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The road to net zero electricity markets

Net Zero Market Design

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Agenda

1. Welcome
2. A snapshot of 2050
3. Why ESO?
4. The journey so far
5. Insights from our stakeholders
6. Lessons from other markets
7. The plan for the year ahead
8. Q&A

A snapshot of 2050

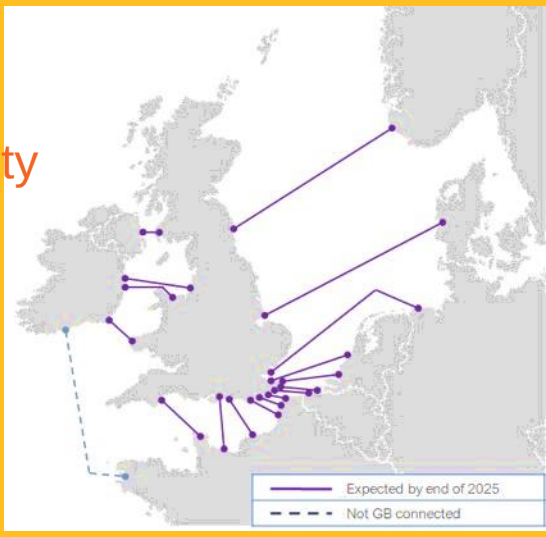
Net Zero ambitions will transform the power sector.

Markets will require reshaping in order to enable efficient outcomes for the consumer of tomorrow.

84GW of offshore wind

100% of vehicles will be electric

27GW of inter connectivity capacity



71GW of solar PV capacity

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Why ESO?

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The journey so far

PHASE 1 - What are the "exam questions" we need to answer on market reform for Net Zero?

18th January

25th March

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Recurring feedback from key internal & industry stakeholders

Key challenges and opportunities

- Need to reward flexibility
- Getting a more active demand side
- Resolving the interfaces between different policy instruments
- A greater role for strategic planning of monopoly networks
- Visibility and transparency of data

Key considerations for ESO's approach

- The need for whole systems thinking – you can't consider the power system in isolation anymore!
- Starting with the consumer and working back from there
- ESO have a key role to play in this debate
- Opening this debate up to those not currently in the energy sector
- Greater transparency in the way ESO engage with industry

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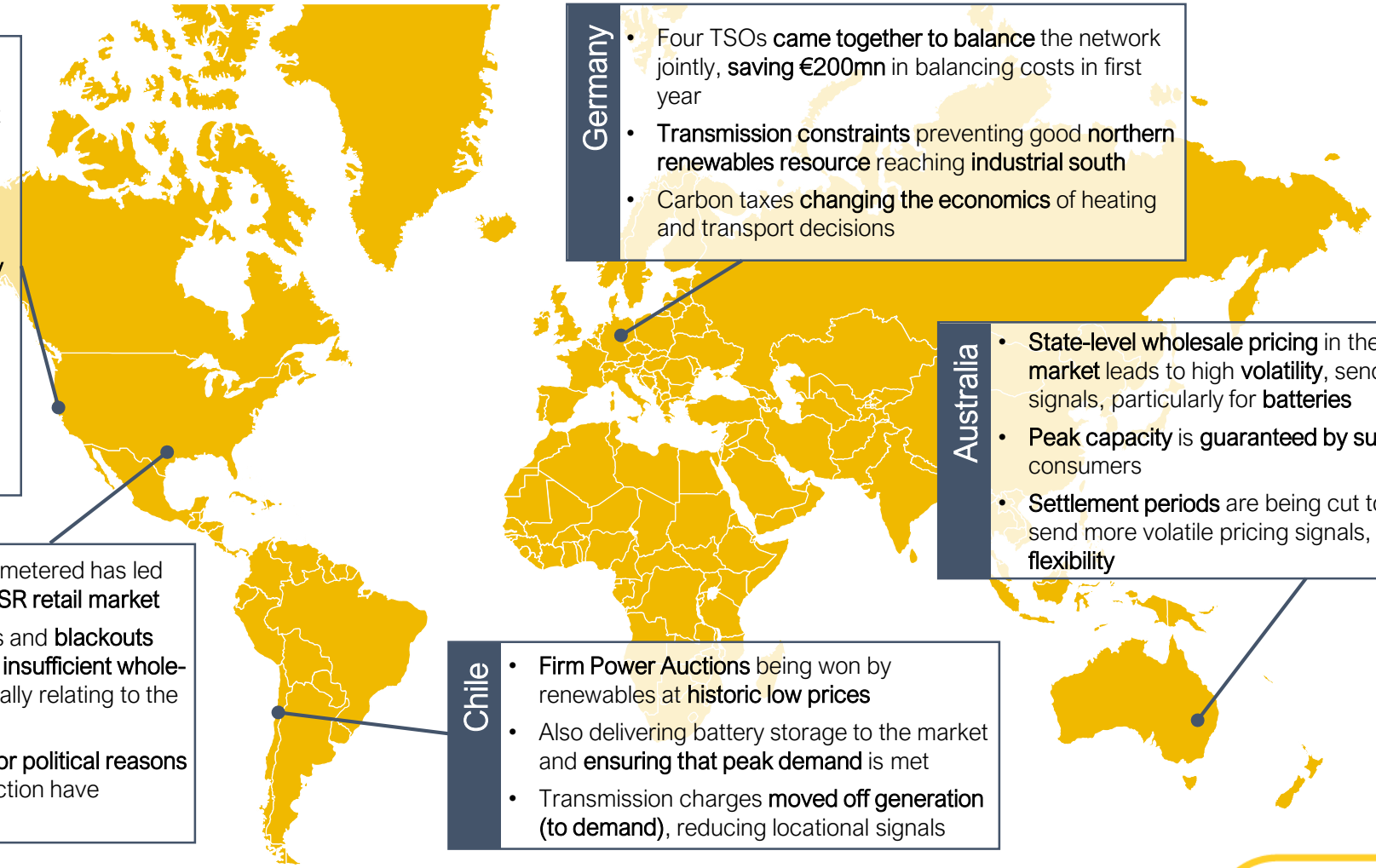
Perspectives from international case-studies



California (CAISO)

- Ambitious, ideology-led renewables targets **creating system issues** with rapid buildout of renewables but also **creating opportunities for long-duration storage**
- **Too much solar generation** has created "duck's back" **operability issues** in midday **trough** and in morning and evening **ramping**
- 2020 blackouts due in part to **extreme weather**, in part to low capacity availability in **climactically similar interconnected systems**

Germany

- Four TSOs **came together to balance** the network jointly, **saving €200mn** in balancing costs in first year
- **Transmission constraints** preventing good **northern renewables resource** reaching **industrial south**
- Carbon taxes **changing the economics** of heating and transport decisions

Australia

- **State-level wholesale pricing** in the **energy-only market** leads to high **volatility**, sending investor signals, particularly for **batteries**
- **Peak capacity** is **guaranteed by suppliers** and large consumers
- **Settlement periods** are being cut to **5 minutes** to send more volatile pricing signals, again **benefiting flexibility**

Texas (ERCOT)

- Almost universal smart metered has led to an **active ToU and DSR retail market**
- Feb 2021 winter storms and **blackouts** demonstrated potential **insufficient whole-system thinking**, especially relating to the gas networks
- System **kept separate for political reasons** – but would interconnection have prevented blackouts?

Chile

- **Firm Power Auctions** being won by renewables at **historic low prices**
- Also delivering battery storage to the market and **ensuring that peak demand** is met
- Transmission charges **moved off generation (to demand)**, reducing locational signals

We have used the market insights and stakeholder priorities to create 4 clusters that frame our analysis

Net Zero Requirements

Ensuring that the system takes account of the changing consumer, societal, market participant and physical needs on the pathway to Net Zero

Open Markets

Market design needs to enable fair access to all market participants – including consumers, generators, and offerings in between these

Market Signals

Market design, regulations and policies to provide clear and consistent signals to investors and market participants

Industry Governance

Industry governance that enables Net Zero market reform at pace, rather than acts as a barrier

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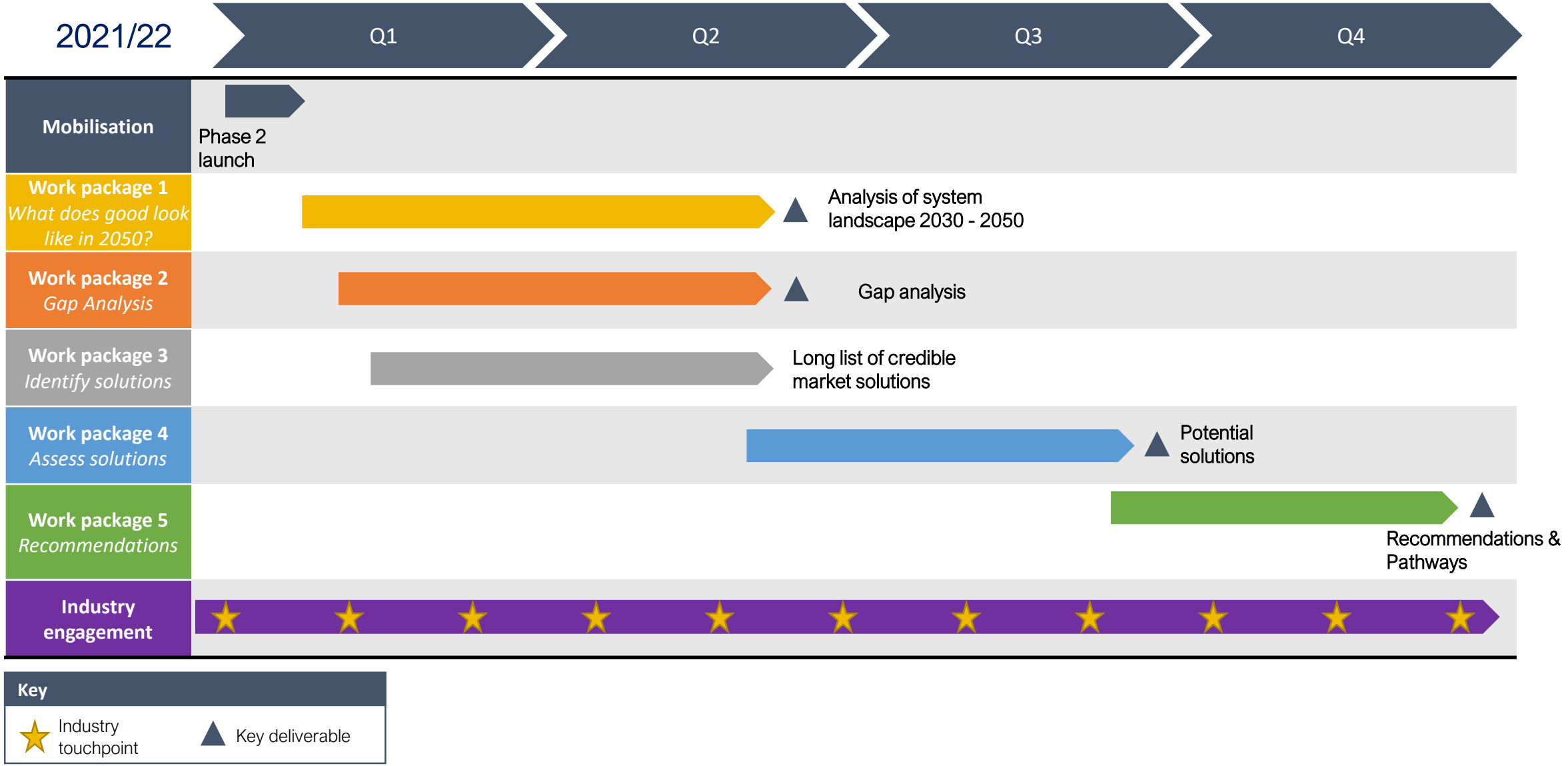
Proposed approach for Phase 2

	Net Zero Requirements *Identify the energy system needs for society, consumer, market participants and operability*	**Market Signals** *Identify the right market signals to efficiently deliver Net Zero Requirements*	**Open Markets** *Identify the design options that ensure markets are accessible and fair to all market participants*	**Industry Governance** *Identify how industry governance can be an enabler not a barrier*
1. What does the future look like?	• How is supply and demand matched? • What flexibility is needed (sub-second to seasonal) • What locational challenges are there? • What level of reliability is needed? • What business models must be enabled?	• What market signals are needed to send suitable investment and operational signals?	• What does the market landscape look like in future? • What capabilities / limitations do future market participants have?	• What are some examples of best practice governance (look to other sectors)?
2. Gap analysis	• How do requirements change from today to 2030 to 2050?	• What signals are sent today, how are they sent, and are they appropriate for the future?	• How do current market designs suppress competition	• Identify limitations of current governance wrt pace and fairness
3. Identify solutions *(examples, not exhaustive)*	• Consider what requirements may be needed from non-market solutions (data, systems etc)	• Locational (*LMP, nodal*) • Capacity (*energy only, firm power auctions)* • Flexibility *(settlement periods)*	• Fair access • Appropriate risk • Simple • Interoperable	• Flexible • Promotes innovation • Works with other sectors
4. Assess solutions & Apply whole system lenses	**Decarbonise the system** | **Maintain system security** | **Achieve value for money** | **Promote fairness** | **Optimise across the whole system** 1. Power market design is fit for rapid convergence of sectors (transport, heat, industry, power) 2. Design is flexible and takes account of what is happening in other sectors 3. Design is doing the right things at the right time to enable the Net Zero targets and milestones of other sectors			
5. 2050 Pathways	• Proposed timings, milestones, owners, initial actions			

Indicative timeline



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Reflections and Q&A with the team

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The road to net zero electricity markets: other events

Tuesday 23rd March		*Wednesday 24th March*		*Thursday 25th March*	
10am	*1pm*	*10am*	*1pm*	*10am*	*1pm*
The road to net zero electricity markets launch	**Market reform insights**	**Code change roadmap to 2025**	**Electricity Market Reform: Capacity Market and Contracts for Difference**	**Net zero market design**	**DSO markets**

Are you interested in finding out about how the electricity market is changing and progressing to a zero carbon grid?

The Markets team in the ESO are running a series of interactive, online events in March, where you will be able to take part in focused sessions with subject matter experts on different aspect of electricity market change.

Click here to find out more and register for the events or access the recordings if you can't make the session.

Thank you

Your feedback is invaluable

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We’d love to hear what you thought of the event.

Please contact us via email:

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