European Commission Consultation Response: A 2030 Framework for Climate and Energy Policies

Policy Exchange Submission

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Introduction

1. Policy Exchange is one of the UK's leading think tanks. We are an educational charity whose mission is to develop and promote new policy ideas that will deliver better public services, a stronger society and a more dynamic economy.

2. Our vision is for climate and environment policies that are sustainable - achieving society's environmental goals at least economic and social cost. Scientific evidence shows the natural environment is under considerable pressure from human development. This poses risks to both the variety of nature and human prosperity. Environmental challenges need to be tackled while minimising adverse impacts on living standards. The social and economic needs of the present should be met without compromising the ability of future generations to meet their own needs. A

pluralist approach usually provides the best way to achieve outcomes for society. Well-designed, regulated markets – with competing decision-makers given the freedom to innovate, respond to new information and fail – have been far more successful in achieving benefits for society than private or government monopoly decision-making.

3. Earlier this year we published a research paper on long-term reform of European climate policy and the EU Emissions Trading System, *If the Cap Fits.*[1] In 2011, we published research on the impact of the EU renewable energy target, *2020 Hindsight*.[2]

Specific questions

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?***

Two main elements of the 20-20-20 package stand out as providing important lessons for 2030 and beyond. The first is the perverse role played by the renewable energy target (RET).

The target has a number of design flaws, which lead to detrimental consequences for overall decarbonisation, and other energy policy objectives.

Technology Specific Focus

There are a wide range of ways to reduce carbon emissions on both the demand and supply side. Installing renewables are just one set of low carbon supply side technologies. Setting a binding target in relation to one approach to carbon reduction only, rather than encompassing a wider set of approaches, will tend to result in resources being allocated to less promising and more expensive measures than would otherwise be the case.

Focus on Expensive Technologies

Many renewable generation technologies are very expensive compared to other options for reducing carbon emissions in the current decade. This appears particularly to be the case in the UK, where the strategy for meeting the RET relies heavily on very expensive offshore wind, a technology yet to approach the cost-competitiveness of other approaches to cutting carbon emissions. For

[1] Moore, Simon; *If the Cap Fits*; Policy Exchange; 2013

[2] Moore, Simon; *2020 Hindsight*; Policy Exchange; 2011; http://www.policyexchange.org.uk/publications/category/item/2020-hindsight-does-the-renewable-energy-target-help-the-uk-decarbonise?category_id=24

example, meeting targets for carbon emissions reduction this decade would be much cheaper using onshore wind or gas to replace coal generation – perhaps half as expensive as using offshore wind. Very expensive technologies such as offshore wind should be the focus of efforts to try to reduce their costs, including through limited 'learning by doing' deployment. But they are not ready to be the focus of mass deployed to meet carbon reduction targets.

Short Time Frame

Setting a sharp short-term deadline for achieving the desired deployment of renewables at 2020 has created further problems.

Firstly, without a longer period to reveal more information about the technologies available and their future costs, the government has largely to make policy decisions based on what they know at the beginning of the period, and has limited flexibility to adjust that while remaining on course to meet the objective.

Secondly, the short-term target means that available resources have to be focused on meeting the target in 2020, rather than on supporting the innovation required to meet the decarbonisation target in 2050. In other words, resources are spent on deploying existing expensive technologies rather than innovation, to identify better cheaper future technologies.

Thirdly, such a short time scale reduces many of the possible learning benefits of supporting renewable deployment. One justification for subsidising deployment of expensive renewable generation such as offshore wind is to reduce its costs through learning by doing. But deploying an additional 11 GW of offshore wind in nine years in the UK gives insufficient time for the cycle of learning to operate. Deploying a lot of capacity simultaneously prevents what is learnt following deployment of each set of turbines – and any cost reductions – from being fully exploited in the next phase of deployment. Offshore wind deployment, as part of electricity decarbonisation to meet the 2050 carbon target, will therefore be even more expensive than it needs to be.

The shortage of time makes addressing other problems associated with renewables difficult. Issues of public acceptance of renewable technologies (for example, hostility to onshore wind farms) are unlikely to be eased and may be exacerbated by pressure to rush their rollout. Likewise, the time needed to adjust other policy areas that strongly affect the cost-effectiveness of renewable deployment, such as planning barriers, may not be compatible with the haste to deploy as much capacity as possible as quickly as possible to meet the target. The lack of time to address public concerns raises the cost of meeting the target, as a greater contribution from offshore wind is required.

Inflationary Pressures

Attempting to force through rollout of one set of technologies across all of Europe in a short timescale leads to a huge ramping-up of demand. Countries and companies bid against each other for limited supplies of relevant capacity, skills and equipment, causing prices to escalate and suppliers to receive inflated rents.

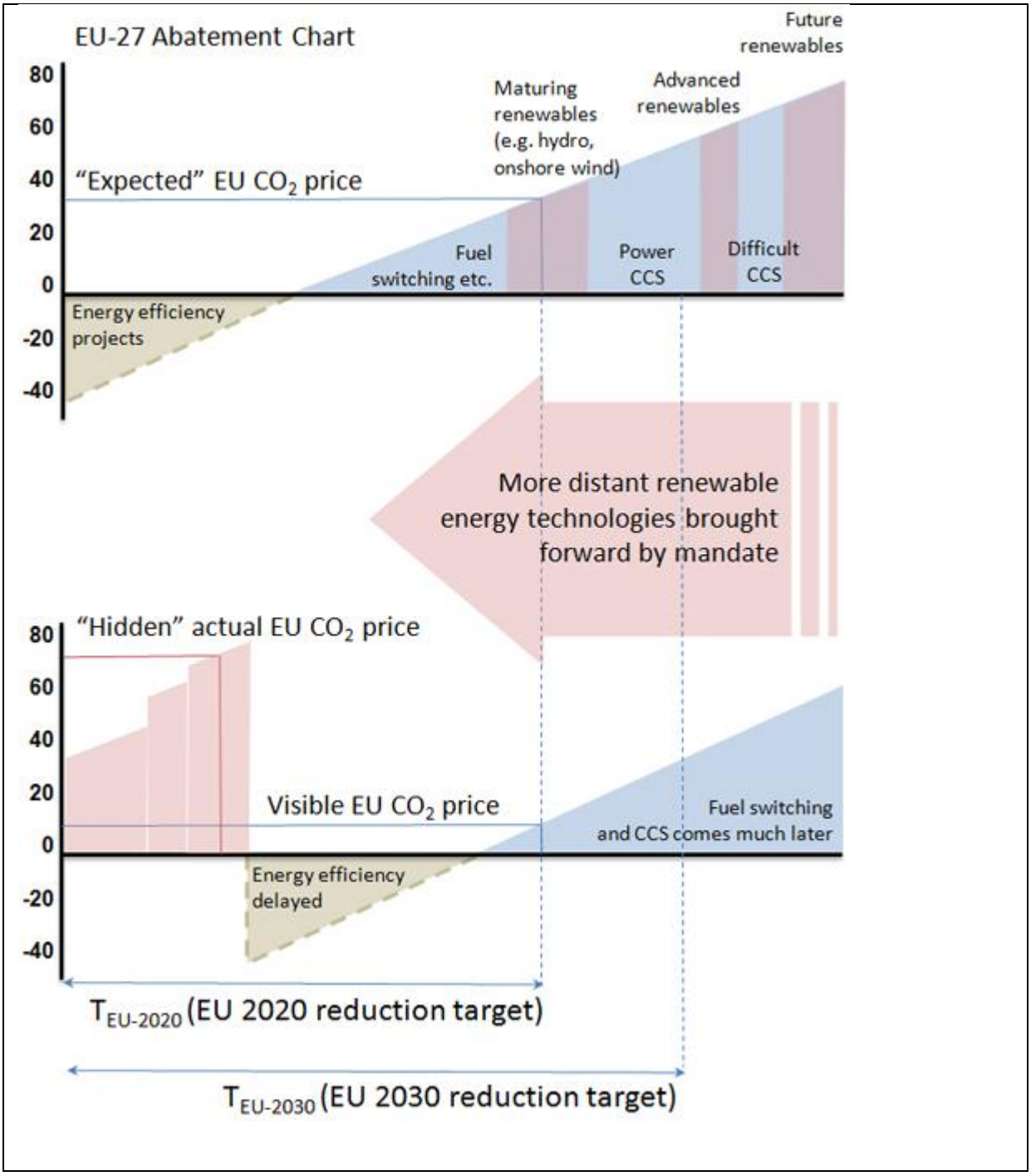
In relation to offshore wind, the availability of specialised ships, steel, manufactured components and skilled workers constitute potential chokepoints which drive up prices and rents. There is also a limited effective number of competing suppliers of offshore wind turbines at present, potentially adding market power to the list of factors driving up prices.

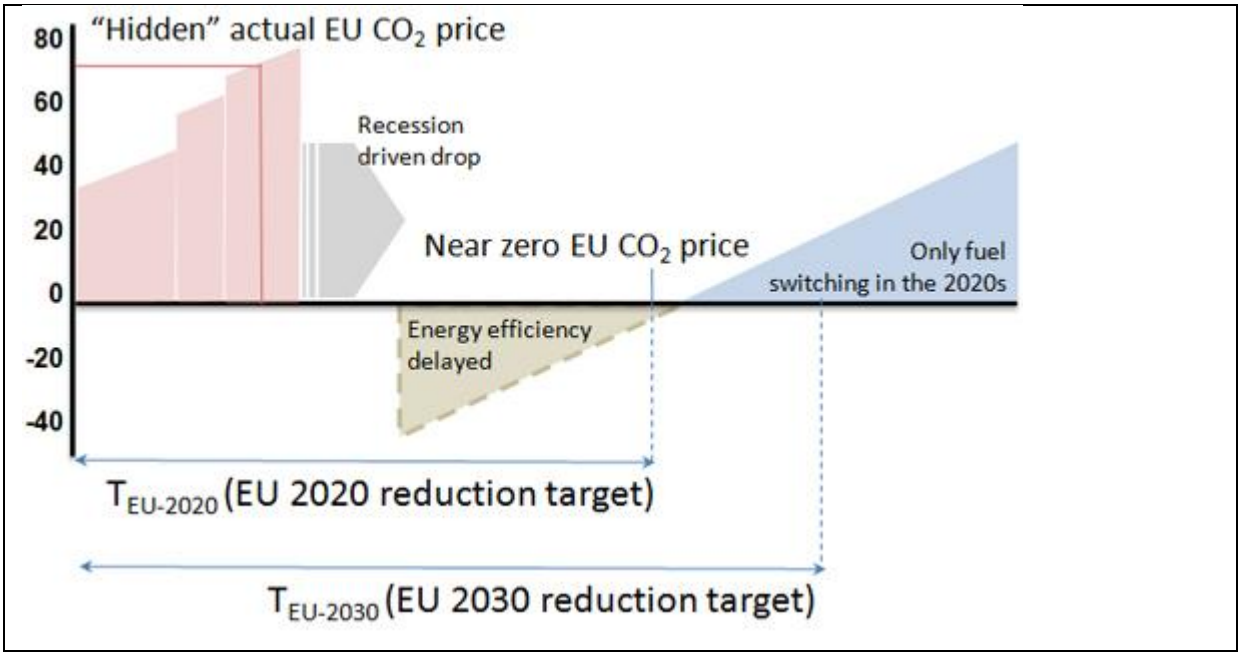
Interaction with the EU ETS

The renewable energy target undermines the EU Emissions Trading Scheme (ETS). Electricity generation is among the industries covered by the ETS. When electricity firms are compelled to buy expensive renewable generation, it means they require fewer carbon permits, reducing the price of carbon permits. The effects of this are shown in the figures below.[3] Bringing forward deployment of renewables by fiat has had the dual effect of lowering the (visible) ETS carbon price, while simultaneously forcing consumers to pay for a much higher 'hidden' carbon price-equivalent in renewable energy subsidy programmes. In such a policy ecosystem, the ETS has become the 'backstop' for other policies (renewable energy targets, national emissions performance standards, etc.), only having an effect if the other policies fail, rather than being the 'backbone' carrying the main weight of decarbonisation. When the effects of the recession is combined with that of the renewable energy target and extensive offsetting, low ETS prices are the consequence. Some non-renewable energy low-cost abatement options (coal-to-gas fuel switching, efficiency) are pushed back in time as more expensive renewables are forced to be deployed before 2020.

Renewable Energy Target and Energy Efficiency Target Reduce Visible Carbon Price while Raising 'Hidden' Carbon Price-Equivalent

[3] Reproduced from Hone, D. (2013, February 1). *Clean Energy in Europe Suffering from Falling CO2 Prices.* Retrieved from The Energy Collective: http://theenergycollective.com/davidhone/179716/carbon-price-in-europe


EU-27 Abatement Chart
Future renewables
Advanced renewables
Maturing renewables (e.g. hydro, onshore wind)
80
60
40
20
0
-20
-40
"Expected" EU CO_2 price
Fuel switching etc.
Power CCS
Difficult CCS
Energy efficiency projects
More distant renewable energy technologies brought forward by mandate
"Hidden" actual EU CO_2 price
Visible EU CO_2 price
Fuel switching and CCS comes much later
Energy efficiency delayed
$T_{EU-2020}$ (EU 2020 reduction target)
$T_{EU-2030}$ (EU 2030 reduction target)



This has the consequence of achieving carbon savings (through renewables) at a much higher cost than necessary. Carbon savings (cheaper than renewables) which would have been made at a higher carbon permit price, are not undertaken at the lower permit price. Therefore, the RET reduces emissions no further by 2020 than would have delivered by the ETS alone — just more expensively.

Huge Costs

The UK's share of the RET requires it to increase renewable energy's share of total primary energy use from 1.3% in 2005 to 15% in 2020, implying roughly 30-35% of electricity coming from renewables. This target is legally binding. Pöyry Consulting found that the UK bears by far the highest cost burden of all EU countries of the target – around a quarter of the cost across the whole EU.[4] The costs of the renewables target are its biggest problem. Put simply, it costs far too much to achieve far too little decarbonisation by focusing so heavily on deploying renewables.

The Impact Assessment of the UK Renewable Energy Strategy assessed the costs of an option that resembles present policy closest at £66 billion NPV, £69 billion in costs offset by modest benefits. A parliamentary written answer from January 2011 provided the following forecast of spending between 2011 and 2020. "The spending is estimated at £32 billion from 2011 to 2020 under the

[4] Pöyry (2008), *Compliance Costs for meeting the 20% renewable energy target in 2020*, http://webarchive.nationalarchives.gov.uk/+/http://www.berr.gov.uk/files/file45238.pdf , p 28 and European Commission (2008), *Proposal for a Directive of the European Parliament and of the Council on the Promotion of the Use of Energy from Renewable Sources*, Brussels, Annex 1

Renewables Obligation; £3.6 billion under small-scale feed-in tariffs; £9.8 billion under the Renewable Heat Incentive; and £8.9 billion under the Renewable Transport Fuels Obligation."[5] Of the total being spent, £35.6 billion is in the electricity sector. DECC figures show renewables policies adding £23/MWh to the price of domestic electricity in 2020, an increase of approximately 20% over their expected baseline, and £22/MWh for non-domestic users, increasing the price by over 25%. The same report shows the total costs of renewables policies levied through electricity bills accounting for £7.4 billion, again in 2020, taken from domestic and non-domestic users combined.[6]

The unnecessarily huge costs are directly a drain on the economy, increasing businesses' costs and reducing household disposable income. They also have a number of knock-on consequences, set out below.

Setting a Poor Example

Expensive EU electricity decarbonisation policies fail to set a compelling example that decarbonisation can be achieved at acceptable economic cost, nor demonstrate a process for decarbonisation which other countries might want to imitate.

Deterred Electrification

The effects of unnecessarily expensive renewable electricity policy are not confined only to decarbonisation of the electricity sector. Together heating and transport constitute the majority of the UK's carbon emissions, and for both of these, switching to electrical power is likely to be an important part of reducing their carbon emissions. This may occur using heat pumps for heating, and battery-powered vehicles. Unnecessarily increasing the price of electricity will tend to deter electrification of heating and transport and make the process of wider decarbonisation more expensive.

Resource Allocation

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[5] Hendry, Charles (2011) *Commons Hansard*, 18 January 2011 Written Answers,

http://services.parliament.uk/hansard/Commons/ByDate/20110118/writtenanswers/part021.html

[6] Department of Energy and Climate Change (2010), *Estimated Impacts of energy and*

climate change policies on energy prices and bills, London,

http://www.decc.gov.uk/assets/decc/what%20we%20do/uk%20energy%20supply/236-impacts-energy-climate-change-policies.pdf pp. 28-29 and DECC (2010), *Updated energy and emissions projections.*

There is a limit to the resources available for addressing climate change. To the extent that resources are allocated to unnecessarily expensive approaches to decarbonisation, fewer resources are available for other approaches and the rate of decarbonisation is reduced.

In particular, allocating resources to mass deployment now of still highly expensive technologies reduces (all other things being equal) the resources available for other supporting innovation. Since innovation and reducing the costs of globally-promising low carbon technologies are critical policies for securing global decarbonisation, wasting resources on deploying expensive renewables domestically risks holding back the overall process of decarbonisation. The 2020 renewables target risks making achievement of the 2050 target of 80% economy-wide decarbonisation, the ultimate intended destination of UK climate policy, more difficult.

Central Planning and Innovation

A final problem with the design of the target, and indeed for any very specific binding target with associated sanctions or reputational consequences, is that the pressure to meet it can lead governments to adopt central planning approaches in order to try to achieve certainty of outcome and timing. Any increased confidence in the ability to precisely meet the target comes at the price of increased costs and less innovation relative to a market-based approach. Paradoxically, these consequences may end up reducing, not increasing the country's ability to meet the target in question.

For example, in the UK, the Renewable Obligation has developed into an instrument which increasingly tries to centrally plan outcomes, in terms of renewable capacity, the mix of renewable technologies and the prices paid for each, driven by the need to deliver the RET.

The 2020 target, and the more centrally planned policy response to it, disrupts the ability of market processes to reveal new information, and hinder low-carbon innovation.

The second lesson from the 2020 package is the importance of setting a sufficiently stringent ETS cap, and the ability to keep it relevant to real-world events.

Setting the cap level is the single most important decision in any cap-and-trade system. The level and duration of the cap determine the environmental effectiveness of the policy, while the cost of carbon abatement is a consequence of the stringency and length of the cap. The current cap has turned out to be a decidedly modest level of ambition. The effects of recession, combined with other weaknesses in design, has left such slack that tens of GW of new coal generation around Europe (8.4 GW in Germany alone) can be seriously considered by their builders, who do not envisage the cap

constraining their profitability. Taking into account the use of offsets, the 2020 cap has effectively been met in 2013, leaving the ETS with no further capacity to lower emissions, only the ability to stop them rising again. It is also out of keeping with the EU's stated long-term climate objectives, as stated in the 2050 Roadmap. The EU has stated, in its 2050 Roadmap, that it hopes to achieve 80-95% reductions in emissions by 2050, in line with its assessment of Europe's 'fair share' of global emissions cut aimed at giving a 50% chance of limiting average global warming to 2°C. The current rate of ETS reduction would not hit that target, leading to a 70% cut by 2050 - some way short of the stated EU ambitions for that date (and that only includes the traded sector, where above average contributions to decarbonisation are expected).

The EU, in its next climate package, should aim for a greater degree of ambition. It should also aim for an ETS that provides a longer-term signal. Wind turbines have expected lifespans shorter than most other generation infrastructure, and are still expected to last 20 years. Nuclear power stations are built for 40 years or more. If it is to provide a durable enough signal to underpin major electricity generation infrastructure investments, a longer-term commitment than the ETS has provided to date would be valuable.

Many countries provide additional support mechanisms for low-carbon generation, not only to meet their portion of the 2020 Renewable Energy Target but also as a response to the weakness of the ETS in providing a long-term carbon signal. In the UK, this includes the Renewables Obligation and the forthcoming Electricity Market Reform programme, which will give generators guaranteed electricity prices far into into the future. Other countries have chosen different methods, such as feed-in tariffs (FITs). All of these programmes have in common a longer commitment of time (and of money) from governments than the ETS cap. Many also imply a much higher cost per tonne of carbon saved than seen in the ETS. This shows that governments are prepared to give longer-term signals when they feel it is necessary and they should apply the same level of ambition to the ETS signal.

The EU should adopt a longer-term carbon cap in Phase IV, that can offer market participants greater clarity about the future position of the carbon cap. It should aim for a cap in keeping with the duration of major energy infrastructure investments, with a minimum of 20 years foresight, at a level in keeping with the EU's climate policy objectives. This would imply, for a cap set in 2015, aiming to set a cap as far out as 2035. A 2035 cap set to reduce emissions in the traded sector by approximately 55% compared to 2005 levels would be in keeping with expressed EU objectives for 2050. If EU leaders are determined to create a target for 2030 instead, this should be set to reduce emissions in the traded sector by 50% compared to 2005 levels

The slack under the current ETS cap has resulted, in significant part, from its inability to adjust to changing economic circumstances. The 'business as usual' case turned out to be highly inaccurate in the wake of the financial crisis. Without any straightforward means of changing course, the ETS risks becoming redundant. This has put its political credibility and policy utility in jeopardy. The current, highly politicised process for intervention has been demonstrably incapable of proving clear signals. While the choice of the ETS as the means of decarbonisation is rightly a political one, reducing the role for political haggling in the operational decisions about the ETS is imperative. An independent agency, with clearly defined rules about when and how it can intervene, provides the best balance between the need to keep the ETS stable and providing longer-term investment signals and ensuring that decisions taken about its directions years earlier are able to keep pace with world events.

A body with advisory powers similar to the UK Committee on Climate Change provides the best balance between independence and political feasibility. Final decisions on cap adjustment would still require European Parliament and member state approval.

The rules governing when and how the new institution would propose changes should be robust. These trigger points for when market intervention will occur should be established *ex ante* to allow market participants to anticipate and plan for changes. The duty of the new institution would be to adjudicate whether the conditions for change have been met, and propose appropriate remedies commensurate to its assessment of the scale of the problem. The review process should operate on a clearly defined timetable. A 2 or 3-year review cycle would best strike the balance between long-term stability and responsiveness to changing circumstances.

Specific price outcomes should not be the motivation behind cap management, but if the proposals in this Chapter to boost the role of the ETS were adopted, they would likely put pressure on the ETS for prices to rise. It should also help reinforce the credibility of the ETS as a whole, if it means price collapses and subsequent calls for the disbanding of the ETS can be avoided. While this would be helpful pre-2020, it must be a core component of any post-2020 settlement, settled alongside the ambition for the cap.

Reorganising institutional arrangements is not be a substitute for political will to tackle carbon emissions in a credible and cost-effective manner. The recommendations of the institution to withdraw or increase the number of permits in the system, as proposed in this Chapter, would need to be approved by MEPs and Member States. These institutional reforms will not fool the market into thinking it is more politically sustainable than politicians allow to be. It will only be useful if it is deemed a credible foundation of the carbon market's long-term reliability.

Establishing such a body would create a clear political commitment to the survival and importance of the ETS. The rules guiding when it can and cannot intervene, as well as the regular schedule of reviews, will improve the message to participants in the market over the current arbitrary and chaotic arrangements. But it will not remove the need for politicians to accept and support a well-functioning market to reduce emissions over the decades to come.

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?***

The EU should focus its attention on setting a single, demanding target for reducing greenhouse gas emissions. It does not need to layer sector-specific or technology-specific targets on top of this – rather, it should allow firms in the market to identify where the cheapest carbon savings can be made and to make them.

It is also worth asking whether 2030 is the appropriate date to aim for when setting another round of targets. At the start of previous phases, the ETS cap horizon has been lengthened – increasing the durability of the signal given by the ETS as part of the process of iterative improvement that characterises the system. If it is to provide a durable enough signal to underpin major electricity generation infrastructure investments, Policy Exchange has argued that a longer-term commitment would be more valuable. Wind turbines have expected lifespans shorter than most other generation infrastructure and are expected to last 20 years. Nuclear power stations are built for 40 years or more. The ETS has never provided that length of signal. Currently, the EU is working on a package of climate and energy targets for 2030. While it arguably makes sense to align setting the ETS cap with that Framework (implying a 10 rather than 8-year Phase IV, we believe the ETS should aim to set a cap level 20 years in advance, in line with investment timetables and government commitments to less cost-effective subsidy programmes.

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

See response to Question 4.1. The EU should avoid setting targets that cover sectors whose emissions are already capped by the ETS. This means, for example, avoiding any further targets for renewable energy deployment or energy efficiency.

• ***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?***

While an EU role is appropriate in setting standards including, emissions limits for transport, a renewables target is completely inappropriate and unnecessary. In principle, at least, expanding the ETS to other sectors has economic appeal. It would enable a more uniform system of carbon pricing across the European economy, in some cases putting an emissions limit on activity which presently has none, and in other cases evening out unequal treatment of emissions from different sources. However, the practicalities of doing this are difficult. Transport fuel could potentially be covered somewhere upstream, but this would sever the direct link between emissions from combustion and the carbon price. Transport fuel is mostly taxed in Europe at a rate carrying a very high implicit carbon price (fuel duty in the UK is equivalent to £220.34/tCO2e for diesel and £254.96/tCO2e for petrol). The question must be posed: would an additional ETS charge make that much difference to behaviour affecting different modes of transport when, for instance, other vehicle duties are already high in many countries. Similarly, it seems unlikely that this would help to promote low-emissions vehicles.[7] Nevertheless, a carbon-capping approach to emissions from these sectors is likely to be a less costly way of achieving environmental objectives than other regulatory alternatives (as the high implicit price per tonne of carbon of UK fuel duty shows).

The EU should continue to investigate ways that carbon pricing could be extended to sectors presently not covered by the ETS. That could entail more detailed investigation of the feasibility of applying a carbon cap to gas or transport fuel networks upstream.

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

A move away from renewable energy targets will help in this area. It may be more appropriate to focus policy effort on clean energy innovation, rather than deployment, avoiding a repeat of the pre-2020 period where deployment of known but expensive technologies was favoured over improving the competitiveness of as-yet uncompetitive technologies at earlier stages in their development.

• *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?*

[7] Fuel duty for petrol and diesel is £0.5795/litre. Carbon content for petrol is 2.3kgCO2/l and for diesel 2.63 kgCO2/l.

4.3. Instruments

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

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

Cost efficiency is best achieved by market processes, enabling the identification of the cheapest means of cutting carbon, which both protects billpayers and enables maximum carbon reductions for the available budget. The ETS is the most appropriate measure for mediating climate objectives and cost.

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

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

Energy savings should compete against other low carbon technologies. Some are cheap, but some are not. The best way of revealing this is a market.

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

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?

The best approach to promoting job creation, growth and competitiveness is to keep the costs of energy and climate policy as low as possible. To ensure that the most cost-effective means of decarbonisation are being promoted, the EU should ensure the primacy of market-based mechanisms, most prominently the ETS, for identifying mitigation opportunities. It should avoid policies which compel Member States to squander resources on deploying unnecessarily expensive technologies, including, but not restricted to, avoiding setting targets for renewable energy, biofuels, or other technology-specific requirements.

• 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?

To date, there little evidence of carbon leakage in practice. There are several reasons for this. Disentangling where movement of economic activity out of Europe has been caused by carbon policy from that motivated by other economic trends, such as the relative costs of labour or the cost of transporting goods, is very difficult. Even in instances where energy costs are the biggest contributor, those cost differentials are not necessarily the result of climate policy, but the result of developments like the US shale gas boom. Implementation of the ETS has also included protections for industry, including the free handout of permits described below, making it difficult to extrapolate what the impacts of a reformed ETS would be.

Arguments about the threat of carbon leakage are central to heavy industrial lobbying against ETS reform and tightening the cap. Governments must be careful about how they respond. Until there is clear evidence of leakage, they should be cautious about implementing generous compensation measures that transfer resources to heavy industry from other parts of the economy.

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

In the electricity sector, the rising costs of gas are currently the most important driver of wholesale price rises. However, costs of RE policy are becoming increasingly important, especially in UK, as larger quantities of more expensive technologies are built and subsidised. While the EU has little influence over gas price trends (though it can help by promoting interconnection and avoiding erecting unnecessary obstacles to shale gas exploitation), the more expensive renewable energy sources are being built in direct response to the EU renewable energy target. Removing this target, and avoiding repeating it in future phases, would remove the biggest contribution the EU is making to rising energy costs.

• ***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?***

When it agreed the 20-20-20 package, the EU made an offer to the international community, that it would increase its ambition to 30% if other countries agreed to sign up to a binding international climate change agreement. In the event that the EU moves unilaterally to 30% this commitment will need to be revisited, and either extended further or abandoned. If, as seems more likely, no global treaty is in place before ETS Phase IV negotiations occur, the framework should include a commitment to review the cap and ensure it is compatible with the outcome of any global 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)?

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

• 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?

The EU must be willing to embrace shale gas as it transitions to a low carbon economy. Using gas, including that produced from shale, can help reduce greenhouse gas emissions, where it displaces more carbon intensive energy sources, and save money, if it displaces more expensive ones.

There are no guarantees that shale in Europe will be cheaply producible, but EU policy should be adaptable to the possibility that it is, and should be positioned to take advantage if it can be produced economically. To the extent that gas displaces coal in the global energy mix, it could constrain greenhouse gas emissions. For example, switching China's use of coal to gas would on its own reduce emissions by more than five times the UK's entire emissions. However, gas could also displace deployment of zero carbon technologies. Gas a transition fuel is only useful if it means that the coal is never burned, rather than just burned later.

To take full advantage of the potential benefits from any low gas price future, and to ensure that the development of gas is consistent with carbon emissions reduction targets, it is even more important that long-term climate policy is enhanced. Primarily, this entails setting out long-term carbon constraints, in the form of a longer-term carbon cap, so that investors can know both how much gas generation capacity they can afford to bring online, and how long they can expect to be able to run it for before it needs to be shut down (or, possibly, converted to CCS).

The direct impact that EU domestic decarbonisation can have on the global climate is limited. The value of actions taken in the EU must primarily be measured against other criteria – whether we are successfully developing and reducing the cost of low carbon technologies of global scalability, and whether we are setting an example in low carbon policy design and implementation compelling enough that other governments will want to follow.

It may not be intuitive how utilising more gas generation in the EU would be compatible with these objectives of leadership and innovation. And indeed, if the only change were to build more gas generation, an opportunity would be lost. But gas generation is currently much cheaper than most mass-deployed renewable generation (most relevantly, hugely expensive offshore wind). Shale gas

developments may lead to this situation continuing into the longer-term. The relative savings in energy costs from utilising gas generation – consistent with meeting a long-term EU carbon cap – could effectively provide a large pot of resources which society could then choose how to deploy. It could be invested in effective low carbon innovation support – research, development and demonstration, and early stage deployment of a range of low carbon technologies with global potential. The global climate impact of such an approach could be far greater than focusing our resources disproportionately on domestically deploying expensive offshore wind (which is just one technology which might, but probably will not, become a major global contributor to carbon reduction). Carbon emissions from electricity, under the EU ETS cap, would be the same under either approach.

Worldwide growth in coal and gas generation makes research of carbon capture and storage (CCS) technologies ever more important. It is clearly a difficult technology to master, though the potential payoff is substantial. The IEA estimates that without CCS, the costs of reducing emissions to 2005 levels by 2050 increase by 70%. Policy Exchange has previously argued that the UK and other EU governments should devote greater resources and political will to CCS research. The size of that commitment should reflect the current shortfall in research development and demonstration (RD&D) investment, which the IEA estimates at between $8 billion and $17 billion per year globally. The EU's continued commitment to a funding CCS demonstration is a welcome start, and opening it to coal and gas entrants reflects the shifting global generation mix. However, with such a large potential contribution to worldwide decarbonisation, CCS RD&D is still under-resourced.

Concerns about risks from shale gas production in relation to water quality, seismic activity and water scarcity need to be taken seriously, but on the basis of current evidence, can be regulated in a way that does not impede a shale industry from developing. The reassurance that effective regulation provides the public - and the avoidance of confidence-destroying incidents - is critical for the development of the shale gas industry and for securing the benefits it offers.

• *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?*

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?*

• *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?*

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

Policy Exchange Environment & Energy Unit

What we stand for

Scientific evidence shows there is an imperative to protect and improve the natural environment and cut greenhouse gas emissions. Environmental degradation poses risks to both wildlife and human prosperity. However, action on addressing environmental problems must minimise any adverse impacts on living standards. **We argue for policy that tackles environmental problems as cost-effectively as possible.** Such a cost-effective – *Greener, Cheaper* -- approach makes it more likely that the environmental problem will be addressed and that it will provide a compelling example for action beyond the UK.

We advocate the use of well-regulated markets, clear pricing signals, simpler policy instruments and targeted use of subsidies to tackle environmental problems. Well-designed markets have been far more successful in achieving benefits for society than private or Government monopoly decision-making. Moreover, tackling environmental problems can strengthen local communities. Civil society has a rich history of protecting and improving the natural environment. This sense of stewardship should be harnessed to both tackle environmental problems and strengthen community ties.

About Policy Exchange

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Policy Exchange is committed to an evidence-based approach to policy development. We work in partnership with academics and other experts and commission major studies involving thorough empirical research of alternative policy outcomes. We believe that the policy experience of other countries offers important lessons for government in the UK. We also believe that government has much to learn from business and the voluntary sector.

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