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Submission to the Building Our Industrial Strategy Green Paper Consultation

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Section 1: Introduction

We, the Energy Policy Group (EPG) of the University of Exeter, welcome this opportunity to respond to HM Government's *Building our Industrial Strategy*. We are an academic research group which works on the links between governance¹ and innovation, in particular with respect to energy although we do have two projects on the food, energy and water nexus. With respect to this industrial strategy, we are most interested in whether it will encourage a sustainable, affordable and secure energy system in the most cost-effective way. However, of course, all pillars of the strategy are needed for the most beneficial, whole system development of GB, and to this extent we make a number of comments about the wider industrial strategy, and its Pillars.

This response is set out in the following way: the next section (Section 2) welcomes the industrial strategy and highlights the areas we particularly support. Section 3 discusses the Pillars we consider to be of most importance with respect to energy (Pillars 3, 4, 6 and 10). Pillar 7, the Pillar which focuses on energy is discussed in Section 4. We close with a few general issues of concern we would like to bring to your attention in Section 5.

Section 2

We thoroughly support the Government's approach to industrial strategy, as set out in the Foreword (p.3) of taking a 'new, active role that backs business and ensures more people in all corners of the country share in the benefits of its success' and that this new approach will move beyond 'short-term thinking to focus on the big decisions that will deliver long-term, sustainable success'.

¹ By which we mean policies, institutions, regulations, market and network rules and incentives

We broadly accept the three challenges as set out (p.5/7). In addition:

- We are pleased to see the recognition of how the UK's competitors have upgraded infrastructures and reformed systems of governance (p.5). We also will argue that learning lessons from elsewhere is essential for GB.
- We also strongly agree with the 3rd challenge discussion (p. 6) that 'a fatal flaw of the 1970s style industrial strategy was the dominant focus on existing industries and companies within them – and then mostly the biggest firms. Too often they became strategies of incumbency'.
- We absolutely agree that 'industrial strategy must be about creating the right conditions for new and growing enterprise to thrive, not protecting the position of incumbents' and ' a modern British industrial strategy must make this country a fertile ground for new businesses and new industries which will challenge and in some cases displace the companies and industries of today', and
- We also agree that we need to create an economy resilient to change and fit for the future (p.9).

Of the Pillars (p.11), we see the following as being of particular importance for the development of a sustainable, secure and affordable energy system:

- Pillar 3 Upgrading Infrastructure – we see energy as vital within infrastructure and we have very particular views about how that should occur. To this end, we put in a submission to the National Infrastructure Commission call for evidence², and this is discussed further in Section 3.
- Pillar 4 Supporting Businesses to start and grow – we absolutely support this, and strongly believe in an enabling environment as being an important dimension of the conditions for companies to start and grow. As said above, it is vital that the Government supports the energy 'businesses' which are the new innovative businesses and not the old incumbents.
- Pillar 6 Encouraging trade and inward investment – we agree that bringing new ways of doing things to the UK encourages a strong economy. IGov (our main Innovation and Governance research project) has focused on understanding best-practice around the world (ie Germany, Denmark, New York State, California etc), and discussing how it could be incorporated into GB energy policy. For further information please see the IGov website³
- Pillar 7 Delivering affordable energy and clean growth – we obviously support this but think that your arguments are somewhat muddled. Energy will be more affordable if GB governance is reformed. It is the current system of markets, networks and tariffs which leads to the high costs in GB. Lower costs to businesses are the end point or outcome but the industrial strategy should be about the steps that have to be taken which will lead to a flexible, smart energy system, which will lower costs. This requires governance change⁴, and part of that is institutional reform – as of Pillar 10.
- Pillar 10 Creating the right institutions to bring together sectors and places – we essentially argue that GB energy institutions are not fit for purpose and need to be reformed⁵. This is discussed in more detail in Section 3 below when discussing infrastructure.

Pillar 7 is discussed in its own section 4 below.

² <http://projects.exeter.ac.uk/igov/wp-content/uploads/2017/02/Exeter-EPG-Submission-to-NIC-Call-for-Evidence-Feb-2017.pdf>

³ <http://projects.exeter.ac.uk/igov/>

⁴ <http://projects.exeter.ac.uk/igov/paper-gb-energy-governance-for-innovation-sustainability-and-affordability-2/>

⁵ See links in reference 4.

We would argue that there is a gap in these Pillars in that there is only a very narrow view of people / customers / consumers / citizens within the strategy. Quite rightly the Strategy talks of improving skills; improving access and transport etc. However, there is nothing about engaging people in societal change – whether it be increasing productivity; as part of infrastructure development and so on. As discussed further in Section 3, we take the view that societal change will not occur unless society connects significantly with the multiple dimensions of the change (whether it be transforming the energy system; increasing productivity and so on). There is a strong line of thought within GB energy policy, including the recent report by the Competition and Markets Authority, that if only GB could increase switching percentages within the retail market, customers and consumers would be happier with the energy system. We believe this fundamentally misses the point with people and everyday behaviours⁶.

With respect to the section in the Summary on delivering affordable energy and clean growth (p.20) – we do not enter the debate with respect to growth, and most of our discussion on affordable energy is below in Section 4. However, we would like to highlight three issues:

Firstly, whilst we welcome the industrial strategy, it only mentions decarbonisation in the power and industrial sectors – and yet this is a minor part of the energy system. A country which wants a cost-effective – and low price energy system – has to have an integrated (meaning cannot separate out power from heat and transport), energy efficient, flexible energy system. Whilst this transformation is a challenge, and heat is in particular a big challenge, it is also a big industrial opportunity which delivers all those good aims expressed by Theresa May in the Foreword to the Industrial Strategy. Furthermore, how and when heat and transport decarbonise will have major implications for the power system, so it is vital that three vectors are considered collectively.

We understand that this is an industrial strategy for GB – and intended to be a ‘real’ document based on the situation that GB finds itself in. However, the momentum of the energy world is moving very powerfully towards a decentralised, decarbonised and digitalised energy system – this is talked about further below. As much as GB wants to build on what it has got – it also has to recognise that it is in its best interests of GB society to move with the world markets. Far better that Britain has a fit-for-purpose energy system that delivers its cost effective energy for all customers from a smart and flexible energy system – rather than trying to maintain pockets of the ‘old’ system in Britain (by which we mean nuclear power and capacity markets). We can understand, to an extent, that the industrial strategy has chosen one of GB’s specialities as nuclear waste disposal (as opposed to nuclear power where Britain is far behind a few other countries), but other than that it is only dealing in one (offshore wind) narrow area of where the low cost energy system is going to come from. World energy momentum (including investment) is towards smart-operated, flexible energy systems based on on- and off-shore wind, solar, energy efficiency, demand side response, storage, interconnection – and probably, to a small extent, gas and a few other RE technologies. We are therefore surprised that ‘heat’ is mentioned only once; climate only 7 times; carbon only 15 times; and decentralisation once. It is within these areas that GB has to focus – to be outside of them is to miss where the world is going.

Moreover, GB has some genuinely innovative business practices – and GB should be focusing more on the software side of those.

⁶ People, Demand, and Governance in Future Energy Systems (<http://projects.exeter.ac.uk/igov/working-paper-people-demand-and-governance-in-future-energy-systems/>)

Secondly, the summary section on affordable energy also talks about cultivating world-leading sectors – and having an open-door challenge to industry to come to Government with proposals to transform their sector through sector deals. We support this approach. It will only work if the Government listens to the ‘new’ energy players. The actors undertaking the new innovative aspects of energy supply and operation - with new technologies, new resources; new ideas; new market platforms and business models - tend to be non-energy or small start-up companies. Government has to listen to them rather than the incumbents, as it says it wants to (page 20).

Thirdly, the summary section also says that the long term roadmap to minimise business costs will also discuss how government can best work with the Regulator Ofgem to ensure markets and networks operate as efficiently as possible in a low carbon energy system. IGov argues that Ofgem is one of the key institutions which needs urgent reform, and this is discussed in the Section below.

All of these points are discussed further below in Section 4

Our Answers to the Questions (p.23) from the Summary of Consultation (p9-23)

- 1 - yes, we broadly agree with the 3 main challenges you have identified.
- 2 - your question is: are the 10 pillars suggested the right ones – we argue that an important omitted Pillar is people, customers, consumers and citizens, who are an essential part of a GB movement towards a successful industrial policy.
- 3 - no, we do not believe that the right institution are in place to deliver a sustainable, affordable, secure, cost effective energy system, and this is discussed further below.
- 4 - yes, there are many important lessons to learn from abroad. Most best practice, with respect to energy, is occurring abroad.

Section 3: Upgrading infrastructure section (page 51-60) and Creating the right institutions to bring together sectors and places (page 119-125)

IGov has recently provided evidence to the National Infrastructure Commission on the future of GB infrastructure. Again, in general, our focus was on energy infrastructure⁷.

We argued that GB is trapped in an infrastructure which is not fit for purpose. Moreover, we do not think that GB is going to be able to transform to a fit for purpose infrastructure system unless those who pay for it also support it, hence our view that there is a gap in the Pillars is people/customers/consumers. The infrastructure changes which occur will 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

⁷<http://projects.exeter.ac.uk/igov/wp-content/uploads/2017/02/Exeter-EPG-Submission-to-NIC-Call-for-Evidence-Feb-2017.pdf>

implementing these transformations (and institutions) and GB should learn from them – as the Industrial Strategy says it wishes to do (p.5).

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 (including institutions) 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 – 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 technologies⁸. 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 (policies, institutions, rules and incentives with respect to market and networks) 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 needs to be planned from the starting point of the end user. It is only in this approach – which would prioritise granular values, new services, new entrants and new ways of doing things - that system energy efficiency and demand side response can be maximised; and an effective decarbonised heat policy can be implemented – which also would be cheaper than the current top-down, inflexible, non-granular system operation. The Industrial Strategy seems to agree with this but does not logically follow through, and this is discussed in the next section.

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 this requires a new role for Ofgem⁹; and it requires the energy system – within the wider infrastructure system - to be people / customer – focused¹⁰.

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.

⁸ <https://www.gov.uk/government/publications/smart-power-a-national-infrastructure-commission-report>

⁹ <http://projects.exeter.ac.uk/igov/new-thinking-reset-the-reset-2-aligning-content-with-intent/>

¹⁰ People, Demand, and Governance in Future Energy Systems (<http://projects.exeter.ac.uk/igov/working-paper-people-demand-and-governance-in-future-energy-systems/>)

The IGov project has argued that UK governance needs to be overhauled¹¹ and that the way people and their demands are viewed needs to alter¹² to ensure that the UK has a 'liveable' infrastructure, and that what people want is delivered as efficiently as possible. IGov has made numerous submissions to multiple bodies and places about this. Please see the IGov website¹³. Examples are a submission to BEIS Ofgem¹⁴; to NIC¹⁵; and to the CMA¹⁶.

Questions with respect to creating the right institutions

- 36 - with respect to local initiative and leadership, Government should enable local authorities to become more involved with efficient energy provision; local energy utilities need to transform into distribution service providers and market facilitators; and there needs to be the ability to have local markets and platforms (ie local areas or providers to sell to neighbours or the local area). All of this needs new governance, as discussed more in Section 4.
- 37 - see answer to 36.
- 38 - see answer to 36.

Section 4

Pillar 7 Delivering affordable and clean growth (page 89-95)

We do not talk to the 'growth' aspect of this Pillar. We are pleased to see that the industrial strategy supports 'smart' power, electric vehicles, storage and so on. Within energy, we think there is no difficulty in fulfilling the aims of the strategy whilst also being committed to fiscal responsibility (p.7) since we would argue that a sustainable, smart flexible future is the most cost-effective.

The opening section (p.89) argues that the 'trilemma' argument needs updating because GB is doing various successful things with security of supply and the environment, including bringing out a forthcoming Emissions Reduction Plan (which we look forward to). It ends up arguing that in 'the years ahead two important areas require a higher priority [than the trilemma]: the affordability for energy for households and businesses; and securing the industrial opportunities for the UK economy of energy innovation'.

We think such a discussion is semantic.

What Britain needs is a fit-for-purpose energy governance system which allows the new technologies; new energy economics; new business models ideas about services; new tariffs; new institutions; and new roles to come through. This is cost-effective and also sustainable, secure and affordable energy system, thereby meeting the trilemma as well as the industrial strategy's 'higher priority's'. Moreover, lower costs to businesses may be the desired outcome, but the industrial strategy has to explain what has to be put in place to achieve this. Transforming to a flexible, smart energy system is the most cost effective way forward

¹¹ <http://projects.exeter.ac.uk/igov/wp-content/uploads/2016/11/Final-Framework-Paper.pdf>

¹² People, Demand, and Governance in Future Energy Systems (<http://projects.exeter.ac.uk/igov/working-paper-people-demand-and-governance-in-future-energy-systems/>)

¹³ <http://projects.exeter.ac.uk/igov/>

¹⁴ <http://projects.exeter.ac.uk/igov/submission-beisofgem-smart-flexible-energy-system-a-call-for-evidence/>

¹⁵ <http://projects.exeter.ac.uk/igov/submission-national-infrastructure-commission-call-for-evidence/>

¹⁶ 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/>

– thereby minimising costs. However, this requires governance change, and part of that is institutional reform – as of Pillar 10, and as discussed above.

IGov argues the current GB energy system is not fit for purpose¹⁷, as explained above: it is not allowing new ideas and new ways of doing things to come through – because the value in the energy system maintains the old system. Moreover, the activities of the Government maintain this. We categorically disagree that investment in Hinkley Point C or the development of the capacity market has been successful (p.89), or helpful, for affordable energy or for securing industrial opportunities. That the industrial strategy says this shows a fundamental lack of understanding of what is happening within the energy system – both technically and from a business model perspective.

With respect to affordable energy for households and businesses, it remains shameful that Britain has the level of fuel poverty that it does – and, again, this is to do with a failure of governance. It would be far better for Britain, for jobs, for appropriate use of public monies or additional costs within the electricity bill - if the 35 year Hinkley Point C costs to be paid for by customer bills - were spent on GB building infrastructure – in particular targeting the fuel poor.

There is no inconsistency in arguing for cost-effective energy policies to help both households and businesses – both groups benefit from an energy efficient, customer focused energy system. If GB's energy system were set up to have integrated markets between heat, transport (electric vehicles) and electricity, to operate the system flexibly and to deliver the most cost-effective resources via markets – which customers want – then businesses would get its lowest cost energy, as would all customers.

We agree that the Government has a role to play in coordinating markets to enable major changes to our energy infrastructure. But it is more than funding basic energy research – which we agree is important. Fundamentally it has to 'reset'¹⁸ the governance. The Strategy (p.89) says:

'While there is a clear role for the government in energy policy, markets also are crucial in inventing and spreading new techniques for saving energy, new and more efficient means of energy generation and storage and new ways to finance clean technologies. It is the private sector which will ultimately be the driving force behind our low carbon economy'.

We agree that the private sector which will be an important driving force behind the 'new' energy system (alongside public private partnerships) but we think these companies and investors are likely to be new to the energy system. As said above, we support Government's intention (p.6) to encourage these actors rather than maintaining the status quo with incumbents to the detriment of GB society.

However, this statement also implies that somehow Government and markets are entirely separate. This is not so. Markets are social constructs. They do not just happen. The design details of them (and therefore what actions and technologies they provide value for) occur as a result of the regulatory process, and influence. At the moment, market design and network rules support the conventional system operation of large, centralised mainly fossil and nuclear power plants¹⁹. If the Government wants to follow through with an industrial strategy of markets which support a low-cost, market-based, flexible operation, including

¹⁷ <http://projects.exeter.ac.uk/igov/paper-gb-energy-governance-for-innovation-sustainability-and-affordability-2/>

¹⁸ Please see the 3 blogs related to reset the reset, this is the first one: <http://projects.exeter.ac.uk/igov/new-thinking-reset-the-reset-1-we-need-institutional-governance-reform-and-we-need-it-now/>

¹⁹ For example, <http://projects.exeter.ac.uk/igov/paper-innovation-and-the-governance-of-energy-industry-codes/>

storage and electric vehicles (and heat), then it has to ensure that the market design, and the value it provides, changes.

Energy, and its governance, is a whole system – markets, networks, tariffs, institutions and policies have to fit together. Government is not doing something ‘wrong’ by reforming governance – it is simply ensuring GB governance fits with the current energy technologies. This is like making sure there are traffic rules once cars were introduced to Britain. Another analogy is that the ‘old’ energy system (with its few players and few, large providers of supply and centres of demand) was like a jigsaw puzzle – once you got the bits to fit, you could leave it. In this analogy, the new energy system is a bit more like a Rubik cube. Every time something new happens (for example, a new storage plant is added) it alters something else in the Rubik cube. This is the result of ICT coming to energy. System operation can be far more efficient; allows the granularity of value to be far greater and therefore can increase the use of markets; and therefore should be more low cost than it would otherwise be. GB can either continue with rhetoric it does not follow through with²⁰ – to the detriment of GB – or it can confront the situation, and move with it.

We applaud the industrial strategy for attempting the latter. But Government needs to be clear, GB energy governance is still interacting with the GB energy system as if it’s a jigsaw puzzle, and it is still supporting ‘old’ ways of doing things and the incumbents – as it the industrial strategy says it did in the 1970’s and as it said it wanted to get away from.

Thus, whilst the industrial strategy says much which is valuable, the inconsistencies within it are also extreme.

Answering the Questions (p95)

- 27 - if Government wants to keep energy costs down, then it needs to undertake governance reform. Our IGov project has discussed this in depth, and put forward a fit-for-purpose Framework²¹. Energy costs are the sum of governance – policies, market design, institutions, networks, tariffs and so on. At this time, of huge change within the energy system, energy economics are being turned upside down. However, the governance structure and where it provides value (i.e. payments) is still to the ‘old’ system. If the Government wants a smart and flexible energy system, which is of lowest cost to all consumers, then it has to bite the bullet and undertake the reform. At the moment, it is ‘fudging’ decisions²². And this is primarily because it is continuing to support the ‘old’ industry and its incumbents – exactly what this industrial strategy says it wants to get away from (p.6).
- 28 - this is more or less the same answer as 27. The reason why GB continues to subsidise everything – from nuclear power to capacity markets – is because GB energy governance is set up to support the ‘old’ system, and the incumbents while happy to transform want to do so at the speed that suits their assets, and they do not want new competitors coming in to the system. The basic momentum of the energy system however is towards the ‘new’ system and therefore GB governance is acting as a finger in the dyke. No-one particularly wants to invest in anything big, inflexible or fossil. However, that is where the value in the system is, primarily because Government keeps it that way. Until that value changes – basically via governance change (new market design and network rules which encourages flexibility,

²⁰ For example, <http://projects.exeter.ac.uk/igov/new-thinking-reset-the-reset-3-der-walking-the-walk/>; or <http://projects.exeter.ac.uk/igov/new-thinking-the-embedded-generator-saga-and-codes-governance/>

²¹ <http://projects.exeter.ac.uk/igov/paper-gb-energy-governance-for-innovation-sustainability-and-affordability-2/>

²² Please see the 3 blogs related to reset the reset, this is the first one: <http://projects.exeter.ac.uk/igov/new-thinking-reset-the-reset-1-we-need-institutional-governance-reform-and-we-need-it-now/>

demand side response and so on) – investment without subsidy is not going to happen. If the Government sorts out its governance it will find that GB is choc-o-bloc with hungry, entrepreneurial, ‘new’ system players that want to be involved. Again, Government is the block to this because it continues to sanction a governance system which is inconsistent with its policy rhetoric – and indeed in this case, inconsistent with its aims of an industrial strategy. We have already provided BEIS with a short paper on this topic, and we can provide it again if you would like.

- 29 - IGov has argued the Government has to take the first steps by establishing a fit-for-purpose governance framework²³. In order to do this, it has to bring all aspects of business together – and as discussed above – and this includes the ‘new’ businesses.
- 30 - Government can support businesses and society in delivering a more affordable, cost effective energy system than now but also one that meets environmental and security issues – by reforming the governance system. GB energy policy is not complicated but the Government has not followed the ‘sensible’ strategy. The reason why GB prices are as they are is the result of a not-fit-for-purpose governance system. Government has to sort that out – and that includes the role of most actors within the energy system: the Regulator, system operator, network companies and so on. The GB energy system is not magically going to become cost effective by doing bits and bobs to it – it needs reform, and Government has to accept that.

Section 5: A couple of concerns about the industrial strategy

As set out above, we welcome, and agree with much of, the industrial strategy.

However, with respect to energy, we would argue that what the industrial strategy says it wants to do (as set out above) is often inconsistent with what it says it is doing successfully. An extremely good example of this is the strategy’s references (e.g. page 17, 89) to the Government’s support of the Hinkley Point C (HPC) nuclear power plant. According to BEIS’s own figures, HPC, is extraordinarily expensive but almost more importantly, it undermines the move to a smart and flexible energy system. HPC is a very large electricity power plant which has to be operated in an inflexible way and this will have a negative impact on GB’s transformation to flexible system operation. Moreover, as RE pays off its subsidy, it becomes virtually free thereby bringing down the average cost of electricity – as is occurring in those (competitor) countries with high proportions of RE. This is not the case of nuclear power, which is proportionately a high cost dimension of future electricity prices.

We also take issue with (p.9) the phrase, an industrial strategy ‘is not about the Government directing the economy or determining the industries of the future from Whitehall’. In fact, in a broad sense, this is exactly what an industrial strategy is, and we think this is a good thing.

²³ <http://projects.exeter.ac.uk/igov/new-thinking-reset-the-reset-1-we-need-institutional-governance-reform-and-we-need-it-now/>