Government of Western Australia
Department of Treasury

AEMO
AUSTRALIAN ENERGY MARKET OPERATOR

westernpower

Constrained Network Access Industry Forum

3 August 2018

AGENDA

The case for change
Zaeen Khan, Public Utilities Office
Cameron Parrotte, AEMO
Sean McGoldrick, Western Power

Modelling market benefits
Ashwin Raj, Public Utilities Office

Morning tea break

Proposed implementation approach
Ashwin Raj, Public Utilities Office

Q&A and discussion session

The case for constrained network access

1. The context for reform

Zaeen Khan, Public Utilities Office

AIM OF ELECTRICITY SECTOR REFORMS

Manage transformation of the energy sector

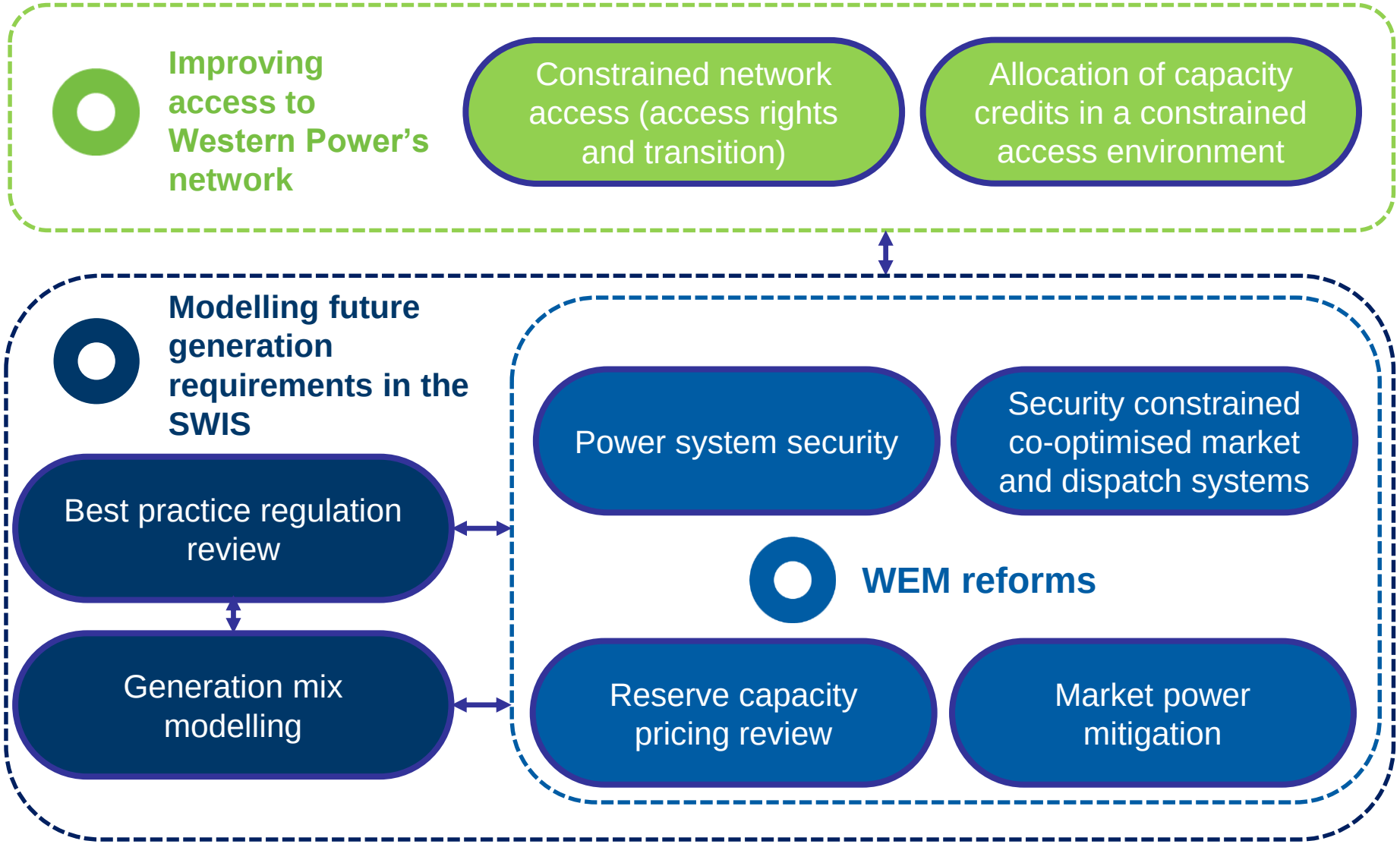
Remove barriers to investment

Optimise grid use

Improve operation of the WEM

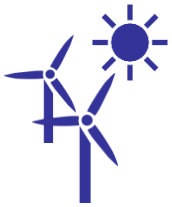
Put downward pressure on prices

CURRENT REFORM PROGRAM



THE PROBLEMS

Network is contractually constrained



Network can handle more connections under constrained access

Won’t achieve least cost market dispatch outcomes

Costs and time for deep network augmentation prohibitive

Barrier to investment

WHY WE NEED REFORM

It is no longer viable to maintain the status quo because:

- Network constraints are expected to bind more frequently
- We are not making best use of existing network capacity
- Constraining access to new generators is technically complex
- Inequity in the market – uneconomic dispatch, higher costs

- Network access reform complements WEM reform

2. Current and emerging challenges

Cameron Parrotte, AEMO

MARKET STOCKTAKE

Breaking	Stuck	Emerging
Security / reliability standards	New connections	Emerging security / reliability issues
Delineation of roles / responsibilities	Efficient network investment	Embedded generation / microgrids
System planning	Gate closure	Renewable Energy Target
Outage processing	STEM improvements	Peer-to-peer trading
Price forecasting	Ancillary service markets	Battery storage
	New technology registration	Virtual power plants

Network access complements WEM reform

TECHNICAL AND OPERATIONAL COMPLEXITIES

- Applying constrained dispatch to new generators only is technically and operationally complex from a systems perspective

- Applying constraints only to new generators does not achieve economic dispatch

- Firm + non-firm access = uneconomic dispatch

3. Future proofing the network

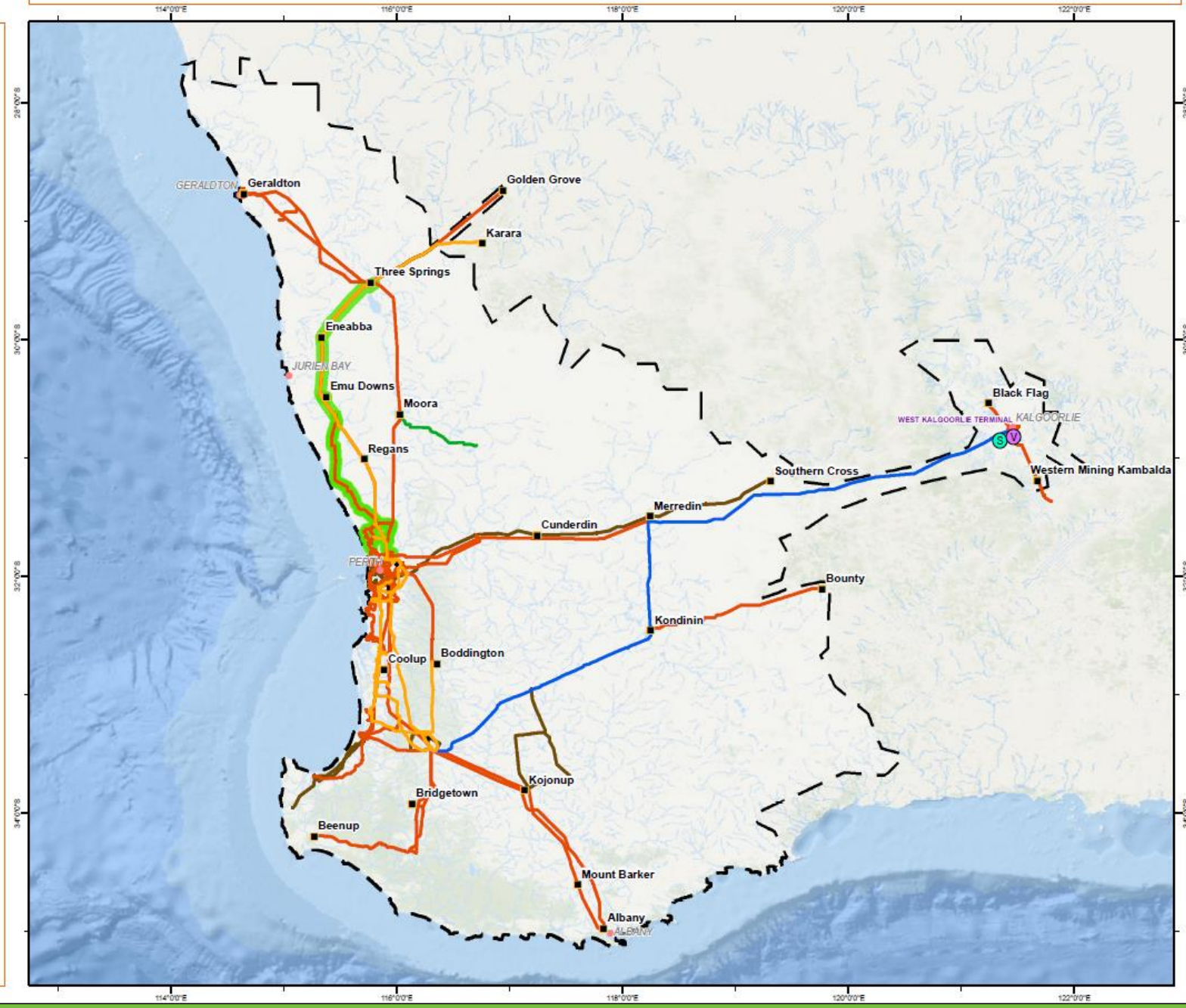
Sean McGoldrick, Western Power

TECHNICAL AND OPERATIONAL COMPLEXITIES

- There are limits to how many more runback schemes can be used in certain parts of the network
- Pre-contingent (GIA solution) is designed as a temporary solution only

- Network cannot sustain current arrangements

Key Transmission Generation Constraints 2018



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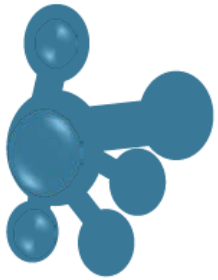
PRODUCED 1/08/2018

FUTURE OF THE NETWORK?

Integrated Network



Current SWIS model

Fringe Disconnection

Future model with small number of islanded systems

Modular Network

Future model with variable network types

Fully Decentralised

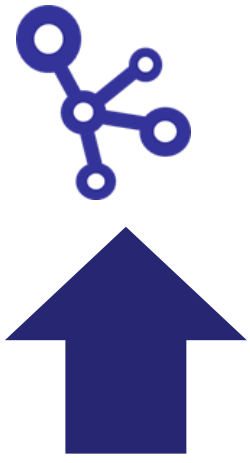
Extreme model without centralised network

Is it appropriate to continue traditional network development in a network that is no longer traditional?

4. Why constrained access is necessary

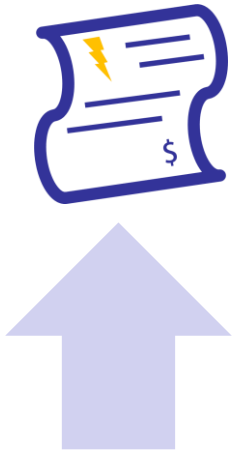
Zaeen Khan, Public Utilities Office

DO NOTHING IS NOT AN OPTION



Network cost

Market cost



Electricity bill

THE OPTIONS

Build more capacity

Augment the network to increase capacity and clear the constraint. Effectively provide all generators unconstrained access

Make better use of available capacity

Provide constrained network access, whereby the output of existing generators is curtailed as necessary. Generators compete to be economically dispatched

The key is to provide equitable network access

CASE FOR CONSTRAINED NETWORK ACCESS

Benefits

Better use of network

Economic dispatch is achieved

Complements WEM reforms

Lower wholesale energy prices

More competitive ancillary services

Increase in generation diversity

Opportunity for renewables - lower CO_2

Costs

Congestion costs

Implementation costs

New ancillary services required

CONSTRAINED ACCESS SUPPORTS THE REFORM AIMS

Improving access to Western Power's network

- Manage transformation of the energy sector 
- Remove barriers to investment 
- Optimise grid use 
- Improve operation of the WEM 
- Put downward pressure on prices 

Modelling market benefits and impacts

Ashwin Raj, Public Utilities Office

WHAT WE HAVE TESTED

- The impact of introducing constrained access
  - Partially constrained *
  - Fully constrained
  - Unconstrained
- Assumptions / inputs
  - Base scenario
  - High scenario
  - Retirements
- Generator impact / Market assessment
  - Total market payments
  - Generator net revenues
  - Network costs

* Partially constrained is effectively the status quo

KEY FINDINGS (BASE SCENARIO)

Fully constrained access provides lowest total system costs compared to partial and unconstrained

Consumers are better off by $288 million under fully constrained access than under partial

Fully constrained access provides lowest total system costs compared to partial and unconstrained

- Total market payments are highest in the partially constrained case
- Total market payments are lowest in the unconstrained case but offset by cost of network projects (estimated at up to $700 million)
- No transmission augmentation required under the partial and fully constrained cases
- The fully constrained case provides lowest total system costs, as it results in lower total market payments.

Consumers are better off by $288 million under fully constrained access than under partial

- Total market payments are $288 million lower in the fully constrained case compared to the partially constrained case
- Net revenue reduction for existing generators with unconstrained access is $194 million
- Net revenue = total market payments – (FOM + VOM + fuel costs)
- Net revenue reduction due to the effects of competition and the effects of network congestion

WHAT ELSE WE FOUND

- Balancing prices are lower in the fully constrained case compared with the partial constrained case
- No economic retirements
- Assuming no transmission investment, we could fit (in addition to GIA):
  - Around 400MW of new wind generation capacity, mostly in Eastern Goldfields
  - Around 500MW of new gas generation capacity, in Kwinana and Kemerton
- We could fit slightly more new entrant capacity in the fully constrained case than in the partially constrained case

KEY TAKEAWAYS

- Assessment of costs and benefits supports a move to constrained access
- Savings to consumers > cost to convert physical firm access to financial firm access
- Constrained access can accommodate more generation capacity while deferring network investment
- Consumers are better off by almost $300 million
- But net revenue for firm access generators are lower

- Fully constrained provides the best outcomes

Proposed implementation approach

Ashwin Raj, Public Utilities Office

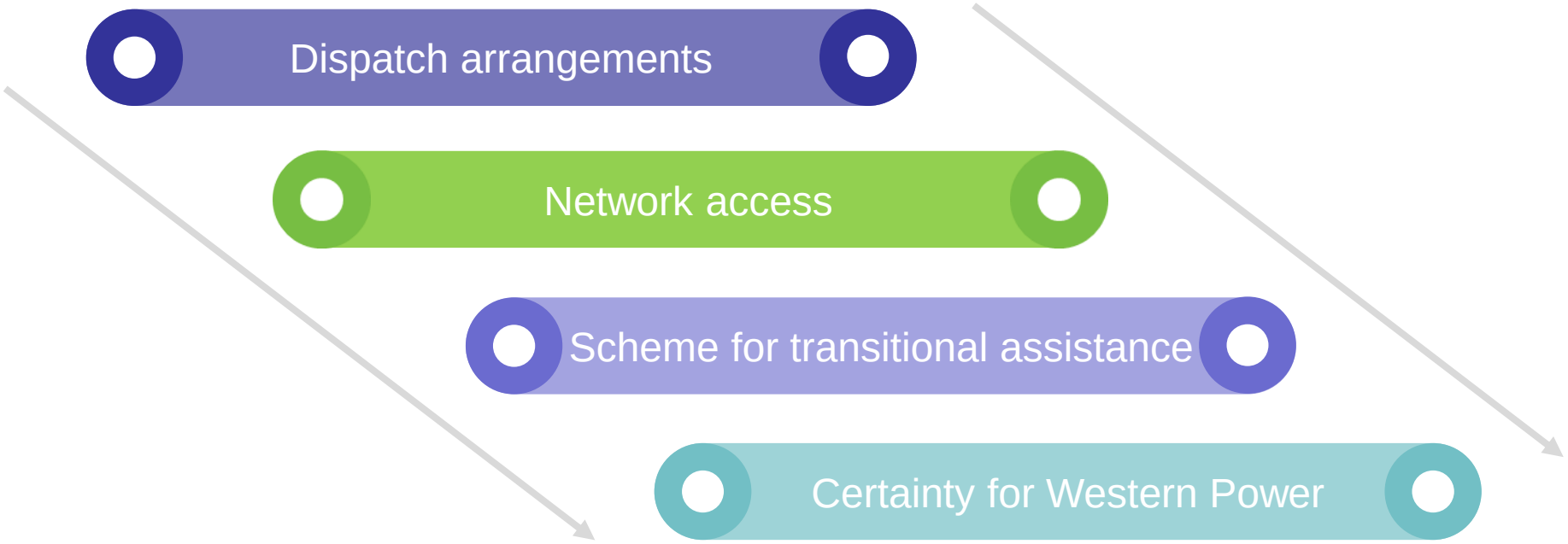
RECOMMENDED APPROACH – FULLY CONSTRAINED

- Our proposed approach
- What's changed from the previous consultation?
- What hasn't changed?
- What we intend to achieve with this approach

- Convert physical firm access to financial firm access

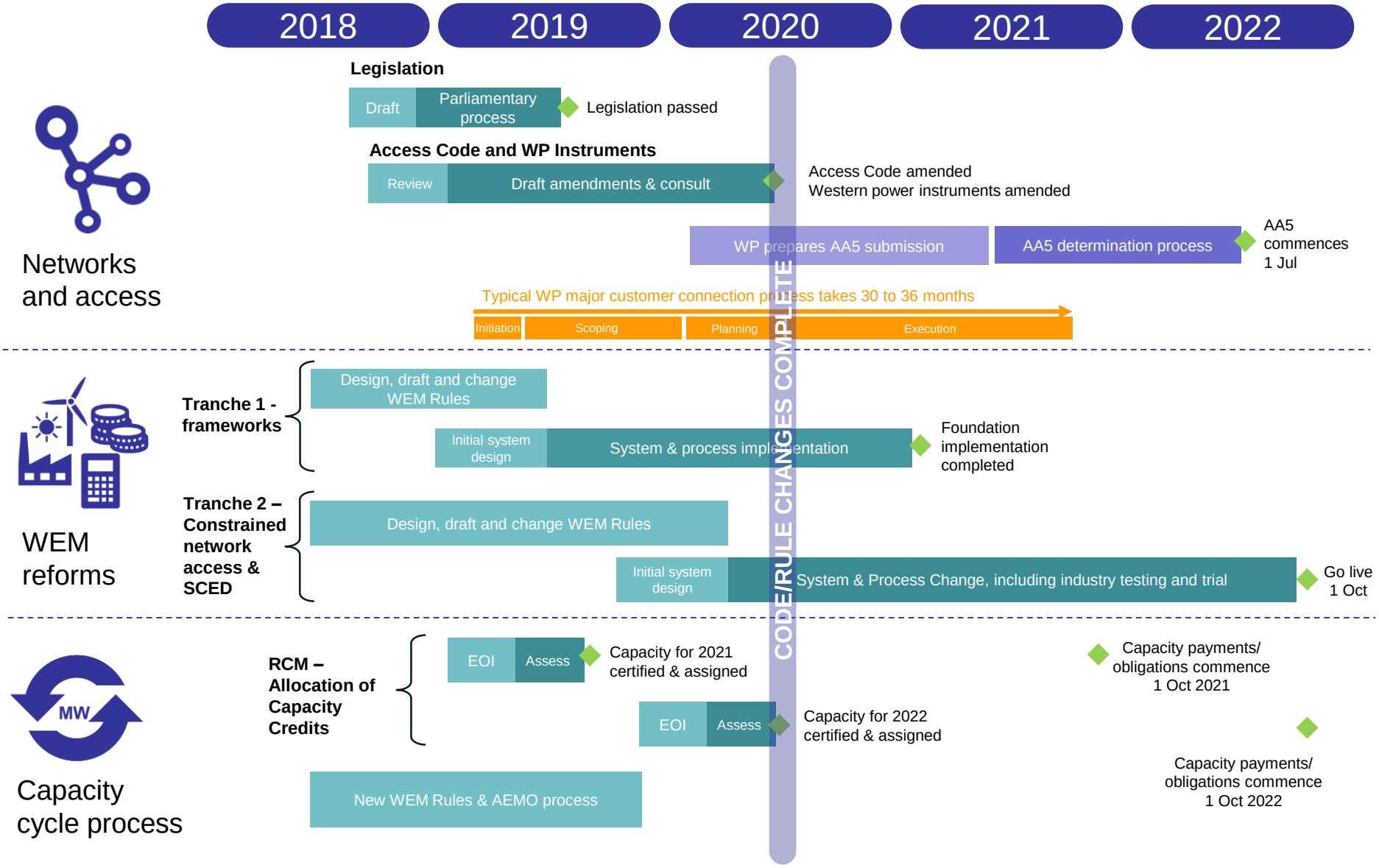
HOW IT WILL WORK

Physical firm access



Financial firm access

IMPLEMENTATION TIMEFRAME



NEXT STEPS

- Consultation paper on proposed approach
  – seeking your views on implementation approach
- 1-on-1 discussions on modelling
- Report on modelling results by end August
- Advice to Government in September

Questions/Comments

For further information

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