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Submission to the National Infrastructure Assessment Call for Evidence

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Summary

This submission argues that GB is trapped in an infrastructure which is not fit for purpose. GB is not going to be able to transform to a fit for purpose infrastructure system unless those who pay for it also support it. The infrastructure changes which occur have to be those which GB people want, and value in their everyday lives. This is a move to an energy efficient Britain – whether this is buildings, the energy system, the transport system and the waste and water systems. All these systems need governance overhauls to provide appropriate incentives for the 'new' sustainable, cost effective and efficient systems and to stop providing incentives to the 'old' system. This is not as radical as it might seem. Other countries around the world are implementing these transformations and GB should learn from them.

Introduction

It is our great pleasure to submit evidence to the National Infrastructure Assessment (NIA) Call for Evidence. The Energy Policy Group (EPG) of the University of Exeter has submitted evidence to the National Infrastructure Commission (NIC) twice before. Firstly, in January 2016 to the Electricity Interconnection and Storage consultation[1] ; and secondly, in August 2016 to the NIC consultation on NIA process and methodology[2] .

We essentially argued in the first of these submissions, that the GB energy governance process (by which we mean policies, institutions, regulation, network and market rules and incentives) is not fit for purpose, and needs to be overhauled if the NIC Vision of Smart Power is to materialise. The second submission argued that whilst we broadly agree with undertaking an NIA, it will only be meaningful if there is meaningful involvement of GB people in its creation, and meaningful consent by GB people to its recommendations. The

[1] http://projects.exeter.ac.uk/igov/submission-national-infrastructure-commission-call-for-evidence/
[2] http://projects.exeter.ac.uk/igov/submission-nic-national-infrastructure-assessment-process-methodology/

Innovation and Governance project, within the EPG, has produced updated papers in this two areas since our last submissions to the NIC and these are: the IGov Fit-for-Purpose GB Institutional Framework (Governing for Innovation, Sustainability and Affordability[3]); and People, Demand, and Governance in Future Energy Systems[4].

Much of our thinking below in this submission continues to reflect those ideas. The IGov website[5] provides detailed case studies of why the GB governance is not fit for purpose (eg Codes regulation[6]) and more details about the proposed institutional framework (for example, distribution service providers)[7].

We are, of course, always happy to provide further input to the NIC if requested.

We first provide an overall comment on the call for evidence, then answer some of the questions, and then conclude.

An overall EPG Comment on the Call for Evidence

An overarching point we would wish to make, is that transforming to a fit-for-purpose GB infrastructure is not just about technology and kit – it is also about people and appropriate governance which links people and their everyday wishes and concerns to their infrastructure needs (whatever that interaction might be).

Moreover, the different infrastructure sectors cannot be separated out – effectively energy, transport, digital communications, waste and waste water, flood risk management and solid waste – and they have to work together in a complementary manner. One can see with all these sectors, that they could do this given the newly available and economic technologies[8]. They all – possibly with the exception of the digital communication sector - have complex governance systems where value is still, broadly, provided for the 'old' system. All of them need an overhaul of their governance systems to ensure that value reflects the outcomes which are wanted (e.g. improved environmental performance, bill reductions and cost effectiveness) through appropriate means (new entrants, new services, innovation and people-focus) and which enable efficiencies between sectors to be captured.

Looking at the energy system in particular, the current governance (rules and incentives) within energy and transport broadly continues to place value for 'old', non-smart, centralised energy at the centre of the system, with 'new' hybrid, centralised /decentralised, flexible energy services still entering only at the margins. The energy system effectively treats people as passive payers of costs rather than actors who may be interested in having more choice and control or as those whose requirements they should serve. Given that people have to accept infrastructural change, live with it, use it and pay for it, then their involvement with it (including its development) has to fit their everyday lives. The energy system operation continues to be top-down and linear rather than bottom-up and multi-dimensional. Energy infrastructure therefore needs to be planned from the starting point of the end user. It is only in this latter approach – which would prioritise granular values, new services, new entrants and new ways of doing things - that system energy

[3] http://projects.exeter.ac.uk/igov/wp-content/uploads/2016/11/Final-Framework-Paper.pdf
[4] http://projects.exeter.ac.uk/igov/working-paper-people-demand-and-governance-in-future-energy-systems/
[5] http://projects.exeter.ac.uk/igov/
[6] http://projects.exeter.ac.uk/igov/paper-innovation-and-the-governance-of-energy-industry-codes/
[7] http://projects.exeter.ac.uk/igov/new-thinking-distribution-service-providers/
[8] https://www.gov.uk/government/publications/smart-power-a-national-infrastructure-commission-report

efficiency and demand side response can be maximised; and an effective decarbonised heat policy can be implemented.

Amongst other energy governance changes, it requires distribution network operators to transform into distribution market facilitators and coordinators (as is occurring, for example, in New York and California). This requires a new form of regulation (a move from revenue based to performance based), and it requires the energy system – within the wider infrastructure system - to be people – focused.

Yes, technology is part of this infrastructural transformation – but only one dimension of it. And the transformation will not occur cost effectively or coherently, unless the other dimensions are there to complement it.

Answering Questions

Q1,2 and 3 As said above, we do not think of infrastructure only as technology, pieces of kit or systems, such as roads, railway lines or ports. Having said that, the two infrastructure projects we would initiate would be an Energy Efficient Britain programme to encompass buildings (new and existing, domestic and non-domestic) and smart energy system operation across GB; and the implementation of an integrated public transport system which reflects the everyday lives (and needs) of people. Together, this would revolutionise Britain.

Energy efficient buildings require building or refurbishment to high specification. This requires the skills to do it; a tightening of building regulations; and a source of cheap finance. We support a KfW-type revolving 0% loan programme capitalised from government debt. A properly functioning Green Investment Bank (GIB) – along the lines of KfW – would also, of course, enable loans for public transport. Energy efficient buildings (including domestic homes) need minimal energy for space heating, and are one important dimension of a cost-effective, decarbonised heat policy. If buildings have their own solar thermal panels, then they also use much reduced energy for water heating[9]. Moreover, new sustainable, domestic homes do not need to be expensive[10].

Combining energy efficient buildings with new energy system operation via new institutions as described above[11], and a public transport system more suited to people's everyday lives would be a step change in GB infrastructure. Moreover, these changes are people-focused. These are the infrastructure changes which most affect people's lives, and must over time contribute to the UK's competitiveness. As the NIC East West Transport Link report highlighted, the UK is increasingly becoming a place where it is hard to have a happy work-life balance. Those that can choose, will choose to live in a place where the work-life balance is better[12].

[9] Author lives in a house which uses minimal energy for space heating and has solar thermal panels for water heating.
[10] For example, see the 'custom build model'. They are half way between traditional sustainable new homes and self-build homes, where home buyers can choose from a range of options, where contractors are lined up to be chosen from, and where homes are sustainable and cheap. See Homemade at Heartlands as a good GB example https://www.homemadeheartlands.co.uk/
[11] http://projects.exeter.ac.uk/igov/wp-content/uploads/2016/11/Final-Framework-Paper.pdf
[12] https://www.gov.uk/government/news/new-east-west-transport-links-could-provide-a-once-in-a-generation-opportunity-for-britains-silicon-valley-armitt

Q4 If governance is set up to enable energy efficient buildings; to require efficient appliances which also minimise electricity use; to encourage a flexible, energy system operation to maximise demand side response and other flexibility possibilities[13]; to be customer focused; and to have the institutions to facilitate all of this, then GB could be hugely more energy efficient than we currently are.

However, the point about implementing institutional change to enable innovation and the overcoming of inertia is that we do not know where it will take us, other than to be more energy efficient. We know that ICT has now effectively come to be applied in energy – albeit is being implemented in widely different ways depending on the governance of the country. If we transformed our distribution companies into distribution resource procurers or distribution market facilitators, as in California and New York, then we can say institutionally the UK would be in a good place to enable innovation to occur so that demand could be managed, reduced[14] and made as flexible as far as possible.

Q5 In general, the UK has been very poor at setting a firm date for when certain unwanted assets would become heavily incentivised against. The current Capacity Market is a good example of mixed messages giving support to fossil fuel generation. The UK should not be giving support to resources which are delivering unwanted outcomes. If Government believes in the market, then they should let that market work. There is no point in Government saying they want to move to a sustainable energy system and then simultaneously supporting both sustainable and non-sustainable energy[15].

Q7 As said above, we would argue that an efficient 0% revolving loans programme open to domestic, local authorities and in some cases companies – similar to the KfW loans in Germany – together with appropriate regulatory drivers and incentives for end users would revolutionise the roll-out of Energy Efficient Britain. An overlap with that is the issue of the fuel poor in the UK. We do not believe that all the responsibility of reducing the numbers of fuel poor should lie alone with suppliers, and existing efforts to collaborate on targeting with Local Authorities, the Department of Work and Pensions and civil society organisations should be rapidly expanded.

Q10 The IGov project has argued that UK governance needs to be overhauled[16] and that the way people and their demands are viewed needs to alter[17] to ensure that the UK has a 'liveable' infrastructure, that people want and which is delivered as efficiently as possible . We have made numerous submissions to multiple bodies and places about this. Please see the IGov website http://projects.exeter.ac.uk/igov/. Examples are a submission to BEIS Ofgem[18]; to NIC[19]; and to the CMA[20].

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[13] http://projects.exeter.ac.uk/igov/submission-beisofgem-smart-flexible-energy-system-a-call-for-evidence/
[14] Reduce, flatten and flex http://projects.exeter.ac.uk/igov/new-thinking-a-no-regret-energy-policy-reduce-flatten-and-flex/
[15] http://projects.exeter.ac.uk/igov/submission-beisofgem-smart-flexible-energy-system-a-call-for-evidence/.
[16] http://projects.exeter.ac.uk/igov/wp-content/uploads/2016/11/Final-Framework-Paper.pdf
[17] People, Demand, and Governance in Future Energy Systems (http://projects.exeter.ac.uk/igov/working-paper-people-demand-and-governance-in-future-energy-systems/
[18] http://projects.exeter.ac.uk/igov/submission-beisofgem-smart-flexible-energy-system-a-call-for-evidence/
[19] http://projects.exeter.ac.uk/igov/submission-national-infrastructure-commission-call-for-evidence/
[20] We have written several submissions to the CMA, see for example http://projects.exeter.ac.uk/igov/submission-to-cma-energy-market-investigation-provisional-findings-possible-remedies/

Q11 A low carbon, energy efficient infrastructure is the most effective means to protect and enhance the environment. That infrastructure has to be people focused, and has to enable people to carry on with their lives. Some people may make pro-environment choices. In general though, Government has to ensure infrastructure which allows individuals to go about their lives in a sustainable fashion. This infrastructure is a well-functioning transport system; energy efficient buildings; and an energy efficient (and therefore cost effective) smart energy system.[21].

Q19 The highest value, least cost solution for decarbonising heat is energy efficient buildings, and the move to a flexible, smart energy system which is able to tap into demand side response down to the lowest distribution level.

Q20 What needs to be done is to put in place a governance system which encourages innovation and flexibility, and which does not lock-in any particular technology use and which is regulated based on what outputs are wanted – for example, low carbon, flexibility etc. We argue that the IGov institutional framework is a framework which does this[22].

Q21 Low carbon vehicles could be a very useful part of a flexible, smart energy system – but they could also be a real problem if governance is not in place to ensure that vehicle owners or users are paid for the value their provide to the system. Currently, value for flexibility is not very granular – and rarely reaches down to the distribution level and certainly not for EV storage. If, in the future, this did occur then EV cars could be used as a system asset, providing useful storage facilities for when supply is cheap and available, and a source of power from storage when supply is limited and expensive. This would mean that less distribution and transmission capacity upgrades would be needed[23].

Conclusion

At root, we would argue that GB is trapped in an infrastructure which is not fit for purpose. GB is not going to be able to transform to a fit for purpose infrastructure system unless those who pay for it also support it. The infrastructure changes which occur have to be those which GB people want, and value in their everyday lives. This is a move to an energy efficient Britain – whether this is buildings, the energy system, the transport system and the waste and water systems. All these systems need governance overhauls to provide appropriate incentives for the 'new' sustainable, cost effective and efficient systems and to stop providing incentives to the 'old' system. This is not as radical as it might seem. Other countries around the world are implementing these transformations and GB should learn from them.

[21] See People, Demand and Governance ibid
[22] http://projects.exeter.ac.uk/igov/wp-content/uploads/2016/11/Final-Framework-Paper.pdf
[23] http://projects.exeter.ac.uk/igov/new-thinking-cheap-ubiquitous-battery-storage/