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For the attention of

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Dear Sir/Madam

NIC Consultation – Energy interconnection and storage

For this topic area, we have not attempted to answer each question as set, however, we would hope it may be helpful to contribute some remarks that might inform the process and suggest a direction toward future lines of enquiry.

Electricity interconnection and storage

The foreword refers to ‘Improving how electricity demand and supply are balanced’ and then sets out highly detailed questions at a level of granularity which seems to indicate that the direction of thinking within the Commission may already be rather advanced in terms of specific options in certain areas.

Without trying to second guess current or future work streams, it may be useful to flag other areas of focus where the NIC could exert influence where little or no coordination currently exists. This could be fertile ground for future review and research.

For example, the NIC is well-placed to examine opportunities in areas where energy from any number of sources interfaces within other significant infrastructure environments, such as cities, transport or water. Although the question you raise refers to electricity, taking a more holistic view of the broader energy landscape will perhaps provide more useful insights in the medium and long-term development of the market.

This is partly because interconnection and energy storage are developing in new ways to form what will likely be key elements of the future energy landscape. To date, they have had a somewhat challenging genesis on account of the fact that these elements do not easily conform to the regulatory and policy frameworks that were set up for a linear, one-way supply-to-demand energy system.

However, the trend is certainly real and it raises a great many challenges such as the inclusion of disparate sources; tenure in the Capacity Auction; and network connection charges, which currently do not reflect the benefits they bring.

Analogous to the energy system at large, there is also the increasingly critical issue of storage to consider. Storage is very likely to become an integral element of future networks. Storage will be required centrally and locally, covering a range of fast and slower response rates, and with higher and lower capacity. Innovations are developing fast across a number of areas from pumped hydro storage to molten salt or hydrogen.

All these opportunities require deeper consideration and may need support to drive innovation and implementation, perhaps with direction from the Commission.

It is already clear that there is no single solution that will define the future energy market. Rather, we will see a range of appropriate solutions evolving. Storage of electricity, thermal storage and potentially hydrogen as a storage vector, all ensure both diversity of supply as well as integration and full life use of existing networks.

In all these areas, the NIC could be a powerful advocate for innovation.

By contrast, there are areas where perhaps the NIC might be advised to consider whether there is a pressing need to take a lead given the potential for regulatory overlap and the risk of creating mixed messages in the market.

For example, large-scale electrical interconnection is making great strides at present through the efforts of National Grid and other developers in Europe and elsewhere. Although broad NIC support may be valuable in terms of engendering support for the UK-Icelandic interconnector for instance, in general terms, electrical interconnection is proceeding well and should perhaps not be a primary area of focus for NIC.

At the same time, interconnection and storage form part of a much broader physical and virtual energy system. These elements must be deployed in a manner that is balanced with the anticipated policy and regulatory framework for all the components of the overarching energy system, including renewables for example. These mechanisms do not operate in isolation. Neither should the determination of interconnection and storage. And here, the NIC could make a valuable contribution.

In particular, regulatory certainty and a willingness to take a broad, holistic view of all the key elements of the energy system will be the key to future success in creating a balanced energy market that meets the needs of energy security, sustainability and affordability. The NIC could drive this thinking.

Equally, demand side measures must also come into consideration. Leveraging elements such as microgrids and, indeed, micro-generation, will have a significant role to play in driving the future supply-demand balance equation. The increasing prevalence of virtual mobilization of existing assets will combine with the development of new physical assets to create 'virtual' opportunities to balance supply and demand. This will form an increasingly important component of the UK energy mix and the NIC should be at the vanguard.

This approach could be more productive than adding to the risk of potentially overlapping with the current roles of the Department of Energy & Climate Change, Ofgem and National Grid. If the NIC adds to that already complex regulatory and policy mix, while at the same time loses the opportunity to explore the full potential of future energy infrastructure systems and how they interface and interact, then that would be a lost opportunity indeed for the UK.

The industry as a whole very much welcomes the advent of the NIC. Sensible planning and prioritisation for long-wavelength infrastructure investment simply must be considered on a time horizon that stretches beyond single Parliamentary terms. The success of the Commission's work will undoubtedly translate into success for UK plc and Arup will stand ready to support the vital work of the Commission as and when required.

Yours faithfully

James Kenny
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