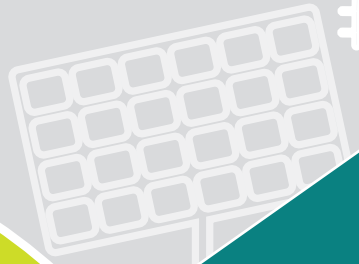
Energy UK

Energy in the UK

2020



The voice of the energy industry

About Energy UK

Energy UK is the trade association for the energy industry with over 100 members spanning every aspect of the energy sector – from established FTSE 100 companies right through to new, growing suppliers and generators, which now make up over half of our membership.

We represent the diverse nature of the UK's energy industry with our members delivering over 80% of both the UK's power generation and energy supply for the 28 million UK homes as well as businesses.

The energy industry invests £13bn annually, delivers £31bn in gross value added on top of the £95bn in economic activity through its supply chain and interaction with other sectors, and supports 738,000 jobs in every corner of the country.

energy-uk.org.uk

Contents

Foreword

Emma Pinchbeck
Chief Executive, Energy UK

> "This crisis has highlighted once again the central role of the energy sector in supporting the economy and driving the delivery of clean energy at an ever-increasing rate."

While this publication mainly takes stock of what happened in the energy sector in 2019, it is difficult to ignore the situation we currently find ourselves in following the Coronavirus pandemic.

We are living through unprecedented times which have brought Industry and Government together to manage the COVID-19 crisis and the economic recovery we need to trigger from it.

Throughout the lockdown Energy UK has supported the energy sector, beyond our membership, to ensure that customers and businesses were able to receive the support they needed when finding themselves in difficult situations.

This crisis has highlighted once again the central role of the energy sector in supporting the economy and driving the delivery of clean energy at an ever-increasing rate.

In the first quarter of 2020 alone, over 60% of all energy coming from low carbon generation and we have seen over 80 days of coal-free electricity between January and June.

In June 2020, Energy UK in collaboration with PwC published a report, titled **'Rebuilding the UK economy: fairer, cleaner, more resilient'**, providing a set of recommendations on how the energy transition can drive the economic recovery. Done the right way, we can accelerate our transition and create a stronger and more resilient net zero economy, avoiding a duplication of costs later. Industry and Government will need to work in partnership to deliver.

Government has played a crucial role in supporting people, businesses and the economy and will need to continue to do so in the foreseeable future, using the many stimulus policy options at their disposal. How this is done will be key to driving both the energy transition and a green recovery.

The UK energy sector has one of the cleanest and most innovative energy systems in the world, attracting private investment and creating jobs as we accelerate through the energy transition towards net zero. Underpinning the entire UK economy, the sector supports more than 738,000 jobs, invested £13 billion in the UK in 2019 and generated £95 billion in economic activity through supply chain.

We now need to meet the upcoming net zero infrastructure challenges, such as renovating our building stock and decarbonising heat in a way that creates new opportunities for low carbon jobs and industries across the UK. All this will need to be supported by enhanced flexibility markets and services to continue the wider deployment of low carbon generation and enable deeper decarbonisation at lowest costs to consumers.

The UK government has already provided some funds towards energy efficiency, decarbonising heat and low carbon technologies, and these are welcome. But we need to be clear about the challenge ahead, we are talking about costs in the region of £50bn, or 1-2% of GDP, per annum to make it to net zero by 2050 according to the Committee on Climate Change*.

2019 showed more progress towards reducing the energy sector's carbon emissions and deploying low carbon electricity. But we need to accelerate the pace and turn these difficult times into the launch of cleaner and more resilient economy and take all sectors and households on this decarbonisation journey.

* The Committee on Climate Change - Net-Zero Technical Report

Key figures of 2019

72% **emission reduction** in the **power** sector since 1990

£13bn **invested by the** UK energy sector

738,000 **jobs supported** across the UK

£770m **spent** by the sector in 2019 **to support vulnerable customers** through social schemes

54% **of power generated** from low carbon sources

£95bn **generated in economic activity through supply chain**

Five policy recommendations for a successful clean energy transition

1. **A retail sector where competition and innovation flourish whilst vulnerable customers are protected**
2. **An increase in private investment in net zero businesses and innovation**
3. **A well-funded and centralised retrofit programme for buildings that covers energy efficiency, heat, and microgeneration**
4. **A rapid decarbonisation of transport, with new incentives for EV use (by fleets and individuals)**
5. **A smart, flexible energy system, fit for future energy sources and user needs**

2019/2020 in review

2019

June

The UK becomes the **first major economy to legislate a net-zero climate ambition** by 2050.

July

Renewables surpass natural gas in quarterly power generation for the first time in Q3 2019.

August

The UK experiences **a 45 minute power cut** on 9 August due to a lightning strike on the national electricity transmission system tripping two large power plants.

The third allocation round for Contracts-for-Difference is held, with **offshore wind clearing at record low £39.65/MWh.**

September

E.ON and RWE's asset swap is **approved by the European Commission** – npower to be part of E.ON.

October

EDF's **Cottam coal plant closes** after more than 50 years in operation.

November

The **Capacity Market is reinstated** with the delayed auction rounds to be held in February 2020.

December

The Competition and Markets Authority approves **Ovo Energy's acquisition of SSE's domestic business.**

2020

January

Climate Assembly UK meets for the first time to hear the **public's views on the UK's pathway to net zero.** Read the final report here.

GB's Electricity System Operator sets out plans to be **ready to operate a net zero power system by 2025.**

February

Capacity Market auctions are held to secure power generation capacity for 2020/21 (T-1 auction), 2022/23 (T-3) and 2023/24 (T-4).

March

The UK is put on a lockdown, leading to **significant reductions in energy demand** over the coming weeks and months.

April

Energy suppliers respond to their customers' hardship by granting **higher levels of financial relief to households and businesses.**

May

Energy UK calls on Government to implement an economic recovery programme which **prioritises investments that support decarbonisation.**

June

The UK witnesses **68 consecutive days without coal,** breaking the previous record of 18 days set in 2019.

Energy and the economy

Energy and the economy

> "The energy sector continues to power the economy while contributing billions of pounds in taxes and consumption through the supply chain."

The energy sector continues to power the economy while contributing billions of pounds in taxes and consumption through the supply chain.

In 2019, the sector created £30.9bn in value adding activity, measured in gross value added (GVA)[1], a 10% increase from 2018. Compared to other utilities, the sector's GVA was between telecommunications (£35.8bn) and water (£24.5bn) sectors.

Additionally, through intermediate consumption across the supply-chain, the sector contributed an added £94.6bn to the UK's economy[2].

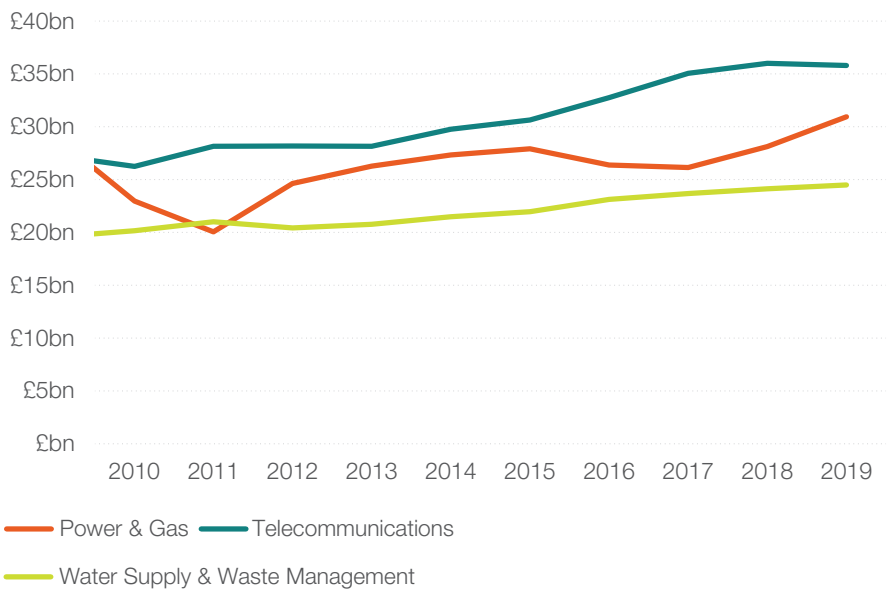
During 2018/19, the most recent year for which data is available, the sector contributed over £7.8bn total in taxes, including £2.4bn in national insurance contributions and £1bn in corporate taxes[3].

The low carbon and renewable energy economy (LCREE) has become a rising contributor to the economy. It achieved a turnover of £47bn in 2018, a 16% increase over 2015, the year of the survey's launch[4].

The largest sectors within the low carbon economy continue to be energy efficiency products (£21bn), low carbon power and bioenergy (£18bn) and low emission vehicles (£5bn).

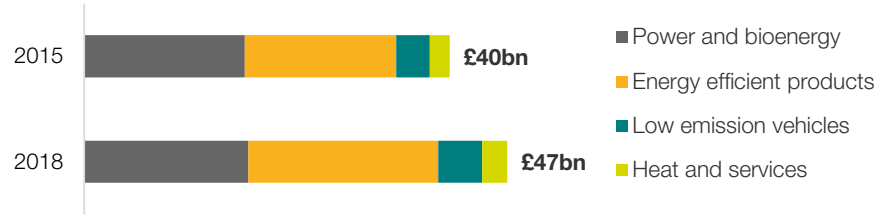
Standing at £3.7bn, offshore wind is closing the gap with other low carbon sub-sectors such as bioenergy (£4.3bn), nuclear (£3.8bn) and onshore wind (£3.7bn).

Gross Value Added of selected sectors, 2010-2019



Source: ONS, current prices

Low carbon turnover by group, 2015 and 2018



Source: ONS

[1] ONS (2020) GDP output approach – low-level aggregates
[2] ONS (2019) Input–output supply and use tables – 2017 figure inflated to 2019 using CPIH
[3] EUK analysis of HRMC data, corporate taxes (FY 2017/18), all figures are in 2019 prices
[4] ONS (2020) Low carbon and renewable energy economy, UK: 2018

COVID-19 and the energy sector

COVID-19 and the energy sector

> "In total between March and July, **Energy UK had over 50 meetings with Ministers** raising the impact of COVID-19 on the industry and consumers."

People and businesses were significantly impacted by the COVID-19 pandemic and many turned to their energy supplier and to government for support.

The sector responded rapidly to assist customers and ensure the secure operation of the system, guaranteeing our security of supply, keeping the lights on and protecting workers' safety.

Suppliers supported customers by providing a significant number of payment holidays, valued at hundreds of millions of pounds, to households and businesses. Generators put their contingency plans into action which ensured our key energy workers were able to work safely and keep our generators and networks running.

Energy UK worked to represent the whole industry, beyond our membership, to the UK, Scottish and Welsh governments; having daily meetings with Ministers and officials from across BEIS, HM Treasury, as well as discussions with Officials and Ministers from the Department of Transport, the Department for Environment, Food and Rural Affairs and the Department of Health and Social Care.

As an industry, we can be proud of the excellent work we have done over the past few months in order to deal with these unprecedented circumstances. Our key wins included: the recognition of key worker status for those employed by the sector and priority testing, as well as regular reporting directly to the Government on staff absenteeism and fuel availability for all the power stations above 100MW. We also worked together with the government to find solutions, such as inputting in the development of the Track and Trace system.

In many ways COVID-19 gave us an insight into the future of the sector, through the changing demand for electricity, the bigger share of low-carbon generation and the changing nature of how customers will use energy in the future.

There are many lessons learnt for the energy sector, including the importance of having a more resilient and smart energy system to accommodate more drastic changes in energy demand.

In June 2020, Energy UK and PwC published a report on rebuilding the UK economy, emphasising the core areas to build back fairer, cleaner and more resilient.

Looking ahead, we now need to work to rebuild the economy in a way that is compatible with our net zero target for 2050. Government's guiding principles should support economic growth, including jobs, climate targets and long term opportunities in line with the UK's net zero commitment.

The energy sector will continue to play a central role in our decarbonisation journey and can support the economy and other sectors by developing new low carbon industries.

> "...we now need to work to rebuild the economy in a way that is compatible with our net zero target for 2050."

In collaboration with:

Capgemini

Capgemini World Energy Market Observatory (WEMO) 2020: **Key Findings**

As business operations and global travel paused during COVID-19 lockdowns, consumption of electricity and gas fell by up to 20%. As countries emerge from lockdown, consumption remains 5-10% lower than previously, suggesting the industry shouldn't expect a full recovery until the end of 2021 or 2022.

Despite temporary reductions in emissions, long-term climate change goals remain out of reach

The consumption decline due to COVID-19 caused the largest reduction in Greenhouse Gas emissions since World War II, with emissions decreasing an estimated 8.5% in 2020. The crisis demonstrated that lifestyle changes, like decreasing travel, have a significant impact on emissions. However, as the world recovers from the pandemic, emissions are rising.

The International Energy Agency (IEA) states that the world's current trajectory will elicit a 3.1-3.7°C rise in temperatures, well above the 1.5-2°C scenario needed to meet Paris Agreement objectives, corroborating our pre-crisis research that the world is not on track to reach the 2015 Paris goals.

Renewable generation and storage technologies continue to mature

Renewables account for half of worldwide electricity generation investment. This is higher in developed countries and lower in developing countries, where coal and gas plants are still being built to meet booming energy demand.

Key points from 2019 and H1 2020:

- The cost and price of Wind and Solar have continued to decline;
- Storage costs decreased 19% in 2019 (Lithium-ion), and 120 Battery Megafactory projects have been recorded of which 88 in China alone;
- European and Asian suppliers compete to champion the Hydrogen market, investing billions of dollars. 2020 is the year of Hydrogen.

The growth of renewables is causing reliability concerns

A dip in consumption, coupled with ideal weather conditions during lockdown, notably in Europe, created an unexpected jump in the share of renewable generation. For some European countries renewables exceeded 40% of the total mix, levels not expected to be reached until at least 2025.

This growth of intermittent power sources has prompted questions regarding grid stability and security of supply and a reminder that more needs to be done to improve reliability, predictability and grid stability.

Using non-carbon emitting storage options (lithium-ion batteries short-term and hydrogen longer-term), leveraging artificial intelligence and automation to improve accuracy in demand forecasting and demand-side management, and deploying smart grids at scale to manage the distributed energy mix could all improve the viability of renewables. But regulation must evolve to bring incentives and economic signals to unleash investment in these areas.

Competition in Electricity and Gas Retail markets recovered after the crisis

During lockdown, consumers spent time better monitoring and managing their consumption, leading to lower levels of switching. However, post-lockdown, churn rates returned to pre-crisis levels. With depressed wholesale prices, consumers are taking advantage of aggressive pricing by retailers to move to cheaper tariffs. On average, European residential consumers spend 8% of disposable income on electricity and gas.

Decarbonisation and investment to net zero

Decarbonisation and investment to net zero

"Renewables generated **119 TWh** of power and **37%** of all generation in 2019, compared to 33% in 2018, and only 7% ten years ago."

Decarbonisation at the least cost to consumer

Powering the UK in 2019

In 2019, the power sector decreased its emissions the most compared to other sectors for the sixth consecutive year, by 13% to 58 MtCO2e[5]. Since 1990, the power sector has reduced its emissions by 72%; most of this reduction has happened since the Electricity Market Reform (EMR) in 2013.

Renewables generated 119 TWh of power, 37% of all generation. This compares to 33% in 2018, and only 7% ten years ago. The share of low carbon generation was also up on 2018, at 54%. 2019 saw the UK run 18 consecutive days without coal on the system. This was surpassed in 2020 with 68 consecutive days.

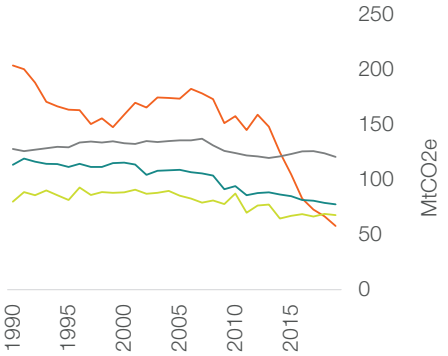
Investing in decarbonisation in 2019

The sector invested £12.6bn in power and gas in 2019, a slight decrease from 2018. This covers capital expenditure in new generation capacity and the upgrade and upscaling of the power and gas network infrastructure[6].

A share of this investment translated into 3.2 GW of new build in 2019, capable of powering 3.5 million UK homes yearly[7], most of it being renewable generation, delivered largely through the Contracts-for-Difference scheme, and 0.4 GW of gas generation. However, this is below an average build rate of 5.2 GW of the previous five years[8], and below the estimated net zero level build rates of 9 to 12 GW per year needed to 2050.

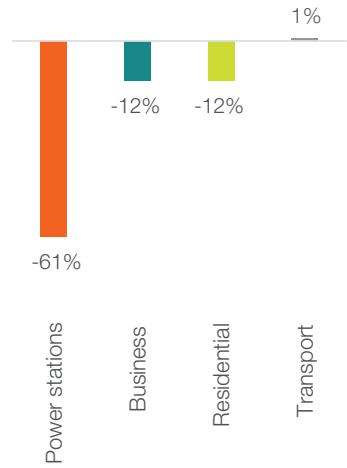
[5] BEIS (2020) 2019 provisional CO2 emissions, 2018 final non-CO2 GHG estimates
[6] BEIS (2020) Energy in brief 2020
[7] EUK analysis, with technology specific load factors and annual consumption of 3,700 kWh
[8] Energy UK analysis of data from LCP

Greenhouse Gas emissions of selected sectors, 1990-2019

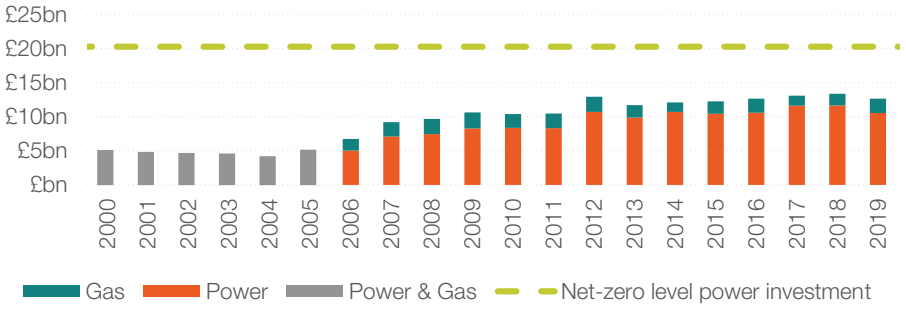


Source: BEIS

Change in Greenhouse Gas emissions, 2013-2019



Capital Expenditure (CAPEX) investment in electricity and gas, 2000-2019



Source: ONS, constant 2019 prices, Net-zero level based on the CCC's estimates.

Minimising costs to consumers

The current market mechanisms are delivering value for customers and have attracted investment in low carbon generation, allowing the sector to drive a transition to net zero at the least cost to consumers.

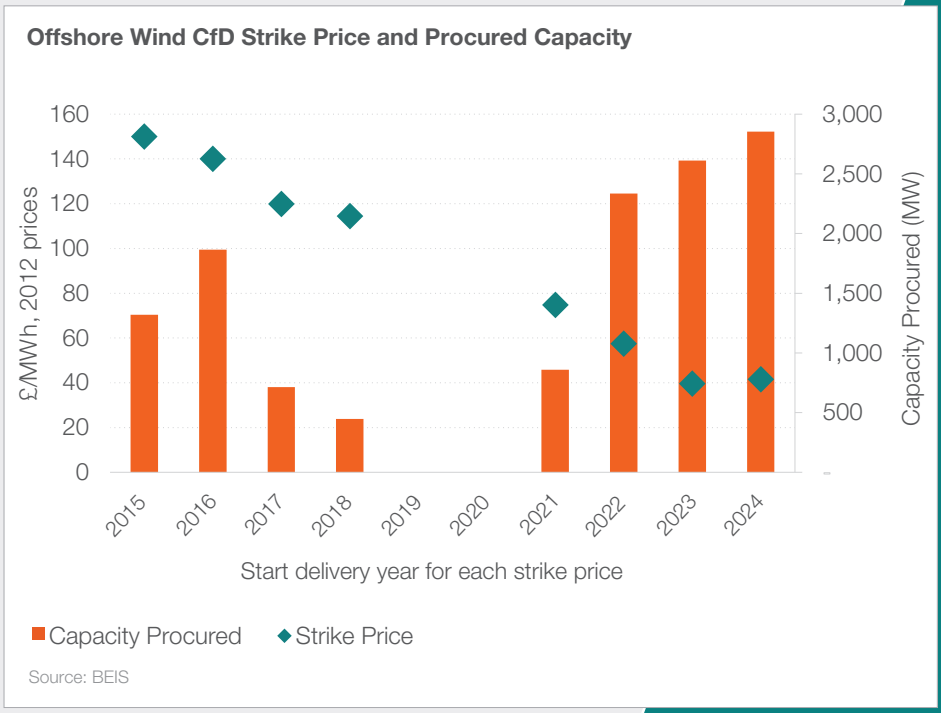
The latest Contracts-for-Difference (CfD) allocation round in September 2019 saw the lowest strike price ever in the UK, as offshore wind cleared at £39.65/MWh (in 2012 prices) for delivery in 2023/24. This is below the long-term power price projections and a 31% reduction from the previous auction in 2017, delivering decarbonisation for customers at the lowest cost.

Another key part of EMR, the Capacity Market (CM), which supports security of supply was reinstated in late 2019. The most recent auctions were held in the beginning of 2020, procuring capacity for years 2020/21 (T-1 auction), 2022/23 (T-3) and 2023/24 (T-4) and cleared at very low prices.

The Feed-in-Tariff scheme for smaller scale renewable generation closed for new applicants in April 2019 and was replaced by the Smart Export Guarantee (SEG) in early 2020. Customers can now from a range of competitive tariffs that reward. Over the first months of SEG, at least 16 suppliers were offering SEG tariffs[9], compensating households for the electricity they exported to the Grid.

Energy UK notes however that all these policy costs on energy bills create a financial burden for low income households and that moving them to general taxation, especially those relating to energy efficiency, would offer a fairer approach.

> "The latest Contracts-for-Difference allocation round saw the lowest strike price ever in the UK, as offshore wind cleared at below the long-term power price projections and a **31% reduction** from the previous auction in 2017."



> "Over the first months of SEG, **at least 16 suppliers were offering SEG tariffs**, compensating households for the electricity they exported to the Grid."

[9] Solar Trade Association (2020) SEG & Export Tariff League Table

Recommendation for a successful clean energy transition

1. A retail sector where competition and innovation flourish whilst vulnerable customers are protected.

Excellent customer service and protecting the most vulnerable

In 2019, the retail energy sector continued to deliver valuable and improved services for customers while looking after the most vulnerable. Complaints were down 9% in 2019 compared to 2018[10], illustrating an improved customer service. Over three quarters (78%) of domestic customers were satisfied with their supplier[11]. Customer engagement also continued to increase, with a record breaking 6.4 million customers choosing to switch energy supplier. This is the highest level of engagement since Energy UK started reporting switching figures in 2013.

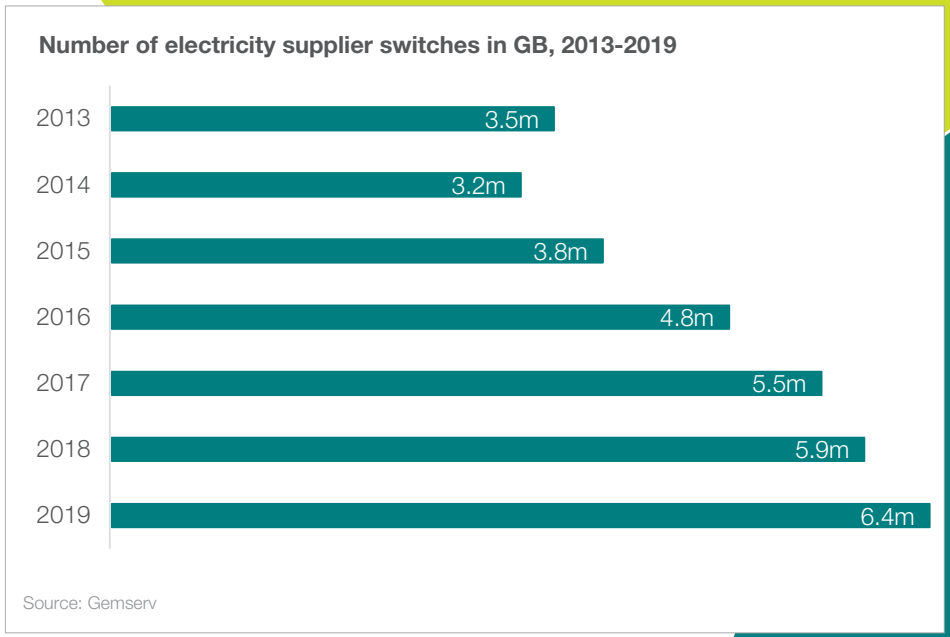
The sector also continues to proactively look after its consumers who find themselves in vulnerable circumstances. This winter Energy UK will launch the voluntary Vulnerability Commitment with the industry in 2020, based on the findings from a 2019 independent review. This independently monitored code of conduct will further improve the standards of support for vulnerable households and shows that suppliers are willing to go above and beyond to protect customers.

2019 saw £770m being spent on Warm Home Discount (£347m) and via the Energy Company Obligation (ECO) (£421m) to support fuel poor customers through rebates and energy efficiency measures[12]. The 221,000 ECO measures[13] installed will bring 13 MtCO2 of carbon savings and save £2bn on customer bills over the lifetime of the measures.

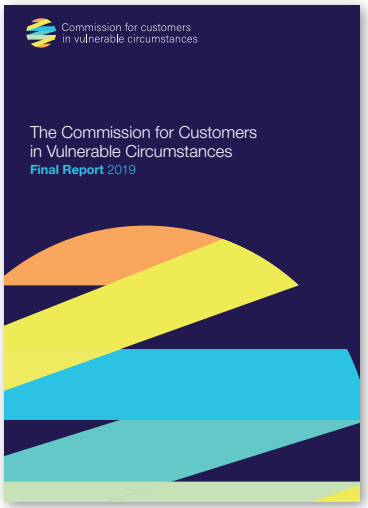
Energy suppliers also installed 4.5 million smart meters, meaning that 37% of all meters across domestic and non-domestic premises are now smart[14]. Smart meters are vital for keeping bills down while transitioning to a smarter and more flexible energy system.

Looking ahead however, we know that the scale of deployment of energy efficiency, low carbon heat and smart technologies to move to much bigger scale if we are to reach net zero by 2050.

[10] Ofgem (2020) Supplier complaints performance – All suppliers
[11] Ofgem (2020) Consumer Survey 2019
[12] WHD based on target spending for scheme year, ECO based on actual costs for 2019
[13] BEIS (2020) Household Energy Efficiency Statistics
[14] BEIS (2020) Smart meter statistics



Source: Gemserv



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78% satisfied customers

"Over three quarters of domestic customers were satisfied with their supplier."

Investment challenge to net zero by 2050

The UK's net zero ambition requires significant investment and efforts across the economy, including sectors where progress to date has been limited, such as buildings and transport.

With the right mechanisms in place to attract investment, the power sector can enable decarbonisation in these sectors, through energy efficiency and new technologies, all underpinned by strong carbon pricing.

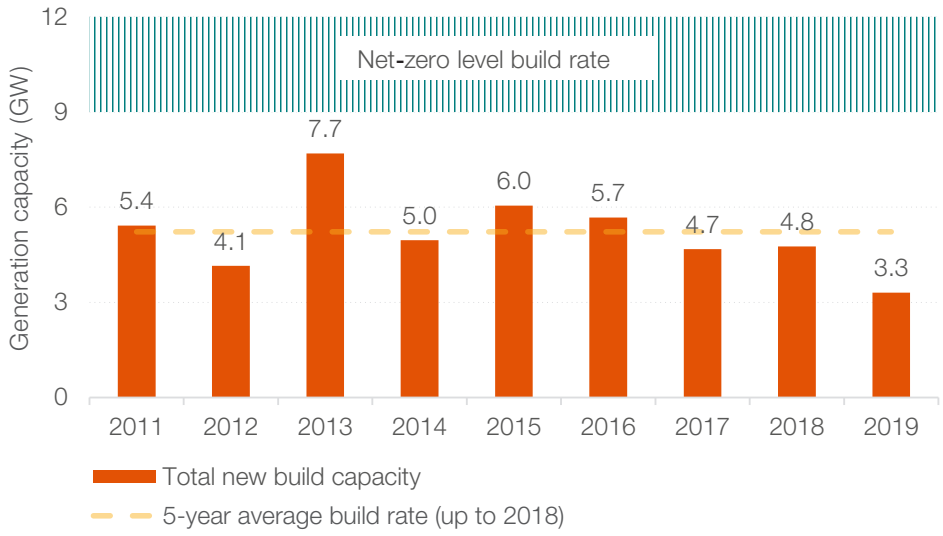
Reaching net zero in power

A greater degree of electrification will mean that power demand may double by 2050 with low carbon generation set to quadruple[15], requiring average build rates of 9-12 GW per year through to 2050 (see graph). In money terms, the CCC estimated this to require an annual capital expenditure of £20bn for the power sector alone[16], almost double the current level.

We will need to continue to build on the success of the CfD scheme by taking forward an ambitious programme and publishing an overall procurement strategy, at least out to 2030. The Government in its Manifesto has already committed to deploying 40 GW of offshore wind by 2030, 10 GW more than planned in the Offshore Wind Sector deal.

Energy UK's call for the CfD to be technology neutral to include all low carbon technologies has been recognised with the reinstatement of solar and onshore wind. Both of these technologies boast significant capacity in the pipeline, which will be able to compete in the 2021 CfD allocation round.

Annual power generation capacity build rates versus net-zero target, 2011-2019



Source: LCP and BEIS

Net zero by 2050

"We will need to continue to build on the success of the CfD scheme by taking forward an ambitious programme and publishing an overall procurement strategy, at least out to 2030."

[15] See the CCC and National Grid's FES series for various scenarios

[16] CCC (2019) Net Zero – Technical Report

[17] BEIS (2020) Renewable Energy Planning Database

Recommendation for a successful clean energy transition

2. An increase in private investment in net zero businesses and innovation.

Alongside the CfD, the Capacity Market will continue to be needed to secure flexible power generation and demand side response to support a greater power demand and greater intermittency in the UK's power generation mix.

The latest T-4 auction which procured 1.8 GW of new build generation capacity[18], mainly in the form of closed-cycle gas turbines and peaking reciprocating engines, will fulfil this need while continuing to enhance security of supply as older and less efficient power capacity continues to retire.

Bringing in the low carbon technologies of tomorrow

The energy sector will continue to play a key role in our decarbonisation journey and can support the economy and other sectors through the development of new low carbon industries.

With emissions from industry accounting for 21% of total UK emissions[19], decarbonising industrial clusters is another essential part of the net zero jigsaw which requires transformation and reinvention at scale. The deployment of removal technologies such as Carbon, Capture, Usage and Storage (CCUS) and Bio Energy Carbon Capture and Storage (BECCS) can allow this to happen and bring carbon neutrality, but also new growth and jobs in low carbon industries.

While Energy UK welcomes the £800m funding for CCUS in the March 2020 budget, we believe that much more needs to happen now. Government needs to develop a hydrogen strategy and funding models for efficient investment in flexibility systems and strategic large-scale projects, such as CCUS, BECCS, low carbon hydrogen and new nuclear, where they deliver the lowest system costs for customers.

H_2O
CCUS
Nuclear

> "...develop a hydrogen strategy and funding models for efficient investment in flexibility systems and strategic large-scale projects."

[18] National Grid ESO (2020) Capacity Market Registers, de-rated capacities

[19] CCC (2020) Reducing UK emissions: 2020 Progress Report to Parliament

Back to Contents page

Investment for customers

Decarbonising buildings and heat

Emissions from buildings account for 18% of the UK's total emissions[20] and the scale of progress to date is inadequate in a net zero context. But, while the decarbonisation of buildings and heat remains one of the main challenges of our journey to net zero, it can also play a crucial role to support a low carbon economic recovery. There is however a need to review existing policy and regulatory frameworks to ensure this transformation of our building stock is done in the most cost efficient manner for customers.

Energy UK welcomes the recently announced £2bn Green Homes Grant scheme for retrofits, however more is needed over a longer period and the Government must act on the £9bn committed in their Manifesto. This should form the backbone for a national energy efficiency program targeting customers in vulnerable circumstances, while also incentivising the able-to-pay market. Tighter minimum standards should also be progressively implemented, by restricting the sale or rental of properties below an Energy Performance Certificate (EPC) C standard from 2030 (or no later than 2035).

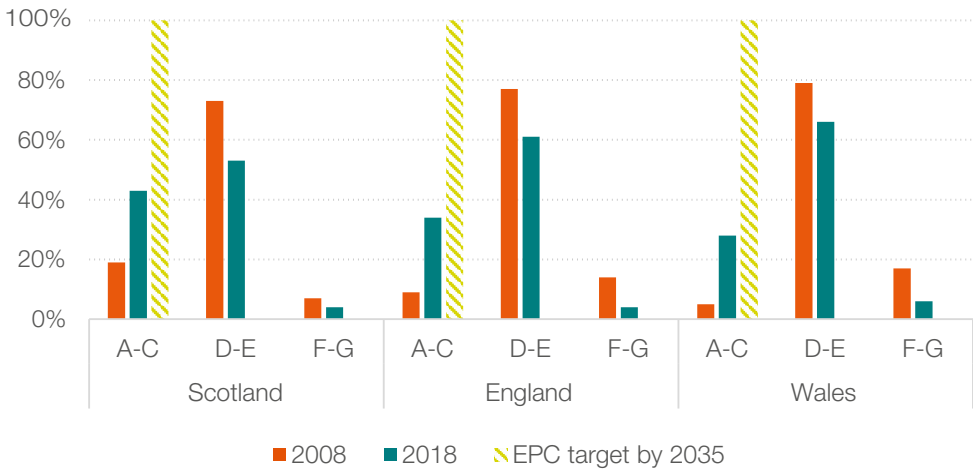
Energy UK is also working on a Heat Sector Deal, a partnership between the Government and Industry to form a strong regulatory and financial support framework for the heat sector and complement the £270m Green Heat Network Fund and Clean Heat Grants announced in the March 2020 budget.

The Heat Sector Deal includes the ambition of having one million heat pumps installed by 2025, a huge increase from the less than 50,000 heat pumps installed under the Renewable Heat Incentive since 2014[21]. This could create significant economic opportunities and support a low carbon recovery.

Recommendation for a successful clean energy transition

3. A well-funded and centralised retrofit programme for buildings that covers energy efficiency, heat, and microgeneration.

Energy efficiency rating bands in Scotland, England and Wales, 2008 and 2018



Source: English Housing Survey for England, Scottish House Condition Surveys for Scotland and Welsh Housing Conditions Survey for Wales.

Note: 2018 energy efficiency ratings refer to 2017/18 for Wales. SAP 2012 used for all ratings except SAP 2005 used for Scotland in 2008.

[20] CCC (2020) Reducing UK emissions: 2020 Progress Report to Parliament

[21] BEIS (2020) RHI monthly deployment data

Back to Contents page

Recommendation for a successful clean energy transition

4. A rapid decarbonisation of transport, with new incentives for EV use (by fleets and individuals).

Make the switch to electric vehicles happen

Surface transport accounts for 24% of the UK's total emissions[22]. At the end of 2019 there were approximately 275,000 electric vehicles (EVs) registered in the UK, a 38% increase from 2018[23]. A clear trend of 2019 was the move away from plug-in hybrids to pure battery electric vehicles (BEVs), BEVs representing 52% of all new EVs registered compared to 27% in 2018[24].

With the lockdown, the first half of 2020 was extremely challenging for the automotive industry, with new car registrations declining by 49% compared to the first half of 2019. However, BEVs showed resilience as registrations increased by 159% in the same period compared to 2019.

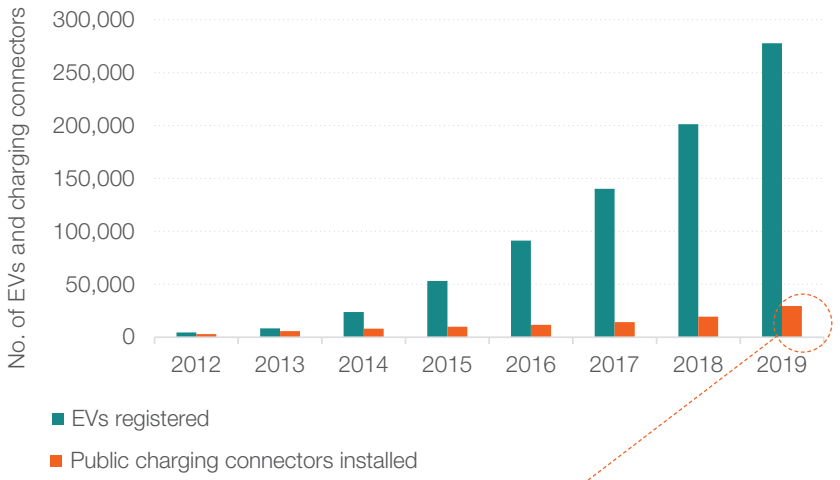
To accelerate the decarbonisation of surface transport, Energy UK calls for the phase-out date for internal combustion engine vehicles to be brought forward from 2040 to 2030. This would need to be backed by appropriate support and clear signals to be credible. There is considerable scope to strengthen the appeal of EVs through better coordinated incentives and vehicle taxation.

In terms of EV charging infrastructure, the CCC estimates that 200,000 rapid charging devices will be needed by 2050, from 6,212 in 2019. Overall, there were nearly 30,000 public charging connectors at the end of 2019, a 52% increase from 2018.

Energy UK welcomed the £500m of support for fast chargers in England announced in the March 2020 Budget, which should be rolled out without delay and be coordinated with the Scottish and Welsh governments to ensure a coherent approach across Great Britain.

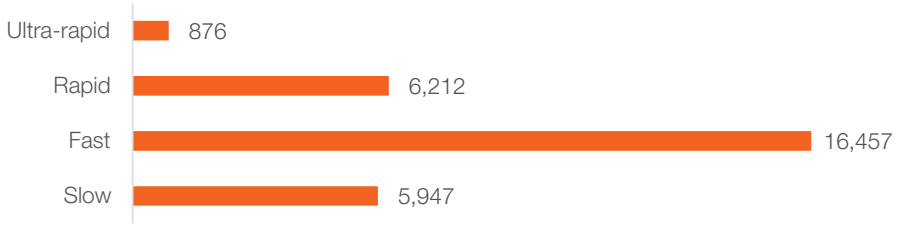
Intervention where it is not currently commercially viable to deploy charging infrastructure should be considered more widely, for instance for on-street charging.

Cumulative number of EVs registered and EV charging connectors installed in the UK, 2012-2019



Source: Zap-Map and OLEV

Number of installed public charging connectors in the UK, as of 2019



Source: Zap-Map and OLEV

[22] CCC (2020) Reducing UK emissions: 2020 Progress Report to Parliament
[23] DfT (2020) All vehicles Incl. battery electric, plug-in hybrids and hydrogen fuel cell vehicles
[24] SMMT (2020) December 2019 – EV registrations

Back to Contents page

Recommendation for a successful clean energy transition

5. A smart, flexible energy system, fit for future energy sources and user needs.

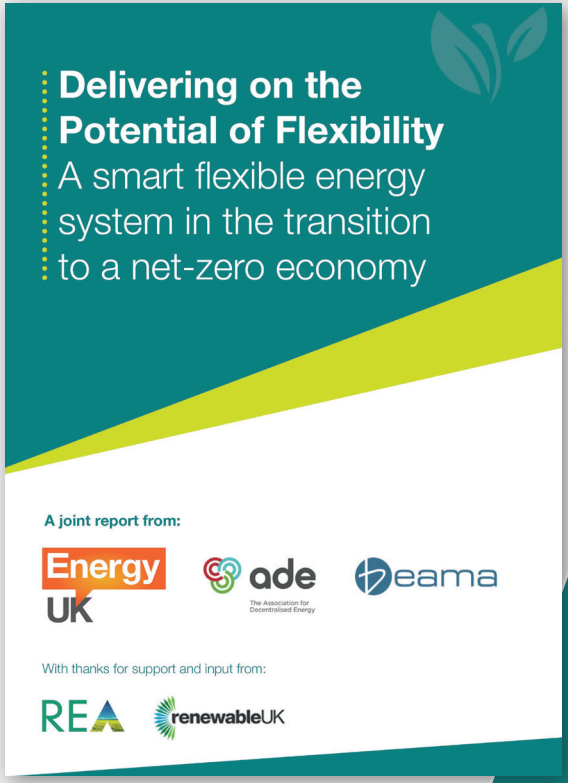
A smart, flexible low carbon system

Investment in flexibility can play a pivotal role in supporting wider deployments of renewable power generation and enable deeper decarbonisation at lower costs. Integrating technologies including Demand Side Response (DSR) and energy storage could lower costs by £3-8bn per year by 2030 and £16bn per year by 2050[25].

Our report on flexibility, launched in February this year, evaluated progress made in developing market mechanisms to enable a smart flexible energy system that delivers at lowest cost to consumers. Energy UK identified some of the barriers, such as the lack of strong investment signals for flexibility services and the lack of market confidence in fair competition, which need to be addressed.

Stable market mechanisms are needed to develop the investment case for flexibility as early as possible to ensure the system is fit to support higher levels of electrification and the transition to net zero. One such example is the integration of low carbon transport: with the right framework and mechanisms in place, EVs have the potential to add up to 38 GW of flexibility by 2050 via vehicle-to-grid (V2G) technology, significantly reducing system costs[26].

Smart controls and time of use tariffs can also transform transport and heating assets into flexibility assets. Smart meters are an enabling technology that can bring down costs and improve services for customers. To also support jobs during the economic recovery, the Government must work on a new approach to bring forward smart meter installation work. This includes working with industry and customers to make smart meter the default option when installing or changing a meter, mandate installations in non-domestic premises and promote time-of-use price signals.



Click image to view report

[25] CCC (2019) Net Zero Technical Report
[26] National Grid (2020) Future Energy Scenarios 2020

Meeting the skills of today and tomorrow in energy

Meeting the skills of today and tomorrow in energy

Employment in Energy

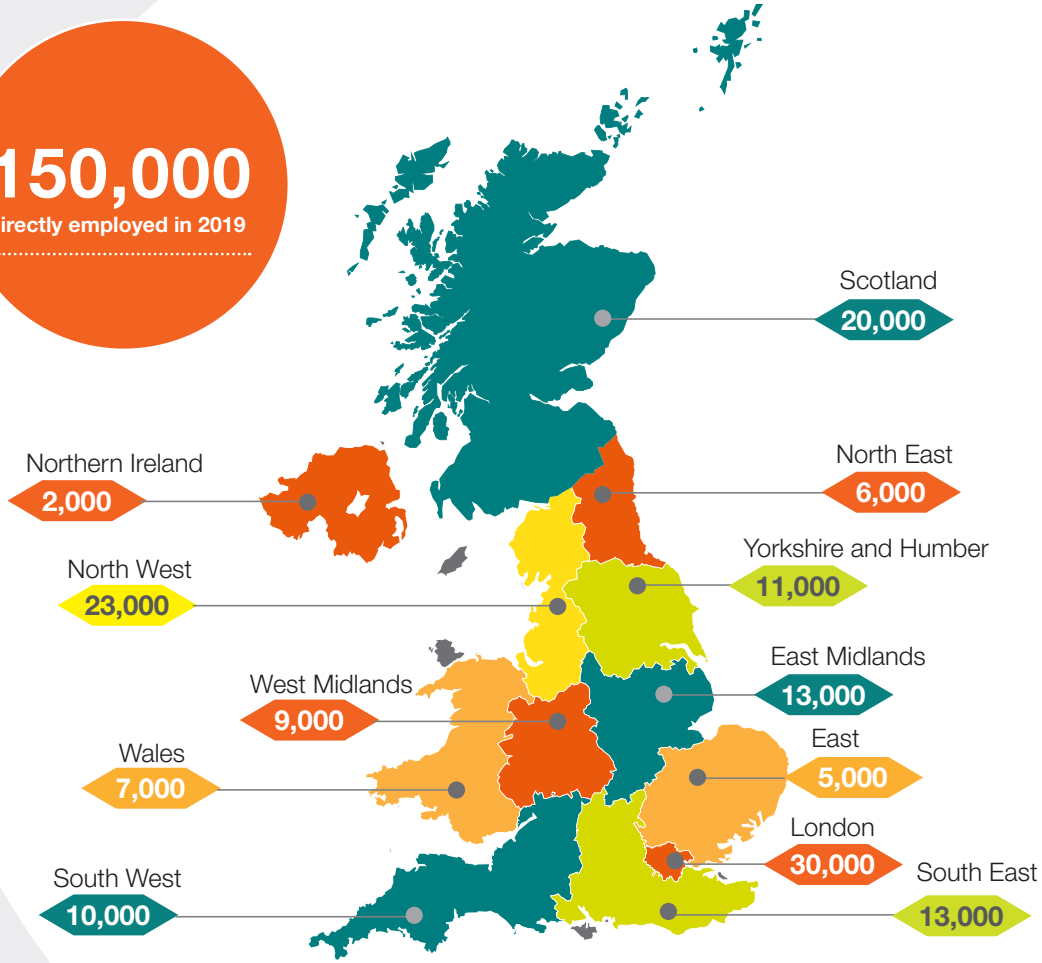
The energy sector continues to be a significant employer within the economy. The sector employed 150,000 people directly in 2019, a 1% increase on 2018[27].

Employment multiplier effects of the power sector are significant (in the top four across all sectors) and together with the gas sector contributed to a further 588,000 employed indirectly through supply chains and related activities[28].

With 738,000 jobs supported in 2019, the energy sector employed one in 49 people directly and indirectly[29].

Broken down by sub-sector, power generation employed approximately 26% of total direct employment within the sector, power and gas transmission and distribution around 50% and trade of power and gas around 22%[30].

Other sectors and industries, such as manufacturing and construction are now also direct employers in the low carbon and renewable energy economy. Overall, the low carbon economy employs around 225,000 workers directly, covering a wider range of activities such as heat, CCUS, EVs and energy efficiency. The latter employs 154,000 workers while 32,500 people work in low carbon electricity and bioenergy and 7,500 in low carbon heat[31].



Source: ONS, figures do not sum to 150,000 due to rounding.

738,000 jobs supported

"...the energy sector employed **one in 49** people directly and indirectly."

[27] ONS (2020) JOBS05 – Electricity, gas, steam and air conditioning, excludes upstream
[28] Out of the total number employed in the UK
[29] ONS (2019) Type I employment multipliers, weighted by direct employment (power and gas)
[30] ONS (2019) Business Register and Employment Survey (BRES) – 2018 estimates
[31] ONS (2020) Low carbon and renewable energy economy – 2018 estimates

Back to Contents page

Diversity and inclusion within the energy sector

Utilising a membership spanning the broad spectrum of the sector, Energy UK continues to promote diversity and inclusion to attract all the talents we need to deliver on our net zero mission.

In 2019, the median gender pay gap for full-time energy workers was at 17.5%, a substantial improvement from ten years ago when the gap stood at 34.3%[32]. However, this is still much higher than the average across all sectors in the UK at 8.9%.

Female share of all workforce within the energy sector remains relatively constant at around 26% in 2019[33]. This partly stems from the lack of diversity in the field of engineering studies (see infographic). Even though this is not an energy specific problem, this is one that the sector needs to solve to ensure we have a diverse workforce.

In September 2019, Energy UK hosted our first 'Inclusion and Diversity in Energy' conference. It provided a platform to discuss how to build a diverse workforce for the energy transition and how to create a more inclusive workplace.

Alongside our Diversity Forum, Pride in Energy, our network for Lesbian, Gay, Bisexual and Transgender (LGBT+) members of the energy industry and their allies continues to provide a safe space to discuss LGBT+ issues.

It is also good to see that both the Nuclear and Offshore Wind Sector Deals have commitments towards diversity with specific targets of 40% of women in nuclear by 2030[34] and an increase from 5% of Black, Asian and Ethnic Minorities currently to 9% by 2030[35] in the Offshore Wind sector.

In 2019, **women accounted for only:**

22% of 37,000 **A level physics students.**

8% of all **STEM apprentices**

and just over

15% of 42,000 **engineering and technology undergraduates.**

Source: National Grid (2020) Building the net zero energy workforce.

PRIDE IN ENERGY

Energy UK & EQUALITY DIVERSITY Forum

[32] ONS (2019) Gender pay gap
[33] ONS (2020) Workforce jobs by industry (SIC 2007) and sex - unadjusted
[34] Nuclear Sector Deal
[35] Offshore Wind Sector Deal

Back to Contents page

Skills and jobs gap to net zero in 2050

A low carbon workforce

By focussing on delivering net zero, the Government can create a vision and pathway for job creation needed for economic growth and the transition to 2050. Hundreds of thousands of jobs can be created directly in low carbon industries and indirectly in their associated supply chains by developing them domestically.

The launch of the Green Homes Grant in September with a focus on low income households is expected to create 100,000 jobs[36], but many more jobs could be created with a government-backed, national energy efficiency programme where every £1 spent on energy efficiency could increase GDP by £3.20[37].

Energy & Utility Skills identified that 277,000 vacancies will need to be recruited or retrained in energy and utilities in the next decade, to replace an ageing workforce and meet net zero ambitions[38]. 117,000 posts within the broader energy sector alone would need to be filled over the next ten years, with half of them being completely new posts, e.g. building and operating new power generation plants, doing energy efficiency improvements and upgrading smart, transport, power and gas network infrastructure[39].

Government needs to work with industry to develop training and reskilling programmes across the country to ensure the sector attract the workforce it needs during the transition. This will require a mapping and matching exercise of current skills and jobs versus future skills and jobs in a low carbon world to identify gaps that need to be filled.

277,000
vacancies

> “277,000 vacancies will need to be recruited or retrained in energy and utilities in the next decade, to replace an ageing workforce and meet net zero ambitions.”

> “Government needs to work with industry to develop training and reskilling programmes across the country to ensure the sector attract the workforce it needs during the transition.”

[36] HMT (2020) A plan for Jobs 2020
[37] UK Parliament (2017) Future Energy Efficiency Policy
[38] Energy & Utility Skills (2020) Workforce Renewal and Skills Strategy 2020
[39] National Grid (2020) Building the Net Zero energy workforce

Back to Contents page

Attracting and retaining talents

To attract new talent to the sector, many of Energy UK members have developed internships, apprenticeship and training schemes for those wishing to learn their trade in the field, as well as industrial and graduate placements for graduates, in areas such as civil engineering, R&D, data and digitalisation, human resources or supply chain. Some work directly with universities and schools in their communities to attract local talents.

Forums such as Energy UK's Young Energy Professionals (YEP) also help to showcase the industry and reach out to young people. The YEP Forum is a network of around 1,500 people, with representation spanning over 340 different companies. It brings together those considering a career in energy with those already working in industry, offering the opportunity to broaden their knowledge, share development successes and network with peers.

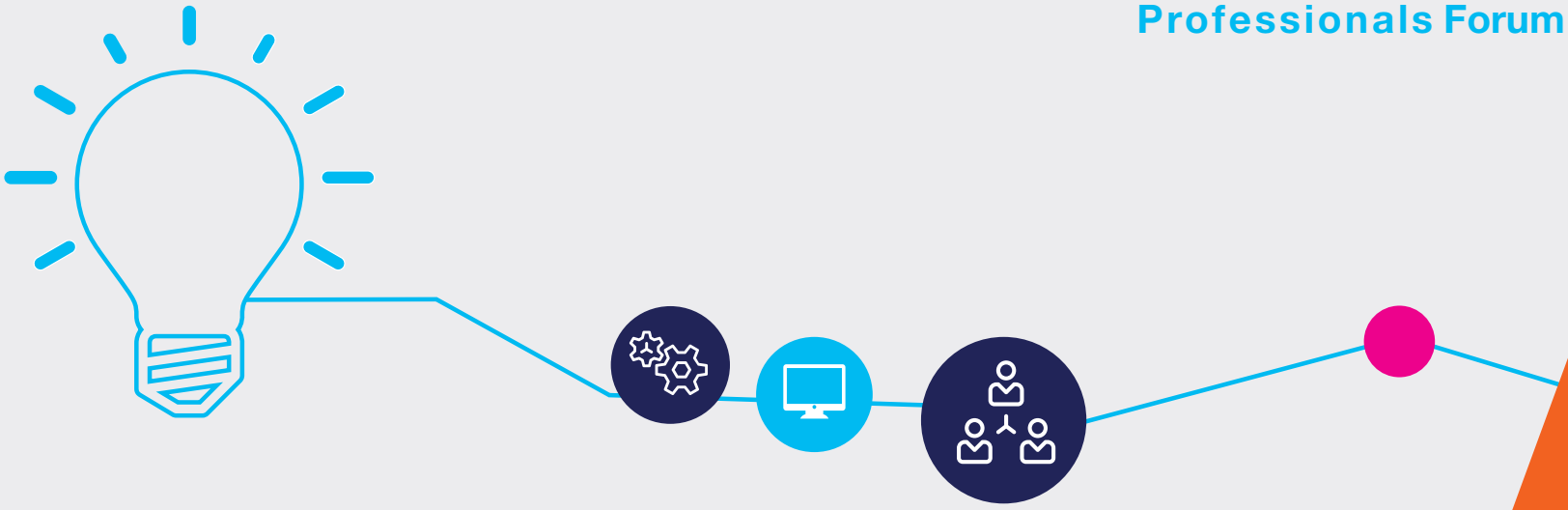
The sector will continue to work with the government to address the key challenges faced by the sector today in a net zero context, such as constricted labour markets and evolution of jobs, promoting workforce diversity, inclusion and overall attraction of the sector and doing targeted training and retraining to meet net zero labour requirements.

"Forums such as Energy UK's Young Energy Professionals (YEP) also help to showcase the industry and reach out to young people."

Energy UK

YEP

Young Energy Professionals Forum



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Back to Contents page

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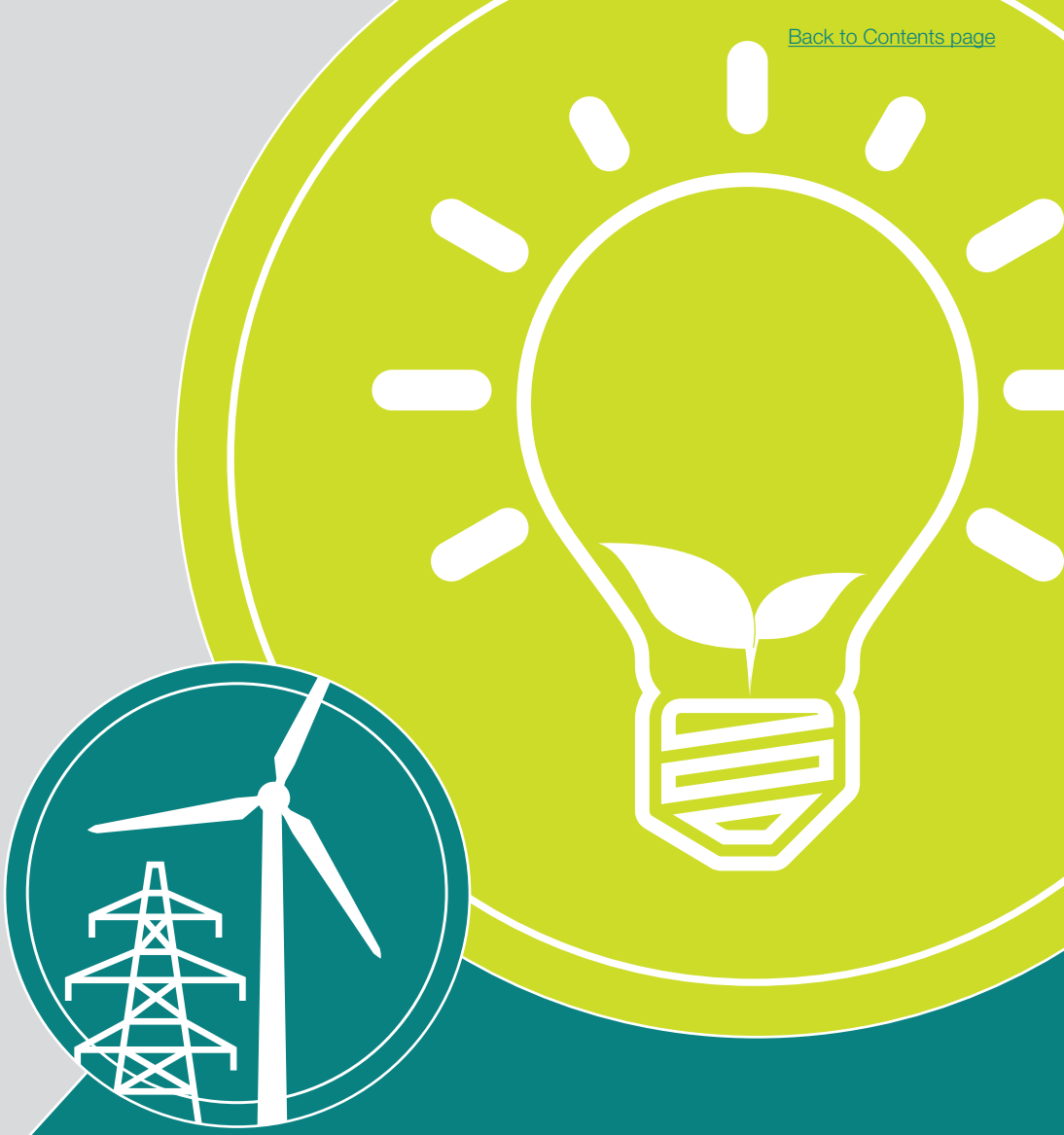

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