Future of Reactive Power Project Market Design – Project Conclusions

29 April 2022

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Housekeeping, introduction and agenda

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Agenda

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The journey of work done so far and what next

Dec 2020

Problem analysis through internal and external industry engagement;

Share the output in **Industry webinar**

Jan - Mar 2021

Gap analysis to identify key focused area and **scope of work next** and share in **industry webinar**

Apr – May 2021

Develop and start **market survey** through emails and 121 meetings;

Initiate **innovation project support** and start RFI

Jun to Sep 2021

Analyse **market survey result;**

Assess innovation RFI options;

Develop **project plan** incl detailed scope and deliverables

Establish **project team**

Sep – Feb 2022

Project kicked off to start delivering the output (Co-creation with industry)

Industry webinars and workshops to share progress and discuss the feedback

Mar 2022

Share **the final project report** with industry

Develop **recommendation** for the next step of reactive market

April 2022 onwards

Industry webinar to discuss the Q&A for final report;

Develop the actions required from recommendation

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Summary conclusions and clarification discussion

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Preferred option **E**

RECOMMENDED MARKET DESIGN

	Long-term market	Year-ahead	Short-term market	Description / rationale
Products	– Pre-fault injection – Pre-fault absorption – Post-fault injection – Post-fault absorption			4 products in both markets : – Pre and post fault – Absorption and injection
Product linking	Option to submit mutually exclusive bids or bundled bids for a combination of products[1]			Participants can link products and make their offers mutually exclusive. Applicable for technologies capable of providing both injection and absorption, pre and post fault.
Contract type	Baseload availability [+ Potential for Fixed shape/peak window products][1]	Same as Long-term market	4 hour EFA blocks	Fixed shape/peak considered in the future. ESO preference for short-term market is EFA blocks initially, in line with initial provider feedback.
Locational Requirement	Nodal			Requirements are calculated and communicated per node.
Procurement strategy	Shortfall + Opportunistic			ESO buys (expected) shortfall plus additional capability if economically efficient
Provider Eligibility	Incremental *investment* only (additionality criteria, e.g. new build assets, existing assets making material investments to unlock additional MVAr)[1]	Incremental *capability* only[1]	Global selective: All providers are eligible. However, NGESO discretion for awarding contracts	**Incremental investment:** Capability which doesn't already exist and requires material investment to be accessible **Incremental capability:** e.g. ORPS providers outside of MSA ranges, existing non-ORPS providers, closing assets **Global selective:** NGESO procure if economically efficient to do so. All providers are eligible incl. existing ORPS providers in MSA ranges

* Further investigation is merited

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Preferred option **E**

	Long-term market	Year-ahead	Short-term market	Description / rationale
Frequency of procurement	National annual procurement	National annual procurement	National daily procurement for next day (D-1)	Annual basis for long term, buying the shortfall and/or opportunistic buying (if no shortfall, opportunistic buying can still occur). ST market has the same logic but broader eligibility.
Lead Time	T-4[1]	T-1[1]	D-1 (post-exchange)	Sufficient lead time for asset deployment, closure decisions, and operational decisions across the three time frames.
Product duration	15 year[1]	1 year	4 hour EFA blocks	Aligns with other long-term contracts (CM, CfD) for the long-term market. EFA blocks sufficient granularity based on ESO experience & in line with provider feedback
Payment structure	**Availability** £/MVAr/SP availability payment	**Availability** £/MVAr/SP availability payment	**Availability + utilisation** – £/MVAr/SP availability payment – £/MVAr/SP utilisation via ORPS payment mechanism	**Long term** market mainly targeting high-capex & low variable cost. **Short term** market targeting high availability & variable cost or low availability & variable cost providers.
Clearing principles	Pay-as-bid			Due to nodal nature of requirement and bundled products (multi-clearing price impractical)
Price control	– TO owned asset solution depreciated over [15y] horizon for new build.[1] – Forecasted short term cost for opportunistic procurement	Forecasted cost of meeting need in subsequent timeframes for opportunistic procurement, [price cap TBC][2]	Real-time alternative cost forecast (cost of meeting demand in balancing timeframes)	One tool to mitigate potential manifestation of market power given nature of reactive needs

[1]Further investigation is merited
[2]Existing procurement routes remain open to ESO to solve specific challenges outside of reactive specific market arrangements if necessary

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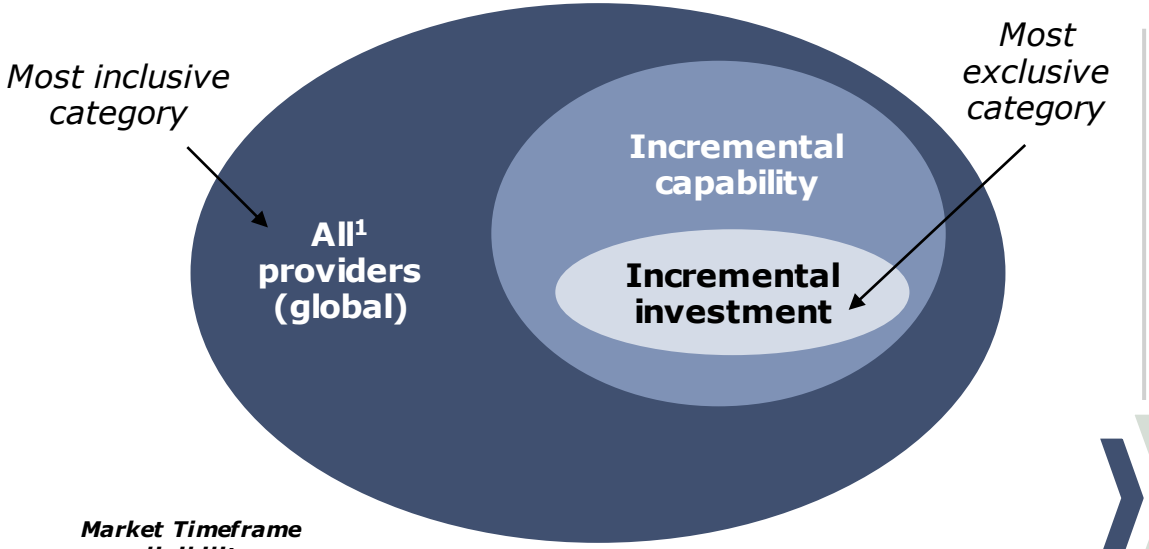
Preferred option E

	Long-term market	Year-ahead	Short-term market	Description / rationale
Availability requirement	High [95%][1]	High [95%][1]	100%	Failing to deliver agreed availability/ utilisation results in facing non-performance process
Non-performance process	Penalties: Non-payment, becoming more 'penal' below availability requirement (similar to current pathfinder approach)		Firm 'penalty' for non-delivery of declared availability (beyond non-payment [strong fixed penalty agreed price * X or agreed price + X])[1]	Strong incentives to 'show up' due to criticality of need. Simple to start with. Desirable end state may be to expose participants to replacement costs (akin to imbalance), depending on time frame.
Effectiveness factor	– Effectiveness factor defined individually per node for each demand node – Fixed at point of contracting for the whole contract duration		– Effectiveness factor defined individually per node – Dynamic, i.e. changing over time to reflect changes towards reference node	Effectiveness determined for both pre- and post-fault products. Effectiveness factors subject to change with changing network topology. Effectiveness factor in any market timeframe is the blended effectiveness factor over the periods in relevant contract duration.

[1]Further investigation is merited

Preferred option E

Due to the nature of arrangements (pay-as-bid, locational, overlapping obligations) we propose 3 categories of eligibility for our preferred option



Market Timeframe eligibility

Long term T-4	Incremental *investment* only (similar to CM, investment threshold test)
Year ahead T-1	Incremental *capability*, including ORPS providers outside of MSA ranges, existing providers with no MSA in place, closing assets
Short term	All[1] providers including ORPS providers in Mandatory Service Agreement (MSA) ranges

Justification of eligibility exclusions

Long term T-4	– This process is for long term contracts, supporting *incremental investment* in new assets – Opportunistic procurement is possible, if a new investment would be cheaper than the alternative – Inclusion of existing assets would complicate the process and cloud transparency
Year ahead T-1	– This process is closer to delivery than the T-4 round, and NGESO's views of capabilities and needs will be more refined – This is an opportunity for providers with firm availability to monetise *incremental capability* from existing assets, including capability not available under the grid code and also assets which would otherwise be expected to close.
Short term	– This is a final procurement round after the D-1 energy market and interconnector nominations, which allows otherwise uncontracted providers to offer availability to NGESO. – Bids will be accepted if they are needed to meet any remaining shortfall and if they are cheaper than the alternative (including the possibility of activation in the BM).

Notes: [1]All categories exclude providers that already have long term *firm* commitments/contracts to prevent double payment (e.g. Pathfinder contract holders, TO assets in RAB)

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Key outstanding items for further consultation and analysis

Implementation readiness and cost

Gap analysis identifying ESO cost and effort to implement new systems and processes.

CBA and/or market trial

Potential for a market trial for ST market, and CBA analysis to be conducted once sufficient data gathered.

Design refinement

Considering feedback received so far in the process, we recommend further consultation with stakeholders to reach final conclusion on issues affecting practicality for participants and ESO (minded-to positions presented but confirmation needed).

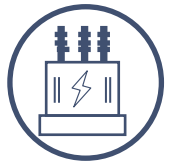
There must also be further refinement of detailed design questions including 'incremental' criteria, specific penalty arrangements, settlement timing etc.

Participant readiness

Identifying any residual barriers and feedback in practical implementation aspects, incl. time & effort needed for integrating with new systems and processes. Continued dialogue with participants.

Ofgem review of ancillary service assets

Assess impact of Ofgem regulatory review of ancillary services assets (once complete) to ensure design compatibility.



TO participation

Refine approach to how TO asset cost data are assessed and included in the LT auction as back-stop.

Residual value TO assets

Further work to explore residual value of TO assets to ensure comparability with commercial providers, who have the opportunity to reflect their views on residual value implicitly through bids into the market.

Expired RAB assets

TO assets outside of their RAB period should be considered as a potential solution if economically efficient. This issue warrants further investigation.

Stacking services

Stacking and co-procurement, exploring potential benefits of co-optimisation with other services.

Regulatory protection

It may be desirable to investigate some form of regulatory protection from potential gaming.

DER participation

We have identified several next steps for the inclusion of DER in any enduring market arrangements. These critical next steps involve changes that will impact distribution network owners, and as such will require a coordinated approach to implementation.

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Next steps

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Next phase of work and focus in 22/23

- Carry out **the feasibility study** to identify gaps and efforts of implementation and understand the readiness of ESO and providers
- Optimise the **details of design** and further assess its effectiveness

Based on the output from the work as above,

- Develop **implementation plan** for short term market, considering the option of a regional daily trial if required
- Develop **implementation plan** for an enduring long term market

In the meanwhile, we will continue to:

- Support the work to explore **a co-optimised procurement** method considering the interaction across different markets
- Support the work to develop **a co-ordinated approach with DSOs** for accessing DER capacity as part of our whole system ambition
- Keep **engaging and consulting with industry** to provide regular update at the key stages of work, discuss market design questions and co-create solution together

Question & answers

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Close

- All project information, recordings and outputs from previous work:

https://www.nationalgrideso.com/balancing-services/reactive-power-services/reactive-reform-market-design

- Contact us via our Future of Balancing Services email address: box.futureofbalancingservices@nationalgrideso.com

Thank you all for listening to this recording.

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