Reactive power roadmap

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Agenda

- Principles of reform
- What is reactive power?
- How is it managed today?
- Why is change needed?
- Roadmap of actions
- Next steps

Principles of reform

Our procurement decisions will be transparent and our methodology and needs will be clear to the market ahead of time.

The design of our products, the way we procure, and the contractual arrangements will increase competition in provision of services to the SO.

Our products will be designed to balance operational requirements and the technical ability of provider assets, while maintaining system security.

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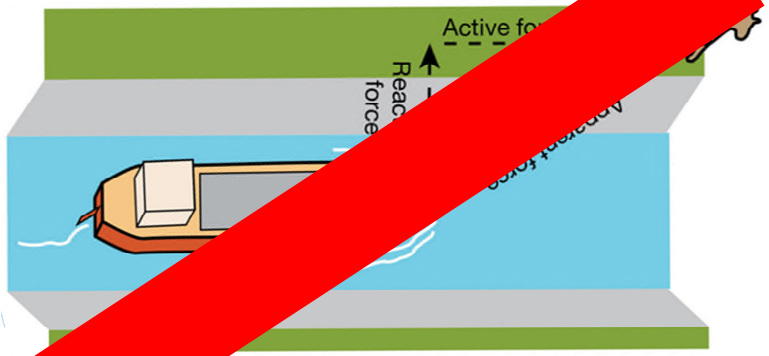
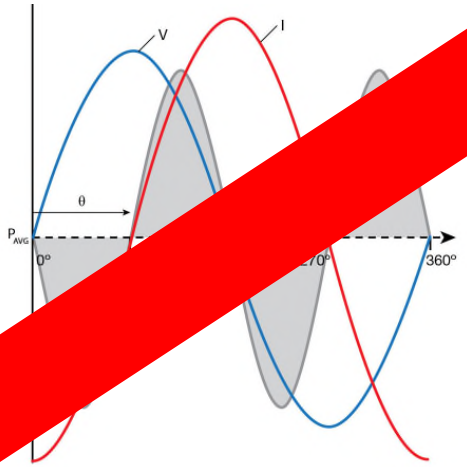
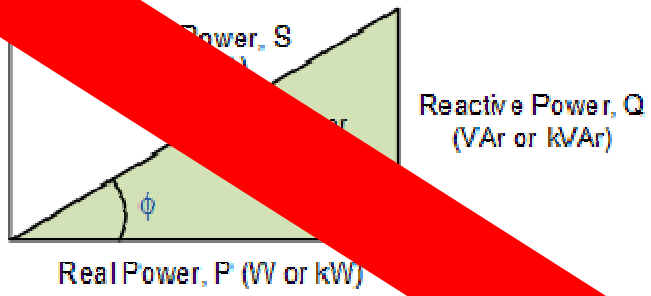
What is reactive power?







$P = VI\cos\phi, \quad S = VI, \quad Q =$

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What you *actually* need to know…

Reactive power is measured in MVar

Reactive power is used to control voltage

- Inject (+ve Mvar) then voltage goes up
- Absorb (-ve Mvar) then voltage goes down

Reactive power is regional

- We need a regional balance of Mvar injection and absorption, with sufficient providers
- Mvar are not effective if they are provided far away from the voltage control need.

How is it managed today?

ORPS (Obligatory Reactive Power Service)

- Payments for mandatory reactive power in the Grid Code.
- Based on ex-post review of ***utilisation*** only.
- Providers are paid at a pre-determined rate set out in the Connection and Use of System Code (circa £3/Mvarh).

ERPS (Enhanced Reactive Power Service)

- Participation is optional. Allows providers to submit enhanced range and pricing for synchronisation, availability and utilisation.
- No tenders accepted since 2009, and none received since 2011, hence we intend to remove this service.
- Opened for tenders every 6 months, with a minimum 12 month commitment period.

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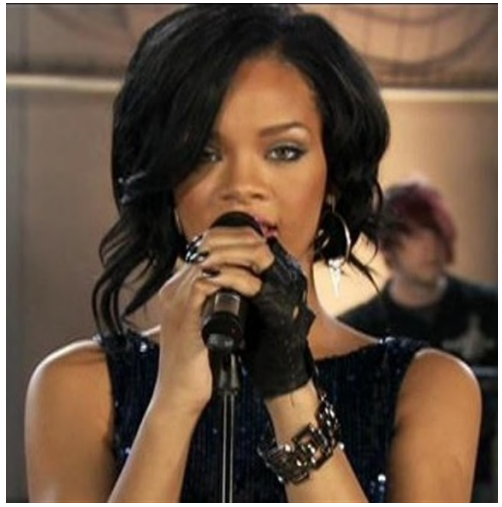
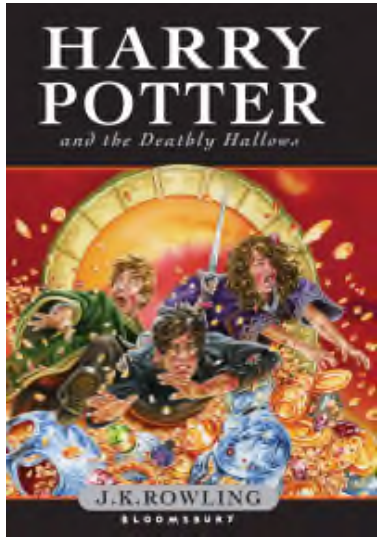
This year was significant for a lot of reasons…



2007



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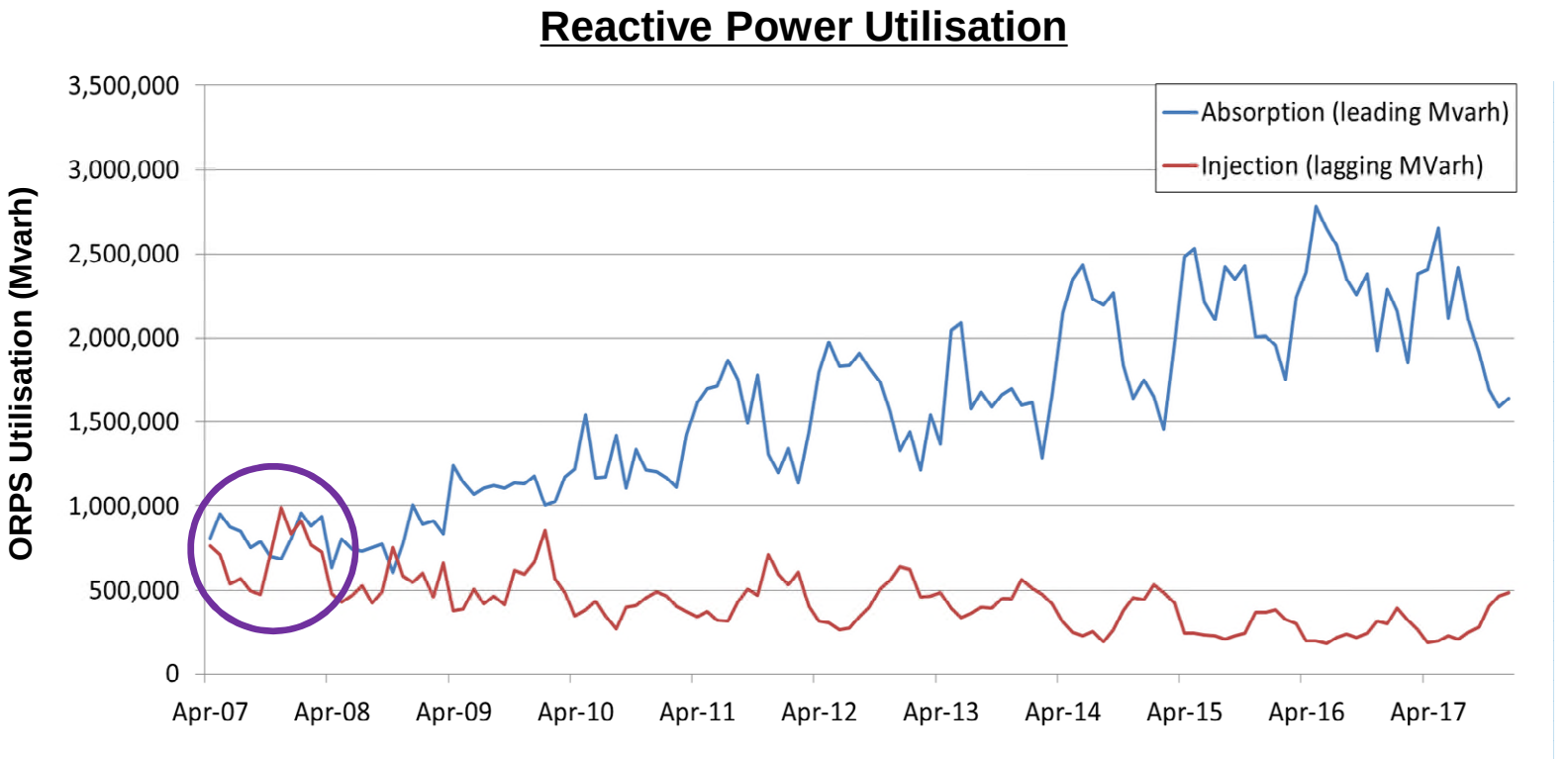
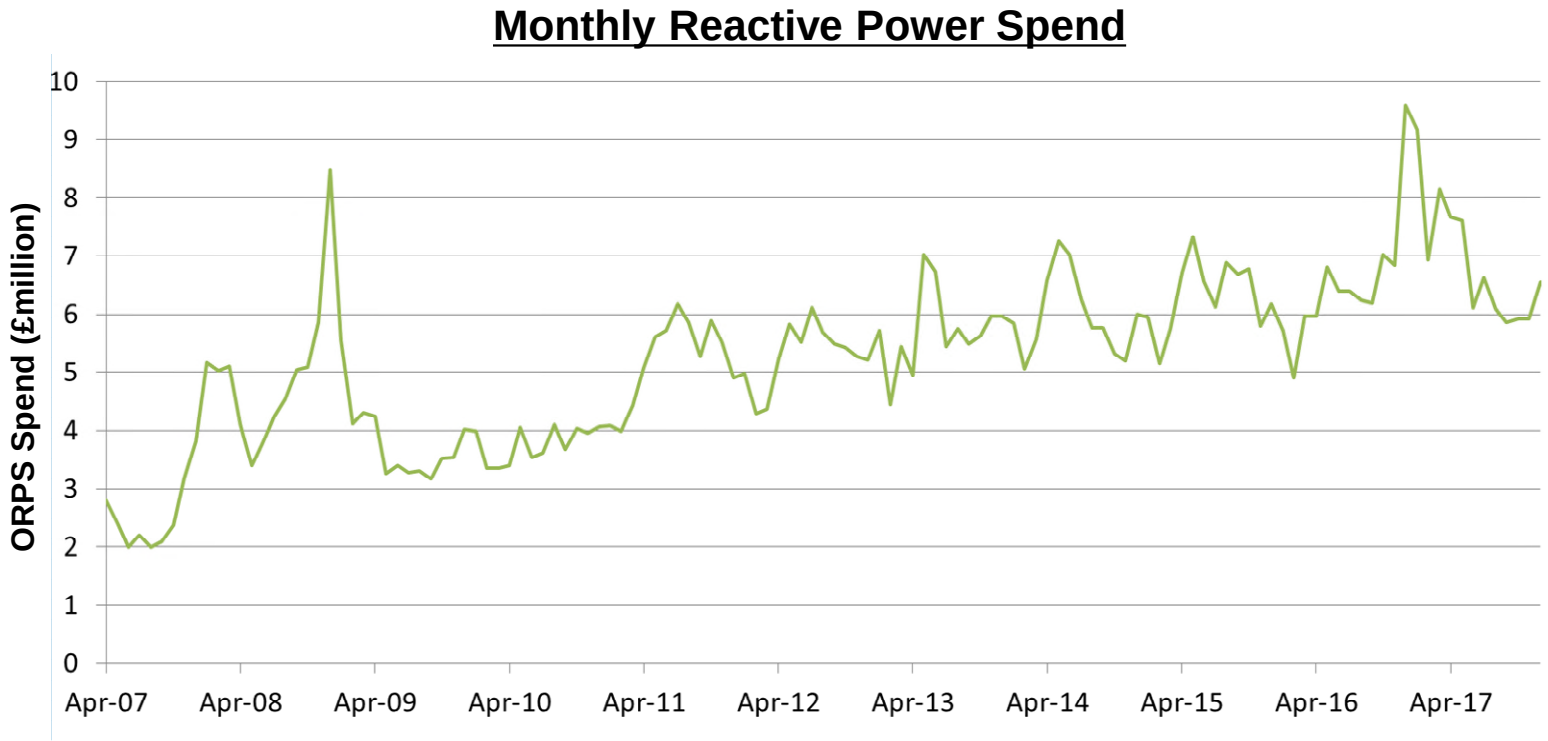
… but why was 2007 significant for reactive power?

- Since 2007, we have observed a continuous trend in changing reactive power needs of the transmission system.



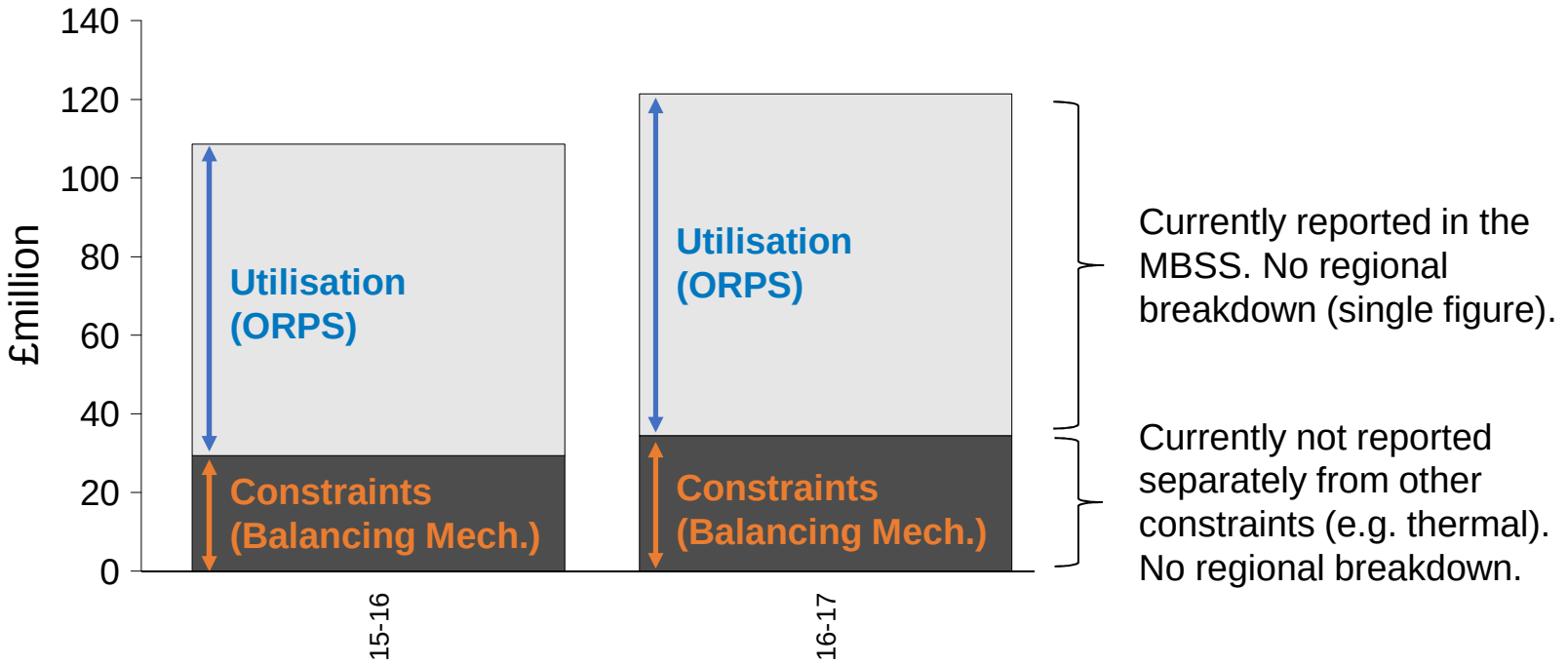
Why is change needed?

- Total annual spend on utilisation in 2017/18 was **£93m.**
  - Default ORPS rate varies from circa £2.50 to £3.50 (index-linked), which helps to minimise risk to providers in changes to cost of delivery.
  - ERPS required long-term commitment, which exposed providers to risk.

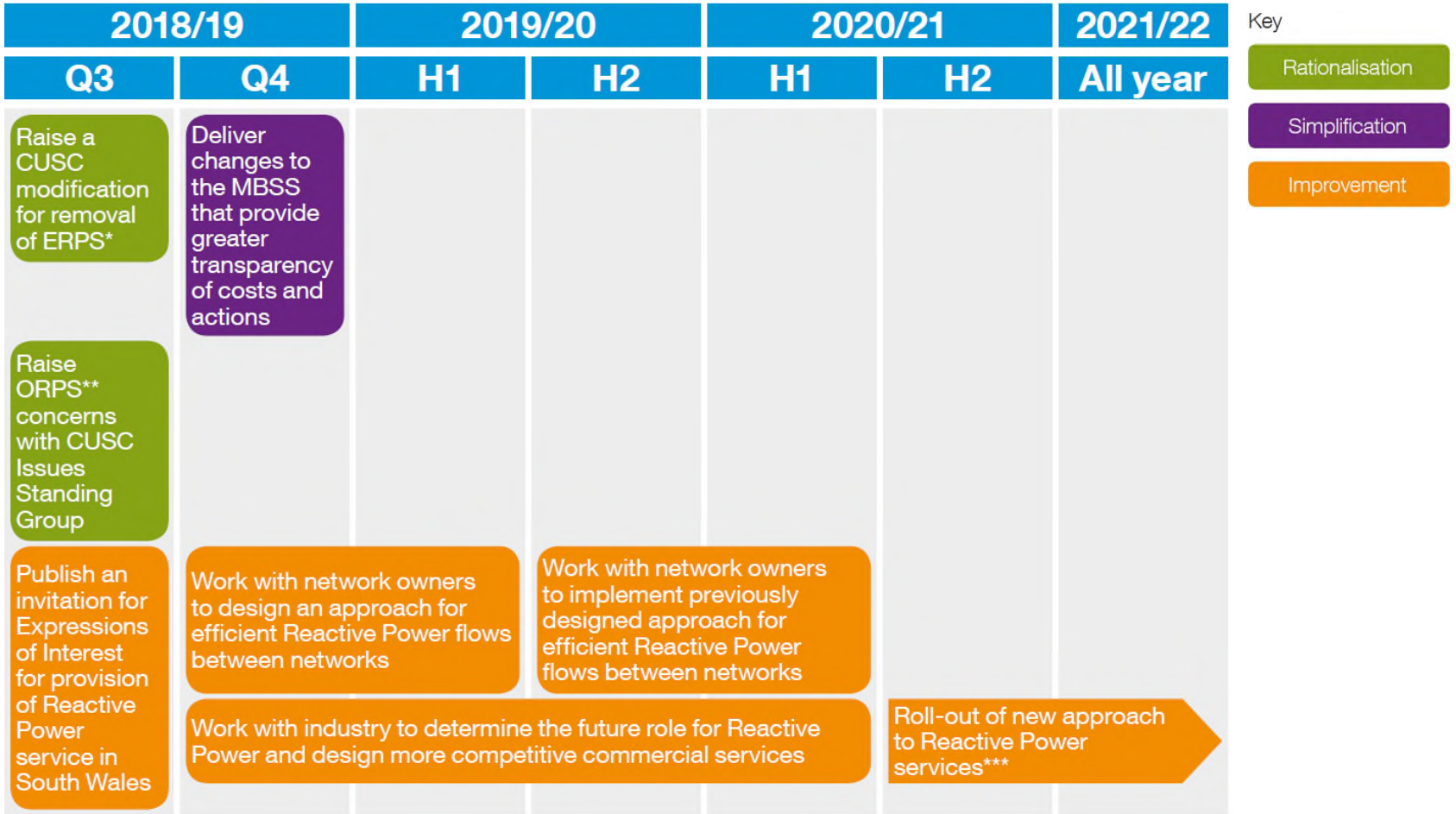


Why is change needed?

- Current arrangements have not been significantly reviewed since their original design in the early 1990's, and are designed based on performance and operating costs of thermal plant.
- Over the last three years, Balancing Mechanism constraint actions for voltage control have risen significantly relative to total spend.



Roadmap of actions



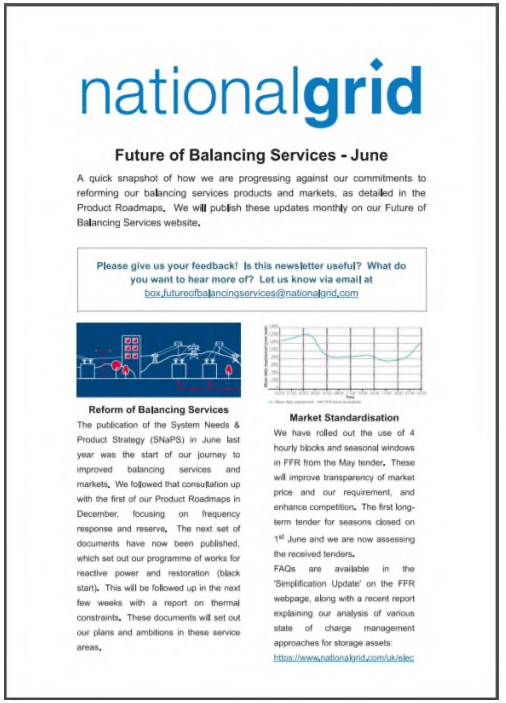
Next Steps

- Propose removal of ERPS and raise issues with ORPS design with the relevant CUSC groups by the end of calendar year.
- In the interim, publish a request for information for providers in South Wales, currently our highest spend reactive power zone.
  - The request will be sent out before the end of this year.
  - The purpose is to identify potential providers and their capabilities.
  - Provisional on the results, we hope to follow with more information and a tender in early 2019, for commencement of service from April 2019.
  - We will conduct the exercise in an open manner, and use the information obtained to inform longer-term reforms.
- Instigate a programme of engagement and consultation to investigate new approaches over the following 12 months.

Continuing the Conversation

- Sign up for our new Future of Balancing Services monthly newsletter.
- Participate in our engagement events
- Get in touch via email:

  futureofbalancingservices@nationalgrid.com



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Future of Balancing Services - June

A quick snapshot of how we are progressing against our commitments to reforming our balancing services products and markets, as detailed in the Product Roadmaps. We will publish these updates monthly on our Future of Balancing Services website.

Please give us your feedback! Is this newsletter useful? What do you want to hear more of? Let us know via email at box.futureofbalancingservices@nationalgrid.com

Reform of Balancing Services

The publication of the System Needs & Product Strategy (SNaPS) in June last year was the start of our journey to improved balancing services and markets. We followed that consultation up with the first of our Product Roadmaps in December, focusing on frequency response and reserve. The next set of documents have now been published, which set out our programme of works for reactive power and restoration (black start). This will be followed up in the next few weeks with a report on thermal constraints. These documents will set out our plans and ambitions in these service areas.

Market Standardisation

We have rolled out the use of 4 hourly blocks and seasonal windows in FFR from the May tender. These will improve transparency of market price and our requirement, and enhance competition. The first long-term tender for seasons closed on 1st June and we are now assessing the received tenders.

FAQs are available in the 'Simplification Update' on the FFR webpage, along with a recent report explaining our analysis of various state of charge management approaches for storage assets:

https://www.nationalgrid.com/uk/elec