

EURACOAL Response to Public Consultations

on the Green Paper – A 2030 framework for climate and energy policies and on the Future of Carbon Capture and Storage in Europe

The European Association for Coal and Lignite (EURACOAL) welcomes this opportunity to respond to the Commission's public consultations on climate and energy policies. The future of coal in Europe has been closely linked to the deployment of carbon capture and storage (CCS), so it is right that the Commission is holding a public consultation on the future of CCS in Europe at the same time as one on a 2030 framework for climate and energy policies.^{1,2} EURACOAL has also responded to the related public consultation on the 2015 international climate change agreement.³ Taken together, these three consultations are of fundamental importance to the EU and its member states. Indeed, the well-being of EU citizens depends on a balanced EU climate and energy policy that continues to value the contribution of different energy sources to the Union's goals on environmental protection, energy security and economic competitiveness. EURACOAL looks forward to an informed debate. Our responses to the specific questions posed in the consultation documents are included in annexes.

Summary

The European Union presents itself as the global leader in the fight against climate change – the union easily met its Kyoto Protocol commitment of a 6% reduction in greenhouse gas (GHG) emissions by 2008-12 compared with a 1990 baseline. However, between 1990 and 2006, the EU's carbon footprint grew by 47%.⁴ EU citizens are consuming more than ever before and this has resulted in the reported massive growth in carbon emissions. Fewer and fewer of the goods that we consume are manufactured in the EU – the share of industry in EU GDP has fallen from 22.0% in 2000 to 19.3% in 2012. Leaving aside the impact on EU employment, imports from outside the EU have grown which has been good for many developing countries, but not so good in terms of environmental impacts. A widget manufactured, for example, in China results in more carbon emissions than the same widget

¹ Green Paper on a 2030 framework for climate and energy policies, COM(2013) 169 final, European Commission, Brussels, 27 March 2013.

² Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions on the Future of Carbon Capture and Storage in Europe, COM(2013) 180 final, Brussels, 27 March 2013.

³ EURACOAL submission to DG CLIMA dated 26 June 2013.

⁴ Brinkley, A. and S. Less (2010), "Carbon Omissions – consumption-based accounting for international carbon emissions", Research Note, Policy Exchange, London, October.

manufactured in Europe because the Chinese economy is much more carbon intensive.⁵ EU climate and energy policy must recognise the reality of international trade and the impact of consumption on the environment rather than focusing solely on the direct emissions from, for example, homes, factories and cars. Thus, a holistic approach to society's carbon footprint is required.

The coal industry is naturally against any unreasonable measures that would damage the future prospects for coal. Like everyone, the coal industry wants greater prosperity and a cleaner environment. Those men and women who work in the industry provide a service to society that we cannot live without – secure energy. Secure energy from coal comes with real added value: it is the most affordable energy and Europe leads the world in coal exploitation technologies for coal mining, coal conversion and coal use. Sadly, the coal industry is at best ignored and at worst vilified. The Green Paper does not include the words “coal” or “lignite”, yet 27% of EU electricity is generated by burning coal and lignite, and European steel production depends heavily on good quality coking coal and coke.

The impact of EU legislation on the coal industry is now being felt in the form of business and job losses as coal mines and coal-fired power plants close. Various directives have created a policy framework that is unfavourable towards coal. EU climate and energy policy sits at the top and would be fully supported by the coal industry if we believed that it properly addressed the global climate challenge, but it does not. To lose one's job because of a policy that fails to address the nature and scale of the global climate challenge is a pointless sacrifice.

The European Union cannot unilaterally stop and reverse the impacts of climate change. Only an international agreement that binds the world's major economies to make significant reductions in all of their GHG emissions, not just CO₂, over the coming decades can achieve the EU's stated policy objective of limiting global temperature rise to 2°C. Acting alone has no environmental benefit. To influence others, the EU needs to speak from a position of strength. That demands a strong and prosperous economy based on policies that support economic growth. Policies which impose costs that are not mirrored elsewhere in the world weaken the EU economy. Such policies are not politically sustainable and leave the region isolated.

EURACOAL makes the following recommendations:

- There should be no further targets for GHG emission reductions in the EU without a binding international agreement that includes the world's major economies. Any new EU targets should reflect national circumstances and, in particular, individual member states' commitments at the UN level.

⁵ Emissions per unit of GDP in 2010, PPP constant 2005 US\$: 0.3 kgCO₂e/US\$ in the EU; 1.1 kgCO₂e/US\$ in China (UNEP (2012), *The Emissions Gap Report 2012 – a UNEP Synthesis Report*, United Nations Environment Programme, Kenya, November, Figure 2.7).

- Future international agreements should be formulated around targets to reduce carbon “consumption” (embodied emissions in the goods that are consumed), not carbon “production” (direct emissions from the production of goods).
- Include coal – the most affordable, the most abundant and the most accessible fuel – in EU energy policy. Coal-fired power plants are every bit as flexible as gas-fired power plants and can provide the necessary back-up to intermittent renewables to ensure 24/7 electricity supply which is indispensable for modern societies.
- The EU should embark on a major push for energy efficiency in the electricity generation sector by offering a suitable long-term framework that induces companies to invest in new, more efficient state-of-the-art coal-fired power stations to replace the EU’s oldest ones.
- Demonstrate CCS at a large scale in the power and heavy industrial sectors for both coal and gas. This must be incentivised by member states in the same way as renewables, so that CCS can contribute to emissions reductions alongside other low-carbon options.
- Plan a CCS infrastructure for Europe so that deep cuts in CO₂ emissions can be made across the power and industrial sectors in the long term.
- To safeguard the internal energy market, the EU should amend existing directives to prevent market distortion from the targeted support of particular generation technologies. Any support should be for “low-carbon” technologies with competition between them: support should apply only to the carbon abatement cost, not energy supply cost.

A 2030 framework for climate and energy policies

The post-2020 climate and energy policy debate is an opportunity for the EU to revise its policy so that it better reflects the rapid globalisation trends of the last two decades. The world has changed significantly since the Kyoto Protocol was negotiated and agreed. To continue as if nothing had changed would be to fly in the face of forces that are more powerful than any EU directive.

Priorities for the EU: energy security and economic competitiveness

The EU has given a very high priority to environmental sustainability in its climate and energy policy. Higher priority should now be given to the remaining two pillars of a balanced climate and energy policy, namely security of energy supply and economic competitiveness. Until now, the Commission has put a major emphasis on climate policy which is the only target with concrete numbers and therefore dominates all other aspects. To remedy this, policies should be in place that quantify, measure and influence the security and

competitiveness of energy supply across the EU. This could include goals in terms of energy independence through the use of indigenous energy sources.

National emissions reduction targets, as in the case of Kyoto Protocol, must take into account the different fuel mixes found in member states as well as their ability to pay. A fully functional internal energy market and a carbon market with agreed targets that operates without political interference should lie at the core of EU energy and climate policy. Deployment of mature low-carbon technologies – such as onshore wind turbines – should fit within this simple framework. Support for the early demonstration and deployment of other low-carbon technologies that are currently not commercial – such as nuclear, CCS, offshore wind and solar PV – should be non-discriminatory and competitive so that public money is used cost effectively to bring forward the deployment of all low-carbon technologies.

No post-2020 targets without a new international agreement

Any agreement on GHG reduction targets for 2030 should be conditional on a ratified global agreement that includes the world's major economies. EURACOAL notes that the signing of a UN agreement does not necessarily lead to its enforcement; for example, a number of countries have left the Kyoto Protocol. Hence, the EU must seek strict conditions. This principle of conditionality with respect to new EU targets is deeply enshrined in the current climate and energy package, as well as the EU's decarbonisation ambitions for 2050. It should be a *sine qua non* in the case of 2030 targets.

EURACOAL is deeply concerned that lessons from the past are not reflected in the Green Paper. The EU's strategy during climate negotiations has been to set binding targets prior to any agreement in the hope that other regions and countries would follow with similar actions. This strategy has proven to be flawed – others have not followed the EU's lead. If a strategy fails, then a new strategy is needed. Instead, the Green Paper proposes more of the same: setting ambitious new targets for 2030 in the hope that others will follow. For EURACOAL, this appears reckless. Outside of the EU, those countries who focus on growth and prosperity will overtake the EU, both in terms of wealth and influence. A unilateral policy is not politically sustainable if it does not offer benefits for EU citizens.

A new paradigm: competitiveness, growth and jobs

Today, we face different economic and technological circumstances than were forecast in the 2008 climate and energy package. Progress with CCS and energy storage has not been as fast as predicted, mainly because governments and industry have had to focus on more urgent, existential issues in response to the economic crisis. Conventional power generation capacity will be needed in the system, but EU policy has effectively frozen investment because there are no technologies on the market that fit with the vision expressed in the climate and energy package. The Green Paper fails to recognise that circumstances have changed and some difficult decisions now need to be taken to ensure that Europe invests enough to maintain a reliable energy supply system. There is no proof that the promotion of low-carbon

technologies will move the EU towards a competitive economy with a secure energy system.⁶ Indeed, it might be that jobs and growth are put at risk *precisely because* the EU promotes an expensive energy system.

Renewables: part of the solution, but not the whole solution

Further development of renewable energy sources is presented as a “no-regrets” option, alongside energy efficiency. This unqualified belief in renewables is questioned; to date, it has been costly for consumers because of high capital costs. It is not creating a new world-beating industrial sector: two out of the top three wind turbine manufacturers are Chinese and the situation is similar for solar PV. The need to import technologies, such as offshore wind turbine installation vessels from South Korea and solar PV panels from China, as well as biomass fuels from North America, mean that the renewables revolution is not creating as much employment in the EU as promised. It is driven by subsidies and not by sustainable consumer demand. Indeed, targets for renewable energy interfere with the proper functioning of the internal energy market. Renewables should be subject to more market competition. The EU should move away from national targets and develop renewables projects in those regions of Europe where they are most economic. In the case of solar PV, south is clearly better than north.

In terms of carbon abatement cost (tonnes of avoided CO₂ emissions), renewables are an expensive option compared with many energy efficiency options, including the modernisation and renewal of coal-fired power plants. Targeted support for renewables should be replaced by generic support for all low-carbon technologies.

A strategy for clean coal in the EU

The replacement and modernisation of old coal-fired power stations is the first step to improve energy efficiency, reduce fuel consumption and reduce emissions, by one third or more in the case of CO₂. In planning for tomorrow’s world, we should invest in R&D for the next generation of high-efficiency, low-emissions coal-fired power stations that can complement renewable generation with their flexibility. The final step is the demonstration and deployment of carbon capture and storage, a suite of technologies that will see coal become one of the most competitive low-carbon sources for electricity generation. Coal can help meet the expected 41% increase in EU electricity demand between now and 2050. EURACOAL promotes a pragmatic 3-step strategy:

1. Introduce state-of-the-art technology across the EU coal-fired generation sector to boost efficiency and reduce emissions.
2. Develop the next generation of high-efficiency flexible technologies for coal-fired electricity generation.
3. Demonstrate and deploy CO₂ capture and storage at coal-fired power stations.

⁶ COM(2013) 169 final, p.1.

The Future of Carbon Capture and Storage in Europe

CCS will be needed

The consultation paper lays out a strong and robust case for CCS as a necessary part of the global response to the climate challenge. For the EU, “CCS may have an essential role to play, as a technology that is able to significantly reduce CO₂ emissions from the use of fossil fuels in both the power and industrial sectors.”⁷ What is certain is that EU power plant equipment suppliers need to showcase the potential of CCS with demonstration projects in the EU. Without CCS demonstration in the EU, it will be politically difficult to persuade others to follow the EU’s ambition to make deep cuts in emissions – the EU proposes an 80% cut in domestic GHG emissions in its 2050 Roadmap. However, carbon capture is but one link in the chain. A transport infrastructure and an accepted framework for CO₂ storage are indispensable complements, yet these are beyond the current scope of electricity utilities’ expertise.

CCS and the carbon market

The consultation paper goes on to outline the challenges facing CCS, in particular the reasons why governments have been unable or unwilling to make progress with CCS demonstration. EURACOAL notes that much attention is given to the current state of the EU carbon market. We are bemused at the suggestion that low carbon prices are partly to blame for the lack of progress with CCS demonstration. This is a false prognosis because the ETS will not promote investment in CCS or renewables for the foreseeable future because the market will take less costly steps first: notably fuel switching from coal to gas at a carbon price of around €50/tCO₂ – see Figure 1.

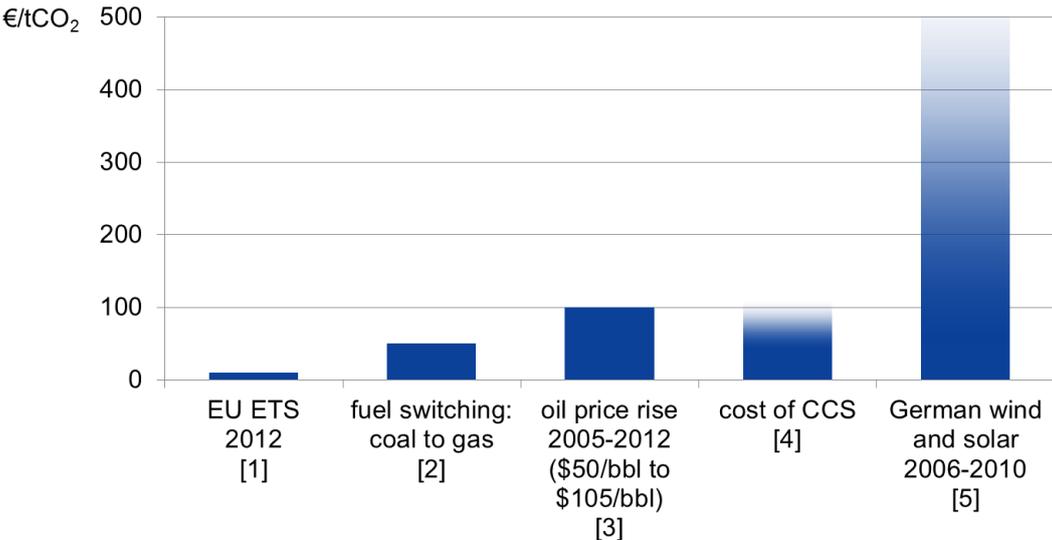


Figure 1 – Carbon prices in the EU

⁷ COM(2013) 180 final, p.11.

Notes:

1. EU ETS allowance prices were below €10/tCO₂ for the whole of 2012.
2. The difference between the spark and dark spreads in the UK has been £20/MWh in favour of coal (gas: 49.13%, 0.411 tCO₂/MWh; coal: 38%, 0.897 tCO₂/MWh; and €1.23/£ gives €50.62/tCO₂).
3. \$(2005)50/bbl = €40.27/bbl, \$(2012)115/bbl = €88.71/bbl. The difference of €48.44/bbl or €355.07/toe equates to a carbon price of €424.01/tC or €115.64/tCO₂, assuming a crude oil CV of 10,000 kcal/kg and an emission factor of 20 tC/TJ (*i.e.* a carbon content of 83.74%).
4. ZEP targets the commercial viability of CCS after 2020 at c. €40/tCO₂, but with none of the promised 10-12 demonstration projects yet built in the EU, costs are uncertain and could be higher.
5. The estimated CO₂ abatement costs of wind and solar energy in Germany for the years 2006-2010 are on average €44/tCO₂ and €537/tCO₂ respectively.⁸

The side effect of a high carbon price would be greater revenues in the NER300 fund. Whilst such hypothecation has a certain temptation, it is not sound policy because it confuses two policy imperatives. The ETS is designed to achieve (and will achieve) a politically agreed CO₂ reduction target at least cost, whereas the NER300 aims to fund new and innovative low-carbon technologies including CCS. One imperative aims to reduce GHG emissions in a “cost-effective and economically efficient manner”, (*i.e.* a low carbon price) whereas the other aims for a large fund to support many projects (*i.e.* a high carbon price). To resolve these conflicting aims, EURACOAL proposes that the EU looks to alternative ways to fund CCS demonstration.

In this respect, EURACOAL fully agrees with the final paragraph of the communication’s main text:

Furthermore national governments also have a role to play in demonstration. Member States could for instance set up systems that ensure a minimum return on any CCS investment made, similar to feed-in tariffs often employed to ensure demonstration and penetration of renewable technologies. If designed in a flexible manner, to avoid windfall profits, and if limited to demonstration only, such schemes could prove effective, and have no undue negative impact on the functioning of the ETS or the internal market.

Other CCS support options

The communication explores other possible options to promote CCS that are not supported by EURACOAL.

- **Mandatory CCS certificate scheme** – incompatible with a competitive internal energy market. The EU should examine how a low-carbon certificate scheme could operate across Europe.
- **Emission performance standards** – in direct conflict with the ETS. If standards are not fuel-specific, then they would tantamount outlaw coal in the EU. This would put

⁸ Marcantonini, C. and A. D. Ellerman (2013), “The Cost of Abating CO₂ Emissions by Renewable Energy Incentives in Germany”, Robert Schuman Centre for Advanced Studies – Climate Policy Research Unit report no. 2013/05, European University Institute, Florence, Italy, February.

energy security at risk, allow gas suppliers to raise prices without fear of competition and leave consumers paying higher prices.

The Commission needs to rationalise support for low-carbon technologies of all types. Creating more policy levers and more bureaucracy is not the way forward. Simplifying measures and eliminating those that are economically irrational is a better approach.

An “infrastructure first” approach to CCS

Governments have an important role in planning and promoting a CCS infrastructure. Water, sewerage, electricity, gas, telecoms, roads, railways, ports and airports do not happen by chance – they are planned and promoted with government support, and built in partnership with the private sector. Likewise for CCS pipelines and storage. These will become just another vital utility that must be part of national strategic development plans.

Annex I – Responses to questions raised in the Green Paper

4.1. General

- Which lessons from the 2020 framework and the present state of the EU energy system are most important when designing policies for 2030?

The 2020 framework has three targets which are in essence complementary: a 20% reduction in GHG emissions from a 1990 baseline; 20% renewables in primary energy supply; and a 20% reduction in energy consumption compared with a business-as-usual forecast for 2020. However, although these targets are complementary, the policies that have flowed from them are not. The EU emissions trading scheme,⁹ the promotion of renewable energy sources,¹⁰ and the requirements for energy efficiency¹¹ mean that the EU now has a plethora of legislation which cuts against the grain of a well-functioning internal energy market.¹² New ideas and proposals are in the pipeline that would further weaken the internal market: capacity payments, priority infrastructure, CCS certificates, *etc.* The most important lesson to be learnt is that multiple targets with multiple measures to achieve them are not compatible with a single market. The EU should focus on realistic measure to achieve its objectives of reduced emissions, energy efficiency and the deployment of a suite of low-carbon technologies, all at an affordable cost, whilst at the same time guaranteeing energy security.

⁹ Directive 2009/29/EC of the European Parliament and of the Council of 23 April 2009 amending Directive 2003/87/EC so as to improve and extend the greenhouse gas emission allowance trading scheme of the Community.

¹⁰ Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC.

¹¹ Directive 2012/27/EU of the European Parliament and of the Council of 25 October 2012 on energy efficiency, amending Directives 2009/125/EC and 2010/30/EU and repealing Directives 2004/8/EC and 2006/32/EC.

¹² Directive 2009/72/EC of the European Parliament and of the Council of 13 July 2009 concerning common rules for the internal market in electricity and repealing Directive 2003/54/EC.

4.2. Targets

- Which targets for 2030 would be most effective in driving the objectives of climate and energy policy? At what level should they apply (EU, Member States, or sectoral), and to what extent should they be legally binding?

National emission reduction targets are the only ones that make sense and they should be legally binding within the context of an international agreement. Any other emissions targets would fail to achieve the objective of climate protection. Other targets should be considered for energy security and energy poverty, using agreed metrics. Finally, energy prices in the EU must be internationally competitive. If they are not, then climate and energy policy will not be supported by consumers.

- Have there been inconsistencies in the current 2020 targets and if so how can the coherence of potential 2030 targets be better ensured?

There are inconsistencies with the current 20-20-20 targets: they interfere with the functioning of the internal energy market and they do not directly address all the three pillars of a sustainable energy policy. The GHG reduction target of 20% goes far beyond the commitments of other parties to the UNFCCC. For the ETS sector, this target became a 30% reduction (by 2020 compared with a 1990 baseline). It is not clear what policy objective is achieved with the 20% renewables target. It helps reduce emissions, but at a high cost per tonne of CO₂ abated. It increases indigenous energy production, but at a high cost to consumers. It has stimulated a new equipment supply sector, but one that is now moving away from the EU to regions where costs are lower. Finally, the target to reduce energy consumption by 20% does not appear to address any policy objective. Energy is required for economic growth: people can do more when energy is available. Policy makers claim a disconnect between economic growth and energy consumption. In fact, the EU has shifted away from industrial production, so emits less, but still consumes the products of industry outside the EU. The aim should be to use energy as efficiently as possible so that citizens are more productive and more comfortable, but not to limit energy consumption *per se*.

For 2030, there should be only one single target: a GHG reduction target that is consistent with the international commitments of EU member states and part of a binding international agreement.

- Are targets for sub-sectors such as transport, agriculture, industry appropriate and, if so, which ones? For example, is a renewables target necessary for transport, given the targets for CO₂ reductions for passenger cars and light commercial vehicles?

No, separate targets are not appropriate since they fail to seek out the most cost-effective reductions and would result in expensive distortions. The EU should aim to extend emissions trading so that it is economy-wide and hence manage emissions at least cost.

- How can targets reflect better the economic viability and the changing degree of maturity of technologies in the 2030 framework?

It is true that renewable energy sources have been treated as a special type of low-carbon technology and received generous public support. From an economic standpoint, it makes no sense to continue this support because many renewable technologies are mature and there are cheaper options available to reduce emissions. For example, upstream energy efficiency improvements at power plants would have a far greater return in terms of cost per tonne of CO₂ abated. Looking ahead, CCS will need pulling into the market, so the 2030 framework offers an opportunity to design a rational support measure for all low-carbon technologies. The objective of reducing GHG emissions could then be met with a number of competing technologies to ensure that consumers do not have to pay any more than is necessary: a good deal for consumers.

- How should progress be assessed for other aspects of EU energy policy, such as security of supply, which may not be captured by the headline targets?

The question of energy security looms large for the EU given its heavy dependence on energy imports, with no import diversity in some member states. It is true that energy security is not prioritised in any of the headline targets and yet without secure energy, civil society quickly collapses. The EU should continue to promote a European-wide energy market so that energy flows to those most willing to pay. In times of crisis, this willingness to pay can quickly resolve shortages by freeing up energy from consumers whose needs are discretionary and are less willing to pay a premium. In the longer term, a diversified, market-based energy mix, including indigenous and imported sources, is the best approach to ensure security. However, the market extends beyond EU borders and the Commission must be open to competition from outside the EU. This will raise difficulties at the EU borders because energy suppliers from outside the EU are not – in most cases – required to meet the requirements of EU legislation. More effort needs to be put into creating a level playing field for EU and non-EU energy suppliers.

4.3. Instruments

- Are changes necessary to other policy instruments and how they interact with one another, including between the EU and national levels?

The fragmented support for renewables needs to be addressed because it results in inefficient use of scarce capital. In a well-functioning internal market, renewables investment would go to regions with the best resources, but this has not been the case. Investment has been attracted to those member states with the most generous subsidies. Worse still, biomass and biofuels are being shipped around the world in search of the best subsidies. It makes no sense to reduce emissions in one member state if the same could be achieved more cheaply in another member state or a third country outside the EU. More effort needs to be put into developing a rational support measure for all low-carbon technologies to avoid such distortions.

- How should specific measures at the EU and national level best be defined to optimise cost-efficiency of meeting climate and energy objectives?

The EU emissions trading scheme offers an appropriate approach to meeting EU climate and energy objectives in the most cost-effective manner. Unfortunately, it is criticised because the outturn has been lower carbon prices than many expected. EURACOAL finds such criticism curious because it is surely a good outcome. The aim is to meet climate and energy objectives at the lowest possible cost, not to strangle the EU with high carbon prices.

- How can fragmentation of the internal energy market best be avoided particularly in relation to the need to encourage and mobilise investment?

Each member state is free to choose its own energy mix and exploit its own natural resources. This reflects the wide differences in energy resources, production and supply across the EU. These differences are not going to disappear, and there is no need to make them disappear. Diversity in energy supply is a strength for EU member states and should be retained. The fragmentation of the market arises most notably from the different support given to particular renewable energy sources. A more rational and that means also a more common approach to such public support would be desirable.

- Which measures could be envisaged to make further energy savings most cost effectively?

Energy prices are the most cost-effective way to drive energy savings. Other measures distort markets and result in unexpected and sometimes perverse outcomes.

- How can EU research and innovation policies best support the achievement of the 2030 framework?

The SET-Plan provides a well-considered framework for research and innovation in the field of energy. A broad approach is required that does not rule out any future options and fits with a competitive Europe. If efforts are focused only on renewable technologies – as called for by some – then the EU risks being left behind other regions where fossil fuels will continue to be exploited at low cost. A balanced approach to research and innovation is needed, one that recognises the global nature of the market for energy technologies, which includes fossil, nuclear and renewable technologies. Putting all our eggs in one basket would be foolhardy and leave the EU isolated in the world. In his last state of the union address, President Obama called for “*an all-of-the-above strategy for the 21st century that develops every source of American-made energy*”. If the EU tries to pick winners by narrowing its R&D effort, then others will likely gain a competitive advantage since all energy sources and technologies will be needed to meet future global energy demand.

4.4. Competitiveness and security of supply

- Which elements of the framework for climate and energy policies could be strengthened to better promote job creation, growth and competitiveness?

A 1,000 MW power plant has a turnover of around €7 billion over its nominal design life.¹³ It is instructive to examine where this cash flows to for different generation options. In the case of coal, the cash flow covers fuel costs (c.67%) and capital costs (c.33%). If the fuel comes from a local mine then wealth is created by the mining company and by the many companies who supply equipment and services to the mine. Similarly, the power plant itself creates supply chain jobs both during its construction and operation. In the case of gas, fuel costs are c.75% and capital costs c.25%. So the major part of the cash flow is used to pay for fuel which in many cases is 100% imported from outside the EU. There is a big economic difference: for coal, jobs and wealth are created within the EU; for gas, they are created mainly outside the EU. EURACOAL is pleased that the Green Paper refers to the need to exploit indigenous energy resources, but is confused as to why there is no mention of coal or lignite which account for 88% of the EU's fossil energy reserves.¹⁴ Quality jobs, real growth and sustainable competitiveness come through the exploitation of the EU's coal resources. Climate and energy policies should reflect the need to retain wealth and employment within the EU for the benefit of EU citizens.

- What evidence is there for carbon leakage under the current framework and can this be quantified? How could this problem be addressed in the 2030 framework?

Top down analysis suggests that the EU's carbon footprint has increased by 47% between 1990 and 2006.⁴ This is hard evidence of carbon leakage: EU consumers are responsible for a significant increase in carbon emissions, whilst the EU's direct GHG emissions declined by 8% over the same period. The EU is producing less but consuming more. The 2030 framework needs to reflect the EU's emissions measured on a consumption basis and not persist with a flawed policy that simply addresses direct emissions on a production basis and thus destroys jobs in the EU.

- What are the specific drivers in observed trends in energy costs and to what extent can the EU influence them?

Oil prices have quadrupled since 2004 and this has had an economic impact that is still being felt today. Gas prices have tracked oil prices upwards. Coal prices peaked in 2008 and have since fallen. Although coal prices remain at historically high levels, coal remains the cheapest fossil fuel by a wide margin: one quarter the price of oil and less than half the price of gas on an energy basis.

¹³ Assuming a load factor of 80%, a 1,000 MW unit generates 7 TWh annually or 140 TWh over 20 years. At a wholesale electricity price of €50/MWh, the income from electricity sales is around €7 billion.

¹⁴ BGR (2012), *Energy Study 2012 Reserves, Resources and Availability of Energy Resources*, Bundesanstalt für Geowissenschaften und Rohstoffe, DERA Rohstoffinformationen 15, December 2012, Table 2.

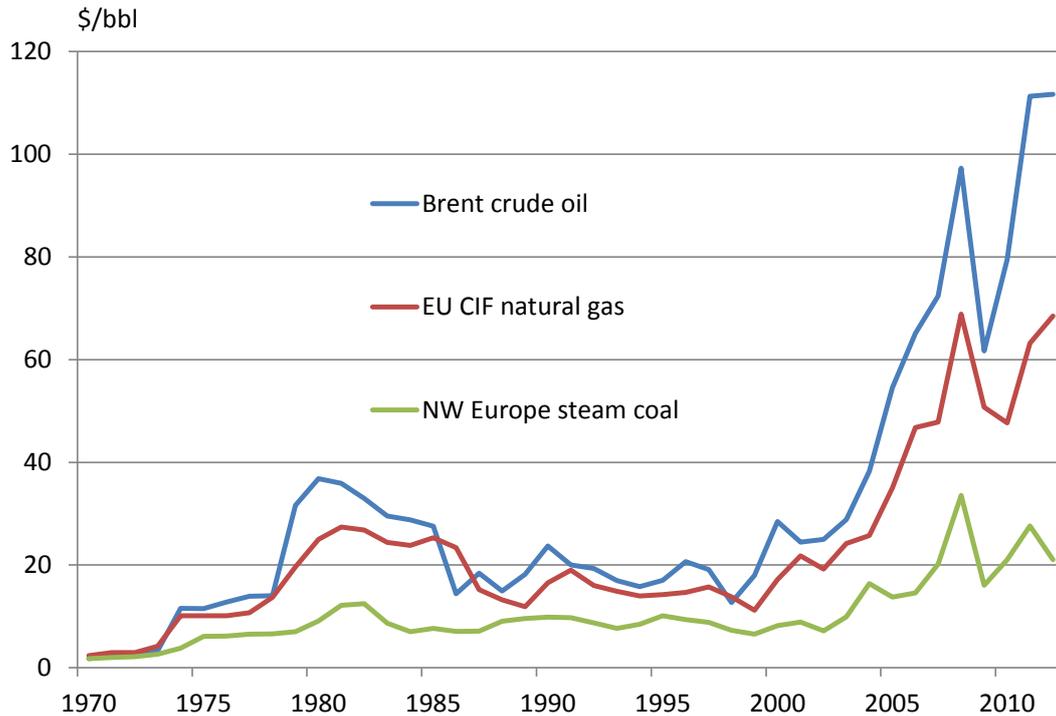


Figure 2 – Oil, gas and coal prices since 1970 – compared on an energy basis
sources: BP, World Bank and McCloskey Coal Information Service

The growth in energy demand from developing nations has driven energy prices higher; energy supply growth has come from more expensive locations. The EU can exploit its own indigenous energy resources to provide a cushion against the vagaries of the international energy market. However, energy commodities are freely traded and EU consumers cannot be protected from high international prices. The EU cannot influence international prices, but it can work to ensure a fair market with competition by diversifying its sources of energy supply and making best use of its indigenous resources.

- How should uncertainty about efforts and the level of commitments that other developed countries and economically important developing nations will make in the on-going international negotiations be taken into account?

EU climate and energy policy should be based on rational economic decisions. The priority should be to strengthen the economy so that the EU has a strong and powerful position on the world stage. If EU climate and energy policy is seen to be strangling industrial activity and leading to job losses, then the EU will carry no influence in international negotiations. Marrying economic growth with reduced emissions was never going to be easy. The EU has reduced its own direct emissions, but not its carbon footprint which has grown by around one half since 1990. Not until this dichotomy is addressed will the EU be able to carry any real influence with developed and developing nations outside the EU. A new international agreement should remove uncertainty – the EU should not promise to act in isolation in the absence of any binding agreement.

- How to increase regulatory certainty for business while building in flexibility to adapt to changing circumstances (e.g. progress in international climate negotiations and changes in energy markets)?

Energy-sector investments are for the long term and therefore investors seek to reduce risks. Correcting mistakes is almost impossible and has led to massive write downs in the past. Successful investments provide stable revenues and profits for decades. Today, the regulatory risk for energy-sector investment is very high in the EU. In some member states, it is virtually impossible to contemplate any new investment in coal-fired power plants, despite the need for new, more efficient plants across much of the EU. Ideally, the EU would agree a long-term strategy around the EU ETS and let the market deliver the agreed outcome. However, political horizons have become shorter and investors are faced with the shifting sands of EU directives and regulations. Even the ETS has been subject to short-term political interference on the grounds that it needs to be “fixed” to boost carbon prices. None of this makes investment any easier. Guaranteed rates over long periods have attracted investment in the renewable electricity sector. If such support were to be stopped, then other low-carbon technologies could compete on a level playing field under the ETS. However, the reality is that investors will always seek state-backed guarantees for the large investments needed in energy infrastructure. To bring forward new nuclear and new coal will likely require some form of guarantees from governments. Finally, new technologies will need RD&D support, at least until they are proven at scale.

- How can the EU increase the innovation capacity of manufacturing industry? Is there a role for the revenues from the auctioning of allowances?

Hypothecation of ETS auctioning revenues gives an uncertain income stream, so is not good policy: either too much or too little money is raised for a desired outcome. Pre-commercial R&D should be supported by the EU and member state governments: the SET-Plan provides a good framework. Industry’s capacity to innovate should be the natural result of market demand. R&D should aim at developing products that will be commercially competitive in an international market place. If the EU creates an isolated energy market, then products for that market will have little or no relevance elsewhere in the world.

- How can the EU best exploit the development of indigenous conventional and unconventional energy sources within the EU to contribute to reduced energy prices and import dependency?

Although 88% of EU fossil energy reserves are in the form of coal and lignite, the Green Paper makes no mention of coal. The exploitation of indigenous coal contributes to EU energy security and can continue to do so in the future. The development of new mines is a long-term commitment. The EU – member states and the Commission – should not turn a blind eye towards coal. Resources should be identified and ranked in national exploitation plans. The exploitation of coal should be included in national energy strategies on the basis that fossil fuels will be needed in the future to ensure 24/7 electricity supply and this can only be provided at a competitive price if there is true competition between gas and coal. Both

coal- and gas-fired power plants offer the flexibility needed to balance intermittent renewable generation, with coal-fired plants having the advantages that efficiency can be maintained at part load and that substantial stocks of coal can be held on site in reserve. In fact, a stock of coal – either mined coal sitting next to a power plant or ready-to-be-mined coal in a nearby coal or lignite mine – is the cheapest virtual store of electricity.

- How can the EU best improve security of energy supply internally by ensuring the full and effective functioning of the internal energy market (e.g. through the development of necessary interconnections), and externally by diversifying energy supply routes?

Gas pipelines from new sources of supply are major investments that appear to be proceeding with the backing of the companies who will profit. Coal supply comes from a well-functioning international market with virtually no involvement of EU governments. In principle, electricity and gas interconnectors should be built in response to arbitrage opportunities. There may be specific instances when an interconnector is deemed necessary, even though it is not commercial, perhaps for security reasons. To ensure that potential investors can respond to price signals, governments should work to complete the internal energy market and remove any remaining price controls. Finally, the internal energy market should not stop at EU borders. There are neighbouring countries who will wish to trade energy with the EU and this needs to be encouraged on a level playing field.

4.5. Capacity and distributional aspects

- How should the new framework ensure an equitable distribution of effort among Member States? What concrete steps can be taken to reflect their different abilities to implement climate and energy measures?

The effort sharing agreement was difficult to negotiate, but resulted in emission reduction targets for member states that reflect their different situations – dictated by history and access to natural resources. There are inconsistencies and these will continue in the future, in the same way that there are inconsistencies between parties to the Kyoto Protocol. Any negotiation includes compromises and a future international agreement will be no different. An international agreement should be the basis of future EU targets so that effort sharing remains equitable. The most equitable targets are those based on *per capita* emission allowances, but the world is a long way from such an ideal.³

- What mechanisms can be envisaged to promote cooperation and a fair effort sharing between Member States whilst seeking the most cost-effective delivery of new climate and energy objectives?

The ETS is the most appropriate mechanism for the cost-effective delivery of all objectives on emission reductions. However, with a fully functioning internal energy market, the effort sharing needs to reflect cross-border energy flows. In particular, member states should be obliged to construct new and replacement power generation capacity and not to simply rely on power from neighbouring member states.

- Are new financing instruments or arrangements required to support the new 2030 framework?

There needs to be a common framework for the support of low-carbon technologies of all types. Without this, the internal energy market will fall apart under the strain of a multitude of national support measures which leave little room for competition between different energy sources. The ETS offers the starting point and should be allowed to function as a market mechanism that gradually tightens the supply of emission allowances, in line with the EU's international commitments. The EIB should lend based on a project's contribution to economic growth and energy security, with targets for a balanced portfolio of projects across the EU which includes new coal mines, more efficient power plants and CCS.

Annex II – Responses to questions raised in CCS communication

- 1) Should Member States that currently have a high share of coal and gas in their energy mix as well as in industrial processes, and that have not yet done so, be required to:
 - a. develop a clear roadmap on how to restructure their electricity generation sector towards non-carbon emitting fuels (nuclear or renewables) by 2050,
 - b. develop a national strategy to prepare for the deployment of CCS technology.

There is absolutely no reason why any member state should be required to abandon fossil fuels. To do so would be economic suicide since it would mean using more expensive alternatives, less inter-fuel competition and higher energy prices for consumers. If fossil fuel resources are available and competitive to use, then there is no reason to switch away from them for electricity generation. The resulting carbon emissions can be minimised by deploying the most efficient power generation technologies such as supercritical steam plant. The EU has been only partially successful in adopting such technologies at coal-fired power plants and more should be done to encourage investment in the modernisation and renewal of older plants, particularly in new member states who should not be denied the benefits of cleaner power generation from coal. Ultimately, carbon emissions from the use of all fossil fuels can be virtually eliminated with CCS. It would be incredibly ambitious to lay out a plan for the deployment of CCS over the next four decades, although the French nuclear programme looked decades ahead when it began in 1973. At this stage, it is far more urgent to move ahead quickly with the demonstration of CCS on large power plants in the EU. The 10-12 demonstration projects, promised in 2008, would have put the EU at the forefront in the field of CCS. Instead, the EU lags behind most other regions. Member states should be invited to co-operate on the few CCS projects that are still actively promoted by their developers. The window of opportunity is closing and the Commission has a role in turning opportunity into reality.

- 2) How should the ETS be re-structured, so that it could also provide meaningful incentives for CCS deployment? Should this be complemented by using instruments based on auctioning revenues, similar to NER300?

The ETS is not an appropriate instrument to incentivise CCS at this stage of the technology's deployment. Neither renewables nor nuclear are incentivised by the ETS and require separate

support mechanisms. Likewise, CCS needs to be supported until the time it is commercially viable. The question should be reformulated to ask how the ETS might be re-structured to incentivise low-carbon technologies of all types. That would be the correct question to ask and even then leads to some difficult decisions. If the carbon market alone is allowed to drive fuel mix across the EU, then fuel switching from coal to gas would be an obvious first step since it requires no capital investment in those countries where gas-coal competition exists and less capital investment than the alternatives in those countries where new gas plants would have to be built. A significant switch to gas would lead to a less secure and more costly energy supply because it would increase the EU's energy import dependence for a fuel that is now sold at a premium in Europe.

Renewable energy support schemes provide a model to follow for the support of CCS during its early stages of *deployment*. To raise the necessary money to fund CCS *demonstration* needs a scheme with more certainty than the NER300 has provided. Hypothecation of revenues from one activity to fund another is never good public policy: revenues will usually be too small or too large and rarely in balance with expenditure. The Commission and member states need to take some brave decisions and fund CCS from core budgets, raising finance through general taxation which already includes substantial taxes on fossil fuels. The EU cannot afford to waste any more time developing new schemes such as the NER300 only to find some new problem later on.

- 3) Should the Commission propose other means of support or consider other policy measures to pave the road towards early deployment, by:
- a. support through auctioning recycling or other funding approaches
 - b. an Emission Performance Standard
 - c. a CCS certificate system
 - d. another type of policy measure

Yes, the Commission should propose new means to support CCS. Just as renewable energy sources receive substantial public support, other low-carbon technologies must be incentivised in similar ways to deliver a suite of low-carbon options. Competition between a number of options will drive down prices.

Hypothecation of auctioning revenues has already been shown to be a risky strategy: revenues are unlikely to match necessary expenditures to achieve policy objectives. Too high, and policy objectives are achieved at too high a cost, too low and policy objectives are unlikely to be achieved. In the case of the NER300, revenues have been low because of the depressed state of the EU economy and consequent low carbon price. It would be wrong to continue with this approach in the case of CCS, a new more certain means of funding demonstration projects is needed.

A single, sector-wide emission performance standard carries many risks. If set at a level that can be met by unabated gas, but not unabated coal – as proposed in the UK – then it would simply mean that natural gas would become the default fossil fuel for power generation in the

EU. Gas would have a free ride and gas producers would take unearned economic rents since they would monopolise the supply of energy for power generation in the EU. This would be an unacceptable outcome of an ill-considered emission performance standard. It would not incentivise CCS since fuel switching to gas from coal would be a cheaper option than deploying CCS on either coal or gas. Even then, CCS on gas would still be required to meet the EU's long-term GHG reduction goals – adding to the already higher costs.

A fuel-specific emission performance standard might be considered, but CCS is already covered in the Industrial Emissions Directive, so it appears unnecessary to consider further legislation. Once CCS is proven at a commercial scale and is economically viable, then project developers would need to demonstrate to the authorities responsible for implementing the IED whether or not a new project should include CCS.

The EU rightly promotes a single internal energy market. The biggest distortion to that market today is must-run renewables which are supported with money from outside of the market. It would be wrong to introduce another priority sub-sector since this would further reduce competition. The nuclear sector would call for “nuclear certificates” and it would be hard to avoid an electricity market that was almost entirely comprised of protected sub-sectors.

4) Should energy utilities henceforth be required to install CCS-ready equipment for all new investments (coal and potentially also gas) in order to facilitate the necessary CCS retrofit?

The CCS Directive of 2009 requires developers of fossil fuel power plants to assess if CO₂ capture and storage are technically and economically feasible.¹⁵ If they are, then developers must leave enough space on the installation site for the future retrofit of CCS. These requirements remain a sound approach today and it would be premature to demand CCS retrofit when it is not technically or economically feasible.

5) Should fossil fuel providers contribute to CCS demonstration and deployment through specific measures that ensure additional financing?

No, the need for CCS is a societal need so the burden of demonstrating and deploying CCS should fall on society as a whole, not just on one particular industrial sector.

6) What are the main obstacles to ensuring sufficient demonstration of CCS in the EU?

A lack of public money during times of austerity and a lack of commitment are the main reasons for insufficient progress with CCS demonstration in the EU. A lack of visionary leadership has also hampered the development of CCS. With no leadership, the public remains both ill-informed and sceptical about the need for CCS which means that projects have met with opposition, although there are notable exceptions – in Spain, for example.

¹⁵ Directive 2009/31/EC of the European Parliament and of the Council of 23 April 2009 on the geological storage of carbon dioxide and amending Council Directive 85/337/EEC, European Parliament and Council Directives 2000/60/EC, 2001/80/EC, 2004/35/EC, 2006/12/EC, 2008/1/EC and Regulation (EC) No 1013/2006.

Finally, industrial-scale demonstration of CCS is not possible without having a suitable infrastructure for CO₂ transport and storage in place.

In 2008, the then Executive Director of the International Energy Agency, Mr. Nobuo Tanaka, said that, “deployment of CCS should be a litmus test for the seriousness of environmental negotiators dealing with climate challenge”. In many instances, nations have failed this test because the climate agenda has become hijacked by those interested in pursuing an altogether different development pathway. For them, reducing GHG emissions is not enough. Their alternative development path includes a switch away from fossil and nuclear energy to renewable energy sources. This may one day be economic, but is not today and will not be for many years to come. Moreover, such a switch would create new environmental problems as more land and more natural resources are progressively devoted to energy production. Given that political legitimacy comes from improving the lives of voters, the economic and social consequence of action in response to climate change are as important as the environmental consequences of inaction. CCS offers a way to marry all three pillars of sustainable development: the IEA estimates that the overall costs of tackling climate change without CCS would be 70% higher by 2050.

7) How can public acceptance for CCS be increased?

This has become a “red herring” for policy makers and politicians to hide behind. If climate change is the threat that scientists forecast, then the emissions from fossil fuel use have to be massively reduced since all projections show a continued dependence on oil, gas and coal over the coming decades. Strong political leadership would overcome any public opposition because the greater good is far more important than any individual concerns over, for example, pipeline routes or storage sites. The problem today is that political leaders are not 100% certain about the need to act and without that conviction the natural response is to stall for time. And that is the position we are in today: there will be no action without committed leadership and there will be no committed leadership until the impacts of climate change are tangible.

1 July 2013