Energy in the UK

Delivering jobs, growth and innovation through sustainable investment

2017
Foreword

Our energy system is changing. More and more of our energy is being located closer to our homes and businesses, which themselves are becoming increasingly digitally connected. And the way we consume our energy, and what energy we consume, will almost certainly change in the future.

On 23rd June 2016, the UK elected to leave the European Union (EU), a historic moment that will define 2016. Since then, the UK Government has put forward an Industrial Strategy to ensure the UK’s economy delivers greater levels of productivity across the country, supporting continued economic growth. Crucial to this is the consideration of how we power our industries going forward, to ensure they remain competitive, and how the energy sector can continue to deliver the future skills and training needed in an ever-changing energy system.

A major contributor to the UK

In 2016 the UK energy sector delivered a significant contribution to the economy: investing £11.9 billion, supporting 730,000 jobs across the UK and contributing £5.9 billion in tax.

At the same time customers benefited from a market that has never been so competitive. In 2016 we had nearly five million customers switch their energy company – a third of these for the first time - which helped small and mid-tier energy companies reach a market share of nearly 20%. This has been aided by the launch of the Energy Switch Guarantee, a commitment to ensure switching is simple, speedy and safe. And with the recent Contracts for Difference auction producing strike prices for offshore wind as low as £57.50/MWh, it is clear that competition is also driving down the costs of renewable technologies.

Delivering the Industrial Strategy

An Industrial Strategy must build upon the success of the ongoing transition to a greener economy. Supporting locally focussed energy schemes, targeting employment across the UK, and ensuring the skills of today are fit for the future.

Low carbon power is no longer something of the future: it is delivering for now. If the Industrial Strategy is going to support further decarbonisation of our economy, we will need a joined-up approach with the power, transport and heat industries: the latter two of these requiring significant decarbonisation improvements if the UK is to meet its carbon targets.

Providing for the future

The success achieved so far should not shadow the challenges going forward. Brexit must be managed appropriately and we must ensure that we can continue to both import and export power and gas across borders efficiently. Our policies and infrastructure must support the rise in both electric vehicles and energy storage, which have the potential to revolutionise the way we manage our energy network and meet our customers’ needs.

A further challenge is how we ensure energy bills are affordable for customers, and that the move towards greater levels of technology integration does not leave those most vulnerable behind. In real terms, energy bills in 2016 were lower compared to 2008, which was largely down to improvements in energy efficiency. This demonstrates and further emphasises the need to adopt a national energy efficiency programme that targets the most vulnerable in our society: to help them manage their energy usage and keep their bills down.
The future prize
Meeting these challenges will not be easy. It will require policy visibility and leadership from Government, with the right flexibility in regulation to promote competition and innovation within a more dynamic energy system.

The outcome will be a consumer-focused energy sector that continues to contribute billions of pounds to the UK economy by providing employment, skills and investment. It will deliver decarbonisation solutions to make sure we meet out carbon commitments and at the same time will ensure the safe, secure and reliable supply of power to our homes and businesses in the most affordable way.

I am proud of what the energy sector has achieved: greater engagement with the public, significant action on decarbonisation and record levels of competition in the sector. While there are challenges going forward, it is an exciting time to be in the industry and being part of the low carbon transition is something the whole industry is proud to be involved in.

Lawrence Slade
Chief Executive

About Energy UK
Energy UK represents the energy industry - from established gas and electricity suppliers and generators, to new and innovative market entrants which now make up over half of our membership. Our 90-plus members produce energy from renewable sources, as well as nuclear, gas and coal, and power 27 million homes and every business in Britain. Energy UK is proud to be accredited with the Investors in People Standard and is a London Living Wage Employer.
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Our contribution

£24bn in economic value created

£11.9bn of investment

730,000 jobs supported across the UK

£5.9bn tax contribution

53% of power generation from low carbon sources

54 active domestic energy suppliers

2016

2016

2015/16

April-June 2017

March 2017
Energy is fundamental to the success of the UK's economy and a key determinant of our standards of living. We depend on a reliable and uninterrupted supply of energy at the flick of a switch, to supply our homes and businesses with electricity and heat, ensuring we stay comfortable, productive and healthy.

The energy sector, as a result, is a large contributor to the UK economy. In 2016 the sector created £24bn in gross value added (GVA). In addition to the value added created, the energy sector also delivered £88bn in economic activity through its supply chains, and from the purchasing of goods and services from other sectors to support energy sector activities.

As well as supporting economic output, the sector also contributes to the fiscal budget of the Government, and in 2015/16 paid a total of £5.9bn in taxes to Her Majesty’s Treasury (HMT), including £1bn in corporation tax, £1.4bn in VAT and £1.8bn in environmental taxes.

These environmental taxes support the UK’s move towards a greener economy. They are used to encourage the transition from fossil fuels to lower carbon energy sources, as well as incentivising the take-up of energy efficiency measures to reduce energy demand.

The two main environmental taxes in the UK which focus on low carbon measures are the Climate Change Levy (CCL) and the Carbon Price Floor (CPF).

Whilst contributing significantly to the economy directly through taxes and economic output, the energy industry also supports the wider economy through the supply of energy as an input to other processes.

In 2016, the sector delivered £88bn in economic activity...
Productivity is an important source for economic growth and a key focus of the Government’s Industrial Strategy. The energy sector continues to be one of the most productive.

In 2016, employees within the sector contributed the equivalent of £162,000 per employee, which was higher than the construction, manufacturing, transport and agriculture sectors, to name a few.

**The Climate Change Levy**

A consumer-focus tax designed to encourage businesses to improve energy efficiency or source the energy consumed from low carbon sources. It is applied to taxable commodities such as coal, gas and electricity.

**The Carbon Price Floor**

A UK Government policy which was introduced in April 2013. It taxes fossil fuels used to generate electricity. It comprises the price of CO2 from the EU Emissions Trading System (EU ETS) and a Carbon Price Support (CPS) tax rate per tonne CO2 (tCO2), which is the UK-only additional element (but does not apply to Northern Ireland). The CPS tax rate is currently capped at a maximum of £18 per tCO2, and it was announced in Budget 2016 that this cap will be in place until 2020-21.
Investing for the future

In 2016, the value of investments made by the UK energy sector was £11.9bn, meaning that almost 1 in every £16 invested in the UK was in the energy sector.

Ongoing investment in the sector has enabled the UK to generate electricity using more efficient power plants, low carbon technologies, and innovative solutions to reducing costs throughout the lifecycle of a project. The National Infrastructure and Construction (NIC) pipeline looks at planned investment in infrastructure across the public and private sectors. The latest report in 2016 lists the energy sector in second place in terms of the number of projects of any sector, with 96 projects worth £79 billion.

Supporting an industrial strategy

The UK energy sector was highlighted by the Government as key to the success of the UK’s Industrial Strategy, ensuring continued affordability for households and businesses and securing the industrial opportunities of energy innovation.

Energy is a key input into the production of goods and services in a modern, growing economy. With worldwide recognition for action on climate change and the requirement to decarbonise, the transition to a low carbon heat, power and transport system will become increasingly significant for UK competitiveness by ensuring costs are minimised, whilst opportunities are exploited. It is important that the increasing interdependence of these sectors is understood and a whole system approach taken towards decarbonisation. Energy UK has already begun to engage and collaborate with industry players within the transport and heat sectors, as well as with other trade associations to support the uptake of ultra-low emission vehicles and the decarbonisation of heat.

The aim of our future energy system will be to deliver a resilient and secure system which achieves decarbonisation of electricity at the lowest cost to consumers, whilst at the same time achieving wider economic benefits such as improved productivity, living standards, supply chain growth, innovation, skills and training. This will support the Government achieving a modern and successful Industrial Strategy. An Industrial Strategy must build on the UK’s strengths, whilst providing a predictable and long term policy framework to provide the confidence and strategy necessary for investment in infrastructure and the development of robust and efficient supply chains.
Case Study: Investment - An integrated approach on the South Coast

As part of its Future Role of the System Operator programme, National Grid is working closely with Distribution Network Operators (DNOs) to determine how best to optimise investment and operation across transmission and distribution electricity networks. One trial project is a regional programme with UK Power Networks area to enable additional network capacity for Distributed Energy Resources (DER) along the South Coast. This is a complex area of the GB network with transmission connected generation and interconnectors to Europe via a long double circuit across Sussex and then subsea. On the local distribution network there is around 1500MW of DER following the recent upsurge of solar projects.

National Grid is working closely with UK Power Networks (UKPN), including more granular planning and operation of the local networks, ensuring that new generation is robust and uses protection systems to reduce the risk of trip, and an extensive Active Network Management (ANM) scheme so that DER can be controlled and managed in time of insufficient network capacity. This approach avoids unnecessary investment in new transmission network assets.

For DER project developers on the South Coast, the approach will provide a simpler single stage connection process. In addition, DER will have the opportunity to participate in a commercial service to provide curtailment services when local transmission capacity is limited. In return, DER customers would agree to be part of the ANM scheme so that the distributed generation status is visible and can be controlled.

Source: National Grid
A significant employer

The energy sector has an important presence across all regions of the UK. In 2016, the sector directly employed 148,000 workers and supported a further 582,000 through supply chain, consulting and other energy related activities. It meant that the energy sector supported around 1 in 48 jobs across the UK.

Below: Map of energy employment across the UK

Source: ONS, figures do not sum to 148,000 due to rounding.
Case study: STEM in Energy – Project Reinvent - 2016

Project Reinvent Challenge invited pupils across Yorkshire, aged 11-19 to use their learning and knowledge in STEM subjects (science, technology, engineering and maths) to develop a workable idea to help improve life in their community. The competition was open to all schools based within a 30-mile radius of Drax Power Station in North Yorkshire.

The objective was for a group of students to deliver an innovative idea that would have a demonstrable benefit to their local community and meet the challenges of our changing world. Students were asked to work in teams of up to six members, with individual responsibilities including project director, project manager, designer, research manager and finance director. Over 1,300 students across 50 schools engaged with the project. The finalists were selected at an annual event billed as the biggest celebration of STEM education. Teams then had to present their ideas to a panel of judges at the grand final held in the Visitor Centre at Drax Power Station.

A team of five Year 7 pupils from All Saints School in York impressed judges with their entry ‘Dynamo’, which plans to create a free cycle hub providing 40 bikes for teachers, pupils and visitors to travel the half mile between the school’s two campuses. Each bike will be fitted with a ‘bottle’ dynamo which allows energy generated from cycling to be stored. The dynamos are then hooked up to transfer the stored energy to batteries which will be connected into the school’s electricity distribution network.

Drax awarded the winning idea £6,000 to help it get started, with the remaining prize fund being split between the runners up. The runners-up ideas were a ‘Learning Garden’ based around science, designs for ‘3 Peaks’, a new climbing wall and a ‘Life Skills Centre’ to support STEM knowledge in adult learning. The Project Reinvent Challenge was supported by the North Yorkshire Business and Education Partnership (NYBEP), a social enterprise based in York that specialises in engaging employers with education to help young people prepare for the workplace.

Source: DRAX

Energy initiatives

Young Energy Professionals (YEP)

Energy UK's YEP Forum is a network made up of over 1,400 energy professionals from over 270 companies that come together to collaborate on ideas, develop relationships and recognise successes.

It is a prime example of a network bringing together both those considering a career in energy with those already working in industry. This provides the opportunities to share in each other’s experiences and learn from the very best energy professionals. The YEP Forum hosts a series of events throughout the year ranging from panel Q&As to debates on topics from the Industrial Strategy to technology and innovation in energy.

YEPs also visit some of the UK’s major power stations and energy centres around the country as well as attend the Forum’s annual awards ceremony, which recognises and rewards those YEPs who have produced outstanding work which has contributed both to furthering the success of their companies and their own careers. The YEP Forum works closely with fellow energy industry networks, diversity forums and skills academies to ensure the next generation of energy industry professionals has a solid foundation to build their careers on. This is why the YEP Forum has created a guide to jobs in energy, providing a snapshot of the diversity of jobs available in the industry today.
Powering our homes and businesses

Going green

In 2008 the Government committed the UK to pursuing a low carbon economy by passing the Climate Change Act 2008. The Act sets out the overall target of an 80% reduction in greenhouse gas emissions - by 2050 - on 1990 levels, with intermediate five-year carbon budgets agreed in order to ensure the UK remains on the path to achieving its commitment.

To support this, the UK power industry has gone through significant changes in recent years. In 2008, when the Climate Change Act 2008 was first signed, low carbon generation accounted for only 19% of total power production – most of this was nuclear. Renewables accounted for only 6%, with no power being generated from offshore wind technology.

In 2008, when the Climate Change Act was signed, low carbon generation accounted for only 19% of total power production...
The pace of development of renewable generation increased throughout 2016, resulting in a significant increase in low carbon plant operating on the system in 2017.

Between April–June 2017, low carbon generation accounted for a record 53% of total power generation. Renewables by themselves accounted for 30%, which was an increase of 5% - or 2.7TWh - compared to the same period in 2016: equivalent to powering an extra 688,000 homes for a year.

53% low carbon power generation

Underlying the success of low carbon power generation is the scale of renewables deployment the industry has achieved and the falling costs for particular technologies to achieve this. Solar capacity has increased by 28,000% since 2010, to reach 12.5GW in August 2017, having deployed 1GW of capacity in the 12 months to August 2017. Latest figures for wind generation show capacity at the end of 2016 of 16.2GW: an increase of 13% (1.9GW) on 20159. Energy UK is clear that we are no longer in a period of transition regarding deployment of low carbon power on the Grid; with over half of all the UK’s power needs coming from these sources it really is business as usual.

The 2017 Contracts for Difference auction results

The result of the second round Contracts for Difference (CFD) auction announced on September 11th 2017 revealed that 11 renewable projects are to receive a CFD contract across the 2021/22 and 2022/23 delivery years. These projects will have a total capacity of 3.35GW - over 1GW more than in the previous auction in 2015 – which included three offshore wind projects, six Advanced Conversion Technologies (ACT) and two Biomass Combined Heat and Power (CHP).

The falling costs of these technologies was the biggest headline grabber. Offshore wind projects cleared at a price of £57.50/MWh, a 50% reduction compared to the 2015 auction. ACT also saw a reduction of 35%. These results highlight the success of these technologies in delivering cost reductions through competition, technology progress and a commitment to low cost renewable generation by industry and government policy.
Statoil, under its Hywind brand, has developed the world's first floating offshore wind farm in Buchan Deep, north-east Scotland.

The 30MW wind turbine farm takes advantage of the technology’s ability to deploy at much greater water depths – potentially over 500 metres - compared to fixed base turbines.

The rapid deployment of offshore wind, combined with oil and gas upstream technology, has enabled innovation and enhanced learning, a competitive supply chain and ever larger turbines. With large investments within floating offshore wind technology, it is expected that the Levelised Cost of Electricity for offshore wind technology will continue to fall if we can build a large floating offshore wind supply chain pipeline to capture the economies of scale.

**Source: Statoil**

Increasing levels of renewable generation present some challenges to the power grid. These sources are “intermittent”, meaning that they only generate electricity when the sun is shining or the wind is blowing. This means we need an increasing amount of flexibility on the system to ensure that the power system remains reliable and secure, and that electricity is available as and when needed.

The vision set out through the BEIS/Ofgem smart systems and flexibility plan\(^1\) provides clarity on the direction of travel for the sector’s need for flexibility, and the energy industry is already driving forward innovation to make this plan a reality. There is an emphasis on developing a smart, more flexible system, which can utilise the current mix of technologies while allowing new services to access the market: facilitating greater levels of competition.

There is still, however, a concern that the Government is not supporting decarbonisation at least cost by excluding the cheapest technologies from competing in CFD auctions. If we are to decarbonise and keep bills as low as possible for consumers we need to have an outcome focussed technology neutral auction which rewards providers for the lowest cost per unit of carbon saved – this should go hand in hand with ensuring all technologies are competing on a level playing field with access to all markets. Government should therefore provide a clear and thorough assessment of the appropriate allocation of technologies and CFD budgets/volumes between allocation pots prior to future auctions.
A step away from coal

As the UK’s Industrial Revolution started in the second half of the nineteenth century, coal use grew year after year. The world’s first public coal-fired generating plant opened at Holborn Viaduct in London in 1882.

This was the first step to coal becoming the main fuel source for electricity generation over the following years and decades. Health and environmental issues associated with burning coal led to the Clean Air Act introduced in 1956 which eventually led to the transition from coal to natural gas as the domestic heating fuel in the 1970s. In 2016, Government announced its intention to close all coal power plants by 2025.

Health and environmental issues associated with burning coal led to the Clean Air Act introduced in 1956...

The result of both policy and industry action has been significant movements within the make-up of the UK’s power generation, largely driven by policy and the continued move to cleaner forms of generation. Coal-fired plants saw their share of power generation go from 22% of total generation in 2015 to just 9% in 2016, with sites such as Ferrybridge C and Longannet ceasing production.

Subsequently, 21st April 2017 was the first continuous 24-hour coal-free period for Britain since the industrial revolution. Already coal is seeing further declining use in 2017, with only 2% of power generation coming from coal in the second quarter of 2017.

Gas, a cleaner source of electricity generation, experienced the opposite effect to coal, with its share going from 29% of total generation in 2015 to 42% in 2016, and now accounting for 41% of total output in the second quarter of 2017.
Declining greenhouse gas emissions
Continued progression towards a greener economy has facilitated declining greenhouse gas emissions across the UK. In 2016 total emissions fell 6% when compared to 2015 levels, which was an overall reduction of 42% on 1990 levels.

The power sector was by far the biggest contributor, with a 19% decline in CO2 levels on 2015 levels. Both residential and transport CO2 emissions increased over the same period. For the UK to meet its objectives set out as part of the Climate Change Act 2008, however, significant effort will need to be taken to decarbonise both the heat and transport sectors going forward, whilst continuing progress in the power sector.

In 2016 total emissions fell 6% when compared to 2015 levels, which was an overall reduction of 42% on 1990 levels.

Securing our power supply
The introduction of the Capacity Market (CM) in 2013 had the objective of supporting increased security of supply within the UK power system: ensuring safe, secure and reliable power can be supplied to UK homes and businesses 365 days of the year. The CM auction held in 2016 cleared with a price of £22.50/kW/year which will ensure the availability of 52.5GW of capacity through winter 2020/21. As well as ensuring existing plants are available throughout the contracted periods, that particular CM auction also delivered 3.5GW of new build generating plants.

Interconnector flows can also contribute to security of supply for the UK power system, providing greater levels of diversity in the generation mix. Interconnectors provide a connection between the transmission system of two countries to facilitate the trading of gas and electricity across borders. The UK currently has 4GW of electricity interconnector capacity, with 2GW of this capacity to France, 1GW to the Netherlands, 500MW to Northern Ireland and 500MW to the Republic of Ireland. Interconnectors will continue to play an important role in the future energy system, with more projects planned in the future.
Capacity Market

The Capacity Market was set out under the Government’s Electricity Market Reform Package in 2013. Its specific aim was to ensure the security of supply problem by incentivising the availability of generating capacity when intermittent sources of generation are not available. The Capacity Market Auction is the competitive process to award Capacity Market Agreements to meet the target capacity for the relevant Delivery Year.

Current pipeline of future interconnectors from Great Britain

<table>
<thead>
<tr>
<th>Project name</th>
<th>Connecting country</th>
<th>Capacity (megawatts)</th>
<th>Delivery date</th>
</tr>
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<tbody>
<tr>
<td>NEMO</td>
<td>Belgium</td>
<td>1000MW</td>
<td>2019</td>
</tr>
<tr>
<td>ElecLink</td>
<td>France</td>
<td>1000MW</td>
<td>2019</td>
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<tr>
<td>NSN</td>
<td>Norway</td>
<td>1400MW</td>
<td>2020</td>
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<tr>
<td>IFA2</td>
<td>France</td>
<td>1000MW</td>
<td>2020</td>
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<tr>
<td>Greenlink</td>
<td>Ireland</td>
<td>500MW</td>
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<tr>
<td>Viking</td>
<td>Denmark</td>
<td>1000MW</td>
<td>2022</td>
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<td>FAB Link</td>
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<tr>
<td>NorthConnect</td>
<td>Norway</td>
<td>1400MW</td>
<td>2022</td>
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Source: Energy UK
Promoting competition and affordability

The retail energy market has undergone dramatic transformation in recent years. The number of active suppliers in the domestic energy market increased 26% in the year to March 2017, with 54 active domestic suppliers now in the market. This is driving competition through greater choice for consumers, innovation and improvements to customer service.

400,000 customers switching each and every month...

Nearly five million energy customers switched their electricity supplier in 2016, which equates to around 400,000 customers switching each and every month. In addition, according to Ofgem, double this number switched to a different tariff with their existing supplier. That is around 15 million customers making an active choice about their energy supply in 2016.

This is far higher than the level of switching in other sectors such as banking or telecommunications. By the end of September 2017, over 4 million customers had already switched supplier with the expectation that the total over the year will be higher than 2016.

It is not just the same consumers switching all the time. According to Utility Week, 37% of those who switched supplier last year did so for the first time.

As a result, by the end of 2016, the market share of small and mid-tier suppliers had risen to 18%, in comparison to just 0.7% in 2011.

The market is more competitive today than ever before. There is, however, no room for complacency. Industry recognises that there is more to be done.

This is why in 2016 Energy UK launched the Energy Switch Guarantee on behalf of the industry, which aims to drive greater engagement by reassuring customers that switching is simple, speedy and safe. Industry is committed to doing more to make it easier and simpler for all customers to engage in the market.

The Energy Switch Guarantee now covers 74% of the market and is looking to roll this out further, with 14 suppliers signed up to the scheme at the end of September 2017 already.

The Energy Switch Guarantee was developed to reassure customers that switching is simple, speedy and safe. Signatories to the guarantee promise a reliable and hassle-free switch will take place in just twenty-one days. If a customer is owed any money, it will be refunded no later than 14 days after sending the final bill. If there are any problems making the switch, the new supplier will contact the customer as soon as possible and will be responsible for putting the matter right. The Energy Switch Guarantee also serves to dispel any myths about switching and build consumer confidence towards the process.
**Energy prices**
Research conducted by YouGov on behalf of Energy UK suggests that more than half\(^\text{15}\) of people who gave an opinion believe that at least half of their energy bill is profit (over £550). This is, however, not the case. According to the most recent audited accounts from the six largest energy firms, 5%\(^\text{16}\) of the average energy dual fuel bill is profit (around £50). The same data continues to show that 77% of the bill consists of costs that are outside of a suppliers direct control – for instance network costs, wholesale costs, policy costs and VAT.

<table>
<thead>
<tr>
<th>Large suppliers: Domestic dual fuel bill breakdown 2016</th>
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<tbody>
<tr>
<td>Wholesale costs</td>
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<tr>
<td>Network costs</td>
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<td>Operating costs</td>
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<td>Environmental / social costs</td>
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<td>EBIT</td>
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<td>VAT</td>
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<td>Other direct costs</td>
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Source: Ofgem –based on Consolidated Segmental Statements 2016

**Supporting customers in vulnerable situations**
Energy suppliers take their responsibilities towards their customers extremely seriously. Via programmes like Warm Home Discount, industry provides financial support in excess of two million customers in vulnerable situations annually. In addition, via the Priority Service Register, suppliers support millions of customers with non-financial support. Earlier this year, the industry also implemented a cap on the amount of money suppliers can charge a domestic prepayment meter (PPM) customer. The cap is one of the remedies introduced following the Competition and Markets Authority’s investigation into the energy markets. Industry is working with Ofgem as it takes forward further work to identify additional support for vulnerable customers.

**Energywise**
Energywise, led by UK Power Networks in collaboration with British Gas and other key partners, brings together industry expertise in fuel poverty. It seeks to engage with fuel poor customers so they can benefit from smart meters, energy efficiency and demand side response.

The key aims of the project are to provide smart meter installations to fuel poor and vulnerable customers across two year-long trials focusing on energy saving and energy shifting (from peak to off-peak time and then quantify the extent to which customers participate in behavioural change. The project also seeks to understand the challenges and best approaches to engaging with these groups of customers whilst testing new technology to support the smart meter rollout within flats.

Source: British Gas
Voluntary actions to support vulnerable customers

**Energy UK Safety Net**
In 2004, the six largest suppliers signed up to the Energy UK Safety Net for Vulnerable Customers. The Safety Net is based on a commitment to never knowingly disconnect vulnerable customers. Where a customer has been disconnected and then is identified as vulnerable, the supplier will reconnect their customer as a priority. Since the Safety Net was founded, the nature of debt and disconnection in the UK energy retail market has changed beyond recognition. In 2003 there were around 16,000 disconnections of domestic customers for debt in the UK. In 2015 - the most recent year for which published data exists - there were just over 250. Participating Energy suppliers want to know they are performing as well as they can against the aims of the Energy UK Safety Net. This is why the signatories undergo an audit each year to measure how they deliver against 13 key objectives including having specialist teams to support vulnerable customers, monitoring repayment options so they take into account a customer’s ability to pay and never knowingly disconnecting a vulnerable customer. The commitment to publish the results reflects the increasing priority Energy UK’s members place upon protecting their most vulnerable customers. As the market develops and grows it will be important to see which supplier becomes the first new signatory to the Safety Net since it was founded.

**Energy UK PPM principles**
In 2016, Energy UK launched ten principles to provide improved safeguards for prepayment customers. The prepayment principles cover the majority of energy consumers in the UK with small, medium and larger suppliers signed up to them. These principles are updated from 2011 when Citizen’s Advice (then Consumer Focus) developed five key prepayment principles to raise standards of service for customers paying for their energy using a prepayment meter. The principles were launched on behalf of the six largest suppliers.

The renewed principles ensure suppliers are monitoring prepayment accounts to identify customers who might be at risk of facing financial difficulties. Suppliers may also provide discretionary credit as well as signposting customers to debt advice and financial support where appropriate. The principles also provide assurances about existing protections for prepayment customers. The updated principles currently have 13 suppliers as signatories: Bristol Energy, British Gas, Cooperative Energy, Ecotricity, EDF Energy, E.ON, First Utility, Good Energy, npower, ScottishPower, SSE, Utilita and Utility Warehouse.

**Helping vulnerable consumers**
EDF Energy works closely with Citizens Advice and IncomeMAX to provide advice and support to customers who are struggling to pay for their energy. They have helped over 8,000 customers get access to impartial debt advice; increasing household incomes by nearly half a million pounds. At the same time EDF Energy call centre staff completed over 5,000 referrals in 2016 and have been given training to identify vulnerability when talking to their customers.

Source: EDF Energy

**Volunteered to offer the Warm Home Discount**
In 2016, Bristol Energy was one of just three smaller energy companies to volunteer to offer the Warm Home Discount, a £140 discount on a winter energy bill for the most in need. Currently, only companies with more than 250,000 customers are obliged to join the scheme. For Bristol Energy, it was vital that they were able to help their most vulnerable customers now. They offer the discount to customers who are in the Core Group, which comprises people in receipt of the Guarantee Credit element of Pension Credit.

Source: Bristol Energy
It pays to be efficient

Energy efficiency represents a cost effective long term solution to tackling fuel poverty and helping the UK to reduce its carbon emissions.

Energy suppliers have been delivering energy efficiency obligations in Great Britain for the last two decades, the latest programme being the ECO (Energy Companies Obligation). In the 12 months to March 2017 energy suppliers installed 320,000 energy efficiency measures, taking the total number of measures installed under ECO since 2013 to over two million. This equates to a total carbon saving of 29.6431 MtCO₂ as of December 2016, which is equivalent to more than six million domestic cars taken off the road since the start of the scheme.

Improved energy efficiency has on average been effective in helping to mitigate bill increases between 2004 and 2016, saving the typical household around £290 per year since 2008, with the potential to deliver further savings of around £150 on average per household in the future according the Committee on Climate Change (CCC).

However, as noted by the CCC, “meeting the Government’s goal of improving fuel poor homes to efficiency band C by 2030 would require roughly doubling the funding currently provided under the Energy Company Obligation”.

Our energy transition

Benefits of up to £40bn from a smart energy system

- 7.68m smart meters in operation across UK homes and businesses
  - June 2017
- 63% growth in electric vehicle sales
  - August 2017 vs August 2016
- Over 650mw of storage planned or being developed
  - As of September 2017
- Over 121mw of low carbon community energy capacity
  - As of September 2017
The next steps towards a low carbon future

A changing system

The energy system is changing, driven by increasing awareness of climate change, enhanced environmental regulation and greater competition that is giving customers more choice and opportunities to engage. The sector continues to invest in new and existing power generating plants, network infrastructure, as well as customer services.

This ensures that the energy supplied to our homes and businesses is safe, reliable and at the lowest cost to consumers. As we continue to decarbonise the power sector there is a need to design a system that is fit for the future.

There is little doubt that the energy sector of the future will be unrecognisable from the one we have today.

To get to this future energy system we must continue the drive towards greater decarbonisation in power, with much more emphasis placed on decarbonising transport and heat, where electrification will undoubtedly have a role to play.

This will require continued investment in low carbon technologies to increase efficiencies and reduce production costs. The continued investment in renewables is making it increasingly likely that we will reach a point where certain technologies will be deployed under a market regime – using market prices - in the future. Low carbon energy is now part of the everyday energy system.

Technology and innovation are transforming how we generate, store and use our power, whilst smart meters, electric vehicles and battery storage will have a transformative impact on power markets, network models and how customers interact with and pay for power. It is clear that if we are to succeed in this transition period, heat, transport and power must no longer be treated separately. Appreciation of the increasing interdependency of these sectors is needed, and a whole system approach to decarbonisation needs to be adopted.

The success the energy sector – power in particular – has achieved to date in lowering carbon emissions, supporting jobs, and delivering investment must continue.
Community energy

Greater levels of renewable energy on our system, much of it located closer to our homes, and heterogeneous customers requiring different decarbonised heating solutions, means community energy projects have an important role to play in the future. Community energy projects currently provide over 121MW of low carbon energy capacity, covering areas such as electricity generation, energy efficiency, heat generation, transport and storage.

Source: Community Energy England

Case study: Bristol Energy Co-operative

Bristol Energy Co-operative (BEC) – a community owned energy co-operative – has installed solar PV on the rooftops of eleven community buildings in the Bristol area since 2012 and owns two ground-mounted solar arrays, one in Bristol and one in Somerset. The annual output from its 9MW solar portfolio is currently 9,105MWh which is enough to power around 2,220 homes. Not only do the projects reduce carbon emissions and save community buildings money on their energy bills, but the revenues generated from the recently installed projects are also going towards a community benefit fund. As part of this fund BEC recently launched the Megawatt Community Energy Fund which had £50,000 available for community action projects that reduce the amount of carbon in our atmosphere and make energy more affordable, including through initiatives that help reduce fuel poverty.

In September 2017, BEC completed its latest crowdfund through an Innovative Finance ISA bond. Part of the money raised from this will fund BEC’s first battery storage project. It is also involved in some early-stage community heat projects, is researching an investment offer for energy efficiency, and is beginning to look at investments in sustainable transport.

Source: Pure Leapfrog
The energy sector is undergoing a transformation towards a more flexible, increasingly decentralised power system, with smart technologies improving efficiency.

Technological progress in energy assets like rooftop solar panels, heat pumps and electric vehicles is offering a range of options for the customer. Uptake of these small-scale assets, often invisible on the network, is resulting in increasing difficulty in predicting levels of demand. Domestic, business, industrial and commercial consumers are showing a growing interest in how they can extract value from active participation in how they produce and consume electricity.

It is important that the energy system is able to match increasing levels of intermittent supply on the system with levels of demand. Consumers can benefit from increased flexibility through actively choosing to adapt their energy usage through smart tariffs, smart appliances or by supplying excess electricity to the system to aid in network balancing and provide value to the wider energy system.

As this transition towards a smarter energy system continues at pace, it is important to recognise smart meters as a key enabler to achieving the end goal of providing the greatest benefits for the customer and industry alike.

Smart meters will allow for the aggregation of value from energy assets (storage, electric vehicles, solar PV etc.), as well as enabling the integration of smart appliances and a range of energy management systems. The energy sector is responsible for installing around 53 million smart meters in more than 30 million homes and businesses across the country\(^2\), \(7.68\) million\(^2\) of these were already in operation across UK homes and businesses at the end of June 2017.

It is critical to the future of the energy system that the rollout is delivered efficiently and at the lowest possible cost to customers. Energy UK has played a central role in the smart metering roll out since 2009 committing a significant financial investment to deliver technical and operational solutions that have progressed the smart programme.

Energy UK has taken the lead for the energy industry, ensuring that consumers are best placed and at the centre of the smart meter roll out: improving health and safety procedures, addressing systematic issues that arise during the roll out, and establishing Smart Energy GB to handle marketing and communications with customers. Once adopted, smart meters will provide the central function of allowing the adoption of connected home technologies and a whole host of innovative energy solutions, providing value to the networks and customers alike.

### Key facts and figures

- **Almost 7.7 million** smart meters fitted into customers properties so far and **1 million** smart meters installed between April to June 2017
- **83%** of people with a smart meter think their energy bill is accurate, compared to **65%** without one
- **8 in 10** people with a smart meter would recommend them to others
- **88%** of people on a low income with a smart meter are likely to recommend them
- **70%** of those with a smart meter think they have the right information to choose their supplier, versus **59%** who don’t
- **10,000 people** will be employed by the energy industry to facilitate the roll out
- **During peak roll out, expected in 2018/19, more than 50,000 meters will be installed per day**
- **80%** of customers with a smart meter are satisfied
Case study: VCharge

Alongside the roll out of Smart meters to its customers, OVO Energy is investing in further technology services to create greater value from smart meter use for its customers and the energy system. 50% of OVO Energy’s customers currently operate a smart meter, and they are also able to actively monitor and view their account using the MY OVO app. With the use of smart meters there is potential for half hourly settlement of customer bills, and OVO is now looking to use these smart technologies to develop a suite of new services, including smart appliances, home energy storage, and electric vehicle charging.

With 1.5m properties in the UK using electric storage heat, OVO Energy and VCharge have developed a solution for electric heat customers in the UK, which utilises the use of smart meters. It utilises the OVO Energy smart meter programme and a smart tariff to unlock grid balancing revenues when the energy is not being used by the customer to offer added value to them. Initial pilot results have demonstrated customer savings, which comprised of reduced overall energy consumption and costs savings through the tariff.

Source: OVO Energy

Flexibility of demand

As the energy system adapts to a range of small-scale distributed energy resources and as intermittent renewables play an increasing role, it is important that adjustments to supply and demand can be made at multiple points. Instead of a top-down flow of information and power, smart systems will enable multiple interactions and reactions to keep the system in balance.

Demand Side Response (DSR) is the term given to a range of options which encourage customers to increase or decrease the amount of energy they are using based on signals from the network. The majority of the existing UK DSR market is based on the displacement of demand at peak times, and is operated through a range of aggregators.

These aggregators typically contract with multiple industrial and commercial customers to create a single larger asset, better aligning local energy use with the requirements and available supply of the system.

DSR has a significant role to play in supporting the transition to a more flexible and responsive energy system by offering an alternative to generation and facilitating a smoother demand curve. The December 2016 Capacity Market Auction saw DSR win over 1.4 GW of capacity agreements, and UK DSR capacity is set to grow further, as National Grid has set a target of meeting 30-50% of balancing services with DSR by 2020.

To further this intention, the National Grid Power Responsive Project has been created with the aim, among other goals, of informing customers of the potential benefits of adopting DSR, both in terms of energy bills and potential further payment from a range of energy markets.

The December 2016 Capacity Market Auction saw DSR win over 1.4 GW of capacity agreements...

Case study: Energy management- Panoramic Power

Centrica’s global Distributed Energy and Power business is helping businesses to take control of their energy and turn it from a cost into a source of competitive advantage. Through information, technology and insight, Centrica is giving businesses the power to operate and optimise their energy assets.

Centrica already has over 1,000 customers and expects to invest £700m in new technologies and partnerships by 2020. Centrica’s Panoramic Power wireless sensor technology is providing businesses with detailed insights into their energy consumption, helping them to save money, and helping customers unlock new revenue streams through demand side response and on-site generation.

Source: Centrica
Meeting our future transport needs

In 2016, there was 88,909 (3.3% of total car sales in 2016) alternatively fuelled vehicle sales in the UK, with 10,264 of these being fully electric\(^1\) and the rest being primarily hybrids.

As a result of these sales and the continued decarbonisation efforts of the motoring industry, the average CO\(_2\) emissions from new cars in the UK continued to decline in 2016 to just 120.1g/km. This was 33.6% below the 2000 level of 181.0g/km. Since then, August 2017 alone saw a 63% increase in electric vehicle sales over the month compared to August 2016.

The transition to a low carbon transport system is being supported by both Government and the energy sector, and the power industry is investing in new solutions to make the transition as smooth and as efficient for customers as possible. The mass uptake of electric vehicles has the potential to offer economic value to customers and the power system through smart charging and demand side response capabilities. These methods will allow customers to offer their vehicle as a battery storage solution to the local network. This allows for impacts on local networks to be minimised, and for this aggregated storage asset to be optimised for efficient balancing, offering backup flexibility to the system.

To support the roll out of EVs, at the end of August 2017 there were 13,000 charging points across the UK\(^1\) and a number of energy suppliers are now offering specific tariffs aimed at electric vehicle owners, even guaranteeing that the electricity purchased is sourced from renewable generation.

This allows customers to pay for all their energy, across heat, domestic electricity and transportation, in a single energy bill. The UK has recently announced that it is to ban sales of new petrol and diesel cars and vans from 2040, with many other countries such as France, Germany and China implementing – or looking to implement – similar legislation.

There is an ongoing global effort to clean up road transport emissions for health and climate reasons, and vehicle manufacturers are responding accordingly by increasing their planned EV manufacturing.

...At the end of August 2017 there were 13,000 charging points across the UK...
Where we must do more

In 2016 demand for gas was 12 per cent higher compared to 2015, driven mainly by gas use in power generation increasing by 40% following reductions in coal power generation on the system. Gas is traditionally used for heating our homes and work spaces, with 83% of UK households using gas boilers. Heating and hot water currently represent a fifth of UK greenhouse gas emissions, so it will be vital to find lower carbon sources if we are to meet our climate change obligations. There is, however, a continued hesitancy from consumers to move to low carbon heating solutions. This is partially based on the perceived lack of an economic driver to move away from the comfort and familiarity of a gas boiler. Alternative heating technologies often result in lower bills for consumers, but require an initial investment for installation, which many consumers cannot afford.

As part of the energy transition, decarbonising our heating system presents a difficult challenge to meeting our carbon targets set out under the Climate Change Act 2008. Between now and 2050, significant decisions must be made, and substantial investment in technological solutions and infrastructure is needed to overcome the challenges of heat decarbonisation.

The Renewable Heat Incentive (RHI) has gone some way to increasing adoption rates of low carbon solutions across Great Britain by incentivising the use of certain heating solutions. Over 73,000 low carbon heating installations were accredited by the domestic and non-domestic incentive by the end of May 2017. Engagement in heating solutions has been aided by the continued adoption of high efficiency combined heat and power (CHP) installations from several hundred watts to several hundred megawatts and increased use of district heating. By the end of 2016, there were 2,182 CHP schemes across the UK, and around 2,000 district heating networks were supplying heat to over 210,000 homes and 1,700 public and commercial buildings.

Regardless of the technologies utilised in decarbonising heat, there will still be a need for winter storage to meet peak demand. The low carbon solution for this is to supply ‘green gas’ which is not derived from fossil sources. Low Carbon Natural Gas can be made by a range of techniques, including anaerobic digestion of food waste, sewage sludge or agricultural products.

There are currently over 400 plants in the UK, with most of these providing biogas for generation or combined heat and power. At the end of 2016 there were 81 plants injecting biomethane into the gas grid, up from one in 2010. There is considerable potential for the supply of green gas to grow, although biomethane from anaerobic digestion will ultimately be limited by feedstock availability.

Beyond this there is the possibility of blending hydrogen with gas in the network or to converting the gas network fully to hydrogen. For hydrogen to be a valid option, however, Carbon Capture and Storage technology needs to be advanced and invested in across key locations in the UK.
Case study: Heat systems - Project Freedom

Freedom is a collaborative energy project between electricity and gas networks. The project’s principal funders are Western Power Distribution, the electricity distribution network operator and Wales & West Utilities, the gas distribution network operator. PassivSystems leads the day-to-day project management and designing the architecture of the smart switching system. This £5.2m innovation project consists of the installation of 75 hybrid heating systems in residential properties in Bridgend, South Wales. The pilot involves system installations, tests and simulations of the properties throughout the summer of 2017, prior to demand for heat rising during the autumn and winter months.

The hybrid heating system includes an exterior air source heat pump, a high efficiency gas boiler inside the home and a hybrid controls panel which enables switching between the two heat sources. No further modifications or interruptions are required in customer properties.

The objectives of the Freedom Project are to:

• Use the ability of smart switching between gas and electric load to allow the buying of fuel and the sale of heat simultaneously to create value and offer highly flexible services that match energy supply with consumer demand for heat;
• Demonstrate and articulate the potential consumer cost, carbon emissions and energy system security benefits from the large-scale deployment of hybrid heating systems, and;
• Gain insight into balancing the interests of the consumer, supplier and network operators.

Initial modelling outputs from Imperial College suggest that the UK energy system could save £1.3bn annually by 2030 from reduced network reinforcement and avoided generation capacity investment as a result of hybrid heating systems in preference to pure air-source heat pumps.

Source: PassivSystems

Storing our power

As the energy system adapts to a changing generation mix, new technologies are integrated into the system and used to take full advantage of energy generated when there is low demand. Storage of one form or another has been used in balancing the energy system for decades, and is well established in the UK, primarily in the form of Pumped Hydro storage and other mechanical methods.

Innovation in battery technology has resulted in increased options for the size and location of storage. In practical terms, this means that renewable generation can be paired with storage assets to better utilise excess low carbon electricity produced on particularly windy or sunny days.

Energy Storage has seen increased levels of investment and research across a range of technologies, including gas, electrochemical (battery), and mechanical energy storage. In October of 2016, there were 35 standalone grid-scale storage projects and 1,500 residential storage assets deployed across the UK, with 650MW of new storage planned or in development.

Increased levels of battery storage on the system will enable a transition to even greater levels of renewable generation, extracting economic value from the technologies by storing excess generation when it is not needed, and providing this as a service to the grid when there is a system supply shortage.
Our skills transition
The transformation to a digital, more decentralised and flexible energy system will require new skills sets compared to the more traditional energy system. Alongside retention and development of “traditional” competencies, upskilling is key to providing the flexibility needed to embrace social and technological change. As demand for software skills increases across the energy sector there needs to be a strong, flexible platform where these skills can be developed.

The energy sector has a key role to play in delivering major infrastructure projects. With vital skills in short supply, this requires an innovative response in terms of reskilling, upskilling, and talent retention and sector attraction. Energy & Utility Skills Workforce Planning data shows that ‘Power’ and ‘Smart Metering’ will have an additional net requirement of 63,000 and 11,000 people respectively by 2025.

The smart meter roll-out offers a significant opportunity to draw new talent into the sector. Employers and government have explored the requirements to meet peak demand of an extra 8,000 smart metering professionals by 2018-19. Once this demand subsides, plans are under development to retain these skilled workers in the sector through a reskilling programme.

The sector continues to strengthen its position by leading the way on apprenticeship reform. The first trailblazer apprenticeship programme was devised by the Power industry, the “Power Network Craftsperson” – and this apprenticeship will play a crucial role in filling skills shortages in essential overhead lines occupations. The sector is also pioneering new practices to support recruitment and retention, such as the sector attraction platform, Talent Source Network.

Case study: Blackburn Meadows battery project
E.ON has begun installing a 10MW battery at its biomass combined heat and power (CHP) plant at Blackburn Meadows near Sheffield – a new energy storage project that will help keep power supplies stable and balance the range of power generation sources feeding into the UK’s national grid.

The 10 megawatt (MW) lithium-ion battery is the size of four shipping containers. It will have the same power as roughly 100 family cars and will be able to hold the same amount of energy as 500,000 mobile phone batteries. Work has begun on site, with the system planned to be fully operational by late 2017.

Blackburn Meadows CHP plant is a 30MW renewable energy plant that can produce enough power for around 40,000 homes, converting recycled waste wood into electricity. It also uses combined heat and power technology which is a more efficient process that captures the heat produced through the electricity generation process to be used in a district heating scheme providing heat to customers including Sheffield Forgemasters, the Motorpoint Arena and Ice Sheffield.

As well as helping to make more efficient use of renewable energy sources, the batteries are also able to provide extra power to the network at times of peak demand as part of the Capacity Market.

This will be one of the first commercial battery systems in Britain and will provide a necessary technology at times of either an over- or under-supply of energy to the grid, E.ON’s battery system will respond within one second, absorbing or discharging power into the local distribution network, ensuring that the power supply and quality is maintained. Customer solutions such as energy storage, cleaner on-site generation, or energy management are part of a range of energy solutions offered by E.ON to help customers to use energy more efficiently and make businesses more profitable.

Source: E.ON

*Based on a system capacity of 5MWh versus a mobile phone battery energy capacity of 10wh (3.7v x 2,700 mAh = 10wh)
Case study: Uniper Engineering Academy

The Uniper Engineering Academy seeks to enhance the skills of new and experienced engineers alike and provide the power engineers of the future with the skills required to thrive within the industry. Based at Ratcliffe-on-Soar near Nottingham, the Engineering Academy has been delivering highly regarded, funded apprenticeships and adult training courses for many years. It offers bespoke training programmes to fit business needs anywhere in the world and has a great track record of success.

The facilities include electrical, mechanical, fabrication and welding workshops, three power plant simulators, an 11kV live HV network with seven sub-stations, and a generation switchroom. Training ranges from power plant maintenance and operation through to control and instrumentation disciplines and smart meter installation, with many of the courses leading to recognised engineering, power plant and apprenticeships qualifications.

In 2016 alone, more than 600 courses were delivered to 4,000 delegates, representing 160+ companies. There are currently 69 apprentices from both Uniper and other companies on schemes with the Academy. In 2017, the Academy will be launching both its new Maintenance and Operations Engineering Technician (MOET) apprenticeship standard, and a 12-month apprenticeship covering all aspects of smart meter fitting, with training provided in both the classroom and on-the-job settings.

The Academy was one of the first organisations in the UK to win Education and Skills Funding Agency (ESFA) accreditation, enabling it to offer new apprenticeships training as part of the new Apprenticeship Levy, introduced in 2017. It is now an accredited member of the Register of Apprenticeship Training Providers (RoATP).

Source: Uniper

Industrial Strategy in action – Hinkley Point C

Nuclear energy plays an important role in the UK energy mix, contributing around 20% of total power. Hinkley Point C, the UK’s first new nuclear project in a generation, is now being built. It will provide 7% of power needs all year round, working alongside gas, renewables and new technologies in a future energy mix.

More than 2,000 employees are working on site today. 25,000 jobs and 1,000 apprenticeships will be created throughout construction. Around 64% of construction value will come from UK companies, including steel from Wales and pumps from Scotland, as industrial benefits are felt across the country.

Source: EDF Energy

Case study: Smart Metering Engineer apprenticeship

As part of the smart meter rollout, the energy industry needs to recruit a large number of new meter engineers to install them. The arrival of smart meters also means that suppliers won’t need meter readers in the future as this will be done automatically. At the beginning of 2017, npower launched an apprenticeship programme to re-train Meter Readers as Meter Installers. Initially, 50 Meter Readers were selected for the programme, which runs up until spring of 2018.

The programme is proving to be very successful and it has now been opened up to other npower employees who would like to re-train as a Meter Engineer. npower’s most recent apprentice cohort started at the beginning of August 2017 and the delegates will complete their qualification around the end of September 2018. In total, npower will have c100 Metering apprentices by the end of September 2017.

Source: npower
In June 2016, the UK voted to leave the European Union. In March 2017 the UK Government triggered Article 50, signalling the start of a two year negotiation period on the terms of the exit and the new relationship between the two blocs.

A positive and fruitful relationship with the European Union will support the UK energy sector’s transition into a low carbon economy that offers increasing benefits to consumers.

As an EU member, the UK is part of the Internal Energy Market (IEM), a system to ensure free flowing and efficient trading of electricity and gas across Europe. Regardless of the future relationship, Energy UK is keen to emphasise the benefits of ensuring that power and gas continue to flow between the UK and Europe.

There should not be any tariff or non-tariff barriers to trading energy following the UK’s exit from the EU. Any tariff on energy would undoubtedly impact customer bills, and non-tariff barriers would also impact customers by creating extra administrative and physical burden on energy companies, i.e. costs.

It is also in the interests of both the UK and the EU to ensure continued cooperation on nuclear issues when the UK leaves Euratom. Both parties benefit from the current trading arrangements and the close cooperation on nuclear policy, safety & regulation and R&D.

Brexit represents uncertainty for investors across many sectors, and none more so than energy. Whilst it will be important to know the future trading relationships with Europe on power, gas and intermediate goods, much of the final investment decision rests on domestic policy and schemes such as the Capacity Market and the Contracts for Difference, for which the Government has ultimate control.

These schemes will continue to play an integral role in delivering the UK’s energy objectives. Meanwhile, clarity on the direction of travel is required to provide investors with the visibility they need to make investment decisions and avoid delays in the development and modernisation of the UK’s energy infrastructure.

Energy UK has been calling for an implementation period of at least two years to avoid a cliff-edge and give the energy industry time to adapt to the new relationship. The Government has signalled that it is working with the EU to deliver such a transition.

The UK’s withdrawal from the EU affords the Government the opportunity to develop an industrial strategy that puts energy infrastructure at its heart, delivering long term benefits to the economy. Ensuring that new low carbon technologies still at a relatively early stage of development and deployment have access to innovation funding is crucial. This will ensure the UK will not fall behind in the race to enter these new markets and develop world leading technology as the UK’s access to EU funding post-Brexit becomes limited.
Glossary

CCL  The Climate Change Levy is a tax on energy delivered to non-domestic users in the UK.

CFD  Contracts for Difference is the support mechanism for new low carbon power plants. That provides a top-up on the wholesale power price up to a predefined strike price. The CfD replaces the Renewable Obligation mechanism for new build.

CMA  The Competition Market Authority is the UK’s primary competition authority and was tasked with looking into the energy market in 2014. The CMA proposed a range of remedies that are currently being implemented.

DSR  Demand side response financially incentivized customers to lower or shift their electricity use at peak times, helping to manage load and voltage profiles on the electricity network.

GDP  The Gross Domestic Product is a monetary measure of the market value of all final goods and services produced in a period (quarterly or yearly) of time.

GVA  The Gross Value Added is the value generated by any unit engaged in the production of goods and services. GVA per employee is a useful way of comparing sectors.

EUETS  The European Emissions Trading Scheme is the EU mechanism for incentivising measures to reduce carbon. The ETS sets a cap on greenhouse gas emission across participating installations, with emission allowances then auctioned, allocated or traded.

ECO  The Energy Companies Obligation is the current Government scheme to support and improve the energy efficiency of the housing stock to help reduce carbon emissions and tackle fuel poverty.

IEA  The Internal Energy Market is the name given for the current rules governing energy trade across the EEA to address market access, transparency and regulation, consumer protection, supporting interconnection, and adequate levels of supply.

Notes

Photo credits

Front cover: West of Duddon Sands Offshore Windfarm image courtesy of Scottish Power Renewables and Dong Energy

Front cover: Drax biomass train, image courtesy of Drax group

Page 30: West Burton battery storage facility, image courtesy of EDF Energy.

Page 8: Hinkley Point C construction, image courtesy of EDF Energy


# EUK member list

**Chairman of the Board of Directors:** Sir David Arculus  
**Chief Executive:** Lawrence Slade

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