

This event will be recorded



Engineering Roadmap to 100% Renewables

Stakeholder Webinar

3 February 2023



We acknowledge the Traditional Owners of country throughout Australia and recognise their continuing connection to land, waters and culture.

We pay respect to their Elders past, present and emerging.

Purpose and interaction

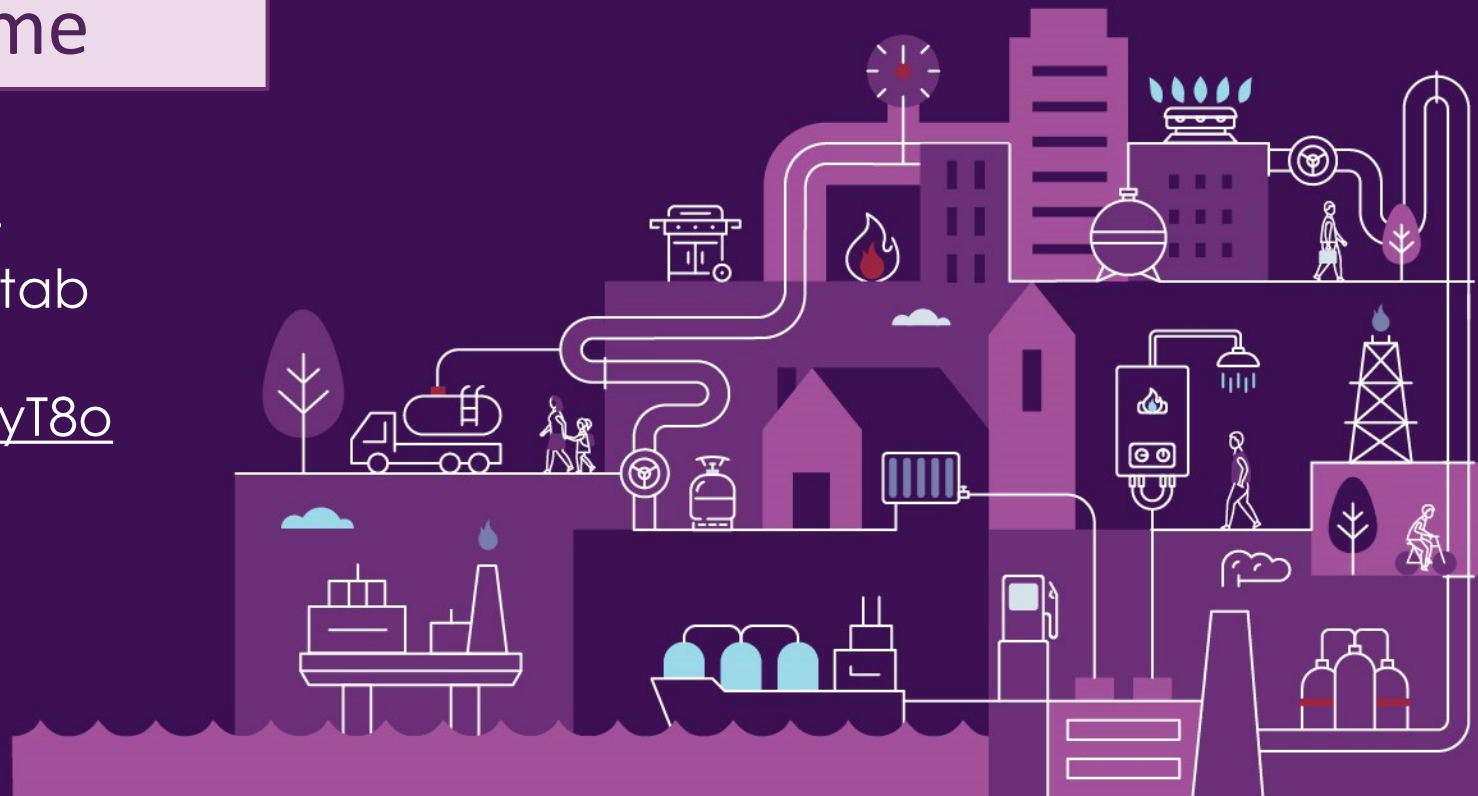


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- Please ask questions using Slido.
- Join the Slido chat via another tab or window directly through <https://app.sli.do/event/x2Vkwyt8onFPkcwmoiMYRu>

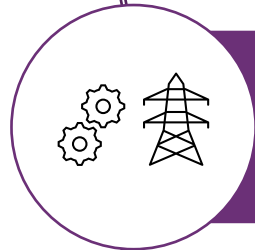


Today's presentation



Background context and Roadmap structure

Q+A Break #1



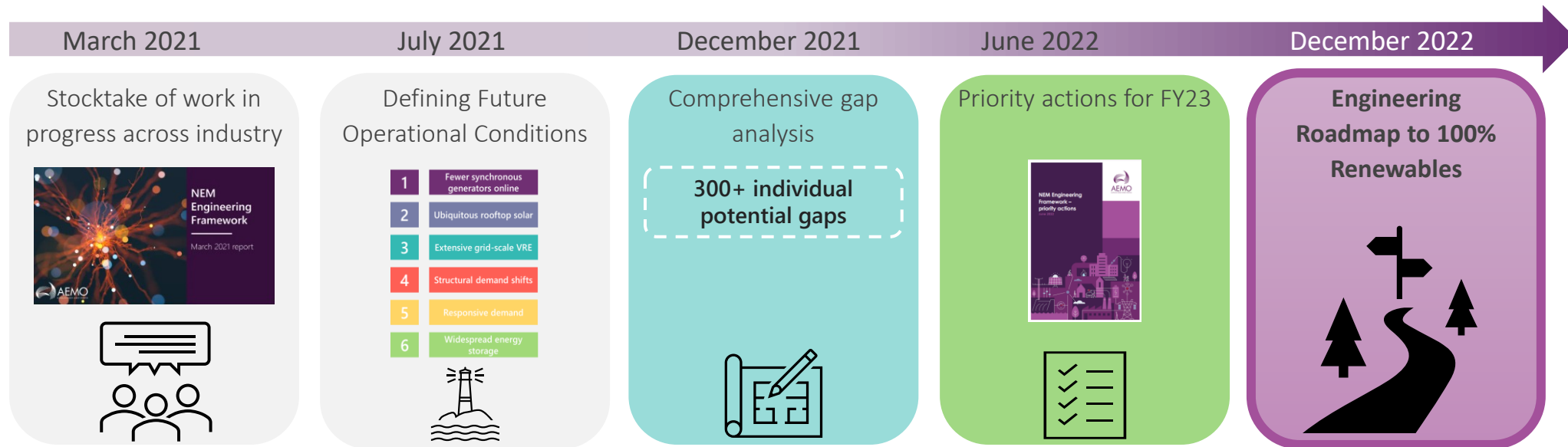
An overview of the engineering and operational readiness steps to prepare for 100% renewables

Q+A Break #2



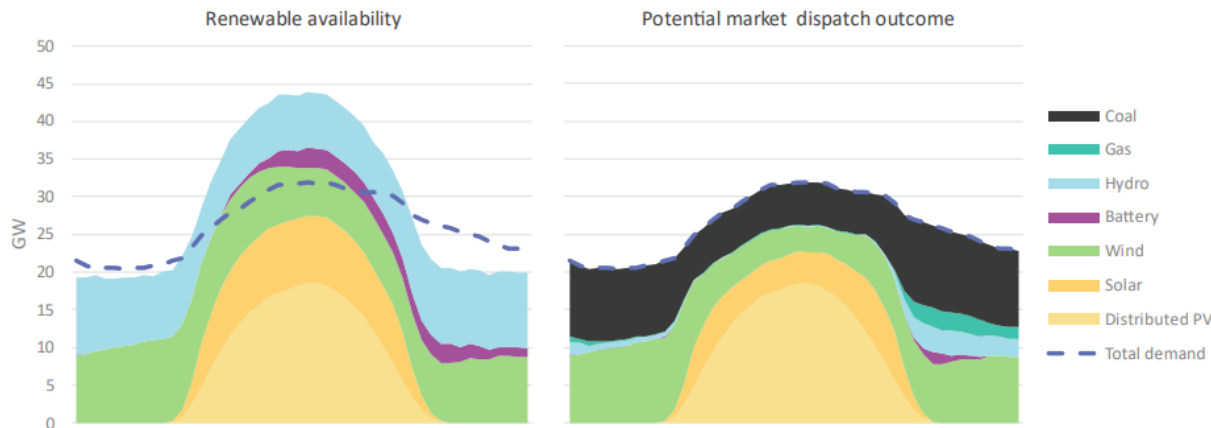
Next steps and how to stay involved

Journey to-date

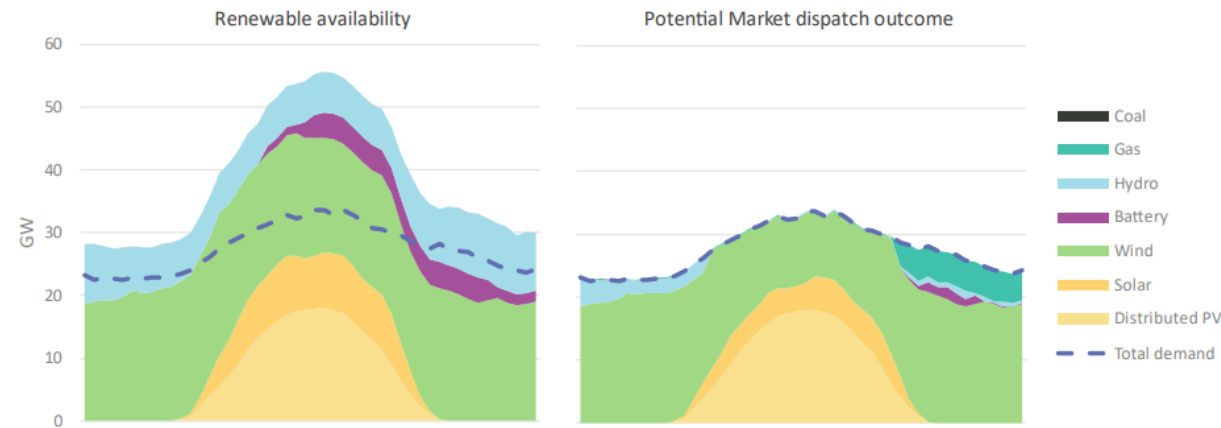


Utilisation of renewable resource potential

Day where full renewable resource potential cannot be utilised

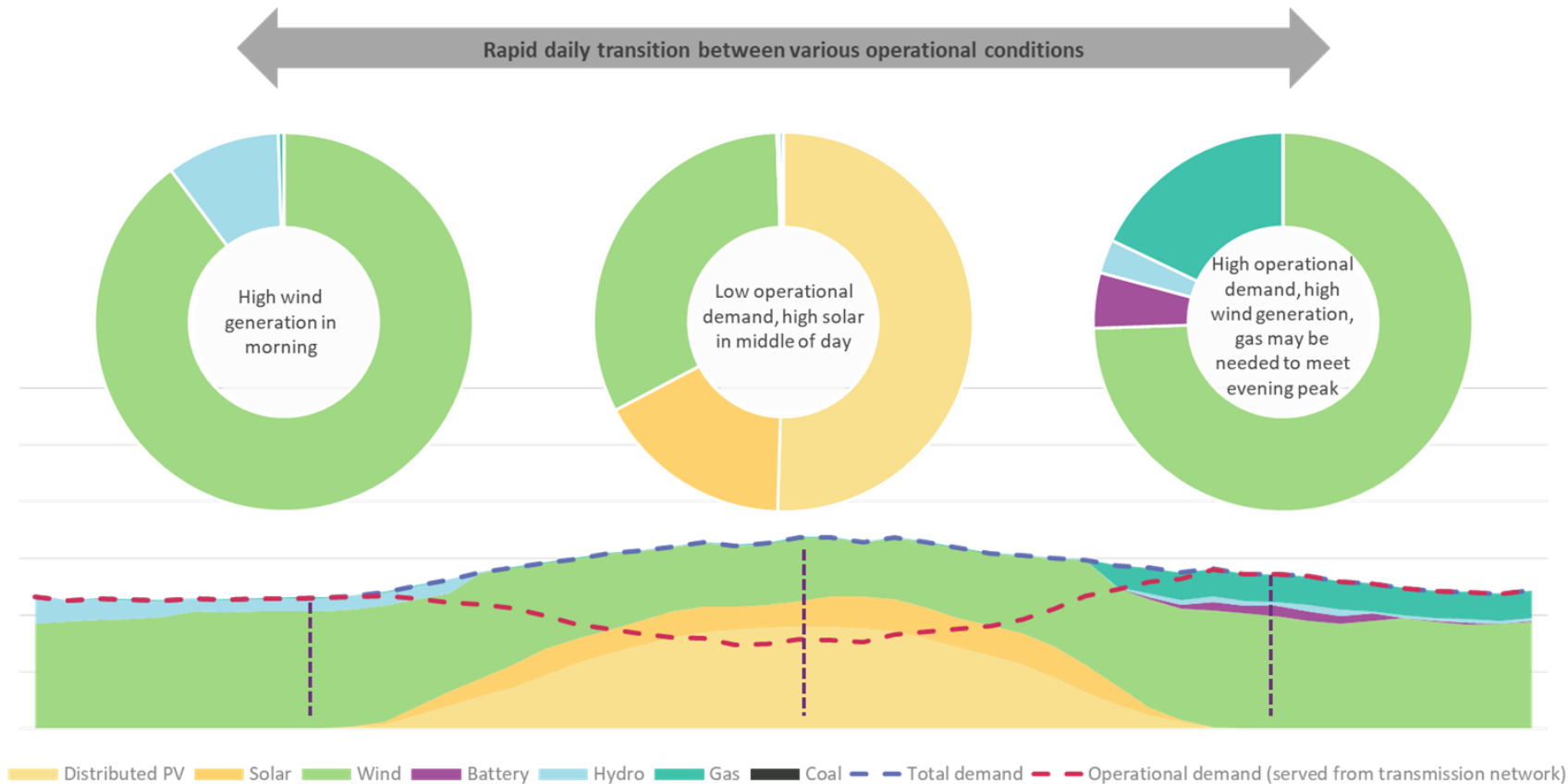


Day with viable 100% renewable penetration



- It may not be possible to dispatch the market at 100% renewable penetration the first time that 100% renewable resource potential.
- Operating a secure and reliable system under these conditions will require sufficient reserve margins and sources of essential system services, at the time of 100% renewable operation and during the surrounding periods.
- Economic bidding behaviour from market participants may further influence whether renewable resource potential is dispatched.

Rapid daily changes in generation mix

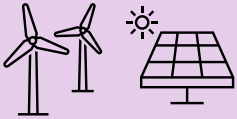


- Multiple generation mixes likely
- Rapid daily transitions
- System will be a hybrid of synchronous generation, IBR, synchronous condensers, dominated by different technologies at different times of each day.

Scope of roadmap



Detailed, **engineering-focussed** roadmap



AEMO's view of the technical, engineering, and operational actions required to **operate the NEM at 100% instantaneous renewables** for the first time

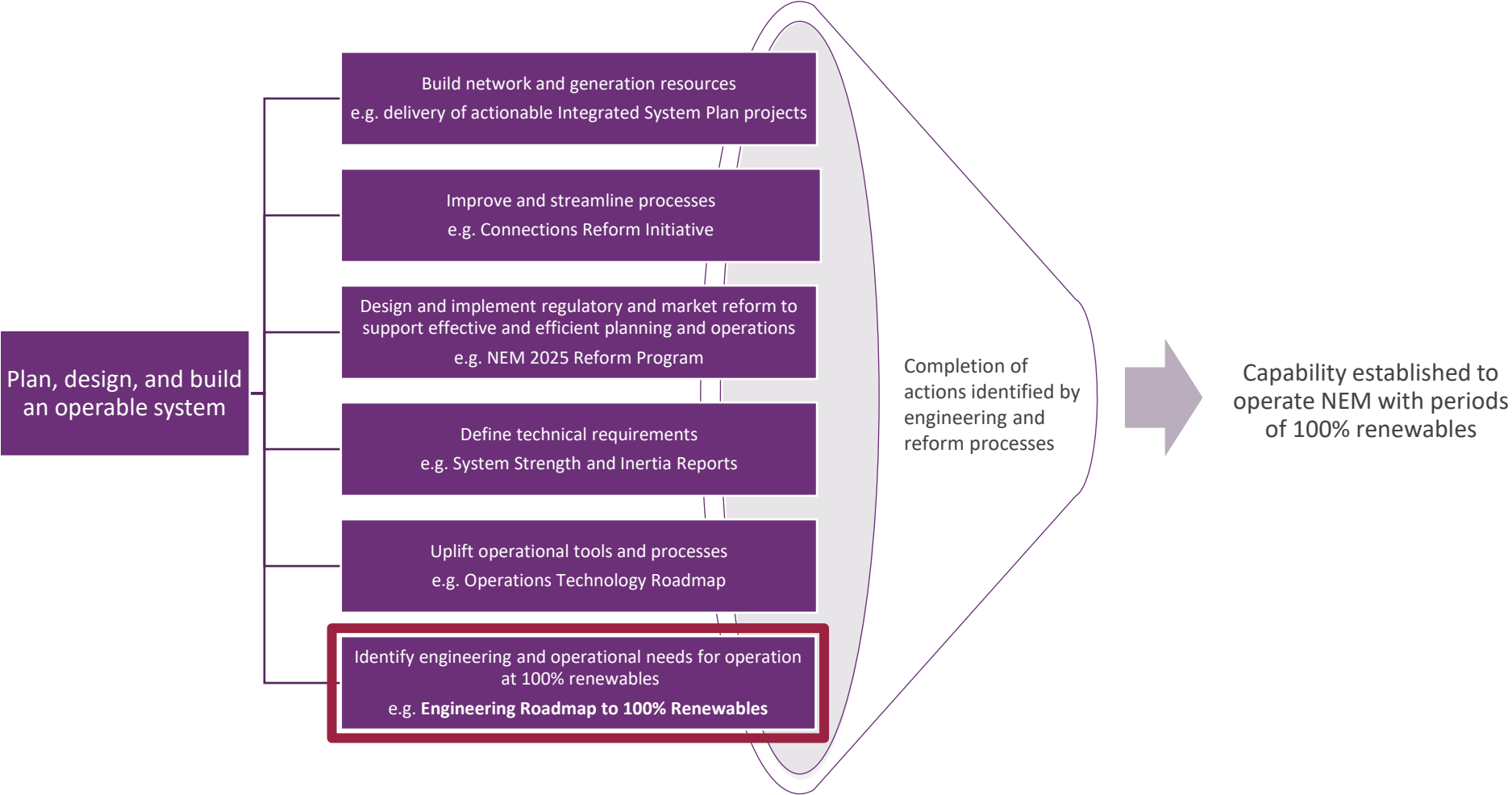


Technical base to **inform industry prioritisation of steps** necessary to transition through key milestones on the way to 100% renewables



Provide confidence around **underway actions** and highlight **areas requiring further attention**

Preparing for 100% renewables



Roadmap structure

Power system security

- Frequency & inertia
- Transient & oscillatory stability
- System strength & converter driven stability
- Voltage control
- System restoration

System operability

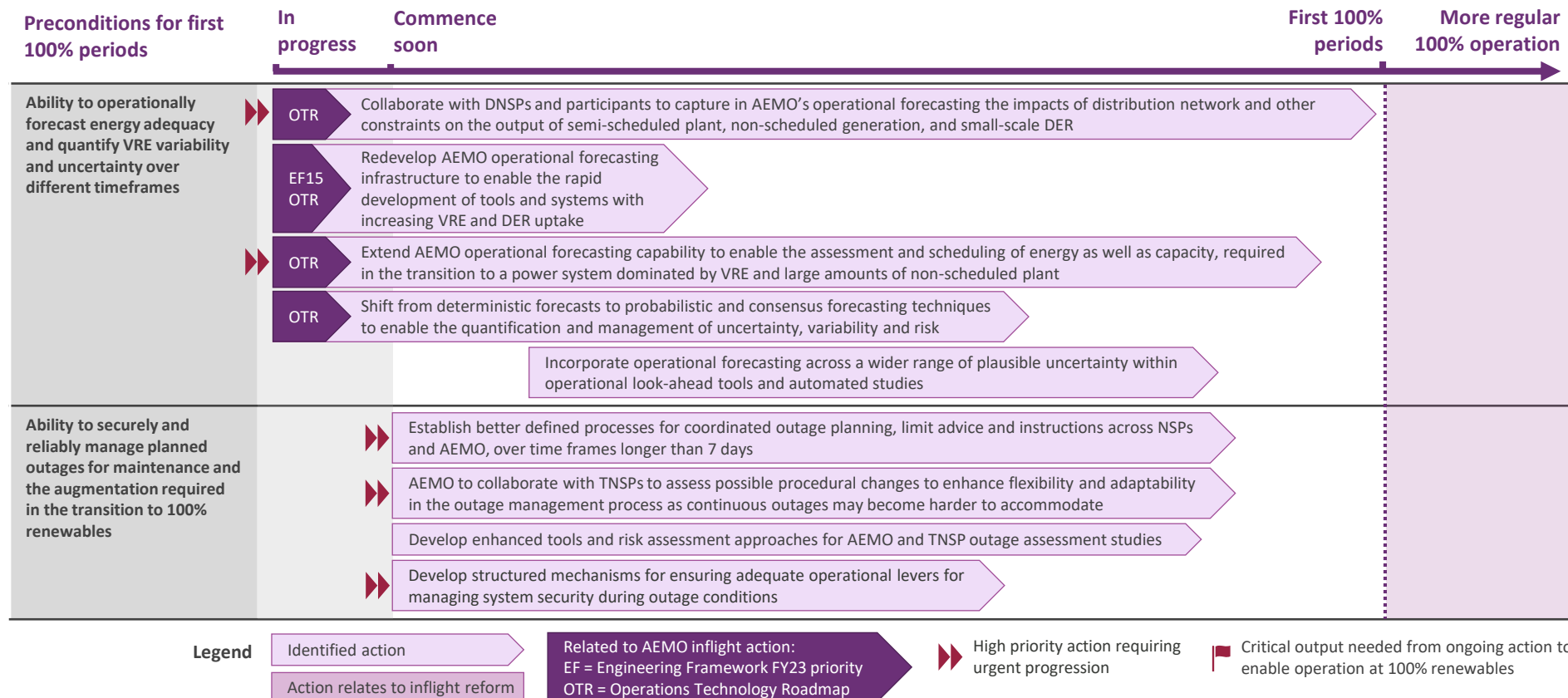
- Monitoring & situational awareness
- Operational processes
- Power system modelling

Resource adequacy & capability

- Utility-scale variable renewable energy (VRE)
- Distributed energy resources (DER)
- Structural demand shifts
- Transmission
- Distribution
- Firming

Roadmap example: Operational processes

What the transition to 100% renewable operation will require



Q+A Break

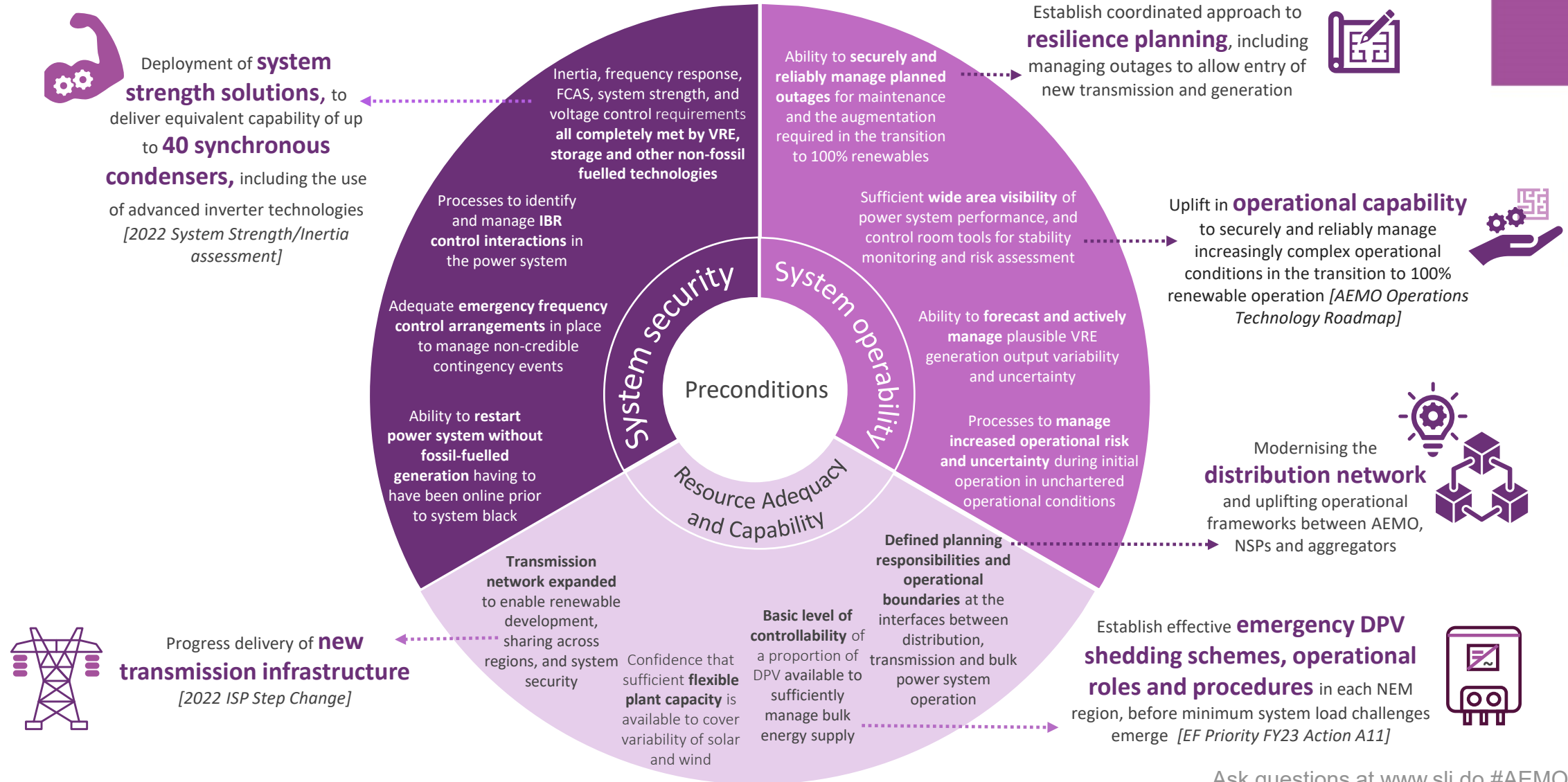
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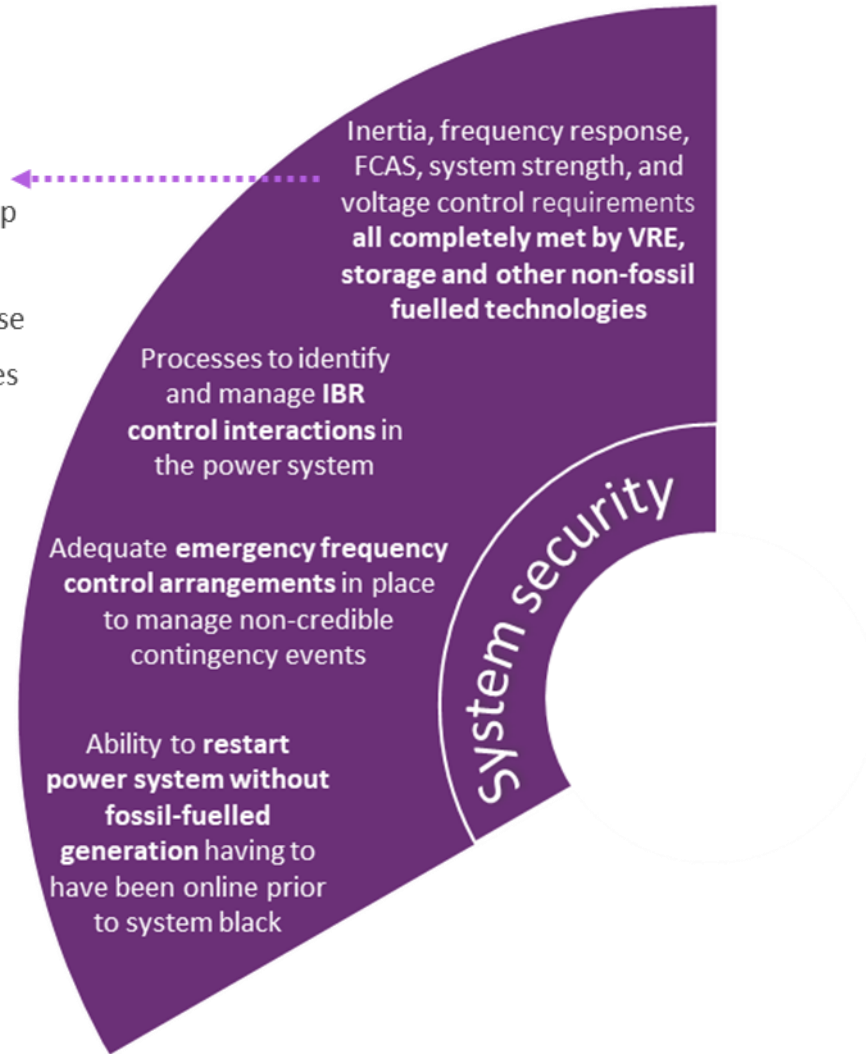
Key messages



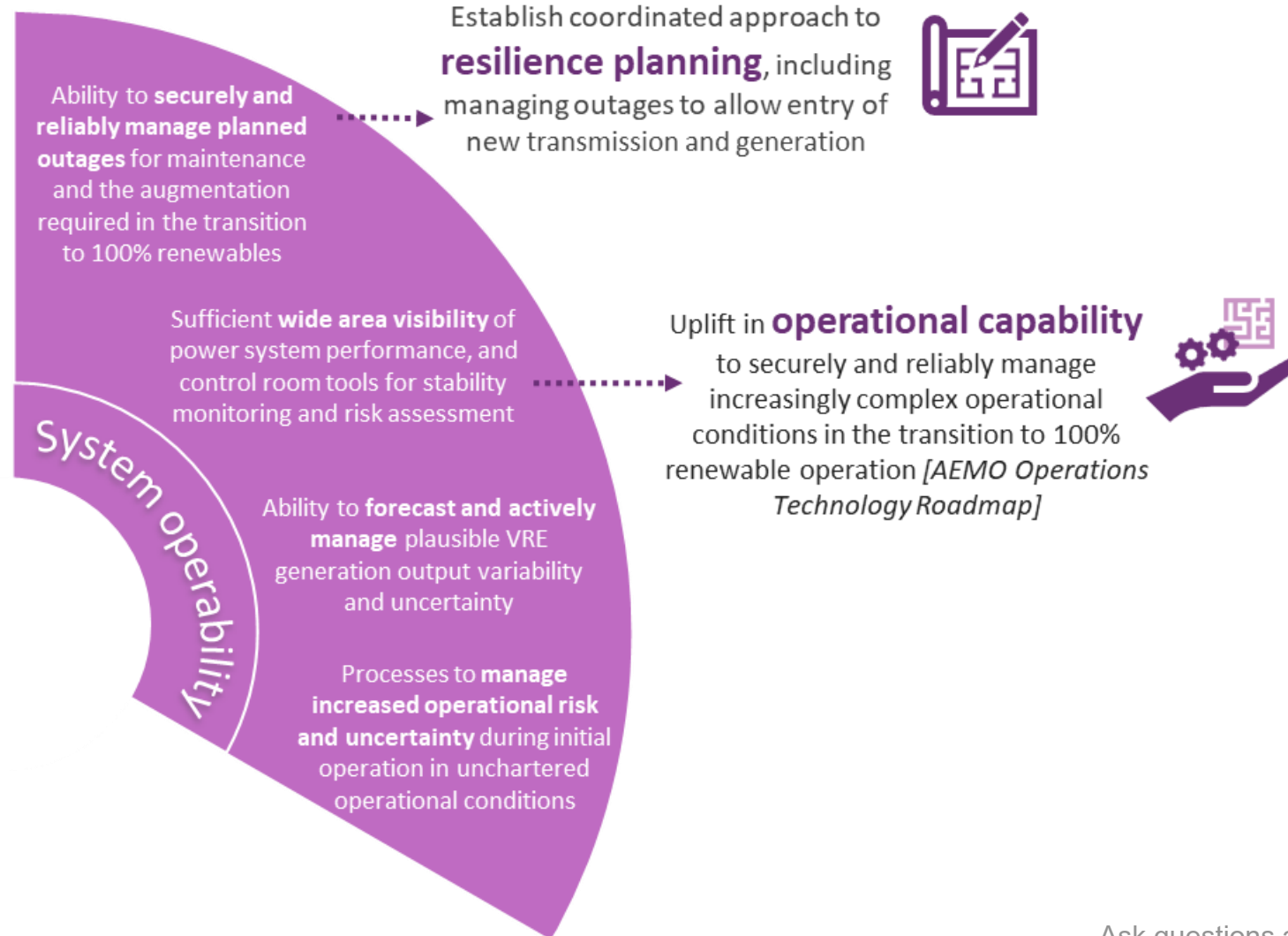
Key messages: System Security



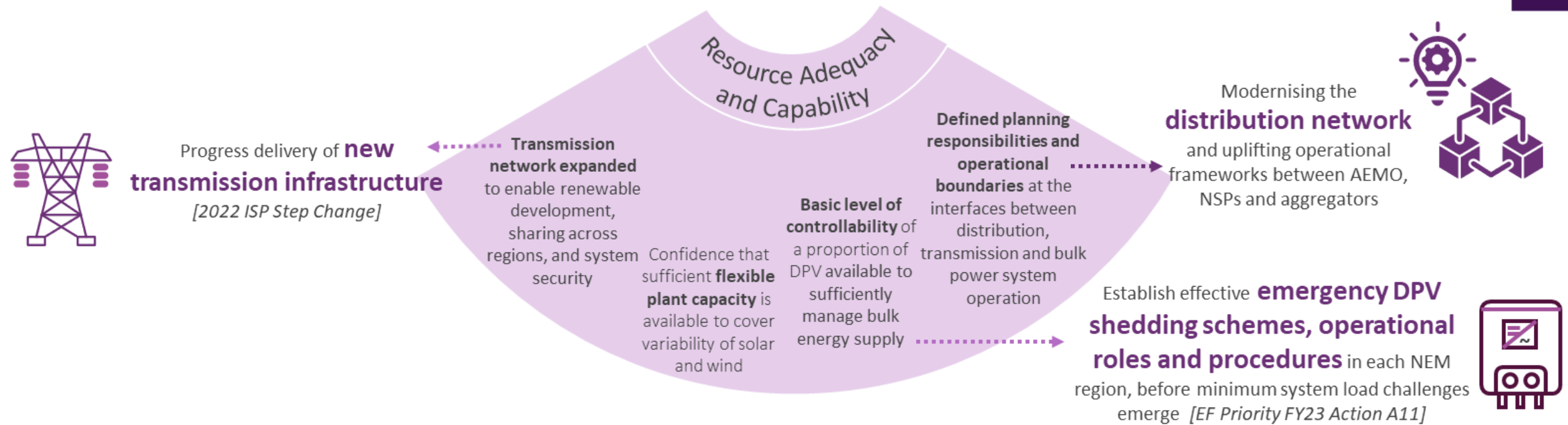
Deployment of **system strength solutions**, to deliver equivalent capability of up to **40 synchronous condensers**, including the use of advanced inverter technologies
[2022 System Strength/Inertia assessment]



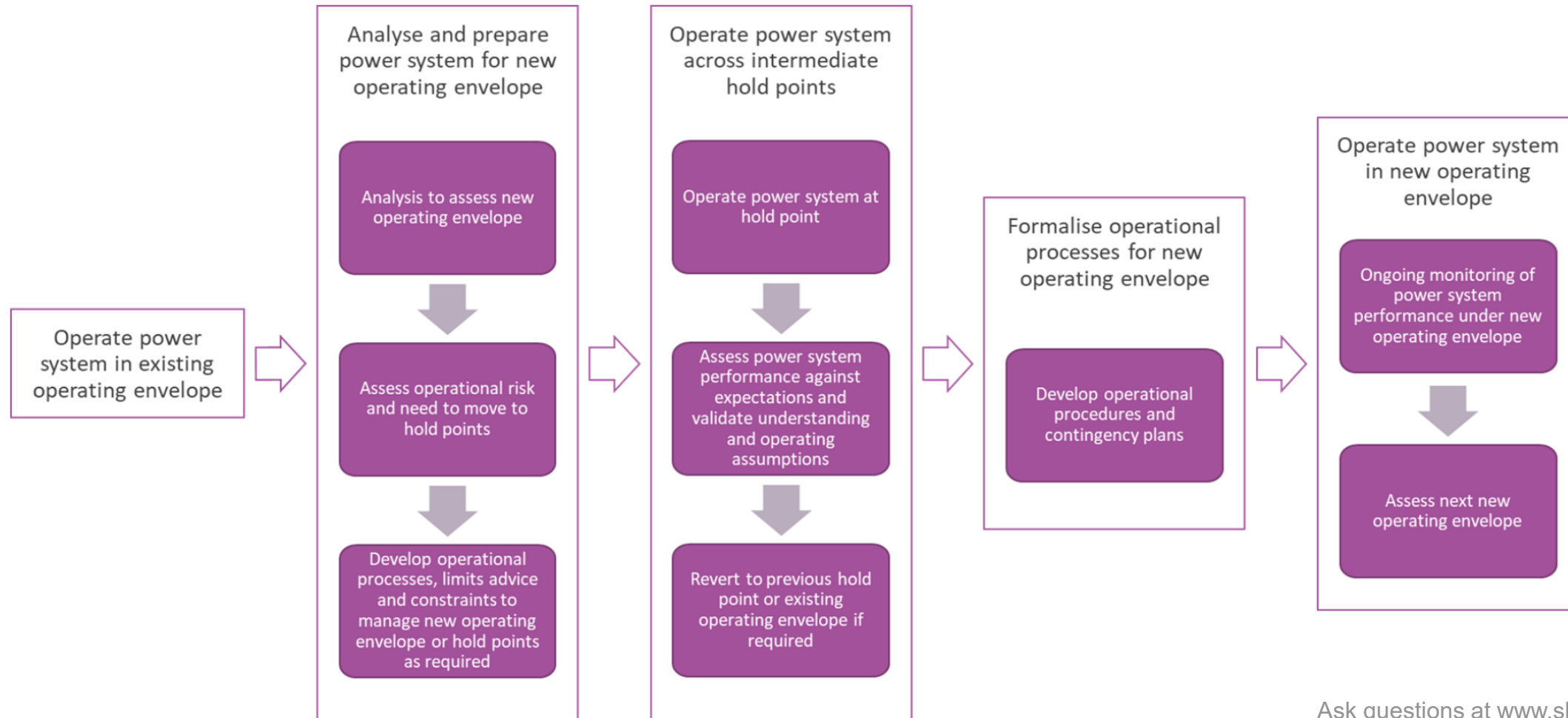
Key messages: System Operability



Key messages: Resource Adequacy and Capability



Evolving the power system operating envelope



Q+A

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Next steps

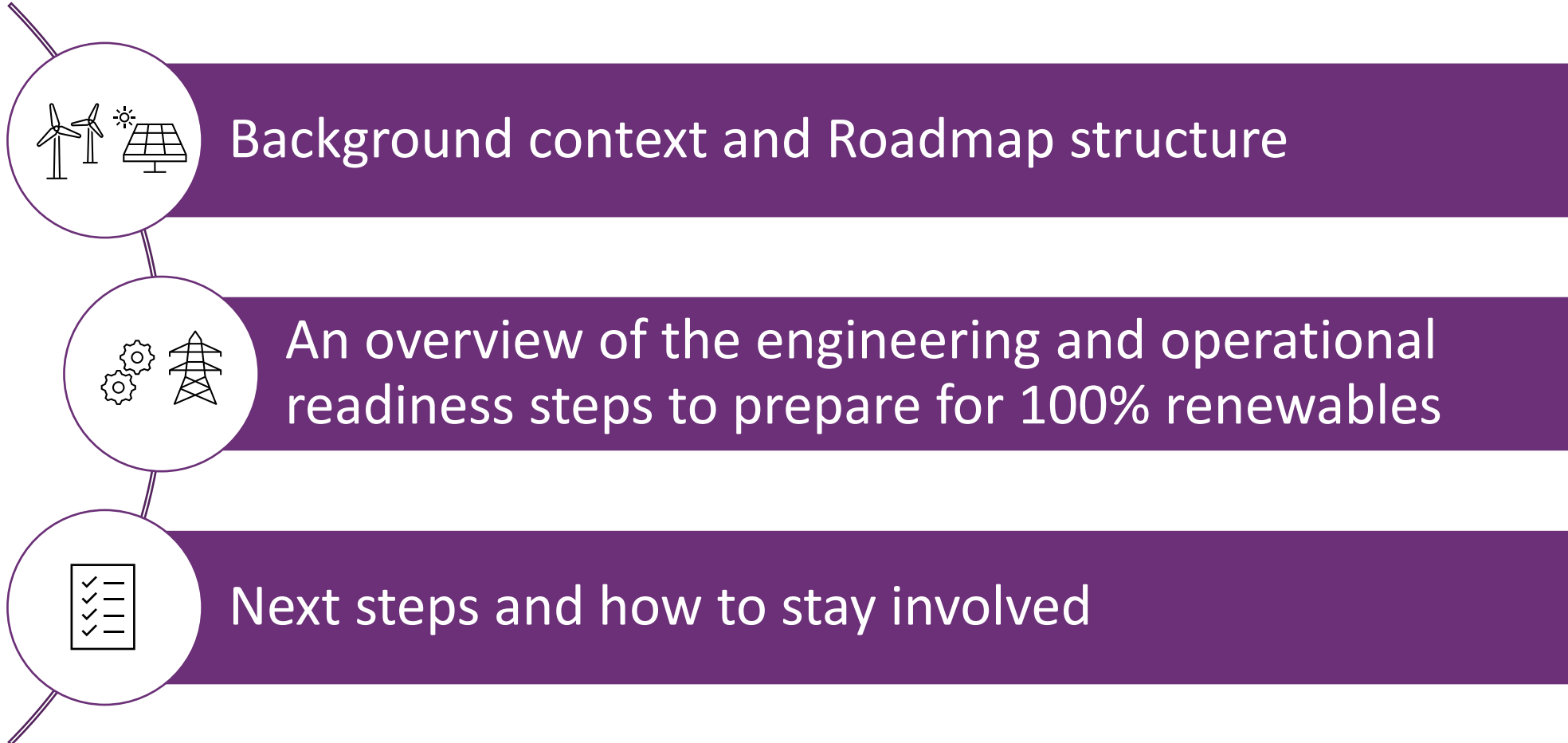
Activities to June 2023

- Targeted engagement on request
- Ongoing delivery of FY23 Priority Actions
- Scoping of additional priorities for FY24
- Update on Priority Actions

How you can stay involved:

- Read the [Engineering Roadmap to 100% Renewables](#)
- Sign up for our mailing list
- Reach out to AEMO directly
- FutureEnergy@aemo.com.au

Summary



Survey and close

Please provide AEMO with feedback from today's webinar by responding to this pulse survey:

<https://forms.office.com/r/YYVt95n6pG>

Thank you!



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