



# **Powering ahead:**

## **How UK industry can match Europe's environmental leaders**

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### Section one

# Introduction

The global climate is changing. Despite the existence of an occasional sceptic, mainstream opinion accepts that the planet is getting warmer. Many believe that addressing climate change will be the world's most pressing challenge in the twenty-first century.

According to the UK's Committee on Climate Change, sea levels have risen by about 20 centimetres since the end of the nineteenth century. Retreating glaciers and arctic ice, and shifting distributions of species, are consistent with a warming world. The main cause of the changing global climate is emissions of greenhouse gases from human activities. And while scientific knowledge of the climate system is incomplete, the Committee on Climate Change argues it is clear that continued emissions will lead to further warming<sup>1</sup>.

So far, so straightforward. However, some take the view that we cannot afford to focus on green issues at a time of economic insecurity. The UK's decision to leave the European Union has led to short-term fears, and at least short to medium-term uncertainty, about the prospects for the UK economy. This, it could be argued, is a time for retreating into a safety-first mentality. The sustainability agenda, according to such a view, is a luxury that we simply cannot afford.

There are two main problems with this argument. First, the suggestion that economic growth and climate change is a zero sum game was firmly challenged by the 2006 report, 'The Stern Review on the Economics of Climate Change'. In this report, Lord Stern said: "Stabilisation – at whatever level – requires that annual emissions be brought down to the level that balances the earth's natural capacity to remove greenhouse gases from the atmosphere. The longer emissions remain above this level, the higher the final stabilisation level. In the long term, annual global emissions will need to be... more than 80 per cent below the absolute level of current annual emissions."<sup>2</sup>

Lord Stern accepted that a central estimate of stabilisation will cost, on average, around one per cent of global GDP by 2050. There is, however, an even higher price to delay, which would make it necessary to accept both more climate change and, eventually, higher mitigation costs. Lord Stern added that climate change mitigation will provide new opportunities across a range of industries, with markets for low-carbon energy products likely to be worth at least \$500bn per year by 2050.

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<sup>1</sup> 'Reducing emissions and preparing for climate change: 2015 progress report to Parliament – Summary and Recommendations', Committee on Climate Change, June 2015.

<sup>2</sup> 'Stern Review on the Economics of Climate Change', HM Treasury, October 2006.

Second, the TUC believes that a sustainable industrial strategy is essential for the UK and for Europe, not only to meet our climate change commitments, but to support the balanced economic growth that is even more necessary post-Brexit. The Intergovernmental Panel on Climate Change argues that in order to avoid damaging global warming, European use of fossil fuels must be reduced by approximately three to four per cent annually for the rest of this century. That is simply not possible without a green industrial strategy.

This paper will explore the recent history of sustainable industrial policies. There was not one single moment when the threat of global warming stopped being the concern of a committed minority and became widely accepted. However, milestones – such as the success of the Green Party in the UK in elections to the European Parliament in 1999, the Red-Green Coalition in Germany in 2000, the Stern Review of October 2006, which helped shape the thinking of UK governments under first Tony Blair and then Gordon Brown, and the Climate Change Act introduced by Ed Miliband, will briefly be revisited.

The paper will focus on the UK, Germany and Denmark, the latter being countries where the idea of sustainability has particularly taken root and which have undertaken a systematic programme of moving to green energy. ‘Energiewende’ (energy transition) is allowing Germany to become a world leader in environmental technology. Denmark has pioneered the use and potential of wind power, and seeks to be free of fossil fuels by 2050. This paper gathers new evidence from German and Danish trade unionists who, through those countries’ systems of trade union engagement, have had a major influence on policy development. A chapter setting out conclusions and recommendations, based on the evidence gathered, will round off the report.

Before continuing, one note of caution needs to be added. Different countries have different assessments of how a sustainable industrial policy should be fashioned. Some concepts being pursued in the UK, including Carbon Capture and Storage technology, are rejected in Germany. A central pillar of ‘energiewende’ is its rejection of nuclear power, a source of fuel that has never been used in Denmark. Successive UK governments, however, have embraced nuclear power, so the idea is not to develop a ‘one size fits all’ approach; it is to highlight the power of government in driving green transformation and to consider how trade unions can and do support such a revolution in thinking.

### Section two

# Summary of recommendations

- Advocates for a sustainable industrial strategy should seek to build a consensus across political parties, business organisations and trade unions, in favour of this approach.
- Emerging from this consensus, interested parties must develop a roadmap to develop a sustainable industrial strategy. This industrial strategy should be 'sustainable' in the sense that it balances economic, social and environmental concerns. HM Treasury and the Department for Business, Energy and Industrial Strategy (BEIS) must pull together to make the new industrial strategy a reality. A restructuring of government should be considered to bring this about.
- Support must continue for the development of Hinkley Point C, but the future of nuclear energy, including the commissioning of new nuclear reactors, cannot be pursued as Hinkley has been pursued. In future, the government should produce a comparative study of nuclear technologies, including small modular reactors, and make decisions according to viability and price.
- The government should aim for 50 per cent of the UK's energy coming from renewable sources by 2050.
- Cuts to renewable energy subsidies, undertaken shortly after the 2015 General Election, should be reversed. Specifically, these include:
  - the subsidy for biomass conversions and co-firing projects for the duration of the Renewable Obligation (RO)
  - subsidies for solar photovoltaics of 5MW and below under the RO
  - changes to the preliminary accreditation rules under the Feed-In Tariff (FIT) scheme.
- Central to the sustainable industrial strategy should be a study into the technologies that the UK would need to bring us up to 50 per cent of renewable energy and what industries could be developed in the UK. Those new industrial sectors should be targeted on those communities that lost their livelihoods with the demise of heavy industry.
- Government should put together an international consortium to finance a Carbon Capture and Storage demonstration project.
- The UK should continue to support the UK's gas sector, but should seek to minimise its reliance on imported gas.

- The UK offshore wind sector is highly successful, but needs to deliver more UK content. Any new trade agreement between the UK and EU must include social clauses similar to those enshrined in EU procurement directives to support jobs and skills in this sector.
- The US government has set up the Advanced Research Projects Agency-Energy (ARPA-E), which is supporting pioneering work in renewable energy, including battery technology. The UK must consider developing a similar structure here, if this work cannot be undertaken by an existing agency.
- The Institute for Apprenticeships, to be established shortly, should adopt the principles of social partnership to agree high quality apprenticeship standards. This body could also plan for apprenticeship provision to meet the needs of a sustainable industrial policy.
- Privatisation of the Green Investment Bank should be halted. The GIB should, instead, be given additional borrowing powers while remaining in public hands.
- Energy transition should be paid for out of general taxation, to avoid the increased short-to medium-term costs of transition adding to already unacceptable levels of fuel poverty in the UK.
- Government should set up a competition for companies and universities, working jointly, to bid for funds to research solutions to the specific issue of the storage of renewable energy.
- Government support for start-ups, including small-scale energy companies, should be dependent on those companies meeting agreed standards around pay and apprenticeships.

Section three

# The 'greening' of politics and economics in Germany, Denmark and the UK

Environmental issues, what might be called 'green' issues in the politics of today, first came to prominence in their modern sense in the 1970s. It was during this decade that the damage of a warming planet began to be understood. Specifically, an economist at Yale University, William Nordhaus, alluded to the danger of global temperatures rising by more than two degrees above pre-industrial levels, which would "[take] the climate outside of the range of observations which have been made over the last several hundred thousand years."<sup>3</sup>

Yet environmental politics remained the preserve of a small fringe until the 1980s. In the 1983 general election in Germany, the Greens won 27 seats in the Bundestag, the lower house of Parliament. In the 1989 elections to the European Parliament, the Green Party of England and Wales polled 15 per cent of the vote, with 2.3 million votes, the best-ever performance by a Green Party in a nationwide election, anywhere in the world. This gave the Greens the third largest share of the vote, behind the Conservatives and Labour, although the UK's first-past-the-post voting system – since replaced by a proportional system in European elections – meant that it failed to gain a seat in the European Parliament. The Greens' success nevertheless led mainstream political parties to wake up to public concern about the environment.

During these years, environmental sustainability was considered to be at odds with economic growth. Climate scepticism was still a strong feature of public debate, with those doubting the existence of global warming arguing that environmentalism would damage a country's economic prospects for no good reason.

## Denmark

An exception, perhaps, was Denmark, whose energy mix in 1973 – the year of the first oil shock – included more than 90 per cent of its supply based on imported oil. This and a second oil crisis in 1979 led Denmark to shift from oil to coal for electricity production and propose the use of nuclear power to ensure security of supply. This was the start of a proactive energy policy promoted through four energy plans over the following two decades.

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<sup>3</sup> [www.carbonbrief.org/two-degrees-the-history-of-climate-changes-speed-limit](http://www.carbonbrief.org/two-degrees-the-history-of-climate-changes-speed-limit)



Denmark's First Energy Plan, set up in 1976, included only a marginal role for renewable energy. The plan provided financial support for public research, while spreading the costs of that research among all electricity customers. In 1979, Denmark created its own Ministry of Energy. By the early 1980s, several manufacturers were producing wind turbines with a capacity larger than 55kW. Too costly for individuals, the concept of local wind co-operatives developed.

Denmark's Second Energy Plan, established in 1981, included proposals for oil and gas recovery in the North Sea, along with nuclear power, as well as subsidies for the construction and operation of wind turbines and biomass plants. Taxes levied on oil and gas helped increase the competitiveness of renewable energy plants. A large renewable energy market in California created an export opportunity for Danish wind turbine manufacturers. In March 1985, a majority of the members of the Danish Parliament decided to exclude nuclear power from future energy planning. Wind power became accepted as one of the key alternatives to nuclear power.

Denmark's Third Energy Plan, launched in 1990, set a target of reducing Danish CO<sub>2</sub> emissions by 20 per cent between 1988 and 2005. Specific targets included providing 10 per cent of electricity from wind turbines by 2005. In 1992, the Minister of Environment and Energy ordered municipalities to find suitable sites for wind turbines throughout the country. A fixed feed-in tariff for electricity production was introduced in 1993 and decoupled the power purchase price from existing electricity rates. Wind projects received a refund from the Danish carbon tax and a partial refund on the energy tax.

In 1996, Denmark's Fourth Energy Plan (Energi 21) envisaged that renewable energy would provide 35 per cent of all energy by 2030. By 2001, wind turbine co-operatives, which included more than 100,000 families, had installed 86 per cent of all turbines in Denmark. By the turn of the century, Denmark had become a net exporter of energy. In the following years, rising oil prices and an increased awareness of climate change influenced new energy policy guidelines, with higher ambitions for renewable energy production.

In 1999, the new centre-right Danish government decided to liberalise the electricity market by 2002. The Danish government emphasised the need to increase competition in the energy sector and to encourage greater competitiveness in the renewable energy plants. 2004 saw considerable restructuring of Denmark's power supply sector. Power companies were privatised and power distribution, transmission and production became independent sectors, each with distinctive frameworks. Between 2001 and 2008, energy policy developments in Denmark were considered very unambitious. In its energy policy statement of 2008, the Danish government committed to addressing climate change at minimal economic costs and without risking security of energy supply. This included making improvements in the nation's energy efficiency, increasing renewable energy and technological development in the sector.

In 2009, Denmark saw a rejuvenation and strengthening of its wind energy sector. A significant rise in installations was funded by an environmental premium added to

the market price. The grid connection costs for offshore wind farms were financed by electricity consumers. A combination of market price and premiums ensured stable revenues for the producer. At around this time, the repowering of old turbines that were reaching the end of their lifespan became an important part of the national energy market.

### Germany

From 1998 to 2005, Germany was governed by a red-green coalition. A 50-page coalition agreement, 'Awakening and renewal: Germany's way into the twenty-first century', set out the government's political programme. This was based on a selective emphasis on political issues including environmental protection, group rights and gender equality, around which the two parties could find common ground, while ignoring issues such as energy and defence, which divided them.

A central decision of the red-green coalition, however, was the decision to phase out nuclear power in the long term. In pursuit of this policy, the power plants of Stade and Obrigheim were turned off in November 2003 and May 2005 respectively. This was part of the "nuclear consensus" reached with the big utilities. A Renewable Energy Sources Act provided for a tax in support of renewable energy. The German government, declaring climate protection as a key policy issue, announced a carbon dioxide reduction target of 25 per cent by the year 2005 compared to 1990 levels. The opposition Christian Democratic Union (CDU), now led by Angela Merkel, objected to the agreement to phase out nuclear power, calling it a "destruction of national property". Merkel promised that the agreement would be revoked if the CDU came to power.

In 2009, Angela Merkel's CDU, and its Bavarian sister party, the Christian Social Union, won the German elections and formed a coalition with the Free Democrats (FDP). True to their word, the new government extended the operating time by eight years for seven nuclear plants and 14 years for the remaining 10. This became known as the "phase out of the (nuclear) phase out".

In 2011, the Fukushima nuclear disaster in Japan forced a rethink. Like the 1986 Chernobyl accident, it concentrated minds in nuclear-sceptic Germany. Having reversed its planned withdrawal from nuclear power, Germany changed its mind again, committing once more to ending the use of nuclear power, shutting down eight nuclear plants and limiting the operation of the remaining nine until 2022.

This led to the policy of *energiewende*, a term in use since the 1970s but which came to represent the new German energy policy. There are four aspects to *energiewende*: the ending of nuclear power by 2022, a reduction of greenhouse gas emissions by between 80 and 95 per cent by 2050, a growth in the use of renewable energy sources, and increased energy efficiency.

## United Kingdom

As noted above, environmental policy was not a serious consideration for UK politics until after the stunning success of the Green Party in the 1989 European elections. In the years that followed, environmental issues began to gain greater prominence.

In 1993, John Selwyn Gummer became Environment Secretary in the UK. Gummer introduced the Environment Act 1995 and the Landfill Tax. The former set up the Environment Agency and required the Secretary of State to prepare a national air quality strategy and a national waste strategy. The latter was seen as the key mechanism for enabling the UK to meet its targets set out in the Landfill Directive for the landfilling of biodegradable waste. Friends of the Earth described Gummer as “the best Environment Secretary we’ve ever had”. After his ennoblement, John Selwyn Gummer took the title of Lord Deben, and he now chairs the UK’s independent Committee on Climate Change.

In 1996, the European Council of environment ministers became the first political body to support the aim that “global average temperatures should not exceed two degrees above pre-industrial level”. Signing the statement alongside the UK’s John Selwyn Gummer was Germany’s Environment Minister, Angela Merkel, and Denmark’s Svend Auken. The following year, 193 countries signed the world’s first binding agreement to cut emissions – the Kyoto Protocol. The treaty set limits on countries’ emissions, taking into account their historical contribution to climate change and their ability to implement policies, with the aim of cutting global emissions by five per cent on 1990 levels by 2012. Negotiators then spent 10 years trying to persuade countries to ratify the treaty and by 2005, almost 160 countries had done so. The Kyoto Treaty was hamstrung, however, by the absence of the United States, the world’s largest carbon emitter.

2006 saw the Stern Review published by Tony Blair’s Labour government in the UK. This report, commissioned by the Chancellor and reporting to both Chancellor and Prime Minister, began with the words: “the scientific evidence is now overwhelming: climate change presents very serious global risks, and it demands an urgent global response”. This emphasised both the importance of the challenge and the fact that, by the time it was published, arguments against man-made climate change had become diminished. Climate change was described as “a unique challenge for economists”. It was “the greatest and widest-ranging market failure ever seen” and therefore required a global response, with long time horizons<sup>4</sup>.

Lord Stern argued that carbon emissions had already pushed up global temperatures by half a degree Celsius. If no action was taken, there was a more than 75 per cent chance of global temperatures rising between two and three degrees Celsius over the next 50 years and there was a 50 per cent chance that average global temperatures could rise by five degrees Celsius. Environmentally, climate change could result in an increased flood risk from melting glaciers, a decline in crop yields, particularly in Africa, and the extinction of up to 40 per cent of species. Economically, a two to three

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<sup>4</sup> ‘Stern Review on the Economics of Climate Change’, HM Treasury, October 2006.

degree Celsius rise in temperatures could reduce global economic output by three per cent. A five per cent rise in temperatures could see up to 10 per cent of global output lost, with the poorest countries losing more than 10 per cent of their output. To ensure the sustainability of the eco-system, emissions would need to stabilise in the next 20 years and fall between one and three per cent after that. This would cost one per cent of GDP.

More positively, however, Lord Stern emphasised the opportunities that tackling climate change could provide:

“There are ... significant new opportunities across a wide range of industries and services. Markets for low-carbon energy products are likely to be worth at least \$500bn per year by 2050, and perhaps much more. Individual companies and countries should position themselves to take advantage of these opportunities.

“Climate-change policy can help to root out existing inefficiencies. At the company level, implementing climate policies may draw attention to money-saving opportunities. At the economy-wide level, climate-change policy may be a lever for reforming inefficient energy systems and removing distorting energy subsidies, on which governments around the world currently spend around \$25bn a year.

“Policies on climate change can also help to achieve other objectives. These co-benefits can significantly reduce the overall cost to the economy of reducing greenhouse-gas emissions. If climate policy is designed well, it can, for example, contribute to reducing ill-health and mortality from air pollution, and to preserving forests that contain a significant proportion of the world's biodiversity.”

Stern continued:

“Comparing the social costs of carbon on a BAU [business as usual] trajectory and on a path towards stabilisation at 550ppm [parts per million] C02e [equivalent], we estimate the excess of benefits over costs, in net present value terms, from implementing strong mitigation policies this year, shifting the world onto the better path: the net benefits would be in the order of \$2.5 trillion. This figure will increase over time.”

In 2008, the Labour government passed the Climate Change Act. This made it the duty of the Secretary of State for Climate Change, who at that time was Ed Miliband, to ensure that the net UK carbon account for all six Kyoto greenhouse gases for the year 2050 is at least 80 per cent lower than the 1990 baseline. An independent Committee of Climate Change (chaired by Lord Deben, as noted above) was created under the Act to provide advice to the UK government on these targets and related policies.

In 2010, the UK saw no single political party win an overall majority, which resulted in a Conservative-Liberal Democrat coalition government. The Coalition Agreement on which this was based committed the government to a “low carbon and eco-friendly economy”, which would include the establishment of feed-in tariff systems in electricity, the creation of a green investment bank, the establishment of an emissions

performance standard that would prevent coal-fired power stations being built unless they were equipped with sufficient carbon capture and storage (CCS), the establishment of a high speed rail network, the provision of a floor price for carbon, as well as efforts to persuade the EU to move towards full auctioning of Emissions Trading Scheme (ETS) permits, the continuation of the outgoing Labour government's proposals for public sector investment in CCS technology for four coal-fired power stations, and an increase in the target for energy from renewable sources, subject to the advice of the climate change committee. The Coalition Agreement acknowledged differences in the two parties regarding new nuclear construction, allowing new construction to go ahead on the understanding that Liberal Democrats would abstain, rather than vote against, such proposals.

The period between 2010 and 2015 saw tension between the coalition partners over energy policy within the UK government. Two Secretaries of State for Energy, Chris Huhne and Ed Davey, both of whom were Liberal Democrats, pushed for a 52 per cent cut in greenhouse gas emissions by 2025, in line with a recommendation from the Committee on Climate Change, but were resisted by the Conservative-controlled Treasury. In the end, the 52 per cent target stood, but investor confidence was damaged in the process.

By December 2015, at the time of the Paris Climate Conference, David Cameron was leading a majority government in the UK. Cameron joined Angela Merkel, who was still German Chancellor, the Danish Prime Minister, Lars Lokke Rasmussen, and more than 140 other world leaders for the conference. The Paris Agreement united all the world's nations in a single agreement on tackling climate change for the first time in history. The key elements of the Paris Agreement were:

- to keep global temperatures “well below” 2 degrees Celsius above pre-industrial times and “endeavour to limit” them even more, to 1.5 degrees Celsius
- to limit the amount of greenhouse gases emitted by human activity to the same levels that trees, soil and oceans can absorb naturally, beginning at some point between 2050 and 2100
- to review each country's contribution to cutting emissions every five years so they can scale up to the challenge
- for rich countries to help poorer countries by providing “climate finance” to adapt to climate change and switch to renewable energy.

Section four

# Evidence from Germany

## **The beginnings of environmentalism**

As noted in the previous chapter, the concept of environmentalism developed in 1970s Germany, led by green activists and Non-Governmental Organisations (NGOs). Not only were trade unions absent from this coalition, but they were actively opposed to environmental policy.

Ralf Bartels is Head of Mining and Energy Policy at Industriegewerkschaft, Bergbau, Chemie, Energie (IGBCE), the German union federation comprised of workers in the mining, chemical and energy sectors. Ralf told this report: “I was a little boy at the time, but as I learnt, trade unions were quite far away from this debate. It was a real industrialised trade union movement in Germany.... back in the 80s. On the one side of the sometimes physical barricade there were the workers of the energy, for instance, the power plants, and on the other side there was Greenpeace or the upcoming NGOs and it was not a discussion, it was a period of conflict.”

Frederik Moch, who is responsible for energy policy and energy efficiency at the DGB, the German Trade Union Confederation, says the DGB had been a supporter of nuclear phase out since the first decision to end nuclear power, taken by the red-green coalition in 2000. Some German unions, including Verdi and IG Metall, were in favour of this position while others, including IGBCE, were opposed. Ralf Bartels says that it was not until 2006 that the DGB first had an official position recognising man-made climate change. This was not accepted by the union federation as proven science before this time.

The first nuclear phase out decision ended the conflict between pro- and anti-nuclear views. In 2002, the decision to end nuclear power was based on a consensus among the Social Democrats, the Greens, the utilities and the energy supply companies, to exit nuclear by 2021. A 20-year transition period was considered to be manageable and the big conflict of the 1980s and 1990s came to an end.

## **A new energy concept**

In 2010, (i.e. after Angela Merkel’s election but before the Fukushima disaster) the government of Angela Merkel announced a new energy concept. Ralf Bartels told us: “Our (union) president said, ‘OK, fine. Germany needs a new energy concept. The last one is from the 1970s and it means nuclear and coal. We should talk about another one’. But there were no talks. Government didn’t invite trade unions to talk to them. They didn’t invite NGOs to talk with them. All they did was [to invite] the CEOs of the four major energy companies, they told them the best solution to bridge

the gap to a renewable future would be nuclear. So the government in 2010 presented an energy concept with lifetime extension of the German nuclear power plants.”

A meeting of IG BCE works councils believed that existing nuclear plants could not bridge the gap to energy security; the only way to do so would be to build new nuclear capacity. In the event, the Fukushima disaster of nine months later ended the argument. This disaster led to a policy u-turn and the decision, once again, to phase out nuclear. The new energy policy, *Energiewende*, was born shortly afterwards.

Politically, all major German parties now support the energy transition policy. The Social Democrats, the Christian Democrats and the Free Democrats are all in favour. Only the right wing populist party, ‘Alternative für Deutschland’, is opposed.

Both Frederik Moch and Ralf Bartels are clear that the phase out of nuclear power is a German solution, not necessarily a solution that all countries must follow. Frederik says: “We are not suggesting that everyone should follow the German path, as all countries have their own particular strengths.” Ralf adds: “Combating climate change is a global thing, not a national one, and I do understand the [Intergovernmental Panel on Climate Change] saying there are four ways to combat climate change: it’s renewable, it’s energy efficiency, it’s nuclear and it’s carbon capture and storage. Germany decided to quit one of these four... I’m convinced that each society, each national society, has the right to find its own ethical answers... if it is about ethics what about the French? We can’t say they are unethical people because of nuclear power plants. Every society has its own responsibility and its own way to answer this question.”

## **Energiewende**

The four elements of *Energiewende* are:

- ending nuclear power by 2022
- a reduction of greenhouse gas emissions by between 80 and 95 per cent by 2050
- a growth in the use of renewable energy sources
- increased energy efficiency.

The main drivers of *Energiewende* are medium-sized companies and community projects. Most regions in Germany have some kind of renewable energy project. There is less involvement from the large energy utilities.

*Energiewende* has widespread public support and is ambitious in scope. Energy prices have risen in the short to medium term and the cost is falling on consumers. The prize is that in 30 years’ time, Germany will have cheaper and greener energy. This is the vision behind *Energiewende*. According to Ralf Bartels, 91 per cent of the German population support the transition, notwithstanding the higher cost of energy in the immediate term. The DGB believes that, rather than being paid for by energy consumers, the energy transition should be paid from general taxation, which would

## Evidence from Germany

make this a progressive policy, in the sense that richer people would pay for a greater share of the transition.

### Sustainability

Ralf Bartels distinguishes between environmentalism and sustainability: “I prefer talking about sustainable instead of green or ecological. There are three dimensions of sustainability, the ecological one, the social one and the economical one and it’s about bringing them together. If it’s only the ecological dimension then we talk about environmental protection but not about sustainability. If you take the social dimension into account you start talking about justice, you start talking about just development, about conflicts on ... sharing the goods of the society...”

German unions see no conflict between support for energy transition on the one hand and the continuation of energy intensive sectors on the other. Frederik Moch told us: “Electricity prices are structured so that energy intensive industries pay a lower tariff. The DGB supports this decision. If energy intensive industries were forced to shift their production activities abroad this would not only result in a loss of jobs in Germany but it would also be bad for the climate and the environment. The energy intensive sectors are important to the development of a low carbon economy. Builders of wind turbines are the second largest users of steel after the automotive industry. The photovoltaic sector needs chemical products as well as cement. Solar power requires aluminium. The energy transition is not possible without the energy intensive sectors. Regarding other industries, companies such as Volkswagen in Wolfsburg, which can produce its own energy, also pays a lower tariff.”

Ralf Bartels agrees: “My main concern in German industry overall is the steel, is automotive, is chemical, it’s all those sectors who depend on energy because I believe that what made the German industry sustainable even in the crisis of 2008 and 2009 and even competitive against countries with wages like China is the inter-linkage between the sectors in a very special way. “ Ralf continues: “If you have energy prices which will make the steel companies in the Ruhr area abolished I wonder how long the automotive industry...will import steel from China to build the VW in Wolfsburg to send it back to Shanghai. So what I’m convinced of is we need a sustainable development of all sectors and I don’t believe in green and brown companies and winners and losers. I believe in sustainable development of companies...”

### Innovation

Energiewende both promotes innovation and cannot succeed without it. The responsibility for this falls particularly on industrial companies and on working people. Ralf Bartels says: “It’s our members who are in the game. They make the energiewende because an energiewende will need innovations; without it will fail on every level. You can’t have a wind turbine in the North Sea standing storms and



standing wind speed of some 300km/h bringing soil and sand against the propeller which [doesn't] come away after a few days without a very special plastic developed by our colleagues from BASF. You need storage capacities if you want to make wind and solar become really 100% energy sources, storage capacities for two weeks of industrial production, that means new ways of thinking... All those innovations, nearly all of them are made by our members, it's chemical, it's glass, it's ceramics, it's the energy sector itself so our members make it, our members are the ones who bear the main risk because if it fails they lose their jobs..."

### **The role of the utilities**

However, if energiewende is driven by medium sized companies and community projects, what of the big utilities? Sabrina Schulz, Head of the Berlin office of the energy consultancy, E3G, is critical of the way energiewende was introduced as, she says, it caused major problems for the utilities. Sabrina told this report: "There was no master plan, there was no strategy. There was no roadmap. It was just targets: by that stage you would have this many renewables in the energy mix. We have this much less of nuclear capacity in the electricity mix and all these kind of things. But how do you do this from an infrastructure point of view? From a policy point of view? From a regulatory point of view? From a financial point of view? No one ever thought this through."

The problem was that, untypically in Germany, the nuclear phase out was a decision taken in haste, in response to Fukushima. Sabrina says the four big utilities in Germany – E.ON, Vattenfall, EnBW and RWE – are all in trouble. After the Merkel government recommitted to nuclear power, the utilities invested in nuclear assets that, after Fukushima, were no longer viable. The value of the companies fell and they can no longer raise further capital to invest in new industries. Frederik Moch agrees that the big utilities have a problem raising capital and argues that some thought needs to be given about the shaping of the energy market.

The lack of a major role for the big utilities is also a problem for trade unions, as community companies often have no union recognition and are relatively poor employers. Frederik Moch told us: "We have a problem in that the jobs lost as a result of the energiewende, such as those in the nuclear sector, will be in large companies where unions are present and we have social partnership arrangements, but many of the jobs created will be in smaller renewable companies where that tradition does not exist. Investors, some from the US and the UK, have been invited to finance companies with the promise of low wages. Working conditions are poor in these new companies, some of which have been set up by long-standing green activists. The DGB believes that government financial support should not be made available for companies unless those companies pay decent wages and adhere to the principle of social partnership, but we haven't convinced the government of this yet."

A key reason for German support for energiewende is that it will help reduce imports from Russia. Germany is dependent on energy imports. Frederik Moch argues that

## Evidence from Germany

energy security makes it necessary to reduce energy consumption and to increase the share of renewables. For the next decade, Frederik argues, it is also important to use local lignite sources.

Regarding the loss of jobs in the nuclear sector more generally, Ralf Bartels believes this is not a great problem, because of the timescales involved: “the workers in the nuclear power plants won’t lose their jobs because if you shut down a nuclear power plant there remain about five or six years as it was before. You can’t just turn around and go away, you have to maintain every system, you just take the fuel out of the process... you have to go on working with the whole workforce for about five years and then we talk about decommissioning. Who knows about that if not the workers at the power plant?”

### Germany’s social market economy

Ralf also describes how any dramatic attempt to rationalise through job losses can be dealt with by Germany’s social market system: “the ... uncomfortable side of codetermination [is that a company might tell us] well, sorry, but we have to cut some hundred million euros and we’ve got some ideas, and we should talk about wages, or not wages but maybe what we used to pay a double wages or retirement conditions or whatever. Then we start negotiations... we tell them, well, this can’t be the only way... So first of all you’ve got to tell us your future strategy, how you want to turn the company around and convince us its going to work and maybe we’ve got some ideas on that too. If we agree on a future strategy bringing the company up again then we can talk about sacrifice... “

If the UK wished to pursue such an energy transition, what should it do? Frederik said: “Develop a plan, a roadmap. Don’t think the market will deliver a transition like this on its own. And seek a consensus across politics, across society.” Ralf agreed: “20 years ago people didn’t believe in renewables except some very innovative, very idealistic proselytisers. They would never have been able to combat the markets with a wind turbine or a solar panel. The big utilities, our union, they all told them: “You are crazy. It won’t work. Nice idea – go and play with it”. We needed the [Renewable Energy Act] to boost it up. That worked, having a law saying 20 years guaranteed feed in tariff, 60% in the beginning for a kilowatt hour of solar and you are number one to go into the grid. This is the Renewable Energy Act. That was necessary to create the renewables. Nowadays they are grown up, they are 28% of energy consumption, electricity consumption in Germany. They will be more than 30% next year, so we do have to bring their costs down. We do have to bring this system nearer to the market, to become part of the market – not now, it’s not possible yet – but we need a road map to bring it in to the market...”

## Section five

# Evidence from Denmark

### **The Danish energy transition**

Rasmus Prehn describes the Danish transition to green energy as “close to being an adventure”. Slightly misquoting Churchill, Rasmus – a Member of the Danish Parliament representing the industrial city of Aalborg in the North of Jutland – describes the transition as “a very beautiful story about how to take some of the problems in the world and turn them into opportunities.”

Denmark’s story begins in the 1970s. According to Rasmus, “we had a lack of resources, we had the oil prices and ... therefore, we started to ask: how can we find other ways to [source] energy? ... During the 70s we had quite a heavy debate in Denmark, whether or not we should start using nuclear energy ... in Germany and in Sweden they decided to have nuclear, but in Denmark we decided not to. And we were focusing more on renewable energy strategies.”

Denmark found a limited amount of its own oil in the North Sea, but not enough to be self-sufficient. The country also has no indigenous coal industry, importing coal from Colombia, Poland and Australia. Denmark set out, in Rasmus’s words, “from a political point of view, to secure a better environment with less CO2 emissions, and it was about political idealism, vision and courage and to see the opportunities in the problems, rather than the problems in the opportunities.” One opportunity, quite simply, was the Danish climate: “in Denmark, of course, we have windy weather ... and, therefore, we have quite a big potential via wind turbines.”

In 2012, Denmark set itself the target to have 100 per cent renewable energy by 2050, to have 100 per cent renewable energy in electricity and heating by 2035 and to phase out the use of coal by 2030. At present, 40 per cent of Danish electricity comes from wind. However, one of the most modern coal energy plants in Europe is in Aalborg, because, at present, there needs to be a back-up for when there is no wind.

The United Federation of Danish Workers, known as 3F, is the largest union in Denmark. In 2004, 3F set up its Green Think Tank, comprising researchers and representatives of leading companies and organisations in the fields of renewable energy and new energy technologies. In October 2015, 3F asked the Economic Council of the Labour Movement (ECLM) to catalogue and describe the total potential for green jobs in Denmark, based on a number of specific, relevant green activities, each of which were a step on the road to a green transition.

ECLM found that green activities could potentially create temporary green jobs for up to 58,000 people a year. These jobs are associated with establishing a new energy infrastructure and with energy renovation. ECLM further found that green activities could potentially create 15,000 permanent green jobs. These jobs are those associated

## Evidence from Denmark

with exporting green technology and those jobs related to operating the new green infrastructure. ECLM included both direct employment and indirect contributions through Danish subcontractors in the value chain.

Among the jobs potential, ECLM identified a possible 1,500 permanent jobs from installing 1GW of offshore wind turbines annually in the North Sea up to 2020. The European Commission expects that the production capacity for EU offshore wind must be increased from 9GW in 2014 to 27GW in 2020, or about 3GW annually for six years. Most of this expansion is expected to take place in the North Sea. Assuming that a third would come from Danish-produced turbines, 1,500 permanent jobs could be created from operations, maintenance and service.

District heating is a system for distributing heat generated in a centralised location for residential and commercial heating. According to Danish District Heating Association's Green Energy think tank, a doubling of district heating exports would amount to DKK 8bn (£832m) and is expected to be able to generate 4,000 permanent jobs in the district heating sector. ECLM assess that this would generate a further 2,400 jobs in other sectors.

A doubling of Danish water technology exports is expected to boost employment in the water sector by 4,000 people and using the same principle as used in the example of district heating, ECLM believe a further 2,400 indirect jobs would be created.

### **Siemens Wind Power, Aalborg**

The German engineering company, Siemens, has a factory in Aalborg, the city represented by Rasmus in the Danish Parliament, building wind turbine blades. Formerly Bonus Energy, the company was acquired by Siemens in 2004. The company now builds turbine blades of 75m in length, with two parts of the blade, each made from a single piece of fibre glass, joined together.

Siemens Wind Power is in the process of building a factory in Hull, England, because 90 per cent of wind turbine blades built at Aalborg are exported to UK and it is cheaper to build the blades in England than to transfer them from Denmark. Aalborg is the development factory; all new products are developed in Aalborg. When the market for the blades is identified, a factory is built in the destination country. Given the role of the Aalborg factory in developing products, the unions at Siemens are confident that jobs will not be lost, in spite of the new factory, although they concede that the factory in Aalborg may not grow. Siemens Wind Power has factories in China, Canada and the USA; it has plans to build factories in Morocco, India and Egypt. However, wherever the products are built, they are first developed at Aalborg.

### **The importance of political consensus**

As with Germany, political consensus is believed to be crucial to the success of Denmark's quest for energy transition. Rasmus told us: "we have had two schools in Denmark, a centre-left school thinking we should have quite high taxes, and then lots of innovation and green energy, and a centre-right school saying we should have very low taxes, no taxes, and that we should not focus that much on green energy and innovation. But now it seems like we are merging in the middle, finding some kind of compromise, and that should be the way forward."

Henning Kruse is Head of Government Affairs at Siemens Wind Power in Aalborg. Henning agrees on the importance of consensus: "With consensus ... you know how to work, how to activate, and that's what secures your decisions in a company, and that's what secures that you can actually make the necessary investments, as we have done in in this factory. Without consensus, where you would expect [to financially plan] five, ten, fifteen years ahead of you, without such a situation, then I doubt that Siemens would have accepted these investments here."

### **Does manufacturing have a future in Europe?**

Some years ago, it was fashionable to believe that with the growth of the so-called BRIC economies, manufacturing would move offshore, leaving western countries with high-level innovation and research and development, but without large numbers of jobs in manufacturing. That view has receded, as Henning makes clear: "Luckily enough we have changed our opinion on that, because we learn from heavy industry, we learn from the factories, like [the Siemens plant in Aalborg]. If we don't have the factory here, we won't have the research people here either, and if we don't have research in Denmark, because that will move with the manufacture, then we're really losing out... So our system – our politicians, our unions, our trade associations, our business, our population – they all need to understand that manufacturing goes hand in hand with all that we are doing in society."

The industrial branch of 3F in the city of Aalborg has about 5,000 members. Its President, Benny Vinther, agrees that to maintain innovation in Denmark, it is critically important to keep manufacturing jobs too. Benny told us: "A few years ago [it was argued that] when the industries all move to China, we can live on our brains. But then we started to discuss this [and we knew that] this is not going to happen; we can't live on our brains, because they will also transport that to China, our brains. We have succeeded with that discussion, so that everyone, even the Liberals, are saying "we have to have some production jobs here in Denmark". The brain and the production have to be near each other. Not that industrial jobs have stopped flying to China, but we are agreed that it is a problem and we have to do something about it."

## Evidence from Denmark

### The role of trade unions

Trade unions are important social partners in Denmark. Benny says: “It is a three-part negotiation [i.e. it involves government, employers and unions] but everything regarding the labour market is in the collective agreement.” Five weeks holiday is stipulated by law, but everything else is negotiated between employers and unions at the national level, covering all industrial branches. The government does not set minimum wages or working hours, these are decided by two of the three players in the negotiation, i.e. the employers and the unions. Even dealing with the current refugee crisis, which has seen many refugees coming to Denmark in search of work, it is the job of employers and unions to consider the response.

Wages are negotiated for industrial sectors at the national level, as used to be the case in many sectors in the UK until the 1980s. The national agreement applies to all workers, not just union members, to avoid any attempt to undercut the negotiated wages and conditions.

Unions are also major players in the skills debate. Mads Andersen, the national president of 3F’s industrial sector, says: “Education is a big issue for us, because if we are going to have manufacturing jobs in Denmark, we need to be better than you are in the UK, or than in Spain, or China, or wherever so we are using a lot of time in the union to infuse the education system”. Benny adds: “one of the newest [areas of] education is actually the windmill production... 1,500 blue collar workers [at Siemens] should have the education, but only 40 [have had it so far]. Education is also one of the legs which is very important in the trade union.”

More generally, Mads says that trade unions form one of three partners, alongside the employers and the government, and those three partners sit down together to discuss where the country will be in the years to come. Unions try to influence the political debate. At present, they are not so close, as Denmark has a Liberal Government, but they continue to try to press their members’ case. The government has set up a group to look at productivity and the unions are present in the group.

At Siemens in Aalborg, the unions have an agreement that allows them to speak to new employees. In Thomas’ words, “we have a very good agreement between the management and the shop stewards”. Nevertheless, recruiting younger workers is a challenge for unions in Denmark, as it is elsewhere. 20 years ago, young people joined the union because it was the culture and it was expected of them. Benny says: “If you ask the youth, the ones who are not members of the trade union, why they are not a member of a union, nearly 50 per cent of them would ask: ‘What is a trade union?’ That is a problem.”

### The role of universities

For innovation to achieve its maximum potential, companies must work with universities. The German model of Fraunhofer institutes – replicated in the UK by Catapult Centres – seeks to develop those links. Siemens works with the University of Denmark, especially on aerodynamics, as well as the University of Aarhus, also on aerodynamics, as well as construction issues. It also works with the University of

Aachen in Germany on mechanical design and with the University of Oslo on wind estimations. Closer to home, Siemens in Aalborg works with that city's university on what is known as problem-based learning. Rasmus explains: "It's a very important part of Danish education policy and science policy to work closely with companies... the idea [behind problem-based learning] is that, when the students work with an issue, they should work together with a company to try to solve a problem. So if there were some engineering students who would like to work with Siemens, they could do that.... It is quite common that, while you are a student, you work together with a private company, so when you are finished, as a qualified engineer, then you have ... some kind of understand of... how does it function? That's very important. So you will fit in much more when you have finished."

### **Paying for energy transition**

Like Germany, Denmark has wrestled with the issue of how to pay for green development. Denmark has developed what is called a Public Service Obligation (PSO) tax. This means that the buyer of electricity pays a tax that is added to the bill, a tax that funds research and innovation, science, the local supply of energy, environmentally friendly electricity, biomass and also wind energy. The taxation system is structured to be countercyclical with energy prices, so when the price of electricity is high, the tax is low, but when electricity prices fall, the level of taxation is higher. This seeks to level the electricity price, to reduce uncertainty, and to ensure the continuous flow of investment into science and research.

Of course, the PSO disproportionately affects high users of electricity and the Danes, like the Germans, are keen to support their energy intensive sectors. While seeking to offer such support, industry supports the PSO, while being conscious that the level of the tax needs to be right, especially for energy intensive industries. The PSO also currently falls foul of the EU tax regime and industry is open to its being modified if necessary. Henning Kruse strongly supports the hypothecated nature of the PSO, however: "I don't see similar set ups in other European countries, where you actually allocate part of the money for research and innovation. You can always call it 'taxes', and ... say, 'Should we discuss taking up something for innovation and reserves? How much will we use for healthcare? How much should we use for roads and infrastructure?' But here, up front, you actually decide that part of it should be used for research and innovation, and we need to strengthen our research and innovation expenditure. So I think this is a good way of doing it."

While wishing to protect energy-intensive industries, Benny Vinther nevertheless argues that green taxes incentivise companies to seek lower carbon emissions: "Over the last 20 years so there have been a lot of taxes on energy and on pollution. If you pollute, you have to pay more in taxes. There has been a lot of discussion of this. If you ask the shop steward [at Portland, a local concrete company] he will say '... if there hadn't been any taxes they would not have changed and [become] more reliable'". Of course, you have to take care of the industry, not tax them to hell, but it helps actually."

## Evidence from Denmark

As in Germany, Danish consumers also pay more for green energy. Mads Andersen said: “Not only companies, but the population also pays a lot more for energy than the energy costs, in taxes, and some of this tax is going to change the Danish energy system to a greener energy system... I think the population in Denmark think green more today than they did 20 years ago.” The Danes, like people everywhere, complain about the tax they pay. However, as Thomas Fischer, the senior shop steward at Siemens in Aalborg told us, some people want to pay more for energy from windmills. Consumers can choose if they want green energy, and many choose it, paying 10 per cent more for their electricity as a result.

### **Social partnership**

As we saw in evidence from Germany, to bring about a green energy transition in the UK, we need a roadmap, a plan. This raises a question about the role, and the limits, of government in this process. Rasmus Prehn, a Social Democrat MP in Denmark, told this report: “I would say that the social democratic model is not to have the state do everything. It's to have co-operation between the government and the private sector. So you should have competition and you should have innovation and a private market. But you should have this democratically driven organisation, so you use society and the government as a locomotive, and to put this collective energy into the direction of where you would like to go as a country. Because if you don't have any regulation, then sometimes you will only have the lowest fruit and not the best fruit. That would be my argument.”



## Section six

# Does the UK need an 'energiewende'?

This report has highlighted a growing popular consciousness around the threat of global warming and the importance of action to meet the challenge of climate change. What started as a fringe issue pursued by climate activists and seen as eccentric by mainstream opinion is now generally understood to be the biggest threat facing the planet today.

Addressing the threat of climate change has wide implications for economic, industrial and social policy. It is influenced by, and it influences, wider geopolitics. Lord Stern highlighted that while meeting the climate challenge was expensive, failing to meet it would be more expensive, in the long term. Politicians such as Angela Merkel have taken this one step further by consciously seeking out the industrial opportunities of meeting the climate challenge, thereby turning on its head the argument that green policies are a luxury that cannot be afforded in difficult economic times.

This report has discussed how Germany and Denmark have sought an energy transition. However, we cannot ignore the fact that this has industrial costs as well as benefits. As Germany winds down its nuclear sector, it must face the job losses and lost industrial opportunities that goes with it. Germany is better placed than most to deal with such change, given its traditions of active government and strong social partnership. Nevertheless, there is the suspicion that when German unions express their confidence that this can be done painlessly, they are trying to put a brave face on a difficult situation. Moreover, Germany is not closing its coal industry. Some critics describe coal as Germany's "dirty secret" and believe the greener solution would have been to keep nuclear and phase out coal, as the UK is doing. The fact that coal is centred on economically vital areas and regions of Germany is not, of course, a coincidence.

There are no easy answers to this dilemma and the art of policy-making is to balance a complex and sometimes contradictory set of needs. This report starts from an acceptance of Ralf Bartels' definition of sustainability. Ralf distinguished between green policies, which stressed environmental concerns, and sustainable policies, which held social, economic and environmental needs in balance.

With that in mind, we ask the question, does the UK need a green energy transition, an 'energiewende' of our own? To answer that question, we need first to ask where we get our energy from now, how much energy we will need in the future and where we anticipate getting it from. Specifically, we must know how the new Department for

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Business, Energy and Industrial Strategy (BEIS) predicts we will keep the lights on in, say, 2030, whether that is consistent with climate targets, contained in the Paris Agreement and elsewhere, whether it is realistic and, if not, what changes we need to make. We then consider: what are the industrial costs and opportunities of bringing about this energy transition?

### Where does the UK get its energy from?

Before considering our energy mix, it is necessary to state that the UK consumes less energy than it did in 1970, despite an extra 8.9m people living here<sup>5</sup>. One reason, a positive, is that we are more efficient at both producing energy and using it. Another, less positive reason is the rise of the service sector and the decline of manufacturing – services being much less energy intensive. This immediately has wider policy implications: the TUC has long sought the revitalising of manufacturing and we support the words – even if they have proved rather empty – of the outgoing Chancellor, George Osborne, in his call for a 'march of the makers'. This means that if the UK does pursue an active industrial policy to strengthen its manufacturing sector, we must factor in the environmental costs of that and seek to mitigate them as far as possible in the design and development of that industrial policy.

Specifically, households use 12 per cent less energy, while industry uses 60 per cent less. However, there has been a 50 per cent increase in energy use in the transport sector, due to a big rise in the number of cars on the road since 1970. This suggests that greener cars, through developments such as hybrids and battery technology, are fundamental as we seek to support our world class automotive sector. A large increase in the number of flights since 1970 also underlines the fact that tough environmental standards must accompany the building of a third runway in the South East of England, as the TUC has consistently argued that they should. The former DECC believed that energy efficiency will continue to offset population growth, so we will use the same amount of energy in 2030 as we do today. This is plausible, given the growth in energy efficiency and given the trajectory of the last 45 years, but it is important to be alert to possible economic and industrial scenarios that could alter that prediction.

### Coal

The major change in our energy consumption in the last 45 years has been the rapid decline of coal and associated fuels, such as coke and blast furnace gas. The void has been filled by a rapid rise in the use of natural gas. This story has implications; indeed it has lessons that the UK would be well advised to learn from.

First, the decline in UK coal production since the 1970s does not match the decline in coal use during that time. In 1970, coal accounted for about two-thirds of all

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<sup>5</sup> Population figures for 1971 and 2016 from 'Population' by Jen Beaumont, Social Trends 41, ONS.

electricity. Apart from a sharp dip in the mid-1980s because of the miners' strike, coal use fell most dramatically during the 1990s. Coal use has increased slightly in recent years, due to cheap imports. Oil use has also fallen sharply, and the big fall in coal and oil use in the 1990s was because of the so-called "dash for gas", which was underpinned by cheap North Sea gas and the privatisation of the electricity market.

Even leaving the politics of the miners' strike aside, the closure of the UK's coal industry without any active government strategy to bring new industries to former coalfield communities was a disaster. The economics of coal were complex: the industry began to decline after the First World War, although that decline accelerated after the Second World War and particularly after the miners' strike and subsequent pit closures. Coal produced in the 1970s became uncompetitive, both in contrast with coal from abroad (UK coal faced higher unit costs of production, partly as a result of higher wages) and other sources of energy, such as gas, which are cheaper. Increasing awareness of global warming added to arguments against coal and, indeed, the government has announced its intention to phase out unabated coal-fired power stations by 2025 if it is confident that a shift to a wider use of gas can be achieved within the necessary timescales.

But this does not tell the whole story. As recently as three years ago, the government expected coal and gas fired power stations fitted with Carbon Capture and Storage (CCS technology) – which seeks to siphon off CO<sub>2</sub> and bury it underground – to start producing electricity in 2017. Some argued that this was optimistic three years ago, given the absence of a large scale, fully operational CCS station in the UK. It is now impossible, following the government's decision to scrap the £1bn competition for a CCS demonstration project in last year's Autumn Statement. It seems the government cannot decide if it has given up on CCS or not; the former Prime Minister, David Cameron, appeared to question the viability of CCS technology, while DECC ministers insisted that the government was still committed to CCS, while claiming that the cost of the demonstration project was simply too high. Meanwhile, the Committee on Climate Change believes it will be more expensive for the UK to meet its carbon reduction targets without the development of CCS technology. The TUC believes the previous government pulled the plug on a new and exciting technology purely to cut costs, rather than seeing CCS as an investment in our industrial and environmental future. Given that many other countries, from Poland to China, will continue to use coal, the loss of CCS risks being the loss of a major export technology too.

Furthermore, while it is impossible to measure social cost in statistics, the devastation of the former mining communities after the loss of their only form of livelihood cannot be underestimated. It could be argued that the decline of the coal industry was inevitable, but the real government failure was the absence of economic regeneration in the former coalfields. In this context, it is impossible to criticise Germany for its refusal to phase out its coal and lignite sectors at this stage.

## Does the UK need an 'energiewende'?

### Renewables

DECC also believed that growth in the use of natural gas and in renewables – such as wind and solar power – would compensate for the reduction in coal production, in the short term. By 2030, it expected renewables to be by far the biggest source of energy used in electricity generation, making up about 40% of the overall mix.

Again, we must ask the question, is this realistic, given the current trajectory? In the government's favour, the news on 3 February 2016, that DONG Energy is to build the world's largest offshore wind farm 75 miles off the Yorkshire coast was a huge boost to renewable energy in the UK. Hornsea One offshore wind farm will be capable of powering over one million UK homes with a capacity of 1.2 gigawatts. The project has the potential to create around 2,000 jobs during its construction, with up to 300 additional jobs supported during its 20-25 year operational phase. As we have discussed, a new Siemens blade factory in Hull is due to be built by the end of 2016 to support the Hornsea One project; many of the skilled workers employed by Siemens in Hull will undertake some of their training at Siemens in Aalborg. Hornsea One is expected to be fully operational in 2020.

The government has also said it could support up to 10 gigawatts of new offshore wind projects in the 2020s, with a further three auctions in this Parliament if conditions on cost reductions are met.

Set against this, shortly after the General Election the government "revised" a number of renewable energy subsidies, which entailed:

- removing the guaranteed level of subsidy for biomass conversions and co-firing projects for the duration of the Renewable Obligation (RO)
- launching a consultation on controlling subsidies for solar photovoltaics of 5MW and below under the RO
- a consultation on changes to the preliminary accreditation rules under the Feed-In Tariff (FIT) scheme, followed by a wider review of the scheme to drive significant further savings.

The government argues that it has provided vital financial support for the renewable sector, but points to projections from the Office for Budget Responsibility which show that subsidies raised from bills are set to be higher than expected when schemes were set up, under the Levy Control Framework. This is partly due to lower wholesale electricity prices, but is also the result of higher than expected take-up of the demand-led Feed in Tariffs and the Renewables Obligation (such as solar panels on roofs) and a faster than expected advancement in the efficiency of the technology, meaning renewables are projected to generate more electricity than previously planned. However, while this might be true, it remains the case that we could have gone even further in the use of renewable energy if subsidies had been maintained.

## **Nuclear**

The final piece of the UK's energy jigsaw is nuclear. The TUC, like the government, believes the UK's nuclear industry has a pivotal role to play in a future balanced energy policy.

The government's carbon plan to reduce CO2 emissions to 2050, published in 2011, aims for there to be competition between different forms of low carbon electricity generation. Within three of the four key scenarios in the carbon plan, nuclear energy is shown to deliver a much larger amount of generation than that available now, with the potential to deliver between 16GW and 75GW of the UK's electricity needs. The 75 GW from nuclear energy is part of a scenario where total installed capacity in the UK is around 160 GW by 2050. Nuclear could contribute between 40 and 50 per cent to the energy mix under this scenario, compared with nearly 20 per cent today.

In the words of the government's nuclear industry strategy: "The size of the UK's nuclear new build programme will therefore largely depend on industry's ambition, the success of the initial new build programme, subsequent reduction in cost through experience, growth in investor confidence, and realising economies of scale."<sup>6</sup>

As we have seen from the difficulties experienced by the building of Hinkley Point C, the new build programme cannot be considered to be successful. Yet Hinkley Point C is vital to the energy mix: if it goes ahead – and trade unions will do all we can to support it – it will power six million homes for 60 years and will also provide 25,000 jobs.

A rethink of how the UK's nuclear programme is taken forward is vital. We will return to this issue later in this report.

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<sup>6</sup> 'The UK's Nuclear Future', HM Government, 2013.

Section seven

# What are the industrial policy implications of a green transition?

So far, this report has discussed the ways in which the UK might move towards a 'green energy' model. However, this debate can be widened to consider the role that industrial policy could play in such a transition.

The TUC has published much on industrial policy in recent years. We have made the case for strategic government support for those key sectors where the UK is or could become competitive in the global economy. In our view, the 21st century will be dominated by Asia, but that does not mean there is not everything to play for from a UK perspective. As the Singapore Cabinet Office Minister and NTUC General Secretary Lim Swee Say told us, if a country has nothing to export to China, then the rise of China is the biggest threat that that country faces. But if a country has something to export, China becomes a massive opportunity<sup>7</sup>. Like other advanced western economies, the UK must ensure that it has a portfolio of goods and services that it can export to dynamic Asian economies. We already do well with law, accountancy and financial services. But we must do better with job-rich industrial sectors such as manufacturing. Furthermore, China is on an uneven path to sustainable development. Those parts of China that already enjoy wealth – such as the cities along the Pearl River Delta – are thinking hard about how to become green. Other parts of China that are still catching up are industrialising via heavy industry, as so many other economies did before them, and are not focusing on greening the economy – for now.

## **Building on existing strengths**

The TUC will continue to focus on industrial strategy – and whilst this will inevitable mean developing new sectors, it will also mean nurturing existing strengths. Neither the UK nor other western economies are at a standing start. All have developed specialities in different sectors, so it is worth asking whether we can build on existing strengths in the development of a green industrial strategy.

Earlier in this report, we saw the development of Denmark's wind energy sector, a sector that is now a world leader. We have seen the way in which Denmark's commitment to renewable energy developed, but Denmark already had an innovative wind energy company, Vestas. In developing this sector, how much was Denmark

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<sup>7</sup> 'The Way of the Dragon', TUC, 2013.

nurturing an existing strength, in the knowledge that if it was successful, it would gain first mover advantage?

Vestas began experimenting with alternatives to traditional energy production in the early 1970s. In fact, it developed wind turbine technology in secret, but with the oil crisis looming and with the Danish government exploring alternatives to oil, it might be said that Vestas was, technologically speaking, in the right place at the right time. Vestas sold and installed its first turbine – with a 10-meter rotor and capacity of 30KW – in 1979, the year in which Denmark created its Ministry of Energy. In the early 1980s, US legislation giving tax breaks to wind energy investors led to orders for Vestas turbines. In 1991, by which time Denmark was targeting a CO2 emissions reduction of 20 per cent between 1988 and 2005, Vestas sold its 1,000th turbine. By 1998, when Denmark was seeking a still higher proportion of renewable energy, Vestas had floated on the Copenhagen Stock Exchange and with a share of 22.1 per cent of the world's wind power, the company had become the industry's dominant player.

Some of this might be coincidental, but the rise of Vestas mirrored the rise of renewable energy in Denmark. We must not be surprised, nor cynical about this. Surely it makes sense for governments to focus on areas of existing strength as they develop future industrial strategy?

And if that is the case, does the UK have such areas of existing strength, on which to build? The answer is yes and this report will focus on two such areas, in particular: offshore wind and automotive.

### **Offshore wind**

The UK has a highly successful offshore wind industry. With more operational wind farms than the rest of the world put together, the current generating capacity in UK waters provides almost 15 terawatt hours of electricity annually, equivalent to the electricity consumption of over three-and-a-half million homes. Industry projections suggest that by 2020, offshore wind will supply between eight and ten per cent of the UK's electricity.

The downside to the UK's offshore wind sector is the relative weakness of UK content, i.e that the UK supply chain does not currently contribute as much to the wind farms as is desirable. Employment in the sector now stands at around 6,800 full-time employees – a significant number, but one which could be higher. The offshore wind sector has agreed a target to deliver 50 per cent of UK content.

The Offshore Wind Industrial Strategy, published in August 2013, argues that due to the risks involved in procuring such high value technology, a company with a proven track record enjoys a major advantage over new entrants, even though the latter are necessary to increase competition, increase capacity, introduce innovation and reduce costs. The strategy discusses the importance of sharing best practice,

## What are the industrial policy implications of a green transition?

framework agreements between developers and suppliers, prequalification criteria and methods such as awarding smaller portions within contracts.

There is nothing wrong with any of these suggestions, but they are unlikely to have a major effect. It is often argued that local content requirements are contrary to international trade rules, although the Energy Minister at the time, Michael Fallon, was quoted as saying that it is “only reasonable” that projects supported by the taxpayer deliver a supply chain plan that contains local jobs, local content and local benefits.<sup>8</sup>

The TUC agrees. In fact, we would go further. We have long supported the full use of EU procurement rules that allow social clauses including the provision of skills and the addressing of long-term unemployment, which is surely the case in those areas of industrial decline in which future offshore wind capacity could be built. Any new trade agreement between the UK and EU post-Brexit should allow for similar social clauses.

The UK has an offshore wind sector to be proud of; it now needs to create more high quality jobs for UK workers.

### **Automotive**

According to the Society of Motor Manufacturers and Traders, more than 1.5m cars were built in the UK in 2014, the most recent year for which figures are available.<sup>9</sup> 770,000 people were employed across the UK automotive sector, of which 161,000 were directly employed in manufacturing. 41,000 people worked in motor sport, a highly specialised area clustered along the M4 corridor. Motor manufacturing is an industry with great future potential: 50,000 automotive manufacturing jobs will need to be replaced by 2020, with implications for high skill youth employment.

The motor industry is also a high exporter: 78.2 per cent of vehicles built in the UK were exported and the European Union accounted for more than half of UK-built vehicle exports in 2014. Among non-EU destinations, China was the top destination, followed by the USA, Russia and Turkey. The UK exports vehicles to more than 100 countries worldwide.

The automotive sector is taking positive strides towards greener vehicles. A new car in 2014 was nearly 20 per cent more fuel-efficient than one bought in 2009. Registrations of plug-in cars quadrupled in 2014, to 14,495 cars.

Starting from this strong base, there is clear potential for the UK to strengthen its position in cleaner, greener cars. This should be a particular focus of UK industrial policy.

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<sup>8</sup> <http://www.businessgreen.com/bg/interview/2287472/uk-to-seek-local-content-assurances-from-offshore-wind-farm-developers>

<sup>9</sup> The Society of Motor Manufacturers and Traders: Motor Industry Facts 2015.



Some companies are already stealing a march. For example, Nissan (which manufactures 500,000 cars per year in the UK) set out its vision for the future of electric cars, including a new charging infrastructure and battery technology to deliver a range of more than 340 miles on a single charge. This technology is likely to be included in an updated version of the Nissan LEAF which, along with the Juke, Note and Qashqai is one of the models built in the UK. The challenge, of course, continues to be to develop a long-range battery at an affordable price.

How to encourage more companies to invest in low carbon and energy efficient technologies is a major policy challenge. In its 2012 document 'Growing Pains', the Institute for Public Policy Research (IPPR) called for a targeted 'green deal' for manufacturers. The IPPR argued that there are few positive incentives for conventional manufacturers to reduce process emissions and retrofit their plants and premises. The IPPR called for a targeted green deal for manufacturing firms<sup>10</sup>.

The economist Mariana Mazzucato has highlighted the role of the state in fostering innovation, thereby challenging the received wisdom that the development of ground-breaking technologies is the preserve of the private sector. Mazzucato notes that since the commercial development of lithium-ion batteries (i.e. the rechargeable batteries common in consumer electronics) in the early 1990s, the challenge has been to store and release power effectively enough to make sustainable energy sources viable alternatives to fossil fuels<sup>11</sup>.

Mazzucato points to the Advanced Research Projects Agency Energy (ARPAE), part of the US Department of Energy, which can expect more funding in the light of commitments made by President Obama and other world leaders at last December's Climate Change Conference in Paris, but says that embedded energy infrastructure retains incumbency advantages, while renewable energy sources are in the early stage of development, and so will find it hard to raise capital by themselves. The need for the state to step in, making investments but also ensuring that it reaps an appropriate share of the rewards, is crucial.

It is time for UK policy makers to consider what our own version of ARPA-E might look like.

Finally, there is the role of demand-pull innovation in the automotive sector. In 'London: Global Green City', IPPR argues that London is only three per cent of the way towards its 2020 target of 100,000 electric vehicles<sup>12</sup>. One factor contributing to this slow growth is the inadequacy of the charging network. IPPR called on the next mayor to work with key stakeholders to ensure that barriers to accessibility were reduced. The TUC endorses this challenge to Sadiq Khan, the new Mayor of London. By designing policy to support green vehicles, we are more likely to prompt businesses to make the necessary investments for green development.

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<sup>10</sup> 'Growing Pains: British Industry and the Low Carbon Transition', IPPR, May 2012.

<sup>11</sup> 'A State Powered Green Revolution', Mariana Mazzucato, Project Syndicate, May 2016.

<sup>12</sup> 'London: Global Green City', IPPR, April 2016.

Section eight

# Conclusions

## **Build a social, political and business consensus**

It is crucial that a social, political and business consensus is developed in order to tackle climate change. Henning Kruse of Siemens Wind Power spoke of the business confidence that this provides to investors. It is the nature of democracy that governments change, but a shared understanding needs to develop over a climate change strategy, in order to protect the planet.

Speaking before the 2015 General Election, the former Secretary of State for Energy and Climate Change, Amber Rudd said: "I don't think you could get a cigarette paper between me and Labour on our commitment to getting a deal in Paris," Rudd added: "We are all completely committed to it, so whatever the outcome – and I certainly hope for a Conservative victory – it wouldn't slow down or speed up. Everyone is doing what they can."<sup>13</sup>

Similarly, the CBI business lobby is engaging with climate change as, of course, is the TUC. The fact that both these organisations have committed to support a modern industrial strategy in recent years has helped solidify support for such a policy. The same commitment is necessary on climate change.

## **Develop a roadmap for change**

Consensus must develop into a joint strategy, a roadmap. It was uncharacteristic of Germany to develop its 'energiewende' policy in such a kneejerk fashion, notwithstanding longstanding scepticism about nuclear power in Germany. The TUC is confident that 'energiewende' will be a success, but problems associated with the lack of long-term strategy were highlighted by Sabrina Schultz in this paper and care should be taken to avoid any such problems in the UK.

Much of the institutional architecture is in place. In the Climate Change Act, we have the Committee on Climate Change, chaired by a former Government Minister, Lord Deben, who commands the respect of all interested parties. Carbon budgets – at least in theory – keep the government on track to meet carbon reduction targets.

We need, however, to identify the optimum energy mix going forward. Where we need new sources of energy, we need to identify how we will deliver them. Where we need to phase out others, we must consider how to do that sustainably, i.e. in a way that takes into account the social and economic needs of the workforce and

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<sup>13</sup> <http://www.businessgreen.com/bg/interview/2371516/amber-rudd-im-a-thatcherite-when-it-comes-to-climate-change>

communities that will be affected, and not just the environmental concerns. One of the main attractions of 'energiewende', over and above its content, is the way in which it builds a sense of national mission. The same is true of Denmark's energy transition. The UK needs a national mission for a new, overarching industrial, energy and climate change policy.

Clearly, such a strategy cannot be led by one government department alone. It was noted above that, under the Conservative-Liberal Democrat Coalition in the UK, tensions existed between HM Treasury and the Department of Energy and Climate Change. Addressing an IPPR conference, 'The Path from Paris: The Implications of the Paris Climate Agreement on UK Policy and Business', Lord Deben said that as he travels the world, all countries complain about their finance ministries, because those ministries think in the short term and they struggle to relinquish power. This will not do. A national mission requires the Treasury and the new Department for Business, Energy and Climate Change to pull together.

### **Implement a balanced energy policy**

The TUC has always supported a balanced energy policy. In our view, a new energy policy should seek:

- support for nuclear power – sustainably funded by a diversity of suppliers
- an increase in our production and use of renewable energy sources
- a new strategy to develop Carbon Capture and Storage (CCS) technology
- the appropriate use of gas from the North Sea.

### **Agree a sustainable strategy for nuclear development**

The argument for a balanced energy policy is played out in the current story surrounding the UK's nuclear capacity. The UK has had a nuclear energy sector since the 1950s and trade unions have long represented the workforce in that sector. There is an irony to the history of nuclear power in the UK, given that it has been viewed as a low carbon technology only comparatively recently and its use still divides the green movement.

A nuclear industry strategy, 'The UK's Nuclear Future', which was launched under the coalition government, spoke of plans to deliver around 16GW of new nuclear power by 2030, which broadly translates to at least 12 new nuclear reactors at five sites currently earmarked for development: Hinkley Point, Sizewell, Wylfa, Oldbury and Moorside. The delivery of the strategy would mean a significant programme of new plant building for the UK.

Hinkley Point was given development consent for the construction of the first new nuclear power station in the UK since 1995. It was to be constructed and operated by

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EDF Energy and would cost £12-14 billion. Hinkley, the government hoped, would be the first of five new sites to be developed.

The problems affecting Hinkley have been well rehearsed in the media. The finance director of EDF resigned in opposition to the project and question marks over its cost, to be borne by the British taxpayer, have also been highlighted.

The TUC remains committed to the development of Hinkley Point C, which is essential for the UK's energy security and will provide thousands of skilled jobs in the South West; it is an important economic opportunity for a region which has not shared the prosperity enjoyed by London and the South East in recent years. Yet clearly this is no way to develop energy policy. We are attracted to the idea set out by three environmentalists, George Monbiot, Mark Lynas and Chris Goodall, that the government should produce a comparative study of nuclear technologies, including the many designs for small modular reactors, and make decisions according to viability and price<sup>14</sup>.

### **Build the capacity of renewable energy sources**

The UK must raise its game with regard to renewable energy sources. The government expects 40 per cent of UK energy use to be delivered by renewable energy sources by 2030. We believe the government needs to be more ambitious: 40 per cent of Danish energy already comes from wind and the Danes are aiming for 100% green energy by 2050. The government should aim for at least 50 per cent of energy to come from renewable sources by 2030.

In the aftermath of the general election, as we have seen, the government “revised” key support for renewable energy sources, including biomass conversion, solar photovoltaics and Feed-in Tariff schemes. This was clearly short-sighted and should be reversed. The government's rationale for these cuts was that targets for solar panels and other green energy schemes were being overshot. This is no reason; as Lord Deben told the IPPR, government should not always plan for the most optimistic outcomes when it comes to the take-up of renewable energy sources, but should plan instead for the more pessimistic. This is surely correct.

More specifically, this report has discussed the power of ‘active government’ and we now recommend a new green industrial strategy to do two things: first, the government must conduct a study into the technologies that the UK would need to bring us up to 50 per cent of renewable energy and what industries could be developed in the UK; second, those new industrial sectors should be targeted on those communities that lost their livelihoods with the demise of heavy industry, most obviously the former coalfields.

This is particularly important, post-Brexit. There has been a growing recognition, that was reflected in the referendum campaign, that former industrial communities

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<sup>14</sup> <http://www.theguardian.com/environment/2015/sep/18/we-are-pro-nuclear-but-hinkley-c-must-be-scrapped>

in England have been by-passed by the opportunities that globalisation has presented to other parts of the UK. Polling for the TUC has found that Brexit was as much a verdict on elites as on the EU, with 71 per cent of Leave voters saying that politicians, business leaders and other members of the “establishment” had “let most ordinary people down”. Here is an opportunity to offer real economic change to a section of the population too-often overlooked.

This is a long-term project. Those companies building the green technology of tomorrow will mostly be in the private sector, but Germany and Denmark have shown how, when the government sets its strategy and designs its economic, industrial and environmental policies around that strategy, it creates the certainty that the private sector needs to invest. Government should offer sufficient financial incentives, such as loan guarantees, to companies that may wish to be a part of this project. The expansion of apprenticeships to deliver the skills necessary for these new industries in green technology must form part of this project. Government needs to be a hands-on partner. It finds large amounts of money for major investment projects, whether Hinkley Point C or infrastructure projects such as Crossrail. Some criticise this government spending, but the TUC believes this is exactly what government is for. In one major policy, government could champion the renewal of industry in some of the UK’s most deprived communities and a greener future, both at the same time.

### **Relaunch Carbon Capture and Storage through international cooperation**

The biggest energy disappointment since the new Conservative government came to office last year has, however, been the cancelling of the £1bn competition for a CCS demonstration project. This broken manifesto pledge makes it harder for the UK to meet its greenhouse gas reduction targets, as the Committee on Climate Change has pointed out. The TUC believes this decision was a huge mistake. The question, however, is what to do now.

The door is slightly ajar on CCS, given that DECC Ministers continued to maintain their support for it. It is necessary for the new Prime Minister to show similar commitment, given that her predecessor questioned the viability of CCS technology. However, assuming this hurdle can be overcome, the TUC calls on the government to put together an international consortium to finance a CCS project, sharing both the risks and the rewards.

The UK is involved in many major science projects that are international collaborations. Perhaps the most important is CERN, the European Centre for Nuclear Research, in Geneva. Founded in 1954, CERN was one of Europe’s first joint ventures and now has 21 member states. According to Forbes, the Large Hadron

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Collider, based at CERN, costs about \$1bn per year to run<sup>15</sup>. Without international collaboration, the costs would be simply impossible for any one member state.

This is an argument for international cooperation. The cost of funding the demonstration project that has been cancelled would be about the cost of operating the Large Hadron Collider for a year and a quarter. The idea would not be to try to enlist 21 states, but perhaps five states with an interest in clean coal could come together in an industrial collaboration. China is obviously interested in coal, and it would certainly be a good idea to explore the possibility of China as a partner, but simply seeking a handout from Beijing should be avoided. The prize for investment would be the accrued benefits of international co-operation, resulting in a technology that allows coal burning in a sustainable manner, thereby helping the UK and other industrial partners to meet the climate change targets that they agreed in Paris.

### **Reduce reliance on imported gas**

In its ambition to close unabated coal-fired power stations by 2025, the UK government believes that gas and nuclear will fill the gap. Burning gas emits about half as much carbon as coal. It is not as green as either renewable energy or nuclear power, but it has an important part to play in the UK's energy mix as we make the long journey towards zero carbon. Gas is likely to be used for many decades to come; about 80 per cent of homes are heated by gas.

However, according to the former Energy Secretary, Amber Rudd, the UK currently imports around half of its gas needs and by 2030 that could be as high as 75 per cent<sup>16</sup>. This is not acceptable. The UK should seek to be as self-sufficient as possible in energy policy and while we support a gas industry that provides jobs and skills to UK plc, we should seek to balance our energy portfolio so that we are not so reliant on imported gas.

### **Expand the skills base for an energy transition**

The three pillars of energy policy are security, economy and sustainability. We need to ensure that we “keep the lights on”, that energy is as affordable as possible and that it is produced in a way that minimises the threat to the environment. There is an inevitable degree of trade-off between the second and third of those pillars, at a time of the development of green energy. Eventually, of course, we would expect the optimum energy mix to be both economic and sustainable. The TUC believes there should be a fourth pillar of energy policy: skills.

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<sup>15</sup> <http://www.forbes.com/sites/alexknapp/2012/07/05/how-much-does-it-cost-to-find-a-higgs-boson/#38e9852e64f0>

<sup>16</sup> <https://www.gov.uk/government/speeches/amber-rudds-speech-on-a-new-direction-for-uk-energy-policy>

Technological change is disruptive by nature and that leads to uncertainty among those people working in modern technology. It is often feared that more technology will lead to fewer jobs, even though evidence suggests that technological breakthroughs create more jobs than they destroy. It is, however, essential that if today's workers are to become tomorrow's workers, using new technology, they will need the skills for this change. Upskilling must become a normal and regular part of a worker's life. This is especially true if today's jobs in higher polluting industries are to be replaced over time with jobs in greener sectors. In addition to upskilling the existing workforce, the expansion of apprenticeships to deliver the skills necessary for these new industries in green technology must also form a key part of this project.

There are isolated elements of the government's existing skills policy that do demonstrate a strategic approach to addressing forthcoming skills needs resulting from major infrastructure initiatives. For example, the TUC has welcomed the establishment of the high-speed rail national college and the HS2-TUC Framework Agreement includes a number of important principles in support of boosting skills and apprenticeships as high-speed rail is rolled out. The TUC is also a member of the Strategic Transport Apprenticeship Taskforce (STAT) and is working closely with affiliated transport unions to develop union input to this initiative. The STAT has been established to support the government's ambition to create 30,000 apprenticeships in the sector by 2020 and to increase the diversity of the workforce. National large-scale initiatives of this order provide some examples of what could be put in place to plan for, and meet, forthcoming skills needs in the context of rolling out a sustainable industrial policy.

The TUC has welcomed the general thrust of some of the ongoing reforms of apprenticeships, especially the introduction of regulatory measures – the apprenticeship levy and new procurement regulations - to address long-term under-investment by UK employers. However, the TUC has also emphasised the need for the levy to underpin high quality apprenticeships and for employers and unions to agree these apprenticeship standards as is the case in much of the rest of Europe. A new body - the Institute for Apprenticeships – is to be established shortly and this presents a real opportunity to adopt the principles of social partnership that govern similar bodies in other European countries. This body could play a role in working closely with employers and unions to plan for apprenticeship provision that met the needs of a sustainable industrial policy.

However, a coordinated skills strategy of this kind would require a rethink of some current policies. Firstly, the government would need to revitalise support for the role of sector skills bodies that have had a remit for facilitating employer-union dialogue on both apprenticeships and adult upskilling in different industries and sectors. Without this infrastructure it would be especially difficult to plan for the upskilling strategies involving adult employees. Large numbers of adult employees transitioning to a new occupation or career would also entail significant support structures being put in place and there would be a vital role for unions, especially through union learning reps, to provide support at the workplace level.

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Secondly, there would need to be a review of the increasing demands on adults to take out student loans (i.e. “Advanced Learning Loans”) to fund vocational upskilling. In light of the fact that the bulk of funding for apprenticeships will switch from government to employers in the coming years, there is a strong case for government providing more direct subsidy for retraining and upskilling of adult employees in priority areas as the economy transitions to a sustainable industrial scenario.

Evidence to date shows that uptake of Advanced Learning Loans have been concentrated among young adults and indications are that this is partly due to greater debt aversion among the older adult workforce.

### **Guarantee the work of the Green Investment Bank**

The TUC has consistently supported the Green Investment Bank. We give credit to the Coalition government for creating the world’s first green investment bank; it is the UK’s most active investor in the green economy and for every £1 of public money, the GIB mobilises £3 of private capital. Less welcome was the decision by the Conservative government, shortly after last year’s General Election, to sell its majority stake in the GIB to help fund its austerity agenda. This is a particular concern as the UK needs to invest billions of pounds to upgrade the UK’s energy and transport infrastructure, in order to meet the climate change targets agreed in Paris last December.

The decision to sell the GIB appears to have been rushed through to get it off the government’s balance sheet. The House of Commons Environmental Audit Committee found that the decision was taken without due transparency, consultation, or proper consideration of alternatives<sup>17</sup>. Even the Daily Telegraph has reported that the government has not said whether it will judge bidders on price, green credentials or other features. In the words of the Daily Telegraph: “what is already clear is its aim to raise more than £4bn for Treasury coffers”.<sup>18</sup>

The TUC continues to oppose the decision to privatise the Green Investment Bank. We have long called for it to be given additional borrowing powers to encourage it to develop and extend its role. A transition to a sustainable economy should be seen as a national project, as it is in Germany and Denmark. Such a national project should not be privatising its key assets, selling them to the highest bidder with no guarantee that it will put green transition first.

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<sup>17</sup> <http://www.theguardian.com/environment/2016/mar/06/the-green-investment-bank-must-be-allowed-to-stay-green>

<sup>18</sup> <http://www.telegraph.co.uk/business/2016/05/01/green-investment-bank-privatisation-starts-to-bear-fruit/>



### **Create incentives to fund an energy transition**

The government puts a lot of emphasis on the low cost of energy. It is, of course, quite right that none of us want to pay more for our energy than is necessary. But to put such emphasis on cost perhaps risks missing a bigger prize. We have seen that energy prices have risen in Germany during the 'energiewende' process. The prize will be cheaper, and greener, energy in 30 years' time. The Danish trade unionist Thomas Fischer told us that many Danes pay 10 per cent extra for green energy. Consumers know that cost is important, but cost is not everything.

Of course, Germany and Denmark have an advantage over the UK. Neither of these northern European countries have UK levels of inequality. It may be that the richest people in the UK can afford higher bills to pay for green energy, but those already living in fuel poverty cannot. For this reason, the TUC is attracted to the DGB's idea of energy transition paid for through progressive taxation. In this way, a greater cost falls on the shoulders of those most able to bear it.

The top priority for innovative energy solutions comes in the need for storage systems for renewable energy. Sometimes, there is not enough wind to use wind power. Sometimes there is more wind than we can use. The ability to store wind power for when we require it is a crucial need for renewable energy, as highlighted by Ralf Bartels of the German IGBCE. And as Ralf told us, trade union members, the workforce at innovative companies, will be central to this work. The TUC recommends incentives for companies to link up with universities and propose the development of innovative solutions to the problem of storage.

Finally, tax credits and other financial support is available for new business start-ups, including small scale energy companies. However, as noted by Frederik Moch of the DGB, some of these small companies are poor employers. The TUC believes that government financial support should only be made available to companies meeting agreed standards around pay and apprenticeships.

The TUC produces regular reports on economic and social issues, providing up to date analysis and commentary on key policy debates.

You can also read TUC policy officers' comments on the issues in the report series and the ongoing economic situation at the TUC public policy blog: **[touchstoneblog.org.uk](http://touchstoneblog.org.uk)**

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