



# Stability Market Design Innovation Project

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Electricity Market Development Manager



# We are exploring an enduring market solution to resolve stability challenges


Today we will be presenting the high-level recommendations of the Stability Market Design innovation project and next steps.

## Context




**ESO role**

We are responsible for ensuring the operability of the electricity system. This includes management of system stability.



**Retirals of synch gen**

Managing system stability has become increasingly challenging with the retirals of synchronous generation, historically providing stability as a by-product.



**Zero carbon**

We have an ambition to be able to operate a zero carbon grid. This has an impact on the requirements for system stability services.

## Project overview

A study-based innovation project, working with AFRY. Kicked-off in Sept 2021, aiming to finish by the end of Mar 2022.

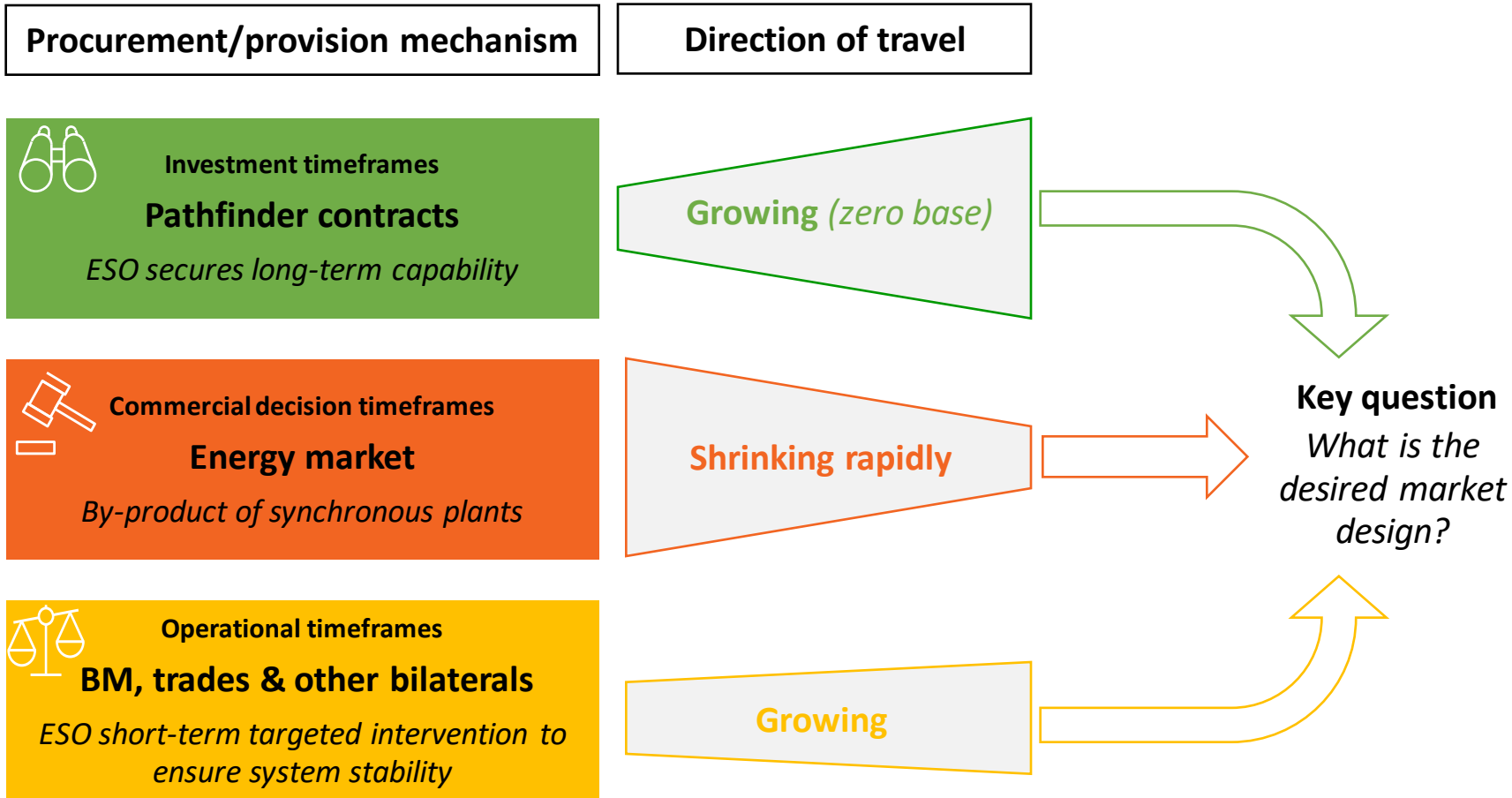
## Project key question

What are the possible high-level designs for a stability market that would allow us to meet our requirements whilst making efficient investment & dispatch decisions, also enabling wide participation with minimal barriers to entry?

## What next?

The project outcome is a preferred way forward – future steps will consider detailed market design & analysis. There would be additional consultation with industry and opportunity to refine based on engagement.

# Current arrangements allow for procurement across different timeframes and ensure stability requirement are fulfilled in the coming years



# We identified some opportunities for change in the current arrangements in line with our Market Design Objectives and Principles



Efficient Investment



Long-term market offers efficient **investment signals** for new capex-heavy investment.



Efficient dispatch



Short-term market enables additional provision to cope with **volatile** system needs.



Short-term market **lowers barrier to entry** for providers who cannot commit in advance and increase **competition**.



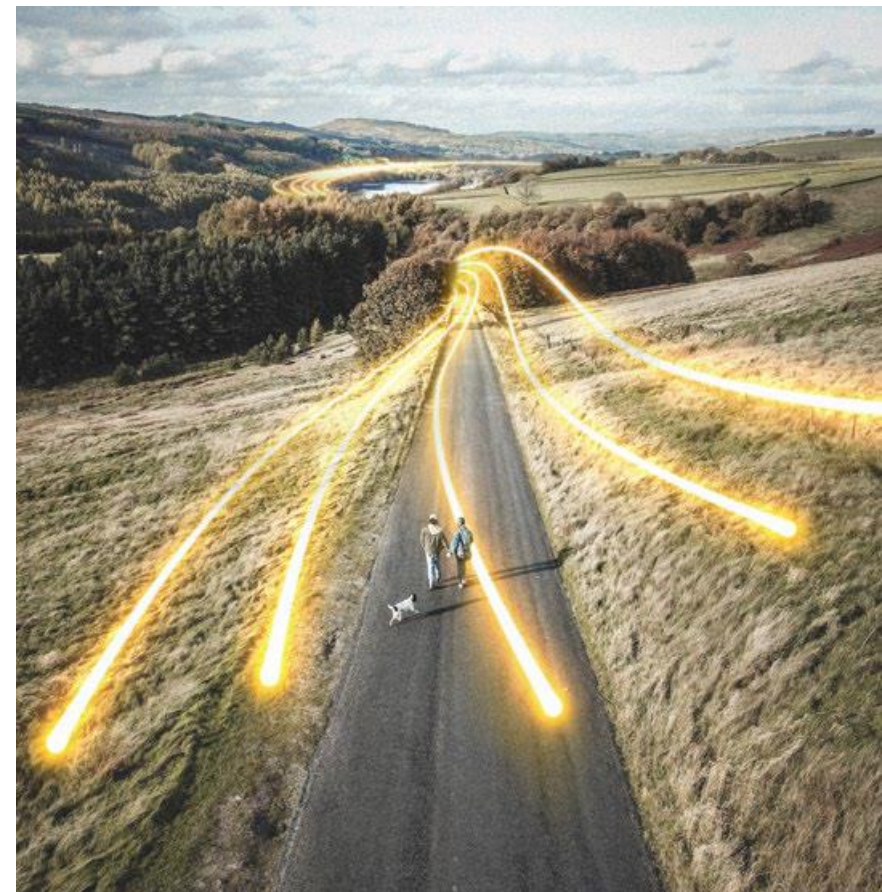
Short-term market offers route to market for providers under current pathfinders, when the **contracts expire**.



Value for Money



Long- & Short-term markets **lowers costs** (~£30m\* in 2026 and ~£58m\* in 2030, TD scenario) **and carbon emissions** as they reduce BM actions.



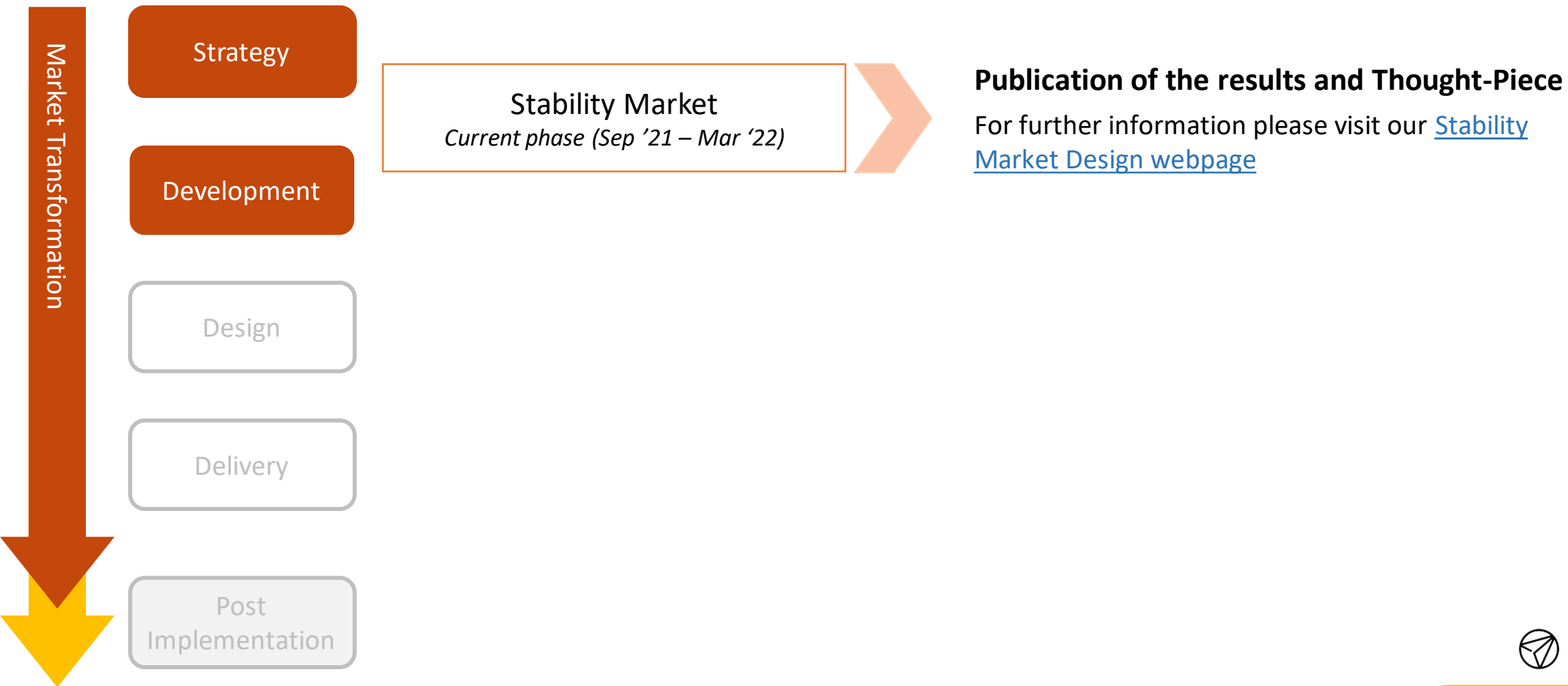
**The core recommendation of the study is to develop a combination of a dedicated short-term market (day-ahead) and long-term market (building on the well-functioning pathfinder approach) for stability services, while retaining BM actions as a backstop.**



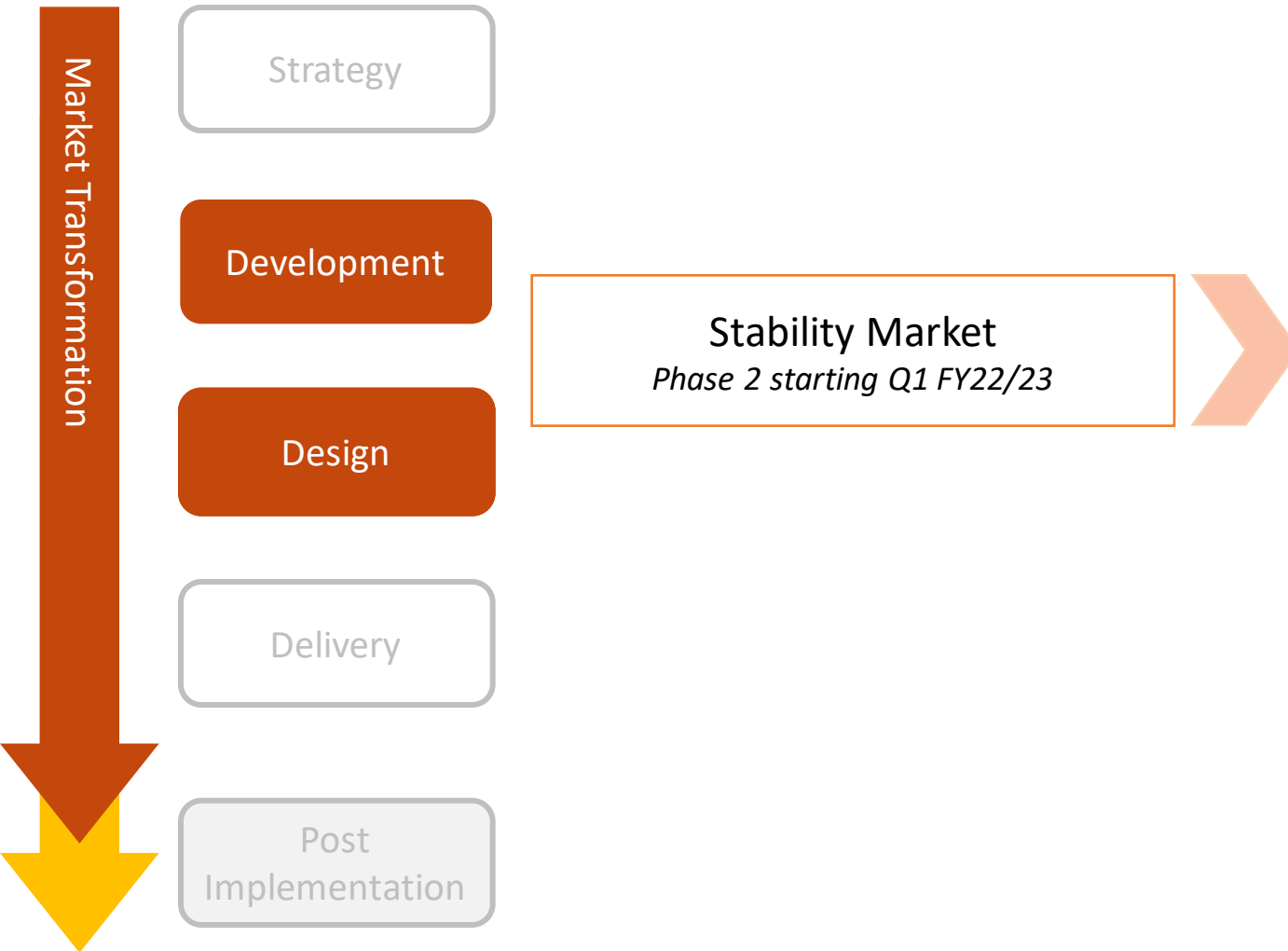
nationalgridESO

\*The analysis used AFRY's BID3 model and ESO's stability requirement based on FES 2019 data for Two Degrees scenario.

# Based on our Market Transformational Stages, further detailed development and design questions to be investigated



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## Stability Market Design Phase 2

The second phase of this innovation project is being scoped and could include:

- Exploring interactions between stability and other services such as reactive and response.
- Refinement of some market design options (e.g. contract duration) and our procurement strategy for long-term vs short-term.
- Thorough cost-benefit analysis with expanded modelling horizon beyond 2030.

Broad engagement and further industry consultation will take place.





Yuting Dai

Ancillary Services Implementation Manager

# Reactive Power Market Design Innovation Project

# What is reactive power and voltage control

- **Reactive Power** (measured in MVAR) is used to control voltage levels across the electricity system, this keeps the voltage balanced at the right level.
- Reactive power can be either injected onto the system to increase voltages, or absorbed to reduce voltages
- Our reactive power need and cost is **highly locational**
- There are different ways to manage voltage, we are currently exploring an appropriate reactive market solution focusing on the **supply side** mainly including:
  - Network Assets
  - Traditional thermal providers
  - Renewable providers
  - Interconnectors



# The case for change in reactive power procurement – rising costs

## Key Challenges

### Loss of traditional providers

Our latest Voltage Screening Report (June 2021) has highlighted across 7 regions we will lose access to 3,600MVAR of reactive capacity by 2025, and an additional 1,000MVAR by 2030, through plant closures.

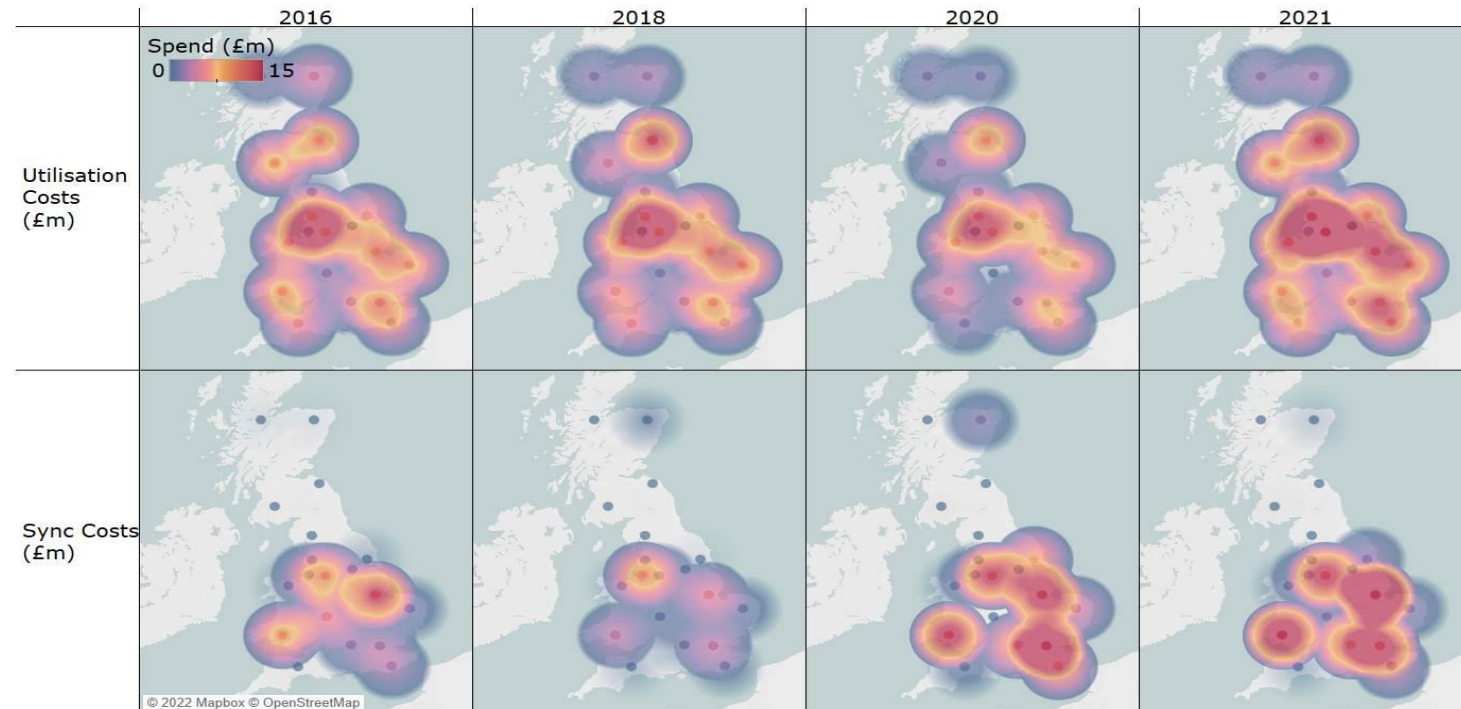
### Changing requirements

Additional 1,600MVAR could be required for reactive power absorption by 2025

### Increased cost

Voltage spent has been **increasing** in the last few years

Reactive cost trend (2016-2021)



# Existing arrangements to access and procure reactive power

		Competitive procurement	Access to all potential providers
Total requirement	<b>Pathfinder</b> (Long term contract)	Yes	Limited
	<b>Voltage contracts</b> (TCM, trades)	Partially	Limited
	<b>TO Network assets</b> (Reactor, capacitors etc)	No	Limited
	<b>ORPS</b> (Obligatory service)	No	Limited



## Current limitations:

- **No competitive** market in place
- **Limited access** to more providers
- **No enduring long term arrangements** in place to drive innovation



# Reactive market design NIA project in partnership with Afry (Oct 21 – Mar 22)



## Project Objective

This project is exploring an appropriate market solution to resolve the challenges for reactive power, which could ensure a **cost efficient** provision in the right location to maintain system **voltage security, increase competition** and **enable access** to wider ranges of providers in the context of a **zero carbon** system.



## Key Questions

- How do we define the reactive power procurement need in a standardised and transparent way to provide a **clear locational market signals**?
- How should we design the **market framework** and develop our **procurement strategy**?
- Which types of providers should be **eligible to participate** into the market?
- What is the best approach to access capability from **distribution connected assets**?
- How will the market interact with or impact the **existing arrangements**?



# What has been recommended as the key design option

- **A nodal approach** for requirement and price setting to improve locational market signals
- **A combination** of long and short term markets
- **Long-term market** offers **efficient investment** and ensures **sufficient capability**
- **Short term daily market** offers **the efficient despatch** and **creates access** to more capacity
- **All commercial providers** are ultimately eligible
- **A coordinated approach with DNOs** is required
- **Keep** the existing arrangements initially





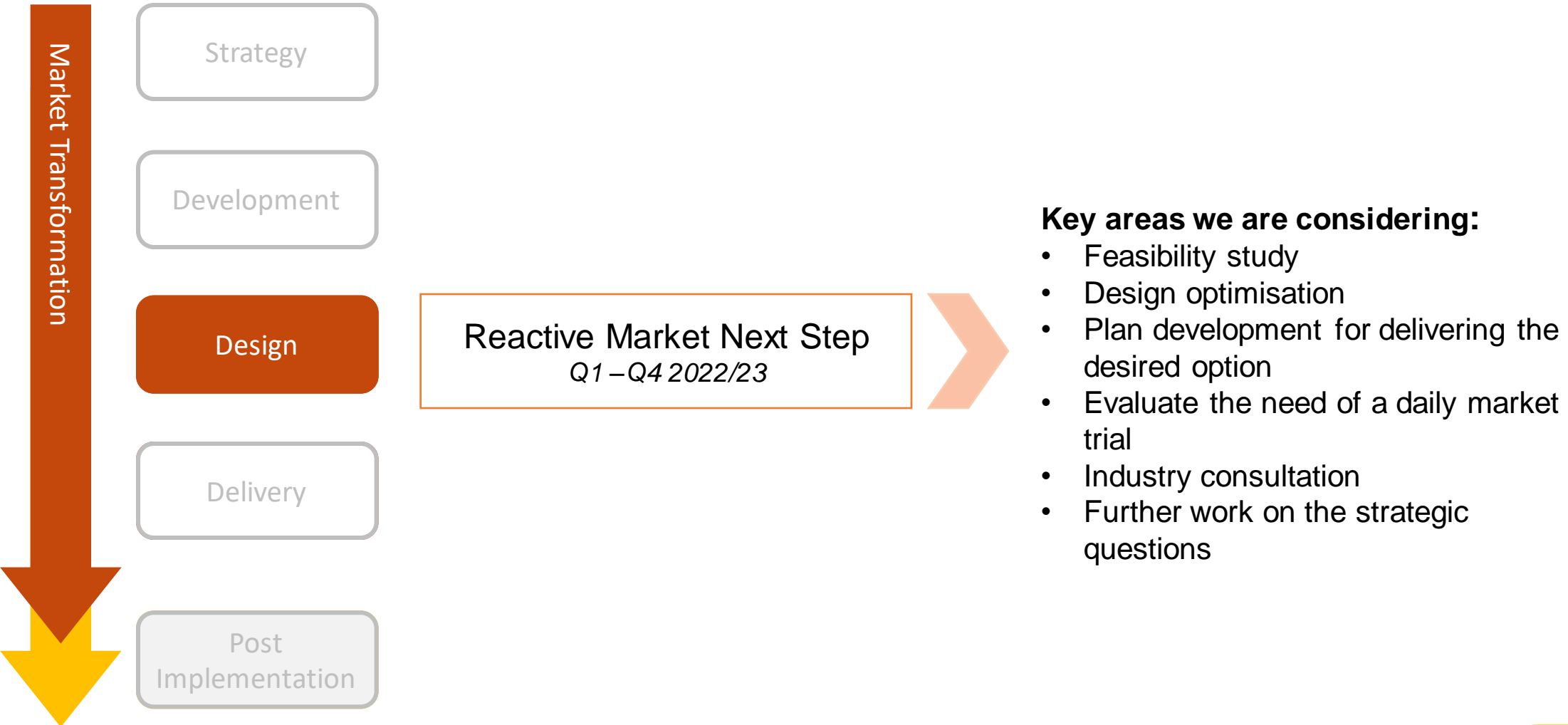
# Further work is required to optimise market design details and develop a plan for delivery



- We are finalising the project report which will be published at the end of March 2022 along with our proposed next steps for the reactive market project
- We will run an industry webinar in April to talk through the report and our next steps

For further information please visit our [website](#)

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# Q&A session

Until 12:10