



New Thinking  
For Energy

# Getting energy governance right: Lessons from IGov

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# 1 Executive summary

The UK has committed to net-zero emissions within the next thirty years. Reaching this goal will require a major transformation of the energy system. This briefing looks at the crucial role of governance in achieving that transformation. It summarises the findings of seven years of work by a team of researchers, based at the University of Exeter's IGov project, analysing energy governance within Great Britain (GB) and elsewhere.

## 1.1 The current position: Outdated governance

The fundamentals of GB energy governance were established at the time of privatisation of electricity and gas, thirty years ago. Since then, there have been reforms, but the basic arrangements remain the same. Governance arrangements define the energy 'market' – what is bought and sold; where the value lies; and who profits. The GB system is inadequate in the face of rapid innovation in energy systems, and the need to decarbonise.

There is currently no process for direction-setting or managing a process of decarbonisation, across government departments and agencies, and across different industrial sectors. This leads to confused signals for market participants. Current arrangements favour established players, who understand the complexities and have the resources to influence policies and regulatory processes. A particular problem is co-ordination across the energy system, both within electricity (linking generation, supply, demand, flexibility services and storage) and between electricity, heat and transport. Neither are there adequate governance arrangements for protecting low-income households.

## 1.2 Principles of energy governance

IGov recommends a series of reforms to create a system of governance which incentivises the outcomes that society requires from the energy system, including security, rapid carbon reduction and social goals. These should be underpinned by three core principles:

- 1. Legitimate and transparent governance:** including setting clear **outcomes**; making institutions and decision-making processes **transparent** and accessible to all system participants; and aligning **value** in the system with the outcomes required, through market design and regulatory mechanisms.
- 2. People at the centre:** Energy governance must create markets which reward people for providing system services such as demand reduction, flexibility, and demand response. This requires a different system of consumer protection, including greater segmentation, understanding that not all people will be actively engaged, and that vulnerable households will require specific interventions and policies. There should also be an acknowledgement that people have a role beyond their participation in the market, as citizens giving (or withholding) consent and engaging with governance.

**3. Adaptive regulation:** Given the rapid pace of innovation, there is a need for regulation that can adapt to changing circumstances. Specifically, there should be a shift from 'input' type regulation to output-based regulation. Reviews should also be incorporated into regulatory processes, to allow adjustments during the period of regulation. Finally, regulation needs to be adaptive to the needs of a local area, with local areas developing their own plans.

### 1.3 A new governance framework

There is a need to reform institutional structures for energy governance. IGov recommends the creation of an Energy Transformation Commission (ETC), to implement objectives set by government. The ETC would oversee the transformation process through co-ordinating all the institutions involved, and providing a hub for consultation and engagement. An Integrated Independent System Operator would integrate gas, electricity and aspects of transport, at different levels, both transmission and distribution, and ensure implementation of carbon goals. It would oversee an independent Codes Manager to enable open and fair consultation and engagement from all market players.

Ofgem's remit would be reformed, to allow it to focus on regulation of the companies involved in the transmission, distribution and supply of energy and energy services. It would have an explicit duty to regulate for carbon reduction in line with statutory targets. It would no longer be responsible for strategy or system change.

At local level, IGov recommends the devolution of energy governance to local levels, in the form of a new statutory duty on local authorities, requiring them to produce a Local Transformation Plan. This Plan would require local areas to set devolved carbon budgets, with freedoms, flexibilities and funding provided from national government.

Local markets for energy services would be provided through Distribution Service Providers (DSPs), created through reform of Distribution Network Operators (DNOs). DSPs would implement the shift from the linear, top-down value chain of the energy system to one which places customers at its focus and values efficiency, flexibility and sustainability. They would combine current DNO functions – managing networks and systems operation – with new sub-GSP area co-ordination and balancing services, for electricity (including electricity for heat and mobility), demand response, flexibility and ancillary services.

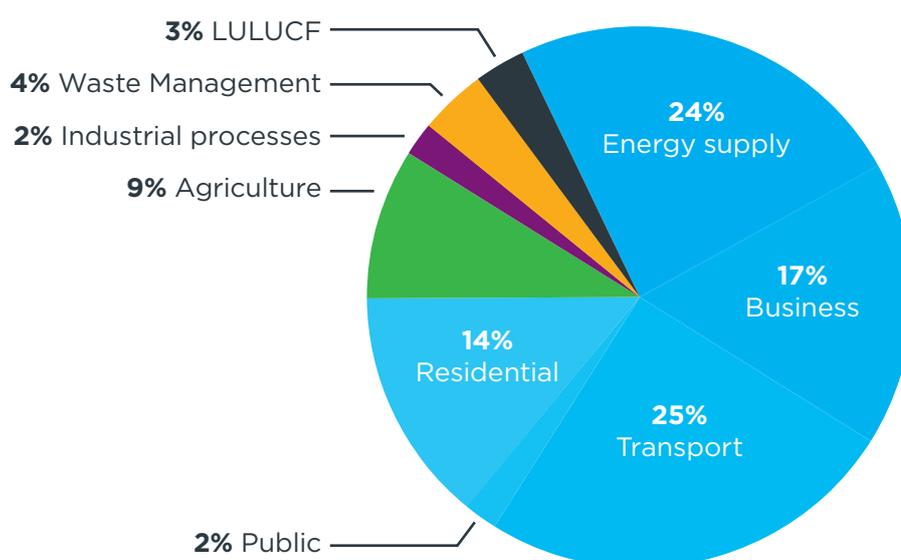
Lastly, IGov recommends the establishment of a cross-economy Data Regulator; a data body or portal for energy system information; and a market monitor to follow market exchanges and identify improper trading or profiteering.

Together, these reforms will create a clear direction for the GB energy system, allowing people to benefit from innovation, and providing a route to net-zero carbon emissions.

## 2 Governing the energy system

### 2.1 Context

Over the coming decade, the UK needs to bring about radical reductions in greenhouse gases, to move to net-zero emissions by mid-century at the latest, in order to fulfil its obligations under the Paris Agreement and avoid climate breakdown. Following legislation in June 2019, the UK has a statutory target of net-zero emissions by 2050. Energy use, for electricity, heating and transport, accounts for 80% of UK greenhouse gas emissions (Figure 1)<sup>1</sup>. Reaching this goal will therefore require a major transformation of the energy system. This briefing looks at the crucial role of governance in achieving that transformation.



**Figure 1: Greenhouse gas emissions in 2016 by sector. All sectors in blue represent emissions that can be attributed to ‘energy’.** Source: BEIS 2018 <sup>1</sup>.

As the government’s Industrial Strategy acknowledges, energy systems are on the brink of significant change. A wave of innovation, driven by decentralised generation and ICT-enabled products and services, is leading to greater integration between different system components (electricity, heat, transport, storage, efficiency and demand response).<sup>2</sup> Achieving decarbonisation will also require greater engagement of individuals, as citizens, customers, and consumers. Taken together, the change to energy systems can be characterised as ‘D4’: decarbonisation, decentralisation, digitalisation and democratisation.

To harness this innovation, and achieve social and environmental goals, there is a need for better governance. We define governance as ‘the policies, institutions, rules and incentives related to the energy system, and the underlying decision-making process which establishes those rules and incentives’. Current governance arrangements were established in the 1980s and 1990s following privatisation of electricity and gas, and have evolved but not changed fundamentally since that time, despite technological (and cost) advances.

<sup>1</sup> BEIS, 2018. 2016 UK Greenhouse Gas Emissions, Final Figures Statistical Release: National Statistics. [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/680473/2016\\_Final\\_Emissions\\_statistics.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/680473/2016_Final_Emissions_statistics.pdf)

<sup>2</sup> IET & Energy Systems Catapult, Future Power Systems Architecture (IET, 2016); HM Government, Industrial Strategy: Building a Britain Fit for the Future (HM Government, 2017)

IGov argues that there is a need to review and reformulate energy governance, to manage a process of transformation, to encourage innovation and to achieve radical carbon reduction alongside social goals at lowest cost.

## **2.2 About IGov**

IGov, a project of the University of Exeter's Energy Policy Group, examines innovation and governance in the energy system. We focus on the fundamental, rapid energy system change either currently underway or straining to occur, driven by technological, economic, social and environmental factors. We examine the shifts in governance that are required in order to respond to these changes; to move to net-zero carbon emissions; and to ensure energy security and affordability.

Since 2012, IGov's researchers have analysed energy governance at both national and local levels within Great Britain (GB), the US, Australia, Denmark and Germany. Research included stakeholder interviews and roundtable events, meetings with representatives from government, regulators and industry advisory panels, and case studies of specific regulatory processes.

## **2.3 The importance of energy governance**

When electricity and gas were privatised, in the 1980s and 1990s, assets were transferred from the public sector to the private sector. The state switched from being the provider of energy services, to overseeing the regulation of private energy companies. Separate regulatory regimes were established for the maintenance of networks, generation of electricity, and supply of electricity and gas. Electricity and gas network operators, who look after the pipes and wires, are natural monopolies. So the amount that the new companies could charge, and the expected amount of profit that they would make, was set through regulation – the 'price control' process, which continues, in modified form, to this day. To encourage competition in the generation of electricity, a market was created, which allowed companies to earn money for each unit of electricity that they generated. Again, this has evolved, but not changed fundamentally, over time. A separate market was created to supply electricity and gas to households and businesses. Competition was encouraged, but within strict rules set by government, and enforced by regulators.

The key point is that the privatisation of energy did not result in a 'free market', but a system of governance which allowed firms to compete in markets designed by regulation, with different arrangements in place for networks, generation and supply. There is no such thing as a 'free market' for energy. Neither would we want a free market, given that the energy system needs to meet certain standards of security, safety, consumer and environmental protection.

Because energy markets are created through governance arrangements, the 'cost' or 'price' of any energy product or service, and the profits that can be made, are bounded by those governance arrangements. In fact, the actual product or service that is traded, is itself defined by governance. For example, in the market for electricity generation, units of electricity are bought and sold, by the kilowatt hour or megawatt hour. It would be possible, instead, to design a market where

the 'product' traded is an amount of warmth or light; or a market which rewarded energy saved through demand reduction or efficiency. There are already emerging research and trials into such market arrangements.<sup>3&4</sup>

In short, governance determines the 'cost' of different generation technologies; the feasibility of different business models for generation, supply, demand, efficiency, flexibility and storage; and the definition of 'value' within the energy system.

This matters because, since the time of privatisation, so much has changed, due to both innovation and new social and environmental goals; yet the fundamentals of energy governance have not changed in step. Instead, the old system has been overlaid with new regulations and institutions to attempt to incentivise new system requirements, including decarbonisation, efficiency and social goals; yet the fundamentals have not changed, and, as a result, the overall system has become complex and contradictory.

**There are a number of ways in which energy governance is no longer fit for purpose:**

- There is **no process for direction-setting** or managing a process of decarbonisation. While the Department for Business, Energy and Industrial Strategy (BEIS) and the Committee on Climate Change have responsibility for achieving the targets established in the Climate Change Act, other bodies, including Ofgem, do not have a formal requirement to adhere to these targets. The Department for Transport, which is responsible for the rollout of Electric Vehicles, have presided over increases in carbon emissions from transport.<sup>5</sup> The Distribution Network Operators (DNOs), as regulated monopolies, have no formal responsibility to reduce carbon emissions; however they manage the connection of distributed renewable electricity to the grid.
- **The system favours established players**, because it was designed for them, and because increasing complexity in the system benefits incumbents, which understand and can influence the rules. For example, IGov studies of the Industry Codes process<sup>6</sup> and the creation of the capacity market<sup>7</sup> show strong evidence of the overriding influence of incumbent actors in rule-setting processes.
- There are **confused signals for market participants**. Government strategies and statements<sup>8</sup> have set out a vision of flexible, decentralised, ICT-enabled energy system. However, the consultations published by BEIS in July 2019<sup>9</sup> are not consistent with each this overall vision, or with each other. There are many such examples of confused signals.

3 <https://es.catapult.org.uk/wp-content/uploads/2019/06/SSH2-Field-Trial-Learnings-Insight-Report.pdf>

4 [https://www.citizensadvice.org.uk/Global/CitizensAdvice/Energy/Future%20for%20all\\_FINAL.pdf](https://www.citizensadvice.org.uk/Global/CitizensAdvice/Energy/Future%20for%20all_FINAL.pdf)

5 <https://www.theccc.org.uk/wp-content/uploads/2018/10/Lord-Deben-to-Chris-Grayling-Greg-Clark-on-Road-to-Zero.pdf>

6 <http://projects.exeter.ac.uk/igov/wp-content/uploads/2015/12/ML-Innovation-energy-industry-codes-in-GB1.pdf>

7 <http://projects.exeter.ac.uk/igov/wp-content/uploads/2017/10/WP-1702-Capacity-Market.pdf>

8 <https://www.gov.uk/government/speeches/after-the-trilemma-4-principles-for-the-power-sector>; see also the Clean Growth Strategy & The Industrial Strategy

9 <https://www.gov.uk/government/news/innovative-funding-models-and-technologies-to-drive-investment-in-new-wave-of-low-carbon-energy>

- There is **no way of co-ordinating integration across the energy system**. Such integration is necessary within the electricity sector – linking generation, supply, demand, flexibility services and infrastructure planning in order to bring down costs and carbon. It is also necessary to link the governance of electricity, gas, transport and other energy use. For example, the successful roll-out of electric vehicles requires alignment of transport policy with energy governance. Decarbonisation of heat also requires co-ordination, alongside important decisions on the future of natural gas networks.
- The **governance arrangements for protecting low-income households and ensuring access to affordable energy are not clear**. BEIS has overall responsibility, Ofgem has a responsibility for consumer protection, and Citizens' Advice has a statutory advisory and watchdog role. It is clear that digitalisation and technological change will require much greater focus on consumer protection and equity. There should not be a trade-off between protecting consumers and transforming the energy system.<sup>10</sup>

In the following sections, we outline our proposed reforms to energy governance. In section 3, we set out the principles that should guide governance, and in section 4, we address institutional questions.

<sup>10</sup> [https://www.citizensadvice.org.uk/Global/CitizensAdvice/Energy/Future%20for%20all\\_FINAL.pdf](https://www.citizensadvice.org.uk/Global/CitizensAdvice/Energy/Future%20for%20all_FINAL.pdf)

### 3 Principles of energy governance

As described in Section 2 above, energy markets are designed and managed through governance. Therefore, governance processes can be used to construct markets which incentivise the outcomes that society requires from the energy system, including security, rapid carbon reduction and social goals. Getting governance right allows markets to flourish, because value is aligned with outcomes.

Below, we set out our three key principles for governance: legitimate decision-making; people at the centre; and adaptive regulation.

#### 3.1 Legitimate and transparent decision-making

The first essential principle is to ensure legitimate decision-making, through being clear about required outcomes; making institutions and decision-making processes transparent and accessible to all system participants; and aligning value in the system (via market design and regulatory mechanisms) with the outcomes required. These three issues are interlinked. We discuss them in turn below.

**Outcomes:** There is a need for far greater clarity in setting the outcomes required from the energy system, and devolving responsibility to different sectors, government departments and agencies. Markets, policies and incentives are not outcomes – they are a means to achieve them. Outcomes would include rapid carbon reduction by a certain time; a fair system that supports vulnerable people; and security. It must be clear which government department or agency is responsible for which outcomes, accepting that there will be many overlaps. For example, the role of Ofgem in encouraging rapid carbon reduction needs to be stated unequivocally (even whilst the Ofgem role may be much smaller than it currently holds). IGov proposes the creation of an Energy Transformation Commission (see section 4) to oversee the process of assigning responsibility for outcomes, co-ordinating between different system actors and overseeing the transformation of the energy system.

**Transparency:** The process of energy governance must be opened up and made transparent, to ensure that all actors, particularly new market entrants, can engage fairly in the system. This would be helped through greater clarity of outcomes, as above, and an end to self-regulation through the Codes system, discussed below.

However, it will always be the case that established players have greater power and resources to influence decision-making processes. This is particularly the case at a time of rapid change in the energy system, driven by innovation and decarbonisation. This must be countered through specific support for new entrants to access these processes.

**Value:** To move to a smart, flexible system that enables rapid decarbonisation it will be essential that the ‘value’ in the energy system can be captured by new technologies, business models and actors. ‘Value’ is used in this sense to describe the payments for a service or for a function within the energy system. At the moment, the services and functions which receive payments continue to be related to the conventional energy system. Those payments (or value) need to be accessible to the smart and flexible energy system – otherwise, new system

entrants cannot capture value and generate revenue and profit. This will open up competition, allowing new technologies and business models to develop.

In order to do this, the rules relating to the energy system interaction need to be reformed to support and value the sustainable, smart and flexible properties needed from the energy system – this includes codes and licenses to enable companies to be involved in the energy system; market design rules; the network regulatory mechanisms and charging rules; and rules for flexibility provision.

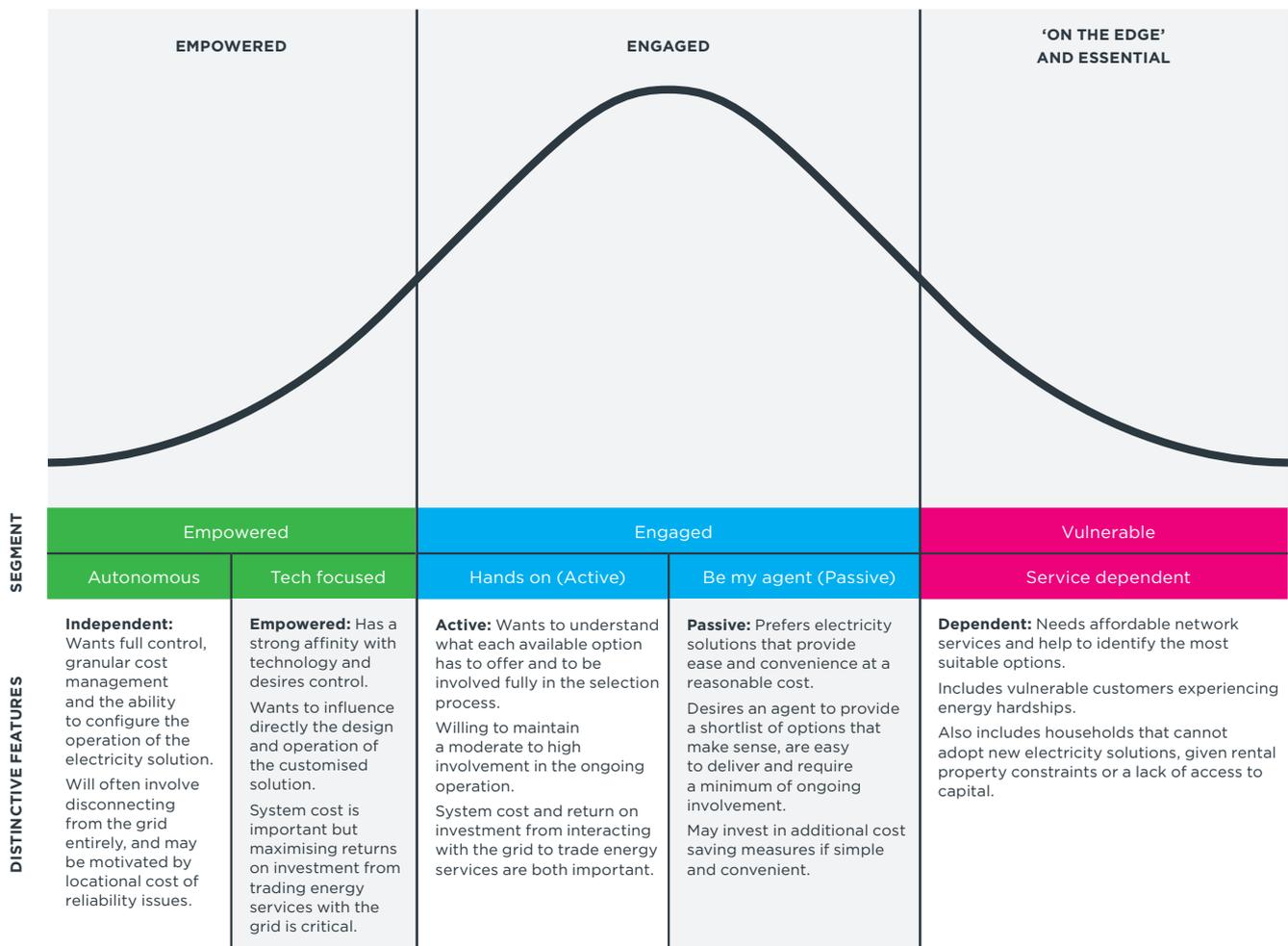
### **3.2 People at the centre: Citizen engagement and customer propositions**

There are two shifts required in the way in which people are understood within energy systems: first, a move away from the understanding of people as passive consumers; and second, an acknowledgement that people have a role beyond their participation in the market, as citizens giving (or withholding) consent and engaging with governance.

First, as described in Section 2, innovation is resulting in many more options for energy services, in which people move from buying units of electricity or gas, toward a market in which they can generate and store their own power, reduce demand, and provide demand response through ICT-enabled services. However, the current regulatory system sees individuals primarily as passive consumers. Energy governance must create markets which reward people for providing system services such as demand reduction, flexibility, and demand response. Paying customers for these services would reduce the need for additional generation capacity.

Policies should create incentives for personalised service and interaction, rather than a standardised approach, as with current supply tariffs. This requires thinking about customer propositions – what do customers actually want – and thinking of people as individual customers rather than a homogenised whole – and could happen as part of the move to local energy markets that we describe in section 3.3.

As markets become more personalised and targeted, there is a clear need to ensure that vulnerable customers are protected, by creating fair and inclusive energy markets. This will become more important with a move to ICT-enabled services, which might encourage providers to ‘cherry-pick’ and avoid offering services to poorer households. At the moment, there is a blanket approach to consumer protection, with the assumption that everyone needs similar safeguards. Instead, there is a need for greater segmentation, acknowledging that some vulnerable households require specific interventions and policies. Other customers, particularly the most engaged, require different treatment.



**Figure 2: Customer segmentation in Australia. Source: Energy Networks Australia. Electricity Network Transformation Roadmap.**

This diagram, from Australia, illustrates how people’s orientation toward energy systems can be segmented into three broad categories: empowered, engaged, and essential. The Eastern Australian expectation is that the majority of people will become engaged (either actively or passively) within the system. ‘Passive engagement’ refers to people who are happy to have intermediaries, either new or existing service providers or other market actors, who provide financial reward to people for providing system services. However, some people will remain unwilling or unable to engage in the system, perhaps because they are economically and socially vulnerable, and particular policies and market arrangements will be required for this group.

Second, people also play a role in the energy system as citizens – voting; engaging in the planning system; giving consent (passive or active) to energy infrastructure; and reducing or changing energy use for reasons other than cost-saving, such as a desire to contribute to carbon reduction. There should be a clear acknowledgement that people are energy citizens as well as energy consumers, and that those roles influence each other. In the IGov proposal for an Energy Transformation Commission, there would be a requirement for consensus-building processes to draw on public views and values in order to set a strategic direction for the energy system. The citizens’ assemblies being

established by Parliament and many local authorities may provide a model for this deliberation and consensus-building, and the ETC would provide a route to integrate the advice of such assemblies into decision-making processes.

### 3.3 Regulatory reform: The need for adaptive regulation

It is widely acknowledged that the pace of innovation in energy services is unprecedented, particularly with regard to ICT-enabled energy services. This poses a considerable challenge to regulators, with a real risk of regulation lagging a few steps behind innovation, and acting as a brake on progress. The example of Eastern Australia (see box A) demonstrates what happens when regulation does not adapt, and how the window of opportunity to undo the damage of inflexibility becomes shorter and shorter.<sup>11</sup>

The institutional arrangements described above – particularly a clearer, more consensual process for setting policy goals; and more flexible local governance – will help to create a more adaptive regulatory environment, governing a transition rather than a static system.

One crucial shift is to develop a market for energy services, rather than units of energy, which, as described below, could be achieved through the creation of Distribution Service Providers (DSPs).

However, from a regulation point of view a move to more adaptive governance requires a shift from ‘input’ type regulation to output-based regulation. These outputs are regulated via performance-based regulation and they can change, as can the stringency of the performance-based regulation. In addition, reviews can be included in regulatory mechanisms, so when something goes very wrong, such as the capping of solar a year into the RII01 price control period, change can occur.<sup>12</sup> Moreover, Regulators need the ability to undertake assessments of ‘new’ topics as and when they come up, as opposed to have to wait out an agreed forward plan which may become irrelevant by the time it is put in place.

Lastly, regulation needs to be adaptive to the needs of a local area. Areas all differ in many ways including generation capacity, demand profile, settlement patterns, transport infrastructure, and the needs and values of local people. National co-ordination of governance is required to make sure that carbon targets are met, and to offer a stable framework for innovation. But there should be space for local areas to develop their own plans, and local markets for energy services. This is discussed further in sections 4.4 and 4.5.

<sup>11</sup> [https://www.energynetworks.com.au/sites/default/files/open\\_energy\\_networks\\_-\\_required\\_capabilities\\_and\\_recommended\\_actions\\_report\\_22\\_july\\_2019.pdf](https://www.energynetworks.com.au/sites/default/files/open_energy_networks_-_required_capabilities_and_recommended_actions_report_22_july_2019.pdf)

<sup>12</sup> <http://projects.exeter.ac.uk/igov/new-thinking-solar-surprise-revisited/>

## BOX A: Rapid PV uptake in Eastern Australia

Eastern Australia is a good case study of governance problems in a fast-changing energy system.<sup>13</sup> In 2008, they started to support small-scale renewable energy at the household level, including solar, with generous feed-in tariffs. A more comprehensive scheme was added in 2011, designed to last until 2030. There was then a steep rise in the cost of retail electricity from the grid, in part because of increasing gas prices. At the same time, the cost of solar installations fell, meaning that PV was cheaper than retail electricity, over a ten-year period. The area now has the highest percentage of domestic PV installation in the world. By 2018, nearly a third of all households in South Australia and Queensland had solar, with concentration in some areas as high as 45%.<sup>14</sup>

This situation caught network operators, and regulators, by surprise. Network operators had been planning for increased demand at peak times, and they had received approval from the regulators for big investments in transmission capacity. The huge increase in PV installation was not anticipated, yet as network costs increased due to the transmission investment, the price of retail electricity had to increase to cover the costs of investment. This made domestic PV more attractive, especially as costs for storage fell. A major blackout contributed to the popularity of solar, as householders saw security benefits too.

This unexpectedly rapid expansion of domestic solar shows how quickly energy system transformation can happen. While there are major benefits to the growth in domestic solar, and the knowledge of system change and operation that it has driven, the governance system has struggled to keep up. Supply companies have seen their markets shrink, and there is less electricity passing across networks, raising questions of how the grid can be paid for in future. There are equity issues, too, because poorer households cannot afford upfront investment for PV installations so are having to pay the higher costs of retail electricity. This case study demonstrates the importance of adaptive regulation, as discussed above.

<sup>13</sup> For more details of the Eastern Australia case study, the IGov primer has a list of resources – see <http://projects.exeter.ac.uk/igov/primer-energy-system-change-in-eastern-australia/> see also: [https://www.energynetworks.com.au/sites/default/files/open\\_energy\\_networks\\_-\\_required\\_capabilities\\_and\\_recommended\\_actions\\_report\\_22\\_july\\_2019.pdf](https://www.energynetworks.com.au/sites/default/files/open_energy_networks_-_required_capabilities_and_recommended_actions_report_22_july_2019.pdf)

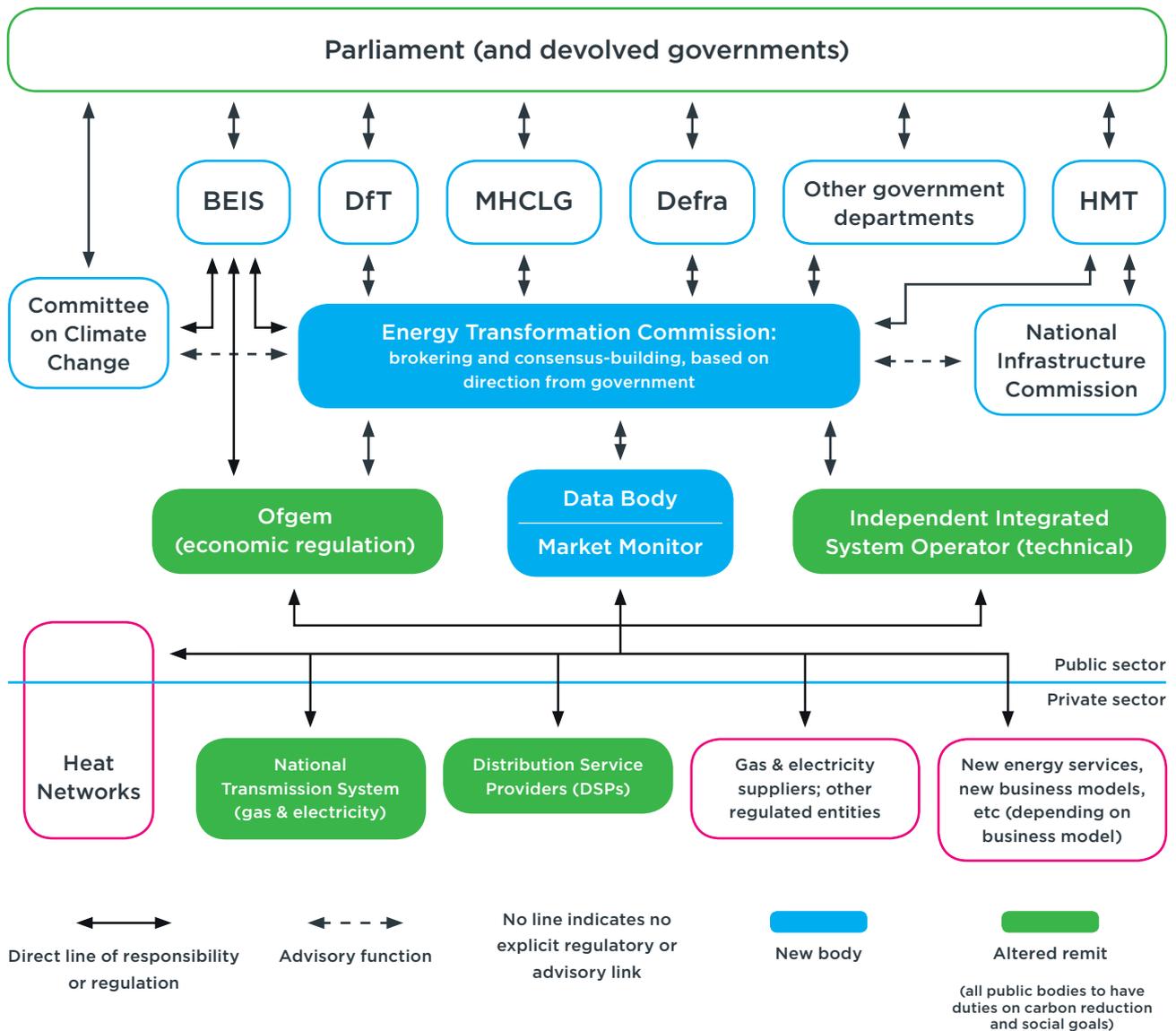
<sup>14</sup> <http://projects.exeter.ac.uk/igov/primer-energy-system-change-in-eastern-australia/>

## 4 A new governance framework

Achieving these principles of energy governance will require new institutions, and reformed roles for some existing institutions.

There is a need to manage the process of energy system transformation, being clear where change should get to and by when; instituting market design rules and incentives to deliver required outputs; and ensuring that the current energy system works well for people and businesses.<sup>15</sup>

There are currently multiple advisory and regulatory bodies, working to different objectives, overseeing different aspects of the energy system. Whilst carbon targets are economy-wide, no government departments except BEIS have a specific responsibility for carbon reduction, or requirement to respond to advice from the Committee on Climate Change<sup>16</sup>; neither does Ofgem have a direct relationship or responsibility in this area. There is no clear means to ensure co-ordination between institutions, to achieve vital energy system goals such as rollout of electric vehicles; social goals; demand reduction or system integration.



**Figure 3: GB energy governance: proposed new institutions and responsibilities**

<sup>15</sup> <http://projects.exeter.ac.uk/igov/electricity-market-design-5-summary-of-blog-series/>

<sup>16</sup> <https://www.theccc.org.uk/wp-content/uploads/2013/03/CCCFramework-Document.pdf>

This diagram sets out our overall proposals, including:

- A new institution, the Energy Transformation Commission, to implement the transformation process set by government, through brokering, co-ordination, consensus-building and engagement;
- An Independent, Integrated System Operator, overseeing gas and electricity systems, and moving into the public sector;
- An amended remit for Ofgem, focussing on economic regulation;
- The evolution of Distribution Service Providers (DSPs) from Distribution Network Operators (DNOs);
- Data Body and Market Monitor;
- Heat networks.

These are discussed below.

#### **4.1 Energy Transformation Commission**

IGov recommends the creation of an Energy Transformation Commission<sup>17</sup> (ETC) to implement objectives set by government. The ETC would work alongside the Committee on Climate Change, Parliament and BEIS. The ETC would complement the CCC in that it would be a similar entity, and whilst the CCC provides Advice to Government on Budgets, the ETC role would be to provide Advice to Government on how best to meet those budgets (given the specific issues it would be taking account of below).

It would oversee the transformation process through co-ordinating all the institutions involved, and providing a hub for consultation and engagement. This proposal is informed by experience from elsewhere. The New York REV process is the most similar to our proposals (see box B). Lessons can also be learned from the Danish system of negotiated Energy Agreements, which are agreed between the major political parties and supported by the Danish Energy Agency.<sup>18</sup> The ETC's core function would be to provide strategic oversight of progress toward energy system goals, as set by government. It would also act as a hub for engagement, both for industry stakeholders and the wider public. Whilst keeping a focus on the overall process of transformation, the ETC would also work on a project basis to build consensus and co-ordinate planning in key areas of change, such as the roll-out of electric vehicles. This would reduce the need for separate taskforces and processes to be established to tackle individual energy system issues, and would provide greater certainty for industry.

#### **4.2 Integrated Independent System Operator**

The recent creation of an 'Independent System Operator', as part of the National Grid Group, was a step in the right direction, but IGov analysis suggests that this needs to go further. IGov proposes an independent, non-profit Integrated Independent System Operator. This would integrate across electricity and gas.

<sup>17</sup> <http://projects.exeter.ac.uk/igov/enabling-the-transformation-of-the-energy-system/>

<sup>18</sup> <https://stateofgreen.com/en/profiles/state-of-green/news/the-energy-commission-presents-recommendations-for-denmark-s-future-energy-policy>

The task of the IISO would be to oversee the implementation of strategy set by the government and co-ordinated by the ETC, within energy markets. This non-profit organisation would integrate gas, electricity and aspects of transport, at different levels, both transmission and distribution. A key role of the IISO would be to ensure implementation of carbon goals set by the strategic level (as above).<sup>19</sup> The IISO would also be responsible for the management of industry Codes and Standards, overseeing an independent **Codes Manager** to enable open and fair consultation and engagement from all market players.<sup>20</sup>

### **BOX B: Transforming New York's electricity system – the NY REV**

Since 2014, NY REV has steered a process of transformation in energy governance. The catalyst for change was Hurricane Sandy, which struck New York State in 2012, resulting in major disruption to electricity systems, and revealing a worrying lack of resilience.<sup>21</sup> NY Rev aims to transform the concept of an energy utility, to create an energy system which is focussed on customers; embraces distributed technology; reduces costs and meets State-wide carbon targets.

At the heart of NY Rev is the creation of new-look utility companies, called 'platform providers' or 'distributed system providers' (DSPs). These replace the traditional utility model of selling units of power from centralised generators to passive consumers. Instead of this one-directional approach, the new entities co-ordinate a two-way, or multi-way, flow between producers and consumers, incorporating balancing and response functions, to provide energy services to customers.

The NY Rev process both sets out a clear vision, and co-ordinates a complex process of systemic change. It starts from the understanding that the electricity system is a managed market, and that the regulatory system provides the mechanism by which incentives for utilities are aligned with the aims of the system as a whole. There is high-level political support from the Governor of New York State, and the process itself is delegated and managed through an independent Board. In this way, it is an example of a new balance between regulation and markets, where there is more direction from the legitimate, policymaker. This reflects a difference from the GB principle of delegation.

Since 2014, the Public Service Commission has overseen a complex process of regulatory change, in order to redesign the electricity system to achieve the aims of NY REV. There are more than forty work streams, each with stakeholder involvement, examining in detail issues such as customer engagement, customer protection, models of metering, and so on. These work streams are all linked into a wider vision of system change. Conscious efforts are made to resist inertia, through maintaining a focus on the transition process. New York State's REV initiative provides a good model for the process of direction-setting in the UK.

19 For more detail, see <http://projects.exeter.ac.uk/igov/wp-content/uploads/2017/03/Ofgem-Future-arrangements-for-the-electricity-SO-submission-from-EPG-March-2017-FINAL.pdf> and <http://projects.exeter.ac.uk/igov/new-thinking-not-just-independent-but-also-integrated/>

20 <http://projects.exeter.ac.uk/igov/wp-content/uploads/2016/09/Lockwood-et-al-Innovation-and-the-governance-of-energy-industry-codes.pdf>

21 For more details of the NY REV, the IGov primer has a list of resources – see <http://projects.exeter.ac.uk/igov/primer-new-york-state-rev/>

### 4.3 Ofgem as economic regulator

The creation of the ETC, as above, would mean that Ofgem could concentrate on its core function, economic regulation. It would regulate the operation of the transmission and distribution system, including the new Distribution Service Providers (see below), as well as gas and electricity suppliers, other regulated entities (including heat networks), and new energy services.

Ofgem would no longer be responsible for strategy or executing system change – this would be managed by the ETC – or code management, which would fall to the IISO. Its duties would be pared back, and its mission would be set out by Government in a Strategy and Policy Statement.<sup>22</sup>

This new role reflects the more transparent and legitimate decision-making. Government would be taking decisions, on advice from the ETC and CCC, which have distributional impact. Ofgem would no longer be executing high level policy (and taking the decisions to enable that) which inevitably has distributional consequences. The ETC and IISO would ensure that those Government decisions were implemented.

The degree to which an independent regulator delivers what a Government wants is related to the Duties on the Regulator, and any guidance issued to them. If those Duties are not clear, then the Regulator will understandably be cautious. Government has to take responsibility for ensuring the Duties on the Regulator are clear enough so that their economic regulation is sufficiently stringent.

### 4.4 Local level energy governance

In recent years there has been increased attention to the role of local areas in energy and climate change. Through the Industrial Strategy, Local Enterprise Partnerships (LEPs) have been encouraged to focus on low-carbon growth; funding has been provided for local energy system demonstrators; and five regional energy ‘hubs’ have been established to work with LEPs. In addition, pressure from activists has led to a large and growing number of local authorities declaring a ‘climate emergency’ and pledging to develop local climate strategies, often involving deliberation with local people in the form of a Citizens’ Jury or Citizens’ Assembly.

<sup>22</sup> <http://projects.exeter.ac.uk/igov/new-thinking-the-lost-strategy-and-policy-statement/>

Despite this upsurge in local activity, energy governance mechanisms remain concentrated at the national level. Local authorities have no statutory duties on carbon, and activity on decarbonisation varies widely across authorities. We argue that a formal co-ordinating role should be devolved to local authorities.<sup>23</sup> This should take the form of a new statutory duty on local authorities, requiring them to produce a Local Transformation Plan (LTP), which includes setting (in negotiation with central government) and meeting devolved carbon budgets; and the freedoms, flexibilities and funding to enable this process. The main purpose of the LTP would be to devolve responsibility to local areas, and to co-ordinate across energy, planning, transport and economic development.

Figure 4 sets out the interplay between national and local energy governance.

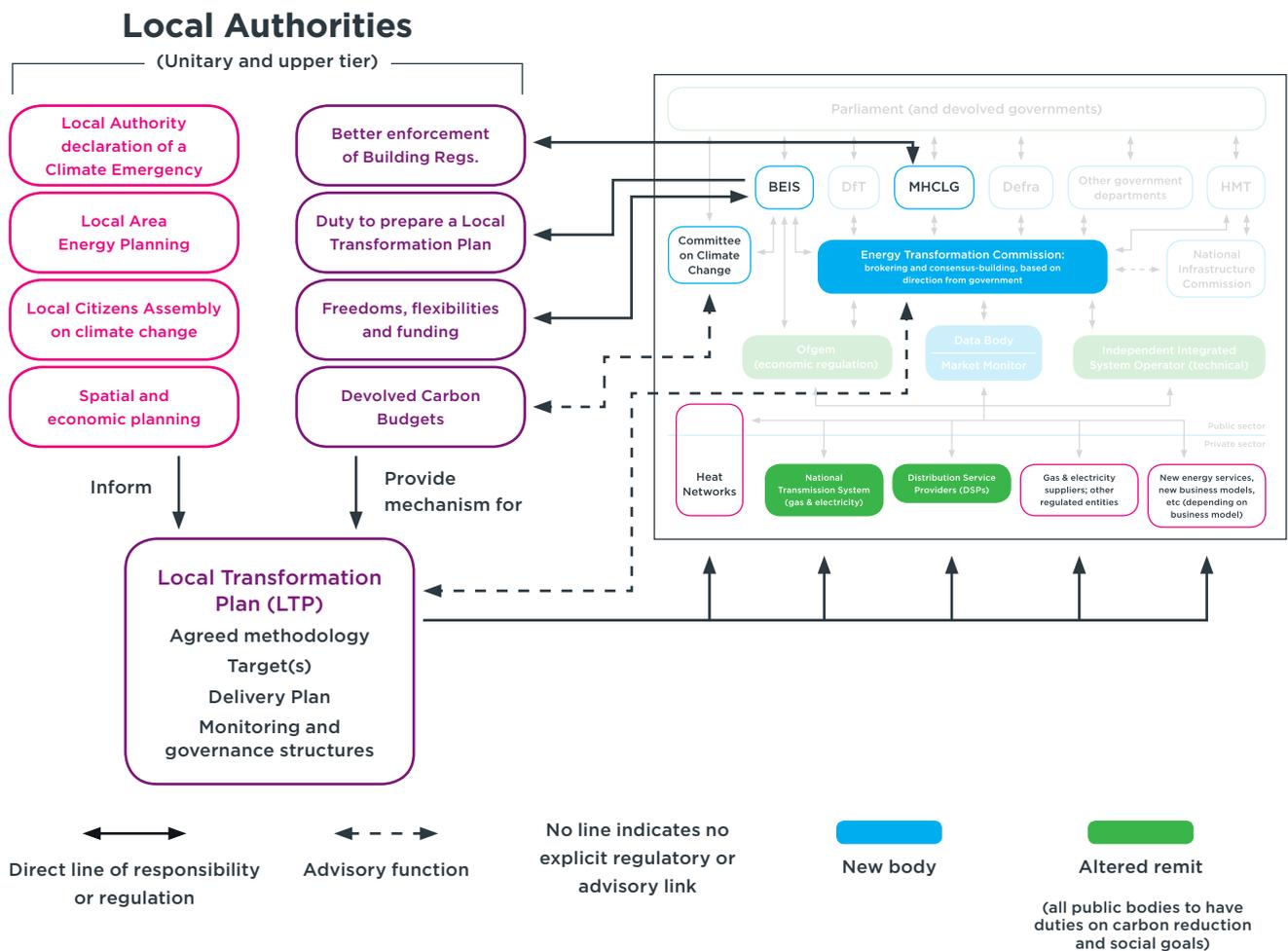


Figure 4: IGov proposals for local and national energy governance

23 <http://projects.exeter.ac.uk/igov/new-thinking-governance-for-local-energy-transformations/>

## 4.5 Distribution Service Providers and the creation of local markets

IGov proposes the creation of Distribution Service Providers (DSPs) to replace Distribution Network Operators (DNOs, which currently manage the local distribution networks and are combined 'wires' and system operator companies).

DSPs would implement the shift from the linear, top-down value chain of the energy system, to one which focuses on customers and values efficiency, flexibility and sustainability.<sup>24</sup> They would combine current DNO functions – managing networks and systems operation – with new co-ordination and balancing services, including demand response, flexibility and ancillary services. Thus the DSP would facilitate local markets.<sup>25</sup>

Figure 5 shows how this would work. At the distribution level, the DSP would manage the local network and the market balancing and co-ordination functions. Below the level of the Grid Supply Point (GSP), there would be many bodies such as resource providers, aggregators and local energy platforms operating and interacting with consumers, prosumers and Distributed Energy Resources (DER).

The DSP would have oversight of all trades occurring in their geographical region. In addition to being able to trade with each other, assets within the DSP region have the choice of selling in to, or buying from, the DSP coordinating and balancing market or selling in, or buying from, the national market. The information from these trades would be known by the DSP as it would allow them to identify any issues on 'their' part of the network, such as constraints which may arise through the activation of certain assets. This knowledge would allow them to activate ancillary services to rectify such issues.

This arrangement would reveal prices and enable more entrants. It would reduce the possibility of larger companies capturing local value without paying for the attendant network costs – as can happen with private, local energy platforms.

<sup>24</sup> <http://projects.exeter.ac.uk/igov/blog-1-of-name-form-and-function-of-distribution-entities/>

<sup>25</sup> <http://projects.exeter.ac.uk/igov/electricity-market-design-5-summary-of-blog-series/>

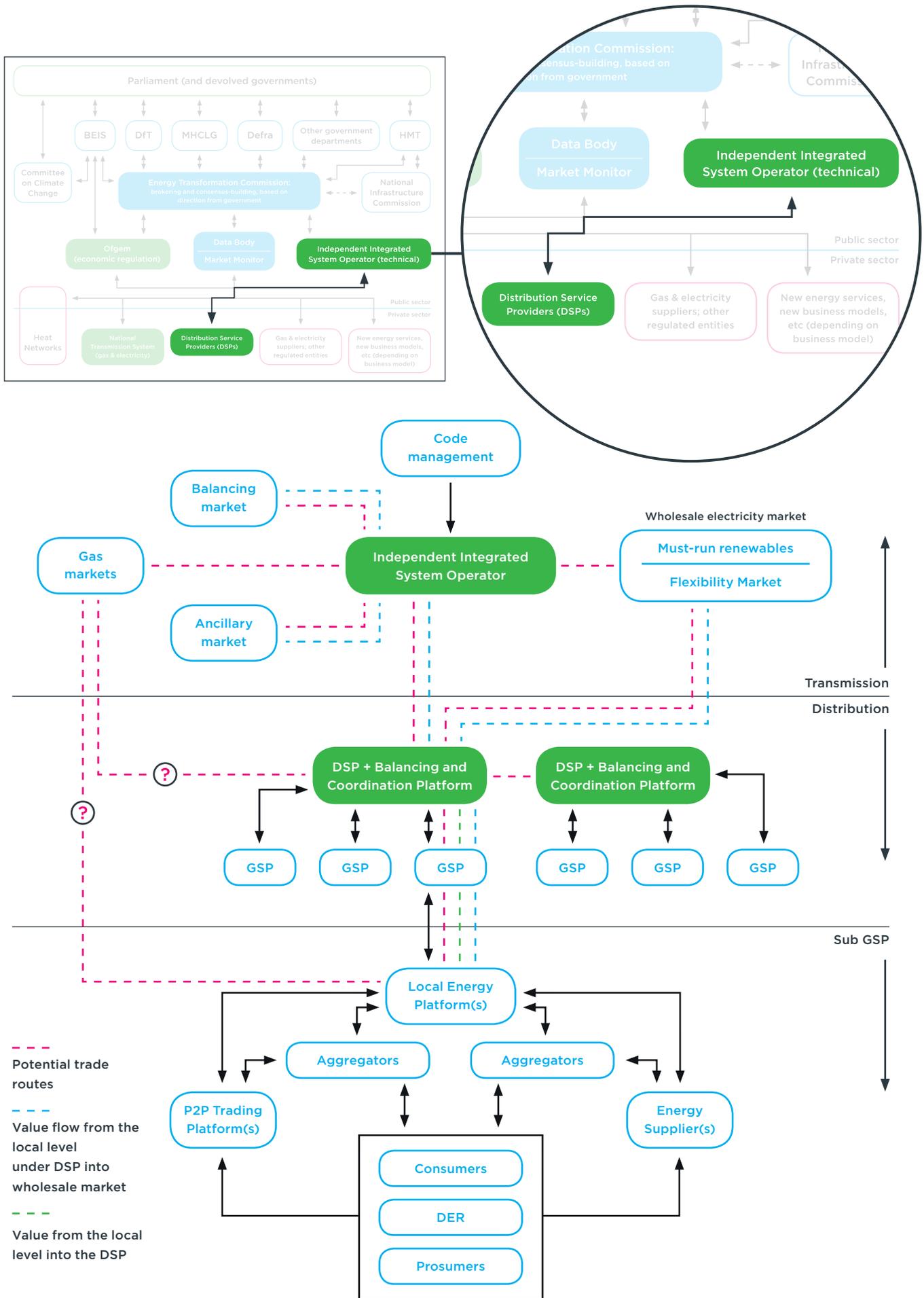


Figure 5: Local market design

## 4.6 Data Body and Market Monitor

The complexity and volume of data in the energy system is increasing dramatically.<sup>26</sup> So, too, is the potential value that can be derived from this data. At the same time, there are complex considerations around data protection which relate not just to energy use but the wider economy. We see a separation between bodies to open up energy system data and the regulation of the use of data by system actors.

We argue there is also a need for a new cross-economy Data Regulator, which would include energy issues related to the use of data by system actors in its remit. This would provide one element of customer protection in relation to use of customer data within the energy system (or sold more widely elsewhere).<sup>27</sup>

There is also a need to provide access to system data, to enable innovation and new entrants in the energy system – as discussed by the Energy Data Taskforce.<sup>28</sup> The Office for National Statistics, for example, could act as a data repository (in effect, an accessible data body).

Wider customer protection issues to do with appliances, problems with suppliers and so on should be dealt with through a simple redress process, and via significantly beefed up institutions already in the energy system – Citizen’s Advice, the Energy Ombudsman and the CMA – as well as a continuing, albeit different role by Ofgem.

Another aspect of customer protection relates to knowledge of what is going on in energy markets, including how actors link the prices paid for energy with those that they sell at. A market monitor is a body which follows and analyses market exchanges and which can provide information to show whether any improper trading or profiteering has occurred. Certainly in the US, independent market monitors are a norm and seen as vital institutions to protect customers from potentially improperly raised prices. IGov suggests a new institution: an independent Market Monitor.

## 4.7 Heat Networks

The CCC suggest that 18% of the UK’s heat demand could be required to come from heat networks in 2050 for cost effective decarbonisation, up from around 2% currently.<sup>29</sup> While some of this growth may be in new developments, a significant amount of deployment is likely to take place through the retrofitting of networks in dense urban areas. This retrofitting will require significant involvement by local authorities to plan networks, coordinate with LTPs (see 4.4) and potentially invest directly and own assets alongside private sector organisations.

There is also a need to develop a regulatory framework for heat networks at the national and local scale. Nationally technical standard and consumer protection should be regulated by Ofgem and local governance frameworks should explore the role of zoning in reduce demand risk, encouraging investment in networks and co-ordinating heat decarbonisation locally.

<sup>26</sup> <https://blogs.exeter.ac.uk/energy/2019/03/25/ai-in-energy-is-it-as-smart-as-you-think/>; <https://blogs.exeter.ac.uk/energy/2019/04/01/ai-in-energy-is-it-as-smart-as-you-think-2/>; <https://blogs.exeter.ac.uk/energy/2019/04/08/ai-in-energy-is-it-as-smart-as-you-think-part-three/>

<sup>27</sup> <http://projects.exeter.ac.uk/igov/5001-2/>

<sup>28</sup> <https://es.catapult.org.uk/wp-content/uploads/2019/06/EDTF-A-Strategy-for-a-Modern-Digitalised-Energy-System-FINAL-REPORT-1.pdf>

<sup>29</sup> [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/766109/decarbonising-heating.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/766109/decarbonising-heating.pdf)

## 5 Conclusion

The innovation sweeping the energy system has the potential to radically shift the way energy is produced, stored and used, and help the UK achieve its goal of net-zero carbon emissions. Yet IGov research, summarised here, has shown that governance of the energy system is outdated, and supports existing technologies and companies at the expense of innovators. The reforms outlined in this briefing would ensure that governance supports innovation, adapts to change and puts people at the centre.

Further detail on this research can be found on the IGov website, and is summarised in a series of Primers<sup>30</sup> on different aspects of energy governance.

<sup>30</sup> <http://projects.exeter.ac.uk/igov/category/research/primers/>



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