

Delivering affordable energy and clean growth



The opportunity

During the last decade, energy policy in the UK was often discussed through the framework of a ‘trilemma’ – the need simultaneously to find policies that would contribute to meeting climate change targets, guaranteeing security of energy supply and minimising energy costs. Nearly 10 years on from the Climate Change Act, that framework requires updating.

Security of supply is, of course, foundational – and the lack of a long-term energy strategy over previous decades saw the planned closure of energy generating capacity without its adequate replacement being secured. Much progress has been made through the successful launch and operation of Capacity Auctions, as well as Contracts for Difference bringing forward substantial renewable capacity, and more recently the decision to proceed with Hinkley Point C, the first new nuclear power station in a generation.

On climate change, the settled policy position is reflected in the Government’s commitment to meeting its legally-binding targets under the Climate Change Act. How we will continue to meet our legal obligations will be set out, as required, in the forthcoming Emissions Reduction Plan and we have an exemplary record of meeting our obligations.

This means that in the years ahead two important areas of energy policy require a higher priority: the affordability of energy for

households and businesses, and securing the industrial opportunities for the UK economy of energy innovation.

The Government has had a prominent role in energy markets historically, and in recent years it has introduced a range of new levies to fund the deployment of renewables. Some types of energy, such as nuclear power, require upfront investments that are too large for the market alone to deliver. The Government also has a role to play in coordinating markets to enable major changes to our energy infrastructure – such as the potential combination of electric vehicles and smart grids. It can fund basic energy research which is too long-term for the market to deliver, and in promoting the early stage commercialisation of new discoveries that might otherwise be lost to competitors. Such research investment will be crucial to seizing the opportunities that the global shift towards a low carbon economy will present over the coming decades.

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



The challenge

There are three major challenges for energy policy that our industrial strategy will address.

First, to ensure that the shift to a low carbon economy is done in a way that minimises the cost to UK businesses, taxpayers and consumers.

Second, for the Government – working with the energy industries and regulators – to manage the changes to energy networks required in the transition to a low carbon economy. For example, the roll-out of electric vehicles may require important changes to the way our electricity grid works, including physical upgrades to the infrastructure and new frameworks for charging customers as they either discharge stored electricity into the grid at

peak times, or draw from it at others. Ensuring that our grid is smart and resilient to new demands – and new sources of supply – will be important for energy security, cost and industrial opportunities.

Third, to make sure that the UK capitalises on its strengths in the energy industries to win a substantial share of global markets. These include in manufacturing and services around clean energy, but also making the most of our strengths in areas in which Britain has a lead, such as nuclear decommissioning and offshore oil and gas, including in clusters of excellence such as Aberdeen and other industrial hubs on the east coast⁹⁶. This requires us to be strategic in how we invest in innovation, and in the design of the regulatory frameworks that can influence investment.

Our approach

Affordable energy

The transition to low-carbon – and the securing of our energy supplies – must be done in a way which minimises the cost to business and domestic consumers.

Although energy costs on average account for three per cent of UK business expenditure, the impact is uneven. There are 15 sectors in the economy – including steel, chemicals, glassmaking and ceramics – where energy costs represent more than 10 per cent of total business expenditure⁹⁷.

Industrial gas costs are internationally competitive but electricity costs have moved out of line with other European countries⁹⁸. During the last five years action has been taken to reduce the impact of policies on the electricity bills of eligible energy-intensive industries up to around 80 per cent⁹⁹. This mitigation – including compensation worth around £260 million for 2016 – is paid either by other consumers or the taxpayer¹⁰⁰. The difference between UK industrial electricity prices and those of other European countries is now mainly due to our higher wholesale prices and network costs¹⁰¹. The industrial strategy provides an opportunity to explore ways of reducing overall costs in a sustainable way.

To this end, the Government will set out in 2017 a long-term roadmap to minimise business energy costs. To inform this, the Government will commission a review of the opportunities to reduce the cost of achieving our decarbonisation goals in the power and industrial sectors. The review will cover how best to support greater energy efficiency, the scope to use existing instruments to support further reductions in the cost of offshore wind once current commitments have been delivered, and how the Government can best work with

the regulator Ofgem to ensure markets and networks operate as efficiently as possible in a low carbon system. We will also review the opportunities for growth from the energy sector and the opportunities for the UK.

The industrial strategy will also consider how energy costs can be contained or reduced by increasing resource and energy productivity. Increasing the efficiency of material use across the whole supply chain can deliver huge cost savings and improve the productivity of UK businesses. The Government will work with stakeholders to explore opportunities to reduce raw material demand and waste in our energy and resource systems, and to promote well-functioning markets for secondary materials, and new disruptive business models that challenge inefficient practice. This work will be supported by the Government's 25 Year Environment Plan which will set out a long term vision for delivering a more resource efficient and resilient economy.

Subsidies and other forms of state support have played an important role in creating markets for new technologies and driving down their costs. But it is important that we move steadily to an operating model in which competitive markets deliver the energy on which our country depends.

Changes to energy infrastructure

To address the challenges the low carbon transition will create for our energy networks we are already taking steps to be one of the most advanced economies for mainstream smart grids.

The Smart Meter programme will offer interactive smart meters to every household and small business site in Great Britain by the end of 2020, and the Smart Systems Call for Evidence¹⁰² – recently launched with Ofgem – will report in 2017 on further steps required to

take advantage of the opportunities for a more responsive network. This offers the further prize of bringing prices down by making more flexible alignment of demand and supply – meaning less need for costly permanent stand-by capacity.

The Office for Low Emission Vehicles is leading work across the Government to improve our understanding of the system impacts and opportunities of the shift to electric vehicles. We are also exploring the potential opportunities offered by hydrogen fuel technologies across multiple applications, including heating, energy storage and transportation.

Harnessing the industrial opportunities from new energy technologies

Britain is well-placed to benefit from the transition to a low-carbon economy. In many parts of the energy sector – from

decommissioning to new build – the UK has a depth of expertise and experience that present a major opportunity for domestic employment and export earnings.

The role of the industrial strategy is to make the connections between public policy decisions and industrial opportunity so that the full value can be obtained.

In nuclear, the decision to proceed with the first new nuclear power station in a generation at Hinkley Point is accompanied by a commitment to develop a strong UK supply chain to support the sector, with EDF expecting over 60 per cent of the project’s construction value to be placed with UK companies. In turn investment in nuclear skills – at college and university level – is upgrading both the domestic capacity to provide the labour required and the level of skills and income in the local workforce.



In renewable technologies, such as offshore wind, the long-term certainty of the policy framework has led to important new investments¹⁰³. Siemens' turbine-blade plant opened in Hull in December, creating a thousand new jobs and sustaining a supply chain of smaller businesses servicing the industry.

The industrial strategy – and the combination of the policy portfolio of the former energy and climate change ministry with the business and industrial strategy brief, allows a more explicit strategic set of connections to be made. An example of this is the strong synergy

between our strengths in the automotive sector, in clean energy, and in research and development. This paper commits us to a programme of research and innovation in energy storage and other smart technologies which aligns with the work underway on designing a smart grid and the roll-out of public charging points for electric vehicles, and smart meters at homes and commercial premises. Bringing together these separate strands shows how we can position the UK to benefit from technological transformation that will be in demand across the world.



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Actions under way:

- We have acted to **limit policy costs on energy bills** and have reduced such costs for the most energy intensive industries by up to around 80 per cent.
- We have doubled support for **energy innovation**, and are already investing £600 million in support to accelerate the transition to ultra low emission vehicles. Additional funding of £270 million was announced in the 2016 Autumn Statement.
- We are requiring energy suppliers to offer interactive **smart meters** to every household and small business site in Great Britain by the end of 2020.

New commitments:

- The Government will set out in 2017 a **long-term road map to minimise business energy costs**.
- To inform this, the Government will commission **a review of the opportunities to reduce the cost of achieving our decarbonisation goals in the power and industrial sectors**. The review will cover how best to support greater energy efficiency, the scope to use existing instruments to support further reductions in the cost of offshore wind once current commitments have been delivered, and how the Government can best work with Ofgem to ensure markets and networks operate as efficiently as possible in a low carbon system. We will also review the opportunities for growth from the energy sector and the opportunities for the UK.
- We will publish our **Emissions Reduction Plan** during 2017, providing long-term certainty for investors.
- As set out above we will review the case for a **new research institution** to act as a focal point for work on battery technology, energy storage and grid technology, reporting in early 2017.

Questions for consultation

27. What are the most important steps the Government should take to limit energy costs over the long term?
28. How can we move towards a position in which energy is supplied by competitive markets without the requirement for ongoing subsidy?
29. How can the Government, business and researchers work together to develop the competitive opportunities from innovation in energy and our existing industrial strengths?
30. How can the Government support businesses in realising cost savings through greater resource and energy efficiency?