



A SUSTAINABLE
FUTURE
FOR UK
ENERGY



A sustainable future for UK energy



The energy sector is in the midst of a radical transition. Major technological developments are dramatically changing the way we produce, store, and consume energy, and offer the promise of decentralised systems of energy production.

Opportunities abound for those countries willing and able to take advantage of market openings in cutting edge fields such as battery storage and renewable generation technologies. But is the UK positioned to seize these opportunities, and is UK energy policy working to further our collective goal of a secure, affordable, and decarbonised energy system?

The signs are not encouraging. The privatised market system introduced in the late 1980s has ensured steady profits for the big energy companies, but often at the expense of adequate investment in new infrastructure, new technology, and in critical skills. At the same time, the UK's recent record on energy R&D is not good. After a surge of primarily nuclear-related energy R&D spending in the 1970s and early 1980s, UK energy research spending stagnated for more than two decades. A recent recovery has still not brought us back to 1970s levels, despite the challenges and opportunities we face.

What is urgently needed is a holistic, scientifically-informed, long-term vision for the UK energy sector, one which avoids ideological dogma and is instead motivated by a drive to meet our climate obligations while developing a green industrial strategy that can deliver high quality, high-skilled jobs and usher in a new era of sustainable economic prosperity.

Mike Clancy

Mike Clancy, Prospect general secretary

A SECTOR IN TRANSFORMATION

Both UK electricity consumption and carbon emissions have been falling in recent years, driven by increased energy efficiency, the growth of renewable energy, and the decline of coal.

But progress has started to stall and consumption has been static over the last three years, while progress on emissions reductions has slowed significantly. If ambitious, and legally mandated targets for cutting carbon emissions are to be met, much more concerted action is needed. The government has already admitted that we are on track to miss targets for the end of the next decade, and the Committee on Climate Change has identified a major policy gap.

The CCC believes that emissions from the power sector need to fall by 65% between 2016 and 2030 which would require a truly radical change in the way we produce and consume electricity, and can only be achieved with concerted policy action from government.

Renewables are key to meeting our environmental goals, but increasing the use of wind and solar, whose output varies with the weather, poses challenges for grid stability and energy security



GREEN POWER

The introduction of low-carbon forms of energy production has accelerated exponentially and renewables and other low carbon generation now account for nearly half of electricity production in the UK, double the level just 10 years ago.

The expansion of renewables has been particularly dramatic, and in the last five years alone wind and bioenergy generation has roughly doubled, while solar has increased nearly seven-fold.

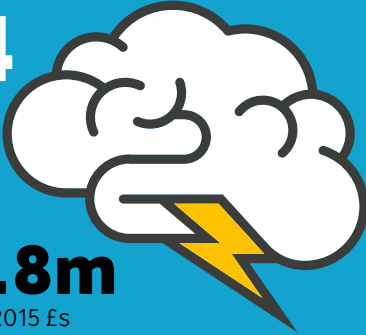
But, as impressive as this growth has been, the expansion of renewable generation needs to accelerate further if decarbonisation goals are to be met. Yet progress is starting to stall, largely due to the lack of a coordinated and long-term approach to energy policy.

Renewables are key to meeting our environmental goals, but increasing the use of wind and solar, whose output varies with the weather, poses challenges for grid stability and energy security. These challenges can be overcome, partly by building a smarter and more flexible electricity grid, but require sustained investment and proper planning.

The gains to be made from supporting the greater use of renewable generation are not just environmental. With the right support from government, including an industrial strategy for green technology, the renewables sector presents significant opportunities for job growth and the export of high tech goods and services. Offshore wind alone is forecast to create more than 10,000 new jobs over the next decade, many of them in high-skill engineering and science fields.

ENERGY R&D real UK spending

1974



£806.8m

In real terms at 2015 £s

2014



£351.3m

Down on 1974 by 43.54%

UK CO₂ EMISSIONS (MtCO₂e)

2005

555.2

MtCO₂e

2015

403.8

MtCO₂e

A reduction on 2005 by 27%

UK ELECTRICITY USAGE (TWh)

2005

357.2 TWh

Total usage

125.7 TWh

Domestic usage

2016

311.1 TWh

Total usage down 13%

107.9 TWh

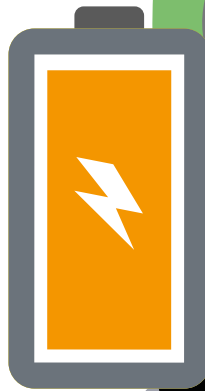
Domestic usage
down 14%

Technologies like battery storage and demand response could underpin new 'smart grids', helping to balance supply and demand more effectively while cutting costs and reducing emissions

A REVOLUTION IN ENERGY TECHNOLOGY

Beyond renewable generation, a host of other new technologies promise further disruption to traditional patterns of generation and consumption. Technologies like battery storage and demand response could underpin new 'smart grids', helping to balance supply and demand more effectively while cutting costs and reducing emissions.

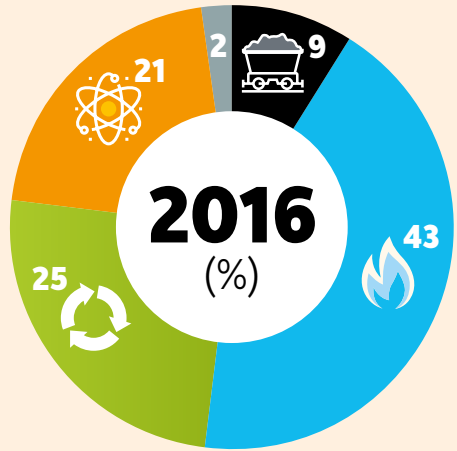
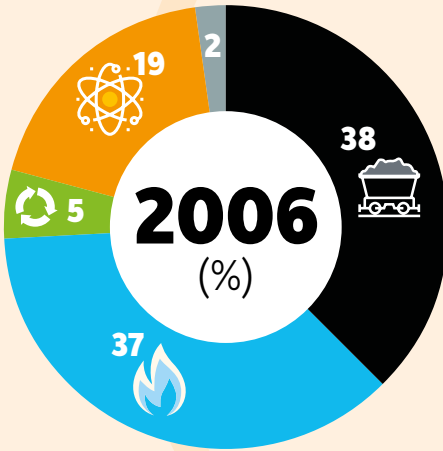
At the same time, other technological and policy developments present major challenges for our existing energy infrastructure, in particular the rise of electric vehicles. With the recent announcement of plans to ban new petrol and diesel cars in the UK by 2040, and forecasts of exponential growth in electric vehicles over the next two decades, our existing network infrastructure will need major investment to cope with the significant extra demand placed upon it.



A WORKFORCE FOR THE FUTURE

The transition to a sustainable and secure energy future will not be possible without the skilled workforce to deliver it. The UK electricity sector currently employs tens of thousands of workers and, with the expansion of renewable energy and the transition to smart grids, current estimates suggest the workforce will need to expand significantly over the next decade. There are also growing concerns that existing workforce levels are too low, with days lost to stress and ill-health increasing as workers feel the strain of chronic understaffing.

UK ELECTRICITY GENERATION



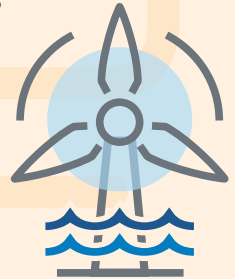
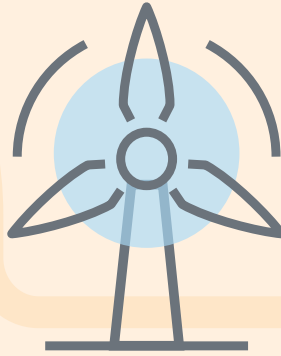
■ Coal ■ Gas ■ Renewables ■ Nuclear ■ Other

RENEWABLES 2016 = 83,225 GWh

Bioenergy
30,043



Onshore wind
20,962



Hydro/marine
5,394



Solar **10,420**

Offshore wind
16,406

FUTURE SKILLS NEEDS FOR UK

Source: Energy & Utilities Skills Partnership

74,000
new hires needed
by 2025



36% of hard-to-fill
vacancies in the
energy & utilities
sector are due to skills shortages

Source: (2015 Employer Skills Survey)

55

**1-in-4 engineers
and technicians in
the power sector
are over 55**

Source: Energy and Utilities
Skills Partnership



But, there are real concerns about the UK labour market's capacity to supply sufficient numbers of skilled workers. More than a third of the existing vacancies in the energy and utilities sector are proving hard to fill because of a lack of qualified candidates, one of the highest rates in the UK economy. At the same time, the UK has an estimated annual shortfall of at least 20,000 graduate engineers.

Compounding these problems is the fact that the existing electricity workforce is aging; one-in-four workers in the sector are aged 55 or over. In order to replace retiring workers and grow to meet new challenges, the sector will need to add thousands of jobs each year over the next decade.

There is an urgent need for a substantial overhaul of skills policy, as our current approach is not delivering the results we need to see. The government needs to adopt a social partnership approach to skills policy and work closely with employers and trade unions to develop effective and inclusive training and workforce development mechanisms, supported by adequate funding where necessary.

Serious action is also needed to improve the diversity and inclusivity of the energy workforce. The utilities sector as a whole has a poor record on diversity; the utilities workforce is 78% male compared to 53% nationally, and only 6% of employees are from a black, Asian or minority ethnic background, compared to 11% nationally.

Given the scale of both the challenges and the opportunities ahead of us, Prospect is proposing six measures that will be key to setting the UK on a path to a secure, affordable, and sustainable energy future

PROSPECT'S SIX STEPS TO A SUSTAINABLE ENERGY FUTURE

1 A balanced, low-carbon energy mix: Prospect has always argued that a balanced mix of generation sources must remain one of the key goals of UK energy policy; the risks to security of supply are too great to allow dependency on a single source of power. At the same time, the increased use of low-carbon energy is essential for meeting our climate goals, and the government must continue to set ambitious targets for renewables, while continuing to explore the feasibility of other low-carbon energy technologies. Nuclear power remains an important element of our low-carbon mix, which is why Prospect has called for *A New Deal for Nuclear* (bit.ly/nuclear-deal) to ensure the future viability of UK nuclear.

2 Leadership and oversight: Energy policy has been plagued by short-term, reactive thinking, and there is a desperate need for a coordinated, considered, and long-term approach to the problems we face. That's why Prospect is calling on the government to urgently establish a new Energy Commission with responsibility for strategic policy oversight and long-

term energy planning. This commission needs to enshrine a social partnership approach to energy policy and include representatives from industry and from organised labour, and have strong input from relevant technical experts. Its remit should include establishing sustainable long-term energy policy objectives and determining the resources and measures needed to achieve them.

3 Action on the workforce crisis: The UK energy industry is facing serious workforce challenges. There is an urgent and growing need for more skilled workers in the sector, but ongoing policy failures around skills and workforce development have left the UK labour market consistently unable to supply sufficient numbers of qualified candidates. At the same time the existing vocational qualifications landscape is confusing and fragmented, and is failing to deliver for both workers and employers. There is also a need to ensure that existing workers are properly valued and provided with the right opportunities to develop their full potential. With this in mind, the government urgently needs to establish



a new national body to provide clarity and strategic oversight to skills policy, and existing sector skills councils need to be reconfigured to include a strong voice for workers in planning and delivering sector-specific skills and workforce development measures.



Addressing market failure and restoring public confidence:

Privatisation has not been a success for consumers or workers. Investment levels are too low, while consumers have lost confidence in energy companies and believe they are being over-charged. The sheer complexity of the regulatory framework has also contributed to public distrust and has made it easier for energy companies to exploit information asymmetries. There is an urgent need for a full, independent assessment of the energy market, with strong input from workers and consumers, and the government needs to consider radical overhaul of the current market model.



Seizing new technological opportunities:

The UK has historically been at the forefront of developments in energy technology, but despite a recent resurgence total real spending on energy R&D is still half the level it was in the early 1980s. The recent announcement of government funding for a new battery institute is welcome, but much more is needed. The government should establish a new public body to plan and coordinate energy research, and commit to directing increased research funding towards the most promising new developments. This needs to be linked with an industrial strategy that can allow the UK to take full advantage of market openings to commercially develop new technologies.



Preparing for life outside the

EU: A hard Brexit could undermine critical energy relationships with Europe, particularly the UK's involvement in the EU's Internal Energy Market and Euratom. Our ability to maintain security of supply risks being undermined if we cannot participate freely in European energy markets, and our entire civil nuclear programme risks derailment if we leave Euratom without a clear and credible alternative in place. Access to skilled EU labour has been critical for meeting essential skills shortfalls, while participation in EU research networks has resulted in the UK being a net recipient of EU research funding. The Brexit negotiations must make energy issues a priority, and the government must secure a sensible deal that preserves our key energy relationships with Europe.

**Prospect
is the largest union
for energy specialists,
managers and professionals**

**We are calling on the government
and policy makers to meet
our climate obligations while
developing a green industrial
strategy that can deliver high
quality, high-skilled jobs
and usher in a new
era of sustainable
economic
prosperity.**



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