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Green Paper on a 2030 framework for climate and energy policies

Shell welcomes this opportunity to respond to the Commission consultation on a 2030 framework for climate and energy policies. We have set out our views regarding the questions for your consideration below. Our response is mainly focused on the power, industrial and transport sectors[1] which account for around two-thirds of Europe's greenhouse gas (GHG[2]) emissions.

Background

Shell is one of the largest independent oil and gas companies in terms of market capitalisation, operating cash flow and oil and gas production. Europe is a key region for Shell where we continue to explore for, produce and refine oil and gas into the building blocks of many everyday consumer products. Shell is an energy intensive company exposed to international competition. At the same time, we are developing low emission technologies, such as renewable fuel technologies and carbon capture and storage (CCS).

We believe that in order to catalyse the transformation to a low emissions future it is essential to put a meaningful price on GHG emissions. As such Shell supports the ETS as the central policy tool in the EU's climate and energy framework. We believe that the objective of the EU ETS is to reduce GHG emissions and to send a price signal incentivising investments in low carbon technologies

Overview of Shell position

We believe that a simplified 2030 energy and climate policy framework is essential to underpin the investment needed to deliver substantial progress in innovation and the development, as well as the demonstration and deployment of low emission energy technologies, which are needed if Europe is to meet its aspirations of a decarbonised economy by 2050.

[1] Sector refers to the main sections of the economy such as power, industry and transport. For the avoidance of doubt, the term "sector" does not refer to sub-sectors of the industrial sector such as chemicals or refining.
[2] Greenhouse gas emissions in this document mainly refer to carbon dioxide (CO_2) and the terms are used interchangeably.

A swift agreement on the 2030 policy framework should focus on a single, economy-wide, EU greenhouse gas (GHG) emissions reduction target, the "single CO_2 target", which recognises that different sectors of the economy will require dedicated policy instruments to deliver emission reductions. This overarching target should be proposed by the EU Commission before the end of 2013 to give a clear investment signal. It has the potential to deliver Europe's energy and climate goals in a cost-effective manner, while stimulating innovation and simplifying the policy framework. Conversely, a set of overlapping or misaligned targets run the risk of creating an uneven playing field, increasing energy costs, and weakening the essential price signal for stimulating innovation, investments in efficiency and deployment of low carbon technologies.

For the power and industrial sectors, underneath the single CO_2 target, we believe the most cost-effective policy mechanism to reduce GHG emissions is the EU ETS. This system should be strengthened to enable it to deliver an effective price signal to drive a combination of fuel switching, energy efficiency and deployment of low carbon technologies, such as CCS and renewable electricity. In parallel, measures to support the competitive position of industries at significant risk of carbon leakage should be maintained until there are similar schemes globally. We recognise the need for additional policy and funding mechanisms to support low carbon technologies, most notably renewable technologies, before they reach commercial maturity. As such we support Horizon 2020 (focusing on Research & Develop) and an extension of the current demonstration funding mechanism (focusing on demonstration and pre-commercial stages of technology development the so-called New Entrant Reserve 300).

For road transport, we expect to see a diverse range of fuel and vehicle options, where fuels will include traditional hydrocarbons, biofuels, hydrogen, electricity and natural gas to deliver sustainable mobility. Reducing GHG emissions from road transport will require an integrated approach, involving changes in vehicles, fuels and infrastructure, as well as measures to influence consumer choice and behaviour. For example, in the near term gas can provides an economic abatement solution in commercial road transport, shipping and rail. We believe the most efficient regulatory mechanism for driving GHG reductions in road transport fuels is through an integrated approach which includes fuel standards, rewarding fuels based on their well-to-wheel (WtW) GHG performance.

The early stage development of low carbon fuels, for example advanced biofuels, is costly and such technologies need additional policy support in order to reduce costs and bring them to commercial deployment. Additional support is also needed to bring new technologies to commercial deployment and therefore a fuel standards program should be supplemented by targeted, time-limited programs to support introduction of new, low-carbon fuels.

CCS is critical to mitigating climate change, both globally and in Europe, because it is the only technology that addresses the absolute level (or 'stock') of carbon dioxide (CO_2) in the atmosphere. CCS can permanently store the GHG emissions resulting from the use of fossil fuels not only from power generation but also industrial sectors of the economy such as refineries, steel and cement production. Therefore the need for CCS technology to address the challenges of energy supply and climate change remains high. For CCS to have a material impact however, it will need to be successfully demonstrated in Europe before moving towards wide-scale deployment.

The EU Institutions should agree on a new binding single GHG target for 2030 as soon as possible on the basis of a Commission proposal before the end of 2013. In summary, we suggest the following policy recommendations to be included in the Commission proposal:

- For 2030, there should be a **single, economy-wide, EU greenhouse gas (GHG) emissions reduction target**. The "single CO_2 target" should be achieved through a new policy framework with an approach that reflects the structure and behaviours of different sectors of the economy;
- The most cost-effective way to reduce emissions from the power and industrial sectors is through the EU ETS. **The EU ETS should be strengthened** by permanently removing allowances, or adjusting how the cap declines from year to year through the linear reduction factor. In parallel, it is important to maintain support for energy intensive and trade exposed industries to ensure that European industries are not disproportionately impacted by EU climate policies;
- CCS has the ability to significantly reduce emissions. Without this technology the overall costs of reducing GHG emissions could be far higher, according to the IEA. However, it is a technology that is entirely climate change driven and, as a result, will only progress with policy support. To achieve the EU's future climate ambitions, **funding and supportive policy measures are required for demonstration and early deployment of CCS**. Demonstrating the viability of the full CCS value-chain is critical to overcoming operational, legislative, financial and public perception uncertainties;
- For the road transport sector, advanced biofuels, in combination with improved vehicle efficiency, represent the most realistic solution for decarbonising the transport sector over the next 20 years. In addition to better sustainability and technology characteristics compared with today's biofuels, advanced biofuels offer even more significant GHG reductions and can be used with existing infrastructure and vehicles. Shell believes this can be achieved **under a stable and long-term policy approach which sets a GHG emissions reduction goal for road transport** on a well-to-wheel basis, whereby a range of technologies with reduced GHG emissions intensity are supported and specific sub-targets for advanced biofuels should be set up during the pre-commercial phase in order to bring this technology to commercial deployment;
- For low carbon technologies, including renewables (eg advanced biofuels) and CCS, we support an extension of the current New Entrant Reserve 300 (NER 300) funding mechanism. An extension of this funding mechanism can play a key role to enable the commercialisation of the energy technologies that are required to meet the EU's climate and energy objectives; and, to allow the EU to successfully compete for investments in low carbon industrial projects that contribute to sustainable growth and jobs.
- Diversification of energy supplies including access to indigenous sustainable resources are important factors in driving down energy costs, security of supply and therefore improving EU competitiveness.

Our detailed responses to the questions in the green paper are included below.

Yours sincerely,

Ivan Martin - Head EU Liaison for Shell Companies

1 General

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

We recognise that Europe is on track to meet the 2020 economy-wide greenhouse gas (GHG) emissions reduction target, which will reduce emissions by 20% below 1990 levels. However, we also note that these emission reductions have been achieved by a combination of reduced European output as a result of the economic crisis as well as by the policy instruments adopted. From the 2020 framework, we have learnt that:

- The current triple targets to reduce GHG emissions do not represent a cost-efficient outcome for industry or society as a whole and the real cost of carbon in the economy is hidden and high. The headline targets for renewable energy, GHG emissions reduction and energy savings are not aligned and policies to deliver these targets overlap and in some cases undermine each other. The abatement curves in Figures 1 and 2 show the volume of abatement (tCO_2) at different carbon costs (EURO/tCO_2). Figure 1 shows a scenario where the EU ETS is the leading policy instrument and the 2020 cap on GHG emissions is met through improvements in efficiency, fuel switching and the initial phase of mature renewable energy technologies. However, Figure 2 shows the EU ETS as a residual policy tool whereby the EU ETS cap is met through a more expensive approach which forces the implementation of renewable energy projects first (including the less mature technologies), delays energy efficiency implementation and has the effect of pushing other options for reducing GHG emissions to a later timeframe (Figure 2). This is the current situation in Europe. As a consequence, the visible carbon price from the EU ETS falls, but the hidden carbon price is much higher and it is this which is passed through to consumers. For example, IHS CERA's report[3] on the energy investment imperative states that,"support costs for renewable generation alone will reach at least €50 billion by 2020, an increase of almost 70% over today's €30 billion".
- We have learnt that the policy framework requires a strong and well-functioning EU ETS. The EU ETS should be the leading policy instrument under the single CO_2 target, which catalyses the transition to a low carbon future by incentivising investments in low carbon technologies. Today's surplus of allowances and the resulting low carbon price fails to deliver the necessary price signal. We believe that a permanent retiring of a number of allowances, or amending the cap on emissions through adjusting the linear reduction factor

[3] The energy investment imperative: toward a competitive and consistent policy framework. IHS CERA. 2013.

could restore the original level of ambition of the EU ETS and ensure it is the leading policy instrument at the heart of the EU Climate and Energy Policy.

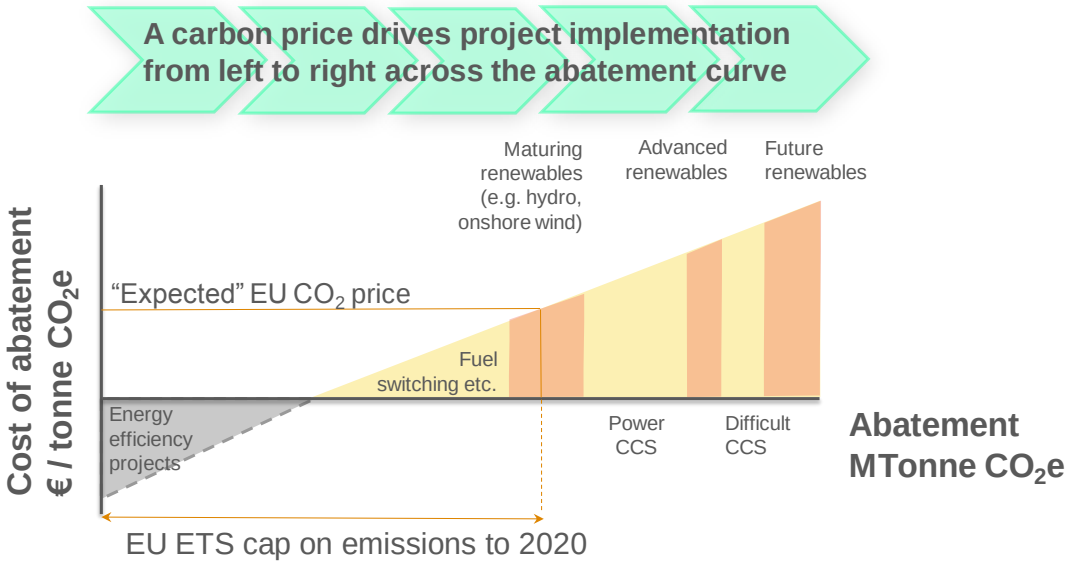

Figure 1: EU ETS is a leading policy instrument. The abatement curve shows that the 2020 cap on emission is met through improvements in energy efficiency, fuel switching and the initial phase in of mature renewable energy technologies from the CO_2 price signal from the EU ETS.

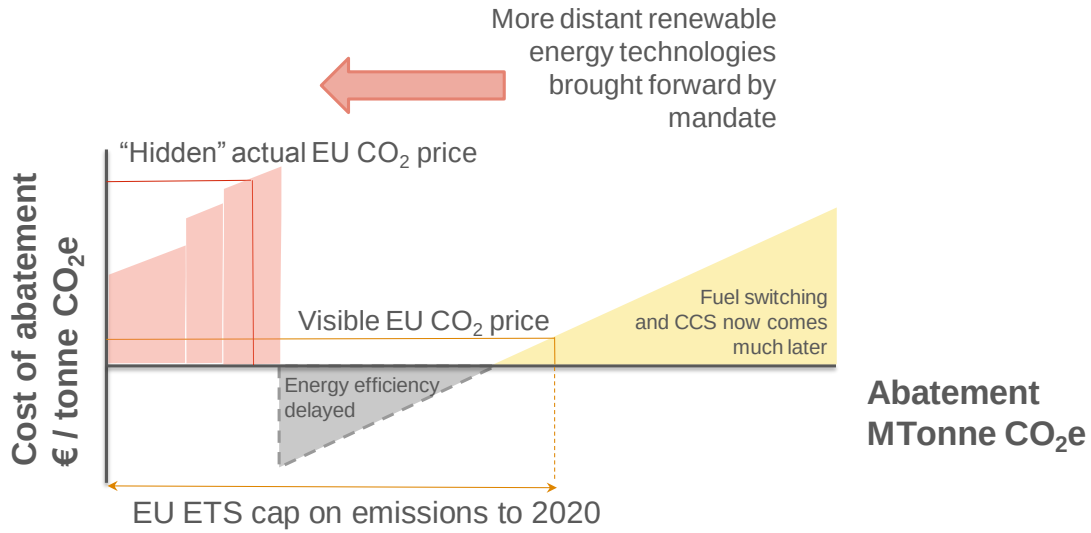

Figure 2: The EU ETS is a residual policy instrument. The 2020 EU ETS cap is met through a more expensive approach with the implementation of renewable energy projects first and delayed energy efficiency implementation. There is a hidden and visible CO_2 price.

- The current package has not successfully delivered the demonstration of CCS. CCS is critical to address climate change, both globally and in Europe, because it is the only technology that tackles the absolute level (or 'stock') of CO_2 in the atmosphere. CCS can permanently store GHG emissions resulting from the use of fossil fuels not only from power generation but also industrial sectors of the economy such as refineries, steel and cement production. Europe has already identified the pivotal role of CCS in its transformation to a low carbon economy because CCS plays a significant role in most scenarios which the 2050 Energy Roadmap outlines. The EU Energy Roadmap to 2050 states that "for all fossil fuels, CCS will have to be applied from around 2030 onwards in the power sector in order to reach decarbonisation targets";
- The current 2020 policy framework is over-constrained. For example, the current construct of the Renewable Energy Directive (RED) and Fuel Quality Directive (FQD) results in overlapping requirements and inconsistencies in implementation, including record keeping and reporting, across Member States. Our preference is for a single policy and a single EU market for compliance (allowing some form of inter-country trading or pooling). We believe this could result in a more efficient, lower cost implementation, as we expect alternative fuels and technologies, such as advanced biofuels, electricity, natural gas and hydrogen, will emerge at different scales in different places.
- The policy instruments in the framework need a degree of flexibility because predicting economic and technology growth is difficult. The EU ETS should be robust to macroeconomic events so that the price of carbon is sufficient to drive the necessary emissions reduction and we support the introduction of a supply-side flexibility mechanism. We believe the most efficient regulatory mechanism for driving CO_2 reductions in road transport fuels is through fuel standards, and note the importance of appropriate compliance mechanism to meet the Directive's targets by addressing potential regulatory or technical barriers.
- Uncertainty in road transport policies to 2020 and beyond is hindering investment in new, low-carbon fuel technologies. The current proposal to review the Renewable and Fuel Quality Directives to tackle indirect Land Use Change (ILUC) and accelerate the development of advanced biofuels should extend the legislative framework beyond 2020. This is critical to secure investor confidence to bring new technologies for advanced biofuel manufacturing to Europe, and also to support the supply chain investments required by obligated parties to comply with the targets. Otherwise, investment decisions would be undermined, against a framework that is set to be reviewed in 2017 and then expires in 2020.

2 . Targets

2.1 Which targets for 2030 would be most effective in driving the objectives of climate and energy policy?

The "single CO_2 target", a binding EU economy-wide GHG emissions reduction target for 2030, should be central to the policy framework with accompanying dedicated sectoral policy instruments to drive the transformation and support emerging energy technologies.

Below we describe how the single CO_2 target would be effective in driving the European Commission's objectives of climate and energy policy, which are (i) competitiveness, (ii) sustainability, and (iii) security of supply.

Competitiveness will be enabled by policy instruments under the single CO_2 target, because:

- The EU ETS has a limit on emissions, the cap, and the ability to trade, which means that emission reduction will occur where it is most cost efficient (see the abatement curve in Figure 1);
- A simplified policy framework to 2030 will enable a cost-effective approach to a low carbon economy with cheaper energy costs compared to energy costs under a more complex policy framework;
- The EU ETS drives energy efficiency, which will enable industry to compete better globally;
- The EU ETS supports sectors at significant risk of carbon leakage such as the EU refining and petrochemical industry, which provides over 1.8 million jobs, contributes over € 240 billion in duties and taxes and provides many of the base materials and products required for the manufacture of renewable technologies. Furthermore, 12% of EU workers (or some 24 million people) are believed to work in the high carbon sector[4]; and
- Underneath the single target, road transport policy can be designed to ensure that fuel suppliers reach their GHG emission goals through the cost-effective routes and support economic development through enabling alternative energies.

Sustainability will be achieved through:

- The cap on emissions under the EU ETS setting a limit on the total amount of emissions and therefore guaranteeing an environmental outcome;
- The price signal from a strengthened EU ETS which will promote investment in energy efficiency, fuel switching, CCS and mature renewable electricity technologies;
- Enabling CCS, which can deliver a decarbonised future whilst enabling sustainable economic growth; and
- Fuel standards for road transport reducing GHG emissions through increased usage of low-carbon, alternative fuels.

Security of energy supplies will be enhanced by the policy instruments under the single CO_2 target, such as:

- The EU ETS, which is technology neutral and ensures competition between low carbon energy sources;
- The GHG emissions intensity goal for road transport which supports a diverse range of technologies; and
- Robust implementation of the third energy package and allowing access to, and development of, sustainable indigenous resources.

[4] Pg 13 of the Commission Staff Working Document. Exploiting the employment potential of green growth. European Commission (April 2012)

2.2 At what level should they apply (EU, Member States, or sectoral), and to what extent should they be legally binding?

We believe that the economy-wide GHG emissions target should be binding and agreed at EU level. Achieving the target can then be cascaded into dedicated policy instruments and implemented through appropriate Member State targets to ensure that emission reductions are achieved throughout all sectors of the economy and to support emerging alternative technologies from discovery to commercial viability along the technology pathway.

We note that there is wide variation in national energy mixes, indigenous resources, security and diversity of supply and progress in developing low emission alternatives across Member States. Furthermore, the ability of governments and consumers to pay for the investments required varies. We therefore support a continuation of the effort sharing principles to ensure an equitable and fair burden of responsibility is conveyed on Member States as currently defined under the Effort Sharing Directive (ESD). The ESD establishes binding annual GHG emission targets for Member States for the period 2013 to 2020. These targets are related to emissions from sectors not included in the EU Emissions Trading System (EU ETS), such as transport (except aviation), buildings, agriculture and waste.

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

Yes, there have been inconsistencies in the current 2020 targets. The current triple headline targets have overlapped, and include a fourth target of economic growth which was too ambitious. For example, as investigated by Climate Strategies[5] and CDC Climat Research[6], part of the emissions reduction required under the EU ETS is being delivered by the renewable energy target and more may be delivered through the Energy Efficiency Directive (EED). Furthermore, it was recognised in the European Commission's roadmap to a low carbon economy[7] that allowances may need to be removed from the EU ETS due to the impact of energy savings as a result of the implementation of the EED.

Inconsistencies between the headline targets mean that the real cost of carbon in the economy is hidden and high. As stated by IHS CERA[8], "the costs of decarbonisation need to be recognised and balanced against the expected benefits". They find that subsidy costs to support the legacy investments made before renewable electricity sources reach cost-competitive levels could peak in 2020–30 at around €45 to €60 billion per year, and that this cost burden is largely placed on the end consumer. We believe that there are substantial benefits from re-focusing the existing targets to ensure technologies are supported at the right phase of their development.

For instance, at current prices of around 3 €/tCO_2 (May 2013), the EU ETS is little more than a short-term compliance accounting system for reporting on GHG emissions. This price indicates that other policies instruments will be doing the heavy lifting, leaving the ETS as a

[5] Strengthening the EU ETS. Creating a stable platform for EU energy sector investment. Climate Strategies.Grubb (2012)
[6] Reforming the EU ETS: give it some work! CDC Climat Research. Berghmans. (February 2013)
[7] A Roadmap for Moving to a Competitive Low Carbon Economy in 2050, European Commission (2011), COM (2011) 112/4, Brussels.
[8] Sound Energy Policy for Europe: Pragmatic Pathways to a Low-Carbon Economy. IHS CERA (2011)

residual policy instrument. When the scheme was designed it was envisaged that the 2020 goal might have been met through improvements in efficiency, fuel switching and the initial phase-in of commercially viable renewable energy technologies all driven by the carbon price. For example, the coal to gas fuel switching which would require average carbon prices to be in the range of €20 to €30/tCO_2 through 2020[9]. Instead, Europe's climate change goals have been met through a much less cost effective approach, which forces the implementation of renewable electricity projects, including the less mature technologies, delays energy efficiency implementation and has the effect of pushing fuel switching to less carbon intensive fuels, as well as CCS into the 2020s and 2030s.

The result of the above is that the visible carbon price from the EU ETS falls, but the hidden carbon price operating in the economy is much higher and impacts economic competitiveness. For example, the average cost to save one tonne of carbon dioxide (tCO_2) under the UK's renewable electricity scheme was £97/tCO_2 in 2011[10] (equivalent to approximately €100/tCO_2), and in Germany this rises to more than 300 €/tCO_2 (Frontier Economics[11]). Furthermore, some European countries have taken action to rectify the shortfalls, and are putting in place measures such as the UK's carbon price floor. Unilateral measures are locally effective but serve to further undermine the European policies and create inefficiencies. The consequence is that populations are already seeing the result of these cost-inefficient policies in higher energy bills.

There is also overlap in the FQD GHG emissions reduction target and the Renewable Energy Directive (RED) transport target. Although the two directives are aligned in some respects, such as biofuel GHG emissions intensity values, there are also areas of misalignment. For example, the double credit mechanism in the RED to support advanced biofuels does not exist under the FQD. This effectively reduces by 50% the carbon performance of advanced biofuels towards the FQD targets, which disincentivises their use compared to alternative options.

The coherence of the 2030 framework can be achieved through agreeing an economy-wide GHG emissions reduction target for 2030 delivered through policy instruments designed to enable action across all sectors of the economy. In addition, targeted support underneath the single headline target to support energy technologies before they are commercially viable is required and the whole policy framework tested for alignment and to ensure progress towards a low carbon economy can be achieved.

2.4 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 CO_2 reductions for passenger cars and light commercial vehicles?

For sectors covered by the EU ETS there is no requirement for targets for sub-sectors. However the overall policy framework should be supportive of low carbon technologies, including renewable energies and CCS, at the pre-commercial stages of development.

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[9] The New Deal: An Enlightened Industrial Policy for the EU Through Structural EU ETS Reform The Centre for Clean April Policy. (May 2013)

[10] Renewables Obligation Annual Report 2011-2012. Ofgem (2013)

[11] Lessons learnt from the current energy and climate framework: a report prepared for Business Europe. Frontier Economics. May 2013

For example, the introduction of low carbon technologies in the road transport sector requires a much higher price signal than in the industrial and power sectors. Therefore a sectoral approach is required, with a specific policy framework, which allows the EU to decarbonise the road transport sector in parallel to the stationary sector. Relying on the ETS to decarbonise transport, would mean deferring change in this sector.

In general, the commercial deployment of alternative fuels requires a collaborative approach between governments, vehicle manufacturers and fuel suppliers to enable economic build up of demand followed by the supply of alternative fuels. To avoid fragmentation throughout Europe, and taking into account the cross-border nature of transport, refuelling standards such as refuelling hardware (connectors), refuelling procedures and labelling of fuels.

Additional support is needed to bring new technologies to market in the road transport sector, and therefore a fuel standards program should be supplemented by targeted, time-limited schemes to support introduction of new, low-carbon fuels. For example, the development of advanced biofuels would require a combination of targets and funding to enable investment in the construction of the first industrial demonstration plants for the production of advanced biofuels. The EU funding scheme for demonstration (NER 300) should continue to play a role in helping bring to commercial deployment innovative and emerging low carbon technologies (such as advanced biofuels) needed to meet the EU climate and energy aspirations. Policy support should be transitional, restricted to the demonstration phase and delivered against verified performance.

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

The single CO_2 target should set the overall environmental outcome for the 2030 framework and the underlying policy instruments for each stage along the innovation chain should take into account the changing degree of technological maturity.

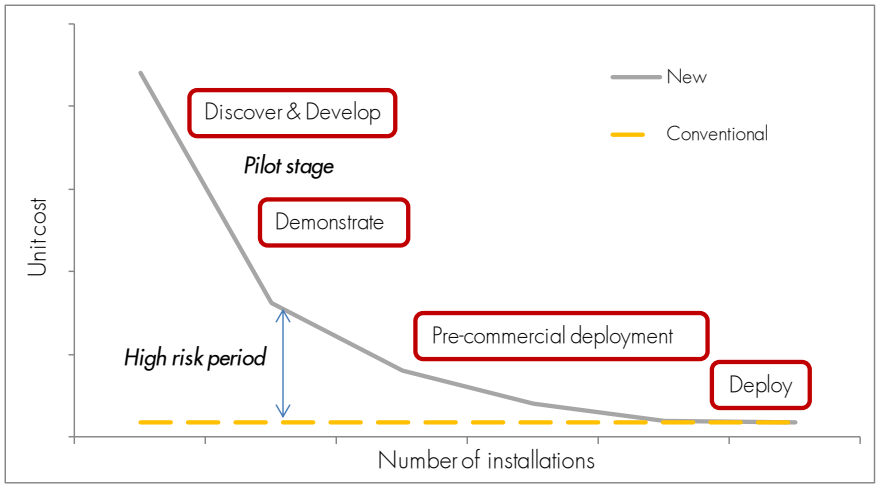

Figure 3: Technology learning curve

The existence of targeted support schemes to achieve the overarching single CO_2 target should be reviewed regularly to ensure that the overarching goal is being met in a cost-effective way and that action is occurring across all sectors of the economy. Therefore, once technologies are commercially viable, the policy instrument (the EU ETS) designed for commercial deployment is the only active policy mechanism.

New technologies, such as CCS and renewables, tend to move through a technology learning curve as outlined in Figure 3. This curve illustrates how the cost of a technology tends to reduce as the technology matures. However the market alone does not pull technologies along this curve and so at key phases further support from policy makers will be needed.

The technology pathway can be divided into four distinct phases: (i) discover & develop, (ii) demonstrate, (iii) pre-commercial deployment and (iv) commercial deployment, and each phase should have dedicated policy design as described below which reflects the economic viability and changing degree of maturity of a technology (summarised in Table 1).

- The discover & develop phase (i.e. research and development) is where new ideas are generated and tested, requires collaboration and funding from government, industry and academia.
- The demonstration phase is important to enable low emission technologies to be tested at scale. The initial capital costs of demonstrating technologies can be high, but it is an important step to overcome technical and non-technical risks as well as bring down costs. Demonstration funding is vital to deliver both CCS and innovative renewable technologies, such as advanced biofuels. For example, the EU ETS provides funding for the demonstration of emerging low carbon technologies from the revenues from the auctioning of 300 million allowances from the New Entrant Reserve (NER300). We support the NER300, and believe similar funding mechanisms for demonstration will need to be an essential component of the 2030 framework.
- Under this framework there is a role for targeted support under the single CO_2 target to enable the development of alternative energies in the pre-commercial phase. This is when technologies can operate at scale but are still not competitive with conventional technologies and need support in order to bring down costs. For example, due to the complexity of the road transport sector, advanced biofuels manufacturing will need targeted support which should recognise that new technology will develop slowly.
- In the commercial deployment phase, low carbon technologies can be commercially deployed under the dedicated policy mechanism designed to achieve emissions reductions for the sector.

Table 1: Proposed 2030 policy mechanisms along the innovation chain

	Power & Industry	Road Transport
Discover & Develop	Attractive environment to enable innovation e.g. Strategic Energy Technologies Plan, Horizon 2020, tax incentives Collaboration between industry, academia and government e.g. knowledge transfer networks	
Demonstrate	Additional support mechanisms for demonstration, revenues from the sale of allowances from the EU ETS (e.g. NER 300)	
Pre-commercial deployment	Targeted support for alternative energies (e.g. sub-targets, tax exemptions, feed in tariffs and contracts for difference)	
Commercial Deployment	Emissions Trading Scheme	GHG emissions intensity goal Vehicle GHG efficiency standards

2.6 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?

With respect to security of supply, the current Gas Security of Supply Regulation provides a clear set of guidelines and measures which represent the best route to track progress on security of supply.

3 Instruments

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

Yes, changes are necessary to policy instruments and how they interact with one another. The 2030 policy framework should be designed so underneath the single CO_2 target the EU ETS is the primary driver to reduce emissions from the power and industrials sectors, and for road transport there needs to be alignment between the existing policies and simplification so that GHG emissions can be reduced cost effectively.

For instance, under RED there are sustainability standards for fuels produced from biomass (biofuels), but the same sustainability standards are missing for electricity produced from biomass. To be effective, these environmental standards for biofuels should be applied to other, larger, land users and for all uses of biomass, including power generation. Sound policy can encourage the deployment of agricultural or technical production practices that mitigate or reduce the risk of Indirect Land Use Change (ILUC). ILUC risks are incurred by the production of any land-dependent commodity, from biomass in the power sector to substances used in household goods and luxury consumables. We believe that ILUC mitigation schemes, as

described in a recent report by Ernst & Young[12] for a consortium of NGOs and companies (including ePure, the International Union for Conservation of Nature, Neste Oil, PANGEA, Riverstone and Shell), could be employed to encourage activities to prevent or reduce the risks of ILUC. Technologies or practices that reduce ILUC risk could include advanced biofuels, the use of co-products, improvements to crop yields on existing agricultural land, the use of co-products for animal feed purposes, crop production on abandoned lands, integration with existing livestock rearing systems and strategic land use zoning, such as Brazil's agri-ecological zoning.

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

We support measures at the EU-level which ensure a coherent policy framework as described in Q2.5 to optimise cost-efficiency with consistency in implementation throughout all Member States which for power and industry has been achieved through the EU ETS. The cost effectiveness of reducing GHG emissions through a carbon market is primarily determined by the range of abatement options available to the market. International linkages between carbon markets, for example, Europe and Australia, provide more coverage and the ability to capture more cost effective abatement options and we support the use of certain types of credits from the Clean Development Mechanism under the EU ETS.

EU renewable policy needs a more coordinated approach:

- Renewable electricity has shown rapid growth across Europe in recent years and now represents a significant part of the electricity mix, as such renewable electricity sources should be fully integrated into the market and support schemes should reflect the wholesale price. Infrastructure and network reinforcement costs associated with renewable electricity deployment, as well as the operational costs incurred to ensure the stability of the power systems all need to be reviewed and coordinated to optimise cost-efficiency (CERA 2013[3]);
- For road transport, we support a single EU market for compliance allowing some form of inter-country trading or pooling after 2020. We believe this could result in a more efficient, lower cost implementation, as we expect alternative fuels and technologies, such as advanced biofuels, electricity, natural gas and hydrogen, will emerge at different scales in different places.

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

The Third Package, the Gas Target Model, Security of Supply Regulation and Regulation on Wholesale Energy Market Integrity and Transparency (REMIT) together represent the collection of instruments for delivering transparent, liquid and well-functioning single European markets in gas and power. We believe that there is a need for a swift and full implementation of the Third Package of legislative proposal for single electricity and gas markets which will avoid fragmentation of the internal energy market.

[12] Biofuels and indirect land use change. The case for mitigation. Ernst & Young (June 2011).

As a business we wish to see a legislative environment where customers, shareholders and partners can prosper. The need for investment will strongly depend on the future energy mix and the energy transition policies in existence, such as the EU ETS, measures to safeguard security of gas supply, infrastructure package, the implementation of the Third Package and individual Member State response to capacity remuneration. Setting a simplified climate and energy policy framework for 2030 will give certainty to investors and mobilise investment where it is required.

Please see our response to Q4.8.

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

Essentially, a single CO_2 target for 2030 combined with appropriate policy instruments will enable energy efficiency and this includes standards for vehicles and buildings to overcome market failures where energy efficiency may not occur in the absence of such policy instruments. In order to minimise the impact on energy costs, it is important to remove support for mature energy technologies once they can be commercially deployed, as mentioned in Q2.5.

Saving energy and energy efficiency can help European industry to remain competitive. The EU ETS can play a pivotal role in driving energy efficiency. Today's surplus of allowances and the resulting low carbon price fails to deliver the necessary price signal. We believe that a permanent retiring of a number of allowances from the EU ETS, and/or amending how the cap declines in the future through the linear reduction factor combined, longer term, with a supply side flexibility mechanism so that the scheme is robust to unforeseen events will restore the original level of ambition of, and ensure it remains at the heart of the EU Climate and Energy Policy.

We do not yet know the impact of the EED which is currently being implemented at Member State level and we support the implementation of this Directive in a consistent manner taking into consideration the existing policies that enable energy savings e.g. EU ETS and vehicle efficiency standards. This is an example of an incoherent policy framework as the mechanisms to deliver GHG emissions reduction and the energy efficiency target could overlap and in some cases undermine each other. However, we note that the EED has a role to play in promoting combined heat and power (CHP) which can lead to significant fuel, cost, and GHG emissions savings over conventional, separate forms of power generation and heat-only boilers.

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

Innovation is a key driver to achieve a low carbon economy. Technological change and development will significantly enhance the portfolio of options available and, over time, will bring down the cost of achieving global climate change goals. Strong co-operation between industry, government, and academia is required. Governments have an important role to play by developing an attractive environment that supports emerging low carbon technologies as they proceed to commercially maturity. The discover & develop phase (i.e. research and

development) is where new ideas are generated and tested, requires collaboration and funding from government, industry and academia.

Demonstration support should also be designed with the research and development (R&D) phase in mind. The high-risk nature of the R&D phase means that technologies may need early support (such as the Strategic Energy Technology Plan or the Horizon 2020 programme) and clarity on the availability of demonstration funds that could be accessed *after* a technology has passed through the R&D phase to drive investor confidence[13]. R&D support and demonstration funding are thus complementary.

4 Competitiveness and security of supply

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

To enable the growth of low carbon technologies a stable policy framework for 2030 as described in our response to Q2.5 should be proposed as soon as possible and no later than the end of 2013. We believe the following elements of the framework could be strengthened to promote job creation, growth and competitiveness:

- A simplified policy framework to 2030, with a strong ETS, will enable a cost-effective approach to a low carbon economy with cheaper energy costs compared to energy costs under a more complex policy framework;
- Strengthening the EU ETS through retiring allowances or amending how the cap declines will allow this policy instrument to become the central pillar for reducing emissions from the power and industrial sectors. This scheme represents the most cost-effective route to decarbonisation and has measures to support the competitiveness of sectors at risk of carbon leakage;
- A stable framework is critical to ensuring Europe's ability to compete with North America and other regions in attracting significant investments in advanced biofuels. The US Renewable Fuel Standard contains features which provide stable, long term support for the development of advanced biofuels such as sub-targets for advanced biofuels and alternative compliance mechanisms if technology growth is slower than expected;
- The existence of demonstration funding can help to grow emerging industries and we support the use of revenues from the auctions of allowances from the EU ETS to support alternative energy technologies in the demonstration phase (see our response to Q4.6); and
- Finally, the climate and energy package will need to find a way for industrial activity to continue whilst ensuring that decarbonisation goals are met. CCS is the only technology that can achieve deep emissions cuts in industries such as refineries, steel and cement in line with Europe's GHG emission reduction goals. The need for CCS technology is driven entirely by climate change and it is not economic by itself, and for Europe to take a leading role in developing this strategic technology, the 2030 framework needs to incorporate support for research, development, demonstration of this vital technology.

[13] Shell submission to EU Commission's Communication on Energy Technologies & Innovation, March 2013. Ecofys and CEFIC (2013).

4.2 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?

The 2030 framework needs to include measures to support the competitiveness of industries that are at significant risk of carbon leakage. Under the EU ETS, there is a mechanism which allows industries at risk of carbon leakage to receive a proportion of their allowances to emit GHGs at no cost. Sectors on the carbon leakage list receive this benefit and the list is reviewed every five years taking into account a sector's carbon costs and trade intensity. We support the continuation of this process after 2020 until there are comparable schemes to address climate change globally. In the absence of this support both production and investment leakage could occur in the future as described in CEFIC's roadmap to 2030[14].

For the road transport sector, fuel standards should be designed with the recognition that crude oils and products are traded globally. For example, European standards that discriminate against certain crude oils may competitively disadvantage European refiners with no choice of raw materials due to their location. Furthermore, this type of legislation may also result in an overall increase in GHG emissions if certain crude oils and products are redirected to less regulated markets. Therefore, we support an average GHG emissions intensity value for diesel and petrol.

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

Energy costs are a function of the price of the energy on the market, e.g. wholesale price, plus the costs of transportation, distribution and additional government imposed levies. The EU can influence energy costs by simplifying the policy framework and therefore minimising the costs of decarbonisation and the costs passed on to consumers, for example, €30 billion was spent in 2012 (CERA 2013[8]).

Europe can help with energy costs and competitiveness by setting a level playing field for mature energy technologies, removing financial support for mature technologies which can compete with conventional technologies and bringing forward guidance on harmonisation of support schemes for Renewables to strengthen the internal market. Furthermore, encouraging access to all energy supplies and therefore increased competition can help to reduce energy costs. Policy makers need to ensure investment can occur in infrastructure, that there is a stable tax regime for exploration and production and the opportunity to develop sustainable indigenous sources is available.

4.4 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?

The uncertainty about efforts and the level of commitments is recognised through the design of the EU ETS with the periodic review of the carbon leakage list and we believe that this mechanism should be extended beyond 2020.

[14] European Chemistry for Growth: unlocking a competitive, low carbon and energy efficient future.

All policy instruments should be robust to external development with the appropriate review process as progress is made internationally.

4.5 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)?

Long-term certainty is desired by the energy sector due to the life-times of our assets and it is in the interests of business and the economy that we have certainty through a long-term and transparent regulatory environment. However, we recognise the possibility of changing circumstances. There should be appropriate review guidelines which are conducted in a transparent manner and allow for the framework to be adapted to changing circumstances globally.

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

Yes, we see a future role for the use of revenues from the auctioning of allowances to support the demonstration of emerging energy technologies and increase the innovation capacity of manufacturing industry.

For example, the manufacture of advanced biofuels requires new technologies that need de-risking and like many new energy sources, cannot be expected in the beginning to be commercially competitive with mature, established industries (see also our response to Q2.5). To accelerate implementation of strategic advanced technologies, demonstration funding to advance and prove new technology, with the level of financial support reflecting the commercial maturity of the technology. At the EU level, the Commission should consider the extension of the EU demonstration fund for low carbon technologies (NER 300) to support emerging low carbon technologies critical to deliver EU climate policy objectives.

4.7 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?

When framing the proposed climate and energy policy framework for 2030, we urge the Commission to take into consideration the fact that US shale gas production has revolutionised global energy supply. The industry believes that shale gas is potentially an opportunity for Europe and can be developed safely, in an environmentally responsible way; this is always the industry's priority.

We believe that natural gas from unconventional sources including shale would add to diversity of supply. Several European countries may hold commercially recoverable shale gas resources, and industry needs to carry out initial exploration activities to determine the size and commercial viability of the potential resource.

Given the current limited scale of the European onshore industry relative to its US counterpart, it will take some time before full development of unconventional gas in Europe takes place. It is important that the potential of European unconventional resources can be properly tested by exploration and appraisal and that experience and capability can be developed in Europe. It

is worth noting that a study[15] published by Phillippe Partners, on behalf of the European Commission DG Energy, in October 2011 concluded that existing legal and regulatory frameworks applicable to unconventional gas activities are adequate and practicable.

The industry is committed to work with European and national policymakers and competent authorities to achieve appropriate long-term solutions for unconventional gas exploration and production in Europe:

- to ensure that policy making around exploration and production is based on facts, science and sound risk-management; and
- to ensure that EU Member States can continue current exploration and any future production activities, as is their right under Treaty on the Functioning of the European Union Article 194.2.

4.8 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?

Europe can best improve security of energy supplies through unlocking sustainable indigenous resources and enabling a stable and attractive investment climate for companies and regulated undertakings, for example, Transmission System Operators (TSOs).

There is a need for a swift and full implementation of the Third Package of legislative proposal for single electricity and gas markets. In particular, the EU Network Codes covering congestion management, capacity allocation and tariffs are crucial to ensuring market integration and development. Developments to date are welcome; however, regulators need to be wary of being too prescriptive or creating undue uncertainty for gas shippers.

For example, the capacity allocation code now requires the mandatory bundling of entry and exit capacity at EU cross-border points. We oppose such a move as it risks reducing the amount of capacity available to the market and the flexibility available to shippers to move gas between markets. Alternatively, the EU Code on tariffs needs to ensure that it strikes the right balance between within-day and day-ahead arbitrage and long-term capacity investments by shippers.

Investment is a crucial issue. With regards to network development, additional TSO investment should be a market driven process. That is, shippers should signal the need for any investment, be it via auctions or open seasons (the former is probably the best option for incremental system investment, while Open Seasons probably lend themselves to big projects). That said, there needs to be an investment obligation on TSOs in response to market demand, including physical reverse flow at interconnection points.

The Third Party Access Exemptions (TPAE) Regime has been very successful in delivering merchant investment in storage facilities, interconnectors and import terminals, notably in GB but also elsewhere in the EU. Care should be taken to ensure that a prescriptive approach to the TPAE Regime does not damage its effectiveness in delivering future investment (important in

[15] The legal and regulatory framework for shale gas exploration and exploitation activities in the EU. Phillippe Partners (October 2011).

relation to the issue of supply diversification). For example, the mandatory use of Open Seasons or the nature and structure of "use-it-or-lose-it-rules" (UIOLI) rules need to be carefully designed.

5 Capacity and distributional aspects

5.1 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?

We note that there is wide variation in national energy mixes, indigenous resources, security and diversity of supply and progress in developing low emission alternatives across Member States. Furthermore the ability of governments and consumers to pay for the investments required varies. We therefore support a continuation of the effort and burden sharing principles and efforts to ensure an equitable and fair burden of responsibility is conveyed on Member States.

5.2 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?

We support mechanisms to enable a cost effective delivery of the objectives of the climate and energy package, such as co-operations mechanisms under the RED. Similarly, we support the initiative of the EU Commission to provide guidance to renewable energy support schemes. Supports should limit market distortion as much as possible therefore, as technologies mature, stronger market integration is essential.

For road transport in the future we support a single EU market for compliance (allowing some form of inter-country trading or pooling) after 2020. We believe this could result in a more efficient, lower cost implementation, as we expect alternative fuels and technologies, such as advanced biofuels, electricity, natural gas and hydrogen, will emerge at different scales in different Member States.

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

We recognise the need for financial support for demonstration and pre-commercial deployment of strategic low carbon technology. For example, CCS is a critical technology, and relies on a strong carbon price to secure its long-term commercial viability.