National Infrastructure Commission Studies – Call for ideas response form

Name/Organisation: Institution of Engineering and Technology – Energy

You have up to 500 words to outline the problem for a NIC study to focus on, and if you wish, to explain why this should be a priority. You must demonstrate how your suggestions fulfil the criteria outlined in this ‘Call for Ideas’.

Suggestion:

The UK’s energy infrastructures will see transformational change as we deliver the carbon reductions required by the Climate Change Act. By taking a whole systems approach to this, that accounts for the multiple energy vector interactions, we will reduce the risk of compromising the security, integrity and reliability of our energy system at physical, operational and data levels.

The Future Power System Architecture (FPSA) report, commissioned by DECC from the IET with the Energy Systems Catapult, which focused on electricity, found that Britain’s power system architecture requires transformative change by 2030. The IET believes that similar thinking should be applied to the infrastructures that deliver our other energy vectors, particularly gas, oil and heat, and that it should be extended to fully consider the linkages between them, with electricity, as a whole system. We believe that this approach would help identify the future risks and opportunities that we must manage to deliver a secure and affordable low carbon energy system.

We propose that the NIC could take the first step to carry out an analysis of the whole energy delivery system, taking the learning from the FPSA work, to draw initial conclusions about how the architecture of this whole system should be developed.

Further information on FPSA: [https://es.catapult.org.uk/what-we-do/fpsa/](https://es.catapult.org.uk/what-we-do/fpsa/)
Rationale:

• Does the suggestion deal with a nationally significant issue?
Transformational change through a coherent program rather than incremental adjustment, can mitigate serious risks such as: significant extra cost, material constraints on integration of new technology, compromises to system security and resilience and possibly failing to meet policy objectives.

• Does the suggestion need to be considered now?
Transformational change to the wider energy system needs to be undertaken on the same timescale as electricity – by 2030 – thus a special focus and urgency is required considering the work necessary (defining, developing, risk assessing and testing) before solutions could be introduced into service at scale.

• Does the study deal with a challenging issue?
The new functionality will encompass interactions spanning the whole system, from individual smart appliances to our largest power stations – very different to today’s compartmentalised view (for electricity) of generation, transmission, distribution and consumers. Such change, embracing a truly whole system approach, coordinated across multiple energy vectors, is a seriously challenging and complex issue.

• Would any potential recommendations be realistic in terms of cost?
Beginning this project soon would distribute economic costs over intervening years, and importantly avoid much greater cost later on through increasing operational costs, ineffective investment, stranding of assets, and potentially failure to deliver service.

• Would the NIC add value by considering this issue?
The NIC is in a unique position to take the whole system perspective required to ensure the effective and secure integration across multiple vectors and parties, ensuring we have a resilient and efficient system architecture in place for energy as a whole. The IET with the Energy Systems Catapult is able to offer a ready–tested methodology and synthesis team to assist in the development of such an analysis.

Please e–mail this form to: NationalInfrastructureCommissionSpecificStudy@HMTreasury.gsi.gov.uk