

Richard Howard | November 2015

GOVERNING POWER

Improving the administration of the energy
industry in Great Britain

A Policy Exchange Research Note

About the Author

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Acknowledgements

The author would like to thank KPMG for their input into this project. The views expressed in the report remain those of Policy Exchange and not KPMG. The author would like to thank Professor Catherine Mitchell (Exeter University) and the energy team at Citizens Advice for reviewing and providing comments on a draft of the report.

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Executive Summary

The energy industry in Great Britain has undergone major changes since privatisation, with new policies, industry regulations and market reforms being continually introduced. Complexity has increased as new policies for clean energy, smart energy, security of supply, and retail competition have been overlaid on legacy arrangements. Further change is expected as the transformation towards a low carbon energy system gathers pace.

Over time, new bodies, institutions and agencies have been established and there are now more than thirty such bodies actively involved in the administration of the energy industry – centred around DECC, Ofgem and National Grid.* These are the bodies that create, deliver and administer the energy policies, regulations and rules that govern electricity and gas industries and markets.

The Challenge of Complexity

Administrative responsibilities split between so many different bodies result in additional costs, which are paid for from general taxation and charges on consumer bills. Estimating the total cost of energy administration is difficult, since there is little transparency on exactly where money is being spent. We estimate that the cost of administrative bodies (excluding DECC) is over £500 million per year, plus there is at least a further £135 million in administrative spending at DECC.

Administrative complexity also creates significant costs for participants in the energy industry, as companies have to comply with numerous policies and regulations and interact with an increasing number of organisations. A large integrated energy company could typically have a team of up to 200 people working on energy policy (including delivery of obligations), regulation, and government affairs.

Unnecessary complexity also risks deterring new entrants and stifling company growth and innovation. Discussions with energy companies as part of this research revealed that they simply do not have the resources to engage with all

* Note: for the purposes of this report we limit our discussion to electricity and gas markets, and mainly on generation and supply rather than upstream activities such as oil and gas production and extraction.

aspects of energy policy and regulation, such as the numerous industry working groups which develop industry ‘codes’, or market rules. In particular, smaller companies have to prioritise heavily, cherry-picking only the policies and regulations which affect them the most. This is partly due to the complexity of the policies and regulations, but is exacerbated by the complex institutional landscape. This risks giving large incumbent companies a competitive advantage, as only they have enough capacity to participate fully in the development of policies, regulations and market rules.

The energy industry is undergoing a significant transformation in order to meet decarbonisation objectives, which will involve new technologies, products and services, and business models. The fragmentation and complexity of the current policy and regulatory regime may act as a barrier to this innovation, as well as undermining its responsiveness and flexibility during this period of rapid change.

Recommendations

We recommend the Government initiates a review of the energy institutional landscape as part of the Comprehensive Spending Review now underway.

Bringing forward reforms in this area offers the following potential benefits:

- **Lower administrative costs** as duplication and overheads are reduced. Energy administration costs are paid for by taxpayers and bill-payers, and could be reduced through rationalisation. DECC is currently being asked to make significant savings in expenditure as part of the Comprehensive Spending Review, and reforms to energy administration could be part of the solution.
- **Less administrative and regulatory complexity**, reducing cost and barriers to entry in the energy industry.
- **Greater responsiveness and flexibility** to technological, business and market developments.
- **Clearer accountability**, in particular for managing security of supply.

This paper discusses potential new models and options for reform. While generally maintaining existing DECC and Ofgem responsibilities for policy development and regulation respectively, there are clear opportunities to rationalise the remaining bodies as follows:

- There are at least ten bodies currently involved in the delivery of energy policies for renewable energy, energy efficiency and fuel poverty, and security of supply. We recommend that these bodies are rationalised into a single **Energy Delivery Body**. This could be built around the responsibilities of the existing Ofgem E-Serve organisation, and subsume the functions of several similar organisations (some of which could then be disbanded). These functions could either be run by a standalone public body, or be outsourced to the private sector.
- There are currently six organisations involved in the management of the eleven industry codes which govern how markets operate. We recommend that these are rationalised into a single **Industry Codes Body**, to reduce complexity and cost, and improve consistency.
- Responsibility for managing system operation and security of supply is currently split between several different bodies. An option which we think needs further consideration is the creation of an **Independent System Operator (ISO)**. This would combine the system operation and planning functions of National Grid, with electricity and gas market settlement activities performed by Elexon and XoServe. This would create clearer accountability for security of supply, and remove potential conflicts of interest.

1. The Challenge of Complexity

This report considers how energy markets are governed in Great Britain,* and the consequences this has in terms of administrative cost, complexity, and regulatory burden.

There is now a very complicated landscape of organisations, agencies and other bodies involved in the administration of the energy system (Figure 1). In total we have identified over thirty different bodies that perform a variety of different roles. In the main these bodies are centred on the Department of Energy and Climate Change (DECC) in terms of policy; Ofgem in terms of energy sector regulation; and National Grid in terms of system planning and operation. Other departments play a multitude of related roles such as HM Treasury (e.g. infrastructure delivery and finance, control of departmental spending), BIS (innovation, industrial policy), DfT (low carbon transport), DCLG (infrastructure planning, building regulations), and Defra (environmental regulation). In addition, there is an increasing level of interaction between British and European energy institutions, for example through energy-related Directives, State Aid rules, and the ongoing harmonisation of European energy codes and market rules.

In the future this picture could become even more complex due to the devolution agenda. Although energy is a reserved matter, the Devolved Administrations have already become involved in aspects of energy policy such as planning and innovation, and the trend towards further devolution is set to continue. The recommendations of the Smith Commission were that Holyrood should take on further powers relating to onshore oil and gas licensing, and energy efficiency and fuel poverty, and a formal consultative role in relation to energy regulation and renewables.¹ Similarly, the Wales Bill will devolve further powers over energy planning and licensing of onshore oil and gas.² Under English devolution, certain city regions may also start to play a more significant role in energy policy and delivery. Manchester City Region recently called for the devolution of £1 billion of carbon taxes to local control.³ Certain energy policies such as the Energy Company Obligation already have a local delivery element.

* This report focuses on electricity and gas industries in Great Britain (as opposed to the UK). Some UK energy policies also apply in Northern Ireland, but it is functionally part of the Single Energy Market in Ireland, which has its own regulatory regime.

In addition to this, there are a plethora of different bodies involved in funding energy related Research and Development and innovation, including the various Research Councils, BIS, DECC, Technology Strategy Board, Energy Technology Institute, Technology Catapults, Carbon Trust and so on. The innovation funding landscape is so complex that the government has created a 'Low Carbon Innovation Coordination Group', to try and draw these various bodies together.

Cost of Energy Administration

There are significant costs associated with splitting energy administrative between so many different bodies. Estimating the total cost of energy administration is difficult, since there is little transparency on exactly where money is being spent (or indeed the performance that is being delivered for this funding). In addition to this, these bodies are funded in a variety of ways, either from general taxation, or through price controls or levies on consumer energy bills. All of these costs ultimately fall on the end consumer/taxpayer.

Based on publicly available information, our conservative estimate is that the cost of administrative bodies excluding DECC and other government departments is at least £500 million per year (see Appendix A for further details). The most significant costs relate to National Grid (in its functions as System Operator, Electricity Market Reform delivery body, and code administrator), the Smart Meter Data Communications Company, Ofgem (as a regulator), the Carbon Trust, Elexon, and Ofgem E-Serve.

In addition to this, a proportion of DECC's departmental expenditure relates to administration of the energy industry and markets. DECC's net expenditure totalled some £7.9 billion in 2013/14, of which nearly £7.0 billion related to nuclear decommissioning and liabilities (which is outside the scope of this study).⁴ However, the remaining spend of £874 million comprises a wide range of activities including administration, delivery and programme activity, as well as some subsidy payments. DECC's accounts identify £135 million of pure administration cost ("Delivering DECC capability"), plus there are likely to be additional administrative costs within other programme activities, although these are not identified separately.

Figure 1: Energy Institutional Landscape

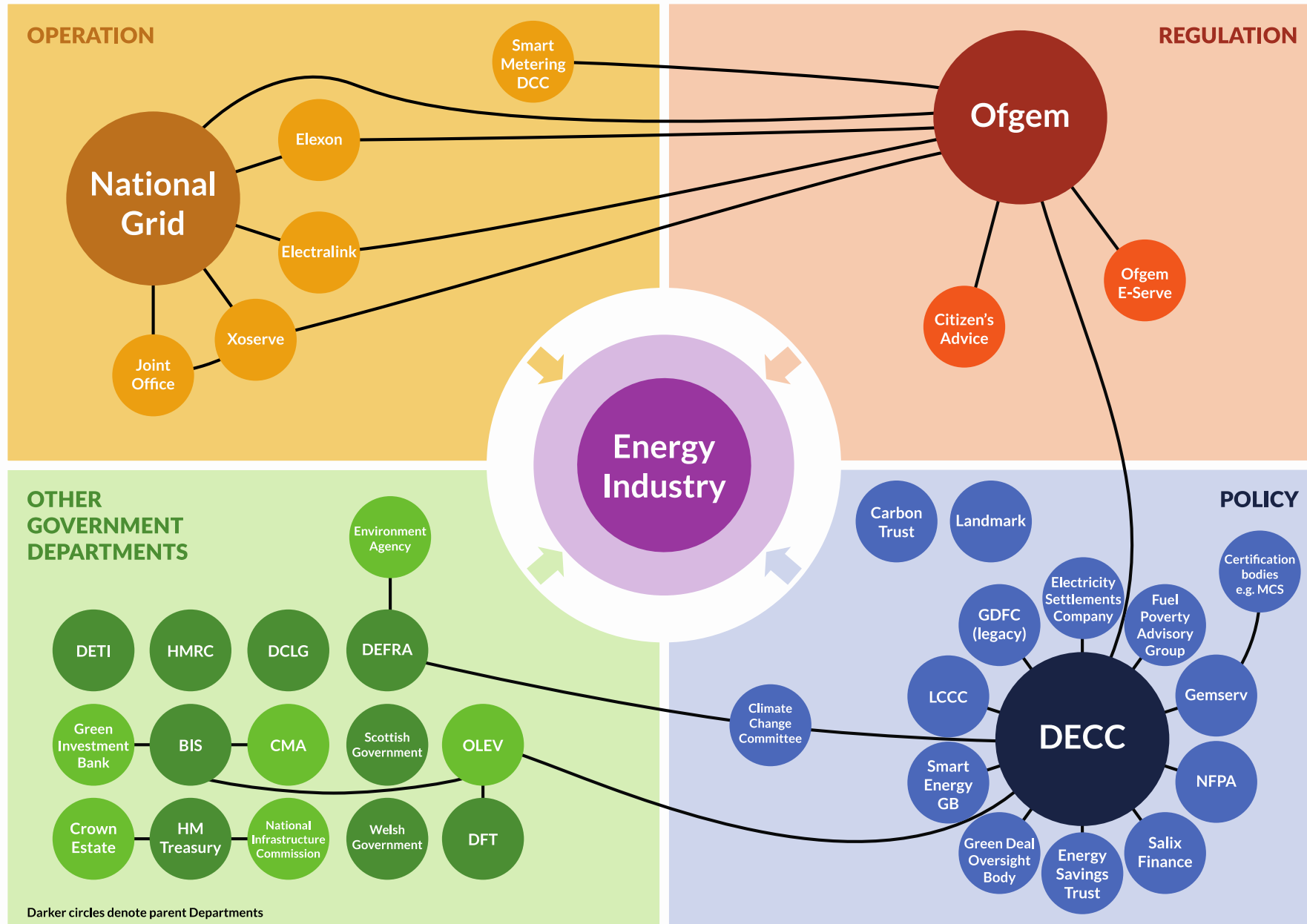


Figure 2: Breakdown of Spending on Energy Governance, excluding DECC

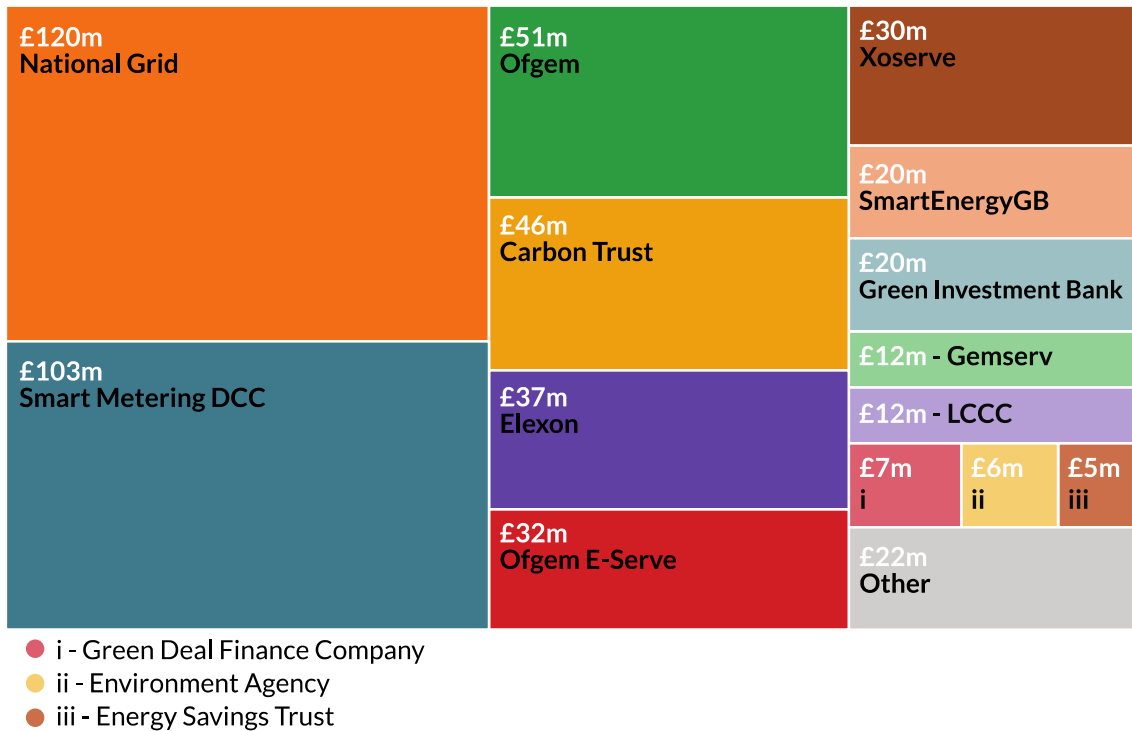
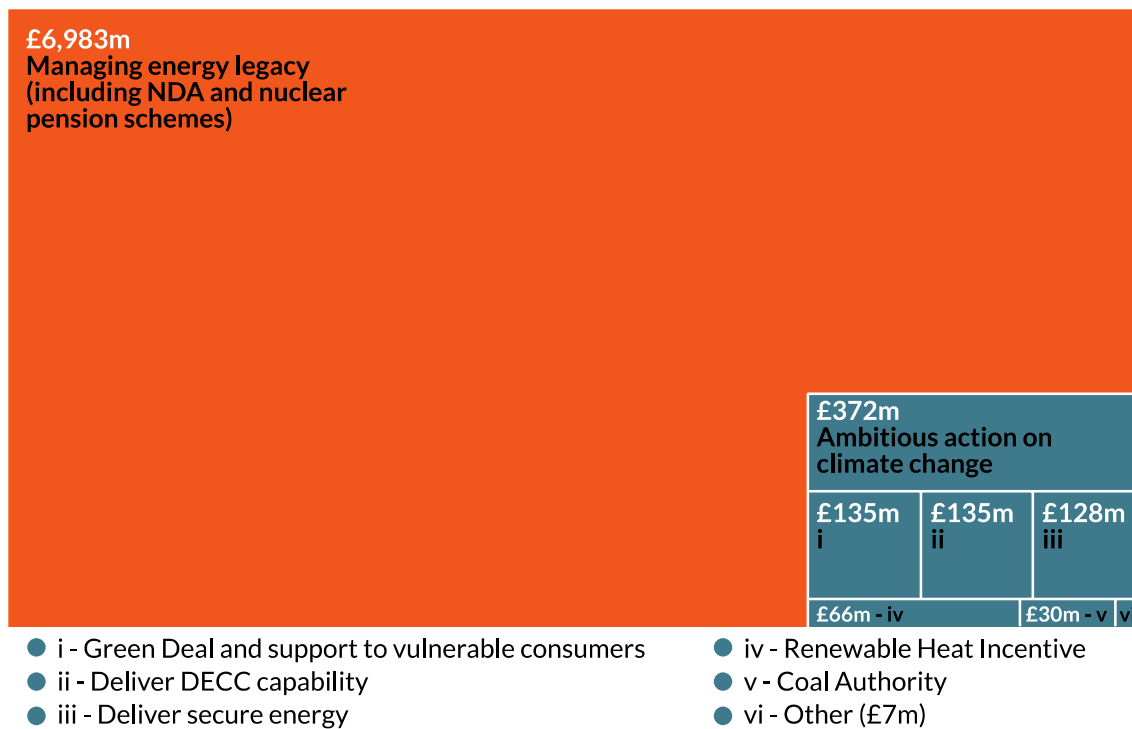


Figure 3: Breakdown of DECC expenditure, 2013/14 (£millions)⁵



Importantly, this analysis does not include the costs incurred by energy companies and other industry bodies to comply with rules and regulations and engage with Government and regulators. Given the large number of industry participants, their aggregate costs are also likely to be significant. Our discussions with a number of energy companies revealed that it is not unusual for a large integrated energy company to employ up to 200 people involved energy policy (including delivery of obligations), regulation and government affairs. As Dieter Helm commented: *“Every company in the sector has its own regulatory team, with the result that the total number of people across the companies is probably greater than that of Ofgem. Then there are all the specialist regulatory advisers, consultancies and lawyers covering regulation. Regulation and government intervention has created its own industry [employing] literally thousands of people.”*⁶

How did we get here?

It is over 25 years since the electricity and gas sectors were privatised in Great Britain. The industry has moved from one where Government led all aspects of the energy system including price setting; to one where markets and customer choice determines energy prices, and regulators set prices for the monopoly networks. However, many energy decisions (and the associated administrative processes) remain in the hands of Government and regulators. Some of the key events since privatisation are listed below, each of which caused changes to a wide range of licences, industry procedures and codes:

- The £32 billion electricity privatisation took place in 1990, with the industry restructured into generation, transmission, distribution and supply, before sale to private sector parties. The industry regulator, Offer, was established to regulate monopoly businesses and facilitate competition. New industry codes and agreements were established to replace old public sector arrangements.
- Gas privatisation took place in 1986, placing the £9 billion British Gas monopoly company in the private sector, and setting up its regulator, Ofgas. The market was not opened fully to competition until 1995, which also saw the introduction of an industry code governing these arrangements. Subsequently, in 1997, British Gas demerged into Supply (Centrica), Exploration and Production (BG) and Network (Transco) businesses.

- The electricity market at privatisation consisted of a 'pool' design. Administration tasks of market operation and settlement, code governance, and system operation and planning were performed independently (of generation or supply activities) by National Grid. Once the new arrangements were in place, the Department of Energy was subsumed into the DTI (in 1992).
- During the 1990s major efficiency improvements were realised in all utility company operations, combined with a major shift towards gas-fired power stations that were low cost and quick to construct. The decade also saw increased integration between gas and electricity supply companies. The later 1990s saw a continued increase in industry self-governance of common industry codes and processes, encouraged by regulators and Government.
- After 2000, the increasingly integrated nature of the electricity and gas sectors saw the merger of Offer and Ofgas into Ofgem, and also a merger between National Grid and Transco. New electricity trading arrangements were implemented to replace the 'pool' and introduce greater competition into electricity generation in England & Wales, and later into Scotland as well. The sale of a number of National Grid Gas Distribution companies took place in 2005.

The last decade has seen some major new trends: the introduction of Government policies to reduce carbon emissions, a gradual move back towards state involvement in the planning of major energy infrastructure, and more recently a gradual erosion of the dominance of the 'Big 6' energy companies alongside growth in independent generators and suppliers.

Since the creation of DECC in 2008, policies for decarbonisation have been rapidly developed and implemented. Many of these have been driven by successive environmental commitments by government, including the Climate Change Act 2008, the EU renewable energy and energy efficiency targets for 2020, and measures to reduce local air pollution such as the Large Combustion Plant Directive and Industrial Emissions Directive. The introduction of a raft of new policies to support low carbon generation and energy efficiency has effectively meant that Government has become more involved in determining the mix of new energy projects. Government has delegated new responsibilities to existing bodies in some cases, and in other cases established new organisations.

For example:

- Ofgem E-Serve (a division of Ofgem) is responsible for management of the renewable energy schemes like the Renewable Heat Incentive, Feed in Tariff, Renewables Obligation; fuel poverty schemes like the Warm Homes Discount; and energy efficiency schemes like the Carbon Emissions Reduction Target, Community Energy Saving Programme and the current Energy Company Obligation.
- The Environment Agency is responsible for administering the EU Emissions Trading Scheme and the Carbon Reduction Commitment
- The Low Carbon Contracts Company (LCCC) was created to manage payments under the Contract for Difference regime.

These have been overlaid on top of the legacy institutions and industry processes that existed before. Organisations have rarely been closed down, for example, the Non Fossil Purchasing Authority (NFPA) is still operating, despite the creation of other bodies like the LCCC that perform a very similar task.

Complexity as a Barrier to Entry and Growth

A new entrant into the energy industry is now faced with navigating a complex set of industry rules, covering codes, licences, standards of conduct, and legislation (UK and European) which apply not only to their own organisation but to others they interact with. This presents an 'entry cost' in that potential new entrants are obliged to understand and maintain knowledge and compliance of industry rules and regulations. Some potential new entrants may well not participate in the industry as a result, acting as a deterrent to competition and innovation. Such is the complexity that there are now companies offering 'Supplier in a Box™' solutions to help new entrants navigate the complex rules and regulations.⁷

In addition, even once companies have entered the sector, they may not have the capacity to fully engage in all aspects of policy and regulation. This creates a risk that industry policies, regulations and codes favour larger incumbents, since only they have the ability and capacity to input into their design.

An example of complexity is the system of industry codes that govern electricity and gas markets. Industry-wide rules or 'codes' are self-governed by industry groupings, which make recommendations to the regulator Ofgem. There are

currently 11 codes administered by six different organisations (National Grid, Energy Networks Association, Electralink, Gemserv, Elexon, Joint Office).

In its recent investigation of the energy market, the Competition and Markets Authority (CMA) expressed concern about the complexity and slow speed of change of industry codes as a potential barrier to new entrants. This has emerged as one of the CMA's 'theories of harm', and recommendations to realise improvements are expected in early 2016 when the CMA investigation is expected to conclude.

In part the complexity stems from the number of separate codes that market participants have to be familiar with, as well as the level of detail. Codes and licences have become increasingly more detailed and complex as the industry processes have evolved to recognise many changes in the sector e.g. renewables, smart meters, LNG, interconnectors, etc. For example the current supplier licence is now 465 pages long, and the gas industry's Uniform Network Code (UNC) is more than 1,600 pages long. Worse still, some of the codes oblige energy companies to comply with a large number of subsidiary documents, which in total amount to a staggering amount of regulation. For example, the Balancing and Settlement Code obliges signatories to comply with seven different subsidiary documents, some of which contain further codes of practice, in total amounting to over 120 separate documents and roughly 3,000 pages of documentation (all of which is legally binding). Across all the relevant codes a vertically integrated energy company could potentially be bound by around 10,000 pages of code regulations in total.⁸

This complexity is further increased by the fact that codes are governed by different organisations. As pointed out by the CMA, each code requires users to be familiar not only with the contents of the code, but also with the unique governance and modification arrangements for each code. Disparate governance means that there is no central point of information on all of the codes, and there is the potential for a lack of consistency and coordination. There have been instances where multiple change processes have been consulted on simultaneously across the various codes, and many companies have struggled to respond. Another problem can be that one change may require amendments to several different codes, which under the current system will be progressed by completely separate working groups.

Also, code changes can sometimes take significant time to accomplish. Even simple changes can take a long time: a proposed modification to change references in code documents from fax to email has already taken over 18 months.⁹ More complex or contentious changes take far longer, for example a change to introduce Half Hourly Settlement of meters will have taken six years from start to implementation.¹⁰ This inefficiency is driven by the sheer complexity of the codes system, compounded by conflicts of commercial interest by the industry participants, and risk aversion by those administering the codes. In order to try and speed up industry modification processes on contentious issues, Ofgem introduced a new 'Significant Code Review' process in 2010 (which itself took three years to establish). However, this has been less than successful with the longest decisions still taking several years.

Overall this represents an enormous regulatory burden, particularly on smaller players in the industry, and deflects resources from more productive or innovative activity. These examples demonstrate the need for change in how industry codes are governed.

Ofgem has taken steps to improve industry code processes, recently introducing a 'code of codes': a code of practice for code administrators to improve performance and enhance consistency. However, it remains to be seen whether this will realise improvements in a meaningful timescale. **A rationalisation of code bodies could potentially lead to more significant and rapid change (this is discussed further below).** By bringing code governance within a single organisation there may be potential to improve consistency and efficiency in how codes are managed.

2. Drivers for change

There are a number of drivers of change which together reinforce the need for changes to the energy institutional landscape:

Improving Efficiency, Reducing Cost

The principal driver of change is the need to increase efficiency and reduce cost to taxpayers and bill-payers. Under the current Comprehensive Spending Review, unprotected departments (such as DECC) have been asked to achieve savings in resource spending of between 25 and 40%. As shown in Figure 3 above, the vast majority of DECC's budget is spent on nuclear decommissioning and liabilities, where it may be difficult to find significant savings.¹¹ This is likely to further increase pressure on other areas of expenditure, such as administration of the electricity and gas industries, and could have major ramifications in terms of DECC's internal functions as well as for organisations under its control.

It has been several years since the last comprehensive review of the energy delivery landscape undertaken by DECC in 2011, which largely left the existing landscape unchanged.¹² The 2011 review took place in a very different environment where DECC was looking to build its delivery capacity, having received a relatively favourable outcome from the 2010 Spending Review, rather than looking to make significant cuts to its costs.

The current Spending Review, and the requirement it places upon DECC to think innovatively about how it achieves very demanding savings targets, offers an opportunity for a wide-ranging review of the energy institutional landscape. While the Spending Review requires a focus on DECC and the administrative bodies connected to it, it is important to think about how these bodies interact with the rest of the industry to ensure that reforms result in a more coherent delivery landscape. It is therefore important to consider not only policy development and delivery, but also regulation and planning and operation of the system (Section 3 below contains further discussion of each of these functions).

Another related driver of change is the Government's 'Red Tape Challenge', which aims to cut unnecessary regulation to reduce business costs. It involves staff from BIS and the Cabinet Office jointly working with Departments, regulators and business to identify opportunities for regulatory reform, improved enforcement and implementation practices, and savings to business. As part of

this, BIS is conducting a review specifically looking at the energy sector. Evidence gathering for the energy review was completed in September 2015 and will be followed by identification of the main issues and the options for reform. Although the 'Red Tape Challenge' tends to focus on individual regulations, it is also important that the deregulation agenda also considers regulatory infrastructure and institutions, since as discussed above this can also be a source of cost and complexity for businesses.

Innovation and Energy Transition

The energy system is gradually moving from a traditional system of large centralised generation (e.g. coal, gas and nuclear) to one with far more distributed generation (wind, solar, biomass, CHP). The demand side is also changing, with previously passive consumers becoming more active in the market through new technology such as smart meters. This transition is likely to result in innovative new business models emerging, for example involving distributed generation, energy storage, home energy solutions, and smart meters. Some of this innovation is coming from companies currently outside the energy sector, such as ICT and other technology firms. It has been argued that this type of innovation could reduce bills, reduce environmental impacts, and increase reliability and safety of the energy system.¹³

However, there is a risk that innovators and disruptive businesses are stifled by red tape under current arrangements. Ofgem has recognised this risk, and recently carried out a call for evidence on so-called 'Non Traditional Business Models' (NTBMs) in the energy sector.¹⁴ This recognised the potentially significant role that NTBMs could play in the transformation of the energy sector, as well as the risk that these companies may not fit into current regulatory arrangements. Respondents to the call for evidence suggested that the current regulatory regime is 'complex and prescriptive, stifles innovation, and is more suited to larger participants.' Furthermore, the review concluded that regulation needs to become more flexible in order to enable disruptive innovation by NTBMs. Similarly, research by Exeter's Energy Policy Group suggests that the trend towards decentralised energy and NTBMs implies a much greater importance for the system and market operator function, and a need for much greater flexibility and nimbleness.¹⁵ They go on to conclude: "*GB needs a governance system where the institutions are set up to best enable both the technical*

and functional needs of delivering an efficient system and to do so in a nimble, legitimate and credible manner. This is not currently the case for both requirements.”

Ensuring security of the energy system

Security of supply has historically not been a significant problem for the UK, with the UK identified as having one of the most secure energy systems in the world.¹⁶ However, electricity capacity margins have dropped significantly in recent years due to the retirement of some older coal, gas and nuclear power stations. Recent estimates show that the electricity capacity margin could drop to around 5% in the coming winter, after emergency measures are taken into account.¹⁷

While the Secretary of State for Energy is ultimately responsible for ensuring energy security of supply, management of this is delegated to a number of bodies (DECC, Ofgem and National Grid), potentially leading to uncertainty about roles and responsibilities. Many activities related to security of supply are currently performed by National Grid’s ‘System Operator’ function, but it is not ultimately responsible for security of supply, government policy aims, or managing distribution networks.* Moreover, National Grid is itself a private company whose primary business is in electricity and gas networks. It has also been argued that Ofgem, as an economic regulator, focuses heavily on short term efficiency and ‘finds it harder to think in terms of long term system change.’¹⁸

In addition, technology and market changes are likely to create new challenges for system operation and security of supply, for example due to:

- Greater intermittency in large scale generation (e.g. large scale wind);
- Growth in locally connected generation (e.g. solar) that is not dispatched centrally or ‘visible’ to the Transmission System Operator;
- More active customers managing their demand, including automatic control systems;
- Substantial and novel new demands for electricity, stemming from electrification of transport and heating;
- Greater use of distributed storage;

* National Grid manages the national gas transmission network, plus the electricity transmission network in England (but not Scotland). It manages 4 of the 8 gas distribution networks, but none of the 14 electricity distribution networks.

- Integration of information and data technologies, and the risk this creates in terms of cyber attacks.

Against this backdrop, there have been several calls for a single, independent body to take charge of managing security of supply. Professor Dieter Helm discussed the need for an independent Energy Agency to advise on security of supply as far back as 2001.¹⁹ With the growing realisation in recent years that capacity margins are tightening, there have been further suggestions along similar lines. For example, the Labour Green Energy Paper in 2013 suggested the creation of an 'Energy Security Board' combining system operation with infrastructure planning to ensure security of supply. A separate proposal was for the creation of an integrated 'Energy Security, Sustainability and Affordability Board' to oversee delivery of all of these policy aims.²⁰

The Institution of Engineering and Technology (IET) proposed the creation of a 'System Architect' to achieve more joined up thinking in how to achieve energy policy objectives.²¹ The IET argued that the current landscape lacks accountability for 'ensuring the functionality of the increasingly complex system'. It proposed the creation of a 'System Architect' organisation, accountable to Ministers, and responsible for ensuring an adequate power systems architecture. Two options were considered in the IET's report: under the first the System Architect would be responsible only for system wide issues (leaving subsidiary issues to code groups), and under the second the System Architect would integrate other functions such as management of industry codes into a single organisation.

It is clear that the concerns over security of supply also go to the highest levels of Government. The Treasury's newly created 'National Infrastructure Commission' has been given an explicit remit to consider how to optimise solutions to security of supply, and talks have recently been held at Downing Street concerning the security of supply situation.²²

Overall this demonstrates a growing concern about the ability of the current framework to meet the increasingly complex challenge of managing security of supply. **Below we consider the case for a new Independent System Operator to take responsibility for security of supply, system operation and planning.**

3. Proposals for reform

The previous sections set out the case for making changes to the energy institutional landscape. **We believe that the forthcoming Comprehensive Spending Review presents an opportunity for Government to announce a review of the energy institutional landscape.** This should aim to clarify responsibilities and accountability; reduce complexity and costs; improve flexibility and responsiveness to change; and encourage innovation and new entrants.

In making any changes to the institutional landscape, there are a number of issues and constraints to be considered if the benefits are to be maximised. These include:

- **Cost Reduction:** the costs of energy administration are currently either passed on to energy consumers or funded by taxpayers via DECC's departmental budget. There may be a temptation to reduce departmental spending by passing more costs onto suppliers. However it remains the case that however administration is funded, costs are eventually borne by final consumers/taxpayers, so savings are needed in both areas to benefit consumers. Equally, Government must balance the need to reduce cost against the need to ensure sufficient capability within the institutions that run the energy industry.
- **Transitional costs:** Whilst there is a strong case for change, it must be recognised that change itself could create short term costs and uncertainties, which will need to be managed carefully.
- **Energy security:** administration of the electricity and gas industries is complex. In making any change, it paramount that energy security and other energy policy objectives are not compromised. Conversely, as discussed above, reforms should seek to clarify institutional responsibilities with regard to how energy security is managed.
- **Future proofing:** the industry is expected to change significantly over coming years with the emergence of new technologies and business models, as well as changes in consumer behaviour (see Section 2). Rationalising the energy landscape should in principle increase flexibility and responsiveness to the future evolution of the energy industry, provided that this is designed in from the outset.

- **System integration:** power, heat and transportation systems have historically been viewed largely in isolation. However, the ongoing transformation of the energy system will result in greater integration between these systems, for example through the electrification of heating and transport, and through technologies such as ‘power to gas.’ Changes to the institutional landscape should be taken forward on a system wide basis, not for electricity and gas systems separately.

Proposals for reform

There are a number of options for reforming energy institutions going forward. Our proposal is to rationalise institutions around the following essential functions:

- **Strategy and policy development** – developing high level strategy, assessment of trade-offs, and development of policy;
- **Policy delivery and compliance** – delivering policies, including development of systems, administering taxes and payments, and ensuring compliance;
- **Regulation of markets and monopoly businesses** (e.g. networks) - developing detailed market rules and regulations and ensuring compliance;
- **Energy system planning and operation** - ensuring the right energy mix to ensure that decarbonisation and security of supply objectives are met, including both day to day operation and long term planning.

It is important for existing and new functions to be allocated to the most effective and efficient place, to ensure that bodies are not burdened with services that they are not best suited to deliver. As described above, incremental changes to the energy institutional landscape over the past 25 years have led to a lack of clarity on the responsibilities of individual bodies, as well as significant complexity and duplication. For example, whilst DECC's main activities are strategy and policy development, it has increasingly become involved in policy delivery, and energy system planning. Similarly, in addition to its core remit as an economic regulator, Ofgem has become increasingly involved in delivery of energy policies through its E-Serve subsidiary. There is anecdotal evidence of this leading to confusion amongst energy companies, who don't know when they are talking to a regulator, or not. National Grid is not only a network owner and operator, but also acts as the system operator and a delivery body and advisor on policies under Electricity Market Reform, again, potentially leading to confusion.

Our proposal is therefore for functions and responsibilities to be rationalised under the groupings identified above. Under this model, strategy and policy development would continue to be provided by DECC, with close ministerial oversight, but other delivery responsibilities would be transferred away to another body. This would allow DECC to focus on strategic and policy issues, whilst also removing duplication of resources with other bodies and reducing administrative costs. Similarly, we would propose that Ofgem should retain its core function as an economic regulator, but no longer perform other functions such as policy delivery or advising on security of supply.

Alongside this, we would propose that bodies which perform the other essential functions identified above are rationalised into the following three bodies (these are detailed further below):

- An **Energy Delivery Body**, assuming responsibility for the delivery and management (but not development) of energy policies.
- An **Industry Codes Body**, responsible for administering the eleven existing industry codes.
- An **Independent System Operator (ISO)**, combining system planning and operation functions, with electricity and gas market settlement activities.

Key responsibilities of the different entities would be as follows:

1 – Energy Delivery Body

Under the current system, ten separate bodies are involved in the delivery of energy policies such as renewable energy subsidies, energy efficiency and fuel poverty schemes, and policies related to security of supply. Our proposal would be for all of these functions to be brought into a single Energy Delivery Body (note: security of supply policies could alternatively be delivered by the Independent System Operator). The Delivery Body would be accountable to DECC, with a remit to manage systems related to each of these policies, carry out settlement and payment functions, and ensure compliance.

The Delivery Body could potentially be built around the existing Ofgem E-Serve organisation (which already delivers many policies). Functions carried out by other delivery bodies would be transferred, and these organisations disbanded (e.g. the Low Carbon Contracts Company, the Energy Settlements Company, and legacy organisations such as the Non Fossil Purchasing Authority and Green Deal Finance Company). Delivery activities currently carried out by DECC and

National Grid could also be transferred into the new organisation. Energy policy delivery activities could potentially also be transferred from other public bodies such as the Environment Agency (e.g. EU Emissions Trading Scheme, Carbon Reduction Commitment, and Climate Change Agreements), and Salix Finance (provides low cost loans for to public sector bodies for energy efficiency improvements).

We expect that this significant consolidation of activities would result in cost savings through efficiency and removal of duplication, as well as clearer accountability. It would also create a far clearer focus on delivery – as opposed to the current setup where, for example, Ofgem’s duties are split between regulation and delivering policy. The Delivery Body would also be able to provide a far clearer view of the totality of expenditure related to government policies. As identified in our previous report, there has been a lack of clarity and scrutiny over consumer funded policies to date,²³ and this is part is due to the complexity of the current delivery model.

The possibility of creating a DECC Delivery Agency was previously considered as part of DECC’s review of the energy delivery landscape in 2011. At the time it was dismissed due to a perceived lack of critical mass of delivery functions to consolidate, although the review did raise questions over the effectiveness of the relationship between DECC and Ofgem E-Serve. It is clear from our research that there is now a very large amount of delivery activity taking place across DECC, Ofgem and other organisations; hence there is a strong case for revisiting the concept of a Delivery Body.

2 – Industry Codes Body

As discussed in Sections 1 and 2 above, the management of industry codes has become excessively complex, giving rise to considerable cost to industry participants, and well as the potential for inconsistency in approaches.

Our proposal would be for management of industry codes to be consolidated into a single entity (or at least into fewer entities than at present), based on the existing code functions of National Grid, Energy Networks Association, Electralink, Gemserv, Elexon, Joint Office. The new body would be regulated by Ofgem, and code decisions would still be taken by Ofgem, with the CMA as an appeal body.

This would provide opportunities for code and process reform and a stronger ability for Ofgem to drive necessary industry change. It should also reduce complexity, conflict of interest, risk aversion, and cost arising from the various code administrators and processes. It would appear that Ofgem agrees with the thrust of this recommendation: in its recent response to the CMA enquiry, Ofgem proposed the creation of a single body to manage all the codes governing retail markets (although stopped short of rationalising all codes into a single body).²⁴

3 – Independent System Operator

As outlined in Section 2, responsibility for managing security of supply and system operation is currently split between a number of different organisations, centred around National Grid. Under the current system, National Grid has a range of responsibilities, as the overall system operator, an owner of electricity and gas transmission networks, the delivery body for various government policies (such as the Capacity Mechanism), and the owner of unregulated businesses in power interconnectors. Alongside this there are two other Transmission Owners in Scotland (Scottish Power and Scottish Hydro Electric, a subsidiary of Scottish and Southern Energy), and DECC and Ofgem also have roles in relation to security of supply.

An extensive review by Ofgem into the current approach to system planning and operation identified a number of significant shortcomings:²⁵

- **Misaligned incentives**, in particular the review highlighted the mixed incentives associated with National Grid being both a Transmission Owner and System Operator;
- A potential **lack of coordination** between the three Transmission Owners, and other parties (such as owners of interconnectors and offshore wind);
- Potential **conflicts of interest** within National Grid due to its multiple roles. Concern over potential conflicts of interest has been raised on several occasions, for example during a Government inquiry concerning implementation of Electricity Market Reform.²⁶ National Grid has taken steps to manage this, and Government and its advisors have said to date that these conflicts of interest are manageable and unlikely to be acted upon.²⁷

As discussed in Section 2, there have also been growing calls for a single body to take control, in particular due to the tightening capacity margins and new

challenges to security of supply as we transform towards a low carbon energy system.

The Ofgem review considered a number of potential reforms to the current approach, including incremental changes to the status quo, creating an Integrated Transmission System Operator for all of Great Britain (National Grid does not currently own electricity transmission in Scotland), or the creation of an **Independent System Operator (ISO)**. A growing number of countries have an ISO which runs and plans the system, but does not own significant infrastructure assets (unlike National Grid). ISOs are common in countries at the forefront of energy market liberalisation such as the US and Canada.²⁸ In the US there are multiple ISOs covering individual states or groups of states, of which the largest (PJM) covers 13 states. PJM has been extremely successful in integrating Demand Side Response into the way it manages the system, which has led to some significant savings: a reduction in wholesale electricity prices of 5-8%, and a reduction in peak time prices of 90%.²⁹

The Ofgem review concluded that the creation of an ISO would resolve the majority of issues with the current approach to system planning and operation, and although this model would present some issues, they can be resolved if appropriate rules are put in place. Overall, the review recommended that the ISO model should be considered in more detail.

In practice, in the context of Great Britain, this would involve breaking the System Operator function out of National Grid into a separate entity, and combining this with the settlement activities currently performed by Xoserve and Elexon. The ISO would be responsible for short term system operation, offering connection agreements, directing investment in transmission infrastructure (potentially on a competitive basis), liaising with system operators in Europe, and setting network charges.

As in the US examples, the ISO could also lead on the delivery of policies related to ensuring security of supply, including the Capacity Mechanism and Demand Side Response. It would also take on the lead role in advising Government on security of supply and long term system planning, which is currently performed by both National Grid and Ofgem. Given the developments in smart energy, and the intrinsic link between this and security of supply in the future, the ISO could also optionally take on smart metering communication activity performed by the Data Communications Company. Additionally, given the trends identified in Section 2

towards decentralised generation and more active demand, there may be a need for the system operator to have a remit to consider distribution level system issues, or alternatively to achieve this through greater coordination with Distribution Network Operators.

Experience from other countries suggests that it is best if an ISO is established as a not-for-profit entity.³⁰ The ISO would need very clear responsibilities and performance criteria, and the interfaces with National Grid and the other Transmission Owners would need careful thought.

Overall there appear to be potential benefits from moving to an ISO model, and we recommend that it is considered further by Government.

Conclusions and Next Steps

This paper suggests a set of reforms to the institutions which govern electricity and gas industries in Great Britain. The proposed reforms aim to streamline responsibilities for industry administration into fewer bodies with more clearly defined roles and responsibilities. They also provide a platform to enable future innovation benefits. This is just one model to illustrate some of the improvement opportunities available, and many other variations are possible.

In order to take forward any of the proposed changes, a detailed assessment of costs, benefits and risks will need to be undertaken. The changes are likely to require legislative change, as some of the functions and organisations in question are defined in statute. Particular care will be needed to ensure that existing policy and regulatory certainty is not undermined. However, we expect that the proposed rationalisation would result in significant savings over the medium term, which should offset the transition costs in the short term. Better administration would also be expected to result in an improvement in market competition, as well as wider efficiency benefits.

Consideration will need to be given to the structure, ownership and governance of each of the new bodies described above. Each of the bodies could be established as a standalone organisation (a public body ownership, a not-for-profit, or privately owned company). It may be beneficial to outsource more functions of these bodies to the private sector, particularly in the case of the Energy Delivery Body and Industry Codes Body. This approach has already been taken in some areas, for example the outsourcing of code governance to Gemserv through a competitive tender process.

Appendix A: Estimates of energy industry administration costs

Table 1 identifies the costs of the organisations identified in Figure 1 as being involved in the energy administration landscape. Note that due to differences in cost reporting between organisations, it has not been possible to estimate the costs of all organisations on a consistent basis (i.e. they relate to different years and price bases).

The following organisations also have a role in the administration of the energy industry, but were excluded from the cost analysis below:

Central Government	Agencies/Other	Research & Development
<ul style="list-style-type: none"> • HM Treasury • Department for Business, Innovation and Skills • Department for Communities and Local Government • Department for Environment, Food and Rural Affairs 	<ul style="list-style-type: none"> • Competition and Markets Authority • Fuel Poverty Advisory Group • Citizens Advice / Consumer Futures • Oil and Gas Authority • Nuclear Decommissioning Authority • Coal Authority • Committee on Radioactive Waste Management • National Infrastructure Commission • UK Atomic Energy Authority • Office for Nuclear Regulation 	<ul style="list-style-type: none"> • Research Councils (ESRC, EPSRC, BBSRC, NERC) • Technology Strategy Board • Technology Catapults (e.g. Offshore Renewable Energy, Energy Systems) • Office for Low Emission Vehicles • Low Carbon Innovation Coordination Group • Energy Technologies Institute • Energy Research Partnership • Innovate UK • Wave Hub
<p>Devolved Administrations</p> <ul style="list-style-type: none"> • Scottish Government • Scottish Enterprise • Northern Ireland Executive, Department of Enterprise, Trade and Investment • Welsh Government 		

Table 1: Summary of Energy Institutions (with identifiable administrative/delivery costs)

Organisation	Role	Funding Mechanism	Cost (£m)	Source
DECC	Sets policy framework for energy and climate change. Delivers a number of policies directly.	General taxation	n/a	See Figure 3
Ofgem	Energy sector regulator in line with statutory duties (excludes Ofgem E-Serve activities)	Consumer Levies	51	Ofgem annual report 2013/14
National Grid System Operator	National electricity and gas system operator. Market operator. Electricity Market Reform (EMR) delivery body. Administers Capacity Market, Grid Code, CUSC. Procures Strategic Balancing Reserve (SBR).	Consumers via Price control	120*	National Grid RIIO-T1 Business Plan
Policy delivery and compliance bodies				
Ofgem E-Serve	Delivers Government's environmental and social schemes (RHI, RO, FITs, ECO, Warm Houses Discount, GER). Monitors biomass emissions.	DECC and consumer levies	32	Ofgem annual report 2013/14
Gemserv	Code administration, MCS certification, runs Gas Forum; also provides other services to energy sector clients	DECC and industry participants	12	Gemserv annual report
Electricity Settlements Company	Managing Capacity Market settlements process	Consumer levies	4	DECC consultation on operational cost levies

* Electricity System Operator Opex costs (roughly £80m per year on average 2015-20) + Gas System Operator Opex costs (roughly £35m per year 2015-20), rounded to nearest £10m.

Organisation	Role	Funding Mechanism	Cost (£m)	Source
Low Carbon Contracts Company	Managing Contracts for Difference (CfDs)	Consumer levies	12	DECC consultation on operational cost levies
Carbon Trust	Assists organisations reduce energy use and become more resource efficient	Customer charges	46	Annual report 2014
Climate Change Committee	Advises UK government and devolved administrations on tackling and adapting to climate change	General taxation	4	CCC annual report 2014/15
Smart Energy GB	Promoting consumer engagement around Smart Meters	Consumer levies	20	Annual Accounts 2014, Smart Energy GB website
Green Deal Oversight and Registration Body	Manages register of authorised Green Deal participants, and monitors participants' compliance against Code of Practice	General taxation	2	Annual report 2012/13
Green Deal Finance Company	Green Deal loan provider	General taxation	7	Annual report, December 2014
Non Fossil Purchasing Authority	Administers legacy generation contracts under the Non Fossil Fuel Obligation.	General taxation	1	Annual report, December 2014
System planning and operation bodies				
Xoserve	Gas balancing and settlements agent. UNC delivery body.	Consumers via Price Control	30	Xoserve 'run the business' budget quoted at CMA hearing
Elexon	Electricity balancing and settlements agent. Administers BSC code.	Consumers via Price Control	37	Elexon annual report 2013/14

Organisation	Role	Funding Mechanism	Cost (£m)	Source
Electralink	Delivery for electricity Data Transfer Service (DTS).	Industry participants	2	Electralink annual report 2013
Other (bodies attached to other Government departments, or not attached to single major body)				
Smart Metering DCC	Providing central communications hub for Smart Meter roll out	Consumers via Price control	103	DCC indicative budgets
The Crown Estate	Managers of UK seabed. Lease seabed to offshore energy projects/ interconnectors	Industry participants	3	Crown Estate Annual report 2015
Environment Agency	Implements EU ETS, CRC Energy Efficiency Scheme, Climate Change Agreements (CCAs)	General taxation	6	EA annual report 2013/14 (assume 0.5% of overall EA expenditure).
Green Investment Bank	Investment Bank devoted to greening the economy, invests in innovative, environmentally-friendly projects for which there is a lack of support from private markets	Public / Private	20	Annual report 2014, Operating Expenses
Energy Technologies Institute (ETI)	Public-private partnership between energy/engineering firms to secure, acts as conduit between academia, industry and government to help deliver emissions reductions targets	Public / Private	4	Annual report, December 2014
Salix Finance	Provides low-cost loans to public bodies for energy efficiency improvements	General taxation	2	Annual report, March 2015
Energy Savings Trust	Promotes energy efficiency, energy conservation and the sustainable use of energy	Customer charges	5	Annual report, March 2014
Total			£523m (not including DECC costs)	

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5 | Ibid.

6 | Helm, D. (2014) The Return of the CEBG: Britain's Central Buyer Model

7 | For example <http://www.utiligroup.com/new-entrants/>

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