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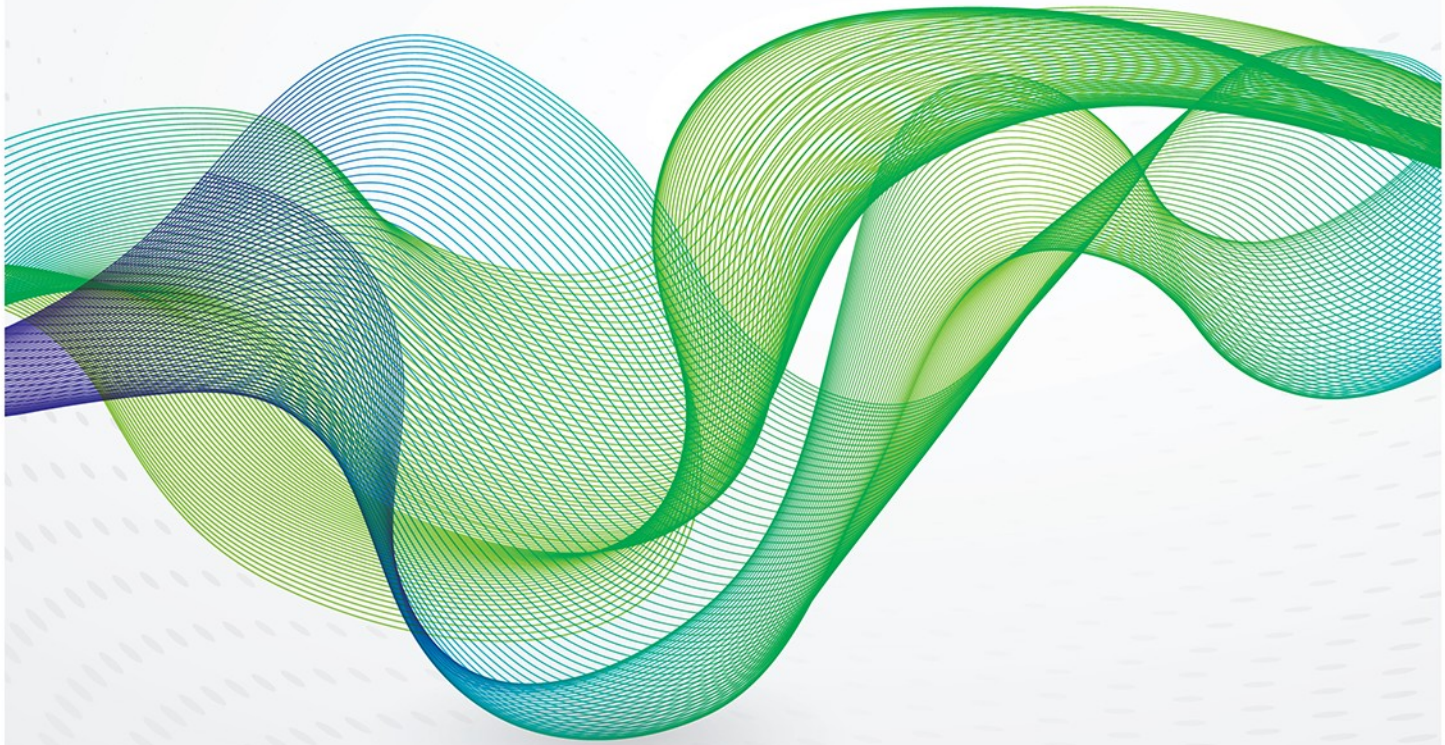
Costs, competitiveness and climate policy: distortions across Europe



OXFORD ENERGY COMMENT

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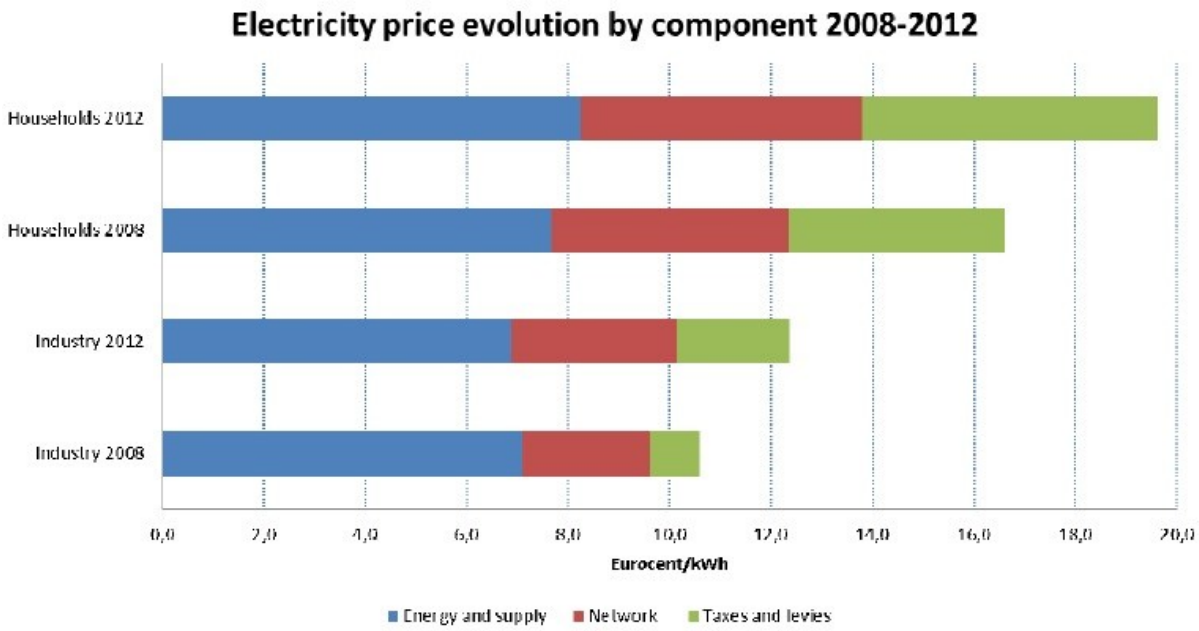
Introduction

Rising energy costs are a real problem for everyone in Europe – for households grappling with fuel poverty (defined as energy costing more than 10 per cent of income); for industry, especially energy-intensive sectors trying to stay competitive with other regions of the world that have lower energy prices and no carbon constraints; and for all those concerned about climate change and the risk of output shifting to countries with more carbon-intensive production processes.

Rising energy costs are also an obstacle to Europe's progress towards a low carbon energy system if this progress is held hostage to the public outcry for immediate action to reduce or stabilise energy prices. This paper focusses partly on energy prices, but more on the clean energy policy costs loaded on top of these wholesale energy prices. For it is these increased policy costs of capping carbon and subsidising renewable energy that are being used as the primary weapon by consumer and industrial lobbies to get the ambition of Europe's climate policy scaled back. So the paper concentrates on what can and what cannot be done to moderate the increase in energy policy costs, and to make the burden of them more tolerable to poorer households and to energy-intensive companies, without at the same time bringing the European Union's energy and climate policies to a halt.

During the period of 2008–2012, retail prices – that is what energy consumers pay – have increased, for households by an average of 4 per cent a year for electricity and 3 per cent for gas. For industry, the average annual increase was 3.5 per cent for electricity and 1 per cent for gas,[1] Over a decade, the increase is significant. For instance, it amounts to a 55 per cent rise in UK household energy bills over the period of 2002–2012. This is despite the fact that, at the wholesale level, while gas prices have fluctuated, electricity prices have fallen in several major European markets due partly to more cross-border trading and competition but mainly to the influx of zero marginal cost renewable electricity.

[1] COM (2014) 21



Source: European Commission, COM (2014) 15 final

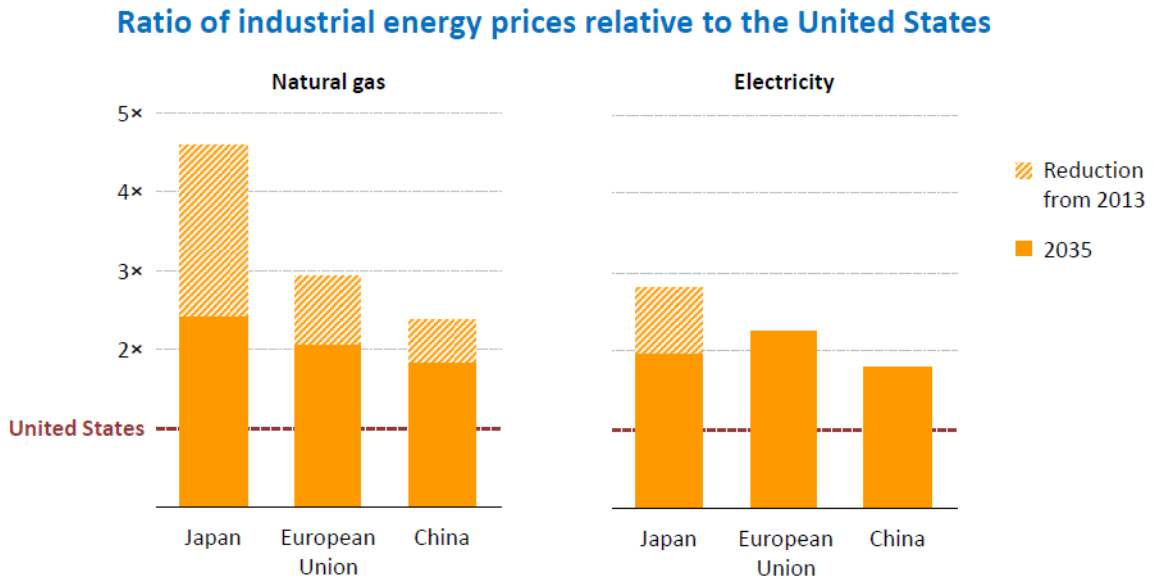
The chart above shows the changes in the weighted average retail electricity prices in the EU for household and industrial consumers between 2008 (the second and fourth horizontal bars) and 2012 (the first and third bars). The colours represent the three components of retail prices – blue for wholesale energy prices, red for network costs, and green for taxes, especially levies for financing clean energy and climate policies. It shows a slight fall in the average wholesale price for industry and a slight increase in the wholesale price for households (the reason for two different price levels is that industry generally gets a price discount for a greater volume of consumption). The chart shows that the overall rise in retail electricity prices is almost entirely due to cost increases in the red and green chunks – network costs and tax and levies – which bear particularly heavily on the electricity sector. These cost increases are bigger for households than for industry, but part of these increases for households is a cross-subsidy to industry.

Across the EU, the wholesale energy cost element is generally the largest component of retail prices, but its share is diminishing. Taxes and levies for financing energy and climate policies have been the smallest element in most Member States, but in many member states they have caught up with or overtaken the share of network costs. They now constitute the largest part of the household electricity price in three Member States.

Overall, the cost of renewable energy added to retail prices now constitutes 6 per cent of the average EU household electricity price and approximately 8 per cent of the industrial electricity price before taking any exemptions into account. The share is increasing due to rising renewable energy shares and falling wholesale electricity prices (which increase the gap between wholesale price and the renewable support price and therefore the subsidy to cover the gap).

While Europe has never been a cheap energy location, in recent years the energy price gap between the EU and its major economic partners has further increased: on average, EU industry gas prices are now three to four times more expensive than comparable US, Indian and Russian prices, 12 per cent more than China's, and are comparable to those of Brazil though less than those of Japan.

For electricity, wholesale prices in Europe have declined in the last few years, are relatively low and are at a roughly comparable level to wholesale electricity prices in the USA. However, EU industrial retail electricity prices are – largely due to taxes and climate policy costs – more than twice those in the USA and Russia, 20 per cent more than China's, though 20 per cent less than those in Japan. Access to cheap gas to generate electricity has helped to keep electricity prices in the USA and Russia low. Moreover, the International Energy Agency estimates that these differentials will last for the next two decades (see chart below).



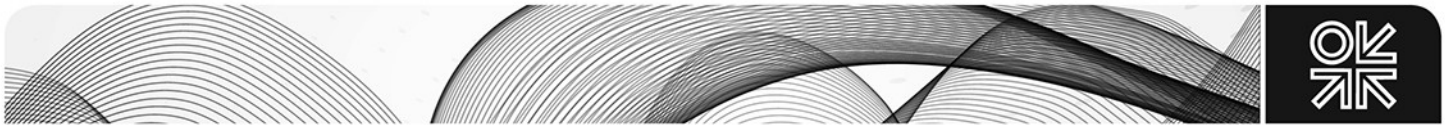
Source: IEA, World Energy Outlook 2013

Industrial migration

In the debate about whether climate policies are leading to Europe's de-industrialisation, it is important to distinguish between industrial migration and carbon leakage. The former could be just the natural tendency of industry to follow demand and to move investment from slow-growing Europe to more dynamic economies elsewhere, while the latter is the specific risk that Europe's self-imposed clean energy policies will drive production and investment in energy-intensive sectors to countries unconstrained by carbon costs.

There are non-energy reasons why European industry's share of global output, and to some extent of global exports, should decline. Europe's economy is mature, its population is not growing, and so demand has been flat. By contrast, many emerging economies have been growing and industrialising fast. So new investment, often by European multinational groups, has naturally been moving to these regions of strong demand, especially in Asia, just as investment was attracted to Europe during its long period of growth in the 1950s and 1960s. China's huge expansion in energy-intensive sectors such as glass-making, smelting of primary aluminium, production of lime, iron and steel has reduced everyone else's share of the world market, though not necessarily of exports.

This trend is not immutable. There is recent anecdotal evidence of companies bringing production back to Europe (and the USA) for reasons such as rising wages in emerging economies, poor quality control in China or poor infrastructure in India. So far this 're-shoring' of production has not tended to be in the more basic energy-intensive products. But there are also some non-energy reasons for



energy-intensive sectors to stay in Europe. Gordon Moffat, director general of the Eurofer steelmakers association, stresses the importance of proximity to customers: 'European steel users like to have their principal relationship with local steel suppliers. European steel producers have an advantage in high and low value products, able to supply low value products quickly and provide quality in high value products. Moreover, the EU steel sector has a comparable cost base with most of its main competitors – in raw materials, transport and, until recently, electricity.' [2]

There are also energy reasons – unrelated to climate policies – that would lead Europe's energy-intensive industries to relocate production in countries naturally well-endowed with energy resources. So aluminium smelting will tend to locate in countries like Canada and Norway to tap their plentiful hydro-electricity, just as petrochemicals is an obvious specialisation for Gulf countries to exploit their low cost oil and gas. The advantages conferred by the energy resource endowments of these countries and regions is large and long-lasting. How long shale gas will give the US a competitive edge is a matter of debate, but the IEA joins the US government in believing that the price advantage will persist for many years. It would therefore be costly and fruitless for the EU to try to counter such resource advantages with any energy price subsidies of its own – especially when many Middle East countries artificially augment their energy advantage by subsidising their oil and gas prices even more. In the past, there has been a good energy reason for industry not to move out of Europe – the high quality of European electricity in the form of minimal power interruptions and frequency variations compared to many emerging economies. However, this may be a diminishing advantage as other countries improve the reliability of their power supply while EU countries face the challenge of integrating intermittent renewables into their power systems.

The context for the current debate over EU climate policies' energy costs – the focus of this paper – is shaped by concern about Europe's general de-industrialisation, under the impact of globalisation and economic crisis. This angst is evident in Brussels, where Germany, Europe's pre-eminent industrial power, is increasingly influential. The European Commission, which at the turn of the century used to champion the knowledge-based service economy model for Europe, has been producing a steady drumbeat of strategy documents, with the aim of raising industry's share of Europe's gdp from around 16 per cent today to 20 per cent by 2020. In 2010 the Commission called for 'an integrated industrial policy for the globalised era'; in 2012 the message was 'a stronger European industry for Growth and Economic Recovery'; and in January 2014, the Commission produced a communication for 'a European Industrial Renaissance'. All this resonates with government leaders. At their March 2014 summit EU heads of government affirmed that EU climate and energy policy would have to be made coherent with the need for 'a strong, resource-efficient and competitive industrial base…including through addressing the issue of high energy costs, in particular for energy-intensive industries'.

Clean energy policy costs and their industrial impact

However, the cost of Europe's clean energy policies has also risen, and will rise further, as a result of the Commission's proposals, made in January 2014, for EU energy and climate targets for 2030. The reason for trying to set these 2030 targets 15 years ahead of when they would take effect is the timetable of the United Nations negotiations for a global climate agreement. The Commission wants to have an agreed position to take into next year's key negotiation in Paris in the hope of reaching an agreement that would probably not take effect until 2020. That is when current EU energy and climate legislation expires; hence the EU's search for a new set of goals. There are two other reasons for

[2] Author interview, February 2014

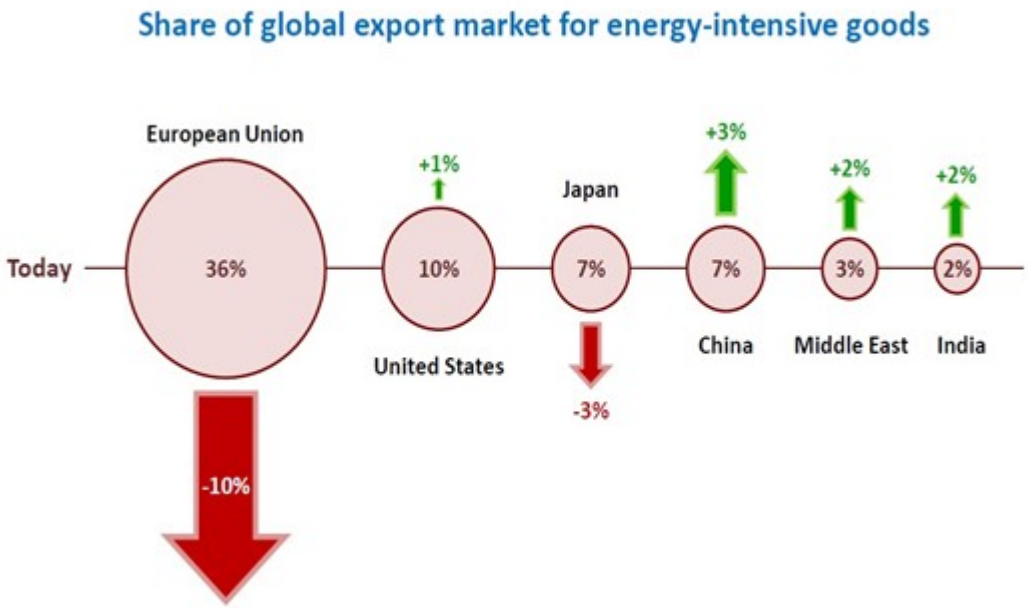
distant goal-setting. One is the need to give certainty to investors in low-carbon energy. The other reason for Europe's penchant for multi-year agreements is that they are so hard to reach among 28 member states in the first place – debate over the 2030 targets will be no exception – and it is therefore convenient to make them last.

The starting point for the debate on the 2030 goals is the EU's current 20-20-20 targets by 2020 (for a 20 per cent cut in emissions below 1990 levels, for a 20 per cent renewable energy share in total energy consumption, and for a 20 per cent reduction in energy use). If the same trajectory of emissions-reduction were to continue after 2020, the Commission estimates the increase in average electricity prices, above inflation, would be 31 per cent from 2011 to 2030. More than half of this policy-as-usual increase in power prices would be due, not to fossil fuels prices, but to new investment in generating capacity, grid extension and energy efficiency, mostly arising from clean energy costs.

However, the Commission is proposing a headline 2030 target of cutting emissions by 40 per cent below 1990 levels (it has also proposed a 2030 goal for renewables, which is discussed later). This is considered the minimum emission reduction consistent with the long-term aim of the EU, and of other developed economies, to achieve an emission reduction of 80–95 per cent by 2050. It is also certain to give a further boost to electricity prices. Hence the concern of Europe's energy-intensive industries (EIIs).

According to the world-wide average calculated for 2011 by the IEA, energy costs amounted to 7 cents in every dollar of global output. Therefore, if a region like Europe has to pay 50 per cent above the world average for energy, its total costs will be 3.5 per cent above the average. However, for EIIs, energy is often a much higher share of total material costs (for instance energy is needed to mine iron ore as well as to turn it into steel). According to the IEA, energy intensive industries, worldwide, account for 20 per cent of total value added by industry, 25 per cent of industrial employment, but 70 per cent of total energy use by industry.

There are significant regional differences in total material and production costs. These differences usually more than offset the cost of shipping products between regions, and therefore EIIs tend to be exposed to a high degree of international competition. This is true of chemicals, iron/steel, pulp/paper, and aluminium, though less so of cement because it is relatively bulky and low value. Hence, based on its estimate that energy prices in Europe will remain higher than in the US for some time to come, the IEA is forecasting that over the period to 2035 the EU, and to some extent Japan, will lose market share in energy-intensive products, as shown in the chart below.

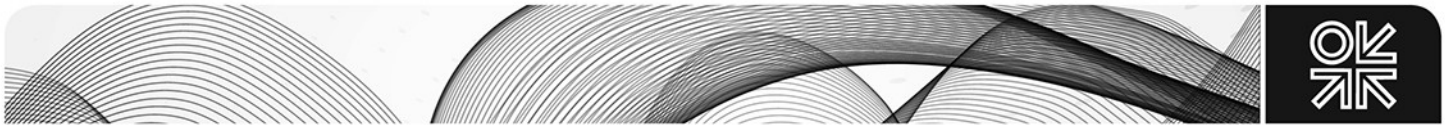


Source: IEA, WEO 2013

This forecast prompts two questions. One is how serious are its implications for European industry – would a decline in energy-intensive exports put Europe on a slippery slope to severe de-industrialisation? The other is how serious would it be for climate change – would it lead to an actual increase in global carbon emissions which would be the result if industry moves out of Europe and into countries where production processes are more carbon-intensive? In these circumstances, carbon would not only leak out of Europe but actually be magnified elsewhere. The evidence is mixed on both questions.

Europe's EIIs say the departure from Europe of more basic, lower value and more carbon-intensive processes in their industry, in search of cheaper energy, would weaken the rest. William Garcia speaks for Cefic, Europe's chemical industry association, in saying 'We face an unprecedented situation as a result of cheaper shale gas and structurally lower taxes in the US, and of the consequences of the Fukushima accident in Germany in terms of its acceleration of renewables to replace nuclear power and in Asia in terms of higher LNG gas prices. Our competitive problem is less serious in electricity, but it is growing, with the US using cheap gas to make power and with the EU increasingly relying on renewables. The EU used to compete just with the Middle East on lower value chemicals and petrochemicals, but now also with the US. Competition with the US is a different ballgame from the Middle East, because the US is a mature market and can exploit the full value chain in chemicals.'

'The conventional wisdom in Brussels – the European Commission, the European Parliament and some environmental NGOs – is that Europe could survive without basic chemicals and by focussing on value added products. Yes, this would be less energy intensive, but it would also decompose clusters and decouple the upstream [in basic chemicals] from the downstream and some R & D would disappear with part of the upstream. There is no outright disinvestment yet, but equally there has



been no new investment for a long time in expanding capacity, though some money is being spent on maintenance, energy efficiency and de-bottlenecking.'[3]

However, Europe is not doomed to general industrial decay just because it has higher energy prices than the US and other international competitors. Even in energy-intensive sectors, the IEA forecast still shows the EU having, by 2035, as big a share of the global export market as the US, China and Japan combined. Energy-intensive investment will react to higher energy prices, and move to lower cost locations – but only if the differential is maintained over a fairly long time, and there is a built-in market corrective to this. If energy consumption were to move to the US, there will be higher energy demand in the US and lower in Europe, possibly leading to downward pressures on prices in Europe and upward pressures in the US. As Bruegel, the Brussels-based think-tank, has pointed out, the level of energy prices tends to determine which sectors countries specialise in – and there is already evidence that the US is moving into more energy-intensive sectors and the EU moving away from these sectors – although this does not determine whether these sectors are competitive[4]. Nor is it always clear that the presence of competitive energy-intensive industries is essential to other sectors. Bruegel cites the way that the German car industry has survived the decline of aluminium production in Europe, remained competitive and exported ever more cars.

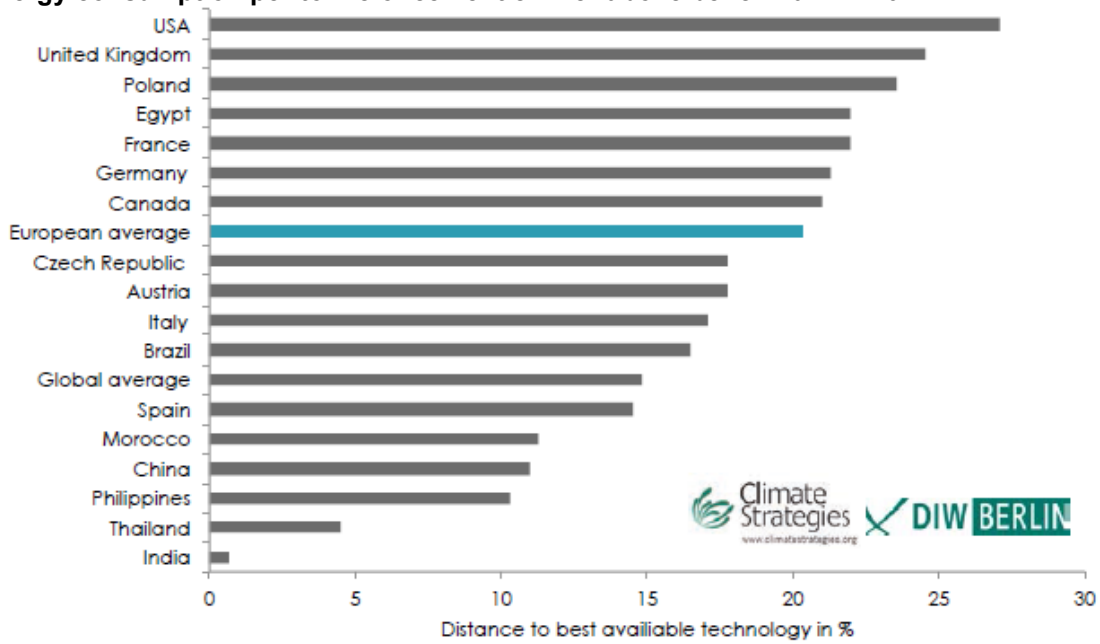
The second question is whether an exodus of energy-intensive production from Europe would cause an actual increase in emissions – and the answer to this is that it depends where this production moves to. Industry has generally had to be more energy-efficient in Europe than most regions of the world, due to higher energy prices, higher energy taxes and levies and a long history of efficiency regulation. So the general assumption in the EU has been that shifting production *anywhere* outside the EU will lead to more emissions. This is reflected in the current legislation setting out which sectors are considered at risk and therefore eligible for carbon cost relief (in the form of free Emission Trading System allowances). Sectors are deemed at risk if their direct and indirect ETS costs add more than 5 per cent to their production costs *and* if the trade (exports and imports) with non-EU countries amounts to more than 10 per cent of the total EU market. In case these two metrics fail to embrace all sectors deemed worthy of carbon cost relief, there is a further either/or criterion to bring in sectors with direct and indirect ETS costs adding 30 per cent of production costs, *or* with exposure to non-EU trade of 30 per cent. The list of sectors eligible for carbon cost relief was drawn up in 2009, has been amended since and is due for review in 2014.

However, while using a sector's trade intensity with all countries outside the EU may be useful as an indicator of possible carbon leakage out of Europe, it is less useful as a measure of environmentally-damaging carbon leakage that actually causes emissions to rise. This is because some countries in some sectors are as energy-efficient as the EU, or better. For instance, the IEA has shown that the energy intensity (measured in tonnes of oil equivalent used in producing a unit of output) in the production of iron and steel and petrochemicals is not much greater in the US than in the EU[5]. So shifting (though not increasing) production in these sectors from Europe to the US could be almost carbon neutral. This is not surprising, given the good US record in innovation and environmental regulation. More surprising is that there is some evidence that strong economic growth leading to modernisation of industrial plants is greatly improving average efficiency in some Asian countries, to the point that they are overhauling many EU countries and the US. The chart below shows that India

[3] Author interview, February 2014
[4] Bruegel, 2013 Manufacturing Europe's future
[5] WEO 2013, page 275

and China now use less energy in making cement clinker, and are nearer using the best available technology, than European countries and North America.

Energy consumption per tonne of cement clinker above benchmark in 2011



Source: Climate Strategies, Staying with the Leaders, 2014

Of course, cement is not heavily traded internationally. The growth in cement making in India and China, that has made modernisation possible there, is not taken from Europe and America. It does not necessarily mean that Europe and America are making any less cement, and it therefore does not result in any reduction in global emissions. But this chart does illustrate the truth that growth can be good for energy efficiency through modernisation, and that lack of growth or of the prospect of growth often leads to companies continuing to use older and less efficient plants, as may be happening in some sectors such as cement in low-growth Europe.

What does this observation mean for EU policy? It does not constitute a rationale for EU countries to embark on macro-economic policies to stimulate general expansion in their economies, just for the sake of achieving parallel improvement in energy efficiency. But realising that the rest of the world is not equally energy-inefficient would allow the EU to take a more nuanced view of carbon leakage, at least from the angle of environmental policy, if not of industrial policy.

Minimising energy costs

What can be done to minimise increase in energy costs? Obviously, much of the increase is a result of increases in the international prices of fossil fuels, and is therefore out of the hands of government, be it the politicians or civil servants in Brussels or national capitals. But some policies can have an effect.

Completing the internal energy market

The Commission makes a good theoretical case that its promotion of market-opening and cross-border competition over the past 20 years will have brought electricity and gas prices lower than they would otherwise be. But it cannot say by how much – partly because the counter-factual is impossible to prove and partly because this long process of creating a single energy market for Europe is still incomplete. Back in 2011 EU heads of government set 2014 as the target date for completion of the internal energy market. But the incomplete nature of this market is as evident as ever. The market-fragmenting impact of national renewable and capacity schemes is running ahead of integration work to link national markets through agreements on cross-border trading via market coupling and network codes. Moreover, the direct regulation of retail energy prices by several member states is contested by the Commission as contrary to EU legislation based on creating a liberalised energy market. Regulated retail prices are often set below the long run marginal cost of production, and as such act as a disincentive for new investment and new entrants into the market. Therefore regulating retail energy prices as France and several other member states do, or proposing to freeze them as the Labour opposition in the UK has done, can be counter-productive by creating energy price inflation in the long run.

Customer switching

Prices are set by markets. But sometimes there is an imbalance in market power between suppliers and customers. Customers in the European market are no longer captive, as they once were when tied to national monopoly suppliers. They are free to switch suppliers in search of cheaper prices, and are encouraged to exercise this freedom to switch by the European commission and national governments. Industrial consumers can often get a better price deal if they sign up to long-term purchase agreements with suppliers.

Long-term contracts

In the past, the Commission anti-trust authorities have criticised, and sometimes taken action against, such long term contracts if these appear to foreclose the market to other suppliers by locking customers into long term deals. However, Brussels now seems to take a more lenient approach to long term contracts, on the grounds that they can give investment certainty to producers and price certainty to consumers, even to the extent of approving certain ‘buyers cartels’. One Brussels-approved example of this is the Exeltium consortium of energy-intensive companies in France which have banded together to negotiate a cheaper long-term price from Électricité de France.

Developing shale gas

The obstacles to this lie almost entirely with certain member states (France and Bulgaria) which have banned the use of hydraulic fracturing to exploit it, and with quite widespread local objections to ‘fracking’ even in countries whose governments (such as the UK) positively encourage it. The European Commission has so far confined itself to issuing, in January 2014, a ‘recommendation’ to member states that they take some basic regulatory and environmental precautions in exploiting shale gas. Such a ‘recommendation’ is the weakest form of Commission proposal, though the Commission did state in January 2014 that if its recommendations were ignored, it might return in 18 months’ time with legislative proposals. But for a variety of reasons, including Europe’s more difficult geology, greater density of population, lack of a competitive oil and gas services sector, few in Europe are counting on domestic shale gas to bring down the price of gas in Europe.

Anti-trust action

A potentially more promising way of bringing cheaper gas to Europe may be the Commission anti-trust case against Gazprom, launched in 2012 and still ongoing. Gazprom supplies around a quarter of all the gas that the EU consumes. The price of most of this gas is still indexed to the price of oil products, which reflects the high price of oil. Gazprom wants to maintain oil price indexation as long as possible, and is able to do so in the cases of certain central and east European members of the EU where Gazprom is still the dominant or sole supplier. The EU investigation alleges that Gazprom has prevented these central and east European states from diversifying their sources of supply and imposed 'unfair prices' on them. While there is some legal doubt as to whether the Commission can act against prices simply because it considers them too high, it can certainly proceed to take action against prices that are proved to be discriminatory (in this case charging a higher price in east European markets than in west European markets). However, the Ukraine crisis of spring 2014 places a question mark over not just the price of Russian gas, but even its supply.

Minimising policy costs

One of the problems with EU member states' renewable energy targets is that they are simple volume targets with no allowance for the relative cost (relative to other ways of reducing emissions) in meeting them. Therefore governments plunged ahead into this unknown field, often setting subsidy rates far above what was needed in contracts that usually last for 20–25 years. There is no way to roll back the level of support given to these existing renewable projects, except by retroactively reducing the level of subsidy and thereby breaking contracts. Spain has done this, and totally shaken the confidence of its investors. However, there are several ways of reducing the cost of future subsidies.

Improve managing renewable and capacity schemes

The Commission has given its suggestions in the guidelines it published in November 2013. In order to avoid over-paying renewable energy developers, the Commission advises governments to conduct regular reviews of subsidy rates to take account of rapid technology cost reductions, as had occurred in solar PV. It also cautions governments to consider alternatives, such as demand reduction or greater reliance on neighbours for emergency power, before setting up expensive national capacity back-up schemes that will add to costs that will inevitably end up with energy consumers.

Germany and the UK in particular are pioneering some useful reforms. At the start of 2014, the new German government announced a series of reforms. These include a clear timetable for tariff reviews and reductions, an annual maximum on the amount of new renewable energy to be subsidised (previously such an annual cap had only applied to solar PV), and, from 2017 on, auctions to make renewable developers compete for available subsidy money.

In the further stages of its 2013 electricity market reform, the UK government is also planning to introduce subsidy auctions which are, in essence, designed to pay renewable energy developers as little as possible, while at the same time to get them to deliver on their projects. The UK has introduced a series of Contracts for Difference that set out a strike price for each renewable technology, and whenever this strike price falls below the electricity market price, the subsidy will make up the difference. However, when the bids to provide new renewable capacity exceed the available amount of subsidy, auctioning will be introduced in which the contracts will go to the lowest cost projects. Thus the strike prices will become the maximum rate of subsidy rather than the rate

paid to all comers. The total amount of renewable subsidy payable each year in the UK is limited to the Levy Control Framework, which is due to rise to £7.6 billion by 2020.

Reducing the level of ambition for renewable

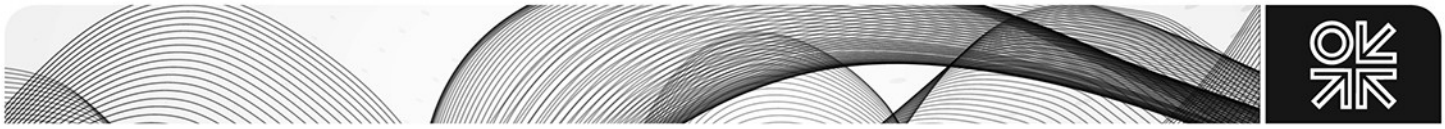
This is effectively what the European Commission has done in its proposal to abandon national renewable energy targets after 2020 and to replace them with an EU-wide target of a 27 per cent renewable share of total energy by 2030. These national targets were designed to raise the average renewable share in final EU energy consumption from 8.5 per cent in 2005 to 20 per cent by 2020, a goal the EU is expected to achieve. There are two reasons why having only one target of 27 per cent for all of the Union constitutes a reduction in ambition. The first is that 27 per cent is only slightly above the 24 per cent level of renewable energy that the EU is expected to achieve purely as a result of its headline target for 2030 of a 40 per cent reduction in emissions. So little extra effort would be needed to hit the renewables target, provided the cut in emissions was achieved. The second reason is that while national targets written into EU laws are clearly enforceable in the EU – the Commission can take member states to the European Court of Justice and can impose fines on back-sliding governments – there is no mechanism for the EU to take itself to court. The Commission has implicitly conceded this flaw by proposing, post 2020, a new system of governance – basically surveillance and supervision by Brussels – to ensure that member states live up to their energy commitments.

This recasting of the renewable target in wider and vaguer terms has been criticised by the renewable energy industry and by green and environmental groups. Their complaints have been taken up by the European Parliament, which in February 2014 passed a resolution – by 341 votes to 263 with 26 abstentions – calling for binding 2030 targets for a 30 per cent renewable energy share and a 40 per cent energy efficiency improvement, in addition to the 40 per cent emission reduction target. But most of Europe's governments, utilities and energy-intensive users have welcomed the Commission's proposal to abandon binding national renewable targets as allowing a more flexible and less costly approach to emission reduction.

Shifting the burden

Is the burden of energy/climate policy costs falling on the right shoulders?
At present, all EU states let the policy costs fall on energy consumers, rather than taxpayers. But it is worth asking whether it might not make sense to fund more of the policy costs out of general taxation. This is how renewable energy was originally supported. Up to 1990, most support came from tax credits for R & D into renewable technology. There is logic, too, in using tax credits to help renewable energy developers, for whom the upfront capital cost of buying and erecting wind turbines and solar panels is far higher than the cost of operating them. One example of a general renewable subsidy being paid out of taxation is the UK's renewable heat incentive introduced in 2011. This is designed like a feed-in tariff, providing a set rate of subsidy for several years for business and households to install air and ground source heat pumps and boilers using biomass, but unlike a feed-in tariff it is funded out of taxes, not a levy on consumers.

It would be easier to help poorer households and energy-intensive companies vulnerable to carbon leakage through the tax system. The tax code makes allowances for poor people and money-losing companies in a way that energy bills do not. Moreover, as regards energy costs' impact on competitiveness, a parallel has been made with the way different EU states finance their welfare



systems. Nordic countries plus the UK fund their welfare system very largely out of general taxation, while Germany, France and a few other countries follow the original Bismarck model of funding welfare out of compulsory payroll contributions by employers and employees. These payroll charges handicap the competitiveness of French or German companies, just as employee health costs are a handicap to the competitiveness of many American companies. It is argued that financing energy policy costs out of general taxation as the British and Nordics do, would remove this competitiveness handicap for companies, especially energy-intensive ones.

There is, however, a major drawback to this argument. Shifting energy policy costs to taxation could defeat a key aim of the policy, which is to get European households and companies to consume less energy. Keeping these costs on energy bills maintains the incentive to change behaviour and to conserve energy. (This efficiency imperative is far less strong with welfare spending where there is not the same drive to get people to consume less healthcare or social security). That said, a modest portion of energy policy costs could be usefully shifted to taxation, where the rich would pay proportionately more and the poor proportionately less. It makes no sense to make the poor pay for policies designed to help them. This is the case with the Warm House Discount, a payment to help people at risk of fuel poverty, which the UK government decided in December 2013 to fund from general tax revenue instead of from a levy on energy bills.

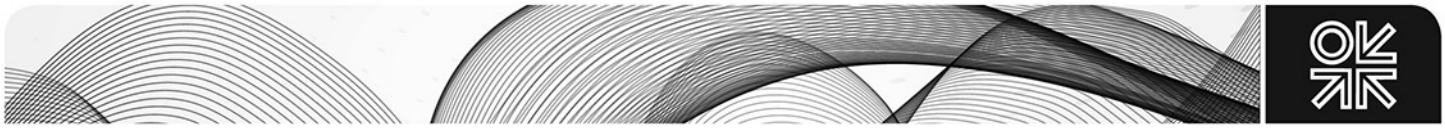
Yet little can be done at the EU level to promote even a modest shift of clean energy costs on to taxation. Most member states are allergic to EU tax initiatives which require unanimous approval that is nearly impossible to attain. Many member states supplement consumer levies for renewable energy by also offering renewable energy developers various exemptions or rebates on their income, corporate, excise, property and value added taxes. No such concessions are possible at the EU level, because no such taxes exist at the EU level.

Offsetting EU policy costs for energy-intensive industries

Direct carbon costs

Carbon leakage was recognised to be a problem for EIIs, once the system of making companies pay for their carbon allowances in the Emissions Trading System began to be phased in, as a general rule during 2013. So a list of EIIs at risk of carbon leakage was drawn up, composed of sectors that are both energy-intensive and exposed to international trade. In order to ease carbon costs for these EIIs considered at risk, while still retaining an incentive for efficiency, it was agreed that companies in these sectors should be given free allowances covering production up to a benchmark of the 10 per cent most energy-efficient companies in their sector. In theory, this meant the 90 per cent less efficient companies in the respective sector would have to buy at least some ETS allowances at auction, thereby incentivising them to improve their performance. In practice, very few EIIs have had to buy allowances so far, because the volume of free allocations – allotted in line with companies' past production profiles – has been greater than the actual, verified emissions of companies, due to the impact of the economic recession in Europe. The result is a large surplus of allowances in the ETS.

EIIs tend to complain about the benchmark because it is set at the *average* of the top 10 per cent in efficiency, which means that only the top 5 per cent most efficient companies actually get all the permits they need free. Companies also complain that allocation is based on their expected output in



line with past production, whereas if allocation were based on their actual realised output it would give them freer rein to expand production. Yet at least it is a common system across the EU.

The Commission has said that free allocations should continue after 2020, though in a 'more focussed' manner, by which it appears to mean more targeted on sectors in real need of protection against carbon leakage. The value of free allocations will remain low until 2020, because ETS prices will be low as a result of the surplus of allowances in the ETS system and because of emission reductions coming from the EU's current EU renewable and energy efficiency targets for 2020. Thereafter, the chronic ETS allowance surplus should disappear if the Commission gets approval for its proposed 'market stability reserve' to regulate liquidity in allowances. If, after 2020, there are also no effective renewable and efficiency targets, then Commission modelling projects the price of an ETS allowances could rise to €53 by 2030, 10 times today's price.

Of course, free allowances only provide protection against carbon leakage if companies do not pass on the opportunity cost of the free allowances in the price of their products. The opportunity cost arises because companies have the opportunity to sell the allowances on the ETS, instead of using them to produce. So if companies forego the opportunity to sell the allowances and use them to produce, they should, in accounting theory, add this opportunity cost to their product prices. In practice, however, if they can factor in such opportunity costs into their sales prices without losing market share, they are not really exposed to carbon leakage, and should therefore not have been awarded free allowances in the first place.

Indirect carbon costs

Even if they emit no carbon in their manufacturing processes and therefore have no need for ETS allowances to cover their carbon emissions, companies still have to bear an indirect cost of carbon via their electricity supply (produced by generators who themselves have had to buy ETS permits). With a limited and declining exemption for power generators in central and eastern Europe, all electricity generators now have to pay for all of their carbon allowances. Early decarbonisation of electricity is considered essential, because carbon-free electricity can then be used to decarbonise other areas such as transport through electric cars. Decarbonising the power sector is also considered possible to do without exposing the sector to carbon leakage, because it trades very little electricity with non-EU countries. But because generators can, and do, pass the full cost of their ETS allowances on to their customers, it can expose these customers to some risk of carbon leakage, especially if these customers use a lot of electricity.

The Commission is projecting that even with the current level of emission reductions – without any further tightening of the overall cap on ETS allowances to achieve a 40 per cent emission cut by 2030 – electricity prices will increase by 31 per cent, in real terms, over the period of 2011–2030[6].

The question is how to compensate EIIs for these indirect ETS costs. Current EU state aid guidelines allow member states to compensate their companies for indirect ETS costs, though not fully in order to preserve some incentive for efficiency. Compensation is limited to 85 per cent of costs in 2013–15, 80 per cent in 2016–18 and 75 per cent in 2019–2020. The problem for the EIIs is that only a few member states – Germany, the UK, France, Netherlands and Spain –are compensating them for their

[6] Executive summary of the impact assessment of the Commission proposals for 2030 energy and climate goals. http://ec.europa.eu/energy/doc/2030/20140122_impact_assessment_summary.pdf.

indirect ETS costs, and at very different levels. The UK government, for instance, has allotted £110m to cover companies' indirect ETS costs in 2014–15, plus another £100m to offset the UK's unilateral introduction of a carbon price floor in order to raise the price of ETS allowances in the UK, and extended the compensation until 2020. This is far less than Germany is paying.

It is not legally possible to force member states to pay this compensation, even if they could all afford to do so. As the Commission puts it, 'the complete discretion on the part of member states is a fundamental difference compared to the free allocations of ETS allowances aimed at preventing carbon leakage due to direct CO_2 costs. That free allocation is harmonised at the EU level, implying equal treatment of all eligible sectors and subsectors across the member states'.[7]

One solution could be to give EIIs more free allowances which could be sold on the ETS and used to cover indirect carbon costs. Such a system has existed in the Australian emission trading system, although the system is being revised by the new government in Canberra, and it figured in the Waxman–Markey climate bill that passed the US House of Representatives in 2009 but failed to get Senate approval. It is also something that many EIIs in Europe would like, because it could apply evenly across the EU, unlike the present patchwork of national compensation.

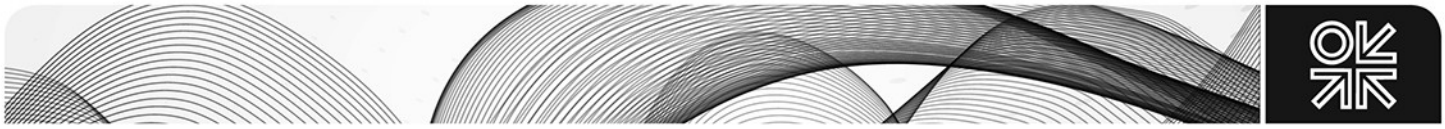
However, issuing EIIs with more free allowances, or indeed even providing national compensation, is not a very popular solution at a time when many EIIs have large surpluses of allowances sitting on their books. The UK House of Commons environmental audit committee said in January 2013 that it was 'nonsensical for government to compensate EIIs for the impact of the ETS on their electricity bills when those companies are making windfall profits from the very same programme'.[8]

Over time, the surplus of allowances is due to shrink to more normal levels, especially if the proposed 'market stability reserve' is accepted and works to stabilise liquidity in the ETS. In these circumstances, any surplus allowances that companies have are likely to be earned through their own energy efficiency efforts. It might then be unfair for companies to have to rely on the extra allowances they have earned in this way to compensate themselves for carbon costs passed through in their electricity supply. These extra allowances would no longer be the unearned 'windfall' that those British MPs were complaining about.

Compensating EIIs for renewable energy policy costs

The extent to which across Europe EIIs are exempted by their governments from these renewable subsidy costs is very unclear. Only a few governments are open about exemptions. The UK government announced in its 2014 budget that its 'EIIs will be compensated for all government policy designed to support low carbon and renewable investments up until 2019–2020', with a compensation package amounting to £500m a year that covers renewable subsidy costs as well as ETS costs. Germany gives its EIIs a reduction from its EEG renewable surcharge. The reduction is huge, an estimated €5bn this year, because the EEG is now a sizeable levy and because Germany has a very large number of EIIs. In 2013 2,026 companies received a reduction, with the top three sectors being chemicals, metal-working and paper, and for this year 2,315 companies have applied for the discount, according to the German government[9]. The discount is available to companies with annual electricity consumption of at least 1 GWh, amounting to 14 per cent of their gross added value.

[7] SWD (2012) 130 final
[8] House of Commons environmental audit committee, January 2013 proceedings, page 20
[9] Federal Office of Economics and Export Control (BAFA), press release, 12/2/2014



The scale of this discount has prompted complaints from companies outside Germany and from consumers, some of them German (because German households end up paying through their energy bills for this discount to industry). As a result, the European Commission competition authorities announced in December 2013 an investigation because 'the reductions seem to give the beneficiaries a selective advantage that is likely to distort competition within the EU internal market'[10]. The Commission is also investigating another concession on German renewable energy costs. This reduces the EEG surcharge for any company, not just energy-intensive ones, that source at least 50 per cent of their electricity from domestic renewable electricity within Germany; Brussels wants to check that the apparent discrimination against non-German renewable power is not protectionist, but merely to avoid giving further aid to non-German renewable electricity that has already benefitted from subsidy in another country.

Germany's economics and energy minister, Sigmar Gabriel, has warned the Commission that it is 'playing with fire' in questioning his country's energy cost rebates and thereby 'threatening industry in Germany and on a larger scale in Europe'. Nonetheless, if Brussels were to request a cut in the rebate's size rather than its elimination – which is likely – this would probably be accepted by Berlin.
In contrast to state aid for indirect ETS costs, current EU state aid guidelines do not allow reductions in renewable energy subsidies. This is one of the reasons why there may be more member states than just Germany and the UK giving discounts on renewable levies, but they do not publicise the fact. However, the Commission view on state aid for this purpose is changing. At the same time as it launched its German investigation, the Commission published its draft state aid guidelines for energy and the environment for the period 2014–2020. In these, the Commission concedes there could be a positive logic in terms of climate policy to reducing renewable energy levies.

It suggested that some reductions may be needed to secure a sufficient financing base for renewable support. 'In order to have a generally high contribution from electricity consumers to the financing of support for renewable sources, some electricity consumers may need to be given a more favourable treatment in particular to prevent carbon leakage'[11]. Another way of putting this is the risk that powerful energy-intensive lobbies, if not appeased with concessions, might succeed in using the carbon leakage argument to wreck the whole carbon reduction effort across Europe.

But the Commission recognises a dilemma. 'With no compensation to particularly affected undertakings, public acceptance of setting up ambitious renewable energy support measures may be limited. On the other hand, if such compensation is too high or awarded to too many electricity consumers, public acceptance for renewable energy support may be equally hampered'.

This last sentence suggests that the Commission will seek not to abolish its EEG renewable surcharge altogether, but rather to scale down its level or the number of companies benefitting from it.
In principle, the Commission draft guidelines state, renewable levy rebates should leave the European playing field level. 'Within the eligible sector [for renewable levy reductions] member states need to ensure that the choice of beneficiaries is made on the basis of objective and transparent criteria and that the aid is granted in principle in the same way for all competitors in the same sector or relevant market if they are in the same factual situation'. However, the only way to ensure such equality is for

[10] EC Press release 18/12/13
[11] Draft guidelines on state aid to energy and the environment, December 2013, page 50. http://ec.europa.eu/competition/consultations/2013_state_aid_environment/draft_guidelines_en.pdf.

all member states to compensate EIIs for renewable energy policy costs; yet member states cannot be forced to shell out state aid for renewable discounts any more than for indirect ETS costs.

One consequence of promoting renewable energy is the need to extend the electricity grid in order to link often remote generators such as offshore wind turbines to the centres of power consumption. This has increased the grid costs which transmission (high voltage) and distribution (low voltage) system operators pass on to consumers. In addition to giving its EIIs a discount on the EEG levy to pay for renewable generation, Germany also exempts EIIs – defined as companies which both use the grid for 7,000 hours a year and consume 10 GWh of electricity – from grid costs. The value of this exemption is much smaller (around €300m a year) than the EEG discount, but the European Commission considers it also distorts competition with rival companies in other member states, and in spring 2013 it launched a state aid inquiry. For its part, Germany considers this is not state aid because it involves private money, and justifies the exemption on the ground that large energy users are to be encouraged to use the network because they have a stabilising effect on it.

From the number of competition cases involving German exemptions for energy costs, it is becoming clear that no harmonised EU approach to cost relief for EIIs is possible unless and until Berlin recognises that the scale of its state aid policy risks are warping Europe's industrial market, just as the scale of German renewables has destabilised much of the electricity market. This German state aid is paid for by German households which cross-subsidise German energy-intensive companies. But it is unlikely that other EU citizens are willing to display this degree of 'industrial patriotism' for their companies. It is not a model that other countries will follow.

Germany argues that its companies need big exemptions because the energy charges they face are big. Yet this is partly the result of Germany's policy to accelerate its entry into renewable energy to offset its accelerated exit from nuclear power, a decision on which it consulted none of its EU partners or neighbours. Germany's partners should wish it every success in carrying out its *energiewende* revolution; but this should not be the pretext for energy cost concessions that tilt the playing field in favour of German companies. The latter already have the advantage of selling to their Eurozone partner countries at a permanently favourable real exchange rate.

Energy efficiency

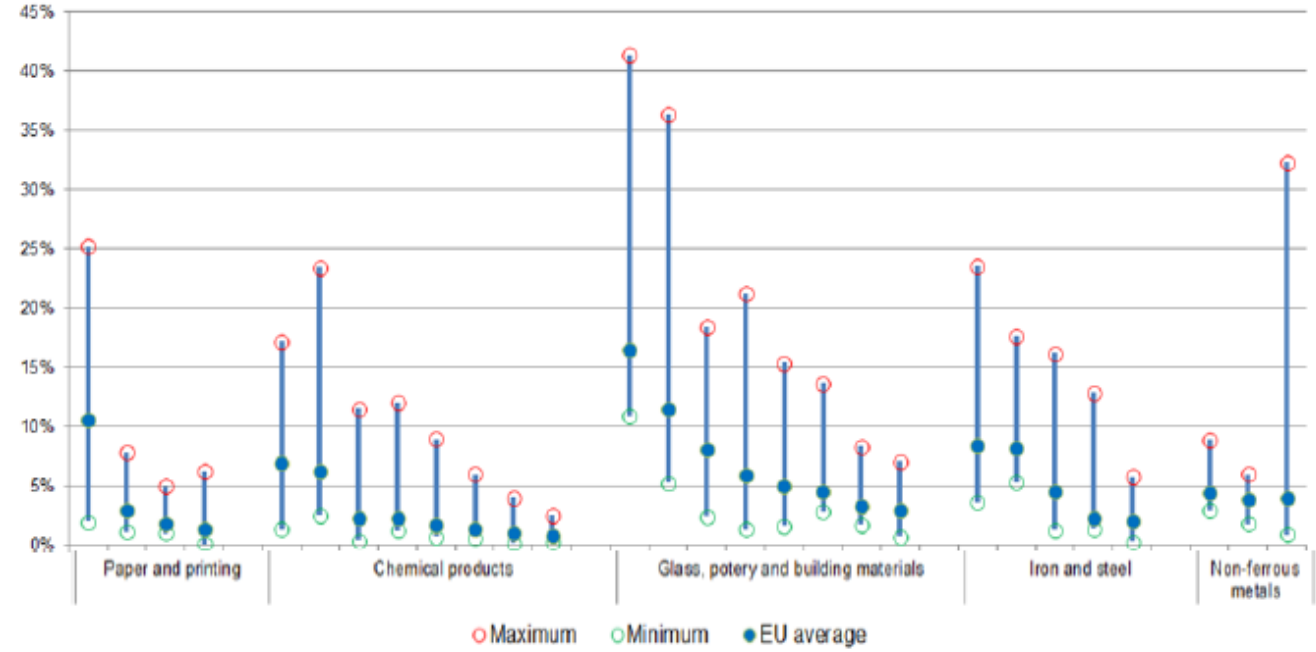
Improvements in energy efficiency are the most cost-effective way of dealing with disparities in energy prices, because they can reduce energy costs. The EU has done well. According to the European Commission's 2012 'European Competitiveness Report', the EU's 12 biggest member states had achieved, since 1995, a larger reduction in the relative weight of energy inputs in their exports of manufactured goods than any of their external trade partners. Past efficiency gains may of course leave relatively less room for further improvement.

This is the contention of the chemical industry which between 1990 and 2009 reduced its energy input by 27 per cent, its use of gas as a feedstock by 37 per cent and its use of oil as a feedstock by 18 per cent[12] [12]. In somewhat the same vein, Gordon Moffat of the Eurofer steel makers' association complains that the EU has failed to reward his sector's past efficiency improvements; the Commission set 2005 as the reference date for the current phase of the ETS, ignoring the steel sector's 20 per cent reduction in emission intensity between 1990 and 2001.

[12] Ecorys, Carbon Leakage Evidence Project, 2013

In fact, perhaps because of its historic role in the precursor EU institution of the Coal and Steel Community, the steel sector seems to get rather more of Brussels' attention than other sectors. In 2013 the Commission produced a special strategy for steel, pledging among other things to defend it more vigorously against unfair imports and to open access for it to export markets. The Commission has also for some years been funding part of the Ultra Low CO_2 Steel-making programme, an industry consortium aimed at achieving emission-reducing technical breakthroughs. Its main current focus is a research effort at Tata Steel's Ijmuiden plant in the Netherlands on the Hlsarna process. This involves making liquid iron using thermal coal and fine iron ore, avoiding two stages in the production process (coking and ore agglomeration) and thereby reducing emissions. However, Koen Meijer, head of the Hlsarna project, said in 2013 that while 'the process has the theoretical potential to reduce emissions from steelmaking by 20 per cent, it will be a minimum of 10 years before it might be realistic for steel markets to start considering adoption of the technology'.[13]

Share of energy in production costs in energy-intensive sectors in the EU (different bars represent subsectors in each industry)



Source: European Commission, Energy prices and costs in Europe, COM (2014) 21/2

Nevertheless, the table above, which shows widely differing energy efficiencies in various energy-intensive industries and subsectors of them, illustrates that there is much remaining potential for improving energy efficiency in the EU. This is why it would be a mistake to compensate EIIs for *all* EU clean energy policy costs, because EIIs can do more to help themselves.

[13] Tata website

Conclusion

Europe has always had higher energy costs than the USA, and yet has long run a surplus with the USA in goods trade. There is no cause, contrary to what many European industrialists argue, to change the general course of EU energy and climate policy or lower its ambition. In their February 2014 'manifesto', the European branch of the International Federation of Industrial Energy Consumers (Ifiec) said 'climate objectives must be set to keep a high performing industry in Europe'[14]. Surely, however, industry policy must defer to climate policy, not vice versa. As the IEA observed in its 2013 World Energy Outlook, climate change 'poses a far greater threat to national economies than the adjustments associated with shifts in relative energy cost'.

That said, something needs to be done to help Europe's EIIs, at least pending an international climate agreement that universalises the cost of carbon, in a way that does not distort the single energy market.

What about using subsidies or taxes to close Europe's price differentials with the rest of the world? No one has suggested Europe could or should use subsidies in order bring its energy prices down to the level elsewhere in the world; not only would such general subsidy involve issuing a blank cheque of unknowable size, but it would relax the drive for efficiency that high prices have provided. By contrast, it has been suggested that the EU could impose border taxes on the imports of goods based on their carbon content, designed to make imports bear the same carbon costs as EU goods. Apart from its technical complexity, however, this would probably spark trade wars, or at least endless litigation in the World Trade Organisation.

The need for some cost relief to avoid the risk of carbon leakage was recognised when the current EU policies were decided in 2009, and when provision was made to compensate EIIs for direct ETS costs with a uniform pan-European allocation of free allowances. However, what was not realised at that time was how significant other carbon costs (essentially renewable subsidies) would quickly become and how very patchy national government compensation for these other costs would be.

There are two ways to even out compensation, both involving the pan-European resource of ETS allowances. One would be to give energy-intensive sectors more free ETS allowances to offset some, though not all, of their indirect carbon costs. Thus indirect ETS costs could be compensated in line with the same harmonised criteria across the EU as direct ETS costs already are; the allocation of extra free allowances would still have to be based on efficiency benchmarks. As mentioned earlier, other countries – Australia and the USA – have considered this solution, and it is time for the EU to do likewise. As also mentioned earlier, giving more free ETS allowances to energy-intensive companies that still have large surpluses of allowances on their books would not be popular, or immediately necessary. However, if the structural surplus of ETS allowances gradually shrinks, *and* if there is no international climate agreement in 2015 or soon thereafter, using free allowances as a partial offset for the cost of carbon in electricity is something the EU should consider.

The other form of common cost compensation would be for EU governments, all 28 of them, to dip into the common resource they now each have in the form of ETS auction revenue in order to partially offset renewable policy costs of their most energy-intensive companies. Each member state is now gaining sizeable amounts of ETS auction revenue, even the poorer central and east European states. Auctioning of allowances for the electricity sector is being phased in at a slower pace in eastern

[14] www.ifieceurope.org

Europe than in western Europe, but there is also a modest redistribution of ETS auction revenue from richer western state to poorer eastern ones. In total, an estimated 8 billion ETS allowances will be auctioned in the EU over the 2013–2020 period[15]. Even at the low current price of around €6 per allowance, this amounts to €48 billion.

Using this auction revenue in this way should not be seen as permitting energy-wasteful companies to go on being energy-wasteful, because they would only get partial relief for their carbon and renewable costs, and this cost relief would be limited by an efficiency benchmark. But some people will object to using ETS auction revenue as a sort of operating subsidy to keep Europe's energy-intensive companies in business until the rest of the world adopts carbon constraints and Europe's self-imposed competitive handicap disappears. Such objectors will point to the 2009 agreement – which was a political understanding, not a legal commitment – that member states should use at least half their ETS auction money for climate change purposes, and not for anything remotely resembling an industrial subsidy. If this objection prevailed, the answer would be to use ETS auction money to finance an innovation fund focussed on energy efficiency in industry. That would serve the purpose of the 2009 agreement.

These two suggestions are aimed at removing the distortions currently caused by leaving cost compensation of clean energy policy costs to individual member states. Therefore it will be vital to scale back state aid, and especially for Germany to realise the fact that it has the deepest pockets of any EU state does not allow it to vastly out-subsidise its EU partners.

Ideally, the competitive concerns addressed in this paper will be temporary, and will dissipate with the advent of an international climate agreement. However, such agreement could be several years coming. In the meantime, the EU needs to find a more harmonised form of carbon cost relief for its energy-intensive sectors. Otherwise, differing levels of compensation will simply compound the differences across Europe in wholesale energy prices, on to which are loaded differing surcharges for renewable energy – and this will pile distortion upon distortion in the European market.

[15] http://www.emissions-euets.com/auctionsco2allowances/472-nims-decision-key-determinations-for-carbon-market-analytics-for-the-period-2013-2020