EUROPEAN ENERGY AND CLIMATE POLICY: TIME FOR SOMETHING NEW

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Introduction

During 2014, European energy and climate change policy has moved centre stage. The annexation of Crimea and the destabilization of Eastern Ukraine have raised tensions with Russia to levels not seen since the Cold War. The EU has responded with an energy security plan, and sanctions.

Developments elsewhere have further complicated matters. In the Middle East, the rapid advances of ISIS (now called the Islamic State), the internal conflicts in Libya, the war in Gaza, and the continuing negotiations with Iran on nuclear matters suggest that early optimism about the "Arab Spring" was at best misplaced, and chronic instability has returned. In the US, the energy revolution continues to change the geopolitics of oil and gas, with the early skepticism about the scale of the changes and the shift towards North American energy independence giving way to recognition that the changes are permanent and profound – for both global energy markets and Europe. The full implications of the end of the commodity super-cycle are both profound for European energy policy and very poorly understood. Commodity prices have tumbled, with oil prices falling below $80 a barrel.

On climate change, there is almost certainly not going to be a continuation of the Kyoto style international framework after the Paris conference in December 2015. Chinese emissions per head have now exceeded those of the Europeans, and it is at last being recognized that the climate change problem is one in which China, not the EU, is centre stage. China has announced that it does not intend to cap its carbon emissions until after 2030, by which time they may peak anyway – from a very much higher base after another decade and a half of increases. The Paris conference will see a series of "pledges" and "commitments" very much on the pattern of the Copenhagen Accord, not

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the credible, enforceable legally binding measures that had been proposed at the Durban Conference of the Parties in 2011.

Global emissions are now growing at almost 3 parts per million, the 400 ppm threshold has been breached, and in Europe, Germany now has rising emissions as coal continues to dominate the electricity generation energy mix. The maximum 2 degrees warming target looks unattainable.

Though many European leaders have been anxious to claim that these external developments in both security and climate change confirm the relevance of existing policies, notably the Internal Energy Market and the Climate Change Package, this position is increasingly difficult to sustain. Something new is needed.

This paper sets out a possible way forward for European energy and climate policy. Section 1 discusses the economic fundamentals, and particularly the trends in commodity prices and in technology. Given this background, section 2 considers the conceptual framework and how the policy instruments can be designed to meet the objectives and targets. This builds on the preceding paper[1]. Sections 3, 4 and 5 deal respectively with each of the main policy elements – security, climate and affordability. Section 6 considers the next steps and the policy options facing Europe.

1. The economic fundamentals

Energy policy floats on the surface of economic fundamentals. Mostly these can be taken as given, but there are points in the history of energy policy when structural change alters the nature of the game. Now there are two – on the costs of fossil fuels and on technologies.

Europe's energy policies have been built around the assumption of ever higher fossil fuel prices. Back in the last decade when the Climate Change Package was being put together, the Commission and the leading politicians in Europe convinced themselves that oil, gas and coal process would keep on going up, so that the renewables would become competitive and by 2020 the subsidies could start to wither away.

As with all such dangerous assumptions about the future market prices, this has turned out to be at best seriously misguided. Energy policy should not be based around assumptions about the outcomes of market processes beyond the control of the policy makers. In fact coal prices fell sharply, gas prices in Europe during 2014 halved, and oil prices slid below $80 a barrel.

(1) Helm, D.R. (2013), "The current situation and mid-term prospects for European electricity markets", October.

The commodity super cycle which lay behind these assumptions has come to an end as a result of a combination of economic fundamentals – a slow down in China cutting into demand growth, and increases in supply, including the coming of shale oil and gas, and the remarkable increase in US production. The high super-cycle prices contained the seeds of their own destruction – and the markets have reacted accordingly. Commodity prices are now at a 5-year low and still falling. There are few reasons to assume that the ending of the commodity super-cycle will stabilize in the near future, notwithstanding the projections made by the official bodies like the IEA. Indeed the IEA's record on forecasting is extremely poor. At the end of the 1970s, when a similar commodity cycle peaked it projected ever higher oil prices, to be confronted with the opposite. It failed to predict the current sharp falls, and it has little credibility in making projections of rising prices going forward (whatever, in fact, turns out to be the case).

The reasons why the commodity super-cycle has turned are fundamental economic ones. High prices cause more investment in supply, more energy efficiency and they tend to damp down economic growth. Eventually lower demand comes up against higher supply. Once prices fall, producing countries struggle to balance their budgets, and the result is that they tend to increase supply to compensate. Eventually, these factors play out and the cycle turns again – provided there are no new cheaper alternatives. In the case of oil, the transport demand is vulnerable to the electrification process and next generation solar might make big inroads into the demand for oil. It may even be possible that oil demand never recovers very much – in other words, it may be the demand for oil that has peaked, not the supply.

The policy implications of lower commodity prices are profound. The renewable subsidies will need to be permanent not temporary if Europe is to continue to address climate change with wind turbines and other current generation renewables. The fossil fuels will remain competitive, unless the carbon price is sharply increased. For nuclear, it means that new nuclear at the current development costs will struggle against cheaper coal and gas without a high carbon price.

The end of the commodity super cycle coincides with the potential for rapid technical change. Whilst existing renewables (despite most official forecasts and optimism to the contrary in defense of the political mistakes that have been made) have little serious chance of ever being competitive or indeed sensible ways of addressing the massive challenges of global warming, next generation technologies (and especially next generation solar) have the potential to make big inroads. Indeed the development of new solar film-based applications as well as greater use of the light spectrum holds out the possibility that it might compete head on with fossil fuels. Graphene and nano-technologies add a broad set of interacting technologies. There are also big potential advances in storage, the coming of electricity transport, new transmission and distribution technologies and the wider application of smart communications to all dimensions of the

industry, and especially to the demand side. The time scales are uncertain, but it should be born in mind that the experience in the last two decades of the rapid diffusion of mobile and internet-based technologies has been extremely rapid. Furthermore since the existing renewables cannot solve the climate change problem, there is no option but to try to speed up the R&D and innovation of the next generation of renewables. Sadly spending billions of euros on existing wind and current generation solar does not help, whilst at the same time it absorbs customers' money which could have been better spent on R&D.

All these technologies hold out the possibility that the economics of electricity might look more like the economics of the internet – zero marginal costs, fixed price contracts, and rapid obsolescence.

Together these developments hold out the prospect of a very different future for the energy industries, and energy policy should be designed with this uncertainty in mind. Instead the history of energy policy points to a rather different conclusion. Policy makers tend to take technology as given and misinterpret the current trend in prices for a permanent trend. They look out the back window, rather than designing in flexibility to account for different commodity prices and new and often surprising technologies.

2. A conceptual framework for EU energy policy

Policy should be flexible to the future possibilities. With this in mind, there is nothing inherently difficult from a conceptual perspective to designing a European energy and climate change policy framework. It is the politics that inhibits a proper framework being designed. It requires three main things: clear objectives; clear trade-offs between the objectives where these conflict; and a set of policy instruments to achieve them.

2.1. The objectives are not defined

A prime reason why EU energy and climate change policy is in such a mess is that none of its objectives has been properly defined. European politicians have avoided them, for fear of confronting the citizens with the implications of their policy choices. Instead there has been much talk of the mutual compatibility of the "trilemma", and how European citizens can be secure, reduce their carbon footprints, and have competitive and affordable energy all at the same time. Unfortunately such a happy coincidence is not possible.

Defining an objective is not just a matter of stating some political platitude. An objective requires a definition of what is to be achieved in a clear and unambiguous form, which can be monitored and measured. Being in favour of "more security" is not an objective, but rather a vague aspiration. "Security" needs to be defined, and the target needs to be given empirical content. Questions have to be answered. What is security? How much of

it is the objective? What are the causes of climate change to be targeted? Is the objective global emissions, and if so what is the target and over what period of time? Is it a global objective, or is it a unilateral target, even if it means global emissions going up? Does it matter if the basket of greenhouse gases goes up if say carbon dioxide goes down?

It is immediately apparent that not only are security and climate objectives ill defined, but also many dimensions are not amenable to EU control. An objective that cannot be achieved because the EU does not control the relevant variables is not a properly defined objective for policy purposes. Yet it is also immediately apparent that the EU cannot control global emissions, and it cannot control all the sources of energy supply – unless security means autarky and self-sufficiency, in which case it is likely to be so costly as to be unachievable in any realistic political scenario.

To security of supply, and climate change, the EU frequently adds a third objective – variously referred to as “competitiveness” or “affordability”. This is better considered an *outcome* of the pursuit of the other objectives, and of global markets. In theory the EU could aim to have an energy cost, adjusted for exchange rates, set at some maximal level relative too the countries or a basket of countries. It could even aim to have the energy costs of a particular group – say internationally trading companies or the poorest 10% of retail customers – below some international threshold. Given however that the EU has little or no power over international prices, and little ability to determine the energy policies and prices in other countries, this is a tall order – even before the placing of security and carbon objectives as subsidiary to prices.

2.2. The trade-offs between the objectives are not defined

If none of the objectives is properly defined, little serious progress can be made in constructing a coherent policy framework. But if they were, then the next step would be to define the trade-offs. Contrary to the political rhetoric, and some of the lobbying by NGOs, there are real conflicts between them. For example, security might be best achieved by burning more coal. Coal is abundant, widely available from diverse sources of supply, it can be stored, and there is no realistic prospect that there will be any substantive hold-ups in supply. No countries could play an OPEC role in the coal market. There are also some indigenous supplies. Coal too is cheap – unless there is a serious carbon price (either explicitly or implicitly in the price of low carbon technologies) and prices for the other emissions associated with coal production and consumption. Coal is however the last fuel to turn to in any credible climate change policy. The route suggested to address these problems via CCS is unlikely to have much impact: the sheer scale of the CCS reservoirs that would be needed given the volume of the gas is out of all proportion to the level and growth of the emissions.

This is just one stark example of the trade-offs that exist between the objectives. The EU has studiously avoided defining these trade-offs, and the result is in this example seen in

the incoherence of both pursuing a climate change policy and increasing the coal burn across Europe, with Germany standing out as the leading example of promoting “green” policies and sharply increasing the coal burn and adding new coal-fired power stations. “Brown” might be a better colour to represent the high pollution route Germany is in fact pursuing.

2.3. The instruments are not properly targeted on the objectives

Even if the objectives are defined, and the trade-offs are also defined, there needs to be a set of credible and coherent policy instruments to achieve them. But instead of a clear assignment of instruments to targets, there are a plethora of measures designed to placate various lobbies and interest groups. On security of supply, the instruments are those that meet the least resistance. Hence there is no serious attempt to enforce the EU’s competition policy on Gazprom, and no requirement for minimum conditions, like the rights to resell gas, the ruling out of price discrimination, or a determination to develop credible alternative pipelines like Nabucco.

On climate change it is even worse. There are multiple ill-defined and overlapping policy instruments, from protection of “winning” technologies at great cost, to the EU ETS set at so low a level as to make no significant difference, and an absence of credible R&D policy instruments. No serious attempt is made to deal with the conflicts and overlaps between these instruments.

The conclusion that emerges is that Europe does not have well defined objectives or trade-offs between them and has a complex mess of overlapping instruments not properly linked to the objectives. Conceptually it is straightforward – and Europe fails badly on this score. This is reflected in each of the main areas of concern to which we now turn.

3. The 2030 targets and the climate change instruments

For at least two years, the Commission has been debating proposals for a new set of targets for 2030 for carbon, renewables and energy efficiency. The Council of Ministers in October 2014 has settled on 40-27-27. The 40 refers to carbon production (not consumption), whilst the other two are at best intermediate targets, but really are effectively instruments. It is a muddle, and fails the test of clear and defined objectives discussed above.

The rationale for this set of targets grows out of the earlier 20-20-20 set. In both cases, the approach has been political, with little if any economic content. As explained in

The Carbon Crunch,[1] 20-20-20 is highly unlikely to be efficient: the chances that all the targets add up to the magic number of 20, in the year 2020 is obviously close to zero. And so it has proved. The main reason for the performance on the overall target has been the economic depression, lowering European GDP by perhaps 20% below the level it might have been expected to achieve when the 20-20-20 targets were being formulated. This has also helped with the renewables targets – the total energy demand has fallen as a result of a combination of lower GDP and higher prices.

The renewables target has little if anything to do with climate change. Current renewables have negligible impact of global emissions, and by driving up European energy prices they encourage de-industrialisation and hence open the gap between carbon production and carbon consumption. They are incredibly expensive too – and are more so as commodity prices fall. Subsidies will not then wither away between 2020 and 2030, but rather become a permanent feature of the European budgetary scene with a new renewables target, and impact permanently on customer bills.

Why then repeat the folly in for 2030? The answer lies more with the lobbying and vested interests of all those in receipt of the subsidies and with the campaigning of "green" groups. The 20% renewables targets have created great economic rents and rent-seeking companies and organizations have pursued them with vigour. The renewables industry has developed formidable lobbying organizations.

The energy efficiency target lacks even the necessary definition to make it coherent. Is it independent of price – and hence the price and income elasticities? What exactly is the counterfactual? It is far form clear there is any practical operational answer to these questions.

The overall carbon production target of 40% has the political merit of being twice the number 20, but again it is far from clear what relationship it bears to the global emissions. It is presented as unilateral, and it is on production not consumption. Yet, it is also "flexible", depending on what others offer at the Paris 2015 Conference. So far, China has offered *not* to accept any cap until 2030. Whatever the eventual number, it has nothing to say about Europe's carbon footprint and hence carbon consumption.

An efficient overall carbon target aimed at global climate change should address these questions. Once set, there is no obvious reason why the policy instruments should not be defined as the most efficient. This means a carbon price, and the noticeable feature of the EU's current and proposed approaches is that it has multiple explicit and implicit carbon prices. The EU ETS provides one price – currently well below € 10, and hence for all practical purposes it is irrelevant for the determination of either the coal-gas trade-off,

(1) Helm, D.R. (2013), "The carbon crunch: how we're getting climate change wrong—and how to fix it." London: Yale University Press.

or the future of low carbon generation. It merely makes lots of money for traders, protects incumbents, and gives political cover for the lack of effective actions.

The renewables carry another set of carbon prices – implicitly. Thus offshore wind has an implied carbon price of more than € 200 per tonne once the full cost has been taken into account (roughly the scale of the UK FiT subsidy and *before* any consideration of the network and intermittency impacts). New nuclear has a price three times the EU average wholesale price, and hence a big implied carbon tax too.

What would a credible carbon policy look like? It would contain the following three elements:

- a conditional carbon consumption target,
- a credible long term, stable and rising carbon price,
- an R&D policy focused on future renewables.

All three are noticeable by their absence. The result is that the EU makes no significant difference to reducing global emissions, its carbon prices have little impact, and it is missing out on the chance to develop next generation solar and a host of related technologies that might make a difference, as well as contribute to the growth of the EU's economy.

In failing to put these three elements in place, the EU's proposed climate change total package of 40-27-27 will not improve security, will damage competitiveness and makes electricity less affordable for retail customers particular those in fuel poverty. The 27-27 components are particularly unhelpful. The 40 overall production target hits the wrong element, but at least if the sole binding target, and if tied to a reformed EU ETS, would produce a carbon price to provide *some* incentives for de-carbonization. A carbon consumption target would be superior and with a border carbon price address some of the competitiveness issues. The practical details are beyond the scope of this paper. However contrary to a number of suggestions that such an approach would be unduly complex, it is important to bear in mind that it is a small number of energy intensive industries that account for the bulk of carbon trade, and that there are upstream and downstream options. Whilst all such measures are necessarily approximations, it is better to be roughly right than (as with production-based approaches) precisely wrong.

4. The EU Security Plan

The security of supply objectives are vague and general. There are claims that security is measured by total import dependency and hence the objective is to reduce this. But why would the EU want to reduce the share of oil that is imported given that production is so low? Reducing oil consumption does not reduce the share of oil that is imported.

Its economic impact depends mainly on its relative price, not the country of origin. There are no claims that imports as a share of the coal burn should be reduced, though many that coal should be less important in the total energy mix. On gas, it is argued that an objective is to reduce gas imports in total, and also to reduce gas imports from Russia. But again the best short-term policy to reduce gas imports from Russia, and generally, is to burn more coal, and hence the security objective turns out to be to reduce the gas burn regardless of source.

Oil, coal and gas imports are not the only interpretation of the objectives of security of supply. There are narrow measures, related to the electricity generation margins, the risks of power cuts, and the vulnerability of particular countries.

The second problem with the security objectives is that there is no percentage target. A general target is just that – and best regarded as a general aspiration. To be a credible objective it needs to be monitored and measured. A general aspiration does not meet this criterion. Security of supply needs to be defined. In doing this, the EU needs to recognize that there are trade-offs within the various components of security of supply and trade-offs between security of supply, climate change objectives and competitiveness and affordability. The budgets are not open ended – spending on Nabucco was clearly regarded as too much for the EU. Spare generation capacity remains a significant cost, as would strategic gas storage at the EU level. Interconnectors are also a claim on the EU and member states budgets. Finally, if Russian gas is cheaper than LNG, what is the trade-off between the extra security from LNG versus reliance on Russian supplies?

The EU security plan does not answer these objectives questions. Rather it seeks to suggest that the measures that the EU is already pursuing – the Internal Energy Market and the Climate Change Package – are the basis for implementing its vague objectives. In effect, these two policy packages have become objectives rather than instruments. In doing so, the EU ducks away from measures that really would make a difference.

There are three possible approaches the EU security plan could take as a response to the perceived and actual threat that Gazprom and Russia represent to the security of European gas supplies. These are: the Polish proposal for an energy union with a single buyer; the application of competition policy rules to Gazprom and the contracts European gas companies can enter into with Gazprom; and to directly invest in alternatives, and their associated mutual protection, pipelines and LNG facilities. The implied objective in the three cases would be to reduce Gazprom's market power, but not necessarily to reduce European import dependency either generally or in respect to Russia.

A pure central buyer would be the contracting agency for all Russian gas on behalf of the member states and the companies that seek to import Russian gas. It would have maximum market power, since Gazprom would either have to stop supplying Europe or agree terms. These might include: the right to resell gas; cost related pricing; and the

prohibition of any price discrimination on grounds other than costs. The Russians would therefore face the prospect of the loss of considerable revenues and all this implies for a state 70% dependent for its national budget on oil and gas revenues if it failed to reach agreement. A partial central buyer for the eastern countries would have less impact, but nevertheless reduce the discrimination.

An alternative, which might reach a similar result, is to apply competition law to Gazprom. European competition law is based upon the two pillars of the prohibitions of the abuse of market power and discrimination. Arguably, Gazprom violates both. In addition, it leverages political and state power to influence outcomes in the market. If the same vigor was applied to Gazprom as was applied to Microsoft and now Google, then European companies would not be allowed to enter into the sorts of contracts they currently have with Gazprom. Banning resale would be illegal, as would the undue influence on reverse flows. Oil indexation might also come under pressure. The price discrimination in the market would be illegal too.

Mutual protection might also form part of a coherent EU energy security plan. This would include not just a requirement to come to the aid of any member state facing gas shortages, but would extend to gas storage and EU control of gas storage. An energy union would have at its disposal the availability of gas storage, the interconnectors to make sure it could reach the various parts of the EU, and the powers to direct its use in the event of a threat to security. There could be financial support (possibly through the EIB) for security enhancing investments, including LNG facilities and key interconnecting pipelines and strategic storage.

Guaranteeing sufficient electricity generation capacity to avoid power cuts and price spikes has been – and remains – overwhelmingly a national preoccupation. The Lisbon Treaty retains the choice of the energy mix to member states. Yet it is apparent that security of supply for electricity generation is a portfolio issue, and the portfolio effects are greater the more interconnections there is. A number of factors combine to make this much more a European issue.

The two prominent factors are: the coming of greater scope for the technologies of cabling and electricity transfers; and the problems of intermittency of supply from the growing current generation renewables. These augment the underlying advantages of interconnections between countries – that national energy policies and the interests of the incumbents have so far managed to limit the development of.

A European electricity grid has a great deal going for it as an economically efficient way of handling electricity supply, of helping to arbitrage the variance in prices across the EU, and to provide much greater security of supply. Interconnection adds portfolio benefits which reduce the total amount of capacity needed to meet a given electricity demand. It

also greatly enhances security of supply – for both electricity and the gas side, where gas is the marginal fuel for electricity generation.

As security of supply problems increase with the intermittency and as old plant retires, the inadequacy of an energy-only market in wholesale electricity supply have become increasingly apparent. Some form of capacity mechanism and capacity payment will required as and when capacity margins tighten (sooner in some cases like the UK, and further out in excess capacity countries like Germany). There are obviously competitive advantages of having a common European approach to capacity market design. Yet this is precisely what is not happening, further fragmenting the markets. The result is that there is a direct trade-off between this dimension of security of supply and the competitiveness agenda.

5. Competitiveness and affordability

Whilst the EU has been pursuing its climate change and security objectives, the world around it has changed. In the energy markets, there have been two powerful developments. On the demand side, the commodity super cycle looks to be at an end as China's economic growth catch up starts to fade and normalization of economic growth in China is gradually reasserting itself after two decades of phenomenal expansion. On the supply side, the revolution in unconventional oil and gas has turned the US's energy supply position on its head, with the prospect that by 2020 it will require much less by way of imports and may even start to seriously export. This in turn displaces supplies in the global market in both oil and gas, and therefore puts downward pressure on prices. In 2014 the fall in commodity prices has gradually gathered pace.

There are two main effects on the EU. First, the gap between energy costs in the US and Europe has grown. Whilst it is true that the EU has deindustrialized to a significant degree over the last two decades, and now suffers from very low growth, the impacts at the margin on industrial location, competitiveness of existing industrial energy intensive users and consequently on jobs and growth are significant.

The second impact is to open up the gap between fossil fuels and current renewables. It is no longer credible to argue that the EU's current renewables are going to be cost competitive by 2020 given the ending of the commodity super cycle and the economic fundamentals, and it raises the costs of the various proposed 2030 targets significantly. The 2008 Climate Change Package was based upon the *assumption* that oil and gas prices would keep going up, and that there would be a significant EU and global carbon price. The reality is pointing in the opposite direction. The EU ETS price is currently around € 6, the oil price has fallen to below $80 a barrel, and during 2014 European gas prices at one stage halved. Coal prices keep on falling, and other commodities, like iron ore, point towards a much weaker general commodities market.

It is nonsense to pretend that the specific European climate change proposals will improve competitiveness. They will make little contribution to security of supply. Indeed their intermittency can make matters worse.

The competitiveness objective is, like the security and carbon objectives, poorly defined. There are no measures of relative price targets, and indeed very few instruments other than subsidies with which to deliver it. At any point in time most of the energy infrastructure is given, so the focus for policy instruments is on future rather than current competitiveness.

6. Where next for Europe

A repeat of the failures of the 2020-20-20 failures is not inevitable. The incoming Commission has inherited much of the baggage of the outgoing Commission, but it has real choices as to the path forward. With a single carbon target, the Commission will need a serious carbon price. The EU ETS does not currently provide this, nor under the various proposals to tinker with it, is it likely to be sufficient. A first call on the new Commission is therefore to work out how, given the EU ETS, to rectify this key policy instrument.

It would be sensible to include some conditionality into the overall carbon target. The “flexibility” element matters. If China has no cap until 2030 (it has suggested a cap after 2050), if India fails to adopt any target, Russia obstructs, Canada, Australia and Japan make little commitment, and Africa also stays outside, it is legitimate to consider whether a EU target would make any difference to global warming.

A carbon consumption target, and a carbon tax with border adjustments initially directed at the main energy intensive industries involved, makes unilateral action more plausible, given it ameliorates the competitiveness issues. In this case the objective is clearly set, the trade off with competitiveness is at least in part addressed, and the policy instrument is well aligned.

On security, there is no serious problem for coal or oil supplies and little need for additional measures. The real focus is on gas, and in a world of falling prices and abundant supplies, the issue is very much focused on Gazprom and Russia. Either an energy union as a single buyer or the rigorous application of competition policy on Gazprom would make a significance difference. With lots of alternative potential sources of supply, the obstacle is infrastructure not physical gas shortages. This infrastructure is the obvious policy instrument.

For security of electricity supply, the issue of generation margins in the presence of intermittent renewables has been largely a national concern. As margins tighten, there is a good case for capacity contracts. The various national designs limits competition and

the new Commission should consider how these might be harmonized. The size of the portfolio requirement depends upon market size, and interconnections have a considerable role to play. Moving towards a European grid is a policy goal that should be given higher prominence.

But whilst the Commission grapples with these particular policies, the most important step it could take is to define the objectives properly. That would force political leaders to make choices, and it would be a game changer.