Policy Exchange

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Greening the economy – not 'green economy'

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> *"Renewable energy technologies will deliver a third industrial revolution … At a time when closures and cuts dominate the news cycle … [r]enewable energy is surging out across the United Kingdom, blazing a trail of start-ups and jobs. … Our … priority is … ensuring more clean technologies are designed and manufactured here … We're missing a trick unless we start supporting low-carbon manufacturing here in Britain – and grow the green supply chain: locking in profits and expertise, and creating the exports that will keep Britain competitive … [T]his government has resolved that we will be the largest market in Europe for offshore wind … We will not heed the … green economy deniers."*
>
> Chris Huhne MP, Secretary of State for Energy and Climate Change, Renewable UK conference, 26 October 2011

The risk of dangerous levels of climate change is a major threat to the world's ecosystems and its prosperity. The current scientific consensus is clear about the role of human greenhouse gas emissions in driving this risk. Helping to stem the rise in global emissions and to reduce them substantially must therefore be a UK policy priority, to sit alongside the priority to stimulate UK economic growth.

It is possible to have both economic growth – to benefit from new innovations and improved productivity – and at the same time to reduce carbon emissions.

Moreover, strong UK growth is needed to pay for the costs of policies moving us to a low carbon economy. Growth is needed to fund sustained, long-term investment in low carbon research and development, upgrading the energy efficiency of the UK's housing stock, and to support early stage deployment of low carbon technologies that are still more expensive than their high carbon alternatives. As the UK reduces its own carbon emissions, the economy will contain a larger proportion of jobs in so-called green sectors, such renewable generation and installation of household insulation, as well as in

many other industries steadily reducing their carbon emissions.

We need growth and we need to become greener. But is this is what is meant by those promoting 'green growth' and the 'green economy'?

The Secretary of State for Energy and Climate Change, Chris Huhne, argues for large subsidies for selected UK 'green' industrial sectors, particularly types of renewable generation such as offshore wind, as a key way to boost growth and employment in the UK economy. He is supported by those representing commercial interests in the subsidised renewable energy sector. The subsidies are paid by the rest of UK economy, largely through increased energy prices.

The argument – under the term 'green growth' – is not that subsidies for such selected sectors are the best way to reduce carbon emissions, but that a principal objective of these public subsidies is to promote UK growth, exports and employment. Chris Huhne thus makes a clear political pitch for the sort of industrial policy interventions to boost predicted future growth sectors, not often heard in the UK since the 1970s.

Chris Huhne has recently criticised as 'green economy deniers' those who question this approach, even conflating them with those who reject the scientific consensus about the risks from climate change.

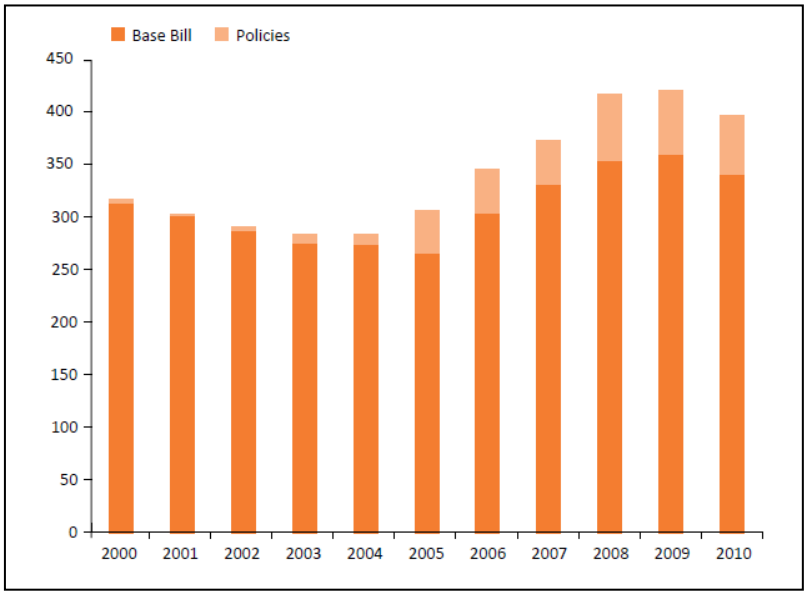
This Research Note explores the likely impact of such 'green growth' policies, both for economic growth and emissions reduction.

Economic costs of reducing emissions

As the UK economy grows, its carbon emissions must decline, as part of the UK's contribution to international action. To achieve this requires appropriate government policies to promote emissions reduction measures.

Some emissions reduction measures are financially beneficial – so are both green and directly good for economic welfare. If householders take measures, such as loft insulation, which save them more money in reduced energy consumption than they cost, they have larger disposal incomes. If businesses can reduce their energy input costs, then they can become more competitive. But most of the carbon reduction measures that will need to be taken over time have net costs.

Figure 1: UK domestic electricity bills (2010 £) and environmental policies 2000-2010 (3300 kWh customer)[1]



Already the costs of climate-related policies have had a significant impact on electricity bills. According to research at Cambridge University, policy costs made the greatest contribution to the increase in a typical domestic customer's electricity bill between 2000 (when climate policies essentially began) and the last full year, 2010 (see Figure 12).[2]96 Policy costs in electricity prices are set to continue to rise, so that in 2020 prices will be around 30% higher for domestic customers – and 40% higher for business customers – than they would have been in the absence of climate-related policies.[3]

Increasing energy costs (particularly the cost of electricity – two-thirds of which is consumed by businesses and the non-household sector) has the potential to slow growth, in the same way as increases to other input costs. Higher energy costs:

- reduce the resources otherwise available to businesses to invest for long-term growth;
- reduce the disposable income of consumers; and
- reduce competitiveness, where they place UK businesses at a competitive disadvantage to foreign competitors subject to lower policy costs (see box below).

[1] M Pollitt (2011), *Some inconvenient economics of Energy and Climate Policy*, EPRG-Centrica-CEEPR Conference, London, 22 September.

[2] Between 2000 and 2010 the average bill for a 3300 kWh customer rose 24% in real terms, but would have risen only 8% in the absence of climate-related policies. Electricity prices moved both up and down over the 2000-2010 period: If the price trough in 2004 is taken as the starting point, then real bills rose 40%, and would have risen only 25% without policies. These figures do not take into account the latest price rises in 2011.

[3] Chris Huhne has said that climate related policies will not raise domestic energy bills. This statement is justified by estimating how much an average householder will reduce her consumption (including as result of policies like the Green Deal) and offsetting this against energy *price* rises. The existence of cost- effective policies, like the Green Deal, which help householders reduce energy consumption does not alter the fact that a range of expensive climate and renewable energy policies will push up energy *prices* – with a substantial impact on the economy.

Competitiveness impact of climate policies

To the extent that climate-related policies increase the energy input costs of UK businesses above their competitors in other countries, this raises a concern about UK 'competitiveness'.

Nevertheless it needs to be recognised that exchange rates adjust, broadly, to mitigate the average effect of differential input costs between different currency areas. So higher energy costs would show up as reduced national incomes rather than inability to export. But this is a general – and long run – effect, and particular firms or sectors could lose or gain in competitiveness. High energy costs could in particular lead to loss of competitiveness in energy intensive industries,[4] such as aluminium, steel and concrete manufacturing. Energy-intensive manufacturers, consuming at least 100GWh of electricity per year and with energy comprising over 20% of their costs, employ around 700,000 people in the UK, and tend to be concentrated in more deprived areas, such as the north-east of England.[5]

There is no sense in climate policies causing such sectors to close and move elsewhere – or to cause them to choose to open new plants elsewhere. This would not only damage the UK economy but also the environment. If an energy-intensive industry chose to locate in, say, China and export their goods back to the UK, then they would still be emitting carbon – and more of it – since China's electricity is more carbon intensive than the UK's.

Policy Exchange's report *Carbon Omissions*[6] showed that while the UK's production of carbon emissions within its borders has fallen, its carbon consumption, including carbon embedded in the manufacture of imported products – have shot up (by perhaps 30% 1990-2006). It makes no environmental or economic sense for environmental policy to accelerate this trend.

So it is vital to tailor environmental policy appropriately to these selected energy- intensive sectors. We want these sectors to be as energy efficient as possible, but not to drive them offshore.

Measures to help energy-intensive manufacturers are expected to be announced soon by the government.

Of course, the key approach to reducing carbon emissions is to price carbon effectively. This means that energy prices will need to rise.

But it is important that the economic costs of climate policies are no higher than needed to achieve carbon reduction targets, and that the revenues generated from the higher carbon prices are used cost-

[4] UK Green Fiscal Commission (2009), *The Case for Green Fiscal Reform – Final report of the UK Green Fiscal Commission*.
[5] D Blair (2011), UK manufacturers to bear greater energy costs, *Financial Times*, 27 October.
[6] A Brinkley (2010), *Carbon Omissions: Consumption-based accounting for international carbon emissions*, Policy Exchange.

effectively to promote growth and carbon reduction.

The box below discusses how green taxes, or carbon permit costs, may be offset by reduced taxation elsewhere. The next section discusses some of the policies currently driving up energy prices and the uses made of the funding raised.

Green tax shift

The UK Green Fiscal Commission looked at the scope for increasing 'green' taxes while using the revenues raised to reduce taxes elsewhere, such as taxes on employment.[7]

They cited research, carried out as part of the European research project 'Competitive effects of environmental tax reforms' (2004-06), which found that increasing green taxes and using the revenues to offset taxes elsewhere (and also making provisions for energy intensive sectors) actually led to a small increase in economic growth rates. The revenue recycling effect plays a part in compensating for increased energy costs.

Of course such macro-economic modelling is fraught with difficulties. Nevertheless this work highlights the scope for increasing carbon prices whilst minimising the impact on growth.

It should be noted that this is not the main thrust of the current UK policy approach, where the majority of projected policy levies on energy bills over the next decade or so are set – not to be recycled in lower taxes elsewhere but – to be spent on subsidies for particularly expensive ways to decarbonise, such as deep-water offshore wind.

Climate policy design

The design of climate-related policies is important – both to promote success in delivering carbon reduction and in minimising impact on growth. Fortunately policy design principles that are likely to lead to successful long-term global decarbonisation are also, in the main, likely to be friendliest to growth:

- The first principle is that policies should promote lowest cost carbon reductions. The lower their cost, the more likely policies are to be politically sustainable and so to successfully reach long-term emissions reduction targets. Cheaper UK decarbonisation processes also set a more compelling example to other countries, helping to stimulate the global emissions reduction needed to mitigate climate change. And the lower costs of decarbonisation, the smaller the impact on incomes and growth.
- The second principle is that UK policies should focus on promoting the innovation needed to achieve cost-competitiveness in those low carbon technologies with the potential for greatest

[7] UK Green Fiscal Commission (2009).

global deployment. Prioritising research, development and demonstration also plays to the UK's historic strengths and comparative advantage.

- The third principle is that climate policies should exploit the potential for markets, steered by a neutral long-term carbon price, to innovate and discover the best, lowest cost, ways to decarbonise. A focus on carbon pricing also generates revenues which can be used to mitigate growth impacts of decarbonisation.

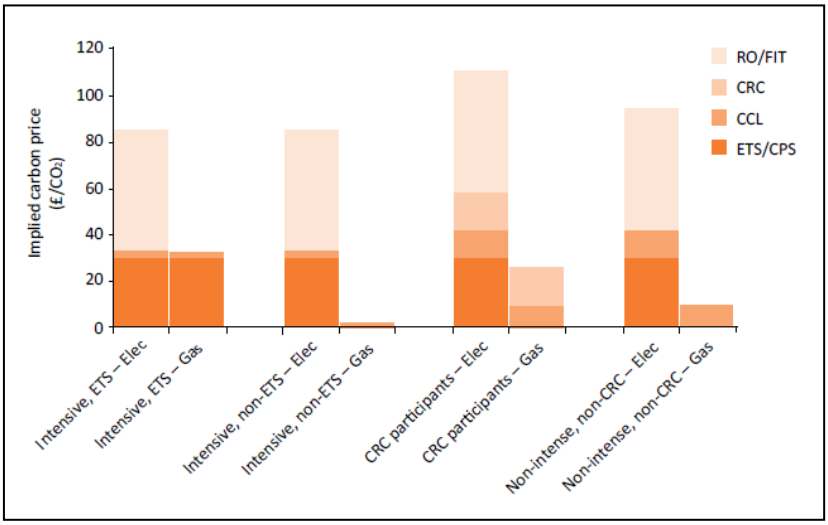
The UK has a number of policies that, broadly, reflect these principles. The Green Deal targets low cost carbon reduction potential in improving household energy efficiency; the EU Emissions Trading System (ETS) and Carbon Price Floor focus on giving the market a carbon price; and budgets for demonstrating Carbon Capture and Storage and for low carbon research and development focus on stimulating low carbon innovation.[8]

There has been much discussion about the impact on UK businesses of the UK's Carbon Floor Price. It is not an ideally designed instrument. It would be better if the EU ETS could instead be reformed to operate more effectively, or the floor price applied across the EU. The floor price starts unnecessarily early in 2013, the commitment to it should be firmer, even contractual, and should go well beyond 2020 if it is give effective investment signals. Nevertheless, it is at least a technology-neutral carbon price and has the potential to be built-on. And it should also be recognised that its projected impact on electricity prices is much less than the impact of the UK's renewable subsidies. Figure 2[9] shows relative costs of climate-related policies on electricity (and gas) prices by 2020, for different categories of business, expressed as pounds per tonne of carbon dioxide. It highlights that the renewable subsidies ('RO/FiTs') are the largest policy driver for increased electricity prices, with much greater costs to energy customers than the Carbon Floor Price/EU ETS.

[8] Policy Exchange had argued for a Green Deal-style policy (*Warm Homes*) and a broad- based, long-term carbon price floor (*Greener, Cheaper*). More recently, Policy Exchange has argued for mandatory carbon reporting to stimulate cost-effective energy efficiency measures in organisations, and more effective carbon pricing in relation to heating (*Boosting Energy IQ*).

[9] G Newey (2011), *Boosting Energy IQ: UK energy efficiency policy for the workplace*, Policy Exchange.

Figure 2. 2020 estimated levy per tonne of carbon under climate-related policies, for a range of different categories of businesses



The UK's renewable generation subsidies, currently mainly delivered through the Renewable Obligation (RO), are driven by the need to meet the EU 2020 Renewable Energy Target.

The UK's renewable generation subsidies are the most important example of policies that fail in relation to the principles set out above. They privilege expensive decarbonisation approaches, are focused on deployment targets not stimulating innovation, weaken the carbon pricing framework and disrupt the effective operation of the energy market. The renewable generation subsidies unnecessarily add to electricity prices, act as a drag on economic growth, and achieve no additional carbon reduction while arguably damaging the future prospects for decarbonisation.

The cost to the UK economy of the Renewable Energy Target has been estimated by the government at £66 billion.[10] As part of meeting the target, the government plans to deploy 13-18GW of mainly deep water offshore wind by 2020, at a current cost of around £300 per tonne of carbon saved. Yet, the Renewable Obligation saves no more carbon emissions by 2020 than would have been saved under the EU ETS carbon cap (where the carbon permit price is currently only around £10, and the floor price rises to only £30 by 2020).

Of course there is a strong case for public support for promising new low carbon technologies. The UK has historic strengths in research and development. Much R&D spending is likely to be positive for growth, and is one of the key ways the UK could contribute to global emissions reduction. There also a good case for appropriate support for early commercialisation of technologies with global potential to help improve their cost-competitiveness, focused on maximising learning-by-doing. But the UK's current renewable generation subsidies are not focused on this. Instead, the Renewable Energy Target commits the UK to roll-out out of particular short-term deployable technologies on a pre-determined and

[10] DECC (2008), Renewable Energy Strategy Impact Assessment.

massive scale, whatever is discovered about the success and cost of those technologies. It seems inconceivable that spending tens of billions of pounds on deploying offshore wind by 2020 is the best use of available resources for low carbon innovation, given offshore wind's high costs, no guarantee that it will become cost-competitive and its limited global deployment potential.[11]

Given such wasteful policies, there is scope both to better promote more carbon reduction and to reduce the energy policy cost burdens on the economy, promoting growth.

Policy Exchange (*2020 Hindsight*)[12] has recommended renegotiating the 2020 Renewable Energy Target, focusing instead of improved long-term carbon pricing and genuine support for innovation. Carbon prices would probably be higher – but even doubling the expected carbon price in 2020 would add less to electricity prices than the expected subsidies for renewables. And the revenues from carbon pricing would be available to offset other taxes on the economy, rather than wasted on unnecessarily expensive technologies. A focus on simple, neutral carbon pricing would also avoid other costs on the economy from the current approach to climate policy – from complexity, distorted price signals, rent-seeking and regulatory uncertainty.

However, it is to the most wasteful policies – for subsidising favoured technologies – that 'green growth' industrial policy justifications are most commonly attached. This may be because these policies cannot be justified in terms of carbon emissions reduction at least cost to the economy. So do the 'green growth' industrial policy arguments stack up an alternative case for these policies?

'Green growth' industrial policy

'Green' policies – to promote reduced carbon emissions – and growth policies – including to help pay for carbon reduction – are both important priorities. But muddling them up in the concept of 'green growth', or worse 'green jobs', is damaging to the goals of both emissions reduction and growth.

Under the concept of promoting 'green growth', the government favours and subsidises selected 'green' – usually renewable energy – industrial sectors, for the purpose creating the growth and export sectors of the future. This is reminiscent of government industrial policy interventions in the UK's economic history where particular industrial sectors – for example, advanced gas-cooled nuclear reactors (AGRs), British car manufacturing or supersonic civil aviation – were favoured with generous subsidies in the hope that they would power future growth and exports.

Following one recent adjustment to renewable subsidies levels, in which offshore wind had its long-term subsidy levels increased still further, Climate Change Minister, Greg Barker, was quite explicit about this being "ambitious green industrial policy in action."[13] 'Green growth' industrial policy arguments are

[11] Offshore wind has only 1% of the global potential of solar PV.
[12] S Moore (2011), *2020 Hindsight: Does the Renewable Energy Target help the UK decarbonise?,* Policy Exchange.
[13] J Murray (2011), *Marine and offshore wind big winners in renewables subsidy review*, Business Green.

strongly supported by those lobbying for subsidies – exploiting the rent-seeking opportunities – such as the organisations representing offshore wind interests.

The problem with such a policy is that there is no reason to believe that subsidising any one industrial sector can increase overall UK growth or employment levels. Overall UK employment levels and growth rates depend on fundamental economic factors such as skills levels, the functioning of labour markets, competition and overall investment levels.

Successful export sectors are based on comparative advantage. The government believes that it can create UK comparative advantage in relation to offshore wind, and potentially other marine renewables, based on the UK's offshore deployment potential and North Sea engineering expertise. It also believes that there will be a large world market in marine renewables that the UK will then be in a good position to export into. It is committing tens of billions of pounds to these beliefs.

Yet it is very far from clear that this will be true. There are huge unknowns about the development of global marine renewables – currently some of the most expensive forms of electricity generation – as well as the UK's ability to capture any significant proportion of any global export market, in competition with other countries. The government is taking a huge gamble, directing massive levels of resources here, which cannot therefore be used for investment and spending elsewhere in the economy.

Moreover, the history of government taking such industrial policy gambles is a stark warning. There is no reason to believe that government has any special ability – over and above the market – to pick winners. Major failures of the past, such as AGRs, British Leyland or Concorde, bear this out.

Where there is real comparative advantage, markets are better able to develop these than government.[14] Both markets and governments may fail. But in markets – better at discovering and responding to new information – failures happen more quickly and cheaply.

The arguments outlined here – and, worse, the potential for EU countries to get into damaging subsidy competition with each other – are the reasons why, in most sectors, the EU prohibits state aid. However renewable energy carries certain exemptions to these rules.[15]

Industrial policy subsidies to selected sectors are paid for by the rest of the economy, and so reduce the investment and spending in other sectors. For example, the cost to the German economy in subsidies for each job in its solar industry has been estimated at 175,000 euros.[16] An optimistic outcome is therefore that such policies simply shift jobs around the economy, with no overall jobs and growth

[14] In the case of low carbon sectors, the government has a clear role. This is to ensure effective pricing of carbon and to address market failures in relation to low carbon innovation, not to gamble on picking future growth and export industries.

[15] It may that this exemption should be narrowed so that renewables subsidies are tightly focused and justified on the basis that state support is necessary to achieve innovation.

[16] M Frondel (2010), *Economic impacts from the promotion of renewable energy technologies*, Ruhr Economic Papers 156, Ruhr University.

impact.

Securing energy supplies

Security of energy supply is an important issue for growth, separate from the arguments about 'green growth'.

The government makes further arguments for high subsidies for certain energy technologies, in particular renewables, that they deliver economic benefits through reduced exposure to 'volatile' gas prices and to 'foreign' energy sources. David Cameron and Chris Huhne recently said 'We are … taking steps to deal with our exposure to volatile world energy prices and promote more sources of energy generated at home.'[17] Are the government's measures to promote energy security a benefit to economic growth?

It is far from clear that energy being foreign is a strong predictor of its insecurity. The UK has historically suffered most energy insecurity as a result of domestic events such as outages, strikes and protests. Moreover, recent global energy market developments have much increased the prospects for secure gas supplies. While the UK's North Sea gas has declined, the UK gas market has itself developed large new infrastructure to tap the burgeoning global Liquid Natural Gas market. This ensures that the UK can secure gas in a relatively liquid market supplied by a wide range of countries. In addition, Norway will remain a key gas supplier. Coupled with recent global developments in shale gas – particularly in the US, but also a recent, potentially huge, gas find in north west England

– mean that gas looks more secure as an energy source for the UK economy. We cannot know future gas prices, but it is far from clear, as some confidently predict, that future gas prices will be very high. So supply security concerns do not appear to justify the high costs to the economy of subsidies for domestic energy, such as renewables.

Nevertheless, gas prices are likely to continue to fluctuate based on the global supply and demand balance. Would the UK see higher overall economic growth if we were somehow able to insulate ourselves from such price volatility? For this to be the case, the economic damage from gas price volatility would need to be clearly greater than the damage from paying the guaranteed high price of, for example, offshore wind.

Clearly gas generation emits carbon. While gas is likely to play an important role as a transition fuel to a low carbon economy, having half the emissions of coal, unabated gas emits carbon at levels inconsistent with meeting the UK's 2050 carbon target. But the way to address gas's future role in the process of decarbonisation is through having an effective long-term carbon-pricing framework, and in particular an effective long-term EU Emissions Trading System cap.

[17] D Cameron and C Huhne (2011), *Our Plans to Tackle Rising Energy Costs*, MoneySavingExpert.com, 17 October.

A more pessimistic – and more likely – outcome is that growth is lower than it would otherwise have been, as a result of resources being diverted by government away from industrial sectors with greater growth and export potential than, for example marine renewables. It is the economic activity, entrepreneurship and innovation that never happened which is the major cost of the government directing massive resources to its preferred sectors. And this is not only detrimental growth, but also to emissions reduction. Muddled 'green growth' industrial policy objectives mean resources are squandered that could otherwise have been used to deliver greater emissions reduction, to strengthen the EU carbon cap and to stimulate genuine low carbon innovation.

Recommendations

The government should eschew the muddled concept of 'green growth' and the 1970s-style industrial subsidies for hand-picked future growth sectors which it leads to. The government should instead concentrate on policies to promote growth alongside other policies to go 'green' – reducing carbon emissions – as cost-effectively as possible.

About the author

Simon Less is Research Director, Environment and Energy, at Policy Exchange. He was previously a Director at Ofwat, leading market reform in the water sector, and has held a number of Senior Civil Service positions in the Treasury, including leading on energy policy, and in the Ministry of Justice. Simon is a Senior Research Associate at the Regulatory Policy Institute in Oxford; an independent regulatory policy consultant; and a trustee of ReStore Community Projects, a London furniture reuse charity. He has a first class degree and PhD from Cambridge University in chemistry, and an MBA from Imperial College Business School.

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