BEIS Review of Electricity Market Arrangements (REMA)

SSE response summary – October 2022

Overview

A shift in GB policy and regulation: Greater focus on long-term value

REMA represents a critical opportunity to build on the UK's past successes to deliver a cleaner, more secure and more affordable electricity system that will be the backbone of an energy-independent, low-carbon economy out to 2050 and beyond. Given the need for REMA to deliver long-term success, it is important that related measures to address energy issues for this winter or next do not undermine the REMA process that is so critical to delivering the necessary investment to meet the Government's objective of becoming a net exporter of energy by 2040. The REMA consultation document and the approach taken by BEIS has, rightly, focused on this long-term challenge.

The next phase in electricity market development is about moving from a world where low-carbon power was a novelty, to one in which it is the predominant electricity source. This means the final design must focus on rapidly scaling the deployment of new and existing technologies. To do this, we must ensure that decision making across the system is based on what experience tells us gets things built cost-effectively, based on what we have collectively learned about the realities and complexities of delivering major infrastructure. The UK has had significant successes in decarbonising electricity, most notably in the development of offshore wind following the introduction of Contracts for Difference (CfDs) within the Electricity Market Reform (EMR) established in legislation in 2013.

The impact of the UK's success has been felt domestically in lower infrastructure costs as well as a framework which is already mitigating the impact of higher prices on consumers in this and in future winters. Internationally, it has helped inform the rapid acceleration of energy transitions in other countries, with the UK looked to as an exemplar. Last year, as a COP26 Principal Partner, SSE commissioned KPMG to consider the learnings from the UK's experience that could be taken as a blueprint for others to follow[1]. The key question moving forward is how we can build on the success we have enjoyed to date as the pace of change accelerates – adapting to the changing landscape and heightened ambition without undoing any of this enviable progress.

In that respect, REMA presents an inflection point. There is a significant opportunity to build on the strong base that has been established by considering both the immediate issues facing the market in the wake of Russia's invasion of Ukraine, and the underlying structural issues – many of which were already well understood and under consideration. In particular, SSE views that REMA needs to prioritise addressing the following key challenges:

- **Ensuring electricity network development keeps pace with generation and demand evolution deployment** so as to allow the full benefit of the renewable energy buildout to be captured quickly and to avoid significant constraint costs, as well as supporting the electrification of heat and transport.
- **Introducing a greater focus on long-term value within the GB policy and regulatory framework** to support capture of wider societal benefits and mitigation against future high-impact, low-probability events in a cost-effective way.
- **Accelerating the development of homegrown energy provision** to refocus on ensuring security of supply while supporting economic growth and boosting energy exports for UK plc.

[1] KPMG (2021) – *Hindsight is 2050 vision*

Optimal REMA approach: Evolution of current market frameworks

The policy mechanisms are largely in place to deliver the significant levels of investment required to transform the GB energy system to meet the Government's REMA objectives. The CfD, the Capacity Market (CM) and the RIIO-2 framework will do much of the heavy lifting out to 2035; but to ensure the REMA objectives are met at best value, evolution will be required to address some of the emerging challenges. These incremental improvements will be needed in addition to the introduction of mechanisms to support investment in low-carbon flexibility to include long duration storage and the Dispatchable Power Agreement (DPA), helping to deliver first-of-a-kind power CCS and hydrogen-fired power generation projects.

With the UK Government's focus on delivery of low-carbon infrastructure and the importance of accelerating the rate of investment over the next 10 years, **REMA should focus on evolutionary improvements of existing mechanisms** and ensure coherence across development of the range of policy and regulatory mechanisms. With the need for a 'build focus' in the coming decade, more fundamental changes should be avoided unless a robust case for change has been made, accounting for trade-offs given the disruption and distraction they could cause. In the event that a case for more fundamental change in a given area *can* be made, it will still be important to consider the knock-on implications given that existing policy mechanisms would likely need to be reorientated to mitigate the negative impacts that would arise.

The most significant and controversial debate that has been initiated as part of REMA is the possibility of moving away from a single national price for electricity in Great Britain to a complex nodal pricing model, which would create over 500 different wholesale prices across the electricity system. SSE does not see a sufficiently compelling case for such Locational Marginal Pricing (LMP); it would represent a change so fundamental that the resulting increased market complexity, and the damaging effects of this on the investment case for projects, would greatly outweigh any perceived benefits. Analysis undertaken by Frontier Economics for SSE, alongside other market participants, suggests that implementing **nodal pricing in Great Britain could add 2-3 percentage points to the cost of capital[2], which would in turn add at least an additional £90bn to the cost of the energy transition up to 2050[3].** This analysis does not account for any wider disruption that would result from implementing such a radical change at what is a critical time for not only maintaining but rapidly accelerating investment in low-carbon generation.

The case that national pricing has led to increased network constraint costs has not been adequately made. Nonetheless, open discussion of this proposal to restructure in such a fundamental way the GB electricity market is already leading to increased uncertainty for investors with the associated implications for the cost of capital. Indeed, this is now impacting our own investment decisions. In light of this, we would not only caution against implementation of such a policy, we would recommend removing nodal and zonal pricing options from consideration for the next steps of REMA in order to maintain investor certainty and minimise the cost of capital.

Of course, we agree that there is a need to ensure that sufficient locational signals exist to ensure the system develops in the most cost-effective way. However, we strongly believe that locational challenges can be best resolved through more timely and strategic buildout of the GB electricity transmission network – as is being done under the Offshore Transmission Network Review (OTNR) – in combination with other evolutionary changes to existing frameworks which can cut constraint costs with far less disruption[4].

[2] LCP (2022) - *Impacts and implications of the British Energy Security Strategy (BESS)*

[3] Frontier Economics (2022) - *Locational Marginal Pricing - Implications for Cost of Capital*

[4] Frontier Economics (2022) - *An Assessment framework for a move to LMP in the GB Electricity Market*

SSE view that the biggest opportunity for the REMA process to deliver value for consumers is through extending the CfD to cover all non-flexible, low-carbon generation. This would save consumers £48bn by 2050 alone[5]. It would remove the current imbalance between incentives for new and existing generation, which favours new generation over more cost-effective life extensions, refurbishments or repowering of existing generation. **This would also have the important benefit of de-linking electricity prices from volatile gas markets by effectively splitting the market, ensuring that an energy crisis of the magnitude felt by consumers today could not happen again in the future, irrespective of geopolitical factors.**

REMA next steps: Areas requiring further consideration

In developing our response, through consultation within SSE and across industry, we have identified a number of specific areas we believe most merit consideration by Government, regulators and industry:

- **Moving the CfD to paying on deemed output.** This would incentivise more flexible and responsive behaviour for renewable assets, reducing system costs whilst also reducing uncertainty for developers of renewable energy projects. More analysis is required on the practical implementation in Great Britain and how any adverse impacts could be best mitigated.
- **Developing hedging products for a renewables-based electricity market**. Whilst greater volumes of CfD generation will largely hedge consumers from energy market volatility, there is a question about new hedging products suppliers will need in the future, as traditional baseload and peak contracts will no longer match suppliers' exposure.
- **Assessing alternative options to address locational challenges**. A comprehensive assessment of options to alleviate transmission system constraints should be conducted, including:
    - An accelerated transmission network build;
    - CfDs based on deemed output;
    - Introduction of Transmission Network Use of System (TNUoS) credits to incentivise storage and electrification in export constrained areas;
    - Reforms to the Balancing Mechanism (BM); and
    - Other targeted measures.

SSE would recommend that BEIS sets up targeted expert working groups to examine what could be done across each of these three areas, and, alongside other industry stakeholders, we are keen to work towards solutions that support the cost-effective delivery of secure, low-carbon energy.

[5] LCP (2022) - *Impacts and implications of the British Energy Security Strategy (BESS)*

Key points

1) Low cost, low carbon

- **Given capital expenditure will represent the bulk of the cost of the energy transition, keeping the cost of capital as low as possible should be the primary focus for REMA**

  The UK has been a leading market for investment in low-carbon infrastructure, driven by its stable market frameworks and robust, well understood investment mechanisms which share cross-party political support.

  It is critical that this favourable investment climate is maintained through an evolutionary approach to REMA. Fundamental changes without robust analysis and stakeholder engagement would undermine this hard-earned, but easily lost reputation.

  Given the £350bn in capital investment required to deliver the volume of low carbon generation to decarbonise the electricity system and extend clean electricity across the economy[6], keeping financing costs to a minimum should be the highest-priority objective for REMA.

  An extra 1 percentage point on the cost of capital for low-carbon generation would add £45bn to overall costs by 2050[6]. As such, measures to increase price exposure within the CfD would lead to increased costs that would far outweigh any theoretical benefits, and trade-offs for policy choices within REMA will need to be robustly considered.

  The UK market frameworks have already delivered a lot, and has an enviable, world-leading position. This means the argument for driving infrastructure buildout through robust, stable policy mechanisms that reduce the cost of capital has a huge body of real-life evidence behind it. More hypothetical, academic arguments for fundamental changes lack the same real-word proof base, and would represent a significant gamble with the country's energy future.

- **Valuing all low-carbon generation equally by extending CfD coverage**

  As outlined above, extending the CfD across the market to remove the imbalanced incentives for new and existing generation represents the greatest opportunity for REMA to deliver savings. It would ensure existing generation is incentivised to maximise its output and does not prematurely close due to failure to cover fixed running costs.

  Analysis carried out in July 2021 concluded that addressing this mixed incentive would save £20bn by 2050. However, **the increased 2030 renewables ambition in the British Energy Security Strategy (BESS) means the potential saving has more than doubled to £48bn by 2050**[6]. One option already under consideration is the use of voluntary CfDs as a near-term intervention to address this issue while de-linking electricity from wholesale gas prices. Other options such as split markets could achieve the same outcome, but further investigation is required.

[6] LCP (2022) - *Impacts and implications of the British Energy Security Strategy (BESS)*. The CCC estimate a £400bn figure within the report of its *Net Zero Electricity Market Design Expert Group*.

2) Addressing locational challenges

- **Strategic transmission network buildout is critical**

  In any scenario, **a significant buildout of Great Britain's electricity transmission network is going to be required to meet the UK's 2035 decarbonisation objectives cost-effectively**.

  This is highlighted by the difference in constraint costs before and after accounting for the 2030 network upgrades included in the Offshore Transmission Network Review's (OTNR) Holistic Network Design (HND). NG-ESO's modelling had expected constraints to reach £3bn/year in 2029, but after accounting for transmission reinforcements within the HND the expected constraint costs fall to £1bn/year in 2030[7].

  HND2, due in Q1 2023, is expected to further address future infrastructure barriers by setting out a plan to deliver 50GW offshore wind by 2030 and connect all ScotWind projects. **This coordinated approach to developing offshore grid infrastructure is expected to save £6bn by 2040[8]**, and will help the UK develop a leadership position in floating offshore wind and supporting technologies, such as High Voltage Direct Current (HVDC) transmission infrastructure and options for offshore hydrogen electrolysis.

- **Theoretical benefits of Locational Marginal Pricing don't outweigh costs**

  Many studies have outlined the theoretical benefits of Locational Marginal Pricing (LMP) but overlooked the impacts on the cost of capital through the significant disruption caused to those mobilising investment in major projects and the disruption of a fundamental change to the GB market – at a point when an significant acceleration in investment is required.

  As outlined above, analysis suggests that **moving to nodal pricing could increase the cost of capital for low carbon generation by 2-3 percentage points,[9] which would increase overall costs of decarbonising electricity by at least £90bn up to 2050,[4] even before the wider impact of such disruptive change is considered**. The longer this discussion overhangs the electricity system, the greater the impact it will have on the costs of investment.

  Alongside a buildout of the electricity transmission network, there are alternative options that could deliver the aims of introducing locational marginal pricing with significantly less disruption.

  The next stage of REMA should consider a combination of options to alleviate constraint costs, including: moving to deemed generation in the CfD; demand credits in Transmission Network Use of System Charges (TNUoS); reforms to the Balancing Mechanism (BM); and more targeted measures within existing and/or new mechanisms.

[7] NG-ESO (2022) - *Modelled Constraint Costs: NOA 2021/22 Refresh*

[8] LCP (2022) - *Impacts and implications of the British Energy Security Strategy (BESS)*

[9] Frontier Economics (2022) - *Locational Marginal Pricing - Implications for Cost of Capital*

3) Ensuring a secure electricity system

- ## Optimisation of the Capacity Market

  The Capacity Market is largely fit for purpose, but it needs to procure higher volumes and introduce tougher penalties to deliver the outcomes policymakers expect and that capacity procured can be relied upon at times of system stress.

  Evolving the Capacity Market to support low carbon alternatives will be necessary to meet the Government's 2035 objective to decarbonise electricity, particularly in bringing forward the expected 20GW of hydrogen-fired generation required by then to enable the system to maintain security of supply[10]. There is also merit in considering changes to reward greater flexibility and sustained response within the Capacity Market.

  Interconnectors can deliver significant benefit in sharing excess renewable electricity across markets and in combination with the UK's increased renewables ambition will enable the **UK to become a net exporter of electricity from 2028**, with electricity exports being central to the UK's ambition to become a net energy exporter by 2040[10].

  However, this winter has shown **interconnectors can undermine domestic energy security during concurrent system stress events across neighbouring markets**. Consideration should be given to how interconnectors are appropriately accounted for in the provision of domestic capacity, including potentially applying negative de-rating factors in the Capacity Market.

- ## Need for strategic development of storage options

  The current crisis has amplified the potential benefits of energy storage as well as a diversity of technologies. Deploying 21GW of batteries, 5GW hydro pumped storage and 40GW of hydrogen electrolysers (with hydrogen storage and 25GW of hydrogen-fired electricity generation), would save £2bn by 2040 and help develop the UK's hydrogen economy and secure a domestic supply[9].

  Importantly, deploying this storage capacity would reduce curtailment by 40%, enabling better utilisation of the UK's renewable energy capacity. Targeting the deployment of these storage assets through reformed Transmission Network Use of System (TNUoS) charges, which could be used to address locational issues in the GB electricity system.

  REMA should ensure the electricity system has a mix of short, medium and long duration electricity storage capabilities to deliver on its 2035 objectives to decarbonise the electricity system, with a particular need to ensure market frameworks value sustained response.

[10] LCP (2022) - *Impacts and implications of the British Energy Security Strategy (BESS)*