



**Green collar nation:  
a Just Transition to a  
low-carbon economy**

## **Green Collar Nation: a Just Transition to a low-carbon economy**

By Joss Garman and Ruth Davis, with Philip Pearson

### **About the authors**

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## Introduction

### Just Transition and social justice

The TUC has long argued for a Just Transition to a low-carbon economy, where the shift to a new, greener economic model promotes social justice rather than undermines it. This paper seeks to further develop the Just Transition concept, and sets out the ways in which its aspirations are shared between the trade union and environmental movements.

Significant periods of economic restructuring in the past have unfortunately often happened in a chaotic fashion leaving ordinary workers, their families and communities to bear the brunt of the transition towards new ways of producing wealth. Such injustice cannot become a feature of the UK's green transition.

The pillars supporting a Just Transition model of sustainable economic development include consultation, investment in new jobs, skills and technologies, and social protection for citizens caught up in change.

By looking at different published scenarios and projections for the sectors of the UK economy moving towards a low-carbon model, it is possible to see where new industrial opportunities are cropping up and skilled jobs are being created. It is equally possible to see how many of our high-carbon industries will need to change if they, and the communities that depend on them, are to survive and thrive.

It has sometimes been the case that the TUC and the environment movement have held differing views on the way the transition should be managed. While we will continue to respect our differences in approach and priority, this report explores where our movements have a shared agenda of managing the costs and reaping the benefits of the move towards a cleaner and stronger economy.

This report was written before the new Conservative government began making a series of radical changes to its low-carbon energy policies. We have a shared agenda and common interest in resisting these cuts. It remains to be seen whether the government will enact new decarbonisation policies to take their place.

## Foreword

Ruth Davis, political director of Greenpeace UK

### **'Climate change is hitting the poor first and hardest.'**

We are used to hearing these words – so used to them, in fact, that it is arguable that they have lost some of their meaning for us.

And yet the story they tell of governments and peoples across the world is one we need to hear if we are to make the case for tackling climate change, here and now, to the citizens of this country and in particular to its working people.

The impacts of extreme weather on vulnerable populations in developing countries have been devastating for many. Look at the havoc caused by Typhoon Haiyan, which struck the Philippines and from which the country and its people are still struggling to recover. Such extreme events are becoming more frequent as a result of climate change, largely driven by human activities.

In the UK, the consequences have not been on this scale. Nevertheless, as floods and heat-waves become more frequent here, the impacts are disproportionately felt by the vulnerable and those on low incomes.

Having your house flooded can have a long-term impact on ill health (DEFRA, 2014). But having your house flooded when you have inadequate insurance and limited access to alternative accommodation is worse. Many people who suffered from the floods in England in 2007 were unable to return to their homes for months, and in some cases years (Jacob, 2009). They were obliged to live with neighbours or in caravans or bed and breakfast, their lives permanently bent out of shape: parents exhausted with trying to bring up children out of suitcases and cardboard boxes; children constantly tired at school because they were sleeping on sofas or in spare rooms.

Equally, when food prices increase, the poor feel the impact disproportionately. The proportion of a household's wages that is spent on food is, not surprisingly, higher in lower income families (Chalabi, 2013). Yet a series of extreme weather events across the world since 2007–2008 have affected global food supply chains and contributed to rising prices – impacts of the kind economists expect to multiply as global temperatures rise and which hit those on the very lowest incomes the most (Terazono, 2014).

Those living in poorly ventilated housing, and those suffering from heart conditions and breathing difficulties – which disproportionately affect poorer people – are also most susceptible to the impacts of heat waves (Gannon, 2012). In 2003, during Europe's most devastating recent heat wave, it was found that elderly women living in the top floors of ill-ventilated homes in Paris were particularly vulnerable to exposure from the blistering heat.

Other health impacts include worsening respiratory function due to increased air pollution and pollen loads associated with rising temperatures and changes in patterns of infectious diseases (Patz et al, 2014).

The list of climate impacts goes on, and it tells us something that we know instinctively but need to be reminded of with concrete examples. Resilience – having something behind us, in terms of savings, insurance, extended family and social networks, settled communities, decent housing – is necessary to withstand even the relatively limited rises in global temperature that we have experienced so far.

And resilience is in short supply in an economy of low wages, zero hours contracts and scarce housing, where the labour market often separates people from their families.

It is therefore straightforwardly a matter of social justice to tackle from both ends the problems caused by a changing climate: both to reduce the pollution that is driving up temperatures, and to build a new economy – including an energy economy – that increases our collective resilience, provides secure, well-paid employment, and enables people to handle the shocks that are coming their way.

But if we accept that many people in different ways are now painfully exposed to the impacts of climate change, we should also accept that it is neither fair nor helpful to clothe our response to this problem primarily in the language of personal guilt, which, unfortunately, is too often how it was previously presented.

Families dependent on their cars to get their children to school, themselves to work, and perhaps to ensure contact with their wider family and a cheap weekly shop, were caught up in a discussion about car use, which had its origins in a dislike of 4x4s being driven 500 yards to the school gate. But few viable and affordable alternatives were offered to those who are car-dependent, particularly in rural or edge-of-town areas.

Taking a yearly holiday flight to somewhere sunny became a guilty pleasure, as the explosion in cheap flights meant that for the better off, flying became a regular route to a weekend get-away.

Since the majority of people are intelligent enough to work out that behaviour change alone is unlikely to solve this problem, which is global in nature, and rooted in the technologies we use to power our economy, the result of this kind of politics was often a mixture of shame and powerlessness.

Human beings are (for their own sanity's sake) wired to turn away from problems that they cannot solve and which leave them feeling despairing or frightened about the future. Climate change viewed in this way became perceived by many as something close to an 'act of God'. A broken climate took its place alongside death and taxes. Many people switched off.

Nor was this narrative of disempowerment and guilt limited to the personal. It also emerged as a dominant theme of international climate politics. At an international level many climate campaigners focussed primarily on the concept of 'climate debt', which argues that as Britain and other industrialised countries have used up their share of the total allowable 'carbon budget', other countries must now be allowed to use up theirs or pay the equivalent value as a debt.

Such a narrative is anything but inspiring when presented to people struggling through the impacts of a protracted recession in a low-wage, post-industrial economy, where hundreds of thousands of jobs have been outsourced to other countries with even lower wages and laxer environmental standards. People in these circumstances want and need a story of hope – of a positive future to which they can make a personal contribution, not one of guilt, debt and continued economic struggle.

Of course this does not mean that as a country we should renege on our obligations and commitments under international law, refuse to accept responsibility for our pollution or to curb it further; nor should we fail to support the transition to clean development in countries with less capacity to act than ourselves – countries which in many cases are also struggling with a legacy of extreme poverty. It cannot mean that we turn our backs on those suffering the consequences of climate pollution in vulnerable countries.

But for the people of this country, our actions need to be understood as a contribution to a shared endeavour which will help create a fairer, safer future for us all; not a price to be extracted from them to pay a historical debt. Because whatever our frustrations with the current functioning of our democracy, we live in one. So if we are serious about tackling climate change, we must be serious about securing permission to do so from the electorate of our own country.

This in turn means considering much more carefully how as a country we design a new, low-carbon energy system within the context of a just and politically tenable transition here, and globally. This transition will only be truly successful if it is undertaken in a socially just way.

## Green Collar Nation

### New industries and new jobs

The good news is that recently published macroeconomic research by consultancy Cambridge Econometrics suggests that by 2030 the changes in our economy required to achieve the UK's existing commitments to making deep cuts in carbon pollution – set out in the Climate Change Act 2008 – will generate an additional 190,000 net jobs in the UK (WWF, 2014).

A 2012 report by the CBI put the number already employed in the UK's green business sector at one million, and valued these industries at £122bn (CBI, 2012). As the organisation's Director General John Cridland explained at the time, "There is a hard-nosed economic argument that moving to a low-carbon economy can drive significant business investment and create many new jobs across the country. This is happening now, in every sector, in every region, and if we can build on these foundations, it can be a catalyst to transform our export figures and rebalance our economy over the long-term" (Ibid).

Unfortunately, in its first 100 days of office, the newly elected Conservative government announced fundamental changes to its support for renewable energy, energy efficiency and low emissions vehicles.

A new coalition of business, community, environmental and trade union organisations has been established to campaign against cuts in the feed-in tariff scheme, which has propelled the growth of the renewable energy industry. Meanwhile, the CBI has said recently: "We need all countries to pull in the same direction at the Paris Summit to give firms the certainty and confidence they need to invest in the green economy for the long run."

Through investment in clean energy, by retrofitting millions of homes that are currently leaking heat, by building low carbon vehicles, upgrading and expanding clean transport systems, the low-carbon transition can create jobs and build a stronger economy. For this reason, among many others, there is compelling common cause for labour and environment movements to work together.

Speaking at the TUC recently, John Ashton, who was the Foreign Secretary's most senior diplomat on climate change for most of the past decade, explained how the renewables industry is already transforming prospects for communities in some parts of the country.

John Ashton:

*“I grew up on Tyneside. In the 60s and 70s it felt as if the best days in the North East were long gone. In some towns more than 50 per cent of the adult population had no job. The river was black and toxic. The future held no promise. If you go down to the Quayside in Newcastle today, you can get a boat to Tynemouth and back again. It’s an inspiring journey. What you see is one of Europe’s great industrial rivers, a river that had died, stirring back into life. Siemens, with its new base for servicing wind turbines in the North Sea. One of Britain’s biggest facilities, still growing, for the processing and trans-shipment of biomass fuel, including for Drax power station. Nissan exporting from its South Shields terminal fuel-efficient and electric cars to distant markets. And all those installations creating jobs, investment and growth along their supply chains. A great river coming back into life because of a low-carbon economy in our country that kept growing at close to 4 per cent all the time the economy as a whole was hardly moving”. (Ashton, 2014).*

## **Renewable energy generation**

The scope for continued job growth in the technologically diverse renewable energy sector – ranging from wind, solar, wave and tidal power to biomass and geothermal energy - will be largely determined by the volume of renewable power that is deployed here, but the potential for new jobs in manufacturing, construction, installation, maintenance and operation is enormous (RenewableUK, 2013).

The number of jobs already created by the UK’s renewable energy industries rose by 74 per cent between 2010 and 2013 to at least 35,000 (Ibid). This includes:

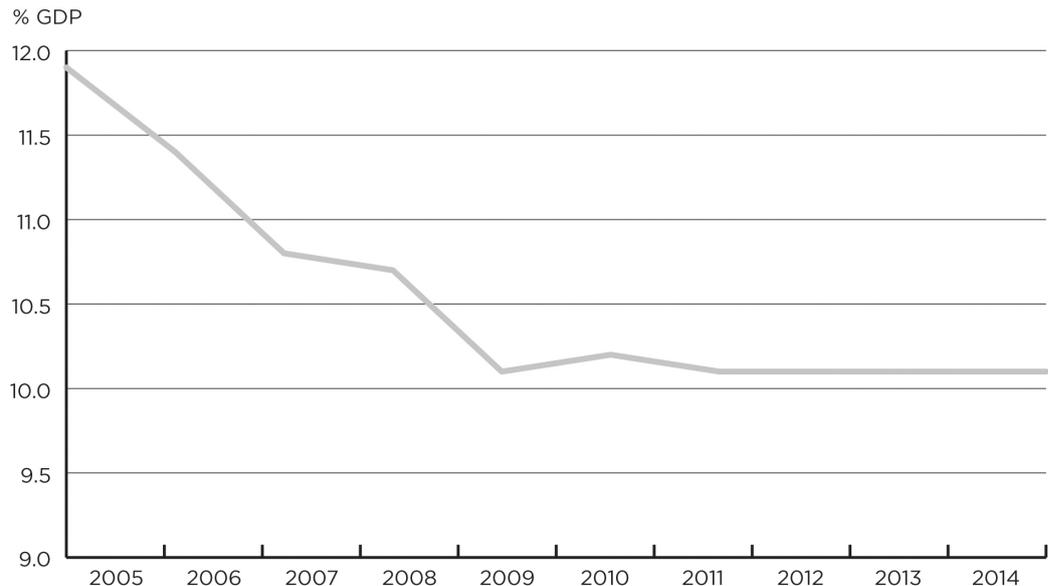
- 15,620 currently working in solar photovoltaic industries
- 13,000 jobs in offshore wind
- 4,000 jobs in onshore wind
- 2,500 jobs in wave and tidal power.

The opportunity for an explosion in the number of green jobs has been demonstrated by Germany where the rapid growth in renewable electricity generation has created more than 380,000 jobs, and where the United Nations Environment Programme (UNEP) expects this figure to rise to 700,000 by 2030 (Maatsch, 2014; ILO, 2010). Similarly, Spain has generated 188,000 jobs in its renewable industry (ILO, 2010).

In any scenario in which the UK keeps cutting its output of greenhouse gas pollution in line with our carbon reduction targets, the share of renewable energy sources in our energy mix must grow significantly. In their advice to the government on what is required to do this cost-effectively, the Committee on Climate Change has published different possible route maps for the power sector. Even in the pathway they outlined with high deployment of both Carbon Capture

and Storage (CCS) and nuclear power, the share of energy demand met from renewable sources also grows significantly (Green Alliance, 2014). Yet manufacturing’s share of the UK economy has flatlined since 2010.

**Green jobs can easily reverse the long-term decline in UK manufacturing**



The Centre for Economics and Business Research (CEBR) was commissioned by the UK’s solar industry to look at the macroeconomic growth potential from deploying their technology in the UK. Our country currently benefits from 5GW of solar power – roughly equivalent to six gas-fired power plants. They concluded that 32,500 jobs would be created in scenarios where 20GW of solar power is generated by 2020, rising to 40GW by 2030 – enough to power 12.1 million homes, and in line with the ambitions of Department of Energy and Climate Change (DECC) ministers. If the level of ambition were to be raised further, so that 60GW of solar power was generated by 2030, some 50,000 jobs could be created.

An additional eight per cent of UK power could be generated cleanly from tidal lagoons situated off the Welsh coast, which would create 6,400 jobs and see more than half of the necessary materials sourced locally in Wales. A fleet of these lagoons around the UK could sustain 35,000 jobs, and create an exciting new export industry (Ocean Energy Europe, 2014).

Research for RenewableUK, which represents both the marine power and wind industries, concluded that if there is sufficient growth in deployment of these technologies around our coastline, there is the potential for 70,000 new jobs over the next decade – about half of which would be created through the expansion of offshore wind (RenewableUK, 2013).

It is often said that our windswept isles have the potential to become “the Saudi Arabia of offshore wind,” and evidence from the United States shows that

offshore wind provides more job-years per unit of energy generated than coal, gas or nuclear power (McNeil et al, 2013). Siemens recently announced that it is to create up to 1,000 new jobs at Hull docks for the UK's first purpose-built factory to manufacture offshore wind turbine blades.

Yet a report from the Institute for Public Policy Research (IPPR) concluded that while Britain already has strengths in many parts of the offshore wind supply chain, for example in components for grid connection and foundation manufacturing, British workers currently only represent a small proportion of the supply chain. The report's authors explained:

*“Turbine manufacturers are clear that greater policy clarity both up to and beyond 2020 is necessary for them to establish a base in the UK.”*

The CEO of the National Skills Academy for Power has written about the need to bring in ‘skills and experience from other sectors of the UK economy (for example, from the armed forces), up-skilling and re-skilling experienced staff, as well as recruiting through non-traditional entry routes,’ such as through apprenticeship schemes, if the jobs being created in offshore wind are to remain in the UK and be filled by British workers (RenewableUK, 2013). Encouragingly, IPPR's research found that there is potential for the UK's oil and gas workforce to transfer their skills to the operation and maintenance of offshore wind farms.

This example strongly illustrates that grounding the low-carbon transition firmly in policies designed to support British industry, improve our skills base and ensure that we are creating well-paid jobs throughout the supply chain will be vital to ensuring a Just Transition.

## **Oil and gas industry**

While nobody seriously disputes that there will be a part for natural gas in the UK's energy mix through the 2020s and into the 2030s, the degree to which our reliance upon this fossil fuel should continue, and for how long, is deeply contentious.

For example, National Grid's ‘green’ scenario for the UK energy system, in which the UK keeps to carbon targets through a major expansion of renewable energy and energy efficiency, sees gas dependency cut by 40 per cent by 2030 (National Grid, 2011). An analysis by Greenpeace, based on data from DECC and the Committee on Climate Change (CCC), suggests gas use will need to fall 70 per cent or more by 2050 if the UK is to keep within national carbon budgets (Kahya, 2014).

When Chancellor George Osborne announced and championed a new ‘gas strategy’ to radically grow the share of electricity demand met by natural gas – implying the construction of between 35 and 40 new, unabated gas-fired plants – it was described by the government's own chief climate adviser as “completely incompatible” with the government's agreed approach on climate change (Carrington and Vidal, 2012).

In a world where the trajectory is ultimately for falling demand for gas not just in the UK, but also in other major European economies (which are transitioning

away from unabated fossil fuel use), it is quite likely that there will be a more and more limited role for our gas industry in supplying a diminished market, and in meeting domestic demand. This expectation for a decline in demand for gas is reinforced when concerns about the security risks associated with access to gas supplies are also considered.

This is why the International Energy Agency (IEA) projects gas demand will fall in Europe (IEA, 2014). The EU's package of energy policies focused on energy efficiency and renewable energy for the period through to 2030 could see European gas demand fall by up to a third (Garman, 2014).

The IEA has also examined levels of demand for oil in a scenario where the world acts to cut emissions in line with what's required to stay below two degrees of global warming (Kahya, 2013). This analysis predicts that oil demand will fall through to 2035, and that three quarters of the world's proven but not yet in production oil reserves would need to remain untapped.

One impact of such a shift away from oil use across Europe could be a boom in the low-carbon vehicles sector. Cambridge Econometrics and Ricardo-AEA conducted a major study on the impact on employment of reducing oil demand from cars and vans across Europe. A rapid switch towards fleets of advanced hybrid, battery-electric and fuel-cell vehicles could create:

- between 500,000 and 1.1 million net additional manufacturing jobs across the EU by 2030 through auto sector innovation
- an increase of between 1.9 million and 2.3 million jobs in all low-carbon scenarios by 2050 (Cambridge Econometrics, 2013).

The UK would be particularly well placed to take advantage of increased demand for greener vehicles in Europe since we're already a market leader in the field. For example, Toyota is already making its hybrid Auris in Burnaston, Derbyshire, and Nissan manufacture the electric Nissan Leaf in Sunderland, working with Gateshead College to train up the workforce with the key skills that they need (Economia, 2013; Zero Carbon Futures, 2011; The Journal, 2013). Aerotails, a company in Bath, Somerset, manufactures devices that can be retro-fitted to commercial vehicles to make them more aerodynamic, saving on fuel consumption and reducing carbon pollution (Economia, 2013).

Of course, oil and gas companies do not necessarily share these assumptions about demand for their fuel being reduced over coming decades. Oil company Exxon, for example, have been very frank in saying that they do not accept that long-term demand for oil and gas will be curbed through efforts to decarbonise the global economy (Crooks, 2014). Instead, the company has planned for the likelihood that three quarters of global energy will continue to come from fossil fuels in 2050 and that prices will remain sufficiently high that new oil and gas extraction projects will remain profitable and not become stranded assets (Carbon Tracker, 2014).

Similarly, Shell is planning its decisions on the basis that 40–60 per cent of global energy demand will still be met by fossil fuels in 2050. In other words, business as usual (Reuters, 2014).

***Except that there is no business as usual.***

Firstly, this is because these companies' business models are predicated on a scenario in which global temperatures could rise by as much as six degrees – threatening the collapse of significant parts of global food production and insuperable challenges to the maintenance of critical infrastructure (*The Economist*, 2014).

Moreover, business as usual scenarios assume that over the same period there will be virtually no technological innovation. Yet the price of solar energy has dropped 80 per cent in the past five years, leading financial analysts to caution against continuing investments in increasingly costly fossil fuel projects (Evans Pritchard, 2014a).

As the *Daily Telegraph* recently reported, “Citigroup said solar already competes in the growing regions of the world on ‘pure economics’ without subsidies. Solar power has reached ‘grid parity’ position with residential electricity prices in Germany, Italy, Spain, Portugal, Australia and the US southwest. Japan will cross into grid parity this year, Korea in 2018. It forecast that even Britain will achieve grid parity by 2020, a remarkable thought for this wet isle at 51 or 52 degrees latitude” (Evans-Pritchard, 2014a). Running in parallel with international and national commitments to tackle climate change, such technological innovations suggest that our energy mix in the future may be different to that predicted by our major oil producers.

The UK's North Sea oil and gas reserves are not inexhaustible, and as the costs of extraction increase with the difficulty of accessing depleting reserves, the falling costs of alternative technologies will represent an increasing challenge to their profitability, especially if oil prices continue to remain relatively low.

Should we not therefore be planning ahead over a rational timescale, by making investments to ensure skilled and well paid jobs in other industries – while acknowledging that oil and gas production in our own fields will continue for some time? That's what Saudi Arabia has begun to do, investing \$100bn in solar capacity to provide for a third of their domestic need (Ibid).

### **Tackling energy efficiency**

More than a third of the UK's carbon footprint is a direct result of wasted energy seeping from badly insulated buildings. Energy efficiency improvements must therefore form a central pillar of the UK's plan to clean up the economy. However, addressing Britain's leaky housing stock should also form the centrepiece of any credible plan to address rising energy bills.

Widespread discontent over the size of household fuel bills means that energy costs have risen to the top of the Westminster agenda. This is hardly surprising:

- 2.39 million households are in fuel poverty in England alone.
- The impact of cold homes on people's health costs the NHS £1.3bn a year.
- 25,000 people are dying from the cold each winter (Platt et al, 2013; EBR, 2014).

- Rising bills are also worsening the squeeze on family incomes: the proportion of household income spent on gas and electricity has risen from 1.8 per cent in 2003 to 3.1 per cent in 2013 (Platt et al, 2013).

Each home leaking heat from doors, windows and walls ultimately means that households are paying over the odds, handing seemingly ever increasing sums over to utility companies for energy that is just being wasted. Families who do not own their homes are particularly badly impacted by the problem of leaking homes leading to higher energy bills since they are left dependent upon their landlord to make upfront investments in loft insulation, and money-saving lighting systems, which too often means improvements do not materialise.

In spite of the fact that efficiency is in everybody's interests, except perhaps the utility companies who want to sell us all as much energy as possible, the popular anger over energy prices has not yet been sufficiently translated into political pressure for a large-scale energy efficiency action plan.

Home improvements could save an average household £230 a year – potentially up to £800 a year, according to a report for UNISON suggesting a major retrofit programme to address rising energy bills should be a no-brainer solution to the bills crisis (Platt et al, 2013; UNISON, 2014). Some analysis suggests that for every pound invested in energy efficiency improvements to homes, there would also be a 42 pence saving to the NHS (Cambridge Econometrics, 2014).

As research from IPPR has shown, the policies the government has pursued on energy efficiency to date have dramatically failed (Platt et al, 2013). About 80 per cent of the funding that has been made available has not been directed to fuel-poor households and the government's flagship 'Green Deal' scheme of household loans for efficiency improvements saw spectacularly low take-up (Ibid). The poor design of the policy meant that less than 1 per cent of those the government projected would take up the scheme actually did so and that consequently a few hundreds of households rather than tens of thousands have benefited from improvements (Ibid).

The government has now scaled back its ambition on energy efficiency so that 400,000 fewer households will have access to government financial help to make efficiency improvements than was previously promised, and regulations to ensure developers produced better insulated new houses have been axed (Mason, 2014; Heasman, 2014). As a consequence, while the government estimates that the UK's energy efficiency industry will employ 35,000 people in 2015, this would mean a doubling of the numbers currently working in this area (Shankleman, 2014). Instead, the Association for the Conservation of Energy is expecting *thousands of job losses*, triggered by cuts to energy efficiency budgets (Ibid).

If there was a major re-focused effort that saw efficiency improvements made house-by-house and street-by-street, landmark new research from Cambridge Econometrics and Verco suggests things could be very different. Their report considered what the macro-economic impact would be of a major infrastructure investment programme that saw all low-income homes in the UK given measures by 2025 to bring them up to 'band C' on an Energy Performance Certificate

(EPC), and other households offered interest free loans to improve them to an equivalent EPC standard by 2035.

It found an approach like this would see employment increased by up to 108,000 net jobs per annum over the period 2020-2030, mostly in construction and service sectors as well as manufacturing supply chains. It concluded that these jobs would be spread across every region of the country. Even as the initial investment stimulus wore off, the research suggests a net increase of 70,000 jobs in 2030 (Cambridge Econometrics, 2014). According to the research, while significant public investment would be required up front, the scheme would pay for itself by 2025 and create net revenue for the Treasury thereafter. It would also cut gas imports to the UK by 2030, which would improve our energy security and save about £2.7bn a year in avoided fuel import costs (Ibid).

## **New technologies**

### *Carbon capture and storage*

One new industry that has sprung up solely in response to the need to cut carbon pollution is based on Carbon Capture and Storage (CCS) technology. The latest comprehensive report from the Intergovernmental Panel on Climate Change (IPCC) suggests that CCS will have an important role to play in worldwide efforts to keep global temperatures to safe levels by capturing pollution from fossil fuel power stations and major industrial facilities like steel mills and chemical plants (IPCC, 2014).

The IPCC concluded that without CCS, the cost of tackling climate change could be much higher. It suggests that the costs of attempts to limit atmospheric levels of global greenhouse gas pollution to 450 parts per million (450ppm) – the level that it has been suggested would give the world a roughly 50:50 chance of staying below two degrees of global warming – could, without CCS, rise by as much as 138 per cent (Ibid). Similarly, the International Energy Agency (IEA) has made the case that without CCS the cost of halving global emissions by 2050 could rise by 40 per cent (TUC, 2014). However, in the absence of cost discovery from operating a CCS plant, significant uncertainties remain around these estimates and therefore the potential of CCS for tackling climate change is still disputed. There is not yet a single commercial scale CCS plant in operation in the UK.

Greenpeace, along with many other environmental organisations, remains unconvinced that CCS, particularly when applied to power plants, will deliver genuinely cost-effective reductions in emissions within a meaningful time-scale (Sherman, 2013). Concerns also persist about the residual emissions after CCS has been applied. For these reasons, green groups have argued that public support should instead be focussed on renewable energy and energy efficiency. The TUC on the other hand is more enthusiastic, seeing CCS as an essential technology to avoid dangerous levels of climate change.

However, all leading political parties currently see a major role for CCS technology in our energy sector through the 2020s and so does the Committee on Climate Change.

In the reference scenario projection from the Department of Energy and Climate Change (DECC), the government foresees that there will be about 4GW of CCS equipped power generating plants by 2020, rising to around 30GW by 2030. The CCSA – the trade association for the industry – envisages up to 20GW by 2030. To put these scenarios in perspective, that's dozens of CCS-equipped coal and gas-fired power stations in operation across Britain through the 2020s.

Supporters of CCS technology argue that this would create many new skilled jobs in the UK. The world's first CCS plant, built in Canada, has reportedly seen the creation of 1,500 jobs in the construction process and 41 jobs remain in maintenance of the station (Ibid). New-built CCS projects in the UK are projected to create 1000-2500 jobs per plant during construction, which usually takes four to six years. 200-300 jobs would remain in the operation and maintenance of each of these plants, including those at the plants and in the supply chain.

Research for the TUC and CCSA suggests between 15,000 and 30,000 jobs could be created in the CCS industry by 2030, including roles in design, engineering, project management and procurement activities. The economic benefits to the UK generated from CCS investment on this scale have been estimated to be £2bn–£4bn a year by 2030 (Ibid).

### **Industries that must change to survive**

While these opportunities from greener growth are increasingly well understood – in terms of new jobs and industries built around low-carbon technologies – less attention is given to what must happen to Britain's existing fossil fuel or energy intensive industries and those who work in them in the context of a transition to a low-carbon economy.

Yet it is how we deal with any potential 'losers' from the transition that will characterise our success in this shared endeavour, as much as our ability to capture the benefits of new technologies and investments.

The recession of the early 1980s saw two million jobs lost in British manufacturing and heavy industry, including many hundreds of thousands in coal mining, steel and shipping.

The deprivation, demoralisation and humiliation suffered in the communities that lost these jobs extended over a generation. Grimethorpe in Yorkshire was classified in 1994 as one of the poorest places in Europe and unemployment in some former mining villages in the 1990s was running at 50 per cent (Argus 2014). Nor was the problem just the loss of jobs; it was the loss of community, tradition, sense of place and collective pride which devastated lives and was felt by many to be irrecoverable. The children of those who went through this 'industrial transition' are able to bear testimony to the scars it left on their lives.

A transition from one kind of energy economy to another over a period of two to three decades involving change in the fuels we use and the kinds of technologies we manufacture will inevitably bring significant shifts in the distribution and nature of employment. The question we have to ask is how this can happen in a

way which helps to rebuild skills in our workforce, resilience in our communities, along with a shared sense of contribution towards the common good?

### **Energy-intensive industries**

The British businesses most sensitive to the cost of climate change policies are those that are heavily reliant upon energy for manufacturing – examples include the metals, concrete, chemicals, and glass industries.

These ‘energy intensive’ businesses directly account for 225,000 jobs in the UK, and create many more jobs here through their supply chains (CBI, 2011). Tata Steel, for example, estimates they create five jobs indirectly for every one of their employees. With many of these employers clustered in the Aire Valley, the North East and North West of England, they play a key role in helping to rebalance the UK’s economy away from London and the South East. Since many of these companies are situated in areas with higher levels of unemployment than the South, the jobs they offer should be valued particularly highly.

While the nature of their industrial processes means that they are major polluters representing a significant proportion of national carbon emissions, many of these energy intensive industries will also be crucial to our country’s efforts to decarbonise. That is because they produce many of the products that will be needed to clean up the energy sector; including, for example, the steel and chemicals required to manufacture wind turbines and low-carbon vehicles.

It makes no sense to allow a policy environment to develop that would be uncompetitive and drive these businesses offshore, especially to countries with weaker labour and environmental standards, and from which we would need to continue to import the products. This would result in higher emissions and lost jobs and revenues here in the UK.

Indeed it is for this reason that these industries have begun to be compensated for the impact of climate policies that would otherwise have risked undermining their competitiveness.

Some environmental groups, such as Sandbag, have suggested these compensation schemes have in fact been too generous. They point out that the government has significantly over-estimated the carbon penalty currently paid by these industries, and that taxpayers’ money has been used to support companies that are making healthy profits, and for costs that they never incurred. Equally, they note fossil fuel price hikes have been a significantly greater driver of rising energy prices than climate change policies, and that energy efficiency improvements would both improve industrial competitiveness, and curb pollution (Bergamaschi, 2014).

Certainly it is the case that, contrary to a widely held misconception, the competitiveness of European heavy industry as a whole has largely been maintained. A recent analysis by EY concluded, “Despite the economic crisis, most European industrial sectors have managed to maintain or even enhance their competitive advantage since 2007” (EY, 2014).

However, in its report, *Building Our Low-Carbon Industries* (2013), the TUC highlighted how the UK’s energy intensive industries are still particularly

vulnerable to international competition due to the need for transitional energy cost relief and up-front investments in improved efficiency and breakthrough technologies. A targeted strategy is therefore urgently needed for this sector, which should be focussed on innovation.

That is because emissions from these industries will need to continue to fall if the UK is to deliver the scale of emissions cuts that is needed. The government estimates this sector will need to cut its footprint by around 70 per cent through to 2050 (Nash et al, 2012a). For this to happen both further energy efficiency improvements, and technology breakthroughs, will be required. The European Commission estimates that there is potential for energy intensive industries, and the wider industrial sector, to reduce emissions by up to 87 per cent by 2050. But as the cross-party Environmental Audit Committee highlighted, this scale of carbon cut would require significant investments, and large-scale deployment of carbon capture technology for heavy industries like steel and chemicals as well as the power sector by the 2030s (EAC, 2013).

To maintain a downward trajectory for emissions in these sectors, alongside continued competitiveness, we will require constant vigilance and flexibility from policy makers, including active steps justified by facts on the ground, to ensure that that they are not undercut by competitors relying on higher carbon energy sources. The aim in steel, for example, should be for Britain to maintain and grow the world's leading centre for low-carbon steel production.

### **Aviation**

The climate challenge is also particularly difficult for the aviation sector, which directly employs about 140,000 people in the UK (AEF, 2011a).

Flying represents the fastest growing contributor to the emissions problem but clean aircraft technology solutions that can enable significant aviation growth while limiting greenhouse gas emissions are simply not yet commercially available, and are not expected to be for many years. The difficulty in solving the pollution problem with aviation explains why successive governments have exempted aviation from climate change laws both in the UK and internationally. For example, aviation sits outside of both the carbon targets in the UK's Climate Change Act, and the Kyoto Protocol.

Many climate scientists have advised that, short of technological breakthroughs, it will ultimately be necessary to prevent demand for flying from growing exponentially if a situation is to be avoided in which greenhouse gas pollution from planes cancels out reductions in pollution made across all other parts of the economy. Equally, they have advised that if aviation does continue to grow then it will require a greater emphasis on finding pollution reductions in other industries (Bows et al, 2010).

Given these trade-offs, aviation does need to be brought within the overarching national and international frameworks for dealing with carbon pollution from across the whole economy, including the EU Emissions Trading Scheme, the Climate Change Act and whatever new international agreement emerges from the

UN climate process. There is no reasonable justification for this industry to be given special treatment over all others.

Nevertheless, there must be a recognition that families increasingly rely on planes to stay in touch with one another, and businesses rely on aviation to conduct trade. This is very unlikely to change. What's more, it is patently obvious that penalising families for taking their family holiday once a year is not a sensible approach to winning public support for the low-carbon transition.

Environmental groups, including Greenpeace, argue that there should be limits placed on airport growth to manage aviation demand. They point the Aviation Environment Federation's (AEF) analysis that suggests there is already sufficient airport capacity in the south east of England to meet demand for flights through to 2050 without the need for new runways, and although better use can be made of existing airport capacity, the UK is already very well connected to our global trading partners (AEF, 2011b, AEF, 2011c).

The TUC disagrees and expresses grave concerns about this sort of approach, supporting the work of the Airports Commission, chaired by Sir Howard Davies, to explore this issue. They believe airport expansion is necessary to safeguard jobs and growth in the UK, but that this should be done in a way that is mindful of environmental and climate change considerations.

There is however agreement between the TUC and Greenpeace on the need to advocate for a much greater focus on cleaner alternative forms of travel (Viita, 2012). There is scope for trains to play a greater role in serving destinations as close by as Paris and Brussels. This will become easier as the availability of high-speed train routes increases, and investment in these more sustainable transport options could also create new jobs in the rail and bus industries.

There is also agreement on a need for government policies – particularly on greener aviation technology development – to work towards ensuring that where clean transport alternatives to flying already exist, they should be made a more affordable option. Generally, given a more environmentally friendly option, people will very often choose to take it. It is not sustainable that short-haul flights, for example, between London and Edinburgh are often far cheaper than the train alternative, when taking the train is ten times less damaging to the environment than flying. Similarly, it doesn't instinctively seem right that when most British people fly very little (if at all) in a given year, that these individuals should be hit with the same level of air taxation as those who can afford to fly frequently. Ongoing research by Leo Murray for the New Economics Foundation is examining whether there could be a fairer approach to air taxation for business and leisure travel.

The World Wildlife Fund (WWF) also argues that greater use of rail for short-haul journeys, together with increased video-conferencing instead of long-haul journeys, has meant some major British businesses have cut back on how often their staff fly. There remains potential to replace some aviation demand through an expansion in the use of these technologies.

Both Greenpeace and the TUC also share a campaign goal of securing far more investment to support research into new technology to minimise the pollution effects of transport, including cleaner fuels and electric cars. The transport sector should contribute its fair share in securing the low-carbon transition so that other sectors of the economy, such as energy-intensive industries, don't carry a disproportionate burden.

### **Coal-fired power generation**

About a third of the UK's electricity supply still comes from highly polluting coal-fired power stations. According to the government's advisers at the Committee on Climate Change, to keep on track with the carbon cuts that the UK has signed up to will require the almost total phase-out of unabated coal power (ie coal-fired stations without carbon capture technology) within the next decade. Air pollution from coal-fired plants, thought to be causing 1,600 premature deaths a year in the UK, means there is also a powerful public health argument for reducing coal consumption (HEAL, 2013).

There is already a cross-party consensus on the need to prevent new coal plants being constructed without CCS, and an increasing debate over what measures are now required to ensure coal consumption begins to fall in existing coal-burning stations that are not equipped with capture technology (Ottery, 2014).

But the coal industry also has a long, proud history in the UK. The legacy of mine closures has left many communities hungry for alternative sources of skilled, well-paid employment in recognition of the contribution they and their families have made to our national well-being. Ensuring that they are not left behind will be an essential part of achieving a just transition, which in turn means actively linking the provision of skills and training in former mining areas with opportunities in new industries.

Many in industry and the trade union movement would argue that this should include the development and deployment of CCS for both power and heavy industries. The development of our energy system will also need to be embedded in a wider regional and industrial strategy, providing opportunities in a range of emerging new industries, and enabling technologies to be matched to skills and geography. (Nash et al, 2012b).

### **Reforming energy markets**

Irrespective of the precise pathway the UK follows over the next two decades, what this technical analysis of our potential energy futures shows us is that if we are to reduce climate pollution and in doing so reduce the harm it will do to our communities and country, we will need to embrace a huge change in the way we generate energy. Over time we will also need to diversify our economy to reduce our high dependence on income generated from fossil fuel production.

What a technical analysis of this kind cannot provide is a recipe for how to undertake this transition in a way which ensures that costs and benefits are fairly distributed, respects local traditions, and builds diversity and flexibility into our shared response.

As John Ashton put it in his speech to the TUC:

*“Fixing the climate demands a reengineering of the energy system, and therefore of the high-carbon growth model that since the industrial revolution we have built around it. If you re-engineer the growth model, you re-engineer the power relations that underpin it.” (Ashton, 2014).*

**This is the work of Just Transition.**

It needs to be understood both in the context of rapidly evolving energy technologies, and our broader national politics. In particular, we need a transition that contributes to the work of building a more democratic economy – one which invests in skills, builds respect and a voice at work, retains economic value at the local and regional level, and through this helps to rebuild resilience in our communities and to renew our shared institutions.

A first step towards this will come from fostering a more dynamic relationship between the centre and our cities and regions in planning and financing future energy infrastructure.

At present there appears to be two competing models for future energy planning. One is based on ‘top down’ decisions about future demand and the lowest cost route to the delivery of existing targets, which relies on the provision of new, large-scale, power generation capacity broadly financed by bill payers and built and owned by large energy companies.

As we discuss below, there is a more radical, more democratic vision – advocated by Greenpeace and others – that builds on the potential of a more diverse range of local energy sources and a bigger role for active demand management, linked to regional industrial policy, and with the potential to encourage a wider range of players in the market, from smaller energy companies to local authorities, co-operatives and social enterprises.

### **Linking top down and bottom-up reforms to our energy system**

The risk is that instead of linking these two approaches, we pursue them independently. On the one hand, we continue to rely mainly on ‘top-down’ energy planning which is less responsive to technological innovation, more likely to ‘lock in’ unabated fossil fuel power generation and contributes to further public alienation from government and energy companies, as they see the costs of the transition fall on them without experiencing any of the benefits. On the other, decentralised projects flourish at a community level (Solar Schools, 2014) but remain an ‘add on’, funded by those with the existing political, social and financial capital to invest in them, and never reaching a sufficient size to make a significant contribution to energy production, or to rebuild the health of local economies.

We can do better than this, but it will require a much more active conversation between the advocates of these different approaches. We may need to think about how we allow cities and regions to develop their own plans for future energy management, while integrating these local and regional initiatives successfully into

a national system that continues to maintain reliable and affordable supplies of energy to homes, businesses and industry (Platt et al, 2014).

The current system, whereby energy customers all make the same financial contribution via their energy bills towards the low-carbon energy transition irrespective of their means, also needs to be reviewed, particularly in the context of sustained failures in energy efficiency policies. That a family struggling to get by each month is currently ‘paying in’ the same proportion from their energy bill towards new energy infrastructure schemes as a billionaire financier in the City is deeply regressive.

Worse, the financial returns on these investments are often never fully seen by those paying in: the system has been set up to transfer these funds via subsidies to large energy companies, to incentivise much -needed investments in the UK energy system, which even then are too often not materialising (Carter, 2012). Instead, as a report by Bloomberg for Greenpeace showed, bill payers’ money that is intended to be spent on the low-carbon transition is instead indirectly finding its way into dividends for shareholders at the Big Six energy companies (Ibid).

When the ‘climate sceptic’ former Conservative Environment Minister Owen Paterson wrongly attacked the UK’s climate change laws, he nevertheless was making a legitimate point when he described the “coerced increase of electricity bills for people on low incomes to pay huge subsidies to wealthy landowners and rich investors” (Paterson, 2014).

New research from IPPR on City Energy has set out some policy options for how municipal energy providers could start to compete with the Big Six here in the UK too, democratising the energy market and providing a boost to local economies in the process (Platt et al, 2014). Fostering local partnerships between clean energy companies and trade unions and local colleges and universities, for example through new apprentice schemes, could also increase our ability to design, build and install clean tech using local labour.

A long-term energy plan jointly owned by the centre and by entrepreneurial partners, including citizens, and at the city and regional level, offers a real chance of moving from a high- to low-carbon economy in a way that maximises value in our economy. It also provides us with a chance to work with the grain of local traditions and capabilities - in doing so diffusing some of the deep-seated resentments about the centralised imposition of large infrastructure projects, which are perceived to have little benefit for local people.

For example, for those working in former coal-mining communities or for the oil and gas industry there is an understandable appetite for ensuring that CCS technology is able to play its role in reducing the risks from climate change, notwithstanding the concerns about costs and effectiveness raised by green groups. For many in rural communities who unite in opposition to large-scale onshore wind farms, there is an interest in a range of other indigenous energy sources from solar power on schools to anaerobic digestion, geothermal energy and sustainable biomass. And for communities with strong maritime traditions, offshore wind, tidal and other marine renewable energy technologies provide a



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natural match between traditions, skills, natural resources and economic opportunities.

There is also no reason why consumers paying into the transition shouldn't end up owning a stake in it, with potential to reap financial rewards from investments.

In Germany the boom in renewables (supported by substantial government intervention) has enabled citizens, community groups, churches, trade unions, cities and local authorities to take a much greater ownership stake in the energy system. Just 5 per cent of the renewables installed in Germany – that have been known to provide up to three quarters of the nation's power needs – are owned by the big utilities (Ottery and Kahya, 2014). The possibilities for municipalities and householders to have a stake in Germany's new renewable energy strategy (the 'Energiewende') goes some way to explaining its popularity there where polling shows majority public support for the clean energy surcharges on their bills (RI, 2013).

### **Boosting infrastructure investment**

Securing a sustained green transition will require new and innovative forms of finance. 'Green bonds' - bonds issued to raise funds for clean technology deployment or schemes to reduce climate impacts – are expanding around the world. The recent growth in the institutional green bond market, including a \$1.5bn dollar green bond sale by the German infrastructure bank KfW, demonstrates their potential (Nicola, 2014).

We need to consider how any new infrastructure bank could work with a strengthened Green Investment Bank, and with local banks, to drive energy solutions that have local backing but are also deliverable on a large scale. Ambitious change will need greater capitalisation for the UK's Green Investment

Bank, which, with its own borrowing powers, would have scope to boost investment in new forms of local energy production as well as wider green infrastructure and new low-carbon technologies. Instead the Government has announced its intention to privatise the GIB, which risks undermining progress towards incentivising private investment in low- carbon schemes.

There also remains an untapped opportunity for citizens to invest in low-carbon energy projects through retail forms of green bonds such as green ISAs (Green Alliance 2014b), or through shares in local energy schemes (such as Brixton energy), or crowd-sourcing of the kind offered by companies such as Abundance (Abundance, 2014).

If we want to get the most out of investments in new energy projects, we will need to ensure a greater diversity of local suppliers and energy cooperatives, and greater opportunities for people to invest. But if we are to design, build and install more energy projects using local labour we must also foster partnerships between clean technology companies, trade unions, local schools, colleges and universities and new Apprenticeship schemes.

## Conclusion

### A Just Transition for the common good

The transformation of our global energy economy from a high to a low-carbon model is a huge human undertaking. Our reasons for doing this must be clear – we must remember that we are acting to protect the ability of people in the UK and around the world to build stable lives in communities with decently paid work, safe homes and affordable food.

If these are the reasons for our actions, it also stands to reason that the way we undertake this great change must help to build those conditions in our country and beyond, and not undermine them.

Many historical precedents can help us understand the dangers of a disorderly and top-down transition from one set of technologies to another, or from one social structure to another. The lives discarded in these shifts were not cheap – each was as valuable as ours – but they came to be regarded as such, in the face of apparently untameable forces, whether industrial development, technological advance or the power of the globalised market.

Taking a different path to change will not be easy, but it is absolutely crucial if we are to secure the rational consent of working people here and around the world.

As the TUC has said:

*“Injustice cannot become a feature of environmental transition. Not only would this be morally wrong and socially damaging but it would undermine the credibility of the transition itself and could slow or even halt this vital and urgent shift” (TUC, 2008).*

Drawing on the key pillars proposed by the International Trades Union Congress (ITUC) for a just transition, we have argued in this paper for a transition that puts skilled work at its heart. Achieving this transition cannot rely on a political narrative of guilt, debt and punishment, either at an individual or national level. Instead it should build on the politics of the common good, seeking active co-operation in solving a shared problem, developed through strong relationships, robust institutions and the harnessing of technological innovation and optimism wherever it can.

## Recommendations

### A Just Transition plan

Recognising the appetite for a more dynamic and inclusive democracy which this has created, we propose a much more active role for citizens, communities and trade unions, not just as stakeholders and consultees on Government policy, but as the initiators, financiers, manufacturers and beneficiaries of the low-carbon economy.

To make this a reality, we have a number of practical proposals which we think could form the heart of a just transition plan for the UK, all of which should include trade unions as participants, not just as interested observers:

- a comprehensive national climate change risk assessment, taking account of impacts on livelihoods, homes, infrastructure, businesses and heritage across the UK. As IPPR recently proposed, this should emulate the successful climate risk assessment conducted by the Obama administration (Straw et al, 2014)
- an ambitious energy security and competitiveness plan, which makes improving energy efficiency an infrastructure priority for the country, cutting bills for households and businesses, and reducing our dependence on imported fuels. This could, for example, make use of revenues generated from existing carbon taxation schemes
- a commitment to make the UK a world centre for low-carbon manufacturing, including steel production – incorporating a regular and open review of the impacts of energy policies on costs and competitiveness
- greater opportunities for cities and regions to design, fund and implement their own energy and transport solutions, based on local skills, natural resources and traditions; but integrated into long-term national plans, which ensure national economic needs are met, and manage the systems and balancing challenges posed by the presence of greater amounts of decentralised generation on the grid and electrification in the transport sector (for example) (Platt et al, 2014)
- action to champion a diverse range of funding sources for low-carbon projects, including active co-operation between central banks (the Green Investment Bank and any new national infrastructure bank) and regional and local lenders; expansion of green bond schemes, including retail bonds/green ISAs; new opportunities for citizens to invest in local energy cooperatives, and for institutional investors to support local infrastructure development; and an enhanced role for new private sector players in the energy market
- a ‘clean technology’ strand of national apprenticeship programmes. Employers, training providers, trade unions and educational institutions should work together to develop and promote these high-quality apprenticeships, which would equip young people with transferable skills and provide local economies with the skills needed to implement regional and city energy and transport plans.

**The quality of the Just Transition plan that we adopt will, in the end, determine the success of our efforts to decarbonise our economy. What is clear from our**

**analysis is that plans to tackle carbon pollution cannot exist in isolation from a wider effort to bring more democracy to our economy.**

A sustained effort to improve skills and retain value in local economies, building respect at work and a stronger union voice, the rebuilding of financial institutions – national and local – with a genuine, long-term commitment to the common good, are all parts of a bigger political project to underpin climate policy and to create a society in which communities and trade unions are resilient, and everyone has the opportunity to flourish.

This should be the shared aim of both the trade union movement and all those working for a safe climate.

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