

National Infrastructure Commission call for evidence

Regen SW response

January 2016

Summary

Regen SW welcomes the National Infrastructure Commission's call for evidence. This response addresses two of the 'Electricity interconnection and storage' questions.

In the Secretary of State's speech on 18 November 2015 on a new direction for energy policy, Amber Rudd commented, "locally-generated energy supported by storage, interconnection and demand response, offers the possibility of a radically different model." We agree.

Changes need to be made to enable a much more active role for Distributed Network Operators in balancing the system, to make half-hourly metering the standard approach to provide the data needed for smarter use of energy and to ensure price signals drive behaviour to make best use of our energy infrastructure – for example through storage and demand side response.

A more integrated approach to energy is also required through addressing regulatory barriers to enable flexibility on a constrained network to use 'excess' electricity to create another energy vector, such as heat, hydrogen or ammonia.

Many of the changes required are being trialled or worked on by Ofgem and market players. What is now needed is greater impetus and focus on implementing these changes.

Regen SW

Regen SW is an independent, not-for-profit centre of expertise on sustainable energy with frontline experience of working in the renewable energy sector in the south west. We are a membership organisation with over 260 business and local authority members, as well as a network of over 250 community energy groups in the south west and beyond.

Regen SW's response is based on experience of working on the ground with developers and community groups, as well as over a decade's worth of experience supporting the wider renewable energy industry. It also draws on the learning from being closely involved in Work Stream 6 of the Smart Grid Forum over the last two years; from managing a demand side response trial; and from supporting supply chain growth in the smart energy sector.

Electricity interconnection and storage

1. What changes may need to be made to the electricity market to ensure that supply and demand are balanced, whilst minimising cost to consumers, over the long-term?

DECC has set out why better system balancing will minimise the cost to consumers over the long term, including:¹

- Deferring or avoiding investment in network reinforcement
- Reducing the need for a significant increase in reserve generation capacity

¹ DECC (2015) Towards a Smart Energy System. <https://www.gov.uk/government/publications/towards-a-smart-energy-system>

- Making the best use of our low carbon generation.

Better system balancing includes: smoothing demand; making renewable generation more predictable; and shifting demand away from peak times and towards times when renewables are generating. There are a number of barriers to the market responding to balancing opportunities. These include:

Access to demand side response (DSR) opportunities: The current market is limited to large scale DSR at the transmission network level. The Distribution Network Operators (DNOs) are not yet using DSR to balance the distribution network on a business as usual basis. And potential smaller DSR providers, such as renewable generators and community energy groups, do not yet have access to the market.

Multiple parties may benefit from DSR opportunities, but action is needed to enable value from DSR and facilitate commercial arrangements. Local flexibility markets are required to enable smaller providers to access opportunities. This would be best achieved by a move from a DNO to a Distribution System Operator (DSO) model. In the interim, we encourage the use of bilateral contracts between the DNO and the service provider. Support will also need to be provided to facilitate DSR providers' entry into emerging and established markets through developing appropriate contractual and product requirements.

Time of use price signals and cost-reflectivity: The full value of DSR is not visible or available to the customer without a time of use price signal. And effective time of use price signals require half-hourly settlement, which is currently not standard practice for domestic and small and medium sized enterprises. Half-hourly settlement will allow a shift in demand to be directly rewarded via the settlements system, whereas today the value is lost in the profile smearing process.

Innovative supply models: New and innovative supply models are required to enable consumers to engage in and benefit from flexibility markets. We have seen various new models come forward over the last year, many of which are at the trial stage and are facing regulatory and commercial barriers.

Local supply models that include local generation and balancing can reduce pressure on the networks and potentially enable more generation to be connected. Regen SW is working with Western Power, Wadebridge Renewable Energy Network and Tempus Energy to trial a Sunshine Tariff in Wadebridge.² The project aims to resolve network capacity issues in the local area by incentivising customers to use electricity between 10am and 4pm in the summer months. If the trial demonstrates that the Sunshine Tariff is reliable and consistent in shifting energy consumption to times when solar PV is generating, Western Power will consider enabling new renewables projects to connect to the network where it is technically at capacity.

Another example is the Community Energy Service Company (CESCo) model being trialled by Energy Local.³ This enables a group of domestic customers to pool their local generation and net this off a single, aggregated demand curve. The aggregated demand is then settled half-hourly to enable them to benefit from moving their use of energy to cheaper times of day and matching it to local generation.

Both of these models are exploring the potential for localised distribution use of system (DUoS) charging and Line Loss Factors (LLF) to reflect that they are using a much smaller proportion of the electricity network. The potential reduction in charges would help incentivise customers to shift demand and provide balancing services. Work Stream 6 of the Smart Grid Forum also recommended that Ofgem explores the trialling of alternative DUoS charging methodologies for networks where there is a high percentage of local generation and local use.

Further work also needs to be done on the viability of local balancing of generation and demand as part of the settlement process. Elexon is exploring the potential for a Local Balancing Unit (LBU) and Energy Local is looking at alternative approaches.

² <http://wren.uk.com/sunshine>

³ <http://www.energylocal.co.uk/>

On a more general note, current trading arrangements generally assume that contractual positions for supply and demand will be achieved at a national or supplier portfolio level. This arrangement doesn't exclude local operators per se, but puts them in a weak position, compared with national operators. Furthermore, the costs associated with setting up and running a supply licence (even 'licence lite') are considerable and partnerships require a third party licensed supplier to deliver services on behalf of local suppliers. Further work needs to be done by Ofgem and DECC on how local supply models can be supported.

2. What are the barriers to the deployment of energy storage capacity?

There are a number of regulatory and commercial barriers that affect deployment of storage within the GB market:

Classification of storage: Storage is not defined in any legislation and is treated as an 'end user', which obliges any supplier operating storage to pay obligations and levies twice: once when electricity enters the storage and again when the electricity reaches the true 'end user'. It is also unclear how storage should be accounted for in Use of System (UoS) charges. UoS charges may be applied when storage charges and discharges, however it is not 'demand' or 'generation'. DNOs need to assess how current UoS charges impact on the viability of storage and whether charging specifically designed for storage is required.

Furthermore, storage is often treated as 'generation', this means that ownership and operation of storage by DNOs is not allowed in the generation licensing regime.

Technology costs: costs of storage, or at least the initial capital cost, are still high and without volumes of scale, costs will not fall. Support is needed in the short-term through the cost reduction phase.

Flexibility market: contracts for balancing services are currently available at transmission network level. However, they tend to be of short-term nature and so do not provide long-term certainty for potential investors. They are also only suitable for large scale or aggregated storage, which can rule out smaller schemes. Contracts at the distribution network level would support growth in the market. This may require a move to a DSO model, which would involve greater distribution system balancing and the introduction of arrangements to enable this to happen.

Multi-vector approach: One approach to providing flexibility on a constrained network is to use 'excess' electricity to create another energy vector, such as heat, hydrogen or ammonia. This is common in other countries such as Denmark where the amount of electricity generated by wind can reach 140% of demand and some of this is stored and used as heat through the country's extensive heat network system.

There are a number of barriers to this. Regulatory challenges include gas quality regulations that may block hydrogen injection into the gas network. It is also not clear whether a DNO could trade heat, hydrogen, ammonia or other vector under current licence conditions.