforms  
required to 'keep  
the lights on'...



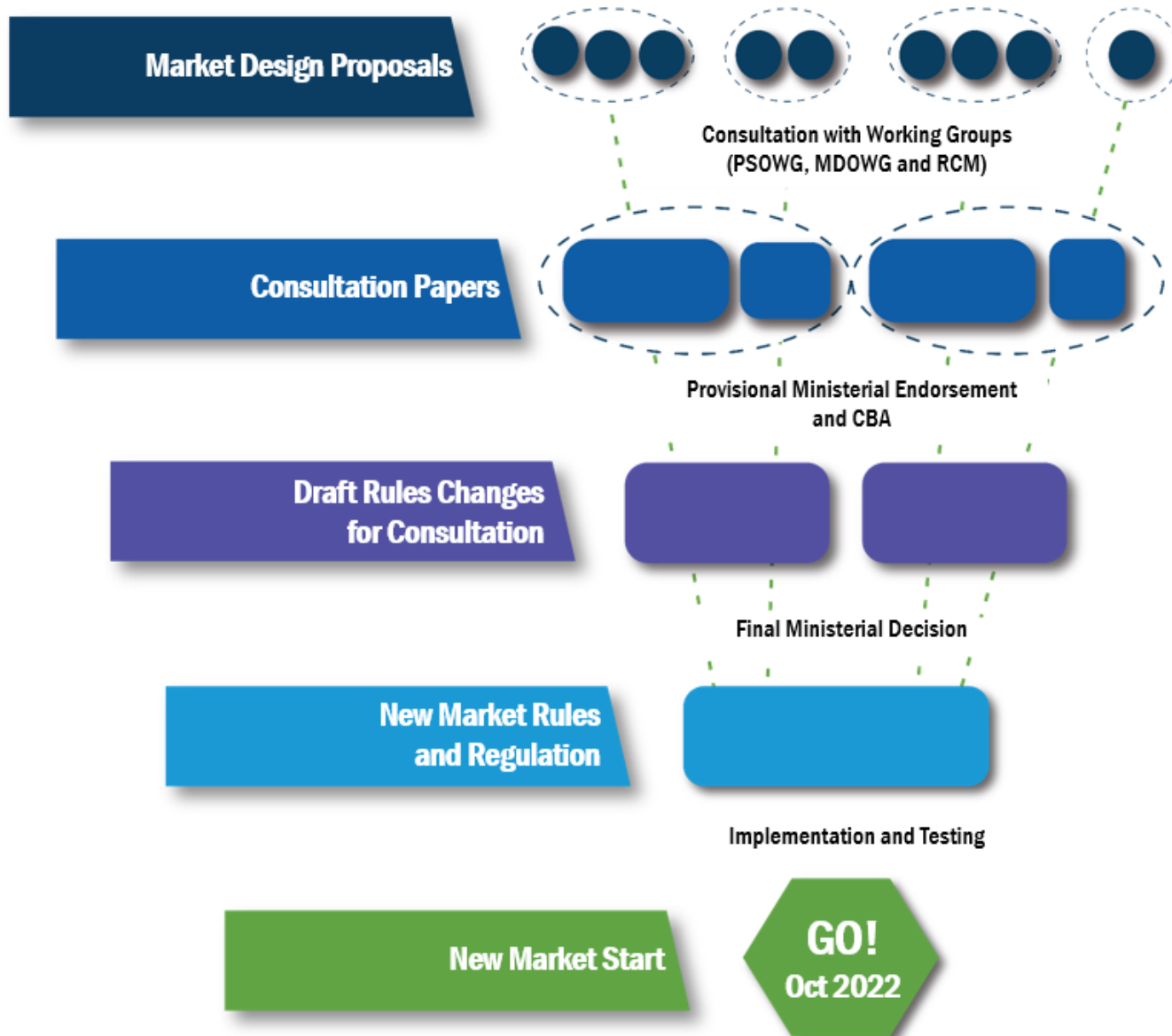
... the other reforms are required  
to make sure we can afford it. 3



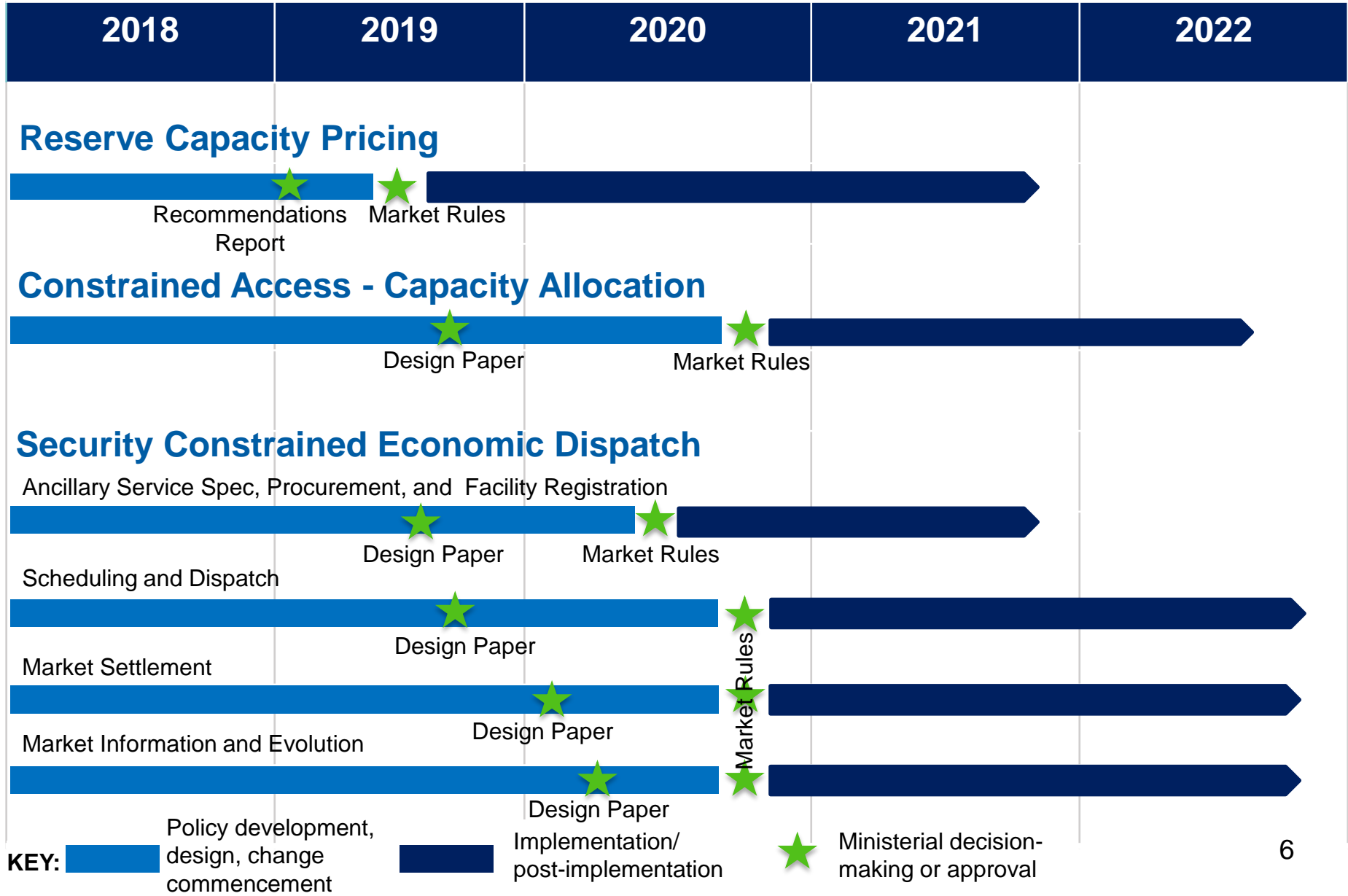
# STAKEHOLDER CONSULTATION



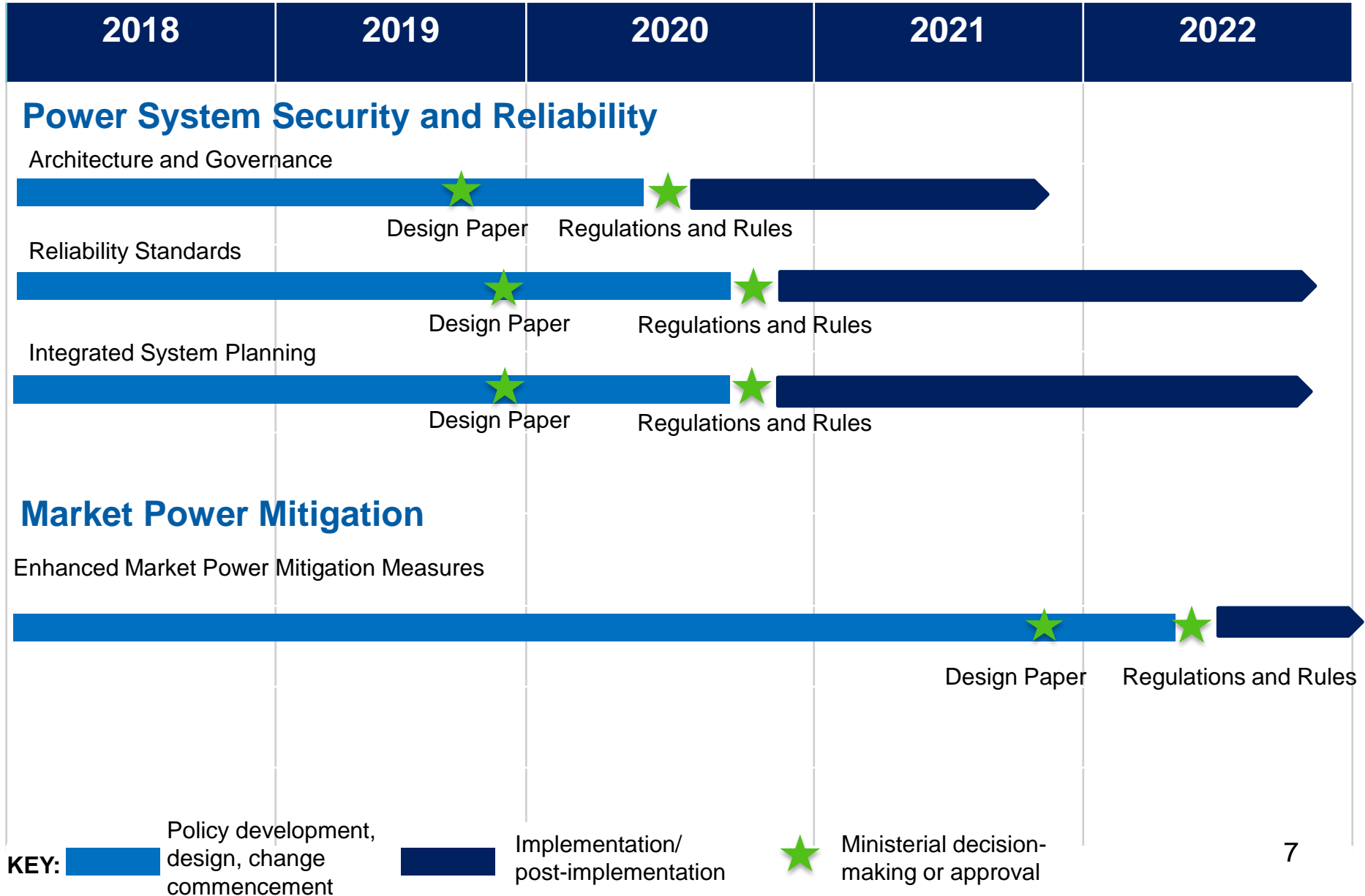
# WEM REFORM PROCESS



# MINISTERIAL DECISIONS AND APPROVALS



# MINISTERIAL DECISIONS AND APPROVALS



# **AGENDA ITEM 2**

# **QUANTIFYING THE BENEFITS OF REFORM**

**SIMON ORME  
SAPERE RESEARCH GROUP**



Government of **Western Australia**  
Department of Treasury



# Quantifying the benefits of reform

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# CONTENTS

1. Why quantify reform benefits and costs?
2. Proposed assessment criteria
3. Main assessment components
4. Options
5. Modelling overview
6. Identifying benefits and costs
7. Implementation

# NEED FOR REFORM ASSESSMENT

## Statutory requirement

- Proposed rule changes (as subsidiary regulation) must be assessed against the statutory objectives (WEM objectives) in the head of power (Electricity Industry Act 2004).
- Are proposed changes consistent with the Act?

## Economic and stakeholder impacts

- *Stakeholders emphasise need to demonstrate an economic net benefit, inclusive of risk and uncertainty*
  - *Can reform costs be funded by consumers?*
  - *Can reform costs be financed by participants?*

## Financeability

Capital and ongoing operating expenditure

- Financed by market participants
- Significant share financed by Synergy (hence State budget)

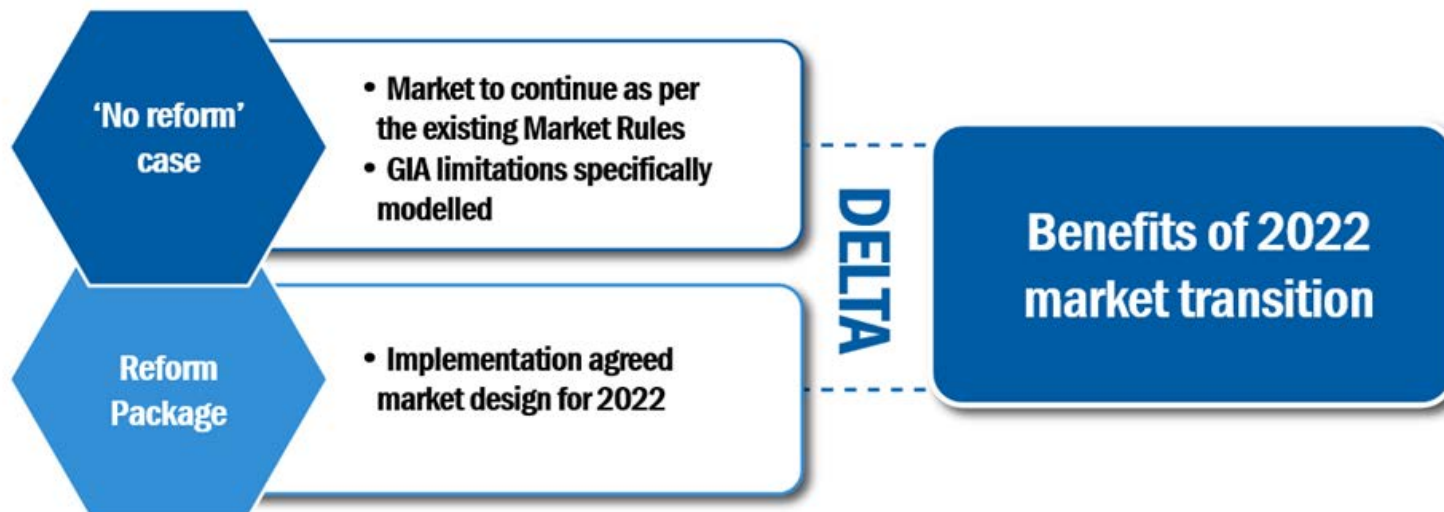


# ASSESSMENT COMPONENTS

1. Definition of policy objectives
  - WEM objectives and stated government policy objectives
2. Problem definition
  - Extent objectives not delivered in past/future
3. Options identification
  - Summation of option definition outcomes from design papers
4. Impact assessment (economic and stakeholder)
  - Define baseline
  - Identify and quantify where possible benefits and costs
  - Identify stakeholder impacts (not economic benefits/costs)
  - Metrics for ex – post review of reform
5. Consultation
  - Summarise matters raised and how addressed
6. Overall assessment
  - Net benefit, after risk and uncertainty?

# OPTION DEVELOPMENT

- All reform streams in scope
- Detail of reform case developed over a series of market design papers open to consultation
- All costs and benefits incremental to a defined (no reform) baseline case.
  - Quantification of difference in economic outcomes between reform and no reform cases



# PROPOSED BENEFITS AND COSTS

## Benefits

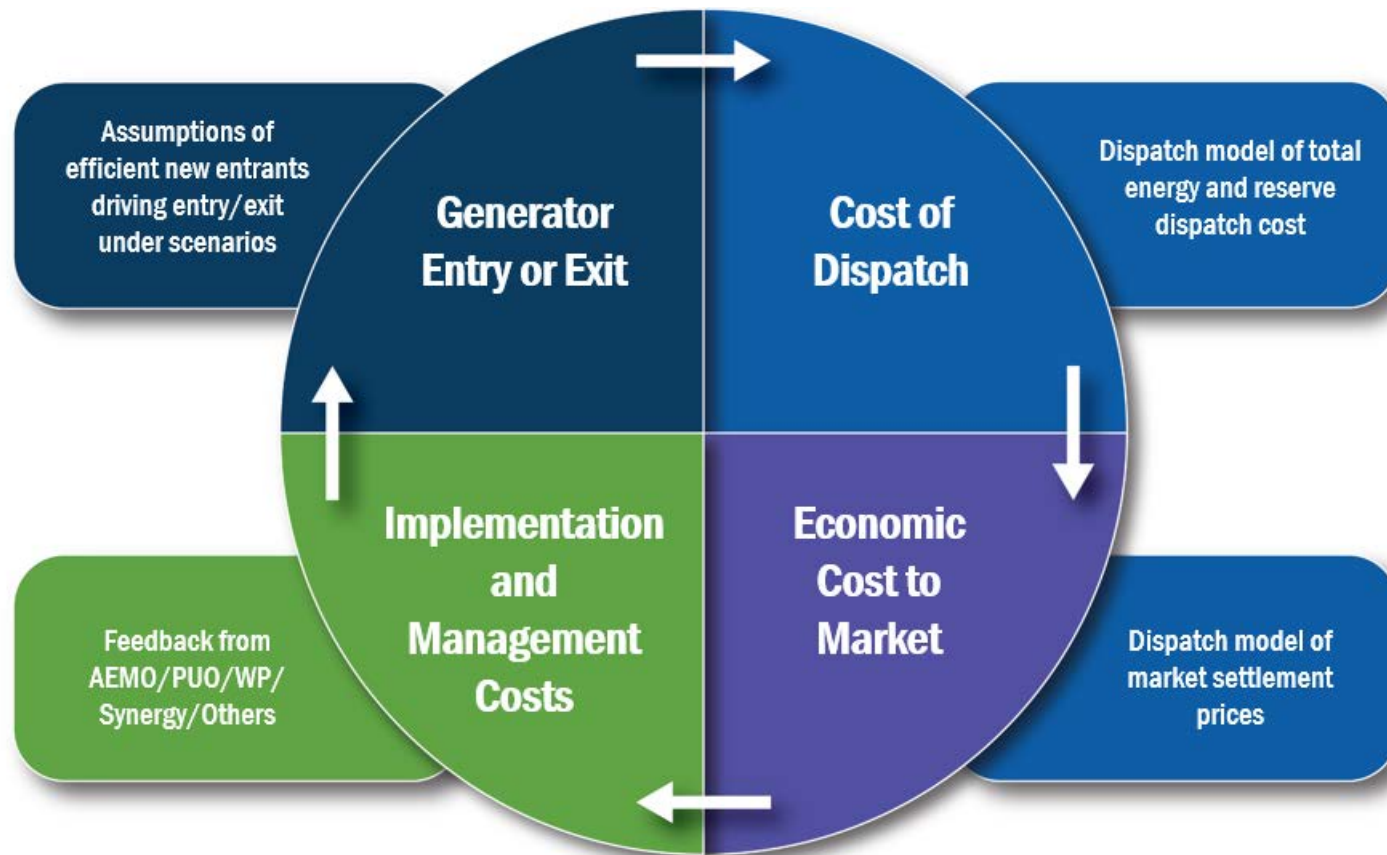
1. Optimizing the current generation fleet – facility bidding and energy and non-energy (e.g. frequency control) co-optimization
2. Optimizing the fleet mix – efficient entry and exit
3. Reliability (value of customer reliability)
4. Greenhouse gas emissions reduction
5. Transaction costs of operating the WEM reduced (reduced risk and cost)

## Costs

1. Transition costs (up to and say 1 year after go-live)
2. Ongoing costs (thereafter)
  - *All relative to a defined baseline (which may not be static)*
  - *Forward looking, economic, costs and benefits (not a financial CBA)*
  - *Stakeholder impacts considered e.g. customer price outcomes*

# MODELLING APPROACH

- The modelling approach is in development
- Main elements indicated below



# IMPLEMENTATION

- Proposed assessment framework applies to entire reform process
  - Benefit and costs identified in market design consultation papers, alongside drivers
  - Preliminary economic assessments of detailed design choices (e.g. settlement) over Q2-Q3, 2019
  - Qualitative with quantification where possible (e.g. data) but very provisional and subject to change in Q4, 2019 assessment
- Implications for overall assessment process
  - Provisional assessment of relative merits of alternative market design choices in design consultation papers (necessarily limited including due to interactions between components of market design)
  - Provisional assessments liable to change – e.g. new insights or data from stakeholders in response to market design consultation papers
  - Assessment using inputs from consultation (circa Q4,2019) precedes any recommendations to Minister on market design choices for any given topic

# **AGENDA ITEM 3**

## **FOUNDATIONAL MARKET DESIGN FEATURES**

**ADITI VARMA**

**MANAGER, WEM REFORM**



Government of **Western Australia**  
Department of **Treasury**

# Proposed Market Design Features

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# APPROACH

- PUO's 2016 *Final Design Recommendations for Wholesale Energy and Ancillary Service Market Reform paper* used as starting point
- Previous design features were reviewed in the current context for their continued validity and relevance
- Industry feedback since taken into consideration
- Design features deemed still relevant form the basis of this paper



# GUIDING PRINCIPLES

All design features:

- measured against WEM objectives
- Fit-for-purpose for WEM, learning from best practice approaches in other jurisdictions
- Align control and responsibility for market outcomes to empower entities able to effect an outcome to do so
- Avoid unnecessary cost impost and administrative/regulatory burden
- consider practicality of implementation
- Avoid complexity if no demonstrable benefit
- Improve transparency of information and outcomes

# CORE DESIGN FEATURES

- Security-constrained economic dispatch
- Individual facility bidding and dispatch
- Co-optimisation of energy and ancillary services

Supported by:

- Reduced gate closure
  - Stagger implementation from 30 mins to 0?
- 5 min dispatch interval
- Ex ante pricing
- Self commitment



## **Other Design Features**

# NETWORK MODEL USED IN DISPATCH

- Choice driven by desire to quantify and publish cost of network congestion
- Practicality and time of implementation create limitations
- Models:
  - Hub-and-spoke
    - single zone with single price (current WEM);
    - multiple zones with zonal prices (e.g. NEM);
    - multiple zones and single price
  - Nodal model (previously not supported)

*Should a multi-zonal network model be pursued for the new market?*

# REFERENCE NODE AND MARKET PRICE

- Single reference node at Southern Terminal
  - propose early rule change
  - consequential changes to transmission marginal loss factors
- Single market price
  - previously supported as opposed to complexity introduced from locational pricing

*Are there any material concerns with an early rule change to implement a new reference node and transmission marginal loss factors?*

# BASIS FOR DISPATCH

- Current balancing market - 'sent out' dispatch.
- Most Synergy facilities - 'as generated' basis.
- Move to 'sent out' dispatch has advantages but entails costs and challenges for Synergy.
- A combination of 'as generated' and 'sent out' dispatch for new generators can be facilitated on a case by case basis

*Are there any material concerns if a combination of 'as generated' and 'sent out' dispatch arrangements were retained in the new market?*

# FIVE-MINUTE SETTLEMENT

- Five minute dispatch interval allows for spot prices to be calculated for each five-minute.
- If current 30-minute settlement interval retained, a single averaged price for trading interval would need to be calculated, disadvantages exist
- Availability of meter data for shorter intervals may pose limitations

*Do stakeholders prefer 5-minute settlement to align with 5-minute dispatch intervals?*

# SETTLEMENT TIMELINES

- Currently STEM is settled on a weekly basis and other markets on a monthly basis.
- Shorter settlement cycle can reduce prudential requirements for market participants but has potential disadvantages.
- Previously broad support for shorter settlement timeframes

*Can stakeholders provide any estimates of benefits they may accrue from shorter settlement timeframes?*



# SETTLEMENT APPROACH

- Current Electricity Industry (Metering) Code 2012 requires all loads without interval metering be served by Synergy called Notional Wholesale Meter.
- No difference between transmission, distribution or non technical loss residues.
- Trade-off between cost and complexity of moving away from status quo and equity concerns with Synergy mopping up loss residues
- Work underway to understand if optionality exists

# STEM

- STEM provides energy at reasonable prices, good certainty levels with low transaction costs and incorporates market power mitigation.
- Currently there is no alternative forward market with all these features.
- Previous suggestions around making STEM participation voluntary.
- More work needed

*What advantages or disadvantages are associated with retaining STEM?*

# CONSTRAINED PAYMENTS

## RETAIN CONSTRAINED ON

Constrained on - Generator required to operate despite its higher offer price.

Constrained on payments to generators are funded by loads to compensate for their costs.

Retain constrained on payments to properly compensate generators, but further work required on the design of these payments.

## REMOVE CONSTRAINED OFF

Constrained off – Generator is not scheduled to operate despite its offer price being lower.

Remove constrained off payments as right of generator to transfer capability of the network is determined by both economic and system security factors and not economic factors alone.

# MARKET POWER CONTROLS

Market power controls including but not limited to:

- Synergy mandated to provide Ancillary Services, until more providers come in.
- Regular reviews needed to assess evolution in Ancillary Services provision.
- Energy price limits
- AS price limits
- Definition of market power
- The use of SRMC as a market power mechanism
- Rebidding rules in the absence of gate closure

# **AGENDA ITEM 4**

## **FORWARD SCHEDULE FOR MDOWG PAPERS**

# Market Design and Operations Working Group

## Provisional Forward Schedule for MDOWG Papers

**NOTE: (1) Papers will usually be in the form of slide presentations to help introduce and discuss various concepts. MDOWG feedback will be incorporated into final consultation papers for publication.**

**(2) Provisional forward agenda a guide only, consistent with current status of projects and plan. Timing of papers is subject to change.**

<b>MDOWG meeting dates</b>
<b>6 March 2019</b>
<b>3 April 2019</b>
<b>8 May 2019</b>
<b>5 June 2019</b>
<b>3 July 2019</b>
<b>7 August 2019</b>
<b>4 September 2019</b>
<b>2 October 2019</b>
<b>6 November 2019</b>
<b>4 December 2019</b>

# Market Design and Operations Working Group

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Forward Paper Schedule
<p><b>Energy Scheduling and Dispatch</b></p> <p>Following-on from the initial Market Design Features presentation, this session will include a presentation of options on how energy services are scheduled and dispatched in the market. Proposals will be put forward regarding issues such as facility aggregation, gate closure period, and future treatment of the STEM.</p>
<p><b>Tranche 1 Enabling battery storage participation in WEM</b></p> <p>Results of AEMO and PUO due diligence on whether battery storage providers are able to participate in the WEM.</p>
<p><b>Ancillary Services Procurement</b></p> <p>Presentation of options for the efficient procurement of ancillary services. Options will include minimum standards for market participants, procurement of services via long-term contracts, and procurement of services via shorter-term markets. This item follows analysis of current and future ancillary service needs, with work by consultant GHD being a major input.</p>
<p><b>Settlement Processes</b></p> <p>Presentation on matters relating to financial settlement in the market, including approach to measuring energy consumption for settlement purposes and subsequent allocation of residues, settlement interval, settlement timelines, treatment of contracts and constrained on compensation. (Settlement of Ancillary Services is excluded at this stage).</p>
<p><b>Scheduling and Dispatch – Ancillary Services</b></p> <p>This presentation will discuss issues relating to scheduling and dispatch of ancillary services under a security constrained economic dispatch regime. It will revisit the Energy Scheduling and Dispatch topics where necessary, cover co-optimisation concepts, and discuss Ancillary Service planning.</p>
<p><b>Market Power Monitoring and Controls</b></p> <p>Presentation on the ways in which market power may be defined, options for potential market power mitigation mechanisms, including restrictions on the way offers are made, ‘last resort’ obligations to provide ancillary services, and market monitoring requirements for entities such as AEMO and the ERA. Options to be presented will draw-upon potential market power issues identified through responses to previous consultation papers.</p>

# Market Design and Operations Working Group

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### **Outage Management Processes**

Changes to outage management processes are required to account for security constrained dispatch including changes to forecast calculations, data inputs for the operation of the market. The impact of an outage regime on the capacity mechanism must be considered.

### **Settlement**

Presentation to revisit proposed settlement and cost recovery arrangements for Ancillary Services following decisions around their procurement, scheduling and dispatch.

### **Market Registration and Participation**

Presentation on options for improvements to the framework for facility registration and participation in the WEM. Focus of this work is to facilitate the participation of emerging technologies, such as energy storage, in all aspects of the WEM, ensuring that appropriate obligations are in place to ensure performance of the power system and correct allocation of cost.

### **Market Evolution**

Presentation of proposed ongoing schedule of monitoring, review, and potential change triggers to inform future market evolution. The goal is to ensure that design choices implemented in the 2022 changes are regularly revisited to check they are still fit for purpose and identify information required to support the reviews.

### **Market information**

Presentation of information to be captured and stored as part of market processes, and/or provided to relevant parties. The goal is to ensure that current and potential market participants have timely, comprehensive and transparent access to information to support their decision making.

### **Modelling of Quantitative Benefits of Reform**

Outcomes of modelling using assumptions from positions previously established through consultation. To be used to support rule change process.