Dear sir/madam,

Your colleague Deirdre Bell has forwarded feedback from Storelectric to your consultation on embedded benefits, because most of it is highly relevant to this consultation. Please accept it as my submission.

Further to that feedback, I would like to add the following.

Fundamental overhaul needed
It is our view that we need a fundamental overhaul of the regulatory and contractual framework of the grid. More tinkering, such as you propose in this consultation, is merely adding more patches to an over-patched and worn out tyre. It is a 20th century framework for a 21st century grid, and on course for complete collapse as described in my other feedback.

You state that you are reviewing this system to put in place temporary fixes between 2017 and 2018. This is exceedingly counter-productive, creating complete regulatory and contractual uncertainty for that period and ensuring that fewer assets are built due to that uncertainty. Much better to leave today's system in place (with only minimal, essential tweaks) until that overhaul, and announce as early as possible the 2018 regime.

General incentives
Your SO incentives are focused on keeping electricity flowing in the grid in the short term future - hence your 8-year RIIO frameworks in which all assets need to be evaluated, and your 2-year contract periods. I explain the damage caused by the latter extensively in the other submission. Therefore you need to change your incentives to incorporate the 20-year horizon: will the grid be fit for purpose then? Will there be enough generation at each level (transmission, distribution) then? Will we be over-dependent on imports?

Current incentives push operators merely to sweat assets with a minimum of maintenance and patches to the system. You need long term contracts, signed before construction, to incentivise proper long term investment in the system. Nobody will build a major asset on the offchance that they may win a contract with a duration one-tenth of the life of the plant.

Balancing costs
You evaluate the costs of balancing the system at £850m p.a., but this ignores other costs (particularly those recovered through levies, and those such as grid reinforcement that could have been deferred under a better system but were not and whose costs are hidden) incurred to patch up the broken system, such as the Capacity Market.

Contract start
Moreover, as a fundamental problem intrinsic to your RIIO regime your contracts all need to deliver power within a 2-3 year period, whereas a new transmission grid connection takes 5-10 years; distribution grid connections also take an uncertain number of years for delivery. To this lead time needs to be added the time to obtain planning permission (NCIP if generation over 50MW) plus the pre-planning design and project development time. This current situation prevents any investment into any asset that requires a new grid connection, which therefore means that if demand has moved elsewhere, generation doesn't move with it (a particular problem with the growth of London). Major investments should be supported by long duration contracts for the services that they deliver, timed to start when planning, grid connection and 1-2 years' pre-planning are complete.

In this context, while CCGT and battery developers can often build on sites with existing grid connections (though this does not take account of changing demand patterns), some assets like ours and many renewables (e.g. wind, wave, tidal, hydro, geothermal) need new grid connections because they are tied to geologies, geographies etc. that are not handy for old ones.

Dispatchability
Current incentives for renewable generation merely incentivise generation, regardless of when it's wanted. This is for excellent reasons, especially the intermittency of such generation. But if there were additional incentives for dispatchability, the developers would develop generation in conjunction with storage and the SO would find the entire system cheaper and easier to sustain.

This dispatchability would have to be graduated, on a sliding scale, with its main variable being duration: if an entire night's generation can be time shifted, this should reap more reward than if only 0.5 - 2 hours' generation can be time shifted.

Monetising all capabilities
If all capabilities of a given asset class could be monetised, again the SO's job would be cheaper and simpler while each asset class would receive revenues more in keeping with their contribution to the whole system.

For example,

- Inertia is not rewarded. Yet as inertia on the system reduces, the SO needs to create an entirely new market mechanism, EFR, to incentivise pseudo-inertia.
- Reactive power is inadequately incentivised so the SO finds itself having to build four new reactive compensators in the West Midlands and North West.
- There is no standard mechanism for evaluating and compensating (maybe by splitting the benefits between developer and SO) grid reinforcement deferral, so new plant is built where grid connections already exist rather than where they will do the system the most good.
- Layering of revenues is discouraged by the lack of coordination of Ts and Cs of each market mechanism, so equipment such as new large scale storage is not built because it struggles to monetise its services.

A new system
Any new system needs to balance long term and short term health of the grid, and to consider whole system costs rather than salami slicing it. Things to look at include:

1. Contracting for up to 50% of each service under long term (15 or, better, 20 years) contracts that can only be let to new construction, with the start of delivery deferred for as long as it takes to design, build and connect it to the grid - and the remainder under shorter term contracts available to existing plants;
2. These long term contracts for new plant should be written to incorporate all the services that such new plant will offer, e.g. in a single contract including generation, frequency response, reactive power, inertia, demand turn-up and black start;

3. Creating a standard mechanism for evaluating grid upgrade deferral resulting from any given investment, and sharing those benefits (one-off and ongoing) between both operator and developer, which would incentivise the geographical location of the asset;
4. Grid location of asset: distributed assets are excellent, up to a point, and there needs to be a minimum supply and demand on the transmission grid;
5. Co-ordinating the terms and conditions of services to encourage layering of revenues;
6. Ensuring that all services, including dispatchability and inertia, are incentivised;
7. Incentivising cleanliness in all services, probably by a multiplier dependent on the emissions as a percentage of those that would be emitted by a CCGT offering the same services, together with a factor to reflect the cleanliness of the manufacture, construction, longevity, upgradeability, demolition and disposal of the technology and site;
8. Creating a regulatory definition of storage so SOs can invest in it (including using the NIA and NIC schemes), so they can contract storage services, so neither capital nor operational costs are charged twice when they should be charged either once or not at all for different aspects - with the benefits depending on the degree of control given to the SO;
9. Recognising the three main aspects of storage in any resultant contracts: capacity, duration at rated capacity, and response time (both up and down) - adjusted for efficiency and for the cleanliness of both operation and equipment.

Your questions - Section 1
1a: Yes, put financial incentives on the SO that are in line with the above recommendations for the fundamental overhaul of the system. This will get them thinking and acting along the right lines (practice makes perfect), and predispose them to the ways of acting which you seek to incentivise in the new system.

1b: Minimise change in the contractual structures until the fundamental overhaul, so as not to create undue certainty.

1c: Only as incentives on the SO, not as significant changes to the contractual framework.

Your questions - Section 2
1a, b, c: Minimise change. And if you're capping and collaring such services, you're only hiding their true costs and confusing the issues that the system overhaul should clarify, thereby making both your and the SO's job harder.

Your questions - Section 3
3a, b, 5a, 6a, 6b, 8: As my response to Section 2.

4a: Auction each, for short term contracts; include in long term agreements for new plant.

5b: The IRM needs to be modified so the SO can invest in longer term initiatives such as large scale electricity storage.

7: Yes and no. There should be more bilateral contracts negotiated, to enable the SO to incentivise the developments and assets it really needs, but these should then have their (at least, main) terms published so others can (a) plan their own initiatives with a clearer view of

potential revenues, (b) more easily access them especially if they're not big incumbents, and (c) ensure that the system is not being abused.

Invitation
We would welcome any opportunity to discuss our submission and to help you formulate your proposals.

Please add this and my other feedback for consideration in your forthcoming consultation on flexibility.

Sincerely,
Mark
--
Mark Howitt
Director, Storelectric Ltd
www.storelectric.com
+44 7910 020 686
Skype: Storelectric.mah

Storelectric is developing Compressed Air Energy Storage in the UK, to store many gigawatt-hours' worth of electricity in order to make renewable energy more useful and profitable, costing ~1/10 the cost per GWh of pumped hydro-electric storage, in more useful locations and without major environmental impact. We have patent pending technologies to increase efficiency to well beyond that achieved by any other CAES installation.