

This annex includes contributions from stakeholders submitted via the online questionnaire. Contributions which were submitted via our email have been converted from alternative file formats and merged with those submitted via the online questionnaire. Responses are shown from those registered stakeholders which indicated that their contribution should not be treated as confidential and at the same time are registered in the Register of interest representatives<sup>1</sup> (have provided their identification number for the Register in their response to the questionnaire). Contributions are shown sorted by the identification number in ascending order. Some of the contributions refer to attachments or accompanying papers – these can be found on our website: [http://ec.europa.eu/clima/consultations/0005/index\\_en.htm](http://ec.europa.eu/clima/consultations/0005/index_en.htm). All contributions shown have not been edited.

Contributions shown in the remainder of the document do **not** represent the position, opinions and views of the European Commission and are sole responsibility of those submitting these comments.

### Questions:

**Q8** Do you have any comments on the policies evaluated in the previous question? Do you have any comments on any other policies?

**Q9** The EU will need a diverse portfolio of technologies to build a low-carbon future. Some examples of potential technologies and energy efficiency solutions are carbon capture and storage, renewable energy technologies, electric vehicles, fuel cells, smart grids, heat pumps, cogeneration, next generation nuclear power, zero emission buildings, etc. Which technologies do you think will be the most important in achieving a low carbon economy by 2050 and how can the EU foster their development and deployment?

**Q10** What are in your opinion the most important initiatives the EU should pursue in the next five to 10 years to secure a successful transition towards a low carbon economy by 2050?

**Q11** The EU Emissions Trading Scheme is a central element of EU climate policy. The EU wants to foster international climate action by reinforcing international carbon markets, e.g. by making links among emissions trading systems and by further developing crediting systems. What elements do you think should go into the EU low-carbon roadmap? (e.g. bilateral agreements to recognise international allowances and credits, sectoral crediting systems, separate financing mechanism for the purchase of international credits from developing countries, etc.)

**Q12** Achieving a low-carbon future means investing in the medium to long-term. How can the EU roadmap help to create a stable environment to encourage investment in low carbon technologies? Would it be a good idea to consider a mid-term objective for 2030 and, if so, in what form?

**Q13** We want to cut emissions in the EU by 80% to 95% by 2050. Some of the measures needed to achieve this could bring about more sustainable growth, extra jobs, accelerated innovation, cleaner air, increased energy security and lowering our vulnerability to external energy shocks. Which of these do you think should be top of the list? What should the EU do to maximise the benefits you think should be delivered in priority by future climate action?

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<sup>1</sup> <https://webgate.ec.europa.eu/transparency/regrin/welcome.do>

**Q14** What sectors do you think may be most vulnerable to the negative impacts of climate change, and what policies do you think the EU should pursue to help them to adapt? Do you have any suggestions on the integration of adaptation policies in the Common Agriculture Policy, civil protection, environment, energy, transport, research and development policies?

**Q15** Do you have success stories that could lead to new initiatives for steering EU transition to a low-carbon economy you wish to highlight? Please add other further comments or suggestions here if you wish.

#### **Answers:**

#### **0014082722-83 EUROCHAMBRES – Association of European Chambers of Commerce and Industry**

**Q9** It is difficult to forecast which technology will be most important and the best solutions might still need to be invented. It should not be the role of the EU to focus on certain technologies which could have financial consequences. Market-based, foreseeable price signals, combined with enhanced innovation, R&D, entrepreneurship and flexibility will help businesses to come up with new and maybe better low carbon solutions. Nonetheless, for CCS the EU should not leave it alone to the Member States to create appropriate storage sites: we need a review of existing legislation (nature protection, soil/water) which might be a burden for the realisation of new sites and campaign for CCS to help implementation. We also believe that the buildings sector has potential for GHG reductions: investments in refurbishment create positive ecologic, economic and job market effects. Investments in and incentives for technologies should be also efficient in terms of costs for CO<sub>2</sub> reductions. **Q10**

- A global, binding agreement on action against climate change that includes all major emitters: industrial+developing countries
- Putting the focus on GHG reduction and energy efficiency technologies for the R&D strategy: more R&D on future technologies and use of existing technologies at best sites in the EU (Renewable Energies)
- Coordination of environmental, energy and transport policies & instruments with the goal of a low carbon economy; enforcement of existing legislation
- Setting a framework for the development of future technologies for mobility (e.g. legislation and implementation standards). Review of existing legislation as it could hinder the realization of infrastructure (e.g. nature protection legislation)
- A clear, credible price based signal to make emission reductions more efficient
- Raising awareness for GHG emissions and possible reductions at all levels from citizens to policy makers and scientific evaluation of the carbon impact of all relevant EU policies

**Q11**

For a future global ETS, systematic benchmarking at international level for the different national schemes is needed to turn the system less bureaucratic & more efficient. To prevent carbon leakage, European companies must obtain free emission allowances and get compensated for higher electricity prices due to ETS. ETS should remain a market based instrument organised between the original trading partners. Separate or parallel financing mechanisms between the EU and third countries would compromise the economic efficiency of the system. In brief, these points should be addressed:

- Less red tape in the process of benchmarking & allocation
- Greater efforts for non-ETS sector within the EU-effort sharing
- Full recognition of credits from international projects (CDM or JI)
- Problem of crowding out of local mechanisms for CDM
- Closer international cooperation to achieve cost-efficient emission reductions
- Level playing field and equal worldwide CO<sub>2</sub> price for ETS-sectors

**Q12** By setting clear objectives, such a goal might offer a more reliable framework for investment, but it would also have to take into account the climate policies in other parts of the world. A unilateral pledge to realize an ambitious reduction goal in the EU means additional costs in Europe. EU companies would be at a disadvantage compared to their global competitors. EUROCHAMBRES is convinced that unilateral, stand-alone actions will hinder growth & thus devalue Europe as a business location. Sustainable climate protection

can only be guaranteed globally by comprehensive, coordinated actions, especially by industrial countries. The aim must remain to achieve a comprehensive international agreement on climate politics. Therefore we also strictly oppose a unilateral increase beyond 20% till 2020. The roadmap could also support investments by offering swift & reliable authorization procedures for investments in all low-carbon technologies all over Europe and by increasing R&D support. **Q13** EUROCHAMBRES believes that future climate action should deliver in priority • Accelerated innovation, more R&D, training + better information • Increased energy security & less vulnerability to external energy shocks • Treaties with other regions (eg Asia) on energy efficiency & the use of low carbon technologies, recognizing Intellectual Property Rights, are necessary to develop the market for those technologies • Sustainable growth where the focus should not only be on “green jobs” but also on keeping a strong industrial base • Too detailed product regulation (eg via an extended eco-design directive) should be avoided as such an approach demands too much efforts in terms of development of standards, information & enforcement However, we would also oppose a unilateral EU 2050 target which would hinder growth, devalue Europe as an attractive business location & diminish the EU’s influence on international climate talks. Comparable reduction pledges on a global level are urgently needed. **Q14** Experience has shown that most of the problems arising as a result of climate change are connected with flood water or drought. Therefore, these problems have to be integrated into the directives and regulations concerning the use and management of water. For companies it is difficult to make provisions in the case of climate change because the concrete development for a certain region (e.g. precipitation, temperature rise) is difficult to assess. The first step is to improve research on these subjects and to convey information about the findings broadly. Overall, it is of utmost importance that adaptation to climate change takes into account effects of climate change along value chains. A focus on singular effects might distort adaptation strategies. The following areas are vulnerable to climate change impacts and need preventive measures: 1) Civil protection 2) CAP (reforms need to allow for more flexibility of agricultural production) 3) Environment **Q15** EUROCHAMBRES successfully coordinated a project called CHANGE – Chambers promoting intelligent energy for SMEs – which was supported by the EU’s Intelligent Energy Europe (IEE) programme. The CHANGE project helped SMEs optimize their energy use by developing a European network of intelligent energy advisors at Chambers of Commerce and Industry and by kick-starting and enhancing concrete assistance to SMEs. The project built on the traditional role of Chambers as “first port of call” for SMEs. About 60 staff members from local and regional Chambers in 12 European countries have undertaken training and exchanges of experience to obtain basic knowledge about energy efficiency and cost-efficient applications of renewable energy sources. These Chambers facilitated the access to information for SMEs, organized workshops and encouraged SMEs to take energy pre-checks. Thus, they bridged the gap between SMEs and more specialised consultancy and technologies available on the market. **Additional Comments** Concerning question 15, EUROCHAMBRES would like to add the following comments and examples of successful initiatives: • In Central Europe there was a great deal of CO<sub>2</sub> emission reduction when subsidies to polluting industries were cut in the early 1990s. This structural change was hard economically and socially, but the current situation (in terms of the relative significance of these industries and the financial resources available for mitigation) is a great deal more favorable. • In Germany, there is a partnership between federal government and chambers of industry and commerce for climate protection. Parts are: information campaign including 5.000 visits of SMEs to stimulate energy efficiency activities, qualification campaign (3.000 new energy managers) using EUREM, development of a climate group of leading German enterprises in the field of climate protection and efficiency. Further general comments: • The EU could contribute to a great extent to reaching the objectives if it would put more emphasis

on providing information to EU citizens on the importance of a low-carbon economy. The efforts and campaigns organized so far by the European Commission have not reached a critical mass. • The EU should encourage Member States to integrate questions of climate change and energy efficiency into their education system (school and university programs). • A better knowledge and awareness of all EU citizens would also facilitate acceptance of necessary investments and infrastructure projects.

**00851204658-62 Vereinigung Rohstoffe und Bergbau e. V.** **Q9** Without doubt, the most important technology in the short term and medium term, will be energy efficiency. Government-led initiatives have focussed on downstream energy use (end-users) where the potential savings are greatest, but where life-style choices mean that these savings are difficult to realise. Upstream energy efficiency, for example at power plants, can deliver carbon reductions with much greater certainty. Unfortunately, upstream energy efficiency is largely ignored by policy makers. In the longer term, the most important technology in achieving a low-carbon economy will be CO<sub>2</sub> capture and storage (CCS). By promoting today, high-efficiency power plants that are CCS-ready, the EU could follow a “no-regrets” strategy that leads to a low-carbon end point without compromising EU competitiveness or energy security in the short term.**Q10** Legislation for infrastructure development and energy efficiency is needed, including for CO<sub>2</sub> transport and storage. More should be done to encourage high-efficiency coal-fired generation and the substantial CO<sub>2</sub> savings that could be made through the replacement and modernisation of older plants. In the short term, decarbonisation should be only one objective and one that should not dominate, given the current weakness of international climate change negotiations and fragile state of the global economy. Industrial competitiveness and security of energy supply cannot be subordinate to sustainability. Evidence shows conclusively that the richest economies are also the cleanest, so economic development should go hand-in-hand with climate action.**Q11** This question sensibly highlights the major flaw in an EU-wide trading scheme: it isolates Europe in its efforts to tackle what is a global issue. High carbon prices are needed to drive deep cuts in CO<sub>2</sub> emission, but high prices are economically damaging, especially if industries in other countries are free to emit and export their products to the EU. It is therefore crucial that the EU ETS is open to emission credits generated elsewhere. This is likely to dampen emission allowance prices in the EU, but without compromising the global objective of significantly reducing GHG emissions (not just CO<sub>2</sub> emissions) at the lowest cost. Unilateral action in the EU does not address the climate challenge, so the EU must integrate the ETS with bilateral agreements, sectoral crediting and trade in international credits.**Q12** In the EU roadmap to 2050, coal's future role should be scrutinised more closely as part of Europe's long-term decarbonisation goal and related energy policy decisions. Any assumption that the 2050 objective can be met without coal and without CO<sub>2</sub> capture and storage (CCS) for gas and coal use must be questioned from cost and security of energy supply perspectives. A mid-term objective for 2030 would not be helpful; it would potentially discredit the 2020 objectives which are already challenging enough and may not be met. The EU must earn political credibility if it is to influence the other major economies around the world on climate policy. This means that specific EU targets must be measureable, achievable and realistic. Today, they do not meet all these criteria.**Q13** Increasing EU energy security and lowering our vulnerability to external energy shocks should be the most important measures. To achieve the benefits listed, more investment is needed to replace and modernise old coal-fired power plants. This can be justified initially by the cost-effective CO<sub>2</sub> savings from improved efficiency, and can include enough design flexibility to retrofit CO<sub>2</sub> capture and storage (CCS) and so meet longer-term targets. **Q14** An important point to note here, and one that is largely ignored in the climate debate, is that the world must face all the predicted negative

impacts over the next century, regardless of what mitigation actions we take today. The cumulative effect of GHG emissions emitted over the last century, coupled with the large inertia of the global climatic system, means that mitigation measures can only benefit future generations, today's population will not live to see the benefits. In the interim period, the most vulnerable sector to the negative impacts of climate change is the built environment which is threatened especially by floods and rising sea levels. Wide-ranging R&D programmes and development policies should be adopted for areas most at risk of such natural disasters. **Q15** The greatest success over the last decade is the remarkable speed with which CO<sub>2</sub> capture and storage (CCS) has moved from being an interesting mitigation option, discussed mainly by academics, to one that has been taken up with enthusiasm by industrialists to the extent that we are now on the cusp of building commercial-scale plants to demonstrate the viability of this technology. Government-sponsored programmes, such as the development of nuclear fusion and the Apollo moon missions, have rarely delivered so quickly (the Manhattan project being a notable exception) and we should now address ourselves to overcoming the remaining hurdles: public acceptance, financial viability and outstanding regulatory issues. **Additional Comments** EU ETS – In an unparalleled experiment, the EU continues to develop the ETS as a central plank in the bloc's response to the climate challenge. Full auctioning of emission allowances during the third trading period from 2013 will see a major shift in the scheme's impact on fuel choice for power generation. The safety nets and national allocation preferences of the past will be replaced by harmonised rules, the details of which are currently being finalised between the Commission and Member States via the comitology procedure. Even with these new harmonised allocation rules, the scheme will remain subject to future political decisions (e.g. on targets and inclusion of JI/CDM credits) and uncertainties. The rules foresee fuel switching from coal to gas as a desirable outcome, without regard to the consequences of such a shift on economic competitiveness or security of energy supplies in the EU. By 2020, EU dependence on imported gas is likely to reach 73-79%, and rise to 81-89% by 2030, according to the Commission (SEC(2010)1395). Faced with similar levels of energy import dependence, Japan turned to coal in the 1970s and is today the world's largest importer because, unlike gas, coal is available at competitive prices from diverse sources without cartel risks. In the EU, we have the added benefit of indigenous coal which reduces energy import dependence and offers long-term price stability. Unfortunately, given the unpredictability of carbon prices under the ETS, coal-sector investments, particularly in new coal-fired power generation capacity, have almost come to a halt. The plants being commissioned today are the result of investment decisions made over a decade ago, a time when government policy was less fixated on carbon emissions. The utility industry is like a super tanker – it takes years to find out if regulatory and investment decisions were beneficial or not. The ETS experiment risks leaving the EU short of secure base-load generation capacity at a time when it is most needed to balance a massive dependence on imported gas and to backup intermittent renewables.

**01614024708-86 Sund Energy AS** **Additional Comments** Sund Energy follows closely the developments in European energy policy at several levels and supports a wide range of stakeholders with analysis on potential implications both short and long term. We are positive to the creation of a common market for energy and wish the European Commission success with the 2020 energy targets. These are important steps in improving economic competitiveness and security of supply, while minimising environmental impact. We also welcome the early roadmap for meeting the targets to 2050 and would like to share with the Commission some of the insight we have acquired in this area in recent work. First, in a written report to the Nordic Innovation Centre, Sund Energy has looked at the possible role of carbon capture and storage (CCS) in a Nordic energy picture with more renewable energy in



2050. The context is one where the Nordic countries want to become climate neutral (avoiding all non-biogenic emissions of greenhouse gases) by 2050 in a world committed to combat climate change. With current accounting for greenhouse gas emissions, CCS for biogenic emission sources could be recognized as negative emissions. If such credit is given, it is possible to have some fossil greenhouse gas emissions which are extremely expensive or technically difficult to avoid and still become climate neutral. However, the accounting of captured biogenic emissions is uncertain. The European Commission should set up a framework for recognizing and incentivizing negative emissions by clarifying their value in fighting climate change and their accounting in light of this. Second, Sund Energy prepared an overview of biogas in the Nordic region to Nordic Energy Research. An important conclusion of the analysis is that biogas could be a potentially significant lever in meeting climate goals despite currently small market shares. The European Commission should acknowledge the value of reducing emissions of methane from agriculture and waste streams and at the same time replacing fossil fuels. Biogas has potential for negative emissions in a full life-cycle perspective and could play a role in “decarbonising” the transport sector. The relative merits of different fuels, both from energy and environment perspective, should be visualised by the European Commission in planning for 2050. A full energy picture would be useful in establishing the level of support for the different renewable energy technologies in light of their potential. This should be updated regularly to take account of rapid developments in the sector. In this way, the Commission can ensure that it is not the strongest lobby who wins the competition for subsidies. On December 8, the Norwegian government sent on hearing a law on the green certificate system for investments in renewable energy. Based on a positive voting in the Parliament, Norway will join Sweden’s market for green electricity certificates from January 2012. The common target is to bring 26.4TWh new renewable electricity on line by 2020. The common certificate system for Norway and Sweden is the first support scheme for renewable energy generation covering more than one country. Norway and Sweden would also like to include more EU countries in the system and to explore the possibility of using this flexible financing mechanism in the RES directive. The system is market based and independent of national budgets. The fact that it is based on a law and places no burden to the national budgets in Norway and Sweden means that investors appreciate the scheme as stable and predictable. The green certificate system has been in operation in Sweden from 2003 and it has delivered investment in renewable energy according to expectations. Sund Energy recommends the European Commission to investigate closer such an opportunity on the medium and long run, instead of or in addition to feed-in tariffs. Sund Energy started in 2007 at the initiative of Karen Sund and has gradually developed into a diverse team of experienced partners. We represent different educational and cultural backgrounds and thrive on diversity that enhances communication and sparks innovation. We design strategies, business models and investments, improving dynamics to capture upside, protect downside and increase robustness in future changes. We are motivated by excelling in difficult tasks and have several times assisted our clients achieve what the consensus believed was “impossible”. Amid growing concern about the sustainability of current economic and environmental models in the world, Sund Energy sees the full picture, from several angles and across silos.

**01873234294-62 European Peat and Growing Media Association Q9** In general terms, EPAGMA supports technology that can provide realistic solutions to all the different components of the EU energy mix (ranging from fossil fuels to biomass). The EU Energy policy should be open to all the potential technologies that can boost energy efficiency and reduce co2 emission in short and long terms. More specifically, EPAGMA believes that one of the most important technologies to be developed is cogeneration. For instance, our industry

is an example of success cogeneration and co-combustion processes. Co-firing of peat with biomass improves the efficiency of using poor quality biomass. Efficiency of power improves by 20%. Operational experience and previous research have demonstrated that co-firing wood fuels with peat significantly prolong the life time of super heaters, and minimize the occurrence of bed agglomeration in fluidizing beds. Positive effects when co-firing biomass with peat fuels have been achieved by adding 5–30 % peat to wood fuels. **Q10** As commented above, EPAGMA considers that the energy efficiency action plan should become an important pillar of the EU energy strategy to secure a successful transition towards a low carbon economy. Energy savings and energy efficiency from supply side are two critical issues that the EU has not untapped all its potential yet. **Q11** EPAGMA considers the ETS scheme as an opportunity to reduce CO<sub>2</sub> emissions. In order to become an influential initiative for Europe and other regions, it is necessary to extend it to emerging economies and the US. Bilateral agreements with key partners to recognize allowances and credits are essential for ETS to gain credibility at International level and become an effective tool. Separate financing mechanism for the purchase of international credits from developing countries should be considered in a longer term perspective. **Q13** Reducing CO<sub>2</sub> emissions is not a task that Europe can lead without the engagement of other key actors. The relative failure of Copenhagen Climate Change Conference last December, was a clear indicator of how difficult is to reach consensus on targets and climate change worldwide. For this reason, EPAGMA believes that energy efficiency measures, direct support of cost/effective technologies and a coordinate campaign on public acceptance are critical elements to become a more assertive regional group when negotiating in Cancun COP to be celebrated in December 2010. **Q14** SMEs and European citizens could be the most vulnerable actors to the negative impacts of climate change and a biased energy policy. EU policies designed for big corporations and multinationals will certainly affect the viability of SMEs and citizens as they will both struggle to face administrative challenges, access to funding and knowledge to implement adaptation policies. Development policies by country, energy and environmental policies should be designed in a coherent way to avoid emerging negative trends like energy poverty. **Q15** One example is EPAGMA commitment to the adoption of the new Strategy for Responsible Peatland Management. Within the framework of “Wise Use of Mires and Peatlands”, EPAGMA supported the following key principles: 1) Identification and conservation of high conservation value peatlands; 2) Responsible management for “utilised peatlands” and; 3) Rehabilitation of drained, degraded or severely affected peatlands. This new Strategy contains important recommendations and endorses a clear vision for the future based on the promotion of Wise Use of peatlands through safeguarding their environmental, social and economic functions and respecting their local, regional and global values.

**0285583802-96 Naturschutzbund Deutschland e.V. Q9** According to most 2050 low carbon scenarios applying energy savings technologies economy wide is crucial to achieve a low carbon future. This can be achieved through the introduction of an absolute economy wide binding energy savings target, the introduction of a carbon tax and the push towards higher EU allowance prices by creating more scarcity in the EU ETS. A major area for energy savings is the building sector. In addition, the EU needs a mid (2020-2030) and long term (2050) renewable energy goal. An ecologically sound 100% renewable power sector by 2050 should be the ultimate objective in support of a -95% EU 2050 GHG target. This will also require important and intelligent investments in power grids and power grid storage. Last but not least, it is important that the EU starts to focus more on innovative GHG reducing technologies in the manufacturing industries (steel, cement, paper, chemicals) and develops (prescriptive) technology roadmaps. **Q10** -the implementation of at least a 40% 2020 reduction target of which 30% will be achieved within the EU; -the introduction of Emission

Performance Standards for the EU power sector to avoid a “coal” high emission lock-in; - Binding economy wide primary energy savings target of at least 25% by 2020 compared to 1990 -a review of the CO<sub>2</sub> and cars legislation with the goal to sharpen the current efficiency targets significantly by 2020 -a review of the Energy Performance in Buildings Directive including stronger compliance rules, EU wide passive housing standards for new-build houses and offices by 2015 and the expansion of the legislation towards existing buildings with the goal of a complete EU wide energy savings refurbishment by 2050 -a review of the EU ETS cap with the goal to generate EUA scarcity and hence an EU carbon price which will drive investments in renewables and energy savings consistent with the EU energy savings and renewable energy goals **Q11** -avoid linkages of the EU ETS which will result in a noticeable and structural depreciation the EU carbon price and hence investments in renewables and energy savings in the EU -adjust the phase III EU ETS cap to take into account the windfalls following the economic crisis with the goal to enhance the EU carbon price and stimulate investments in renewables and energy saving technologies -enshrine in EU legislation that a 30% reduction target must be achieved domestically and that under a 40% target at least 30% must happen in the EU and not through off-set mechanisms -Use parts of the EU ETS auctioning revenues to pay for emission reductions in developing countries but do not use the resulting reductions as off-sets -improve the current international market mechanisms on issues as additionality and enhancement of sustainable development. -sectoral mechanisms are acceptable under a 40% EU target of which 30% domestic and if they enhance the current mechanisms **Q12** -the most important element for encouraging investments in low carbon technologies is the upgrading of the current -20% 2020 target to at least -40% -set a safe climate consistent (<+2C) correct EU 2050 target, which is 95% by 2050, to be achieved domestically. Off-setting of EU (and Annex I) reduction targets in 2050 within a global goal of -80% can lead to the requirement of negative emissions in developing countries. -only when scientifically consistent 2020 and 2050 targets are set (i.e. 40% for 2020 and 95% for 2050) the debate on a 2030 goal can start in a correct way. **Q13** We believe the bigger picture is clearly missing in this question. 95% reductions by 2050 are necessary to avoid dangerous climate change and the human, social, ecological and economic costs related to a +3.5 - 4°C world (based on currently planned global policies and measures). This point should clearly be top of the list. All of the above mentioned benefits are incorporated in ambitious policies on energy savings and sustainable renewable energy. Also important is the optimisation of benefits. The introduction of an EU carbon tax or the auctioning of allowances must be implemented in a way that the financial revenues are recycled towards green goals (EU-wide and globally) or to mitigate the unintended social effects of these measures. **Q14** We encourage the European Commission to use the latest scientific research on the (future) adverse effects of climate change on the EU and other parts of the world. Where specific information is lacking the EU has to commission research to fill the knowledge gaps. An Example of this could be studies on the desertification of large parts of Southern Europe before the end of the century. The first policy to implement is the avoidance of the negative impacts through significant emission reductions in the EU and use of Europe’s full diplomatic powers to advocate and implement this ambition level on a global scale.

**04201463642-88 CECED aisbl** **Q9** Buildings have been recognised as an area with massive improvement potential. An adequate synergy of the outer-shelve (the house) and the inner content (the products in the house) is necessary for increased energy savings at home. Already today, products in the highest efficiency classes deliver significant savings. In tomorrow’s smart house energy related products such as household appliances will use intelligent power management strategy to optimise the load on the power distribution grid. Smart appliances can make energy consumption and costs more visible, with consumers better educated and



capable of opting for energy savings options. Technologies are available. What is missing are the tools to increase the overall efficiency of the system: the political will to support Europe's innovative solutions to combat climate change, notably through the spread of dynamic pricing and funding for the uptake of top-efficient products and technologies. **Q10** Political leadership, mandatory measures/targets and accelerated action are necessary. Deployment of participative initiatives/awareness raising programmes such as the energy label are keys to unlock behavioural change. The current electricity market would best develop this in introducing a new measurement unit: Negawatthours. Increased electricity savings, measured with an increase of Negawatthours, should lead to a better electricity price. The guiding principle would be a higher level of competition and transparency thanks to a labeled electricity bill. Consumer provided with multi-contract meters can foster the development of utility providers offering specific energy services or a combination of renewable energy and a specific product or forms of lease contracts. The rise of white certificates schemes and structural interventions to electricity tariffs to take account of energy efficiency could be proposed as well. **Q12** The EU roadmap takes the opinions of all Europeans into account and provides the opportunity to open a larger discussion forum on the 2050 perspectives. The roadmap should identify the areas of transformation needed to reach a low carbon economy and work towards intermediate objectives with all stakeholders. Detailed analysis of the proposed approaches could lead to Commission inter-services working group/task force discussion in coordination with Member States. A mid-term objective for 2030 is thus an appropriate move. **Q13** Energy efficiency and savings is to be placed and remain at the top of all EU energy policies. Measures to encourage energy savings can bring about more sustainable growth, extra jobs, accelerated innovation, cleaner air, increased energy security and lowering our vulnerability to external energy shocks all together. Industry commitments combined with political will and involvement of civil society are an incommensurable source of change. As addressed under question 8, political and financial support to energy efficient technologies and services is the enabler of an accelerated transition to an energy- efficient economy. The EU's objective should be to convince and mobilise policymakers, citizens and businesses in reaching a common goal. Mandatory targets or measures respectively at EU or Member States level is an important measure to unlock the potential that energy efficiency can bring about.

**06798511314-27 European Environmental Bureau Q9** It's not necessarily technologies that will help reduce emissions, but measures and practices. Energy saving offers huge abatement potential and needs targeted measures across the full supply chain, with innovative financing supported by a binding target and a carbon tax on all Member States. Some technologies have been exaggerated in their potential. More stringent criteria is required for biofuels, based on a correct accounting of emissions associated with its use, most importantly by including indirect land use change. Rather than technologies to support unsustainable, growing, energy consumption levels, we must address consumption itself. Achieving emission reductions of 95% by 2050 requires full decarbonisation of our economy and power supply. We must continue to invest in renewable energy technologies to achieve 100% renewables by 2050. CCS should not distract these efforts. Nuclear power involves huge costs, the waste issue remains unresolved and raises concerns over safety. **Q10** The EU needs to set, as an overarching objective, environmental and economic policies to reduce its Ecological Footprint by 50% in the next 20 years. In addition: 40% 2020 GHG reduction target based on domestic action. Carbon budgets, for countries and key sectors. Legally-binding primary energy savings target supported by focused action across all sectors Changes to the grid and network infrastructure to allow flexibility for high levels of renewable generation, including decentralised sources. Promotion of environmental taxation and fiscal instruments, including a carbon tax on all MS, reduced rates for environmentally friendly products and services. By

2020 a shift of at least 10% of the national tax incomes away from labour to environmental pressures, resource use and capital, coordinated throughout the EU by the Open Method of Coordination combined with Enhanced Cooperation, with a mandate for the Commission to annually monitor progress. Climate proofing all EU budget and funds. **Q11** We recognise the central role of the ETS, but in its current form, it is in danger of hindering our chances of achieving a low carbon economy. Credits from action overseas should not become the alternative to domestic emission reductions. Only by investing in mitigation efforts within the EU and taking a stronger emission reduction target can we drive our own low carbon economy. The rules must be flexible enough to adjust the amount of emission allowances available for industry according to an increased emissions reduction target, the improved energy saving obtained by other measures than the ETS itself, as well as the effects of the recession leaving too many permits in circulation. EUA prices have been too low and unpredictable to encourage the cost-effectiveness of investing in the shift from fossil fuels to renewables. In addition: Setting caps for the next trading phase based upon actual emissions and not on the permits allocated. Immediate full, 100% auctioning of permits. **Q12** To set ourselves on the trajectory to 2050, we must take the necessary steps now, rather than delaying action and incurring the devastating climatic consequences. We cannot therefore lose sight of our immediate objectives. EEB calls for the 2020 GHG target to be increased to 40% with domestic action. To reduce Europe's greenhouse gas emissions by 95 % in 2050 compared to 1990 levels requires a substantial change in energy production phasing out completely the use of fossil fuels. Only once scientifically consistent targets have been set for 2020 and 2050 can an informed, scientifically supported debate on any mid term targets begin. GHG emission reduction targets beyond 2020 must be supported by appropriate legislation and policy for renewables and energy saving. In particular to achieve 100% renewables in energy production by 2050. We must set ourselves on the path to a high efficiency, high renewables, low consumption based economy, not just low carbon. **Q13** The greatest benefit to cutting emissions is helping to avoid a vastly warming world. Avoiding humanitarian, social and economic catastrophe must be the determining factor. Energy efficiency and savings are recognised as bringing many benefits while being the most cost-effective, and fastest means of meeting our climate objectives. Europe is the largest energy importer in the world, importing 50% of our energy with estimates that this will rise to 70% in the next 20 years if no further action is taken. Consuming less energy is therefore critical to assure the EU's economic stability and prosperity. Reducing energy consumption by at least 20% by 2020 will reduce the cost of the EU's energy imports by between €100 and €150bn annually. Reducing our energy use by 20% by 2020 could generate a million new, local jobs, including many in SMEs. Reduced energy use will lower energy bills for consumers, reduce fuel poverty and offer substantial benefits in terms of health and quality of life. **Q14** Impacts will be mostly felt indirectly through changes in our ecosystems. Preservation of biodiversity and ecosystems must be the overarching objective and guiding principle of all adaptation measures in all sectors. Infrastructure must be 'climate proofed' in terms of its vulnerability. This requires a change in current planning practices, such as housing and transport schemes. CAP reform is needed to more effectively protect key resources like soil, water, air and wildlife, with redirected funds to reward farming practices which preserve these resources. Special focus should go to reducing total water consumption as well as pollution of (ground) water resources through use of taxes, charges and regulatory measures. The EU structural funds should play a more important role in steering sustainable development in many of the regions which are likely to be hit hard by climate change. Specific EU regions and parts of the population will be more adversely affected than others. **Q15** Energy/CO2 taxes, if predictable and sufficiently high, have proven highly effective in triggering climate change mitigation. The Swedish carbon tax is an illustration: the carbon tax was implemented in 1991, at the

same time as labor taxes were cut. It has enabled a 10% decrease in CO<sub>2</sub> emissions since 1990, without being detrimental to Sweden competitiveness. All consumers pay a 100€ carbon tax whereas the industry pay only 21% of it and revenues go to general budget. In order to avoid carbon leakage and to hurt their competitiveness, some industries such as the agricultural sector are exonerated. The carbon tax is lower for the companies concerned by the ETS. **Additional Comments** The Europe2020 Strategy announced a vision for “Europe's transition to a low carbon, resource efficient and climate resilient economy by 2050.” We are aware that the Commission is also preparing a Resource Efficiency Roadmap, but we would like to emphasise the need for coordination between the two visions, to ensure synergies and avoid perverse impacts.

**09571422185-81 VERBUND AG Q8** Efficient climate protection can only happen on a global scale. The aim is that all industrialised countries, especially the U.S., and newly industrialised countries, like China, India, etc. also commit to emission reduction plans. A global regulatory framework has to be established and several economic sectors should be obliged to follow these rules and international arrangements, such as the energy sector, transport, industry, private households, land use, etc. Therefore, an emission reduction tool like the European Trading System on a global scale could be part of the solution. The EU should act as a climate leader and encourage other countries, institutions and stakeholders outside the EU to commit to reduction targets and form part of regulatory frameworks on climate issues. **Q9** The development of low-emission technologies should be enforced by improving the technology policies by an intense cooperation between politics and economy. A framework for low-carbon technologies has to be built on an international level: equal promotion conditions (especially for innovative, renewable technologies) and useful trading and export conditions would lead to a growing market of low-carbon technologies. The technology portfolio should concentrate on sectors with high reduction potentials for emissions, like the energy and transport sector as well as housing. Focusing on these sectors leads to a high potential regarding investments, research and the creation of green jobs. The implementation of an efficient and sustainable energy management system linking the different renewable energy technologies (mentioned below) is crucial for reducing emissions and for establishing a more climate friendly energy system. The most important technologies from VERBUND's point of view will be the following: – Large and small hydropower, wind and solar energy; – Energy storage technologies: pumped storage hydro power plants; – Electro-mobility: Linkage renewable energy and smart grids with electro-mobility (car batteries are used for the storage and buffering of electricity which leads to a considerable increase in efficiency and to an intelligent load management in renewable energy generation); – Smart solutions: Smart Grid, Smart Meter; – Decentralised energy generation (promotions for different green initiatives, e.g. photovoltaic plants, solar cells on private buildings); – Energy efficiency in private households; – Cogeneration technologies: improving efficiency by investigation; – Grid: Working towards a EU super grid. **Q10** Initiatives that a) do not cause very high costs for Member States but lead to considerable emissions reductions; b) provide the research and learning needed on feasibility of various green technologies; c) build both the supply- and demand-side infrastructure for the path towards 2050; d) cause a change in energy consumption behaviour (industry and private households); e) set a long term emission reduction plan for the highest emitting sectors. Such initiatives include: – Improved energy efficiency (better insulation in building infrastructure); – Promote decentralized energy production and energy storage as well as enhance research on energy storage possibilities; – Reduce energy consumption at household level with the help of smart meters; – Set a strategy to reduce energy consumption on energy intensive sectors (construction, manufacturing, transport, etc.); – Strengthen and develop grid infrastructure to meet

variations in demand and reduce grid losses and work towards a smart grid system that can accommodate increases in small-scale decentralized renewable energy supply; – Set a plan for an EU-wide grid; – Systematically shifting existing subsidies away from high to low/zero carbon options and taking other measures to facilitate an increase in gas and renewable sources in the energy mix while reducing coal and oil; – Implement pilot projects that demonstrate the potential of newly emerging green technologies (business models in model regions, cooperating with the local public authorities, economy and society, including electro-mobility, smart grid, etc.); – Work towards EU leadership in the production and sale of electric and plug-in hybrid vehicles; – Reduce carbon in goods we produce, export and import (life-cycle-assessment). Examples for initiatives: – Incentives on market programmes (like feed-in-tariffs) – R&D initiatives in renewable technologies: o Large and small hydropower, Wind energy, Solar energy o Energy storage technologies: pumped storage hydro power plants o Electro-mobility: Linkage renewable energy and smart grids with electro-mobility (car batteries are used for the storage and buffering of electricity which leads to a relevant increase in efficiency and leads to an intelligent load management in the renewable energy generation) o Smart solutions: Smart Grid, Smart Meter o Decentralised energy generation (promotions for different green initiatives, e.g. photovoltaic plants, solar cells on private buildings) o Energy efficiency in private households o Cogeneration technologies: improving efficiency by investigation o Grid: Working towards a EU super grid

**Q11** An emission trading system on a global level is under current circumstances and developments of international climate negotiations not very realistic. Therefore building up a network on bilateral level would be the more efficient way to involve as much stakeholders as possible into emission reduction policies. First bilateral agreements should focus on high emitting countries like USA, China, India,...and in a second step in a long term perspective on all other countries. A step by step development can be the ideal way towards a global network and building up a global basis for measures to reduce GHG-emissions. By participating in this process the EU could enlarge its pioneering task in climate matters and push other countries towards mitigating the climate change and global warming.

**Q12** A more ambitious EU emission reduction target would set a strong signal for public and private investments. When the EU commits to a stronger emission reduction target of 30 % by 2020 or an additional stronger target by 2030/2050, the political signal will stimulate investments in technologies and research by institutions towards achieving those targets. A mid-term objective is necessary in order to set clear milestones, evaluate them within a reasonable timetable. This enables to manage and steer any misleading development.

**Q13** Energy security is an overriding priority. Moreover, accelerated innovation should be a key priority (and depends strongly on a European-wide energy management system, etc.). Extra jobs and sustainable economic growth would come hand in hand focusing accelerated innovation and higher investments in green solutions.

**Q14** Effects on the energy sector due to the climate change: – Hydro power: o Variation in water supply could lead to a change in electricity generation out of hydro power. o Melting of glaciers leads to a loss of water storage in alpine regions. – Thermal power: o Higher temperature can lead to an increase of river water temperature, which is used for cooling systems. – Grid: o An increase in extreme weather conditions (e.g. storms) could lead to higher maintenance costs and investments for guaranteeing an operating grid.

**Q15** VERBUND is a main driver for electro-mobility in Austria (founder of the platform “Austrian Mobile Power”). VERBUND realised a model region in Styria in order to implement e-mobility in 12 municipalities. We cooperate with the local economy and tourism sector, public authorities and the local society. Different electric vehicles and combined environmental friendly services (like transport systems) are offered to tourists. Moreover, inhabitants of this region are offered special promotions to buy electric vehicles. This



business model should lead to new experiences and know how in the field of electro-mobility and support our related research and development.

**10405322962-08 Wirtschaftskammer Österreich Q9** We do believe that a significant and efficient reduction of GHG emissions and energy consumption is possible in the buildings sector. Nevertheless we have to keep in mind that energy intensive industry, especially in the western Member States, is already operating on a high efficiency level. Process emissions are a substantial part of their GHG emissions and can only be reduced via reducing the production output. Future climate policies have to ensure that the EU stays a competitive location for these companies. Concerted efforts have to be brought on the way to developed GHG-efficient technologies which can only be achieved by funding of R&D projects and enabling the private sector of the required resources. Any new EU environmental/energy legislative proposals should be based on comprehensive impact assessments, avoid contradiction and duplication, have a sound scientific basis and clear objectives and avoid undermining competitiveness. **Q10** A global, binding agreement on action against climate change that includes all major emitters – industrial, emerging and developing countries – ensuring a global level playing field. Setting the focus on GHG reduction and energy efficiency technologies in its R&D strategy by creating a positive feedback loop over the whole life-cycle and providing the required funds. Especially environmental, energy and mobility policies have to be coordinated and harmonized towards a low carbon economy and within the EU. Further initiatives should promote: security of supply, cogeneration, renewable energies (esp. hydropower storage plants), smart electricity grids, alternative mobility concepts (e-mobility), energy efficiency in buildings **Q11** The EU ETS is the biggest CO<sub>2</sub> market in the world and has set a cap on CO<sub>2</sub> emissions for affected industries. This has allowed to level competitive inequalities within the EU, but has put the competitiveness of EU industries at threat. We have to keep in mind that if the costs for energy intensive industries become too high, industries will relocate to areas where there are currently no climate protection costs. This would result in an increase in global GHG emissions. WKO is convinced that the allocation of free certificates – and not BTAs – is the most suitable action to prevent carbon leakage. Future ETS roadmap: reduce red tape especially in the process of benchmarking and allocation, in the future the non-ETS sector has to bear a greater burden within the effort sharing, emission reductions from CDM or JI projects have to remain a vital part of the ETS, ensuring a level playing field and equal worldwide CO<sub>2</sub> price for sectors within the ETS and global MRV standards with rules on infringement. **Q12** Setting a unilateral 2030 target would be a move towards unilateralism. The European Union would hamper its position in international climate negotiations. None of the key international players have yet been sufficiently impressed by the European commitments to follow suit. WKO is convinced that unilateral, stand-alone actions will hinder growth and thus devalue Europe as a business location. Sustainable climate protection can only be guaranteed by comprehensive, coordinated actions, especially by industrial countries. Therefore we also strictly oppose an unilateral step beyond 20% till 2020. European policies should focus on implementing a full life-cycle approach and the development of breakthrough technologies as well as the infrastructure by adapting the legal framework and providing the required funding. European Industry needs a coherent, realistic framework of predictable policies in order to adequately plan the investments that are necessary to adapt to increasing decarbonization. **Q13** Setting a unilateral 2050 target would be a move towards unilateralism. The EU would hamper its negotiation position in international climate negotiations. None of the key international players have yet been sufficiently impressed by the European commitments to follow suit. The WKO is convinced that unilateral, stand-alone actions will hinder growth and thus devalue Europe as a business location. Sustainable climate



protection can only be guaranteed by comprehensive, coordinated actions, especially by industrial countries. European policies should focus on implementing a full life-cycle approach and the development of breakthrough technologies as well as infrastructure by adapting the legal framework accordingly and providing the required funding. Reaching the EU targets for emission reductions and renewable energies depend on accelerated innovation. Innovation is a cornerstone of a prosperous economy, therefore future climate policies have to focus on innovation and increasing energy security. **Q14** Adaptation to climate change has to take into account effects of climate change along value chains. A focus on singular effects might distort adaptation strategies, therefore, a full life-cycle approach for all products is prerequisite for any effective measures. In addition, to sustain Europe as a viable market place to live in at least the basic supply in energy, heat and products must be maintained. Therefore, fossil fuel based electricity and heat production as well as transportation systems have to remain in place until and globally competitive alternatives are available. Adaptation measures shall not be confused with climate protection measures. From our point of view, climate change has to be closely monitored but adaptation measures have to be worked out yet. **Q15** EUREM-a European training program the European Energy Manager has been tailor-made to the requirements of production enterprises. A qualification concept has been created, training modules based on best-practice applications have been established and a continuous training realized - with nationwide recognition. Till April 2010 1.623 people have become European Energy Managers and are promoting and achieving energy efficiency in Europe. The CHANGE project helps SMEs optimize their energy use by developing a European network of intelligent energy advisors at Chambers of Commerce and Industry (CCIs) and by kick-starting/enhancing concrete assistance to SMEs. Given the estimated potential of 10-20% energy savings that businesses can reach through no-cost or low-cost measures, it's fundamental to make SMEs aware of the benefits of intelligent energy use. Thanks to their close daily contacts with the business community, CCIs can support SMEs in taking rational energy use better into account.

**1119946481-54 NGVA Europe** **Q9** The road transport sector in the future will need all available technologies by using the potential alternative fuels, due to the growing of world demand. Electric cars will have their niche in the market, mainly focused in urban surroundings. But when we think in urban heavy trucks and buses and particularly heavy on-road transport, we will be obliged to keep the internal combustion engine, but to be fuelled with non-oil derived fuels. In this line we will need other than the liquid biofuels where the sustainability issue is still not clear. The solution is natural gas in compressed and liquefied form (CNG and LNG), complemented with biomethane, as today's best available alternative to reach our goals to make European transport more sustainable. **Q10** The European Union should, in the short and medium term, try to promote economic, reliable and efficient technologies to solve today's problems, specially the air quality in big cities. When talking about alternative and clean fuels, Natural Gas/biomethane appears as the only real alternative giving risk-free and guaranteed results in both, regulated emissions and CO<sub>2</sub>. The EU should give incentives to the final customers to promote the replacement of old vehicles (Euro 0, Euro 1, etc) by new cleaner ones. This initiative would also reactivate the automotive industry and the general economy. A specific European action plan to address the refuelling infrastructure issue is needed. Locally produced biomethane from waste in big cities is able to fuel practically the whole fleet of urban buses or garbage collection trucks. This fact would be the base of a "virtuous municipal circle" that should be developed. **Q11** We do not see the need for a link to be put between emissions and credit systems. **Q12** Transport targets need to be reviewed constantly. The possibility of establishing some intermediate targets to any of the available fuels, seems to be convenient. Trying to be technology neutral in any of the big

decisions or proposals will lead to a dead end. There are not many available technologies, we therefore suggest that the EU should give some guidelines to allow any of them to reach a certain market share, otherwise the traditional fuels petrol and diesel, being supported with a lot of financial resources, will continue to be predominant. **Q13** Sustainable growth with a guarantee of available energy should be in the first place. Clean air in cities. **Q14** The most vulnerable sector is Transport, which therefore needs more attention in R&D activities. One important aspect covers the need to introduce European transport policies regarding connecting the main transit routes for heavy road transport with alternative fuels. LNG (Liquefied Natural Gas) opens the way for an alternative low-carbon freight transport infrastructure. LNG terminals are already available around Europe. LNG in ships is another interesting issue deserving more attention (several ships already operate in Norway. One of the big passenger/car ferries burns as much fuel as 75.000 passenger cars). Hydrogen/Natural Gas blends need more attention as well, as these mixtures pave the way for production and distribution of hydrogen. Substituting 30% of NG with hydrogen possible, no engine resetting, no storage problem, immediate additional CO<sub>2</sub> savings. **Q15** Heavy urban vehicles running on Biomethane constitute a fantastic example of a success story. Other successful examples for passenger cars: Sweden has a reduction on income tax when buying a company car = up to 8000 SEK (ca. 900 Euros), zero fuel tax on biomethane, low fuel tax on CNG, free parking for methane vehicles in many cities. All of this makes Sweden an exemplary country. Other incentives schemes of this kind can be found across Europe proving that NG/biomethane in transport is a fully accepted and consolidated technology. There are currently 1,3 million vehicles in Europe (market share of only 0,4 %) and more than 12 million CNG vehicles in the world. In number of vehicles in Europe Italy is leading with 700.000 NGVs followed by Germany with 90.000. Both countries have introduced very successful national support schemes. Main driver remains the gas industry though. EU policies would lead to further market expansion.

**11290674627-70 Sir Joseph Swan Centre for Energy Research** **Q9** We would draw attention to the following technologies in view of the scale of the opportunity for rapid deployment:- • Carbon Capture and Storage (CCS) – very important in the more industrialised parts of Europe because CO<sub>2</sub> from other manufacturing plants can be fed into the pipeline facilities for power stations. • Underground Coal Gasification linked to CCS – important in countries which have extensive deep coal resource. Important also for energy security. • Offshore wind – there is an opportunity for rapid roll-out in the North Sea, leading to jobs. • Biofuels – there is a need to accelerate the deployment of sustainable biofuels. • Electric Vehicles – an opportunity for technology leadership along a path which may lead to fuel cell vehicles. It is important to allow countries to play to their strengths with respect to availability of resources (sun, wind, waves, biomass, shallow heat, CO<sub>2</sub> sequestration capacity etc). **Q10** Copenhagen was a major disappointment: the EU should lead a process for securing long-term binding targets. Create regulatory/fiscal certainty for investors once they have committed to their investment - grandfathering. Find a way of putting an acceptable floor under the CO<sub>2</sub> price. Increase the investment in Energy R&D. Police agreements effectively. **Q11** These complications get in the way of making the basic system work. The problem is with the cap - not the trade. Everyone knows the cap is too low - hence the low trading prices. **Q12** What is needed is a stable environment for individual projects - which is a grandfathering arrangement. However, mid-term objectives and some clear milestones are very helpful in stimulating R&D. **Q13** After climate change mitigation comes energy security, then energy-sector jobs. For those jobs to be sustainable and numerous, they need to be at the high-tech end of the spectrum. **Q14** The Stern report covers this well, pointing to health effects, mass migration etc. We need to avoid getting too engrossed in the adaptation agenda (which Stern

says will cost at least 5 times as much as avoiding the problem in the first place) until we have our mitigation plans properly underway and active. Then we can move on to things like a policy for water resources, clever ways of underpinning the cost-effective production of food, feed & fuel simultaneously etc.

**11458103335-07 European Geothermal Energy Council Q8** The roadmap is about a low carbon economy by 2050. The European Council has given a long term commitment to the decarbonisation path with a target for the EU and other industrialised countries of 80 to 95% cuts in emissions by 2050. To reach this objective we do not have to speak about low carbon economy but about carbon free economy. It means two things: First, the electricity and heating and cooling sectors must be completely decarbonised: carbon capture and storage and nuclear energy (large CO<sub>2</sub> emissions during exploration, construction and decommissioning phases) are not a sustainable and a long term options. Secondly, the only possibility to have a carbon free economy is to develop much more renewable energy sources. Along them, geothermal will play a key role providing a renewable electrical base load and heating and cooling. The Geothermal have the resources to supply at least 20% of Europe Global Energy consumption in 2050. **Q9** Challenged by climate changes, the need to secure sustainable economic growth and social cohesion, Europe must achieve a genuine energy revolution to reverse today unsustainable trends and live up to the ambitious policy expectations. A rational, consistent and far sighted approach to energy supply is critical for ensuring such transformation. Geothermal is the only source of renewable energy capable of driving a consistent and reliable (24h per day, 365 days per year) energy production. The Geothermal have the resources to supply at least 20% of Europe Global Energy consumption in 2050. The technology is available, should be proven all over Europe in various geological conditions by 2020 and become competitive with other sources by 2030. For large scale development there may be need of some kind guidance / direction with objectives put in place by the authorities to make things happen at this scale: European risk insurance scheme, regulatory framework, public awareness etc. **Q10** The EU's energy policy should tend to have a long term 100 % RES mix scenario. Barriers to remove are: - New binding RES targets must be established for 2030, with a sectoral approach (electricity, heating & cooling, transport) - The competition on the electrical market must be improved. - The externalities of energy production are largely related to health, environmental degradation and social aspects. These costs are real and should be adequately internalised. In order to have a real and fair comparison, additional costs (for example: network, regulatory, storage etc.) must also be counted. - Removing subsidies to fossil fuels and nuclear and applying the 'polluter pays' principle to the energy markets, would go a long way to level the playing field. - A CO<sub>2</sub> tax must be created at a high level reflecting the environmental and social costs. - The SET plan, being the EU technology policy, remains technology neutral. It has now to endorse all RES technologies and especially geothermal **Q11** The EU's Emissions Trading System puts a cost on emitting CO<sub>2</sub>. By auctioning permits to the power sector for emitting CO<sub>2</sub>, major polluters have to pay for releasing greenhouse gases. It sends a clear message to investors: the cost of climate change, currently borne by society, will be increasingly shifted towards the polluter. Such a system must be replicated at a global level The initial phase of the EU Emission Trading System (2005-2007), did not function effectively: over-allocations resulted in billions of Euros in windfall profits and EU emissions have not been reduced. The 2008 ETS reform plans for a real price of carbon post 2012 - through full auctioning in the power sector. We should use this experience in order to design the international carbon markets. **Q12** In order to achieve a carbon free economy, Binding Renewable Energy Targets for 2030 are needed: As investment decisions in the energy sector are of a long-term nature and as 2020 is at our doorstep, the European Union should quickly proceed with fixing binding renewable energy targets for

2030, continuing its commitment towards developing this prosperous economic sector. A political discussion should start soon between all 27 EU Member States on the 2030 horizon in order to set the right framework towards a 100% renewable energy supply by 2050. **Q13** To cut emissions in such a order, we must go towards a carbon free economy not a low carbon one. All measures mentioned above are essential for our sustainable development. But to answer this challenge, only one solution exists: the renewable energy sources. Sustainability encompasses not only ecological but also economic and social aspects, which must always be considered collectively and in their interactions. A 2009 study by HSBC concluded that the three most promising sectors in terms of social return, job creation and relevance to the recovery of the global economy are renewable energy, building efficiency and sustainable vehicles. Geothermal energy: a local answer, ecological and efficient, to reduce energy costs: friendly for the environment: contribution to the reduction of CO<sub>2</sub> emissions A safe and controlled technology: not depending on climatic conditions an answer to different energy needs: electric power, heating, cooling, hot water **Q14** The current energy, economy and climate challenges call for more ambitious objectives than just a new energy strategy. To meet these challenges, we need a radical shift in the way we produce and consume energy. The development of sustainable and affordable energy, thanks to renewable energy sources (RES), will be the key to a new industrial revolution. The creation of a strong common energy policy is required to answer this unique challenge. This new approach must lead to more ambitious goals (as 100% RES by 2050, with a 20% contribution from geothermal) and a deeper integration of the markets. **Q15** Hardly anyone could imagine how fast the renewable energy sector has developed over the past few years. All forecasts on the expansion of renewable energy have consistently been surpassed. Within just two decades, renewable energy has developed from an alternative energy source in a niche market to one of the most important energy sources worldwide and a driving force for a sustainable 21st century economy. Renewable energy is currently on its way to becoming the mainstream source of Europe's energy system in the conceivable future. By the end of 2009 the renewable energy sector secured more than 10% of Europe's final energy consumption, provided one-quarter of the EU's binding 20% greenhouse gas reduction target (or 7% CO<sub>2</sub> reduction against 1990 emissions), over 550,000 high quality jobs, and had an annual turnover exceeding €70 billion. **Additional Comments** EGEC welcomes the intention and initiative of the European Commission to show the path towards a secure, sustainable and competitive European energy system. EGEC is committing itself to actively support a transition into an energy economy which is fair to all EU citizens, provides a level playing field for all actors on the EU scene, and aims at the goals of efficiency, sustainability, security and conservation of the local and world-wide environment.

**11495514257-89 NOAH Friends of the Earth Denmark** **Q9** The EU should strive for a No Carbon future without Nuclear. Friends of the Earth Europe commissioned in 2009 a report with Stockholm Environment Institute that presents a scenario of how EU can achieve 40% cuts in domestic emissions by 2020 and 90% by 2050. "The 40% Study" <http://www.sei-international.org/publications?pid=1318> Here we point to 1) The most efficient and cost-effective instrument: energy savings, secured through socially balanced taxation. 2) Energy efficiency through insulation of buildings, improving standards and requirements (cf. Eco-design and End Use EE directives etc.). 3) Technologies based on renewables like sun, wind, geothermal, wave, tidal and existing hydro. 4) Some solid biomass with cogeneration, district heating, heat pumps and smart grids. 5) Restructuring of transportation by inter alia: Transport Demand Management; taxes and congestion charges; upgrading and expansion of collective transportation, mainly rail / light-rail. **Q10** EU's emissions reductions targets must be set with respect to delivering a fair share of the global effort that is necessary, i.e. respecting the



remaining available carbon budget as the frame. The EU should consequently reduce nearby 60%. This we unfortunately cannot see happen domestically. We took part in the abovementioned “40% Study” and remain convinced that this is possible. The remaining 20% can be managed through programmes in developing countries delivering renewable energy supply systems. This is not equivalent to CDM projects because it is something that comes on top of what maximally can be accomplished within the EU. CDM in its current shape is only serving as an excuse for insufficient domestic efforts. Just as stringent targets on the EU level are needed, national climate laws are needed as instruments for the achievement in each Member State. This is of course a matter for each MS but we recommend that it is brought into the room of the European Council. **Q11** NOAH strongly urges the EU not to work for an extension of the ETS. In the first place ETS has not proven to be effective in reducing emissions. Enlarging the market is not likely to make it more efficient but would start a race towards the bottom. Market based solutions, be it the ETS or CDM have proven to be inefficient. An increase in the scale of a carbon market will increase speculation and fraud. Instead the EU must use instruments that are safe, expedient, easy to understand for the general public, not rife with loopholes and opportunities for fraud such as taxes and regulation. A carbon market can only be an instrument for emissions reduction if the stress is on the cap rather than the trade. In the case of the ETS, grandfathering made it run aground. The efforts that the EU should finance in developing countries should be separated from the domestic efforts in a way as is proposed in the Greenhouse Development Framework: <http://gdrights.org/> **Q12** Midterm objectives of 2020, 2030 and 2040 are quintessential to reach the demanding target of 95% reduction by 2050. Even more so because the trajectory towards the goal is just as significant as the goal itself. The emissions must be reduced along an exponentially decreasing path in order to respect the remaining carbon budget mentioned in item 10. The reduction rate must be at least 6 per cent annually, starting now. This is a very demanding scenario and it leaves no room for ‘false solutions’ like nuclear (fission any generation or fusion) or CCS. Either we recognize the challenge now or the next generations will face unprecedented hardships waging war against rising sea levels, more severe droughts, more instances of torrential rain, severe stresses for agriculture and fisheries on which we all depend. And on top of that our children will have to face influx of millions of refugees from areas of the World harder hit by climate change. **Q13** A vision of the benefits is crucial. As said: jobs, but better jobs; cleaner air; fewer casualties on the roads; less noise; longer and better lives; less conflicts as the needed transformation must include equity on a new scale. Some people may find it inconvenient to see giant windmills erected in their familiar view. But this has to be negotiated with the risks that we face if we continue BAU. Villages erased by coal mining. Insecurity due to carbon storage underneath your home. Nuclear waste stock piling. The cheap oil is sure to peak soon. Maybe faster than we can accommodate if we do not act now and become independent. The same applies to coal, only later. The transformation needs R&D over a broad range of subjects from renewables to integration and smart grids, efforts to drive energy efficiency forward, the whole range of issues in the transportation sector, a total change in the agriculture and food production towards more localised, organic production with less meat. **Q14** Briefly: Agriculture and forestry will likely be most vulnerable. The CAP must be changed towards sustainable practices with less meat production, less stress on the agricultural land. Low lying areas should be taken out permanently, so it can serve as reservoirs in case of flooding. This should be supplemented with methods to regulate the impact of heavy precipitation in cities by increasing ways for the water to seep into the ground (increase areas without covering). Increase afforestation. But the whole fabric of the modern society is facing insecurity when the ample supply of cheap fossil energy runs out. Then the farm land may become the most safe asset. It all depends upon the courage of the present generation - of politicians, researchers, professionals, businesses and



citizens. **Q15** We want to point again to the “40% Study” (see above re **Q9**.) Also we will point to the report from the Danish Commission on Climate Change Policy, despite its forecast of growth, its weak recommendations regarding transportation and its over reliance on biomass. It is a national vision for phasing out of fossil fuels without recourse to nuclear, CCS and offsetting. It recommends: “That an overall statutory framework be established for the vision of Denmark becoming independent of fossil fuels and achieving significant reductions in greenhouse gas emissions.” “That the government establishes long-term framework conditions, including expected taxes. The framework conditions should provide all players with a basis for planning and implementing relevant initiatives.” “That, on the basis of the national vision of fossil fuel independence, municipalities implement strategic energy planning, which includes planning of future types of supply...” <http://kortlink.dk/klimakommissionen/8fba> **Additional Comments** We submit here a study on CCS we published earlier this year.

**12493392840-79 EURO CITIES Q9** - Exploit the huge potential available in integrated actions in big cities: targeted investment in city/city-neighbourhood pilots, providing critical mass testbeds; transnational exchange between cities can then foster further deployment and joint procurement. In particular, support the conversion of the large amounts of waste and biomass produced in cities to energy for vehicles (biogas), buildings and industry. - The EU should stimulate smarter energy modelling which is managed in a smarter way. Digital technologies will be key to this. - Seek models to integrate energy demand and supply on a city level. - Technical assistance for capacity building around city governance and integrated planning, including energy planning - Better information on energy consumption from a consumer perspective which can also be linked to an integrated transport system - A greater emphasis on district heating and cooling - Decentralised energy production and the development and linking up of smart grids **Q10** - The EU should ensure that the flagship initiatives developed under Europe 2020 are rooted in the reality of the local level. Multi-level governance, better coordination between levels of government and harnessing the potential of Europe’s cities and metropolitan areas are essential. Further explore financial engineering and new mechanisms and partnerships to ensure the required funding is available, particularly given public sector austerity budgets. In particular, gap funding is crucial to bridge the upfront costs of investment and the long payback time for carbon reduction measures. The contribution of public-private partnerships and energy service companies can be much supported through gap funding as well. Target available funding through initiatives that can achieve the greatest impact, lever in additional resources, create green jobs, and provide the examples, lessons and momentum to drive forward the innovation necessary to achieve this objective. **Q11** - Cities account for up to 80% of global energy consumption. We would like to see a greater clarity on how the EU Emissions Trading Scheme and the revenues it generates can help support investment to reward demonstrable carbon emission reductions in our cities. **Q12** - The idea of a mid-term objective in 2030 could be helpful. In addition, we believe it is also essential to recognise that cities, as the major users of energy and sources of GHG emissions must have a more central role in leading the way to a low carbon economy in 2020 and 2030. **Q13** - Top of the list of priorities should be increasing energy security and lowering our vulnerability to external energy shocks. This should be followed by accelerated innovation, extra jobs and sustainable growth. Followed by cleaner air. - In order to maximise the benefits the EU should reduce the demand and generate as much energy within Europe as possible. A clear strategy and approach are needed for how to reduce energy demand and stimulate more renewable energy. Localized energy generation should also be a priority. **Q14** - Most vulnerable sectors are water, energy and transport infrastructure and health. - Encouragement and support for initiatives in cities to guarantee their own water and energy

security. - Localized energy generation to reduce the length, and thereby the vulnerability of transmission networks **Q15** - The EUROCITIES Declaration on climate change, signed now by 89 cities, presents a vision for addressing climate change in an integrated way at city level, including areas such as energy efficiency, sustainable urban transport, renewable energies, sustainable urban planning and international cooperation. It is available at [http://www.eurocities.eu/include/lib/sql\\_document\\_card.php?id=8322](http://www.eurocities.eu/include/lib/sql_document_card.php?id=8322) - Cities are continuously implementing a multitude of actions in the areas mentioned above. You can find a selection of them in our publication on “Cities 4 Climate”, available for download (25KB) at [http://www.4shared.com/document/bLccsVfU/Cities4Climate\\_final\\_reduced.html](http://www.4shared.com/document/bLccsVfU/Cities4Climate_final_reduced.html)

**12955024114-93 Vattenfall Q9** A diverse portfolio of technologies is needed and winners should not be picked beforehand. The main task must be to identify a pathway where resources, new and existing, are effectively used. In parallel with renewable energy sources the options for nuclear power and energy from coal and gas with CCS as well as CHP on district heating must be kept open. Further harmonisation of legislations and licensing schemes for nuclear power is important to make nuclear a realisable option. It is important that adequate attention is paid to securing sufficient reliable power generation capacity to assure network stability and affordable electricity costs for European consumers. It is also essential to stimulate the development of infrastructure that facilitates a cost-efficient development of the energy system. For a cost-efficient allocation of investments a credible timeline for climate targets, the development of the Internal Market for energy and a well functioning CO<sub>2</sub>-market are essential. **Q10** The most important short-term initiative from the EU is to adopt a clear and credible timeline with decadal climate targets (2030, 2040, 2050). The targets should be set in advance and be changed with caution – if at all necessary - as that directly effects today’s EUA prices. The preconditions would then be set for making the investments needed based on a predictable CO<sub>2</sub>-price signal. When it comes to accommodate large amounts of renewable and intermittent electricity and CO<sub>2</sub> storage and transportation, massive investments in energy infrastructure are needed. Investment friendly and harmonised regulatory framework conditions, public acceptance and shorter lead times must be handled by the EU without delay. The EU Commission should fulfil its ambitions to support the building of CCS demonstration plants until 2015 and promote conditions for full commercialization after 2020, including support in the strive for public acceptance for both storage and the necessary transport pipes. **Q11** We see the EU ETS as the cornerstone for delivering CO<sub>2</sub> reductions in Europe. We are positive to linking the EU ETS to other schemes as well as widening of the scheme to other sectors, but thorough impact assessments are needed to make sure that the environmental integrity of the system remains. In the short term indirect linking through project-based and sector crediting mechanisms would be an option. Bilateral agreements allowing for an international offset mechanism such as CDM and JI is desirable in the absence of a second and third Kyoto period. It is important though that the use of international offset mechanisms go in line with the ambition that is needed for domestic efforts within the EU. If going through with new mechanisms they need to be certain and transparent. In the transition to a low-carbon economy large capital expenditures are needed. The roadmap should take into account how revenues from auctioning of allowances are best used to stimulate that transition. **Q12** A credible timeline for CO<sub>2</sub> reductions make investment conditions more stable. We support for that reason that intermediate climate targets for 2030 and 2040 are implemented. For competitiveness reasons the targets adopted in the EU should reflect the outcome of the global climate negotiations. The targets should take into account a fair distribution of efforts between the trading sectors within the EU ETS and the other sectors in the economy. The targets should be accompanied with fully integrated power markets and well functioning CO<sub>2</sub> markets so that the price signal for investment decisions is preserved

and effective. **Q13** The focus of the climate policy should be on delivering reduced emissions at a cost that is acceptable for private and industrial consumers. If targets and policy instruments are implemented in a coherent and coordinated way the transition can also be made in a cost-effective way. Consumers and citizens are crucial to make the transition towards low-carbon economy happen. They need to finance a lot of investments and not the least accept all the changes that needs to be done in their daily environment, as large scale new build of renewable energy, transmission lines, CO2 storage etc. If consumers face too high costs the whole road towards a low carbon economy might be put at risk. Well designed, market-based policies and regulation can play an important role to foster effectiveness, lower costs to the consumers and stronger acceptance of the changes needed. **Q14** We do not have specific views on which sectors might be most vulnerable to climate change, but would like to see support for adaptation measures to be based on demonstrable needs and objective criteria and the design of adaptation policies to be based on cost-efficiency principles. **Q15** Vattenfall's business strategy includes being among the leaders in developing environmentally sustainable energy production. • We are rapidly increasing our use of biomass in our generation and are a leading actor in the development of the global market for biomass. • In 2010 Vattenfall inaugurated the world largest offshore wind farm, Thanet (300MW), off the coast of England, making Vattenfall presently No. 1 world-wide in offshore wind power. • In 2008, Vattenfall began the operation of the world's first ever oxyfuel CCS pilot project unit at Schwarze Pumpe in Germany. Further research will secure successful scale-up to the oxyfuel demonstration plant at Jämschwalde and future large scale CCS projects, as e.g. Magnum in Netherlands. • We are heavily involved in the electrification of transport, where we focus on easy and accessible charging. We are having partnerships with Volvo in Sweden and BMW in Berlin to push the adoption of electric vehicles.

**1414929419-24 WWF European Policy Programme** **Q9** The question states without justification that all of the named technologies are 'needed'. This is not the case – there are any number of 2050 scenarios that do not rely on nuclear energy, for example, and any inclusion of CCS can only be called speculative. For instance, the recent Roadmap 2050 Report published by the European Climate Foundation showed that a European electricity system based on 100% renewable energy system was technically feasible, without endangering system reliability and at an economically affordable cost. WWF is also preparing a global 100% renewable energy vision that will be released in January 2011. --> the continuation of the reply to this question is in the accompanying document. **Q10** - A 40% 2020 reduction target of which at least 30% will be achieved within the EU, with appropriate adjustments to ETS, effort sharing and other legislative instruments; - A 95% 2050 target to accompany a comprehensive assessment of policies to reach the goal. - The EU should strive to achieve an international legally binding agreement on climate change. - Redirection of public funding toward the public good: ensuring European expenditures not only avoid negative impacts (climate proofing) but also contribute to deep reductions. This will mean a significant realignment in most funding areas. Cohesion policy only spends 2.9% on energy, and project implementation is lagging behind. --> the continuation of the reply to this question is in the accompanying document. **Q11** The cap under the post 2012 phase of the EU ETS should be adjusted in order to take into account of the combined effects of overallocation and the economic downturn with the goal to enhance the EU carbon price thus stimulating investments in renewables and energy saving technologies. The EU 2020 objective should be adjusted to a 40% reduction target, of which minimum three-quarters of the reduction effort is to be achieved within the EU and not through offset mechanisms. The EU ETS should be adjusted to the -95% emission reduction path by 2050. An increase in the overall EU emissions reduction target must therefore lead to a tighter ETS cap, and in particular to

doubling of the annual linear reduction factor. --> the continuation of the reply to this question is in the accompanying document. **Q12** There's no lack of resources, the question is how investments are allocated according to the 2050 climate scenarios. The EU needs to clarify the investment requirements 2010-2050 and commission key private financial market actors to participate in designing an enabling framework that will materialize the investments needed. This means setting us off on the right foot with a meaningful 2020 target (e.g. 40%), and an endpoint target for 2050 (95%). Once, but not before, these are established the 2050 target may very well be marked by milestones per decade. --> the continuation of the reply to this question is in the accompanying document. **Q13** There are a number of studies indicating the least-cost pathway to 2050 decarbonisation, as well as several indicating the employment, social and health impacts of different policies. We highlight the following: - RECIPE – a Report on Energy and Climate Policy in Europe, conducted by the Potsdam Institute for Climate Impact Research (PIK) and four other European research institutes for Allianz and WWF found that effective climate protection measures would cost just one year of delayed economic growth by 2050. However, wasting the next decade before taking meaningful action on climate change would result in an increase of mitigation costs of at least 46 % compared to early action. [http://wwf.panda.org/who\\_we\\_are/wwf\\_offices/germany/?179241/New-recipe-for-a-fast-acting-Europe-to-profit-from-going-it-alone-on-climate-action](http://wwf.panda.org/who_we_are/wwf_offices/germany/?179241/New-recipe-for-a-fast-acting-Europe-to-profit-from-going-it-alone-on-climate-action) --> the continuation of the reply to this question is in the accompanying document. **Q15** WWF has engaged in a number of relevant initiatives: - On 23 November we published the climate policy tracker ([www.climatepolicytracker.eu](http://www.climatepolicytracker.eu)), which indicates both successes and failures of EU and member state policy in a 2050 framework. Highlights include the binding 2050 Climate Change Act legislation in the UK and specific sectoral policies that can be found in every member state – whether the steady frameworks for renewable energy investment in Denmark and Germany, or the ambitious forestry policies in Latvia. --> the continuation of the reply to this question is in the accompanying document.

**1420587986-32 Verband Kommunalen Unternehmen e.V. Q9** In particular, a low carbon economy is not conceivable without a clean and efficient energy supply. Therefore the VKU endorses the further expansion of renewable energy. As the national support systems serve this purpose quite well, a harmonisation to a European support scheme is not recommended. CHP already provides a significant contribution to CO<sub>2</sub>-reduction due to its particular efficiency up to 90%. Harmonised minimum standards for CHP-promotion through member-states would support the European expansion of this low carbon technology. Large-scale investments in energy storages, smart grids, distribution networks and flexible mid- and peak-load electricity generation plants are essential for the transformation of the energy system and should be stimulated. Finally, the VKU approves the expansion of electric vehicles. A broad support of sustainable local mobility concepts must complement the roll out. **Q10** Beside the permanent improvement of the present regulations it remains necessary to inform the citizens about the requirements for a low carbon economy. In particular, the expansion of electricity networks and the construction of new generating plants should be accompanied by a campaign to inform the citizen and promote necessary construction schemes. Furthermore, greater efforts in the energy research are preferable. Particularly, the development of innovative storage technologies has to be supported in order to permanently improve the functionality of the electricity networks. The EU should encourage and support policies of member states trying to enhance the advantages of climate friendly technologies via tax benefits. **Q11** The ETS is the central instrument to achieve a low carbon economy within Europe. However, the system leads to a biased competition on international markets, which is only partly avoided through separate treatments for industries facing the risk of carbon leakage. The further development to a global emission trading scheme should remain the



primary long-term objective. The VKU therefore recommends political efforts to establish agreements with countries outside the EU borders to widen the trading scheme.**Q12** For the purpose of investment protection the prior aim of the EU must be the creation of a stable legal framework. The EU has to assure a long-lasting commitment to once taken political decisions. This will increase the binding character of European policies and in turn lead to more planning dependability for the private industry.**Q13** Sustainable economic growth within the Community should be a major objective for any European policy. To achieve economic growth, however, market mechanisms should only be restricted if gains of regulation are high. Especially smaller enterprises have to be protected from excessive regulations to perpetuate a high level of competition. This will increase the benefits for consumers as well as the economy as a whole. Furthermore, the ETS alone cannot guarantee that all countries make efforts to clean up the local air as the trade with emission allowances gives rise to uneven burden-sharing between high-emission and low-emission countries. Therefore, efforts to expand energy efficiency and a clean energy supply on the level of member states remain necessary. National support systems for renewable energies as well as cogeneration satisfy these needs.**Q14** The impacts of climate change will influence several industries. In the energy sector extreme weather conditions like severe storms or dry periods will affect the energy supply in many ways. As to name a few, expected water shortage during the summer may cause serious problems for the cooling systems of thermic power plants and network infrastructures may be damaged through the increasing emergence of storms, floods and drastic variations in temperature. Consequently higher investments will be necessary to adapt generating plants and networks to the climate change. Therefore efforts of energy suppliers and network operators to guarantee a stable energy supply should be supported by the EU. The resulting financial burdens have to be taken into account within the European regulation framework.**Q15** The expansion of communal collection of biogenic waste (area-wide bio-waste container, collection of waste grease etc.) enables the usage of bio-energy in the urban area. Several studies have proven the positive climate effects of bio-energy production in Germany and other European nations. Demonstration projects of so called “Zero Emission Villages” respectively “100% Renewable Energy Villages” in the rural area are projects with a high international perception and multiplier effect.

**15188031940-74 European Association for Coal and Lignite** **Q9** Efficiency measures are most important in the short and medium term to deliver CO<sub>2</sub> emissions reductions at the lowest cost. Government initiatives have focussed on end-users where the potential savings are greatest, but where life-style choices mean that savings are difficult to realise. Benefits are often taken in the form of greater services (e.g. more warmth, light or travel), rather than reduced energy consumption. Upstream energy efficiency, e.g. at power plants, can deliver CO<sub>2</sub> reductions with much greater certainty. Improving the efficiency of a coal-fired power plant reduces emissions, by 30% or more in the case of renewal of the oldest plants. Upstream efficiency is largely ignored by policy makers and industry is reluctant to invest to improve efficiency because of the uncertain market and regulatory environment within which coal-fired power plants operate today. Only short-term investments can be contemplated. Longer term, to 2050, the most important technology will be CCS.**Q10** More should be done to encourage high-efficiency coal-fired generation and the substantial CO<sub>2</sub> savings that could be made through the replacement and modernisation of older plants. Legislation for infrastructure development and energy efficiency is needed, including for CO<sub>2</sub> transport and storage. More attention needs to be given to the socio-economic aspects of CCS. Allaying public fears on CO<sub>2</sub> storage and securing adequate financial support will be crucial to move this technology forward. In the short term, decarbonisation should be only one objective and one that should not dominate, given the current weakness of international climate change



negotiations and fragile state of the global economy. Industrial competitiveness and security of energy supply cannot be subordinate to sustainability. Evidence shows that the richest economies are also the cleanest, so economic development should go hand-in-hand with climate action. **Q11** This question sensibly highlights the major flaw in an EU-wide trading scheme: it isolates Europe in its efforts to tackle what is a global issue. High carbon prices are needed to drive deep cuts in CO<sub>2</sub> emission, but high prices are economically damaging, especially if industries in other countries are free to emit and export their products to the EU. It is therefore crucial that the EU ETS is open to emission credits generated elsewhere. This is likely to dampen emission allowance prices in the EU, but without compromising the global objective of significantly reducing GHG emissions (not just CO<sub>2</sub> emissions) at the lowest cost. Unilateral action in the EU does not address the climate challenge, so the EU must integrate the ETS with bilateral agreements, sectoral crediting and trade in international credits. **Q12** In the EU roadmap to 2050, coal's future role should be scrutinised more closely as part of Europe's long-term decarbonisation goal and related energy policy decisions. Any assumption that the 2050 objective can be met without coal and without CO<sub>2</sub> capture and storage (CCS) for gas and coal use must be questioned from cost and security of energy supply perspectives. A mid-term objective for 2030 would not be helpful; it would potentially discredit the 2020 objectives which are already challenging enough and may not be met. The EU must earn political credibility if it is to influence the other major economies around the world on climate policy. This means that specific EU targets must be measurable, achievable and realistic. Today, they do not meet all these criteria. **Q13** Increasing EU energy security and lowering our vulnerability to external energy shocks should be the most important measures. To achieve the benefits listed, more investment is needed to replace and modernise old coal-fired power plants. This can be justified initially by the cost-effective CO<sub>2</sub> savings from improved efficiency, and can include enough design flexibility to retrofit CO<sub>2</sub> capture and storage (CCS) and so meet longer-term targets. By promoting today, high-efficiency power plants that are CCS-ready, the EU could follow a "no-regrets" strategy that leads to a low-carbon end point without compromising EU competitiveness or energy security in the short term. **Q14** An important point to note here, and one that is largely ignored in the climate debate, is that the world must face all the predicted negative impacts over the next century, regardless of what mitigation actions we take today. The cumulative effect of GHG emissions emitted over the last century, coupled with the large inertia of the global climatic system, means that mitigation measures can only benefit future generations, today's population will not live to see the benefits. In the interim period, the most vulnerable sector to the negative impacts of climate change is the built environment which is threatened especially by floods and rising sea levels. Wide-ranging R&D programmes and development policies should be adopted for areas most at risk of such natural disasters. **Q15** The greatest success over the last decade is the remarkable speed with which CO<sub>2</sub> capture and storage (CCS) has moved from being an interesting mitigation option, discussed mainly by academics, to one that has been taken up with enthusiasm by industrialists to the extent that we are now on the cusp of building commercial-scale plants to demonstrate the viability of this technology. Government-sponsored programmes, such as the development of nuclear fusion and the Apollo moon missions, have rarely delivered so quickly (the Manhattan project being a notable exception) and we should now address ourselves to overcoming the remaining hurdles: public acceptance, financial viability and outstanding regulatory issues. **Additional Comments** EU ETS – In an unparalleled experiment, the EU continues to develop the ETS as a central plank in the bloc's response to the climate challenge. Full auctioning of emission allowances during the third trading period from 2013 will see a major shift in the scheme's impact on fuel choice for power generation. The safety nets and national allocation preferences of the past will be replaced by harmonised rules, the details of which are currently being finalised between the

Commission and Member States via the comitology procedure. Even with these new harmonised allocation rules, the scheme will remain subject to future political decisions (e.g. on targets and inclusion of JI/CDM credits) and uncertainties. The rules foresee fuel switching from coal to gas as a desirable outcome, without regard to the consequences of such a shift on economic competitiveness or security of energy supplies in the EU. By 2020, EU dependence on imported gas is likely to reach 73-79%, and rise to 81-89% by 2030, according to the Commission (SEC(2010)1395). Faced with similar levels of energy import dependence, Japan turned to coal in the 1970s and is today the world's largest importer because, unlike gas, coal is available at competitive prices from diverse sources without cartel risks. In the EU, we have the added benefit of indigenous coal which reduces energy import dependence and offers long-term price stability. Unfortunately, given the unpredictability of carbon prices under the ETS, coal-sector investments, particularly in new coal-fired power generation capacity, have almost come to a halt. The plants being commissioned today are the result of investment decisions made over a decade ago, a time when government policy was less fixated on carbon emissions. The utility industry is like a super tanker – it takes years to find out if regulatory and investment decisions were beneficial or not. The ETS experiment risks leaving the EU short of secure base-load generation capacity at a time when it is most needed to balance a massive dependence on imported gas and to backup intermittent renewables. CCS Directive – Without CCS available as a carbon mitigation option, the European Commission has estimated that the cost of a 30% reduction in GHG emissions by 2030 would rise by 40% (SEC(2010)1395). A similar analysis by the International Energy Agency shows that costs would be 70% higher in 2050 to bring GHG emissions back to 2005 levels. As such, CCS is a key technology in the arsenal of measures to reduce GHG emissions at an affordable cost. The European coal industry therefore welcomes the CCS Directive. A number of European coal mining enterprises and power companies are planning to commission the first CCS demonstration power plants by 2015, all over 250 MW. These projects will include the whole process chain: CO<sub>2</sub> separation at the power plants, transport and permanent storage in deep underground geological formations. The CCS Directive adopted by the EU should be transposed in all Member States to allow these projects to proceed quickly. Although the support for CCS under the European Energy Recovery Plan and ETS are both very welcome, additional support by Member States will also be required to ensure that projects proceed as scheduled. The European coal industry warns against mandatory CCS, either explicit or implied through CO<sub>2</sub> emission performance standards. A market-based approach would see CCS deployed in the most cost-efficient way, and policy makers should resist any attempt to interfere with the operation of the current ETS. CCS will be required at coal-fired power plants, gas-fired power plants and in the energy-intensive industries. We cannot today second guess where the cheapest CCS options will lie – that is the purpose of a carbon market and carbon reduction incentives (e.g. renewable feed-in tariffs). Mandatory measures would be incompatible with an efficient market-based solution which could include special incentives for CCS.

**1550133398-72 European Container Glass Federation Q9** It will be crucial for energy intensive industries to have supply of carbon-neutral energy resources. This would have great benefits to reduce the carbon footprint as fossil fuels are for example in the container glass industry only used for production energy but not for the products themselves. **Q10** Carbon neutral reliable and cost efficient energy supply for energy intensive industries. **Q15** A resource efficient Europe and the aim of the European Commission for Europe to become a 'recycling society' could also help to further move towards a low carbon economy. Glass is 100 percent endlessly recyclable. Closed loop recycling schemes allow to significantly reduce

the CO2 footprint of container glass products and therefore help become resource efficient at the same time.

**15997912445-80 Glass for Europe Q9** Since emission from the buildings stock account for about 32% of overall CO2 emission in Europe, championing nearly-zero energy buildings by doubling if not tripling the EU building stock renovation rate, has to be a priority of any roadmap for a low carbon economy. Technologies, skills and products are all available but incentives and targets are missing. For instance, it has been quantified that over 100 million tonnes of CO2 could be saved annually if Europe's buildings were equipped with the existing high performance glazing technologies. If article 9 of the new EPBD is a very positive tool (see above) it does not offer mechanism to increase the building renovation rate. Solar energy technologies need also to be developed in order to decrease CO2 emissions associated with electricity production. Fiscal and financial incentives to building renovations as well as specific mandatory targets should be enshrined in the EU regulatory framework related to climate and energy. **Q10** The renovation of the existing building stock in Europe represents a golden opportunity to kick start the effective transition towards a low carbon economy. The most important initiative the EU should pursue is an ambitious plan for energy efficiency and renewable which includes binding targets for renovation of existing buildings. An encouragement to link financial and fiscal incentives to the best performing products, above minimum requirements, is essential to boost the uptake of best performing technologies and to act as an incentive to further research. Professional training programmes need also to be developed to create long-lasting and European-based green jobs to match the need for qualified labour in the low-carbon technologies sector. It is only by simulating growth of low-carbon technologies and green local jobs, that a bridge can be made between economic competitiveness and reduced emissions. **Q12** A roadmap complemented with mid-term 'compulsory' objectives would most likely have very positive effects for the deployment of green technologies, products and services by sending a clear signal to stakeholders and Society at large. However, it should be accompanied by a comprehensive strategy to maintain research and production facilities in Europe for these green products. Otherwise, the roadmap towards low-carbon technology may only serve to boost economic and technological growth in other parts of the world. An EU roadmap is therefore a very positive move, if and only if it also looks at the legislative and overall environment allowing EU industries to flourish and maintain the lead in low carbon technology development and production. The three parameters of deployment of technologies, research excellence in Europe and local production are essential for this initiative to ultimately allow return on investment and further investments in Europe. **Q13** It is Glass for Europe belief that in order to cut emission by 80% to 95% by 2050, some specific conditions need to be met. This goal has to be shared by all significant actors on the world stage in order to become achievable without jeopardising Europe's industry. In addition, before taking any further emissions reduction targets, the EU need to take into consideration the industries that are exposed to a significant risk of carbon leakage and to make sure that any planned measure would not put at risk the competitiveness of the European economy, its industries and its jobs. In this context, Glass for Europe believes that the EU should foremost consider how to decrease emissions in the building and transportation sector where risks of carbon leakage are less important than in industry, if not inexistent. Only once all potential reduction from these sectors are achieved, should further measures on industrial emissions could be envisaged. **Additional Comments** Glass for Europe shares the objective of the EU to reduce overall CO2 emission and to set in stone this goal and the instruments to reach it in a roadmap for a low carbon economy by 2050. In fact Glass for Europe believes that this road-map should focus on reducing emissions from the building sector. Not only this sector accounts for 32% of Europe's CO2 emissions but the

potential for reduction is tremendous thanks to already existing technologies. For instance, studies have shown that 100 million tonnes of CO<sub>2</sub> could be saved annually if high performance glazing solutions were utilized widely in Europe's buildings. Ambitious plans for Europe to upgrade its building stock would also help save billions of Euro, reduce energy dependence and create local jobs. Glass for Europe feels very strongly that a roadmap to further decrease emissions should equally concentrate on maintaining Europe's lead in research and production of green technologies. This is the only way to stimulate investments production and economic growth in Europe. The roadmap for a low carbon economy should therefore include a comprehensive strategy to maintain research excellence and production facilities for these low carbon technologies in Europe. Should industry not be sufficiently protected against carbon leakage or should manufacturing of these products be constantly called into question by way of exemptions to be renewed, increased pressure on the use of new technologies, raw materials or substances, production and inherently research in low carbon technologies may be delocalised. To Glass for Europe, it would be a shame if in the end the roadmap towards low-carbon technology may only serve to boost economic and technological growth in other parts of the world.

#### **16329274008-54 European Regions and Municipalities Partnership for Hydrogen and Fuel Cells**

**Q9** Many strategic studies indicate that all mentioned technologies will play an important role in achieving EU decarbonization targets; the role of hydrogen as an energy carrier for transport and stationary applications needs mentioning in this list as well. More needs to be done however to integrate these technologies in an intelligent manner at local level. Local decision makers are faced with a choice of many different technologies that if combined in the right way could achieve even better low carbon results. For example the use of hydrogen as an energy storage solution to make a more efficient use of intermittent renewable energy sources could greatly increase the use of these sources. Electric transport includes electric battery and electric fuel cell vehicles as well as fuel cell hybride buses: if the recharging and hydrogen refuelling of these vehicles is linked to clean primary energy sources in an efficient manner almost zero carbon urban transport will be possible.**Q10** The priority corridors as indicated by the EU Commission in the recent EC Communication on the EU Energy infrastrucuture priorities for 2020 and beyond, could accelerate the development of an efficient energy system that integrates load management and energy solutions like hydrogen. This could greatly improve the efficient use of all primary energy sources at local level: Offshore wind parks and their connection to Northern and Central Europe as well as interconnections in South Western Europe to transport clean power to big cities will need the development of load balancing solutions, like the use of hydrogen as storage medium, to ensure an intelligent use of the intermittent renewable power. 2. With regards to transport, the Cars 21 and Green Car Initiatives and the TEN T programme should greatly enhance the uptake of clean transport technologies lile fuel cells and hydrogen. by actively engaging key industrial players in this field. **Q11** Every low carbon roadmap should include most of all a meaningful and consistent effort towards carbon taxation at international level. Carbon or Energy Taxation has been the elephant in the room for too long of all EU Member State and international negotiations on climate change: all agree that it would be the most effective measure if done at a global scale. However the Emission Trading Scheme could play an important role in the development of more political acceptance of carbon taxation and provide important funding for the uptake of new technologies like hydrogen and fuel cells. No evident link has been established of the ETS with support for regional low carbon initiatives: front runner Member States could be rewarded with extra support for regional low carbon incentives. **Q12** In addition to mid-term and longer term objectives, the EU roadmap could facilitate leveraging financing at EU, national and regional level in the short term. Multi level



budget cycles (EU, national and regional) need to be more aligned in order to make an efficient use of available finances in these economic challenging times. **Q13** All suggested actions will only be possible if developed, executed and maintained by "low-carbon-educated" individuals. The EU should more actively engage with national and regional governments to mobilize the educational system to inform current and future generations of the need to be part of the decarbonization efforts in Europe by making sustainable lifestyle choices. Educational systems in Europe have not yet integrated in a structured manner sufficient and up-to-date information on the challenges and (job) opportunities with regards to the use of clean technologies. If a serious effort to develop a structured and coordinated low carbon curriculum for European schools is not made now, the 30-year olds in 2050 will not be able to effectively start raising the envisioned "decarbonized generation" in 2050. **Q14** All energy consuming sectors using fossil based fuels will be vulnerable to climate change as they will need to adapt rapidly to cleaner practices. A pro-active EU policy that translates the 2050 decarbonization goals to concrete and measurable targets in the affected sectors could accelerate the uptake of new technologies. Active involvement and support of local and regional initiatives in the integration of new technologies will be crucial to ensure involvement of key small and medium-sized industries. In addition the establishment of active and effective technology cooperation with developing countries, to integrate clean technologies and leapfrog development. The EU Strategic Energy Technology Plan offers an opportunity to include technology cooperation with developing countries in each of the European Industrial Initiatives and to use the EU Fast Start funding under UNFCCC for short term actions that will also benefit EU's clean technology industries. **Q15** HyRaMP, since its establishment in 2008, has collected an impressive number of regional initiatives that are accelerating the deployment of hydrogen and fuel cell technologies in their energy and transport system. The combination of a thorough evaluation of local industry potential in this sector and of regional innovation policy support, has facilitated the building of effective and close local cooperation, able to attract financing comparable to EU funding levels in this field. Now representing over 30 regions Hy-RaMP is actively engaging with EU institutions and programmes to take the next step in building local industrial value chains and engage local stakeholders in building sustainable hydrogen infrastructures. Regional initiatives like HyRaMP could therefore further facilitate a speedy uptake and coordinated integration of clean technologies. HyRaMP is currently working with the EU Commission to broaden the activities of HyRaMP to all electric mobility applications.

**1651695283-80 INFORSE-Europe Q9** We find that a diverse portfolio of efficient renewable energy, energy efficiency, and restructuring measures are needed. We find that the most important technologies are: energy efficiency (of houses, products, industry, transportation), restructuring of transport to reduce transport needs and turn to electrified transport, renewable energy in the form of windpower, solar heat and power, wave power, geothermal, biomass mainly in the form of solid biomass and biogas, cogeneration, heat pumps, and smart grid solutions including district heating. We do not find needs or benefits of nuclear power and carbon capture and storage (CCS) as we find them expensive and risky solutions that will slow down a transition because of the large resources they require and their centralised nature. INFORSE-Europe has developed scenarios for transition of some EU countries to 100% renewable energy until 2030-50 and of EU-27 to 100% until 2040, see <http://www.inforse.org/europe/Vision2050.htm> **Q10** Revision of the EU-ETS by setting a minimum (floor) price for allowances of 30 €/ton of CO<sub>2</sub>, limit allowances carried over from the 2008-2012 period to the next period by degrading them by a factor 3 or more, reduce sectors that receive free allowances, combine it with support for companies to reduce greenhouse gas emissions, much stricter rules to limit the use of allowances from CDM



projects in EU-ETS. Only CDM projects that are clearly contributing directly to poverty reduction and basic needs of those that implement them should be eligible. A windfall tax shall be introduced for nuclear power in EU. Setting target of 30% GHG reduction by 2020 and 20% firm commitment for energy efficiency by 2050. Use structural funds and other EU-funding much more efficiently to support transition to sustainable energy. Strong implementation of renewable energy directive, Ecodesign, dir, Energy Perform. Bld. Dir. Stronger energy taxation **Q11** The linking of different carbon markets is questionable proposal, as the modalities are very different for different markets, and by linking there is a very real risk of driving all the markets to the lowest performing one, importing the weaknesses of poor markets into originally better markets. We see this with the linkage of EU-ETS with the Kyoto Protocol CDM, where credits from questionable or even counterproductive projects are depressing the EU-ETS, leading to less GHG reductions in the EU, while the CDM credits lead to low reductions in developing countries because of many bad projects. If a linkage was made to another carbon market, The Chicago Carbon Exchange, problems would even be worse. We believe a more efficient and poverty-reducing CDM is possible, but we do not find different markets should be linked. They can be harmonised to improve efficiency of each market. We support a separate mechanism to support mitigation projects in developing countries. **Q12** A stable environment must be based on stable prices of for instance GHG emissions. This is the basis for our proposal for a floor price in the EU-ETS. It is also important to maintain and guard existing, well-working national support mechanisms, such as the national feed-in tariffs for renewable energy. Investments can further be supported by structural funds. A mid-term objective is a very good idea, such as 70% GHG reduction by 2030. In addition there should be indicative targets for GHG's and renewable energy every 2-5 years. **Q13** They are all important: Jobs and increased energy security/less vulnerability of price shocks are the most important for a stable economy, while clean air is most important for health and environment. Clean air is also likely to be an important competition parameter in the future. To maximise the benefits by future climate actions EU should go for solutions that clearly combine climate mitigation with employment, security of energy supply and local environment. Many of the solutions do that: energy renovation of houses, clean & sustainable biomass from local/EU-based sources, increased train and tram transport, renewable energy produced in the EU. Nuclear power and carbon capture and storage (CCS) lead to less employment and less improvement of security of supply than the above-mentioned solutions. For nuclear because most uranium is imported, so it has its own security of supply issue. **Q14** (we do not work on adaptation) **Q15** We have collected a number of good cases in the form of information and training centers, model villages, etc., see: - [http://www.inforse.org/europe/success/SU\\_trainingcenters.htm](http://www.inforse.org/europe/success/SU_trainingcenters.htm) - <http://casestudies.inforse.org/> We have also comments and proposals to EU policies, see <http://www.inforse.org/europe/eupolicy.htm> We include two press releases for the latest policy initiatives. **Additional Comments** We find it very important that the European Commission in its work with a Roadmap2050 includes scenarios without nuclear and CCS and that scenarios are tested with different cost profiles, including situations with high fossil fuel costs, so they form a good basis for decisions in an uncertain future. We propose that the work on Roadmap2050 also includes a scenario for phase-out of fossil fuels until 2040. Comments to the latest policy initiatives (press releases) are uploaded INFORSE-Europe's proposal for revision of EU-ETS is uploaded

**17161564706-16 Polska Grupa Energetyczna SA Q9** One should keep in mind that Europe's emissions reduction targets ought to be complementary to global actions aimed at climate protection. The problem of CO2 emissions is trans-boundary and even a significant reduction of emissions in the EU will not combat climate change, as Europe is responsible

only for circa 13% of global emissions. According to IEA estimations coal will still play a dominant role as a source of world's electricity and heat generation in decades to come. IEA predicts that by 2030 around 44% of electricity globally will be produced from coal. Therefore, development and implementation of clean coal technologies should become a priority. However, current assumptions that CCS will be commercialized in the near future is too farfetched as of today, particularly because of an extremely high cost and lack of social acceptance, which is becoming a growing problem. **Q10** First the EU should work to commercialize clean coal technologies to the level of application indispensable for achievement of more ambitious targets. Then, ensure that our global partners are all on board – as only such common global actions will deliver the desired results in terms of combating climate change. Only when the above-mentioned conditions are fulfilled, should the EU engage in discussions on further climate protection measures taking into account: - security of power supply - solidary burden sharing among EU Member States - creation of “green jobs” in the entire EU - significant support measures for the most carbon-intensive and less - economically developed Member States. **Q11** Sectoral crediting at this point seems not to be a feasible option because of opposition on part of developing countries. CDM mechanism should be continued post-2012 not only for the poorest nations (limited possibility to develop projects there), but also for other developing ones. Additionally, we should think about developing domestic offset mechanisms in the EU to help reduce emissions in new Member States reliant on coal in electricity generation. **Q12** Development of most economically-efficient low carbon technologies should be market-driven, i.e. we should avoid legal measures to artificially increase carbon prices to make some technologies commercially attractive. In the global context, the EU should first make sure our key global partners also commit themselves to long-term emissions reduction efforts, prior to setting new objectives in this regard. **Q13** Increased energy security should be particularly prioritised. However we should make sure that climate protection actions in the EU do not decrease energy security in some Members States due to increased gas imports from outside the EU. **Additional Comments** In the attachment below, one may find a comprehensive summary of the study which assesses the impact of the EU decarbonisation policy by 2050 for the Polish power sector and Polish economy as a whole.

**17284292859-45 Stadtwerke München GmbH Q9** In our point of view the EU should concentrate their R&D-funding on the most promising technologies, which are renewable energy technologies, cogeneration and electric vehicles. Unfortunately, at the moment a lot of funding is spend on technologies which aren't likely to contribute to the decarbonisation of the European economy on a large scale. Especially, CCS takes a lot of funding which then cannot be spent on the further development of renewable energy. We don't think that CCS has a future in Europe. The technology is too expensive and inefficient. CCS power plants have a degree of efficiency which is approximately 10 per cent below the degree of efficiency of conventional plants (hard coal). Additionally, there are not enough storage capacities in the proximity of power plants. **Q10** One of the most important tasks will be the harmonization of the different support schemes for renewable energy within the EU. A more harmonized system would direct investments to the places in Europe where the highest energy yield could be reached. There would be less bureaucratic barriers for investors and cross border investments would become easier. However, all harmonization efforts have to keep in mind that smaller projects by private investors must remain possible. Another major point is that market based instruments should be used to mitigate market distortion due to the rules of the emission trading scheme (ETS). A good example for ongoing market distortion due to ETS is the inclusion of district heating into the ETS. District heating is environmentally friendly. Nevertheless, it is disadvantaged because it has to compete with other heating technologies

which aren't part of the ETS and therefore don't have to pay for CO<sub>2</sub>-emissions. **Q11** An ambitious post Kyoto treaty is a precondition for linking emission trading systems and improving flexible mechanisms like JI & CDM. The EU should therefore foster such a treaty. In this context CDM and JI criteria should be tightened (e.g. sustainability and additionality). Administration and authorization procedures should be improved as well. There is a need for more: • transparency • improved support for applicants • faster approval of projects • equal treatment of similar projects **Q12** A mid term objective helps to increase the predictability for the industry and therefore helps to make the system more reliable. Especially for the Emission Trading Scheme (ETS) predictability is essential. However, it is vital, first to come to a substantial post Kyoto treaty with internationally binding targets. Without such a treaty we don't think that the decarbonisation of the European economy will be possible without endangering the European industry. **Q13** We are convinced that benefits delivered by climate action could be maximised if further policy focuses on balancing the three basic principles of the energy industry: • Security of Supply: in order to secure the energy supply in the long term indigenous energy sources have to be supported. • Competitiveness: in order to guarantee the best possible price-performance ratio the energy policy should help to increase the efficiency of energy production and establish stable and investment-friendly market conditions. • Sustainability: for sustainability reasons the energy policy should set incentives for efficient energy production and energy production through renewable energy. **Q15** By 2015, SWM is to create enough green electricity in its own plants to be able to supply all of the approximately 800,000 private Munich households. This corresponds to consumption of approximately 2 billion kilowatt hours per year. By 2025, SWM even wants to produce enough green electricity to cover the consumption rate of the entire Munich power requirement – 7.5 billion kWh. To attain these ambitious goals, SWM has started the Renewable Energies Expansion Campaign. With the projects realized und initiated so far, SWM can expand its green electricity production from the original 350 million kWh to 2.4 billion kWh per year; an increase of 600 percent. With this quantity of green electricity, all of the approximately 800,000 Munich households could be supplied. Thus the first goal of the expansion offensive would be attained well before the originally intended date of 2015.

**20457441380-38 BDEW Bundesverband der Energie- und Wasserwirtschaft e. V. Q8 •** EU ETS (European Emission Trading Scheme) Directive Der EU-Emissionshandel sollte unbedingt auch zukünftig das Schlüsselinstrument zur Erreichung der Klimaschutzziele für die vom Emissionshandel erfassten Sektoren bleiben. Bei einer Weiterentwicklung des Emissionshandels muss die Konsistenz an den Schnittstellen mit anderen Klimaschutzinstrumenten und -zielen gewährleistet sein. Dies betrifft insbesondere die Maßnahmen und Ziele für erneuerbare Energien, Energieeffizienz und CCS. Hierbei sind insbesondere die grundsätzlichen Anforderungen von Kosteneffizienz, CO<sub>2</sub>-Preisstabilität und Vorhersagbarkeit zu beachten, da diese entscheidende Grundlagen für langfristig angelegte Investitionsentscheidungen in Erzeugungsanlagen und Infrastruktur bilden. Der Emissionshandel muss auch über die EU hinaus auf internationaler Ebene weiterentwickelt werden. • Effort Sharing Decision Die Entscheidung zur Verteilung der Anstrengungen zwischen den Mitgliedstaaten muss überarbeitet und für die Zeit nach 2020 fortgeschrieben werden. Bei der Festlegung von Reduktionszielen für die nicht dem Emissionshandel unterliegenden Sektoren muss der Zusammenhang mit der Emissionsobergrenze für den Emissionshandel und der sektorale Abdeckungsgrad des Emissionshandels in den einzelnen Mitgliedstaaten beachtet werden. Ein besonderes Augenmerk muss in diesem Zusammenhang insbesondere auf mögliche Wettbewerbsverzerrungen und Verlagerungseffekte an der Schnittstelle zwischen Emissionshandels- und Nichtemissionshandelsbereichen gelegt werden. Als wichtige Themen sind hierbei beispielsweise Elektromobilität, Schienentransport,

Fernwärme und elektrisch betriebene Wärmepumpen zu nennen. Eine überarbeitete Verteilung der Anstrengungen zwischen Emissionshandels und Nichtemissionshandelsbereichen sowie zwischen den Mitgliedstaaten untereinander sollte anhand tatsächlich verfügbarer Emissionsminderungspotentiale und damit verbundener Vermeidungskosten und Überlegungen zur möglichst kosteneffizienten Erreichung der Klimaschutzziele vorgenommen werden.

- Renewable Energy Directive Auch die Erneuerbare Energien Richtlinie muss vor dem Hintergrund des Ausbaus der erneuerbaren Energien regelmäßig überprüft und angepasst werden. Hierbei sind sinnvolle Zeiträume zu wählen, die sich am fortschreitenden Ausbau der erneuerbaren Energien in den einzelnen Mitgliedstaaten orientieren. Ziel muss es sein, zu einem gemeinsamen Energiemarkt in Europa zu gelangen. Des Weiteren sollte aus BDEW-Sicht das Ziel angestrebt werden, die erneuerbaren Energien dort auszubauen, wo diese zu den geringsten Kosten den höchsten Output haben. Studien belegen die hohen Einspareffekte, die damit erzielt werden können. Eine Belastung der Stromkunden in Europa über das erforderliche Maß hinaus sollte vermieden werden. Zudem sollten weitere Punkte innerhalb der Richtlinie konkreter ausgestaltet werden. Hier steht nach Auffassung des BDEW die in Deutschland bestehende Zahlungsverpflichtung von Netzentgelten für den in Stromspeichern einzuspeichernden Strom der in der Erneuerbare Energien Richtlinie geforderten Beseitigung von Hemmnissen für Speichertechnologien entgegen.
- Eco-design of energy-using products Directive Die Ökodesign-RL wurde mit der EU-Richtlinie 2009/125/EG vom 21.10.2009 auf „energieverbrauchsrelevante“ Produkte ausgeweitet. Dies ist als kritisch anzusehen, da es vermehrt zu Überschneidungen u.a. mit der europäischen Bauprodukten- Richtlinie sowie der Gebäudeeffizienz-Richtlinie kommen kann. So sollten im Rahmen der Ökodesign-RL nur "Produkte" behandelt werden und nicht "Systeme". Durch die Ausweitung des Geltungsbereichs werden die Auswirkungen noch unüberschaubarer und komplexer. Geräte/Anwendungen werden evtl. nicht mehr nutzbar, da Komponenten nicht mehr vertrieben werden dürfen. Daher ist jeweils genau zu prüfen, wofür und in welcher Form Produkte eingesetzt werden.
- Energy Labelling of products Directive Das EU-Energielabel hat sich bei Haushaltsgroßgeräten bewährt und für eine deutliche marktgetriebene Erhöhung der Energieeffizienz gesorgt. Entscheidend ist, dass keine einseitige Fixierung auf den Energieverbrauch stattfindet, sondern wichtige Gebrauchseigenschaften mit berücksichtigt werden, so dass die Nutzung nicht leidet. Zudem müssen die Labelklassen so gewählt werden, dass sie sowohl einen längerfristigen Anreiz für die Geräte-Weiterentwicklung für die Industrie darstellen als auch die Einsparungen für die Verbraucher klar erkennbar sind.
- Directive on Cogeneration (CHP) Die EU-KWK-Richtlinie sorgt für eine EU-weite Harmonisierung der Kriterien, nach denen eine Förderung der Kraft-Wärme-Kopplung erfolgt. Zudem wurden Rahmenbedingungen zur Bestimmung des KWK-Stroms festgelegt. Diese sind im Einklang mit der für diese Zwecke in Deutschland genutzten FW 308. Die Bundesrepublik hat die Vorgaben der EU-KWK-Richtlinie mit der Neufassung des KWK-Gesetzes (2009) umgesetzt. Dazu gehören vor allem die Einführung von KWK-Herkunftszertifikaten und die Ausweisung der Bruttostromerzeugung in KWK. Eine Neufassung der KWK-Richtlinie ist somit aus deutscher Sicht nicht zwingend notwendig. Die bisherigen Bestimmungen lassen den Mitgliedstaaten sowohl die notwendigen Freiheiten für nationale KWK-Förderung, geben gleichzeitig aber einen Rahmen vor, der etwaige EU-weite Wettbewerbsverzerrungen vermeidet. Die nach KWK Richtlinie durch die EU-Kommission festzulegenden Wirkungsgradreferenzwerte müssen gleichwohl bis zum 21. Februar 2011 angepasst werden. Hier ist auf ein sachgerechtes Verfahren zu achten.
- Directive on end-use energy efficiency and energy efficiency services (ESD) Die Richtlinie zur Endenergieeffizienz und Energiedienstleistungen ist aktuell mit dem deutschen Energiedienstleistungsgesetz (EDL-G) in nationales Recht umgesetzt. Die ESD bietet für die



Umsetzung in nationales Recht verschiedene Möglichkeiten, den Markt für Energiedienstleistungen zu unterstützen, um so die Endenergieeinsparziele zu erreichen. Wichtig ist, dass die Richtlinie bzw. die daraus abgeleiteten nationalen Gesetze auch zukünftig dazu beitragen, ein einheitliches levelplaying-field zu schaffen, auf dem sich der Markt für Energiedienstleistungen, Energieaudits und sonstige Energieeffizienzmaßnahmen entwickeln kann, ohne die Aktivitäten bzw. den Marktzugang einzelner Marktteilnehmer einzuschränken bzw. wettbewerbswidrig zu fördern. Nach wie vor steht die Erarbeitung eines europaweiten Indikator-Benchmark-Systems aus. Dies ist zur einheitlichen Beurteilung des Erfolgs der getroffenen Maßnahmen dringend erforderlich und sollte schnellstmöglich erfolgen.

- Recast Energy performance of Buildings Directive Durch die bestehende Richtlinie ist die Einführung eines Niedrigstenergiestandards für Neubauten ab 2021 bzw. für öffentliche Gebäude ab 2019 bereits geregelt. Der geringe Energiebedarf der künftigen Neubauten muss außerdem zu einem überwiegenden Teil durch erneuerbare Energien erfolgen. Besonders wichtig sind in diesem Zusammenhang die Energiebedarfe für Lüftung und Trinkwassererwärmung, deren Anteile mit besserer Wärmedämmung weiter zunehmen und gegenüber dem Energiebedarf für Heizung stark dominieren. Bei künftigen Regelungen für Bestandsgebäude muss zwingend das Wirtschaftlichkeitsgebot und Technologieoffenheit gewahrt sein. Für Energieausweise (Ausweise über die Gesamtenergieeffizienz von Gebäuden) sollte ein EU-weites Benchmarking eingeführt werden.
- Fuel quality Directive Neben den Biokraftstoffen der zweiten Generation muss auch Bio-Erdgas (Biomethan) Berücksichtigung finden, weil es drei entscheidende Vorteile hat: 1. Bio-Erdgas hat die doppelte Flächeneffizienz gegenüber Bio-Ethanol und Biodiesel und wird zudem aus Reststoffen hergestellt, 2. Bio-Erdgas kann eine beliebige Beimischung zum fossilen Erdgas umgesetzt werden, 3. Bio-Erdgas wird auf heimischen Flächen angebaut. Bio-Erdgas als Kraftstoff ist bezogen auf die Effizienz des Ressourceneinsatzes, des Schadstoffausstoßes und der Klimabilanz allen anderen Biokraftstoffen überlegen.
- Regulation to reduce CO<sub>2</sub> emissions from passenger cars; Proposal for a Regulation to reduce CO<sub>2</sub> emissions from vans Die Randbedingungen sollten hier möglichst scharf gehalten werden. Außerdem wäre eine Berücksichtigung der Gesamtkette notwendig, um umweltfreundliche Antriebe nicht zu benachteiligen. CO<sub>2</sub>-Emissionen sollten gleichermaßen angerechnet werden. Gerade in der Bilanz „well-to-wheel“, also der Summe aller klimaschädlichen Emissionen von der Produktion bis zur Verwendung als Kraftstoff zeigt Bio-Erdgas seine Vorteile. In der Gesamtbilanz können CO<sub>2</sub>-Emissionen gegenüber Benzin um 95% gesenkt werden. Um Erdgasantriebe ausreichend zu berücksichtigen, sollten diese zudem im Rahmen der CO<sub>2</sub>-Flottendurchschnittsbetrachtung für Hersteller als Ökoinnovation gewertet werden.
- Aviation in EU ETS Directive Die Einbeziehung des Flugverkehrs in den EU-Emissionshandel ist sachgerecht, um die Emissionen des Sektors in marktkonformer und kosteneffizienter Weise zu senken. Der bestehende Rechtsrahmen für den Flugverkehr könnte unter Einbeziehung der Schifffahrt und anderen Frachtverkehrs in ein breiteres transportbezogenes Emissionshandelssystem erweitert werden.
- CCS Directive Die EU hat mit der CCS-Richtlinie ein Instrument geschaffen, das die Entwicklung und kommerzielle Einführung von CCS in Europa ermöglichen soll. Damit wurde dieser Technologie der Weg für ihre europaweite Einführung geebnet, die ansonsten mit Blick auf die Akzeptanz dieser Technologie in einzelnen Mitgliedstaaten ausgeschlossen wäre. Wünschenswert wäre es in diesem Zusammenhang aber gewesen, wenn in der Richtlinie die Fragen der Einführung und des Aufbaus einer europaweiten CO<sub>2</sub>-Transport- und Speicherinfrastruktur ausreichend geregelt worden wären. Zwar sind in der CCS-Richtlinie insbesondere ein grenzüberschreitender Transport von CO<sub>2</sub> oder die Nutzung eines grenzüberschreitenden Speichers nicht untersagt. Die Bedingungen dazu aber sind auch nicht näher ausgestaltet und geregelt. Mit Blick auf die Umsetzung der Richtlinie in das jeweilige nationale Recht der

Mitgliedstaaten wäre die Vorgabe eines europäischen Rahmens zur Lösung grenzüberschreitender Rechtsfragen bei CO<sub>2</sub>-Transport und -Speicherung hilfreich gewesen. • Regulation on substances that deplete the ozone layer Die EG-Verordnung Nr. 2037/2000 über Stoffe, die zum Abbau der Ozonschicht führen ist ein erfolgreiches, funktionstüchtiges Instrument zum Schutz der Ozonschicht. Die im Rahmen der Verordnung erfassten Stoffe mit zusätzlicher Treibhausgasrelevanz sollten nicht durch zusätzliche Klimaschutzbestimmungen doppelreguliert werden. Treibhausgasminderungsziele für diese Stoffe können innerhalb des bestehenden Rechtsrahmens in integrierter Weise unter Berücksichtigung der Belange der Ozonschicht verfolgt werden. Antizipierte Minderungserfolge für diese Treibhausgase im Zuge der Weiterentwicklung und Umsetzung der Verordnung müssen allerdings in vollem Umfang bei den Kosten/Nutzen-Analysen und Wirkungsabschätzungen der anderen Treibhausgaspolitiken und Reduktionszielsetzungen berücksichtigt werden. **Q9** • CCS Die Entwicklung und kommerzielle Einführung der CCS-Technologie wird von der IEA nach wie vor als eines der wirksamsten Einzel-Instrumente angesehen, um bis zum Jahre 2050 weltweit die CO<sub>2</sub>-Emissionen der Energiewirtschaft und der energieintensiven Wirtschaftsbereiche um mindestens 20 Prozent zu senken. Europa hat die Chance, im internationalen Wettbewerb um die Führerschaft bei dieser Technologie einen vorderen Platz zu erlangen. Diese Bemühungen werden von Brüssel unterstützt. Leider mangelt es in Deutschland an der notwendigen Akzeptanz für die Entwicklung und kommerzielle Einführung von CCS. Dies findet auch in der immer noch fehlenden Umsetzung der CCS-RL in deutsches Recht seinen Ausdruck. Für die Wasserwirtschaft steht im Vordergrund, dass bei der Umsetzung der CCS-Richtlinie der Schutz des Grundwassers und der Vorrang der Trinkwasserversorgung als Aufgabe der Daseinsvorsorge unter Beachtung der wasserrechtlichen Regelungen gewährleistet sind. • Erneuerbare Energien, Wind, Solar Im Leitszenario 2009 prognostiziert die Bundesregierung für das Jahr 2050 einen Anteil erneuerbarer Energien am Bruttostromverbrauch von 84 Prozent. Von rund 500 TWh Strom aus erneuerbaren Energien sollen dabei rund 260 TWh aus dargebotsabhängigen Energieträgern wie Wind (228 TWh) und Sonne (32 TWh) stammen. Berücksichtigt man, dass die Bundesregierung ihre Ausbauprognose hinsichtlich der PV-Strommengen für 2020(!) im Rahmen des Nationalen Aktionsplans (Endfassung vom 4. Oktober 2010) zwischenzeitlich auf 41 GWh erhöht hat, muss davon ausgegangen werden, dass 2050 möglicherweise mehr als 60 Prozent des Bruttostromverbrauchs durch Strom aus Photovoltaik- und Windkraftanlagen gedeckt werden wird. Aus dem Ausbau der dargebotsabhängigen Stromerzeugung aus Windkraft- und Photovoltaikanlagen erwächst die Anforderung einer Flexibilisierung des Energieversorgungssystems und der Ausbau der Netzinfrastruktur, um die Versorgungssicherheit aufrecht erhalten zu können. Als Optionen stehen hierfür die Steuerung der Erzeugung, die Steuerung der Last und die Entkopplung von Erzeugung und Last durch Speicher zur Verfügung. Dabei wird die Nutzung lediglich einer Option nicht ausreichen, wenn eine CO<sub>2</sub>-neutrale Stromerzeugung erreicht werden soll. Neben der Beseitigung von Hemmnissen bei der Markteinführung von Speichertechnologien und der Überwindung der Akzeptanzprobleme beim Netzausbau ist in jedem Fall eine verstärkte Förderung von Forschung und Entwicklung zukünftiger „neuer“ Speichertechnologien wichtig, um eine Integration der erneuerbaren Energien in das Stromversorgungssystem der Zukunft zu ermöglichen. Dies gilt insbesondere für die Erforschung von Speichertechnologien, die nicht nur den untertägigen Ausgleich gewährleisten können, sondern auch für Langzeitspeicher wie z.B. zur Überbrückung von Windflauten. • Erneuerbare Energien, Wasser Die Wasserkraft repräsentiert die älteste Form erneuerbarer Stromerzeugung. Daher ist ihr Potential im Vergleich zu anderen Formen erneuerbarer Stromerzeugung stärker ausgeschöpft. Der Anteil der Wasserkraft an der Stromerzeugung wird, nach Abschätzung der Bundesregierung innerhalb des Nationalen Aktionsplans für erneuerbare Energien, zwischen 2010 und 2020 um die Leistung von ca. 250

MW und die produzierte Strommenge um ca. 2000 GWh steigen. Damit wären im Jahr 2020 insgesamt 4.309 MW an Wasserkraftwerken in Deutschland installiert. Der größte Teil des Zubaus findet demnach in der Größenklasse > 10 MW statt.

- **Erdgas, Bio-Erdgas** Erdgas hat unter allen fossilen Energieträgern durch seinen geringen Kohlendioxidausstoß und seine hohen Wirkungsgrade in technischen Anwendungen die günstigste Kohlendioxidbilanz. Erdgas ist somit im Wärmemarkt, in der Stromerzeugung und als Kraftstoff flexibel und effizient einsetzbar und idealer Partner der erneuerbaren Energien. Bio-Erdgas als erneuerbare Energie nutzt die Erdgas-Infrastruktur und kann mit der gleichen Anwendungstechnik eingesetzt werden. Es ist speicherfähig, plan- und regelbar und über die bestehende Erdgasinfrastruktur jederzeit verfügbar. Die bestehende Infrastruktur kann damit als Absatzkanal für erneuerbares Bio- Erdgas optimal genutzt und ausgebaut werden. Der Einsatz von Erdgas und Bio-Erdgas in der Stromerzeugung ist eine wirtschaftlich erprobte, aus Umweltgesichtspunkten attraktive und bewährte Technologie. Moderne und flexible Gaskraftwerke sind bestens geeignet, die durch die verstärkte Einspeisung von Strom aus erneuerbaren Energien entstehenden Schwankungen bei hohen Wirkungsgraden auszugleichen. Gaskraftwerke bieten hier wirtschaftliche Lösungen und zeichnen sich durch vergleichsweise kurze Vorlaufzeiten bei Planung und Errichtung aus. Mittelfristig können intelligente Strom- und Gasnetze dezentrale KWK-Anlagen durch Vernetzung zu virtuellen Kraftwerken und so zu schnell steuerbaren Leistungsreserven zusammenschalten. Dem Erdgasnetz kann so eine wichtige Funktion zur Speicherung fluktuierenden Stroms aus erneuerbaren Energien zukommen. Gerade vor dem Hintergrund der Sozialverträglichkeit der Maßnahmen im Wärmemarkt bieten Erdgas und Bio-Erdgas die Möglichkeit für eine schnelle, wirksame und bezahlbare CO<sub>2</sub>-Absenkung und Effizienzsteigerung. Erdgasheizungen lassen sich problemlos mit Solarthermie kombinieren. Bio-Erdgas kann ohne Umrüstungen und zusätzliche Investitionen im Wärmemarkt in den installierten Erdgasheizungen sofort eingesetzt werden. Durch Bio-Erdgas werden die im Vergleich bereits geringen CO<sub>2</sub>-Emissionen von aktuellen Erdgas-Anwendungstechnologien weiter verringert. Im Mobilitätsbereich sind Erdgasfahrzeuge marktreif und in der Lage, sofort einen erheblichen Beitrag zur Senkung der CO<sub>2</sub>-Emissionen im Straßenverkehr zu leisten. Gegenüber vergleichbaren benzinbetriebenen Fahrzeugen ist der CO<sub>2</sub>-Ausstoß erdgasbetriebener Fahrzeuge um rund 25 Prozent geringer. Der Vorteil steigt weiter an, wenn dem Erdgas Bio-Erdgas beigemischt wird. Eine beliebige Beimischung bis zu 100 Prozent ist ohne technische Einschränkungen bei Fahrzeugen und Infrastruktur möglich. Bei ausschließlichem Bio-Erdgas-Betrieb handelt es sich – wie bei mit erneuerbarem Strom betriebenen Elektrofahrzeugen – um Null-Emissions-Fahrzeuge. Beim Vergleich mit anderen Biokraftstoffen weist Bio-Erdgas die höchste Flächeneffizienz und CO<sub>2</sub>-Vermeidung auf.
- **Geothermie/Elekt. Wärmepumpe** Die Wärmepumpe ist eine ausgereifte Technik, mit der erneuerbare Energien besonders effizient zur Raumheizung und zur Trinkwassererwärmung genutzt werden können. Darüber hinaus sind Wärmepumpen oft Bestandteil von Wärmerückgewinnungssystemen. Wärmepumpen-Systeme werden in einer CO<sub>2</sub>-armen Wirtschaft häufig eingesetzt werden. Durch den wachsenden Anteil erneuerbarer Energien an der Strom-erzeugung resultieren aus Elektrowärmepumpensystemen immer geringere CO<sub>2</sub>-Emissionen. Zudem können sie sinnvoll zum Lastmanagement in intelligenten Stromnetzen eingesetzt werden, was bei hohen Anteilen erneuerbarer Energien an der Stromversorgung von großer Bedeutung ist.
- **Kernenergie** Der Ausstieg aus der Kernenergie ist in Deutschland auch nach der neuesten Novelle des Atomgesetzes verbindlich festgeschrieben. Dementsprechend gibt es keine technologische Entwicklung von neuen Atomkraftwerken in Deutschland. Die Kernenergienutzung in Deutschland soll so lange eine Brückentechnologie darstellen, bis ein hoher Ausbaugrad der erneuerbaren Energien erreicht ist.
- **KWK** Das KWK-Gesetz und das Integrierte Energie- und Klimapaket sehen einen KWK-Anteil von 25

Prozent an der Stromerzeugung in Deutschland vor. Das KWK-Gesetz (2009) sieht zu diesem Zweck eine Förderung des Neubaus und der Modernisierung von KWK-Anlagen vor. Zusätzlich werden Neubau, Ausbau und Modernisierung von Wärmenetzen durch einen Investitionskostenzuschuss von bis zu 20 Prozent gefördert. Die Bundesregierung hatte hier erkannt, dass der Ausbau hocheffizienter KWK nur im Zusammenhang mit dem Ausbau der Wärmesenken einhergehen kann. Die Ausschreibung zur anstehenden Zwischenüberprüfung des KWK-Gesetzes und das Fehlen der KWK und Fernwärme im Energiekonzept der Bundesregierung lassen darauf schließen, dass KWK und Fernwärme durch die aktuell Verantwortlichen nicht mit der nötigen Priorität behandelt werden. KWK und Fernwärme bieten neben ihrer überzeugenden CO<sub>2</sub>-Bilanz die Möglichkeit, durch den Einsatz von Wärmespeichern einen großen Beitrag zur Flexibilisierung der Erzeugungsstruktur und somit einen wichtigen Beitrag zur Integration erneuerbarer Energien zu leisten. Durch die Möglichkeit verschiedenste Brennstoffe einzusetzen ist die KWK als effiziente Brückentechnologie hin zum Zeitalter der Erneuerbaren Energien nutzbar. Zudem stellt sie über den Horizont 2050 hinaus eine zukunftsfähige Technologie dar, mit der die Nutzung erneuerbarer Brennstoffe nachhaltig und effizient erfolgen kann.

- Smart Meter Smart Meter werden in der Zukunft ein wichtiger Bestandteil einer intelligenten Energieversorgung sein. Sie bilden die Schnittstelle der Kundenanlagen mit den komplexen Netzinfrastrukturen und dezentralen Erzeugungsanlagen. Mögliche Preisvorteile für Verbraucher und Energieeffizienzpotentiale sind vor der Entscheidung für Art der Markteinführung (marktgetrieben und/oder Rollout) seriös zu ermitteln und wirtschaftlich zu bewerten. Das setzt die im dritten EU-Binnenmarktpaket empfohlene Kosten-Nutzen-Analyse voraus. Investitionen in Zähler / IT / TK-Infrastruktur sowie die erwartbaren Betriebskosten und TK-Kosten für Datenübertragung und Datenmanagement, wobei Fragen des Datenschutzes sowie der technischen Datensicherheit nicht vernachlässigt werden dürfen, bilden die wesentlichen Kostenbestandteile. Mehrwertdienste beim Kunden, demand side management und Optimierungen von Netz und Erzeugung sind zu analysierende Nutzenfaktoren.
- Smart Grid Das Smart Grid ist einer der Kernbausteine zur Reduzierung der CO<sub>2</sub>-Emissionen. Es unterstützt die Integration der erneuerbaren Energien und vernetzt die Verbraucher intelligent. Im Bereich der Stromerzeugung ist das Smart Grid der Schlüssel zum Erfolg – das Smart Grid muss deshalb ausreichend gefördert werden. Eine Förderung ist möglich durch zusätzliche Forschungsmittel; außerdem sollten die Ergebnisse der nationalen Förderprogramme zum Smart Grid auf europäischer Ebene zusammengeführt und bewertet werden. An dieser Stelle möchten wir auf die Aktivitäten in Deutschland hinweisen, die unter dem Begriff „E-Energy – Smart Grids made in Germany“ (sechs Modellregionen zur praktischen Erprobung) stehen. Anfang kommenden Jahres werden weitere Ergebnisse aus den E-Energy-Projekten vorliegen. Der Rolle der Normung und Standardisierung wird beim Smart Grid eine entscheidende Bedeutung zukommen. Es sollten mindestens europaweite Standards angestrebt werden. Im Rahmen einer CO<sub>2</sub>-armen/-freien Stromerzeugung sind auch die Overlay-Netze (z.B. Desertec) von Bedeutung. Neben der Forschungsförderung sind auch die gesetzlichen Rahmenbedingungen insoweit anzupassen, dass Netzprojekte in kalkulierbaren Zeiträumen realisiert werden können. Im Übrigen sind bestehende Regelungen (Datenformate), die heute wichtiger Bestandteil des Marktes sind, in das neue Umfeld des Smart Grids zu überführen.
- Elektromobilität Lokal ist Elektromobilität emissionsfrei. Wenn der Strom zum Aufladen aus erneuerbaren Energien stammt, handelt es sich nicht nur vor Ort, sondern auch in der Gesamtbilanz um Null-Emissionsfahrzeuge. In der EU werden 20 Prozent der Treibhausgasemissionen durch den Straßenverkehr verursacht. Elektrofahrzeuge könnten darüber hinaus durch die Möglichkeit der Nutzung als Stromspeicher zur Integration des steigenden Anteils Erneuerbarer Energien erheblich beitragen.
- Nullemissionsgebäude Siehe Anmerkung zur „Recast Energy performance of Buildings Directive“ **Q10** Die Erreichung der



energie- und klimapolitischen Ziele ist nur mit einer deutlich verbesserten gesellschaftlichen Akzeptanz der damit verbundenen Infrastrukturmaßnahmen möglich. Dies ist eine Aufgabe aller gesellschaftlichen Akteure. Der Umbau zu einer nachhaltigen Energieversorgung kann nur gelingen, wenn die künftige Energie- und Klimapolitik in der Bevölkerung Akzeptanz findet. Voraussetzung dafür ist natürlich, dass die langfristigen Ziele und erforderlichen Maßnahmen nachvollziehbar begründet werden. Das Schaffen von Akzeptanz für die Lösungen der energiepolitischen Aufgaben der kommenden Jahre ist aus Sicht des BDEW eine der zentralen Herausforderungen der gegenwärtigen Energiepolitik. Daher wird der BDEW alle Bemühungen unterstützen, die zur Förderung der Akzeptanz beitragen. Die Durchsetzung wichtiger Infrastrukturvorhaben ist eine gesamtgesellschaftliche Aufgabe. Dies schließt auch die gesellschaftliche Akzeptanz der Kosten des Umbaus der Strom- und Wärmeerzeugung sowie der damit verbundenen Kosten ein. Die Energieversorger brauchen bei diesen wichtigen Auseinandersetzungen vor Ort die Rückendeckung der Politik und anderer Akteure aus Wirtschaft und Gesellschaft, um einen möglichst breiten Konsens zu erreichen. Mit dem grünen Paket hat die EU einen Pfad zur Erreichung der 20-20-20 Ziele angelegt. Allerdings sind die Beschreibung eines Zielerreichungspfades und die Verankerung verbindlicher Pflichten für sich allein noch kein Garant für die Zielerreichung. Es bedarf vielmehr begleitender Politiken und einer konsequenten Überwachung der Umsetzung in den Mitgliedstaaten. Insbesondere sei hier auf das Ziel eines Binnenmarktes für Energie und die immer noch bestehenden Wettbewerbsbeschränkungen zwischen den Mitgliedstaaten in diesem Bereich hingewiesen. In ihrer Strategie „Energie 2020“ identifiziert die Kommission fünf Prioritäten. Diese Prioritäten sind aus Sicht der deutschen Energiewirtschaft im Wesentlichen richtig gewählt – und zwar auch unter dem Blickwinkel der Erreichung der 2020-Ziele, der Minimierung der volkswirtschaftlichen Kosten der Zielerreichung und einer Einbindung anderer Weltregionen. Allerdings wäre eine vergleichbare Herangehensweise auch für andere Sektoren, namentlich den Verkehrssektor, erforderlich. Die Umsetzung und Anwendung europäischer Vorgaben entscheidet über Wirksamkeit und Glaubwürdigkeit der europäischen Energiepolitik. Eine Reihe von Mitgliedstaaten erreichen die von Ihnen übernommenen Kyoto-Ziele im Rahmen des vereinbarten Burden Sharing nur durch Zukauf von Emissionszertifikaten und verfehlen absehbar die Ziele zum Ausbau der erneuerbaren Energien gemäß der ersten Erneuerbaren-Richtlinie 2001/77/EG. Wenn die EU ihr Ansehen im internationalen Rahmen nicht verspielen will, muss sie glaubwürdig sein und selbst gesteckte Ziele verlässlich erreichen. Hiervon kann man aufgrund der bisherigen Erfahrungen aber keineswegs ausgehen. Künftig darf es erst gar nicht zu Zielverfehlungen einzelner Mitgliedstaaten kommen. Die Kommission muss ein regelmäßiges, objektives und belastbares Monitoring der Erreichung oder Verfehlung der Zwischenziele durch die Mitgliedstaaten durchführen. Die Resultate dieses Monitorings müssen transparent gemacht werden. Bei Verfehlung der Zwischenschritte sind Abhilfemaßnahmen zu ergreifen. Der geltende Rechtsrahmen bietet Potential, welches noch nicht ausgeschöpft ist. **Q11** Die “Low Carbon Roadmap 2050” sollte hinsichtlich Emissionshandels insbesondere umfassen:

- Konkrete Vorschläge und Zeitpläne zur Ausdehnung des EU-Emissionshandels auf interessierte Nachbarstaaten und Beitrittskandidaten (z.B. Schweiz, Kroatien, Ukraine, etc.)
- Vorkehrungen zur Sicherstellung einer kosteneffizienten Verteilung der Anstrengungen zwischen Emissionshandelsbereichen und Nichtemissionshandelsbereichen;
- Vorkehrungen und Ziele für das Erreichen einer kurz- bis mittelfristigen Anbindung (Linking) des Emissionshandels an vergleichbare Systeme in den wichtigsten Industriestaaten (Nordamerika, Japan, Australien, etc.);
- Vorkehrungen und Ziele für das Erreichen einer mittel- bis langfristigen Anbindung des Emissionshandels an vergleichbare Systeme in den wichtigsten Entwicklungs- und Schwellenländern (BRIC, Südkorea, Südafrika, etc.);

der Emissionshandel ist auf Dauer nur international erfolgreich;

- Vorkehrungen zum Erhalt und

Verbesserung der Wettbewerbsfähigkeit der von Verlagerungseffekten bedrohten energie- und stromintensiven Industriesektoren; • Die Weiterführung projektbasierter flexibler Mechanismen unter dem Dach UNweiter Qualitätsstandards und Auswahlkriterien; die Nutzung von Projektgutschriften für die Erfüllung von Abgabeverpflichtungen insbesondere im Rahmen des Emissionshandels ist aus Kosteneffizienzüberlegungen unbedingt fortzuführen. Zu diesem Zweck ist gemäß Emissionshandels-Richtlinie der frühzeitige Abschluss bilateraler Abkommen mit möglichen Gastländern erforderlich. Unilaterale Qualitätskriterien, die Einführung von Multiplikatoren und Nutzungsbeschränkungen außerhalb des UN-Rahmens sollten nach Möglichkeit vermieden werden, um eine Benachteiligung europäischer Unternehmen auf dem globalen Kohlenstoffmarkt zu vermeiden. Falls Nutzungsbeschränkungen zur Aufrechterhaltung der Integrität und der Funktionstüchtigkeit des Gutschriftensystems im Ausnahmefall nicht vermieden werden können, so dürfen solche Beschränkungen nicht retrospektiv und nur mit angemessener Vorlaufzeit angewendet werden. • Untersuchung zusätzlicher flexibler Mechanismen, wie beispielsweise Sektorabkommen oder die Nutzung forstwirtschaftlicher Senken mit dem Ziel, eine möglichst kosteneffiziente Erreichung der Klimaschutzziele zu erreichen und gleichzeitig weitere Entwicklungsländer in den globalen Kohlenstoffmarkt einzubinden. **Q12** Der Übergang in eine CO<sub>2</sub>-neutrale Wirtschaft muss langfristig angelegt sein, denn Industrie und Energiewirtschaft benötigen klare und über lange Zeiträume stabile Rahmenbedingungen. Die üblichen Investitionszyklen in der Energiewirtschaft bewegen sich zwischen 30 bis 40 Jahren. Eine schlüssige Klimaschutzstrategie muss diese langen Investitionszyklen und Refinanzierungszeiten von Investitionen in erneuerbare Energien, neue Kraftwerke, neue Netze und neue Technologien beachten. Die Beschreibung eines Zielpfades über kurz- und mittelfristige hin zu langfristigen Zielen kann eine wertvolle Hilfe für die Investitionsplanung geben. Es reicht allerdings nicht aus, Emissionsreduktionen, Top-Down, isoliert zu betrachten. Es muss konkret, Bottom-Up, auch gezeigt werden, welcher Infrastrukturaus- und -umbau in welcher Zeitspanne und zu welchen Kosten überhaupt möglich ist und wie mögliche Hemmnisse Rückwirkungen auf die Reduktionsziele haben. **Q13** Eine Klimaschutzstrategie für die nächsten 40 Jahre muss selbstverständlich auch Wachstum, Beschäftigung, Technologische Innovation, Luftreinhaltung und Versorgungssicherheit berücksichtigen. Alle Ziele haben eine hohe Bedeutung. Das heißt aber nicht, dass es sinnvoll ist, wenn die EU für alle Ziele quantitative Vorgaben macht und mit parallelen Instrumenten verfolgt. Im Gegenteil führt eine Strategie mit vielen Zielen und parallelen Instrumenten zu inhaltlichen Brüchen und Ineffizienz. Stattdessen sollten ein Ziel (CO<sub>2</sub>-Minderung) und ein wirkungsvolles Instrument (Emissionshandel) in den Mittelpunkt gestellt werden. Innerhalb dieses Instruments muss dann ein Rahmen geschaffen werden, um den anderen Zielen auch Rechnung zu tragen. Auch ist es wenig sinnvoll, alle paar Jahre die Strategie nach neuen Zielen auszurichten, erst Kosteneffizienz, dann Klimaschutz, dann Versorgungssicherheit und jetzt wieder Klimaschutz. Der BDEW fordert von der EU vor allem Kontinuität in der inhaltlichen Ausrichtung. **Q14** Weitere Maßnahmen zur Konkretisierung und Vertiefung unseres Wissens über den Klimawandel und den Klimaschutz sind notwendig. Für die Erarbeitung geeigneter Anpassungsstrategien müssen vorhandene Prognosemethoden, -modelle und -datensätze weiterentwickelt werden. Zur besseren Überwachung der Auswirkungen des Klimawandels werden prägnante Indikatoren benötigt. Der BDEW fordert die EU-Kommission auf, bereits heute erkennbare Interessenkonflikte zwischen Klimaschutz, Natur- und Ressourcenschutz, Anpassung an den Klimawandel, Umsetzung der Regulierung der Energieinfrastruktur und Planungssicherheit aktiv aufzugreifen. Die Auswirkungen des sich verändernden Klimas wirken sich in erster Linie regional aus. Unterschiedliche Situationen und Rahmenbedingungen sind auch innerhalb der Mitgliedstaaten zu berücksichtigen. Anpassungsstrategien müssen daher in erster Linie vor Ort entwickelt und

umgesetzt werden. Schon heute ergreifen die Unternehmen der Energie- und Wasserwirtschaft weitreichende Vorsorgemaßnahmen, Notfallpläne und Absicherungskonzepte. Trinkwasser bleibt unverzichtbares Lebensmittel und eine sichere Trinkwasserversorgung im Klimawandel das zentrale Element des Gesundheitsschutzes der Bevölkerung. Ihre öffentliche Versorgung hiermit ist in der EU daher sicherzustellen. **Q15** Für das Jahr 2009 beliefen sich die CO<sub>2</sub>-Emissionen der öffentlichen Stromerzeugung in Deutschland auf 246 Mio. Tonnen CO<sub>2</sub>. Gegenüber den Emissionen von 289 Mio. Tonnen CO<sub>2</sub> im Jahr 1990 ergibt sich eine CO<sub>2</sub>-Minderung von 43 Mio. Tonnen CO<sub>2</sub>. Das im Rahmen der Klimaschutzvereinbarung zwischen der deutschen Wirtschaft und der Bundesregierung zugesagte Minderungsziel von 25 Mio. Tonnen CO<sub>2</sub> konnte um rund 175 % übertroffen werden. Weitere Anmerkungen: In Deutschland beträgt allein die Belastung aus dem Erneuerbare-Energien-Gesetz für einen Durchschnittshaushalt mit einem Jahresstromverbrauch von 3500 kWh im Jahr 2011 12,25 Euro im Monat. In den Folgejahren dürfte die Belastung aus dem EEG noch weiter ansteigen. Hinzu kommen für die Stromkunden noch Belastungen aus dem KWK-G sowie dem Emissionshandel. Weitere klimaschutzbedingte Belastungen sind u.a., das Marktanreizprogramm für erneuerbare Energien im Wärmebereich und Gebäudesanierungsprogramme. Nach einer Marktforschungsstudie im Auftrag des BDEW vom September 2010 hält ein Drittel der deutschen Haushalte monatliche Mehrkosten von 10 Euro für angemessen, ein weiteres Drittel hält diese Belastung für zu hoch. Die in Frage 2, Section A, für 2020 unterstellte Situation ist in Deutschland bereits im Jahr 2011 erreicht!

**2157643512-49 European Federation of Waste Management and Environmental Services** **Q10** FEAD is of the opinion that, before proposing further legislation, a harmonised implementation of the existing legislation in the Member States is necessary; for the waste management sector the Landfill Directive, for example. It might also be useful to create a better coherency between interlinked legislation (eg. REACH and waste legislation) and to provide better guidance. **Q12** We are of the opinion that investments in R&D can play a crucial role in the development of new technologies. Further incentives could be provided by creating demand-side measures for recyclates and renewable energy sources (e.g. biodegradable waste) in an economically viable manner. Generally, we agree that a 2030 mid-term objective may be helpful. **Q13** We consider all of these points to hold equal importance, especially as they are interlinked. **Q15** Please confer our answer to question 8.

**22295504688-84 Icelandic Cyclists' Federation - Landssamtök hjólréiðamanna** **Q8** Proposal for a Car Labelling Directive : Should consider including health warnings, and then even for electric cars, as the often contribute to a sedentary lifestyle, and a barrier effect to other that would have like to walk or bicycle for transport. Think labelling akin to that used for tobacco Included in or related to ESD is probably “Commission strategy to reduce CO<sub>2</sub> emissions from cars and vans” adopted in 2007. There the focus is on emission per km driven, but even when successful the total emission can still be rising with detrimental effects on public health, noise, sprawl which will harm biological diversity etc **Q9** Too little emphasis is put on ols and tested technologies and adaptations of those. A prime example of something that has received attention, but probably not a lot from the European Commission are the automated bicycle hire systems popping up in hundreds of cities around the world, and especially in western Europe. While some of the technologies mentioned do offer hope of improvement in several fields, some are really in the end only a band-aid on the problem when viewed in context. Take the electric vehicle. Even though energy efficiency improves, and tailpipe emissions are reduced, which will mean somewhat healthier cities, the new technology might even make car more affordable, and very many of the problems we see

today might be set to increase, like congestion, sprawl, road danger ( 1,2 million are killed by motorised vehicles globally every year, and tens of times that are maimed) . In the end, energy consumption by cars and vans could increase, through generating sprawl, and more traffic. The Icelandic Government commissioned a report on which technologies were the most cost effective in reducing greenhouse gas emissions. Across all sectors, the healthier and greener options came out on top, that is of course bicycling and walking for transport in cities and towns, as well as /supplemented by public transport. Not only was the conclusion that those were among the most cost effective if both the short term and the long term were taken into account, but facilitating a shift to those modes would save money. And that was the result, even though the well documented ( WHO Europe and others) monetary effects of improved public health by uptake of cycling was not included in the calculations. We guesstimate that if that had been done the net societal benefit calculated would have been doubled. And that is also without taking the benefits of reducing carbon dioxide emissions into account. **Q10** • no-regret options • low hanging fruits • win-win-win solutions and synergies (where developing a bicycle culture is a prime example ) • putting a price on other externalities ( of e.g excessive car usage) than only CO2 ,and other GHG. That will through synergies eventually also benefit the carbon-footprint of Europe • in particular couple with public health, social cohesion, democracy, equity/equal opportunities → really sustainable development. The professionals within the field will probably be only too happy to work out the synergies **Q11** Not really a n are of expertise of the NGO replying here. The prime matter of concern is probably to ensure that there will not be too big loopholes. And also consider that small loopholes can erode the trust in the system. **Q12** We need to see the synergies activated as soon as possible. **Q13** This has been touched upon above. Not really in the remit of this NGO to choose among those options. **Q14** Planning for and supporting Healthy and green transportation ( cycling and walking ) supplied by public transport is a prime example of an adaptation strategy that is also an emissions reduction strategy. Also meets problem of health problems , and resilience related to climate change. **Q15** • The automated bicycle rental/loan systems in Paris, London; Seville, Dublin etc • The building of a vast network of bicycle infrastructure in Seville, Spain over a period of only 6 years. **Additional Comments** The replies by an organisation or perhaps even a government can “never” be a perfect reflection of the totality of knowledge within the organisation. Also an organisation in most instances will need to put forward a common view, and so some things are suppressed. In the case of a cycling organisation, we naturally focus on the transportation part of the problem, that is our area of expertise , and that is also the area where we can aspire to be talking on behalf of our members. Largely our comments deal with areas of knowledge and action that are almost invisible in the larger scheme of things, not because they are not interesting, but because there is no BIG money pushing this agenda, no single strong group, no single big group that will benefit, but rather the effects are spread out in very many fields and there are lots of win-win situations on offer, lots of synergies. And putting it like that feels like a strong understatement. The areas that peer-reviewed research indicates benefit from improved levels of cycling by replacing car trips ( and even public transport and biking to some extent) are : •

Public health : obesity, joint problems, diabetes type II, several distinct types of cancer, depression, asthma, diseases of the heart and the circulatory system, all-cause mortality (Lars Bo Andersen et al 2000), various diseases see below. • Savings at workplaces / firms by reduces rates of vacancy through improved health • various types of air pollution, including particulate matter from road dust and in exhaust (including from bio-fuels), noise pollution, pollution to the ground/soil and water, all by replacing car driving with something cleaner and healthier • Huge image boost for a healthy and green lifestyle and way of thinking. The bike is iconic, and inspires hope • problems with sprawl, lack of social cohesion, • too few faces inviting questions on how to find your way etc •



resource consumption•  
relatively quickly if done right

lack of belief that things can change for the better, and

**23643001178-02 European Heat Pump Association Q9** Heat pumps providing heating, cooling, domestic hot water & air conditioning are a core technology for decarbonizing the building sector. It provides multi-fold benefits: A reduces primary and final energy demand B integrates a considerable amount of RES into the building sector C reduces the amount of CO2 emissions considerably (with no emissions at the point of operation D reduction of CO2 emissions will be multiplied in the future even in the heat pump stock as all installed units benefit from a de-carbonized electricity mix. E easy integration in future smart grids/smart cities and helps to make better use of intermittent electricity from RES Heat pumps can cover 100% of the heating&cooling demand in residential and commercial buildings –alone or in combination with other heat generators. The technology is available today. Real life applications and ongoing research point towards a huge untapped potential in industrial use of this technology. **Q10** EU/Member State (MS) support needed for - technology recognition of on all levels, - integrating of HP potential in all assessments of the energy system - more accurate data collection, - easier access to funding - measures towards increased building activity (renovation) - better quality of products & know-how of installers! - connection of subsidies to their impact on CO2 savings. Calculation of this potential should be based on a common method. - shifting the cost structure of energy making energy (reduce cost for RES, increase for fossil! For the heating sector, a feed-in tariff financed by a levy on fossil fuels like proposed is an immediate and effective tool! The heating sector requires concerted action between stakeholders, combined with sufficient financial means for a quick uptake of the technology and sufficient training/consulting/advisory services to overcome decision insecurity. A decarbonised electricity generation and securing grid capacity will also be needed. **Q11** The ETS is an Important means to foster decarbonisation of electricity generation. The cap and trade system should be transparent and long-term so that industry can plan ahead of coming cap reductions. An open and full commitment to a post-Kyoto agreement with bold CO2 savings for EU, even without other countries' commitment would transform EU industry into sustainable production, which in the long run will be advantageous. **Q12** Several studies show, that a long term change in the energy supply requires immediate investment. As such we disagree with the statement made. If financing is available, it must be channeled towards today's energy efficiency and RES technology to leap frog their market uptake. The support of existing efficient technologies is much more important than funding research for future technologies that can not provide meaningful contribution before 2030. To measure success mid-term objectives seem necessary for 2030 and 2040. Pursue multi-disciplinary research targeting cost-efficient low-carbon SYSTEMS, not only focusing on products. By smart system integration larger achievements can be reached than on product efficiency alone. **Q13** Supporting the use of efficient RES technologies in the building sector – such as heat pumps – requires a well educated local labor force. Concerted efforts will business opportunities in the field of new products as well as of new services. These efforts will provide employment opportunities to better qualified employees (requiring education and training – see results from the IEE QUALICERT project and EHPAs EUCERT training and certification for heat pump installers). Efficient heat pump systems will also lead to an affordable and secure energy supply for the years to come. The EU should take all of this into consideration and urge member states to do the same to start the next industrial revolution immediately. One important mean could be set on the identification and support of attractive business models for greater RES deployment. **Q14** If this question aims at developing a priority list for future action, than the EHPA is convinced that the use of energy efficient technologies in all sectors is of key importance and should be in the central focus of the near future. This may require re-allocation of budgets. In particular,

support for RES and energy efficiency in the building sector is necessary to avoid energy poverty in the future, to reduce important dependancy and to allow stable and sustainable energy supply! **Q15** EHPA is today coordinating the operation of the training and certification schem for heat pump installers. This scheme originates in an IEE project (EU-cert.HP) and has successfully covercome different issues in the EU market on training and certification. It is based on a common installer course on heat pump technology and on a procedure jointly executed for maintenance of the course material and executing training and certification.

**26207914726-42 European Petroleum Industry Association Q9** - Energy efficiency must be the starting point as it offers the most significant potential for further GHG reductions - Portfolio of all the technologies above is needed: not enough is known yet to choose the right technology for the next 40 years - Need for R&D policy targeted toward low carbon technologies to be developed and driven at EU level - Selective forms of public support might be appropriate for pre commercial technologies, provided there are hard rules for cessation of support when technologies become commercial and scalable so mature technologies do not receive subsidised benefits indefinitely - EU must not decide winning technology too soon, particularly when huge investments in infrastructure are needed, to avoid costly mistakes For example the choice of the fuel for transportation: more efficient hybrids running on hydrocarbons (oil and biomass), vs. full electric or fuel cells which would both require extensive new infrastructure **Q10** - Economy-wide effort required, including tapping into the significant potential of the domestic and transport sectors - EU should raise consumer awareness of the consequences of their choices and engage them by a mix of initiatives including education, incentives and regulation - Policy has a key role in helping shape societal progress and thus should be a balance in achieving emissions cuts through incentivising industry, which is already working towards meeting ambitious emission reduction targets, and other sectors of the economy. Regulation must preserve the competitiveness of the EU manufacturing industry - For example, 85% of the energy in oil extracted is used by the consumer; therefore efficient use of our products is key to reducing emissions. A healthy EU refining sector will be vital for secure supplies - Focus on energy efficiency through better implementation of existing instruments: buildings, transport, eco design and labelling, power generation and distribution **Q11** - ETS would be more cost-effective if its reach were broader than EU, demanding similar efforts from all other industrialised countries and main developing countries through legally enforceable international agreement and international CO2 price - EU should continue to lead global opinion by seeking innovative ideas to demonstrate where small steps may be taken (success often breeds further success), rather than simply setting unilateral targets - Both bilateral agreements recognizing credits and sectoral crediting could help the carbon market develop and broaden but this would require inter governmental action, which industrial sectors (although they are actors) are not able to substitute. Any limits and restrictions should be clearly signaled and not subject to repeated change at short notice - In global refining for example, many non-EU companies have different objectives than OECD oil companies, which would need to be reconciled in a sectoral approach **Q12** - Technologies to achieve the ambitious 80-95% target not yet identified and proven - Step-wise approach is essential, need for intermediate targets and predictable regulatory framework to foster investment in new technologies - Midterm targets should promote practical actions to develop and apply the most cost effective technologies and promote consistent action towards them. Allow existing policy to work before applying new ones - Straight line trajectory to 2050 will not recognise how practical change occurs in the economy – will not deliver the lowest cost solution. Not all economy or industrial sectors will move at the same pace - Roadmap should be flexible enough to change route along the way, taking “no regret” actions now (energy efficiency), but avoid expensive U turns in future

due to hasty technological choices - Progress should be continually assessed against rigorous criteria, e.g. technical progress for deployment and cost effectiveness to deliver the environmental goal **Q13** - Three interrelated goals: a more sustainable, resource efficient future, a competitive Europe and secure energy supplies - choosing “top priority” is not possible - Without secure and affordable energy, EU will suffer compared to competitors and employment and living standards will fall; but if we do not progress towards a more sustainable use of resources, we cannot support long term secure and affordable energy - Innovation, energy savings and a sensible transformation of existing industries will deliver economically sustainable jobs and provide other benefits such as energy security and air quality - Need to consider realistic, cost efficient scenarios that recognize all energy options that will continue to be part of the mix in the decades ahead- must not force this by arbitrary choice between good and bad energy sources - Potential of increased fossil fuels’ efficiency may offer optimal economic benefits as compared with excessive reliance on costly renewable energy options**Q14** Not within our expertise to respond.**Q15** EUROPIA’s energy efficiency campaign SaveMoreThanFuel is an excellent example of a successful initiative where petroleum industry in collaboration with the European Commission provided the consumers with useful tips on how to save energy and CO2 emissions while also saving their money. Promoting energy efficient practices in consumers is a key tool in the transition to a low-carbon economy and the public has to be well informed in order to actively participate. SaveMoreThanFuel website: <http://www.savemorethanfuel.eu/> European Refineries are also amongst the most energy efficient in the world; this has been achieved in part due to the incentives created by the high cost of energy in refining, but also by close attention to good operating practices and the adoption of leading energy technologies where economic.

**27799842497-69 SUEZ ENVIRONNEMENT Q9** Beside that of energy management, the substantial potential for CO2 savings of material resources management should be explored: a 2008 Prognos study indeed highlights that waste management in Europe can achieve an additional reduction in CO2 emissions of 146Mt/year and so contribute to 19% of the European climate reduction targets should the current legislation and recycling targets be fully implemented. Promising technologies exist for the recycling of specific waste flows, notably for end-of-life products whose primary manufacturing is very energy-intensive: end-of-life vehicles, tires, PET bottles... Apart from stimulating the demand for recycled materials and improving their competitiveness vis-à-vis virgin materials, we believe that the standardization approach can help foster the development and deployment of recycling technologies. Significant gaps in the product-design related research also need to be bridged (i.a. smart design for easier disassembly and recycling).**Q10** SUEZ ENVIRONNEMENT is of the view that, in order to secure a successful transition towards a low carbon economy, the EU should as a priority: - stabilize its climate change policy to enable the industry to make decisions on mid and long term investments - within its climate change policy, reward avoided emissions due to material recycling on the same grounds as avoided emissions due to renewable energy generation - streamline the objective of a low carbon economy across policy areas (environmental policy, integrated product policy, energy policy, emerging industrial policy, common agricultural policy, regional policy...) - develop its integrated product policy in view of paving the way for a shift towards a circular economy, notably by activating the Sustainable Consumption and Production agenda - develop common metrics to assess resource efficiency**Q11** A clear and stable policy framework is a prerequisite to industry investment, whether it be within the EU or at the international level. This is why SUEZ ENVIRONNEMENT believes that the EU, while fostering international climate action, should also seek for its stabilization. In particular, the Clean Development Mechanisms would gain from an increased visibility on their future (uncertainty as to the value of carbon credits

after 2012). **Q13** As adequately underlined in the EU 2020 strategy, the three priorities for the EU of becoming a smart, sustainable and inclusive economy are mutually reinforcing. Thus, SUEZ ENVIRONNEMENT believes that the EU should adopt an integrated approach rather than prioritizing between sustainable growth, extra jobs, accelerated innovation, clearer air and increased energy security, which clearly interact. As an example, the recycling sector contributes to creating local, non-outsourcable jobs, both highly and low qualified. **Q14** Though the concrete impacts of climate change on freshwater resources are still subject to scientific debates, it seems clear that climate change will only aggravate the existing water stress in some regions of the world. The EU should not wait for scientific certainty to take action in this area. Whether as a result of climate change or not, our societies are becoming rapidly more vulnerable to the effects of excess or shortage of water. It thus seems necessary to design solutions to secure water availability in the future, which is one of the objectives of the "Blueprint to safeguard Europe's waters" currently under preparation. SUEZ ENVIRONNEMENT fully supports this initiative, and considers that the 3 priorities in this regard are: - conserving water quality - exploring the need for additional water infrastructure (including alternative resources) - controlling water consumption (taking into account the local dimension of water scarcity issues) **Q15** The recycling of specific waste flows from energy-intensive industries is strategic to avoiding emissions from primary production. SUEZ ENVIRONNEMENT has developed several pioneering partnerships with industries: - Recovery of end-of-life cars with RENAULT - Recovery of aircrafts with AIRBUS - Extraction of copper from cables with NEXANS - Recycling of PET bottles with DANONE - Recovery of tires with MICHELIN We believe that this sector-specific approach is crucial view of the moving towards a resource-efficient, and thus low-carbon economy. As far as renewable energy is concerned, Lyonnaise des Eaux - SUEZ ENVIRONNEMENT's water subsidiary in France - has developed a promising system: with "Degré Bleus", it is now possible to recover heat from wastewater.

## **288846415-01 EUROPEAN COMMUNITY SHIPOWNERS' ASSOCIATIONS**

**Additional Comments** Maritime transport is by far the most carbon efficient form of commercial transport. ECSA Members are fully committed to playing their part in global efforts in further reducing CO2 emissions from international shipping and are working constructively with both their national administrations and the EU institutions to deliver a solution through the International Maritime Organisation (IMO) that resonates with efforts made by other sectors and other industries. The inherently international nature of shipping requires a global regulatory framework to deliver meaningful emission reductions. With this aim, IMO's long experience and excellent record of delivering workable international regulations for this most global of sectors means that it is not only the appropriate body to develop CO2 reduction measures from ships but it is the only body capable of delivering a successful global solution. For these reasons ECSA is convinced that regulatory control must be retained in IMO. In addition to a package of new technical regulations relevant to CO2 emission reductions, which is expected to be agreed this year, IMO has already analysed and agreed detailed principles for the development of Market Based Measures (MBMs) that might apply to shipping, on a global basis, in order to incentivize even greater emissions reduction.

**292139621-18 Groupe Carrefour Q9** - Solutions developed in the EMAS draft proposal for retail sector could be useful to exchange goods practices (methods and environmental and economic results). - Technically and economically viable electric vehicles . - And cost efficient renewable energy technologies (important to reduce CO2 emissions in long term) are important. **Q10** Reduce dependence on fossil energies through efficiency and through renewable energies. Facilitate uptake of natural refrigerants. Increase cooperation with developing countries to promote REDD **Q15** We developed our initiatives in the REAP forum



and in the EMAS initiatives. Others could be found in the Consumers goods forum work. These initiatives could influence EC works.

**29575032879-45 European Solar Thermal Electricity Association Q9** STE provide dispatchable and firm electricity combining solar electricity generation with storage and hybridization enabling stable electricity networks and it can meet the real demand. For the EU long-term RES supply regional approaches are of paramount importance (i.e. the Mediterranean Ring). In the long term the Supergrid will be the most efficient way to connect the EU and neighbouring countries. Focusing on STE, the EU and MS should take advantage that the largest potential of the world is in the neighbour countries of the Mediterranean, partners in the UfM. A target of 20GW for 2020 and 85GW for 2030 is feasible. Cooperation with Third countries will be key to achieve the RES targets for 2050, and the RES Dtv. offers through the “Cooperation mechanism” the instrument to make this cooperation feasible. The implementation of the SET-Plan and the STE-EII are vital to achieve RES EU priorities, however they need more public funds. **Q10** I. Delivering 2020 1. Ensure full implementation of the RES Directive and 3rd internal market package 2. Full and harmonized implementation of the art.6, 7 and 9 of the RES Directives “Cooperation mechanisms”. 3. Ensure the implementation of the SET-Plan Industrial Initiatives II. Beyond 2020: 1. Clear vision for achieving 100% RES by 2050 2. Set new binding RES target for 2030 and 2050, including sectoral targets 3. Establish a grid plan for a fully-interconnected EU network 4. Establish a Supergrid connecting EU with North Africa **Q11** To develop regional agreements to recognise international allowances and credits, for instance, with partners of the Union for the Mediterranean in the framework of the Mediterranean Solar Plan. **Q12** Solar power plants are large scale generation plants (100 to 300 MW each) and should be planned in advance according to security of energy supply national plans. Investments also are substantial and need of a stable policy framework. As investment decisions in the energy sector are of a long-term nature and as 2020 is at our doorstep, the European Union should quickly proceed with fixing binding renewable energy targets for 2030. A political discussion should start soon between representatives of Member States, the renewable energy industry, NGOs, the European Parliament and Commission on the 2030 horizon in order to set the right framework towards a 100% renewable energy supply by 2050. **Q13** Developing STE plants in Europe will contribute to sustainable growth, job creation, innovation, fighting climate change and energy security of supply. All these goals are interconnected and will be achieved by developing RES in the EU and neighbouring countries. To develop STE plants in neighbouring countries will contribute to the economic development of the Mediterranean countries (i.e. 20GW of STE plants in the MSP will need 97bn € of investment in both generation of plants and interconnection, and will generate 200.000 man/year manufacturing and construction jobs plus 35.280 man/year in O&M permanent jobs). **Q14** The developing countries are the most vulnerable to the negative impacts of climate change. Most of the developing countries are located in the world’s Sunbelt, STE can contribute to improve their security of energy supply as well as to meet the increasing domestic demand and in some regions generate revenues by exporting solar electricity. In addition, developing STE innovation will contribute to cost reduction. **Q15** STE has much the highest potential and generates dispatchable electricity meeting the energy demand. EU industry is the world leader in STE technology, policy support has been fundamental for the growth of the sector. Today, more than 600MW are operational in Spain, and 1,500MW are under construction, involving a private investment of 5€ billion. The support scheme should be adequate in order to foster innovation and allow for cost reduction. A Regulatory framework is necessary for the promotion of RES. A regional electricity market could be created if the needed policies are implemented. The feed-in tariffs have proved to be the most effective tool to boost the

development of STE. Tariffs must be properly designed, they should be high enough to cover costs and they must also be ensured over a long time period to guarantee the investors a sufficient share in return.

**32132994555-55 European Metalworkers' Federation Q8** For the European Metalworkers' Federation (EMF), climate change is a dangerous reality which demands a social response at European, as well as international national and regional/local and company, levels. With domestic climate targets of 20% reductions in greenhouse gas (GHG) emissions by 2020 and 80% by 2050, Europe has set itself the ambition of leading the world on the development and implementation of a low carbon economic model, but the world is rapidly catching up. We believe that a drive towards new industrial strategies based on low carbon technologies and products offers opportunities for the future of industrial workplaces in Europe but also major challenges, especially in the context of today's economic situation and an older and broader energy and resource crises. To use the opportunities available and achieve the transformation desired by 2050, Europe needs a strong industrial base. Studies conducted by the ETUC, together with the EMF (2007 and recently October 2009), demonstrate the job creation potential from a shift towards an energy- and resource-efficient economy within manufacturing industries in Europe. Jobs which Europe urgently needs. A strong European and national industrial policy framework is key to guaranteeing the long-term sustainability of these jobs. In recent years, the EU has developed a number of policy building-blocs, however it is with regret that the EMF notes that current emissions reductions targets are largely being achieved as the result of the collapse in industry in central and eastern Europe in the 1990s and the current economic crises, rather than as the result of policy-driven changes in behaviour, production and consumption. This is partially due to a fragmentation of European policy and legislation into policy silos. Therefore the EMF calls for binding energy efficiency targets at national level and a coherent and comprehensive industrial policy strategy with clear roadmaps for all sectors (including specific targets and objectives), developed in cooperation with the social partners. In 2008, the EMF warned of the weaknesses of the EU ETS highlighting the price instability generated by a market system, the danger of carbon leakage through the delocalisation of European energy intensive industries (especially steel and non-ferrous metals), and the need for better monitoring and improvement of the Clean Development Mechanism (CDM). The carbon market, as all other markets, has been undermined by the financial and economic crisis. The price of the emission certificates has been slashed by two thirds, and the system has only survived due to political intervention. Revision of the EU Directive on the emission trading system (ETS: 23rd April 2009), provides for the full auctioning of CO2 emission rights by 2013 in the electricity sector, while other energy intensive branches will be subject to a transitional system during which the free allocation of emission rights will be gradually reduced by 2020. The EMF has supported this approach and calls for the provisions to be correctly implemented and enforced. Not all European industrial sites have exhausted their potential for energy efficiency improvements based on existing technologies. This should be strongly encouraged by EU policy to ensure companies invest in BAT, particularly those who have made significant profits in recent years in the economic boom and through the sale of emission rights. We call for the creation of a European benchmarking agency, which should transparently link R&D activities with the definition of benchmarks on best available technology (BAT), including the participation of social partners. Benchmarks must be established at a level to encourage investment in BAT rather than penalising best performers. We also recommend the consideration of „carbon insurance“, whereby if a company relocates production, remaining emission rights for

installations fall to the local authorities and affected workforce. As far as non-ETS sectors and products are concerned, the EMF believes that a light-touch policy approach is inadequate to ensure continuous improvement, innovation and market access for new technologies/goods/services, therefore new and strong European regulation needed, including:

- a. Binding European energy efficiency standards on all energy-consuming products and services are needed as a means of promoting innovation. The Eco-Design directive is a welcome tool and should be further developed.
- b. Greater use must be made of standardisation and the promotion of product policies which insist on continuous technological development throughout the value chain and the Top-Runner model.
- c. Far greater use of green and social public procurement criteria to create market access for new clean technologies. Energy, especially electricity production and supply, are at the centre of a transition to a sustainable low-carbon economy. Strong examples of how significant emissions reductions could be achieved through investment in energy infrastructure and new and existing energy technologies, creating long term employment, already exist (e.g. [Future Climate](#)). We demand the political leadership from the EU institutions to push a strong EU energy policy, including the creation of a European energy authority and a European energy solidarity pact. Technologies for renewable and eco-efficient energy production have a vital role to play in breaking the link between economic development and environmental degradation. Stronger regulation and incentives are needed to support the demand and production of renewable energies, as well as the development of smart grids across Europe, ensuring the affordability of energy for domestic and industrial consumers. It is therefore necessary to increase EU and national targets on renewable energy as a proportion of EU-wide electricity supply for 2020, 2030 and 2050. Solidarity mechanisms are fundamental to ensure that all parts of Europe benefit from technological advances, clean energy and infrastructure spending. Standards on vehicles is part of the solution, however mobility and transport need to be considered as a coherent system, organised to meet specific needs. Urban and rural areas have different mobility requirements. This implies that costs for mobility must not become prohibitive due to energy prices. Both individual and collective transportation systems need to be reconsidered taking into account this aspect. Both investments in e-mobility and in further improvement of internal combustion engines" fuel efficiency are needed. Furthermore, an increase of investment in public transport is necessary to reduce energy bills of low income households.

**Q9** Investment in climate technologies is at a crucial juncture. The impact of the financial and economic crisis on tightening bank lending policies towards manufacturing companies, especially small- and medium-sized companies, is of crucial importance in this regard. In many cases it is these SMEs within industrial supply chains who bear the greatest burden for R&D and innovation. Far more must be done to ease lending policies to these companies, this should especially be the case in banks owned or controlled by public authorities following the bailouts. Greater public support and R&D investment is needed to help prepare our industries for their role in a future low-carbon economy. The EMF calls for a financial transaction tax to contribute to this investment.

Stronger policies are needed to ensure that the 3% Barcelona objective is attained should be a priority of the Commission, while at the same time more qualitative objectives which guarantee an effective use of scarce resources should be added. The EMF believes that there is a need to strengthen the research capacities in less advanced regions and unleash the full research potential of the new member states. Social partners should be better involved in innovation policies and works councils at all levels should be more intensively supported in addressing corporate innovation-issues. For the EMF, it must also be clarified that innovation and knowledge generation also take place outside the formal R&D process. A successful innovation system should develop mechanisms to take advantage of this "learning without formal research". There is little awareness of policies aimed specifically at innovation that is

not R&D-based. Through the proposals of the EU flagship initiative on industrial policy, the EMF welcomes the strengthening of the EU's sector-tailored approach towards innovation through the instruments of technology-platforms, innovative clusters and sectoral research panels/centres/funds. Our experience of being involved at a high-level in the European Steel Technology Platform (ESTEP) is one that we would welcome replication in other ETPs and innovation forum. To ensure participation and the reinforcement of cooperative models of R&D, such as the ULCOS project, it is essential that better means of ensuring financial support for demonstration projects are developed. For the EMF, the focuses for EU technology and innovation policy related to climate change should be:

- Sustainable transport: vehicle producers will have to invest heavily in different powertrain alternatives (hybrid, clean diesel, 2nd generation biofuels, more efficient petrol engines, hydrogen, plug-in electrical cars, clean and efficient ship and aircraft technologies) constituting major investments without clear views on the market potential of all these technologies and thus high risks on returns on these R&D investments. This demands public policy support through standardisation, binding emission-reduction regulation and R&D cooperation. This should be combined with a better integration of the different modes of transport and new concepts for logistics.
- Energy efficiency: the „low hanging fruit“ in the construction and housing sector should be prioritised, with energy efficiency in all sectors promoted, as well as the role of the ICT sector as an enabler for energy efficiency elsewhere.
- Smart energy grids and energy technologies: Energy transportation systems that make it possible to combine different energy sources, as to promote the combination of district heating, solar-, wind-, nuclear- and hydro-power etc. both regionally, nationally and on EU level
- Breakthrough technologies for energy intensive industries (e.g. ULCOS)

**Q10** To achieve, a sustainable roadmap to 2050 and drastic reductions in GHG emissions, a common EU approach on industrial policy is urgently needed, accompanied by coordinated and strong national industrial policies in all member states, based on a transformation of European industries to more energy- and resource-efficient production. Rising energy prices and falling investment in Europe's energy infrastructure threaten the long-term sustainability of our industries. This demands a re-evaluation of the Commission's strategy on the liberalisation of energy markets, an increased role for European and national public authorities in energy markets, through a European Energy Authority, and national planning and the initiation of new major energy production projects to ensure long term supply of electricity as well as investment in improved energy technologies. However, following the adoption of new European economic governance measures agreed by the European Council (21 October 2010), the seriousness of EU commitments to a just transformation of the European economy is in doubt. The strengthened growth and stability pact risks pushing the European economy into a long period of weak internal demand, with industrial companies moving to other parts of the world where the economic perspectives are brighter and government policies are pursuing proactive clean-tech policies. In the context of simultaneously-implemented austerity measures, workers are legitimately concerned that resources will not be available to ensure an active industrial policy at European or national level, particularly resources for the scale of the necessary infrastructure and R&D projects, and the social management of change. On the contrary, collective austerity measures in all member states will take demand out of the economy with disastrous consequences on industrial production and investment, which we have already seen collapse in the financial crisis. Concrete EU investment programmes, drawing in private capital together with public investment need to be further developed. The creation of a European transition fund to support the move towards a low-carbon economy should be established. This should be financed through a Tobin tax on financial market transactions, carbon and green taxes (ensuring that they do not intensify income inequality), the use of



revenue from auctioning of emissions rights and unused emission rights from 2008-13, and a reorientation of EU funds in the next EU budget review. The EMF also maintains its support for the creation of Euro-denominated bonds as a source of revenue for such an overarching industrial and social agenda. In order to move towards „closed-loop“ manufacturing processes, climate policies must consider the contribution towards innovation and greening of all industries and their employees if climate goals are to be achieved in an effective, socially just and stable manner. Properly functioning social dialogue is of key importance to ensuring active stakeholder ownership and engagement in policy initiatives. The EMF is of the opinion that measures must be taken, also at European level, to facilitate transition. In this connection, it advocates the establishment of a European framework and concrete initiatives for the anticipation and management of change that ensure socially responsible management of change and provide guarantees to enable workers to adapt to change, including a framework on transnational collective bargaining respecting the primary role of trade unions in concluding collective agreements. If handled badly, without taking into account the social dimension, climate policies could lead to vast job losses in strategic European industrial sectors and major social strife. Moreover, without social transition measures, the new jobs created could generate more precariousness at work, through poor terms and conditions and the lack of respect of social rights in the workplace, undermining long-term European industrial competitiveness in new and emerging technologies and industries. Already, the significant skills- and investment-gaps witnessed today in our industries must be tackled through measures to secure employment and training if we are to master the transition to a low-carbon economy and avoid further deindustrialisation. The social and employment policy dimension of EU climate action is currently inadequate to meet the challenges posed by climate change and the economic crisis. Employment policy should be an integral part of EU climate and industrial policy-making. Strengthening social dialogue, collective bargaining and workers' participation in the formulation of this response are of primary importance. Corporate governance policies should promote mandatory social and environmental reporting based on recognised standards, verification and worker participation. This should encourage companies to use the best available technologies in their operations throughout the world. Emerging policies on directors' pay could be linked to the achievement of social and environmental sustainability criteria. **Q11** As already mentioned, the EMF is concerned about the weaknesses of the EU ETS particularly the price instability generated by a market system, the danger of carbon leakage through the delocalisation of European energy intensive industries (especially steel and non-ferrous metals), and the need for better monitoring and improvement of the Clean Development Mechanism (CDM). Ambitious European domestic targets and the EU ETS must be flanked by measures ensuring a level-playing field for industries. European binding standards on energy efficiency and incentives for improved performance must be combined to create a virtuous circle. Through the UNFCCC, the EU must continue to demand a binding and comprehensive international agreement on the reduction of greenhouse gases (GHG) guaranteeing a just transition towards a low-carbon economy. Climate change policy must ensure that industry globally continually upgrades its environmental performance and responsibility, whilst maintaining international competitiveness (including, measures against carbon leakage such as border adjustment mechanisms as recognised and accepted by the WTO-UNEP 2009 study). Further additional measures contributing to the lowering of the emissions and the global impact of industrial activities, particularly in the case of high-emitting energy intensive industries should be considered. These measures could be included in the national and local application of the Clean Development Mechanism (CDM). Commitments to the eradication of poverty, promotion of equality and sustainable development require the introduction of a strong social



dimension into the CDM and emission trading projects. In developing countries, companies should commit to investment in local projects aimed at improving the efficiency of logistics systems, collective transport for their workers, ensuring renewable sources of energy for industrial sites, as well as for the local area and workers' housing, receiving in exchange the corresponding credits to the saved emissions. Greater monitoring and evaluation of these projects is necessary to ensure that social objectives as well as emission reductions are achieved. Sectorally, the EMF calls for a global sectoral approach in energy intensive industries ensuring a level playing field and eliminating the risk of carbon leakage, covering the major producing countries and regions, with identical targets, harmonised reporting, monitoring and verification systems and binding dispute-settlement and sanction regimes. The EMF calls for a stronger role for the Commission in these international negotiations to ensure a better coordination of European industrial interests (e.g. within the International Maritime Organisation).

**Q12** In order to guarantee adequate stability for the long-term investments needed in infrastructure and R&D, the EMF recommends that the Commission propose quantitative objectives – as found in the Climate and Energy Package (20-20-20) – for 2030, 2040 and 2050, charting the route towards a scenario objectives of 80% to 95% by 2050. These scenarios should be accompanied by economic and social analyses and impact assessments, developed in conjunction with social partners. European climate policy ambitions cannot be achieved without a strong social Europe. Industries cannot flourish without a solid social Europe providing high quality jobs, education systems, and a strong domestic demand. A strong social dimension to industrial policies is needed to ensure social cohesion and tackle the social instability caused by the economic crisis. Sectoral plans should set out the contribution and actions of each industry to attain these goals. Together with the ETUC, the EMF undertook a research exercise to evaluate the employment impact of various low-carbon industrial policies (Syndex 2009). Employment and social protection policies must be included in the policy analysis. Social dialogue is crucial to ensure the engagement and involvement of social and market actors in the policy. Therefore a consultative committee should be established to engage in EU climate and energy policies to consider the development and implementation of the EU roadmap. The EU should be a leader not only in emission targets but also in developing ways of engaging social actors in the process and ensuring this engagement leads to investment.

**Q13** For the EMF, the main priority to achieve the EU's targets by 2050 should be a regulatory and financial framework to promote the development of smart grid capacity to save energy and for the optimal integration of renewable energy, decentralised production and combined heat and power, including a strong role for public authorities.

**Q14** The EU must provide a credible framework of accompanying measures to manage the social consequences of climate targets for all sectors, alongside sectoral strategies, which explicitly include the responsibility of companies as well as public authorities in maintaining aggregate employment and promoting (re)training and skills development for all workers. The Syndex-ETUC-EMF study Climate disruptions, new industrial policies and ways out of the crisis (2009) presented possible employment effects of various policy options on key industrial sectors (<http://etuc.org/a/7586>). The Commission should undertake sectoral screening in conjunction with the sectoral social partners to create sectoral roadmaps as foreseen as part of the Flagship Initiative on industrial policy. These sectoral roadmaps should bring together all EU policies related to a particular sector, with the aim of avoiding negative spillovers between different policy approaches. The CARS21 high level working group and its consideration of the Commission's strategy for clean and efficient vehicles is an example of this approach, which is much needed in the EU's other manufacturing sectors. In terms of workers in European energy intensive industries which are most at risk of carbon leakage. The still ongoing economic crisis in the EU and the impact of austerity has, if possible, worsened the risk of carbon leakage for the European steel industry,

with blast furnaces and other installations reducing capacity in many member states. This situation increases the risk of delocalisation of new investments and production capacity from the EU to other parts of the world, not subject to legislation on GHG emissions reduction or an ETS. The EU should strongly encourage companies to invest in BAT. Resources generated from the sale of emission rights, as well as those amassed through unused emission rights during the economic downturn, should be committed to maintaining and upgrading European steel production sites and employment. As far as the shipbuilding and maritime industries are concerned. The EMF and a number of affiliated organisations active in shipbuilding joined a protest initiative of IG Metall Küste and the German environmental campaign platform against attempts to weaken the 'sulphur limitation regulation' that applies in European Emission Control Areas (ECA) at sea. The EMF has repeatedly argued for an expansion of ECAs and sulphur emission control areas (SECA) to all EU coasts in order to stimulate demand for more environmentally friendly and energy-efficient ships. If all sea areas around Europe (e.g. the Mediterranean Sea, the Black Sea and the North-East Atlantic in addition to existing SECAs in the Baltic and North Sea) would be designated as Emission Control Areas (ECAs) –covering emissions of sulphur, NO<sub>x</sub> and PM – a situation of balanced competitiveness would be created, protecting the health of thousands of people, preserving the environment and safeguarding jobs. **Q15** A concrete company success story would be UMICORE, a Belgian non-ferrous metal company, which through consistent social dialogue at all levels (including an international framework agreement on sustainable development with the ICEM/IMF/EMF/EMCEF) has transformed itself into a metals recycling leader, maintaining its employment and improving its environmental performance. Other success stories can be found on the International Trade Union Confederation's Just Transition site: <http://www.ituc-csi.org/+climate-change-+.html>

**3394026642-58 BP plc Q8** We have specific comments on the Fuels Quality Directive (FQD). BP support for the FQD has been based on the clear understanding that its primary purpose is to advantage the introduction of advanced biofuels. However, recent proposals to extend the scope to cover Greenhouse Gas (GHG) intensity of crude oil production may well be operationally impossible to implement, and are likely to cause unintended consequences with international oil trade partners. More generally, going forward, we would encourage early clarity on the precise objective of each policy measure, broad consensus that it is the most effective policy for delivering that objective, and confidence that individual policies will neither duplicate nor conflict with each other. The proliferation of policies relating to energy and climate already places these principles at increasing risk. **Q9** Some, many or even all these technologies - and many not yet developed - will be important in achieving a low carbon technology portfolio by 2050. But with limits on resources, and the need to maintain international competitiveness, it will never be possible to develop all the technology options to a level suitable for deployment. For the huge investments needed public subsidy, public investment, and/or public guarantees will be needed in conjunction with private capital. But to make the necessary selective judgements based on GHG mitigation effectiveness between technologies, we believe that carbon pricing (preferably through a cap & trade market, or via taxation or implicit via regulatory costs), and a much greater overall cost transparency (e.g. cost of obligation policies, cumulative green taxation) is needed to gauge the cost-effectiveness of technologies on a continuing basis. The mechanisms of carbon pricing and cost transparency will also benefit entrepreneurs using private risk capital. They will make their own investment choices and hope to be rewarded in the market. For public subsidy, each technology evaluated must also consider the full cost of deployment, including reinforcing networks, servicing, waste handling & disposal, intermittency coverage and decommissioning. Such an evaluation is important - not only to help determine which

technologies are promising in terms of cost effective greenhouse gas reductions, but in allowing a determination of the costs and benefits of emitting less GHGs or not emitting at all – i.e. of deploying lower rather than zero emission supply options, such as natural gas, or pursuing energy efficiency on both the supply and demand sides. **Q10** For electricity generation in the medium term, the Industrial Emissions Directive (IED) will close a number of EU coal fired power stations. This should not be postponed. We think that natural gas for electricity generation will become the most cost-effective option to reduce greenhouse emissions, and is relatively flexible to back up intermittent renewable electricity production. We think that security of supply concerns regarding natural gas availability have been significantly overplayed. There is now a wide diversity of natural gas supply from: - continuing development of European resources, - development of large reserves available to regional pipelines, - increasing global exploitation of unconventional gas resources, and - global LNG plants responding to market prices for export to the EU via new LNG terminals. These sources have all helped dissipate many of the concerns previously voiced on gas availability, price and price volatility. Such concerns could be further reduced by greater connectivity of Europe's own internal gas transmission networks and enhanced strategic storage reserves. Thus the most important EU initiatives will be: For electricity generation: • Completion of the single market for natural gas and electricity • Non-discrimination against gas-fired electric power, including care not to squeeze natural gas out by providing unjustified or uneconomic levels of support for more costly alternatives. • Regulatory predictability in the EU ETS for the duration of Phase 3, and in the national implementation of the IED. For assisting new and existing alternative technologies: • A carbon reference price. • Transitional incentives for development and limited deployment to prove cost effectiveness, • For Framework Programme FP7 and FP8 funding, transparency of technology costs to deployment, and publication of the knowledge benefits from use of public monies; • CCS funding via the EU ETS and from EU and national sources to support full-sized demonstration plant; and • Renewable Energy Directive (RED) and FQD to properly incentivise advanced biofuels in particular. To reduce demand: • Energy efficiency standards, and regulation for buildings, their technologies, and household & office appliances • Continued development & enforcement of vehicle GHG emissions regulations, including light vans and heavy-duty vehicles. Internationally: • Progress in framing international GHG reduction agreements, if necessary with bilateral agreements with non EU countries. • Agreement on both an international maritime and aviation emissions mitigation schemes. **Q11** EU Emissions Trading Scheme (EU ETS) elements to be considered in the road map include: • Regulatory predictability the EU ETS for the duration of Phase 3 to reduce the market cost of political risk. • Maintaining & strengthening the EU ETS as a market-based mechanism. The carbon price needs to reflect the level of demand in the market, not the level of subsidy required by some renewable energy source technology for market deployment. Other instruments exist for that. • Negotiation of bilateral agreements with third countries emissions trading schemes would serve to broaden and deepen existing carbon markets, help build a global carbon pricing mechanism, and enhance policy cooperation and coordination - particularly to reduce carbon leakage. • The EU ETS also allows the use of certain types of CER for surrender against installation emission obligations. This feature 'exports' the EU ETS price into other economies, and is to be encouraged via a reformed and more efficient CDM mechanism. • Much has been made of sectoral crediting mechanisms but more work is required to develop and agree acceptable sector baselines, how such standards will evolve over time, and the role of such credits in national and international carbon trading. **Q12** A stable regulatory environment means not making changes to environmental regulation, except at specific intervals stated in the regulation. **Q13** All of the listed objectives are important. But there are multiple ways of achieving them, and the question appears to fail to consider

alternative ways, some of which, like energy efficiency and natural gas, are already available, and deployable at large scale, quickly and at low cost. The question fails to consider these options both in terms of the time horizon (i.e. pace) over which it is rational to move from deploying existing to deploying new measures to deliver the objectives, and in terms of the economy-wide costs and benefits of choosing to support existing or new options at any given time. Leaving aside the achievability of such reduction targets<sup>2</sup>, there is an intergenerational balance to be struck between achieving future (2050) objectives and meeting current needs, including the international competitiveness of the EU that underpins living standards. This means hard choices for policy makers and the need for strong justification to forego consumption of goods and services in return for investment in and deployment of new technology for the benefit of generations to come<sup>3</sup>. This choice is political, although cost would seem to be an obvious starting point for making such judgements. But the question also fails to consider the overall costs to the economy of choosing particular measures to deliver the objectives. Instead, it suggests that the achievement of more sustainable growth, extra jobs, accelerated innovation, cleaner air, increased energy security and lowering our vulnerability to external energy shocks can be assessed in the absence of cost considerations. For example many emerging and alternative energy technologies are more expensive to deploy than those currently used or available to use; this extra cost has to be paid for by consumers in a competitive market. Likewise, green jobs must be sustainable and their costs justified against alternative sources of employment. Overall, alternative ways of achieving the list of 'co-benefits' have to be considered. And this is best done by customers in the market place, guided by voters in an open political process considering longer term national and EU choices. Finally, the principle of market choice operates most powerfully globally. Whatever level of reductions are agreed, globally and by individual nations or blocs, including the EU, a global carbon market offers the least cost way of delivering those reductions – and creates opportunities for all participants to choose between achieving their reduction commitments at home, over-achieving them and selling their surplus for a return, or under-achieving and buying their shortfall on the market.. This should continue to be the long-term aspiration of climate policy, recognising the pragmatic need to begin at a national or regional level.

**34981544256-74 Col·legi d'Ambientòlegs de Catalunya Q9** Renewable energy technology, smart grids, heat pumps, zero emission buildings. In case of renewable and efficient technology, a way to foster it would be through initiatives at local level and to make communities participate from it. Society needs to feel part of this XXI energy revolution. Concerning zero emission building it should be compulsory, but not only for new buildings.**Q10** - Promote renewable and energy efficiency at local level to let society participate from the investments. - To establish a clear path with clear objectives by 2050.**Q11** - International systems, including the Third World, specially China and India. - Improve the organisation of EU-ETS.**Q12** An EU roadmap by 2050 is essential as it will be like a reference document for all actors. However, it is crucial to set medium targets too to be able to evaluate and to turn strategies in case objectives are not fulfilled. For example: If we want to cut emissions by 90% in 2050, we should fix also a reduction for 2030 (30-40%)**Q13** Energy security, equity and more sustainable growth.**Q14** Agriculture.

**3647455667-08 Confédération Européenne des Propriétaires Forestiers Q9** The ability of a forest to capture and store carbon offers opportunities for combining carbon management and development of renewable energy technologies. Inclusion of forests in the EU ETS

<sup>2</sup> IEA World Energy Outlook 2010 and the divergence between its central and 450 scenarios.

<sup>3</sup> The Brundtland World Commission on the Environment and Development Commission recognised this balance in its definition of sustainable development as "...development that meets the needs of the present without compromising the ability of future generations to meet their own needs"



system can maximize the contribution made by the forestry sector for combating climate change, by giving forestry access to the ‘carbon credit’ market mechanism. The potential of the sector has not been yet fully recognized. Efficiency of use of forest-based biomass in energy production has to be also increased - firstly by improving the efficiency of end-use of energy but also secondly, the cost-effective utilization of biomass. In addition raw wood can be used more widely in constructions, furniture manufacturing etc. providing another opportunity to store carbon. Wood-fibers may also provide substitution to several oil-based products. The recognition of the potential of forests in several different areas and sub-sectors has to be achieved in developing a low-carbon future. **Q10** 1. Renewable energy resources availability assessment and securing the production of renewable energy (from woody biomass) 2. Energy efficiency measures throughout the whole process – from production to energy end use efficiency 3. Research and development measures for promoting innovative products and services with a low carbon footprint **Q12** The forest based products offer the most efficient and “green” solution for the reduction of emissions and producing renewable energy. This has been recognized by the Intergovernmental Panel on Climate Change (IPCC): “In the long term, a sustainable forest management strategy aimed at mitigating or increasing carbon stocks, while producing an annual sustained yield of timber, fiber or energy from the forest, will generate the largest sustained mitigation benefit”. This is what policy makers should encourage to continue. Promotion of sustainable forest management and the use of forests and wood based products has never been more crucial **Q13** Lowering the vulnerability to external energy shocks, the increase of energy security, sustainable growth, cleaner air and extra jobs should be on the top of the list. Accelerated innovation is something that is needed to achieve progress in those areas. Innovative products and services, technologies and policy and governance measures are the key things that can lead to the 2050 goal. Forests and forest-related products and services are already showing the potential in different areas – from recreation and carbon sequestration to next generation biofuels and wood fiber products. Forest and forest based sector has the right components to be a major contributor to the future bio-economy. It needs the appropriate framework conditions to bring major breakthroughs to that future. Supporting the multiple use of forests and forest products, investing in innovation and research increases the possibility to reach the 2050 target. **Q15** Nordic countries have a lot of experience in providing local communities with heat and power from renewable resources. Many of those power plants are community-owned and use woodchips, recycled wood, by-products from sawmills and other wood residuals for producing energy and heat. The woody biomass is usually produced in the surrounding forest areas so the mobilization costs are smaller. The variety of benefits is significant - providing rural areas with employment, additional income for the forest owner, CHP plants provide both heat and electricity so the plants efficiency is also remarkable. The carbon footprint from this scheme is due to the variety of benefits not significant because the carbon which is released during the process was once in the atmosphere and it will be linked to biomass again through photosynthesis

**3954187491-70 International Association of Oil & Gas Producers Q8** OGP remains committed to reducing emissions of CO<sub>2</sub> equitably across the EU. OGP continues to work collaboratively with the EU institutions to ensure an efficient allocation methodology for Phase III of the EU ETS, as well as a pragmatic and effective implementation of the CCS Directive. Whilst we have no comment on the likely effectiveness of the individual measures listed we are, however, concerned at the continued proliferation of policies which have the potential to increase complexity and the overall regulatory burden faced by industry in the EU while not necessarily reducing emissions in the most cost effective way. The drive towards a low carbon economy by 2050 is realistic if and only if the rest of the world moves in the same



direction. Ultimately all these policies translate into higher energy costs for industry and consumers in the EU which are not borne by industry in competing parts of the world. Policymakers must remain vigilant to ensure damage to EU competitiveness is minimised. Industry in the EU will increasingly be starved of investment if competitiveness is not sustained; damaging the EU economy and employment prospects through outsourcing with, at best, no net benefit to global emissions. This issue of carbon leakage is particularly the case in our own sector which operates in global product markets. **Q9** OGP considers that meeting the EU's very ambitious commitments towards a low-carbon economy by 2050 will require parallel development of energy efficiency measures, the development of renewable energy sources, the continued use of nuclear energy and the deployment of carbon capture and storage (CCS). Most importantly, it will require the full use of the most climate-friendly, affordable and abundant fossil fuel, natural gas. OGP believes greater gas usage, together with energy efficiency, are the key options for meeting EU energy demand economically and retaining international competitiveness, while significantly reducing CO<sub>2</sub> emissions. Advanced, proven, and readily available, gas technologies, such as CCGT and CHP, can halve emissions by displacing coal. A switch from coal-fired to modern gas-fired power plants could alone meet the 2020 CO<sub>2</sub> emissions reduction target. The recent step change technologies that have commercialised 'unconventional gas' have greatly increased global gas reserves ensuring abundance, accessibility and affordability for decades to come. By 2050, we would expect natural gas with CCS to have been decarbonising the electricity sector for decades. CCS will be vital to sustain worldwide economic growth whilst mitigating the potentially harmful effects of CO<sub>2</sub> emissions despite the fact that in 2010 there are a number of barriers to commercial viability. As the International Energy Agency concluded: without CCS, the cost of achieving a 50% reduction in CO<sub>2</sub> emissions by 2050 will increase by 70%.<sup>4</sup> **Q10** Over the next decade, significant investment will be needed to ensure a transition to a low carbon economy, not least in terms of the energy infrastructure. In the context of the current economic crisis, this will be challenging, and requires that current low-carbon energy sources and technological solutions will need to take centre stage. OGP would like to stress that a low carbon economy does not mean the end of fossil fuels within the EU energy mix; rather that new ways need to be found to continue use of fossil fuels but with greater efficiency and lower CO<sub>2</sub> emissions. For example, in this period, we would expect demonstration of gas with CCS projects. In terms of initiatives, OGP offers the following suggestions: i) Completion of the internal market in electricity and gas – full implementation of existing measures must be a priority. ii) Measures that take into account the reality that oil and particularly gas will continue to play a critical role in the EU energy mix for decades. This is important given one third of EU electricity generation capacity will need replacing by 2020 according to the Commission's own analysis.<sup>5</sup> There must be recognition of the fact that gas has a much lower capital cost per installed MW – 50% the cost of a coal plant, 20% the cost of a nuclear plant and 15% of wind generated energy.<sup>6</sup> Gas power plants can normally be constructed in about two years, much quicker than coal (52-58 months) or nuclear plants (54-60 months).<sup>7</sup> Gas-fired power plants are much more flexible than coal or nuclear and, therefore will be better for backing-up intermittent renewable generation. Furthermore, gas-fired power plants have a much higher energy efficiency. There should be a special focus on maximising oil and gas resources indigenous to the EEA. This will involve consolidation of EU energy and climate policies in order to set a clear long-term energy strategy that is realistic as a foundation for a low-carbon economy. iii) Developing a framework to enable

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<sup>4</sup> From 2005 levels, IEA CCS Roadmap 2009

<sup>5</sup> Pg 3, Energy 2020: A strategy for competitive, sustainable and secure energy (COM 2010) 639

<sup>6</sup> Mott MacDonald for DECC, June 2010

<sup>7</sup> From Royal Dutch Shell internal analysis

investment in energy infrastructure. Without clear signals to the market, investments in clean power generation from gas will not be made, meaning there will be a short-fall in energy production that could further undermine the EU's economic recovery. This is all the more pressing given the need to replace the EU's current, aging power generation capacity. In terms of capital investment per KWh of installed capacity, gas power plants are the most affordable and can be deployed with the greatest speed. iv) Measures to ensure clean, efficient and affordable back-up for intermittent renewable energy sources. This means replacing coal-fired power plants with natural gas. Moving from coal to gas in power generation is almost twice as big a step in terms of emissions reductions compared with moving from gas to carbon-free renewable energy sources. As well as playing an important role in centralised electricity generation, through micro-CHP natural gas could also play an important role in increasing decentralised electricity generation in the EU. v) Measures to ensure best practices on energy efficiency for the transport, industrial and buildings sectors are shared between industry, civil society and Member States. **Q11** To reduce concerns relating to the international competitiveness of EU industry under ETS, OGP believes the EU should pursue both international and bi-lateral agreements on CO2 reductions. The EU should allow the use of flexible mechanisms. This will allow industry to comply with emissions rules domestically and, at the same time, enhance the transfer of clean technologies in developing countries. Current flexible mechanisms, such as CDM, need improved project sustainability. **Q12** The continued rapid development of new initiatives and policies before the full implementation of existing ones in all Member States creates uncertainty over future energy and climate policies. This uncertainty is damaging to investor confidence and constrains new investment in all energy projects, whichever energy source they concern. Given IEA predictions that oil and gas will play an important role in the EU energy mix for decades, it is important, as outlined above, that clear and predictable demand signals are sent to the investment community now to allow for the diversification of routes and sources. Without these clear and predictable demand signals, investment will go elsewhere, leaving the EU with a potential energy shortfall given the dash for energy by China and India; for example, in back-up capacity of intermittent renewable energies for which gas is especially well-suited. **Q13** Whilst OGP recognises all forms of energy will be needed, given that unabated coal-fired power generation has more than double the CO2 emissions of gas CCGT's, priority should be given to replacing coal with gas as a source of electricity generation in order to quickly and cheaply lower CO2 emissions within the EU. Recognition of the benefits of natural gas within a low carbon economy is also an important priority. When used to generate electricity, gas has the lowest CO2 emissions of all fossil fuels (55% less than coal) but also contributes to cleaner air as it releases very small amounts of sulphur dioxide and nitrogen oxides and virtually no ash or particulate matter. Ensuring greater energy interdependence is also a key issue. EU Member States have enjoyed access to low cost energy sources, such as gas, inside and outside Europe over the last fifty years. Energy independence is therefore neither an achievable nor a desirable goal. Diversification of routes and energy sources, including the development of affordable renewable energy sources, are key policy elements within an inter-dependent environment. Policymakers have an important role in communicating this priority clearly to the public, as large numbers of the public are under the erroneous impression that importing energy poses a threat and that a significant reduction of imports is possible. **Q15** The notable success story of the recent times has been the transformational success of commercialising unconventional gas. Initially in the US, where it now accounts for over 50% of gas production, but increasingly production potential outside the US is being identified and targeted for investment. Within the EU significant potential also exists. Even if the EU resource proves to be less prolific, EU consumers will still benefit from the global abundance and more affordable prices via the displacement impact on traded LNG prices. These

technological and resource benefits to the global economy from within the fossil fuel sector may continue to emerge in the coming decades. Hence the importance of maintaining a material contribution from fossil fuels in the long-term EU energy mix in order to underpin not only new clean energy sources but also high-tech employment and, particularly, the export-orientated manufacturing sector.

**3960234639-24 Quaker Council for European Affairs** **Q9** The problem is not technology; the biggest obstacle to genuine sustainability remains consumer demand. While we consider the speeding-up of research in low-carbon technologies important to facing the twin challenges of climate change and sustainable energy security, we also recognise that market-solutions only deliver monopolies. In the forthcoming energy efficiency and renewable energy revolution, we need to guarantee the protection of a whole portfolio of necessary solutions. Unfortunately, if you look at the level of R&D in energy compared with health and medicine, it's very, very low -- the EU is still lagging behind when it comes to big R&D budgets. Additional public and private research are needed to augment the existing programme of scattered, fragmented and sub-critical capacity research. If the European Union is not careful, a coordinated response to Europe's energy revolution will be impossible, and the consequences ungovernable. **Q10** The housing sector's contribution to realising Europe's 3x20 climate and energy goals bears great potential economically, socially and culturally. Statistics show that buildings account for almost half of end-use energy consumption, and more than 25% of the EU's CO2 emissions. Energy efficiency offers many benefits for homeowners, tenants and housing associations, including more energy-efficient buildings (warmer), an attractive residential environment (better), and significant cost savings for users (cheaper). If we significantly invest in energy savings, the EU economy will not only be more resilient to fossil-fuel price fluctuations, but also benefit from additional growth and job creation in innovative sectors like clean tech manufacturing and exports. Analysis has shown that, without any technical breakthroughs or massive behavioural changes assumed, an 80% GHG reduction can be achieved by maximum abatement within the power sector, as well as significant savings in other areas. **Q11** We believe the EU ETS is a flawed policy instrument. Regardless, we could recommend: Imposing carbon tariffs on countries that are not part of a global agreement to curb greenhouse gases. The inclusion of shipping and aviation emissions. **Q12** For the energy sector to evolve towards supporting the EU's climate objectives, governments should accelerate the removal of inefficient fossil fuel subsidies, as agreed by the G20. Not only do fossil-fuel subsidies encourage waste, but these subsidies amounted to \$312 billion in 2009, and phasing them out by 2020 could cut oil demand alone by 4.7 million barrels per day. The Renewable Energy Directive, the Energy Labelling of products Directive, EU Competition Policy, the Recast Energy performance of Buildings Directive -- there already exists a number of reasonable, medium-term policies, which desperately need full implementation and enforcement -- Member State commitments made in Brussels need to be kept at home. By 2020, no part of Europe should be isolated with respect to energy. **Q13** We need to develop a new, closer relationship with the energy we use, which will encourage us to value our energy more, and to use it less. The age of cheap oil is over. Efficiency in both production and end-use energy consumption is the cheapest way to reduce fossil fuel dependency. The problem is not technology, but our organisation and administration (which includes training and awareness raising). We need to pull together and make it happen. Looking back, it will be hard to image that we collectively couldn't do this. "It is no longer a question of vain words but of a bold, constructive act." -Robert Schuman **Q14** Decarbonising our economy is indistinguishable from a sustainable future for the developing world. Even if governments implement their current climate and energy commitments, the IEA predicts that energy demand will still rise by 36% between 2008 and 2035, driven primarily by non-OECD

countries. Meeting poverty reduction targets will therefore be crucial to the success of Europe, and to ensuring that everyone can enjoy the benefits of sustainable growth. And it's not just in the developing world -- 84 million people are directly affected by poverty in the European Union alone. Energy influences all aspects of development -- social, economic, and environmental -- including livelihoods, access to water, agricultural productivity, health, population levels, education, and gender-related issues. None of the Millennium Development Goals can be met without major improvement in the quality and quantity of energy services in developing countries. **Q15** We believe the public have been underestimated for their impact to deliver on energy policy. There a number of successful, grass-roots, community-led initiatives in response to the pressures of climate change, fossil fuel depletion and increasingly, economic contraction (e.g. <http://www.transitionnetwork.org>) The CONCERTO ([www.concertoplus.eu](http://www.concertoplus.eu)) initiative, launched by the European Commission, is a good example of project which successfully integrates the technical, strategic and process challenges of achieving the highest level of self-sufficiency -- cities can be the catalysts for change. Given that a 20% energy efficiency saving is equivalent to fourteen (proposed) Nabucco pipelines, we've seriously got to consider our priorities, and the necessary actions that will bring about genuine sustainability. If you don't celebrate/acknowledge/showcase successes, all that remains is the hard work.

**39671713910-36 Finnish Forest Industries Federation Q9** Carbon storage in wood products is a fully natural way of keeping carbon away from the atmosphere. Carbon is stored in wood products as long as the product is used, in buildings it can be tens or hundreds of years. After the use the product can be used as a replacement of a fossile fuel in the bioenergy generation. The cycle is carbon neutral but the long-lasting products prolong the storage effect. The sustainable use of managed forest should not be penalized because it would only promote the use of fossil and non-renewable materials that are both energy and CO2 intensive. 2nd generation biorefineries. Investment subsidy are needed for large scale biorefineries. **Q10** Giving priority to climate-friendly renewable materials like wood. The use of wood-based building materials should be increased and thus the climate-effect of construction can remarkably be decreased. The coming Construction Products Regulation gives an opportunity to create mandatory requirements and target levels (BWR7, part c) for use of environmentally friendly materials just like the RES directive does for energy sources. The regulation formulates indicators for climate change, renewable materials and the use of renewable energy. This kind of legislation has already been introduced in France. New construction Products Regulation (Article 3 part 3) gives the European Commission a tool to include carbon footprint as part of the Declaration of Performance in the CE-marking. Investment subsidies are needed for new technologies. High efficiency ratio requirement in power plants. **Q11** ETS in an effective instrument but EU should solve the problems caused by ETS. What is needed: -free allocation for all sectors in global competition -level playing field needed – it is essential that an international climate agreement that is equally binding to all parties is achieved as soon as possible Carbon leakage would damage both the environment and EU's economy. **Q12** Targets for 2030 should only be indicative – binding targets would incentivise the wrong actions and make the overall costs higher. Short term policy creates uncertainty and more costs. **Q13** Focus on renewable materials (eg building, packaging), both consumers and producers. When reaching for extra jobs and more erenewable energy it is essential to save the existing jobs and renewable energy production in such crucial sectors as wood product industry and pulp & paper industry. **Q15** French legislation (Décret no 2010-273 du 15 mars 2010 relatif à l'utilisation du bois dans certaines constructions) is an example of a national initiative for meeting the targets in reducing the CO2-emissions. To achieve greener societys we need to focus on green materials. **Additional**



**Comments** The new roadmap should deliver the ambition to not only have targets and carbon prices but the ambition help industry make this revolution come true.

**4016736872-59 General Electric Company Q9** Europe's diverse geographies, economies and demographics require a diverse mix of technologies to build a low-carbon future. Development of new technologies is an expensive, risky proposition. Effective policy will be needed to (i) bridge the financial gap new technologies encounter as projects move from R&D towards commercialization and (ii) level the playing field for competition against lower cost unsustainable fuels. Examples of technology specific policies to help the EU meet its 2050 target are outlined below. Smart Grids Government policies have proven critical to —jump-starting□ investment in the smart grid yet additional support is needed. We urge policymakers and regulators to: □ Establish performance targets, such as peak load reduction standards, encouraging utility investment in demand response; □ Recognize distribution system efficiency improvements within energy efficiency standards and targets; □ Encourage utilities to take an more 'end-to-end' approach and work more closely with network operators to develop customer-focused solutions o Adopt rate policies, such as decoupling or performance-based ratemaking, will compensate utilities for electricity demand reductions due to demand response and energy efficiency; o Require utilities to offer residential customers variable rate structures who participate in such programs; these price signals are essential to realizing the potential of smart grid-enabled demand response technologies; o Encourage nighttime (off-peak) charging of electric vehicles, require utilities to offer discounted rates reflecting the lower marginal cost of nighttime generation; o Ensure that utilities provide consumers with timely, relevant electricity usage data, and safeguard these data from unauthorized use. □ Provide a range of dedicated incentives across the entire value chain for the deployments of grid technologies, purchase of smart appliances and in-home energy management devices such as increased innovation stimulus for DNOs, tax credits and energy efficiency programmes. Developing smart grids requires a new financing model for electricity distribution. Current practice is mainly focused on network reliability and cutting costs. While incentives from regulators to DSOs will have to move from rewarding efficiency improvements to sustainability, the electricity industry faces concern that it will end up paying for all the investment without receiving reasonable returns. Policy solutions will be needed to address this issue. Wind energy is increasingly promising but requires large upfront investments. Indeed, cost of turbine, foundations, electrical equipment and grid-connection account for up to 75% of total cost. Operational costs for offshore wind turbines are also a factor – incurring three times the maintenance costs of land-based counterparts. To offset these costs while the technology grows in scale, the EU should fund offshore demonstration projects to leverage private investments, reduce risk (encouraging additional investment) and ensure that offshore wind meets its potential – delivering the power Europe needs seven times over. Long-term, sustainable funding instruments like Green Certificates will incentivise companies to continue to invest in new technologies. A pan-European Directive on incentivizing ancillary services for wind turbine technology should also be adopted in light of the growing demand for so- called grid ancillary functions. Ancillary functions stabilize the grid or local network connected to a wind farm. Currently, conventional generators or other grid infrastructure hardware provide these services. However, modern wind turbines can provide voltage control, frequency control and reactive power even during times when there is no wind. Considering overall costs, wind turbine's ancillary services should be used instead of purchasing new hardware. Yet wind turbine units providing these services cost more than less efficient counterparts. To encourage overall efficiency Germany pays a per-kilowatt-hour price to wind farm operators to incentivize use of smart electrical wind turbines. We encourage similar EU policies as well as streamlined,



common planning and connection to provide greater investor certainty, reduce costs and meet renewable targets. Integrated Gasification Combined Cycle (IGCC) Integrated Gasification Combined Cycle (IGCC) is considered a critical low-carbon technology. The IGCC process captures all key pollutants such as particulates, sulphur, mercury and carbon dioxide, prior to combustion. This is more economical than capturing pollutants in a ‘post-combustion’ process. Plus, IGCC plants require far less water than conventional coal plants. IGCC and all of its potential benefits are commercially proven and available. It is already possible to build 900MWe coal stations based on IGCC Technology with carbon capture on the complete station (more about an IGCC project being developed in the UK in our response to question 15). CHP and Waste Heat Capture Combined Heat and Power (CHP) simultaneously generates electricity and heat at or near the point of use, typically achieving a reduction of up to 30% carbon emissions compared to conventional means of energy generation. While the principle has long been utilised in industrial processes, newer technology has improved the amount of heat captured from a source enabling a broader variety of heat sources to qualify. For example, organic rankine cycle technology can capture waste heat from gas turbines and compressors and generate as much as 12MW of electricity The viability of CHP is dependent on a range of complex infrastructure-related factors. Policy-makers can support the conditions for CHP by encouraging energy intensive users to deploy CHP where economically feasible through appropriate financial support mechanisms, tax incentives, planning targets and encouraging network operators to work closely with developers. **Q10** In order to secure a successful transition towards a low carbon economy by 2050, some of the more important policies to be adapted in the coming five to ten years will: I. Focus on resource efficient power generation II. Revive the Strategic Energy Technology Plan (SET-Plan); III. Apply ‘low-carbon’ conditions to the use of EU funds IV. Electricity Market Reform I. Focus on resource efficient power generation Three vital natural resources are consumed in the generation of electricity (and CHP). They are fuel, water, and increasingly in the case of wind and solar power, land. Indeed, the conversion of primary fuels to electricity accounts for approximately 40% of the world’s primary energy consumption. Furthermore, electricity production represents 44% of the EU’s water withdrawals, primarily for cooling – the single largest consumer. Finally, wind power has become the single fastest growing form of power generation in Europe. Quite simply then, supply-side efficiency for electric power means either (1) generating the same output of electricity from less fuel, water and land, or (2) generating more electricity from the same inputs of fuel, water and land. The benefits of supply-side generation efficiencies are independent of how Europe’s future demand for electric power evolves. Yet, all forecasts point to rising European demand for electricity above and beyond expected demand-side efficiency and conservation gains. As a result, renewed supply-side focus on resource-efficient electric power generation is a strategic imperative for Europe. There are currently three main barriers to uptake of measures and technologies to improve the efficiency of energy production: finance, infrastructure and regulations. Each of these impacts an organisation’s motivation to implement efficiency improvements: 1. Financial Considerations: Size of capital expenditure (Capex): Capex is generally higher for low carbon technologies and benefits materialize only during day-to-day operation, incentives need to be provided upfront. Rate of return (ROR): For efficiency investments, a key concern is the certainty with which a company can predict that the regulator will allow the company to recover its investment after taking into account the political and economic impacts of higher tariffs to consumers. 2. Infrastructure The lack of grid capacity removes part of the incentive for investing in renewable energies such as wind but also can reduce the attraction of investing in CHP. Likewise, it is often challenging for owners of CHP projects to negotiate with utilities on the rates at which the excess power is purchased, or the rates that the utility charges the CHP owner for back-up or stand-by power.

3. Regulations Efficiency improvements fall short of full deployment for a number of reasons, most of which can be addressed through effective policies and programmes. The European Emission Trading Scheme (EU ETS) is one such policy. However the ETS by itself and in its current form is insufficient to drive an energy transition and change the fuel mix in Europe. Complementary policies are therefore needed. Policy options to leverage efficiencies in the installed supply-side infrastructure base might include the following EU and Member State-level measures:

- EU-level
- Emission Performance Standards or CO<sub>2</sub> benchmarks: An Emission Performance Standard (EPS) could serve as a viable regulatory supplement to the existing CO<sub>2</sub> emissions trading scheme (ETS). An example of this approach has recently been proposed in the Netherlands where it is referred to as a —bonus/malus□ system.
- Strengthen the CHP Directive: A mandatory target for cogeneration could substantially increase CHP deployment.
- Carbon pricing: EU ETS allowances should eventually provide a valuable push for promoting innovative low carbon technologies.
- Market instruments based on tradable certificates: Tradable certificates (often referred to as —White Certificates□) can be created to certify that a certain reduction of energy consumption or renewable energy has been attained. Similar instrument have been used to promote demand-side efficiencies in some member states.
- Transparency requirements: Power plants could be required to report on resource efficiency improvements. This could be modeled on a similar reporting system used in the USA.
- Member States-level
- Tariff-based incentives for improving power plant efficiency: Under a tariff-based incentive system, regulators set a plant's prices or profits conditional on meeting established targets. If the plant out-performs those targets, it is allowed to retain some portion of the resulting savings; if the plant under-performs, then it pays a penalty associated with the higher system costs.
- Linking water prices more closely to market demand: Water prices should reflect the cost of replacing water removed from aquifers, rivers and reservoirs.
- Remove direct and indirect subsidies to fossil fuels: Phasing-out of fossil fuel subsidies could be a low-cost way to drive resource efficient power generation.
- Grants, tax and fiscal incentives: The fundamental objective of fiscal measures should be to transfer the value that the consumer and society receive from an action to reward the investor and to address the upfront cost of low carbon technologies.
- Introduce incentives for technologies, which improve resource efficiency: Targeted financing mechanisms should be established for new projects that substantially improve resource efficiency in power plants.

Energy is a large-scale and long-term business. Since scale and efficiency work hand in hand, the supply-side opportunities are abundant and can be readily implemented. To help to avoid a long-term lock-in of inefficient energy systems, the EU urgently needs to develop commercially sustainable policies to drive investments in energy efficiency that address the triple challenges of security of supply, climate change and affordability. If clear requirements and incentive structures are established to favour energy efficiency, it will be recognized as a robust investment option and will attract financing. Energy efficiency projects can also be deployed rapidly, creating labour intensive sources of employment and promoting the green economy. Demand and supply-side efficiency represent complementary strategies that can work in tandem to deliver the full range of efficiency potential. Given the —act now□ capability, the energy security benefits, the widespread acceptance of the technologies and the cost-effectiveness that supply side energy efficiency offers, it should be considered as the first wave of a broader energy efficiency strategy and as a transition strategy to a lower-carbon and resource-efficient future.

II. Revive the Strategic Energy Technology Plan (SET-Plan) We urge policy makers to immediately re-focus on the European Strategic Energy Technology Plan (SET-Plan) as a tool to deliver low-carbon technology results for 2020. At its core are demonstration projects that will pave the way towards large scale deployment of low carbon solutions. Currently, however, the SET-Plan has been neglected. It needs a renewal of high-level political commitment focused on: (a) its

necessity and economic benefits to Europe in the global race to secure low-carbon technology markets; and (b) realistic solutions to secure additional public funding, both in the current pre-2014 EU Budget period and in the post 2014 period. If SET-Plan funding for 2014+ can be found within the EU Budget, some possible sources for additional pre-2013 funding are: □ Structural and Cohesion Funds have been allocated and not spent. (Precedents from Gallileo and ITER could be relevant). □ ETS auction revenues from 2012. (Germany has committed 100% of national revenues to fund technology innovation). □ The proposed Technology Accelerator incentive scheme using 800m EUAs under the ETS energy intensive industry benchmark (where SET-Plan projects can include industry). Near term political and financial commitments to the SET-Plan will go a long way towards meeting the goal of a low-carbon Europe in 2050. III. Apply 'low-carbon' conditions to the use of EU funds In order to ensure that the 2050 low-carbon goals are met, Europe's Structural and Cohesion funds should, whenever possible, follow 'low-carbon' guidelines and contain low-carbon conditions. The Commission's recently released Fifth Report on Economic, Social and Territorial Cohesion makes a strong case for the use of clear conditions and strong incentives to support the Union's 2020 Strategy. By the same logic, clear conditions and strong incentives should accompany EU funding in order to meet the 2050 goal of a low-carbon economy. IV. Electricity Market Reform Early decarbonisation of the electricity sector is seen as central to meeting the EU's 2050 greenhouse targets and is a cost effective way to meet the target. However investment levels will need to increase to around three times the current levels and a pan-European approach can advance the EU's climate change mitigation agenda. Current electricity systems across Member States have tended to focus on cost efficiencies and reliability rather than the incentives required for new high capital cost generation. Meanwhile policy-makers and regulators cannot provide certainty that investors need to make long-term investments. More ambitious reform will be required to guarantee the timely delivery of a decarbonized electricity system. The EU should support member states in their efforts to assess the most optimal market arrangements that can be introduced to promote pan-European investment and encourage Member States to implement them. For example, this should consider a lead on how best to ensure an the right balance of market-based mechanisms such as capacity mechanisms and financial support instruments such as the Green Certificate and attempts to introduce pan-European regulations such as emissions standards and a carbon floor. Integration with European electricity markets will be vital to ensure that the costs of the transition to a low carbon economy are minimised. Members States also need to ensure that electricity market design is compatible with integration into a wider European electricity market and make strategic decisions about the way we develop our electricity networks can be taken. **Q12** We believe that the Commission should focus on the policies and priorities that we outline in our response to questions nine and ten in order to create a stable environment to encourage investment in low carbon technologies in the medium to long term. **Q14** Europe needs a portfolio of adaptation strategies to reduce the vulnerability of its citizens to changes in locally available resources and to climate change. Of primary importance will be the policies surrounding water availability. According to the IPCC, by mid-century fresh water management issues will escalate in nearly every region of the world, crop productivity will initially increase in some temperate areas but lower latitude crop production is expected to drop and drought conditions and extreme weather conditions will worsen.<sup>8</sup> In this period, the IPCC also estimates that over eighty percent of the world's population will experience the impacts of climate change related events and we will need solutions to water scarcity, energy

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<sup>8</sup> IPCC, 2007: Summary for Policymakers. In: Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, M.L. Parry, O.F. Canziani, J.P. Palutikof, P.J. van der Linden and C.E. Hanson, Eds., Cambridge University Press, Cambridge, UK, 7-22.

security, medical treatment and coastal flooding. Aligning and understanding the adaptation opportunities presented by existing and developing technologies is critical to preparing European communities for environmental and societal changes wrought by climate change. Policies to develop and deploy adaptation related programs will enable communities to meet the needs of their people in a changing environment. In particular we urge the Commission to focus on the critical issues outlined below (i) water, (ii) a low-carbon fuel mix, (iii) smart grids and (iv) new medical technologies

**I. Water** Water recycling and reuse should become standard policy for communities that face limited water supplies. It is very likely that several EU regions will need to combine aggressive water conservation measures with water recycling initiatives to address current as well as future water scarcity.<sup>1</sup> Communities and other governmental authorities have several options for increasing recycling and reuse of water in their area. Some of the major types of policies being used to increase water recycling and reuse include the following:

- i. Education and Outreach • Recognition awards and certification programs • Information dissemination and educational outreach efforts • Reporting of water consumption, discharge, and reuse data
- ii. Removing Barriers • Modify local regulations to require that all water meet potable standards. • Revising plumbing codes to allow dual piping • Alleviating stringent permitting and inspection requirements for recycled water.
- iii. Incentives • Direct subsidies • Reductions in payments to the government • Payments for reintroduction of recovered water • Pricing mechanisms • Regulatory relief for recycled water users • Government procurement of water recycling/reuse equipment • Structuring of water rights to reduce the use of potable water.
- iv. Mandates and Regulation • Requiring utilities to develop plans for recycled water • Restricting potable water to human or food

**II. Low carbon fuel mix** Policies including those addressed in our answers to questions nine and ten are needed to foster development and deployment of high efficiency, low or no emission power generation and carbon capture technologies utilizing a portfolio of locally available fuels including nuclear, coal, natural gas, wind, solar, biomass/biogas, landfill and industrial waste gases

**III. Smart Grids** A full spectrum of grid improvements to enhance efficiency and ensure stability and operability in challenging environmental conditions

**IV. New Medical Technologies** New medical technologies will improve access to medical records in emergency situations and improve testing and treatment for illnesses related to water borne pathogens, viral and insect transmitted diseases.

**Q15** 1. EU grants for projects that demonstrate the viability of new technologies should be a core element of the EU's roadmap to a low-carbon economy by 2050. Take the example of Integrated Gasification Combined Cycle (IGCC). IGCC can be considered a critical technology in the fight against global climate change. A highly pressurized IGCC gasification process provides the mechanism to effectively capture all key pollutants such as particulates, sulphur, mercury and carbon dioxide, prior to combustion. Pre-combustion capture is more economical than capturing these pollutants in a 'post-combustion' high volume and low concentration flue gas. In addition to other environmental benefits, IGCC plants require far less water than conventional coal plants do. It is expected that post-combustion clean-up technology will require a long-term development cycle before it is mature enough to be applied to existing coal plants. Even at that point, only a small portion of today's operating coal-fired plants will be able to adapt major retrofit conversions. With funds from the European Economic Recovery Plan (EERP) GE is furthering IGCC via the Hatfield project in the UK developed by Powerfuel. Located in the north-east of England, it is a 900MW CCGT power station that is projected to be built by 2013 with full CCS conversion by 2015. It is currently the most viable CCS project in the UK from a technical and commercial perspective and has benefitted from a €180m EERP grant. The fuel flexibility of GE's CCGT technology enables the conversion to syngas and the phased in approach, thus broadening the customer's options for power generation as national CCS infrastructure develops.

2. With the growing penetration of renewable technologies,

there is also a growing need for solutions to ensure a non-stop, continuous electricity supply to consumers and businesses when the wind stops blowing, or the need at a particular hour is low. In early 2010 GE and several business partners launched a development program called —ADELE,□ which has the potential to revolutionise the way energy can be efficiently stored on a large scale. In the simplest of terms, inexpensive power generated during off-peak periods will be stored in the form of compressed air —like a giant battery — and when electricity demand rises, this compressed air will generate power in a turbine – while recovering the heat. The aim is to erect a first demonstration plant after 2013 with a storage capacity of 1,000 megawatt hours and an electric output of up to 200 MW. 3. GE is contributing to this growth as a technology leader in both on and offshore wind with a plan to invest €340 million in European offshore wind capability over the next ten years. Plans include an offshore manufacturing facility in the United Kingdom, an Offshore Technology Development Centre in Oslo and expansion of an advanced demonstration unit production and service facility in Norway.

**41126912590-71 AREVA Q9** Moving towards a low CO<sub>2</sub> generation mix is critical as it both reduces the emissions from the power sector and in those end-use sectors which have the potential for greater electrification (transport, heating). According to the Blue map scenario from the IEA, nuclear (extension of nuclear Gen 2 reactors lifetime and Gen 3 new builds), CCS and renewables energy sources will contribute with broadly equal shares to the CO<sub>2</sub> savings. By 2050, nuclear and wind energy will represent more than half of the European power mix. Efforts should be pursued in order to accelerate the creation of an internal market for these technologies (ia nuclear safety standards and licensing procedures need to be harmonised, international performance standards should be promoted for renewables, consistent grid investments should be encouraged across Europe). **Q10** -Strengthen ETS market to provide strong CO<sub>2</sub> price signals over the long term. -Commit to public sector financing support to facilitate investment in low CO<sub>2</sub> technologies (eg. low CO<sub>2</sub> energy fund, loan guarantees) where market failures are identified. -Foster the development of an EU internal market for low CO<sub>2</sub> technologies and the adoption of an ambitious EU industrial policy for this sector. -Sustain EU technology lead by significantly increasing EU financing in R&D and demonstrators (ie SET-Plan and energy chapter in coming FP8) -Finalize the internal market for energy and accelerate the related infrastructure investments. -Introduce carbon intensity of power generation (gCO<sub>2</sub>/ KWh) as a non binding target for the power sector. -Strive to achieve agreed energy efficiency targets, focusing on the strengthening of current regulations on buildings and emissions of vehicles. **Q11** We welcome the EU's willingness to reinforce international carbon markets and we believe that a combination and interaction of several elements can help achieve it. Bilateral agreements can be a first step towards this objective, provided they can be recognized by and integrated into a future global framework so as not to create unnecessary and costly fragmentation of markets. One should also ensure that full fungibility, high liquidity and transparency are achieved for market mechanisms to be effective. In addition, mechanisms such as the CDM, or any new mechanism, should include all low carbon technologies (nuclear and large hydro should be explicitly eligible) and allow for the financing of wide-scale low carbon projects. Sectoral crediting could be part of sectoral approaches pursued by countries willing to integrate them within their NAMAs under the UNFCCC framework. **Q12** In addition to a longer term vision on carbon prices, a mid-term objective for 2030 would indeed improve the regulatory certainty needed to engage in long-term investment. This 2030 objective should be ambitious in order to grasp the existing window of opportunity resulting from the required power fleet replacements in the next two decades. It should be expressed in % of CO<sub>2</sub> emission reduction so as to let Member states choose among the diverse technology changes available in all



sectors. The IEA Blue map scenario expects by 2030 a reduction of about 40% of CO<sub>2</sub> emissions (compared to 1990 level). For the power sector, a good performance indicator could be the average CO<sub>2</sub> emission per KWh. Voluntary CO<sub>2</sub> performance standards could be envisaged over the medium-term. **Q13** Renewable energy sources and nuclear should be on the top of the list. As recognized by the European Commission in its 2nd Strategic Energy Review, both energy sources contribute to increased security of energy supply and stable energy prices. Both solutions emit little CO<sub>2</sub> and almost no SO<sub>2</sub> and NO<sub>x</sub> thus contributing to cleaner air. Nuclear, being at present the most competitive low CO<sub>2</sub> energy sources for baseload power supply, contributes to sustaining the competitiveness of the European industry. Renewables, a fast growing industry, contributes to EU economic growth. Finally, nuclear and renewables together currently employ over 1 million people (about 500.000 each). Growth of both energy fields will bring clear and significant socio - economic benefits to Europe. **Q14** If the EU wants to achieve its climate objectives by 2050, the power sector will be the one where most drastic changes will have to occur. According to the Blue Map, the share of fossil fuels in power generation will have to decline from 54% in 2007 to only 17.5% in 2050. A smooth social transition towards a low CO<sub>2</sub> economy will require a redeployment of resources and skills across the sector. The EU should be proactive in identifying where the growing needs will develop and launch the necessary training / education initiatives to maximize job creation in Europe. The cost-effectiveness of the transition should also be pursued in order to minimize the impact on EU industrial competitiveness. **Q15** In the last years, China has clearly demonstrated its capacity to integrate a low CO<sub>2</sub> policy with significant industry and engineering capacity building. Encouraging leading low CO<sub>2</sub> technology providers will be the key to a successful climate action in Europe or in China and US.

**41712904517-59 DONG Energy A/S** **Q9** Generally speaking, it is not wise to pursue a "picking the winner" strategy applicable to the entire European Union, as various technologies have different advantages in different European regions. Still, with a view to achieving the 2050-target of a low carbon economy, it is necessary to fully exploit well-known and tested technologies that are already today rather mature with a view to being commercially viable in a future low carbon economy. Key focus needs to be put on the renewable energy technologies that are already being furthered with the launches of the industrial initiatives of the SET-plan, i.e. bio-energy, wind power, and smart electricity grids (including heat pumps and electrical vehicles technologies). **Q10** European infrastructures are too fragmented and with the construction of new RE generation capacities at non-conventional locations, the need for physical and technical market integration is even more acute. Considering the lengthy construction periods of new transmission lines, the key priority for the next decade is to secure swift and effective European mechanisms for construction of transmission lines as well as additional community financing instruments. With 2013 approaching shortly, the EU needs to secure a smooth transition to ETS III where the effective carbon price creates sufficiently strong incentives for large-scale investment in renewable energy generation capacity. Thirdly, the EU needs to tackle the still increasing challenge of fossil fuel dependency in the transportation sector. Therefore, the Commission should already now devote more resources to standardization and policy measures that make room for an electrified vehicle fleet by 2050. **Q12** The roadmap should bring about more predictability for investors in clean technologies and bring about greater certainty that the mid-range 2020 climate and energy priorities will be followed-up by equally or even more ambitious binding frameworks for the period post 2020. Both in terms of research and deployment of new clean technologies it is imperative that the time horizon is longer than 2020. Mid-term objectives for 2030 would be necessary stepping stones, if the 2050-vision should be more than a vague and intangible

dream scenario for a possible low carbon economy, and a clear timeline should be constructed with regards to adoption of binding 2030-targets for emissions reductions and deployment of renewables. **Q13** The outlook is dim for a comprehensive and binding global agreement on absolute CO<sub>2</sub> emissions, and the EU makes up for still smaller fractions of the total global greenhouse gas emissions. In this light climate action needs to be still more related to innovation, competitiveness, and security of supply. This requires, as a minimum, a stronger focus on energy research, deployment of renewable energy technologies, on integration of surplus renewable energy into the European energy grids, and a better alignment of the EU policy priorities with the multi-annual financial framework of the EU. **Q14** Particularly within the agricultural sector it is necessary to ensure that the hunt for biomass does not lead to excessive price leaps for agricultural products, thus that there is a need for developing proportionate sustainability criteria for use of solid biomass and for still stronger measures to expand the scope for 2nd generation biofuels in the transportation sector. **Q15** At DONG Energy we aim to be 85 percent fossil free in our power generation by 2040. In this light we find ourselves aligned with the objective to cut emissions in the EU by 80% to 95% by 2050. We undergo this transition because it makes a sound business case for us as a power utility, but it is still important that the right incentives are put in place to invest in low carbon energy production, and that disincentives to generate cheap fossil fuel power are put in place.

**42433582-82 FORATOM Q9** Gen III NPPs have a life-time expectancy of 60 years, and should be operating beyond 2050. Gen III builds on lessons learned from Gen II providing a high level of safety, good maintainability and operational efficiency. Gen IV NPPs should be commercially available around 2040. Gen IV fast neutron reactors with fuel recycle will offer the possibility to extract 50-100 times more energy from a given amount of uranium. High temperature reactors (Gen III or IV) can provide cogenerative process heat for efficient and virtually carbon-free production of hydrogen or other process chemicals, or for large-scale desalination. The EU can help foster Gen IV research through the SET-Plan and other appropriate measures. The European Sustainable Nuclear Industrial Initiative (ESNII) launched under the SET-Plan on 15 November 2010 is seeking funding of up to €10 billion. Likewise, through the Euratom FP, research and development projects can continue into next generation nuclear technologies. **Q10** EU leadership in nuclear safety, long-term operation of current reactors and long-term development of next generation plants for increased sustainability should be maintained. Focus on human resources cannot be neglected. Nuclear energy R&D should be promoted. EU fission research funding should be kept at a level equal with the potential of nuclear to make a major sustainable contribution to future low-carbon energy mix. The SET-Plan sets out a strategy to make a successful technological transition to a low carbon economy. The ESNII projects must be delivered on time and the appropriate funding assured. The harmonisation of conditions for long-term operation of NPPs should be supported at the EU level. Developing a coordinated EU approach towards harmonising licensing procedures and the design certification framework for NPPs could step up investment in nuclear energy. An upgrade of the EU transmission grid is necessary, continuing to accommodate 30% baseload nuclear electricity. **Q12** Nuclear delivers stable, competitive, large scale and low carbon electricity generation. In order to maintain nuclear's contribution in the energy mix in 2030 it needs investment decisions in the next few years. Strong political support is necessary to ensure the right framework. The creation of new financing models to stimulate wider investment in nuclear new build and the long-term operation of existing nuclear power plants should be put forward by the EU. The EU should look at what investments are most needed in the nuclear sector and investigate what the bottlenecks are to financial investment. The EU should analyse where funding currently comes from and where potential new funding may be available in future. The EU should seek

to harmonise licensing procedures in the EU, and guide MS towards establishing more stable legal & regulatory frameworks and long-term policies. This would reduce uncertainty for the nuclear industry, investors and the public. **Q13** Nuclear power is the single most significant means of limiting the GHG emissions in the power sector, while enabling access to abundant electricity at a stable and low cost. Electricity market regulation should ensure a level playing field for all low carbon electricity generation. Maintaining the EU's leading position in the nuclear field can enhance the competitiveness of the EU's economy by providing jobs, currently +/-500,000, and generating income for domestic actors. Security of supply and cost stability brings about various benefits to the economy, i.e. controlling inflation & encouraging electro-intensive industries to stay in the EU. EU has the industrial structure, skills, and outstanding expertise in nuclear energy. Uranium security of supply is based on diversified resources coming from politically stable countries. Due to its high energy density, nuclear fuel may be easily stored in small volumes in domestic facilities lowering the probability of external energy shocks.

**4271427696-87 EURELECTRIC aisbl Q8** All above-mentioned legislative measures would be needed to reach the 2020 goals and prepare the ground for the next decades. Crucial would be the implementation of such policies, particularly where actions would be required by a vast, fragmented class of actors, like citizens and SMEs. Moreover, the interaction of different policies should be carefully assessed, in order to avoid overlapping and/or inconsistencies in the overall regulatory framework. **Q9** All these technologies will be needed. Our recently published study Power Choices, on the role that a carbon-neutral electricity can play in decarbonising the European economy by 2050 is assessed, this issue is specifically addressed. For more information, please visit our website at: [www.eurelectric.org/powerchoices2050](http://www.eurelectric.org/powerchoices2050) **Q10** EURELECTRIC has recently published the brochure "20 steps to 2020" where urgent measures in the run up to 2020, within a 2050 vision, are stressed. The report is available at: <http://www.eurelectric.org/20stepstowards2020/Default.html> **Q11** EURELECTRIC firmly believes that a robust international agreement on climate change would be the preferred way to foster an international carbon market. Nevertheless, recognising the slow progresses in the UNFCCC negotiations, particularly in view of the upcoming ending of the first commitment period of the Kyoto Protocol, the EU should clarify define the criteria on which bilateral agreements would be based and engage with stakeholders on assessing the impact of possible options. **Q12** Having a clear visibility on how to bridge the gap between 2020 targets and 2050 goals would certainly be beneficial. Having said that, the decision for investing in most of the power plants which will be operating in 2050, will be taken in the next years. It is thus of primary importance to develop instruments to speed the early take up of low-carbon technologies. **Q15** The EURELECTRIC report "Energy Wisdom Programme" is a voluntary initiative of electricity companies in reporting innovative projects aimed at reducing carbon emissions and improving energy efficiency. For more information, please visit the website: [www.eurelectric.org/ewp](http://www.eurelectric.org/ewp)

**43763731235-75 Mouvement des Entreprises de France Q8** EU ETS: Emission Trading Schemes are relevant market-based instruments: they provide more opportunities for reducing emissions at lower costs and for stimulating innovation. However in the absence of similar carbon costs elsewhere, it creates a serious risk of damaging the competitiveness of the European industry. EFFORT SHARING: A proper balance between the EU ETS and other sectors needs to be struck. The present share of efforts born by the ETS sectors is already significant and a continued focus on ETS perimeter would not be cost-effective. Alternatively, buildings, domestic appliances and transport sectors have a significant potential of cost effective abatement measures. RENEWABLES: targets should be achievable, consistent and placing high priority on environmental and cost-effectiveness criteria. The EU and Member

States' support to renewable energies need to be re- assessed in order to minimize the cost to society and the impact on the energy competitiveness of the European industry. **ENERGY EFFICIENCY:** Ongoing initiatives in non ETS sectors, notably buildings and transport, should be supported. These sectors constitute more than half of the current CO<sub>2</sub> emissions in the EU. The implementation of Energy Labelling and Eco-Design directives must fully take into account lifecycle thinking. **BUILDINGS PERFORMANCE:** it should be a source of major economic growth and job creation, while stimulating energy efficiency. The same remark is valid for **CARS LABELLING**, enhanced notably via programs such as the French "scrapping scheme" which favours sales of low CO<sub>2</sub> emitting cars. This, in turn, stimulates the research and development of new generation vehicles, and has a positive impact on the whole economy. **Q9** The energy efficiency field provides the most significant potential for further improvements and GHG reductions. But a portfolio of all the technologies mentioned above should be considered: not enough is known yet to choose the right technology for the next 40 years and more. An R&D policy targeted towards these and as yet unknown low-carbon technologies should be developed and driven at a European level. The EU then needs to facilitate the deployment of promising new technologies on a commercial scale by providing adequate regulatory and financial incentives. In deciding the winning technology first priority must be given to cost-efficiency and competitiveness criteria: Huge investments in infrastructure might be at stake. Special attention should be drawn to the two following technologies: -Carbon capture and storage, which would allow the use of fossil fuels, crucial to ensure the security of supply in the coming decades;- Energy storage, which would ensure the continuous expansion of renewable (but unpredictable) technologies; in this area energy storage (batteries) for vehicles is a critical issue. **Q10** The transition to a low carbon economy will require economy wide efforts. As already mentioned energy efficiency should be on top of the list. There is potential for improvement in areas such as buildings, transport, power generation and distribution and eco design and labelling of energy using products. This is not to be done necessarily by adding new layers of legislation and imposing global legally binding targets but rather via better implementation of existing instruments: .EU should also facilitate public sectors financing in the infrastructure energy field, which is rather capital intensive, and create simultaneously an ad hoc EU harmonisation framework for avoiding distortion of competition between Member States. EU should incentivize R&D targeted toward low carbon technologies. The use of auctioning revenues from the Emissions Trading Scheme could be a potential way of stimulating the development of these technologies. **Q11** International climate action will not be really effective without a comprehensive global agreement: .i.e. a legally enforceable and international agreement that, through the creation of an international carbon price, demands similar efforts from all other industrialised countries and main developing countries. Bilateral agreement, sectoral crediting mechanisms might help for reaching such a global agreement. But it will be especially important to ensure availabilities of offset credits to enable the cost effective compliance of EU companies with their commitments under the EU ETS. **Q12** Not all sectors of the economy, or all industrial sectors will move at the same pace; a simple economy wide emissions reduction target drawn on a straight line trajectory to 2050 will not recognise how practical change will occur in the economy and is extremely unlikely to deliver the most cost-efficient solution. The 80-95 % reduction is at present an aspirational target which should not lead the European Union to make hasty technological choices and consequently to have to make expensive U-turns. Step-wise and flexible approach will be essential, taking no regret actions now (such as energy efficiency), with a predictable regulatory framework and intermediate targets in the midterm (2030). These targets might address specific sub elements of the goal such as energy efficiency in buildings, transport or the development of cost-efficient renewables. **Q13** Choosing a top of the list is not possible as all these aspects are interrelated around three



pillars: sustainability, competitiveness and security of supply. Maximising benefits imposes to put cost efficiency as a first priority as well in terms of emissions reductions as in terms of energy structural changes. In any case all energy options will have to be part of the mix in the decades ahead. In the medium and long term, the European Union should also favour acting in an harmonised EU framework rather than via national targets. **Q14** The agriculture & food sector would seem to be the most vulnerable, and EU water policy may have to factor in the more unpredictable weather patterns. Critical sectors will also include the energy sector, the information networks, transport infrastructure and buildings. **Q15** The French and European nuclear technology is a pathway where the competitive edge should be preserved and further developed. The development of green pathways boosted by the French legislative package “Grenelle de l’Environnement” might also be used as an example for steering the EU transition to a low-carbon economy. Among these green pathways, energy efficiency in buildings, biomass energy and waste recycling for energy use are experiencing a rapid development. Carbon capture and storage offers as well good opportunities for the French industry. **Additional Comments** The trajectory to a 2050 ambition level must be designed to preserve the whole European economy competitiveness, favour job creation and boost low carbon technology pathways where EU can take a leading role on the international scene. A diversified energy mix, a continuous effort for energy efficiency improvement, and the development of cost efficient renewable energies are among the key factors of success.

**4492008176-50 Association of European Airlines Q8** The EU Emissions Trading Scheme, which now also includes aviation, as stipulated in Directive 2008/101, is not an easy concept to grasp. Why should anyone buy and sell something that nobody wants? An easier way to imagine it is as a form of fuel rationing, since CO<sub>2</sub> emissions vary directly with fuel burned – airlines have a fixed quantity of fuel allowances, and can either tailor their operation to fit within this allowance, or obtain additional credits in a functioning market – that’s where the ‘trading’ bit comes in. Initially, in 2012, the number of credits in circulation will be ‘capped’ at 3% below the average annual level of 2004-2006. But airlines will be given only 85% of these, the rest they will have to buy in government-sponsored ‘auctions’. In 2013, the cap will be lowered, by a further two percentage points. This process, which has preoccupied Europe for a number of years, also has important repercussions for the rest of the world. Firstly, the EU system is intended to apply to all airlines flying into and out of European airports, and non-European airlines have been complying or attempting to comply with the preliminary requirements of reporting and verification. In a parallel process, however, some governments have signalled their strong opposition to unilateral action by the EU to impose ETS on non-EU airlines. Secondly, and from the world’s point of view more importantly, a European scheme in isolation is not going to solve global warming, nor aviation’s contribution to global warming. The great powerhouses of growth at present are China, India and the Gulf. If it is recognised that aviation as a whole has responsibilities which it must face, then regional initiatives are not the answer. Unfortunately, they do not address the problem, but they do introduce competitive distortions into an industry which operates in a global marketplace. In the search for a global solution, paradoxically, the airlines of the world are far ahead of their governments. In 2009, the airlines of IATA – around the world, not just in Europe – formulated a commitment to deliver real environmental gains, in a three-phase process. In the short and medium term, up to 2020, the tempo of emissions efficiency, which has always been a feature of the industry, would be improved. Beyond 2020, the rate of aviation CO<sub>2</sub> production would cease to grow completely – but that is just a starting point: onwards to 2050 the industry would cut its CO<sub>2</sub> to half the level of 2005. Because these goals were formulated by airline experts committed to environmental objectives, they are endorsed by other stakeholders in the aviation sector – making these targets those of a global aviation industry -



the only industry that has, at global level, agreed on such short, medium and long term objectives. These are huge promises, and to fulfil them will require that aviation can access new technologies in aircraft and engine design, advanced materials and alternative fuels. All of these developments must be paid for, and it makes eminent sense that if a cash flow results from the EU ETS and other 'market based instruments', it should be ploughed back into the refinement of the technology that will bring about the environmental improvements which the industry is being called upon to make. At the recent Assembly of the International Civil Aviation Organisation, a first step political agreement was achieved on a package of targets for aviation, which includes carbon neutrality from 2020 – but not, as yet, the longer-term halving of CO<sub>2</sub> production. This package has been submitted to the next major climate-change conference, in Mexico this November/December. A well-designed EU ETS would be far more cost efficient and environmentally effective than taxes and charges in achieving environmental objectives and that its application would negate any rationale for additional taxes and charges on aviation. Also, there are still significant issues concerning the EU ETS which will have to be addressed in the short term, e.g. the calculation of historical emissions, the recalibration of the revenue ton kilometres of the base-year 2010 in light of the airspace closures due to the volcanic eruption in April and May and the final list of operators to and from Europe which will be covered by the scheme. These issues need to be solved well before the scheme can actually be implemented in 2012, let alone serve as a blueprint for a global system. In addition, the EU ETS monitoring, reporting, and verification (MRV) system gives airlines credit for biofuel consumed. However, given current levels of infrastructure it will be impossible to meet this criterion without significant investment in new fuel handling systems. Aviation's fuel infrastructure is built for common fuel handling, meaning that aviation biofuel will be comingled with fossil fuel in storage tanks, tankers, and when loaded into partially fuelled aircraft; it is therefore impossible to calculate the percentage of biofuel uploaded. Under these circumstances, the only practical solution would be for the ETS MRV system to be based on the purchase of sustainable aviation biofuel. Unless the MRV system is adapted accordingly, the incentives for airlines to move to biofuels will be too small compared to the price gap between fossil fuels and biofuels. **Q9** The European Air Traffic Management (ATM) system is fragmented and inefficient. CO<sub>2</sub> emissions could be cut by up to 12% if the European ATM system were operated more efficiently through the implementation of the Single European Sky (SES). The (SESAR) programme (the technological and operational element of SES) seeks to improve ATM through new technologies and new operational concepts. SESAR goals for 2020 include a reduction of environmental impact by 10%; in practice the expected savings by 2020 include an average of 948-1575 kg of CO<sub>2</sub> per flight. The "Clean Sky" programme is key to making significant progress towards achieving the environmental goals for 2020 set by ACARE, including a 50% reduction in CO<sub>2</sub> emissions and noise and 80% reduction in NO<sub>x</sub> emissions. The air transport industry has committed to a global aspirational goal of a 50% reduction in CO<sub>2</sub> emissions by 2050 compared to 2005 levels. This goal can be reached if projects like SESAR and Clean Sky can be implemented. **Q10** Aviation's impact on climate change mainly stems from CO<sub>2</sub> and NO<sub>x</sub> emissions. Aviation accounts for only approx. 2-3% of CO<sub>2</sub> emissions and this is estimated to rise to around 4% in 2050. One of the most important initiatives to be pursued over the next 10 years to reduce the climate impact of aviation is the use of biofuels. However, the development of biofuels for aviation needs institutional support if it is to be successful. Revenues from the aviation EU ETS should be used to decarbonise the air transport sector by financing the implementation of SES or improving R&D for aviation bio-fuels. Biofuels research and the development of clean transport technologies are very capital-intensive. A combination of public and private sector resources at EU, national, and regional levels is therefore required to ensure the competitiveness of the European aviation industry. **Q11** An international

agreement is essential to build a fair and effective mechanism for market based measures. The ICAO Resolution adopted in October 2010 contains ambitious targets proposed by the industry at global level (fuel efficiency and carbon neutral growth by 2020 onwards). This Resolution is a first step towards reaching a deal at global level. However, some clarification is needed on the scope (especially on the “de minimis” rule). **Q12** Investors need stability. The parameters of the current EU ETS for aviation and certain elements of the ICAO Resolution need to be clarified. The current legal action against the scheme could also jeopardize its scope and, consequently, potential investments. The EU roadmap should be pragmatic and should provide clear guidelines on sources of investment (earmarking, a clear increase in the share of aviation projects under the TEN-T, support from FPs programme). Before proposing any mid-term objective, we need to assess if the current goals are achievable, both technically and from a legal point of view. **Q13** European Airlines operate in a global market where their international competitors do not have the same level of social/ environment/fiscal obligations. In order to maximize the benefits of future climate action, the EU should maintain current employment levels and take into account global competitiveness. Future trade defence instruments should take into account the environmental/ social requirements as parameters. **Q14** We recognize that agriculture and energy are probably the sectors most vulnerable to the negative effects of climate change. However transport, and aviation in particular, is also exposed to extreme weather conditions caused by climate change (e.g. thunderstorms, wildfires, volcanic eruptions or extreme rainfall), which can cause severe disruption to aircraft operations. The costs of these distortions are not yet quantifiable, as demonstrated by the volcano ash crisis in April 2010. Continued flight disruptions caused by extreme weather events have a detrimental effect on airlines’ finances, which could in turn have negative consequences for the European economy. These problems could be addressed by the implementation of a European emergency plan to manage such events.

**46302264606-44 Schneider Electric Q9** Achieving a low carbon economy will require the development and use of all listed technologies and even furthermore (e.g. ICT). The key issue is how to accelerate the development and use of these in an optimised roadmap according to their maturity of the technology, their acceptability and their potential benefits. Decarbonised electricity is a real opportunity on which the EU industry can build a competitive advantage. The development of smart electrical grid combined with optimised energy efficiency solutions can help the EU to create sustainable growth and jobs. The deployment of smart energy technologies solutions will be achieved by developing ambitious and simple policies tackling the most urgent needs and being feasible in short term. A strong industrial policy fully aligned with a R&D policy and combined with a maximised use of public procurement to serve as demonstration and early adoption are critical success factors for the emergence of EU industry leaders. **Q10** The first step starts with a renewed commitment from Member States on burden sharing. The achievement of Member States objectives shall be assessed and coordinated at EU level on a regular basis (e.g. Annually). The second step will be to put the EU on track with the 20% energy savings objective. A stronger emphasis shall be put on the demand side with a focus on energy end-users. The third step is to enhance carbon emissions visibility. This has started, for instance, with labelling on cars and buildings. More emphasis should be given on this including visibility on emissions reductions linked with activity and energy management: initiatives and proposals should be developed in this context. Last but not least, the financing of green technologies such as smart grid should be supported through effective EU funding mechanisms. In general, any political initiatives shall be implemented in a short timeframe so that European industries could lead the global race for green technologies. **Q11** Energy management is key to reducing carbon emissions and goes hand in hand with a consistent carbon valuation based on the EU climate change targets. Valuation of carbon

emissions must be the priority. Simple & homogeneous mechanisms should be further developed and expanded to all energy users in the context of the final revised ETS provisions, expected in 2013. Priorities shall be given to Measure, Report & Verification solutions that are: - based on systematic real-time process-based measurement vs. theoretical simulation; - relying on standards and certifications; - supporting international agreements; - communicating, allowing sharing and comparing of data. Furthermore, developing carbon market beyond regional frame should allow a more efficient market, taking into account the fact that sectoral systems could allow avoiding competitive burdens on certain industries. **Q12** The EU has set up a critical “Rendez-Vous” in 2020 and this is meaningful for a lot of people in terms of timing. Setting up a 2050 goal is an aspirational goal which would help to anticipate the development and implementation of some technologies. However, it seems more realistic to review long-term political perspectives every ten years. Therefore having a term on 2030 would make good sense. The period 2020-2030 should include detailed targets for energy efficiency and for the energy intensity of the economies as well as targets concerning the CO2 content of the energy used. As regard to energy efficiency in particular, commitments from Member States on burden sharing and getting results feedback on a regular basis would help to achieve the target. According to the experience of the 2010-2020 period, policies should be reviewed and adjusted as to reinforce binding and mandatory instruments for the period 2020-2030. **Q13** The EU shall adopt “no-regret” policies putting energy efficiency and smart energy management at the top of the list to achieve the objectives listed below. The EU has the opportunity to develop a worldwide leadership; however an initial high investment need to be fostered, and all players and stakeholders need to be better aligned on key priorities. Without aligning a strong EU industrial policy with a focused R&D policy and significant investments in training and qualification of actors, is such an ambition realistic? It is crucial to maintain green subsidies so that employers can invest in environmental training for their employees. It is necessary to focus and simplify framework for financing innovation initiatives. Public financing, through public procurements and innovation partnerships is a key driver. Cutting emissions by 80% to 95% by 2050 can appear as a sky-high challenge. Communicating about positive achievements is therefore vital in order to create “virtuous circles”. **Q14** Energy costs will increase undoubtedly, part of the increase being due to the carbon cost, so all energy users will be affected and in particular energy intensive industries. Special efforts shall be made in order to help them maintaining their competitiveness on the global stage. Such efforts should not be detrimental to the development of an effective and workable carbon market at EU level and possibly beyond. **Q15** In the decarbonisation of energy, green electricity will be the major contributor. Pilots and demonstration projects are therefore fundamental to prepare a massive implementation of: - A high share of decentralised intermittent renewable generation managed together with grid connection; - Energy storage combined with the electrical vehicles; - Carbon capture and storage (CCS). **Additional Comments** The Electra report has been sent in a separate email (see question number 8). The Electra Report was written by a team of experts from the electrical and electronics industry, CENELEC, the European Commission Metalworkers’ Federation under the chairmanship of Prof. Edward G. Krubasik, former President of Orgalime, and Günter Verheugen, Vice-President of the European Commission. It was published in June 2008 and is available at [http://ec.europa.eu/enterprise/sectors/electrical/files/electrareport\\_en.pdf](http://ec.europa.eu/enterprise/sectors/electrical/files/electrareport_en.pdf)

**48071001253-27 European Hydrogen Association Q9** All mentioned technologies will play an important role in achieving EU decarbonization targets; the role of hydrogen as an energy carrier for transport and distributed energy generation applications needs to be mentioned in this list as well. More needs to be done however to integrate these technologies in an

intelligent manner at local level. Local decision makers are faced with many different technologies that if combined in the right way could achieve even better results. For example the use of hydrogen as an energy storage solution to make use of intermittent renewable energy sources could greatly increase the use of these sources. **Q10** 1. The priority corridors as indicated by the EU Commission in the recent EC communication on the EU energy infrastructure priorities for 2020 and beyond, could accelerate the development of an efficient energy system that integrates load management and energy solutions like hydrogen. - Offshore grid in the Northern Seas to transport power produced by offshore wind parks to consumers in big cities could integrate the use of hydrogen produced by windparks as a clean fuel for fuel cell buses and vehicles in urban transport; - Interconnections in South Western Europe to transport power generated from various renewable sources will need load balancing solutions like the use of hydrogen. 2. With regards to transport, the Cars 21 and Green Car Initiative and the TEN T programme should greatly enhance the uptake of clean transport technologies like fuel cells and hydrogen. by actively engaging key industrial players in this field. **Q11** A low carbon roadmap should include most of all a meaningful and consistent effort towards carbon taxation at international level. Carbon or Energy Taxation has been the elephant in the room for too long of all EU Member State and international negotiations on climate change: all agree that it would be the most effective measure if done at a global scale. **Q12** In addition to longer term objectives, leveraging financing at EU, national and regional level will need short term objectives as well. Multi level budget cycles (EU, national and regional) need to be more aligned in order to make an efficient use of available budgets in these economic challenging times. **Q13** The EU should more actively engage with national and regional governments to mobilize the educational system to inform current and future generations of the need to be part of the decarbonization in Europe by making sustainable lifestyle choices. Educational systems in Europe have not yet integrated in a structured manner sufficient and up to date information on the challenges and (job) opportunities with regards to the use of clean technologies. **Q14** All energy consuming sectors, using fossil based fuels, will be vulnerable to climate change. A pro-active EU policy that translates the 2050 decarbonization goals to concrete and measurable targets in the affected sectors, could accelerate the uptake of new technologies and speedy adaptation. Long term targets should be complemented with shorter term realistic targets combined with supporting measures that trigger consumer behaviour as well as investments. In addition the establishment of active and effective technology cooperation with developing countries to integrate clean technologies is crucial to support the most vulnerable populations in the world. The EU Strategic Energy Technology Plan offers an excellent opportunity to include technology cooperation with developing countries in each of the European Industrial Initiatives and use the EU Fast Start funding for short term actions that will benefit EU's clean technology industries. **Q15** The EHA supported the establishment of the European Regions and Municipalities Partnership for Hydrogen and Fuel Cells, HyRaMP, in 2008 to accelerate the deployment of hydrogen and fuel cell technologies in their energy and transport system. Now representing over 30 regions Hy-RaMP is actively engaging with EU initiatives and programmes to support regions in their efforts to engage local stakeholders in building sustainable hydrogen infrastructures and engaging with the main European industrial players in creating new markets. Regional initiatives like HyRaMP could further facilitate a speedy uptake and coordinated integration of clean technologies. HyRaMP is currently working with the Commission to broaden the activities of HyRaMP to all electric mobility applications.

**54769274226-76 EDF Energy Q9** Nuclear power will be fundamental to decarbonising electricity and maintaining affordable & competitive energy supplies. The EU must facilitate the deployment of this cost effective option. Fossil fuel with CCS and renewables will also



make a contribution. The wide-scale deployment of heat pumps can provide cost effective scalable solutions. Electric vehicles also have a role to play as a direct replacement for oil based transportation. The involvement of residential consumers is a prerequisite for a wide scale deployment of energy efficiency solutions. Smart metering and smart grids are necessary to raise the awareness of customers and to incentivise them to make appropriate investments. The EU will have a crucial role in supporting R&D efforts in order to accelerate the development of new technologies and processes on both the supply and demand side. **Q10** EU initiatives should focus on R&D and standardisation. Electric vehicles in particular are an area where standardisation at a European level is needed before wider implementation e.g. when considering charging infrastructure. We also believe it is important that scalable low carbon solutions in the heating sector are pursued, and that a proper level-playing field is achieved. We are concerned that certain technologies, such as photovoltaic panels, have prematurely been deployed and that this has been at great expense to consumers through the use of massive subsidies. We believe that such technologies would have instead benefited from further R&D, as their early and costly deployment has had a limited effect on CO2 reduction, and has not given a significant competitive advantage to European manufacturers. This is an issue that the EU may wish to bear in mind when it allocates subsidies. **Q11** The EU ETS should involve to a hybrid scheme which incorporates both a cap on emissions and a floor price for carbon. We believe that international carbon markets, in a long term perspective, may address the global challenges of climate change mitigation in the context of free world trade. However, in the near term, urgent decisions have to be made regarding investment in generation assets and infrastructure. EDF Energy believes that the current focus should be on learning the lessons from Phase 1 and 2 of the EU ETS, so that the carbon price does, contrary to the situation now, provide a long term signal to make low carbon investments. In light of this, we believe that ambitious initiatives that add additional complexity to a mechanism that is still developing should be avoided. This is particularly true given that the EU ETS already incorporates a number of different carbon credits such as the Emission Reduction Units, Certified Emissions Reduction units and Assigned Amount Units. **Q12** We believe that any roadmap would benefit by building in a number of checkpoints, particularly during the period 2025 and 2035, to ensure that any scenarios are deliverable in reality and are not restricted by physical balancing constraints. It is important that any trajectory given in the roadmap is realistic and does not solely focus on the 2050 end game. **Q13** EDF Energy believes that energy policy must deal with the three general overarching issues of decarbonisation of the economy, security of supply and affordability. We believe that fulfilling the first two objectives, at least-cost, should be the basis for assessing the relative attractiveness of different options. It is important that the transition to a low carbon economy is progressed efficiently to ensure that the competitiveness of European energy supplies, and by extension European industry, is maintained while also ensuring the stability and affordability of energy prices. **Q14** The UK Government, in consultation with all sectors (including the power sector), is undertaking a comprehensive adaptation exercise in order to assess the extent of the vulnerability of the UK economy to climate change. The first reporting stage, summarising the outcome of this adaptation exercise, will be September 2011. We believe that similar exercises should be undertaken in other Member States. Such initiatives at the European level may add value by allowing experiences to be shared, and possibly lead to the establishment of guidance that helps achieve a consistent approach. **Q15** We are currently awaiting a number of policy developments in the area of electricity market reform in the UK. We believe that these will provide examples of initiatives that the EU may wish to consider in promoting the transition to a low carbon economy.



**55820581197-35 Union européenne de l'Artisanat et des petites et moyennes entreprises, aisbl**

**Q9** A significant reduction of GHG emissions and energy consumption is possible in the building sector. Yet we have to keep in mind that energy intensive industry, especially in the western Member States, is already operating on a high efficiency level. Process emissions are a substantial part of their GHG emissions and can only be reduced via reducing the production output. Future climate policies have to ensure that the EU stays a competitive location for companies. Concerted efforts should develop GHG-efficient technologies which can only be achieved through significant public funding in R&D projects and enabling the private sector with the required resources. It should be ensured that future climate and energy legislation is non-contradictory. Any new EU environmental/energy legislative proposals should be based on comprehensive impact assessments, avoid contradiction and duplication, have a sound scientific basis and clear objectives and avoid undermining competitiveness. **Q10** A global, binding agreement on action against climate change that includes all major emitters – industrial, emerging and developing countries – ensuring a global level playing field. Setting the focus on GHG reduction and energy efficiency technologies in its R&D strategy by creating a positive feedback loop over the whole life-cycle and providing the required funds. Especially environmental, energy and mobility policies have to be coordinated and harmonized towards a low carbon economy and within the EU. Further initiatives should promote: security of supply, cogeneration, renewable energies (esp. hydropower storage plants), smart electricity grids, alternative mobility concepts (e-mobility), energy efficiency in buildings **Q11** The EU ETS is the biggest CO<sub>2</sub> market in the world and has set a cap on CO<sub>2</sub> emissions for affected industries. This has allowed to level competitive inequalities within the EU, but has put the competitiveness of EU industries at threat. We have to keep in mind that if the costs for energy intensive industries become too high in Europe, industries will relocate to areas where there are currently no climate protection costs. This would result in an even higher increase of global greenhouse gas emissions. In addition these points have to be addresses in the future ETS roadmap: reduce red tape especially in the process of benchmarking and allocation, emission reductions from CDM or JI projects have to remain a vital part of the ETS, ensuring a level playing field and equal worldwide CO<sub>2</sub> price for sectors within the ETS and global MRV standards with rules on infringement **Q12** Setting a unilateral 2030 target would be a move towards unilateralism. The European Union would further hamper its position in international climate negotiations, since sustainable climate protection can only be guaranteed globally by comprehensive, coordinated actions, especially by industrial countries. Instead European policies should focus on implementing a full life-cycle approach and the development of breakthrough technologies as well as the appropriate infrastructure by adapting the legal framework and providing the required funding. European Industry needs a coherent and realistic framework of predictable policies and regulation in order to adequately plan the investments that are necessary to adapt to increasing decarbonization. **Q13** Sustainable climate protection can only be guaranteed globally by comprehensive, coordinated actions, especially by industrial countries. European policies should focus on implementing a full life-cycle approach and the development of breakthrough technologies as well as the appropriate infrastructure by adapting the legal framework accordingly and providing the required funding Reaching the EU targets for emission reductions, renewable energies and energy efficiency depend on accelerated innovation for viable technologies. Innovation is a cornerstone of a prosperous economy, therefore future climate policies have to focus on innovation, increasing energy security and other aspects of sustainable growth. **Q14** Adaptation to climate change has to take into account effects of climate change along value chains. A focus on singular effects might distort adaptation strategies, therefore, a full life-cycle approach for all products is prerequisite for any effective measures In addition, to sustain Europe as a viable market place to live in at least the basic

supply in energy, heat and products must be maintained. Therefore, fossil fuel based electricity and heat production as well as transportation systems have to remain in place until and globally competitive alternatives are available. Adaptation measures shall not be confused with climate protection measures. From our point of view, climate change has to be closely monitored but adaptation measures have to be worked out yet. **Q15** EUREM A European training program the European Energy Manager has been tailor-made to the requirements of production enterprises. A qualification concept has been created, training modules based on real projects with best-practice applications have been established and a continuous training realization - with nationwide recognition - has been achieved. Till April 2010 1.623 people have become European Energy Managers and are promoting and achieving energy efficiency in Europe. <http://www.energymanager.eu/> **Additional Comments** The EU ETS does already bring about substantial emission reductions and will furthermore contribute considerably to reductions up to 2020. Nevertheless, when looking for new emission reduction potentials, it has to be considered that the EU ETS sector is currently the only sector with measurable targets and real emission reduction commitments at plant level. The Renewable Energy Directive can bring about substantial emission reductions if market incentives are set correctly. The focus for an increase in renewable energy production should be put on those technologies that can already produce energy close to market prices. Furthermore, increased effort needs to be put into research and development for renewable energy technologies. It is important to allocate the limited funds for R&D on the principle of effectiveness. We also see a high contribution of the Directive of Cogeneration to the European Emission Reduction targets. Highly efficient CHP reduces the amount of primary energy needed to cover energy demand. District heating networks and CHP plants therefore have to be economically viable in the long term in order to recover high up-front investments and to allow for further development. In this context it should be mentioned that the use of waste heat in combined heat and power production with its very high overall efficiency should be put on a level with renewable energy as already happens with heat pumps. We think that the use of alternative propulsion systems in the transport sector needs to be encouraged at EU level. Electric mobility and natural gas vehicles can bring about substantial air pollutants reductions as well as CO<sub>2</sub> reductions. We do not think that CCS at the current technological level is an efficient way to reduce carbon emissions. Research and development will have to be encouraged to reduce plants' efficiency losses due to CCS systems. Existing plants shall not be obliged to build CCS because investment security needs to be ensured and no space was reserved at the time of the plant's construction. Europe will need a diverse portfolio of technologies to build a low-carbon future: Cogeneration with conventional as well as renewable energy sources can substantially increase efficiency and reduce primary energy demand for electricity, heating and cooling. The adoption of cogeneration technology needs to be accompanied by the construction of district heating / cooling. Renewable energy technologies need to be developed in order to obtain a low-carbon energy system. High emphasis shall be put on the reduction of costs for renewable energy technologies in order to facilitate their adoption. Up to the point where renewable energy technologies can be generated at market prices, sufficient support and stable investment conditions have to be provided by the national authorities. Electric vehicles, along with other alternative propulsion systems like LNG or CNG, contribute to reducing air pollutants and CO<sub>2</sub> emissions in individual traffic. Alternative propulsion systems need to be made more attractive than conventional propulsion systems. First, technical requirements need to be fulfilled through increased research and development in batteries (electric mobility) and the development of better engines (CNG/LNG). Second, incentives have to be given to consumers to switch to an alternative propulsion system – either through purchase subsidies or by granting exclusive rights (for parking e.g.). Along with the rollout of alternative propulsion systems, a new infrastructure has to be built. New

infrastructure specifications have to be standardised at European level as quickly as possible. Smart electricity grids need to be developed in order to prepare for an increased share of renewable energy production. The main challenge for building smart grids is to secure their financing. Hydropower storage plants level out a higher share of intermittent renewable electricity generation and can work as “batteries” for the European electricity network. The construction of new hydropower storage plants therefore needs to be backed by European and national authorities whenever possible to convince the public of the necessity to construct new plants together with related infrastructure (e.g. networks).

**5665831886-97 Svensk Energi/Swedenergy Q9** There is not a single technology that will solve the climate change problem. A diverse portfolio of technologies is needed and the EU should avoid picking the winners beforehand. In the road map for 2050 the main task must be to identify an effective and reasonably economical pathway where resources are effectively used. In parallel with renewable energy sources the options for nuclear power and energy from coal and gas with CCS must be kept open. As Swedenergy sees it, electricity will play a key role to bring the emissions down. Climate neutral electricity could be used to a larger extent in several applications, such as heating (heat pumps/CHP), transport and industry and thereby replace the use of fossil fuels. The Nordic countries have an advantageous position to produce climate neutral electricity which, if grids are expanded, could make it cheaper for the EU to reach a low carbon economy. **Q10** The most important short term initiative from the EU is to adopt a clear and credible timeline with climate targets (2030, 2040, 2050). The targets should be set in advance and be changed with caution. There should be a global context. To be able to meet the energy and climate targets for 2020 and beyond, especially when it comes to accommodate large amounts of renewable and intermittent electricity and CO2 storage and transportation, massive investments in energy infrastructure are needed. Investment friendly regulatory framework conditions, public acceptance, licences and shorter lead times must be handled by the EU without delay. The EU Commission should fulfil its ambitions to support the building of CCS demonstration plants. The ambition to support commercialization of new technology is important. Finally, more and more activities should be included in the EU ETS. **Q11** We see the EU ETS as the corner stone for delivering CO2 reductions in Europe. We are positive to linking the EU ETS to other schemes as well as widening of the scheme to other sectors. Both bilateral and multilateral agreements to recognise international allowances and credits should be considered in order to go to an EU low carbon society. Besides the carbon market, there is scope for other ways to foster international climate action, e.g. by co-operation with developing countries on technology transfer and sustainable forestry. **Q12** A credible timeline for CO2 reductions make investment conditions more stable. We support for that reason that intermediate climate targets for 2030 and 2040 are implemented. For competitiveness reasons the targets in EU should reflect the outcome of the global climate negotiations. The targets should take into account a fair distribution of efforts between the trading sectors with-in the EU ETS and the other sectors in the economy. The targets should be accompanied with fully integrated power markets functioning of power and CO2 markets so that the price signal for investment decisions is preserved and effective. **Q13** The focus of the climate policy should be on delivering reduced emissions at a cost that is acceptable for private and industrial consumers. If targets and policy instruments are implemented in a coherent and coordinated way the transition can also be made in a cost effective way. Further, it is very important to look at the synergies between climate change and air quality/air pollution and biodiversity when developing policy instruments. And also to highlight these co-benefits when discussing climate change policy. Strong and clear policy instruments, such as a price on carbon, complemented by research and development, will automatically lead to a sustainable growth.

New jobs will certainly come, but these will replace old jobs so there will probably not be any extra jobs. **Q14** Swedenergy do not have specific views on which sectors might be most vulnerable to climate change, but would like to see support for adaptation measures to be based on demonstrable needs and objective criteria and the design of adaptation policies to be based on cost efficiency principles. **Q15** Swedish electricity production is today almost fossil-free. This stems from a historical expansion of hydropower and the Swedish programme for nuclear power, replacing mainly the use of oil. A high tax on carbon in combination with support schemes for renewable has further led to a conversion from fossil fuels to bioenergy, CHP and industrial waste utilization, primarily in the district heating sector. The good basis for CO<sub>2</sub>-neutral electricity production in Sweden has also led to industrial development of electricity intensive industry and thereby growth.

**58744833263-19 European Federation for Transport and Environment** **Q9** Binding targets for energy efficiency and emissions are necessary to drive progress - which foster longterm investment certainty and encourage R&D. EU funds, across all policy areas, must prioritise projects and programmes on the basis of environmental impacts as well as value for (public) money. Ideally, projects and programmes should compete on this basis. Clean and safe renewable energy sources, super-smart grids and smart meters are indispensable prerequisites. **Q10** (Non-exhaustive shortlist, please see T&E consultation paper) - 30% EU emissions reduction target to 2020, compared to 1990 baseline. - Including 20% reduction in transport, including bunkers. - At least 80% GHG reduction in transport to 2050. - Review of ETS cap and aviation ETS cap. - Binding Car CO<sub>2</sub> standards for 2020 and 2025. - Binding CO<sub>2</sub> standards for ships, aeroplanes and heavy duty vehicles. - Improvement of the Energy Taxation Directive to account for energy and carbon content of fuels and abolish tax bans for bunker fuels, incl VAT. - Binding standards and incentives to improve well-to-wheel emissions of all fuels, including cleaning up fossil fuel extraction and processing – strengthen FQD. - Introduction of strict (ex-ante and ex-post) emissions-performance criteria across all EU funds. - Market based measures for shipping. **Q11** Do not expand the EU ETS to include land transport: As there is no risk of leakage the lowest-common denominator carbon prices which can be borne by exposed sectors will have very little effectiveness in transport. Inclusion in the ETS also undermines the drive for other, more effective measures, such as vehicle standards. In general, the cap and allowances for the EU ETS and aviation ETS need urgent revision. **Q12** To be consistent with a reduction pathway - for transport including bunkers - of at least 80% to 2050, a target of 50% reduction to 2030 is required. **Q13** The consequences and costs of dramatic climate change if the target is missed must be and clearly communicated as the primary motivation. The inevitable human cost of inaction is as yet poorly understood. Nevertheless, it is clear that the sooner the EU gets on a clear emissions reduction pathway, consistent with our targets, the cheaper it will be to meet them, and the sooner the benefits in terms of investment in innovation, with job creation, environmental benefits, energy security, etc will be realised. **Q14** With regard to the transport sector, clearly transport infrastructure across all modes will be vulnerable to more extreme temperature swings and weather conditions. Current EU funding resources for transport infrastructure should be opened up to allow for climate adaptation measures for existing infrastructure and ensuring safety in more extreme conditions. Policy makers must also take long-term projections into account when considering infrastructure investments. A clear example would be inland waterway projects on the Danube, where increased risk of both flooding and droughts reduces the practicability of such projects. **Q15** The results of the Car CO<sub>2</sub> regulation have recently been demonstrated - carmakers appear to be ahead of schedule in delivering fuel efficiency improvements throughout their fleets. This demonstrates the effectiveness of binding targets, supported by penalties for non-compliance, where the forerunner voluntary



agreement failed. Clearly this also demonstrates that stricter binding targets are eminently feasible. Ambitious standards are now needed for 2020 and 2025 to provide investment certainty and speed up this positive trend. In many cases, the binding standards have been in effect supported by national tax schemes which favour low-emissions models. Consumer energy labelling provides additional awareness and support. This regulatory approach should be extended across all other vehicles and vessels: vans, medium and heavy duty trucks and buses, railways, inland waterway, shortsea shipping and maritime vessels, aircraft, motorcycles, etc. **Additional Comments** Consultation paper to follow...

**59513031434-92 European Centre of Employers and Enterprises providing Public Services Q9** - All technologies mentioned in the question are important to achieve a low carbon economy, but there is not any single solution that would be best for all EU countries. Subsidiarity should be respected in order to have solutions best adapted to territorial situations. - Promotion of public transport as such should also be mentioned. - In order to foster the development and deployment of those technologies, the EU should make money available. Investments should differentiate according to the maturity of technologies: some are already well in the market, others still need much investment in research. Regulated sectors, in particular grids, also need investments. **Q10** cf. question 8 **Q11** - When the price of Emission Trading Certificates decreases, the EU ETS market standing alone is not a sufficient incentive for CO2 reduction investments and it is worthwhile to think about fostering other complementary measures. - All options to reduce the cost burden of the EU ETS are welcome. **Q12** - A stable legal environment is needed to attract investments. - The acceptability of energy projects should be much improved. **Q13** - The point is not to make choices but to have an integrated approach of energy projects, including also a cost/benefit assessment. **Q14** - Developing both affordability of energy and competitiveness of the energy sector should make adaptation to climate change easier. **Q15** - The inclusion of all stakeholders in the decision-making process of the EU energy policy would be the best guarantee of its sustainability. This should also be considered as an important element of Corporate Social Responsibility. **Additional Comments** Two CEEP opinions will be sent via e-mail: - CEEP opinion 2009/14: How the Energy Sector Can Contribute to Overcome the Economic Crisis - CEEP opinion 2009/16: A new deal on energy policy

**60052162589-72 Deutsche Telekom Q9** - Since there will not be only one technology solution but a bunch of most of the addressed technologies, the EU should from our view not only focus on low carbon technologies but also on low carbon technologies under sustainable conditions. - To merge the three main areas of energy efficiency of alternative energy generation and of energy using products, machines, buildings etc. Until today most of the technologies are running independent ways not linking to each other that there will be a strong need for a new thinking how to distribute / decentralize the energy by smart grids and of a new thinking how to manage and merge these technologies. The intelligent use of ICT will be strongly necessary and an all sector (scientific) investigation of the CO2 saving potentials through the use of ICT will be indispensable. **Q10** - Global studies like SMART 2020 show the tremendous CO2 saving potentials through the use of ICT as well as the enormous business opportunities. SMART 2020 reveals that through enabling other sectors, the ICT industry could reduce global emissions by as much as 15 per cent by 2020 – a volume of CO2 five times its own footprint. If businesses systematically used ICT they would unlock energy efficiency savings of over EUR 500 billion. Smart industry motors and automation would reduce 0.97 GtCO2e in 2020, worth EUR 68 billion. The emissions savings from smart logistics in 2020 would reach 1.52 GtCO2e, with energy savings worth EUR 208 billion. Buildings are the second highest consumer of power in the world. Smart buildings technologies would enable 1.68 GtCO2e of emissions savings, worth EUR 216 billion.



Smart grid technologies were the largest opportunity explored in the study, and could globally reduce 2.03 GtCO<sub>2</sub>e, worth EUR 79 billion. **Q11** Links between the existing Emissions Trading Systems and crediting systems are essential In our point of view. It is also very important to generate international recognized standards and methodologies for the calculation, acceptance and trading of credits/allowances. Bilateral agreements and sector specific systems could be first (practical) steps. But the target should be anyway a comprehensive system. We also support separate financing mechanisms for the purchase of international credits from developing countries. Such a mechanism could lead to enormous investments by companies in developing countries. **Q12** - The result of extreme long term targets will in worst case end in being not responsible what ever was said or promised. Furthermore some of the companies offering today respectful targets will in i.e. 50 years be renamed or not longer exist that nobody will remind to what once was targeted. - We therefore propose to expect targets accompanied by serious actions plans including 5 yearly milestones which must be reported to and be monitored by the EU. - Furthermore the CO<sub>2</sub> costs should be outlined as monetary risks in Financial Company Report **Q13** - To cut the emissions in the EU by 80 to 95% will need a total change of our individual behaviour and way of life. - To achieve the above the Individuals must become part of the solutions. "Sustainable Consumption" is one of the key words. - It will therefore i.e. become necessary to... o improve the and promote the individual awareness o provide relevant information i.e. on platforms for sustainable behaviour and consumption for decision making o i.e. to bring the workload where possible to the workers and not the other way around( most countries have meanwhile moved from a production - to a service society) o bring Individuals in the position to count their own footprint **Q14** - to provide the framework for Smart Grids will become the essential part of a new and sustainable power generation and distribution - to strongly improve the efficiency of buildings will be the next more or less low hanging fruit and will also contribute to improve the economy and support employment **Q15** - The financial crisis during the last 2-3 years showed a significant replacement of business travel by audio- and video-conferences. - The above mentioned success was possible because of the fact, that the technology has reached an audio- and specific video-quality which is very close to reality and therefore has achieved a high status of acceptance. - On the other hand companies have identified big monetary but also timely savings. - Finally because of high security restrictions at the airports and train stations the individual gets a personnel benefit in satisfaction does travelling not longer sees only as a type of "promotion". To reduce the common business travel would be a relatively easy task and a big success story regarding CO<sub>2</sub> savings.

**6256831207-27 ENEL Q9** EU targets in RES sector are already very ambitious. What is further needed is a more coordinated approach on the support schemes for different technologies and on licensing issues. RES subsidies should target those technologies which are not mature enough, and should be designed in a sustainable way so as to take into account technology improvements and boost cost efficiency. As large scale penetration of new RES must go hand in hand with the deployment of smart grids. CCS could be the bridge that will allow to minimize the environmental impact of fossil fuels. CCS is technically feasible but today its competitiveness under EU ETS requires a high CO<sub>2</sub> price. So financial support is needed, and the NER300 initiative is more than welcome. Other technologies are promising and will be crucial in the long-term, but their development would require excessively high carbon prices. It is essential to provide targeted stimulus for them until they reach maturity **Q10** • Harmonized EU carbon tax to be applied to all non-ETS sectors (in line with the proposal for a revision of energy taxes) • Improving the coordination among climate policies (in non-ETS sectors) • For the EU-ETS, define the longer-term trajectory and Linear Reduction Factor to 2030 or 2040, in order to make prices more predictable • Support

schemes/stimulus to accelerate technology development (e.g. CCS, concentrated solar, electric vehicles). Direct subsidies are most effective to accelerate R&D investments and demonstration activities • Push forward a global and binding long-term agreement to combat climate change, to build a global carbon market. **Q11** CDM mechanism has proven to be effective in fostering low carbon investments and technology transfer. Therefore, it should be further reinforced by : • Streamlining procedures • Better guaranteeing operators from risks related to additionality and environmental integrity Sectoral mechanisms are potentially very promising but many issues have to be addressed, particularly on how private sector can participate in them and how risks and rewards can be shared among operators. Instead, bilateral agreements to recognise international allowances and credits may lead to market fragmentation, hence they might slow down the achievement of a global carbon market. However, they will become crucial if countries fail to reach a global accord. **Q12** It is important to define a long-term target, because this ensures stability and allows operators to develop investment plans, especially in very capital intensive sectors like energy. Hence we welcome the idea of considering a mid-term objective by 2030, turning it into practice in terms of ETS caps and carbon prices for non-ETS sectors. **Q13** There is no single measure, that should be top of the list. All are indispensable to cut emissions in the EU. EU should assure a coordination between industrial and environmental policies, because ETS only is not enough to reach climate targets. **Q15** Climate change is a global challenge which governments, companies and citizens are called to counter within the scope of their duties. Aware of its responsibilities, we are pro-actively engaged in the fight against climate change. We are deeply committed to foster a fast deployment of Carbon Capture & Storage (CCS) technologies. In this regard we are developing two CCS projects in Italy (Porto Tolle) and Spain (Compostella). We have been the pioneers boosting the energy efficiency through the smart metering's roll-out across Italy. Taking into account the great benefit of the amount of energy saved we are currently implementing the project in Spain. In March 2009, Mr Fulvio Conti Enel CEO was among the leaders of EU power companies committed to achieving a carbon-neutral European electricity industry by 2050. Hence it will translate not only into a sharp increase of low carbon emission power generation (from RES and nuclear sources), but also into a radical shift in consumption patterns.

### **63132502963-54 International Road Transport Union Permanent Delegation to the EU**

**Q9** Solutions to reduce CO2 emissions should be technology neutral. In road transport, the following technology related issues should be addressed: vehicle: create a regulatory framework facilitating the introduction of new technologies (aerodynamics, tyres, etc), techniques and concepts (the use of the European Modular Concept). engine: Reduce fuel consumption. It should be avoided to introduce new technologies to reduce toxic emissions which at the same time increase fuel consumption (eg Euro VI). - fuel: Finding alternatives to fossil fuels which have no negative impact on the vehicle efficiency. Solutions are already available for short distance and urban transport. The biggest challenge remains for long-distance heavy duty transport. - further deployment of ITS in road transport, but the deployed technology should have proven benefits to the road transport operators. - infrastructure: improve road surfaces causing less friction but should allow a better free flowing traffic. **Q10** Ensure that alternative energy sources are produced in an environmentally friendly way, remain affordable, cost-effective and available; Vehicle and tyre manufacturers, telematics and energy providers should ensure that their products achieve a minimum of 10% reduction in fuel consumption and CO2 emissions No new legislation solely aimed at the reduction of toxic emissions; focus on integrated measures aimed at reducing fuel consumption; Provide incentives to accelerate the market take up of the latest and cleanest technologies and safeguard these investments when the operators have chosen the cleanest technology; Promote

and increase, by incentives, the use of buses, coaches and taxis, along the lines of the IRU “Smart Move” initiative, as they are the most environmentally friendly part of the mobility chain and; To achieve more efficient, rather than more, road freight transport and more efficient multimodal transport. **Q12** See question 10 **Q13** It is important to find the right balance between reducing dependency on fossil fuels, reducing CO2 emissions and economic growth. The first two actions should not lead to a negative impact on economic growth and the EU's competitive position versus the other parts of the globe. A framework should be created in which Member States are required to establish a sustainable energy policy instead of a simple fiscal policy for fuel taxation and other environment related taxes and charges; An energy policy should be implemented based on a diversification of energy usage where alternatives to oil exist, e.g. by increasing taxes on oil used for e.g. heating, electricity, steel, cement and paper production; **Q14** See questions 9 and 10.

**63503202933-02 AEGPL** **Q9** Please see attached submission. **Q10** Please see attached submission. **Q11** Please see attached submission. **Q12** Please see attached submission. **Q13** Please see attached submission. **Q15** Please see attached submission.

**64098861011-12 Clean Fuels Consulting** **Q9** European policy makers are MUCH TOO optimistic about the CO2 reduction potential by 2050 for: CCS; electric vehicles; fuel cells; and nuclear power (until problems of waste management are solved). More policy focus is needed on pathways to reach 2050 rather than attempting to LEAP OVER existing technologies that have carbon reduction potential TODAY. Smart electric and gas grids are essential to accept and redistribute renewable energy. Heat pumps, cogeneration, zero emission buildings, gaseous fuel vehicles (LPG and natural gas/biomethane/LNG) energy efficiency and conservation programs will yield results TODAY and closer to 2050. Support for longer term technologies are important but current estimates of certain technologies' CO2 potential cannot be justified before 2050. More focus on the heavy polluting marine and rail sectors is needed. Liquefied natural gas (and to a much lesser extent liquefied biogas) can play an important role in reducing emissions and CO2. **Q10** 1. Grid injection of renewable electricity and biogas and redistribution to the energy consuming sectors via traditional energy networks. 2. Alternative fuels in transport BESIDES electric mobility, especially in the rail and marine sector. More attention needs to be given to the gaseous fuel potentials, since LPG and natural gas are the two most successful market alternative fuels worldwide yet Europe continues to lag behind other countries of the world in their support for these fuels. 3. In the building sector, energy conservation and energy performance ‘best practices, new technologies and, to the degree it might be possible, energy performance standards for building materials and construction practices (including passive and active solar energy concepts). 4. Low carbon electricity generation technologies but not based on carbon capture and storage. **Q11** Some consideration should be given to expanding the ETS to the transportation sector, although it is more challenging than applied to industries producing on-site pollution at single facilities (i.e. power plants steel mills, etc.) But, since vehicle manufacturers are increasingly operating on a global basis, and the market for vehicles is highly ‘internationalized’ some form of ETS credits or rewards need to be focused on this challenging sector. While it may not be feasible to provide credits to individuals (unless a small-scale scheme can be devised to provide cash rewards for low-CO2 vehicle purchases), larger fleet operators and OEMs could benefit from a well-conceived, balanced approach to ETS. **Q12** Creating milestones in legislation is an excellent way of providing implementation and enforcement in a more stable way than merely shooting for a long term target. Businesses operate with measurable milestones in their business plans and so too should government policy mimic these planning practices in the commercial marketplace. Long term planning ALWAYS should include short term milestones to measure achievement in a balanced way.

The form of the milestones should be a subset of the target goals of each program element. Another way to create a stable environment for business investment is to incentivize (financial and non-financial instruments) low carbon technology development. BUT, incentive policies must be long term otherwise they make the marketplace nervous due to uncertainty. While it might be painful for government to create long term incentives it is one of the best strategies for success in the commercialization process for new technologies. **Q13** All the goals listed are important. The challenge is to find integrated solutions to the integrated problems. Biogas from urban, agricultural and waste water sewage can be used directly in electricity production, upgraded for grid injection, or upgraded and delivered directly to vehicles is an integrated solution to integrated problems of waste management, clean water, and cleaner air. It fulfills renewable objectives of EU policy and addresses additional elements of other integrated societal problems. (i.e. energy security and unemployment). The key is not to create a hierarchical priority list of goals/objectives but to use the list as criteria to determine which of the strategies, technologies and measures best address the various societal benefits that have been listed. The technologies, policies and measures that best address most of these objectives would be the ones to prioritize, and not the other way around (i.e. don't prioritize the objectives and fit the measures). **Q14** The 'sectors' that are most vulnerable to the negative impacts of climate change are: • Public health • Food chain suppliers • Water sufficiency and quality management (on the broadest scale and as a public utility) • The vertically integrated energy delivery networks, in that adjustments in policy affecting the 'energy sector' must be consistent with the ideal of ensuring public access to the principal utility services Focused policies on these quality of life and sustainability fundamentals in an integrated fashion over the long term should move Europe in the right direction.

**64436972598-17 SSE ('Scottish and Southern Energy')** **Q9** Whilst all of these technologies have an important role to play in delivering long term goals, renewable energy technologies and CCS are essential in this transition process. With regards to CCS it's important EU support measures not only focus on coal fired power plants, but on the development of CCS projects on gas fired power plants too: \* to achieve climate change goals - increasing numbers of gas CCGTs are likely to be built over the coming decades and it is very important that CCS is available for these plants. \* to increase security of supply - having both gas and coal available in the future will allow a more balanced generation portfolio increasing security. \* Value to customers - a number of studies have shown that gas CCS is likely to be cheaper per MWh of low carbon electricity than coal CCS. \* CCS is very technology specific - coal CCS technology cannot be replicated for gas plant. \* Wider economic benefits - The EU has the opportunity to be the world leader on gas CCS **Q10** - The 2020 EU carbon reduction target of 20% should be raised to 30%, as this is essential to tackle climate change. - The EU ETS should be reformed to provide a stronger long term price signal for low carbon investment. - The CCS programme should incentivise a wide range of technology and fuels (i.e. gas), in particular to retrofit legacy assets and interim power plant, in order to carefully manage the transition to decarbonised energy generation. - The EU should continue its international collaboration in climate and energy policy. This is important for several reasons: \* to secure affordable fuels \* to assist developing countries to pursue low carbon economic development. \* to achieve low cost abatement through collaboration with trading and other regulatory schemes in developed, emerging and developing states \* to stimulate technology investment **Q11** The EU should pursue all of these options, and consider additional technology or sector specific approaches, for example voluntary portfolio based emissions performance standards and innovative financing methods for key technologies such as CCS. **Q12** The EU should introduce a 2030 objective in order to focus efforts around an ambitious medium term programme of policies. Whilst there are a range of options to define the target, it seems that



those which move away significantly from the convention of expressing abatement relative to 1990 emission levels are particularly open to challenge by political debate. **Q13** The EU can promote all of these ancillary benefits from climate action. At this time of economic hardship it appears particularly important to emphasise the economic opportunities and resilience offered by securing competitive advantage in emerging technologies. However, the very positive health and lifestyle outcomes should also be clearly articulated in order to underpin public acceptance and the behaviour change which is necessary to deliver the low carbon transition. **Q14** The exposure of energy intensive sectors is well understood and efforts to moderate the impact of progressive EU climate policy are advanced. The important point to recognise is that most other sectors will be significantly impacted if the 2050 framework is considered. It is important to integrate policy across the sectors mentioned as a short term priority in order to highlight and resolve conflicting outcomes and better prioritise our collective efforts and investment priorities. **Q15** - 2020 Group - voluntary collaboration among wide group of stakeholders through which all sectors of Scotland's economy and civil society aim to underpin and deliver the Scottish climate policy programme - Greater Gabbard offshore wind farm: world's largest offshore wind farm in construction (500 MW), located at the East coast of England, expected to deliver the first electricity end 2011. - Peterhead CCS project: goal is to develop a CCS project at SSE's gas fired power station (2177MW) in Peterhead (North of Scotland), using existing infrastructure to store carbon under the North Sea - Shetland Node project: Addition of an intermediate offshore platform on the planned HVDC link (between Shetland and Scottish mainland) for connecting offshore wind and marine generation, for which 74 million Euros has been granted under the European Economic Recovery Plan

**64869491516-70 European Climate Foundation Q8** The policy objective of securing 80-95% emission reductions by 2050 concretely implies decarbonisation of the power sector by 2050. Only a smart combination of policies will deliver this. Power Decarbonisation is possible with today's technology and at similar costs to BAU investments in infrastructure between now and 2050. The ETS – with effort sharing – aims to incentivise and deliver binding emission targets at fairest and least cost to society. However, only by combining these policies with large scale energy savings and targeted support for lowcarbon generation can the 2050 vision be delivered at least cost. Carbon prices alone will not deliver comprehensive end-use efficiency, and a very high carbon price is required to transition to low-carbon generation. The carbon price level needed could cost power consumers many times the market price of carbon and more than is politically feasible. The RES directive and ESD directives are, therefore, central. The ESD – with binding targets – is crucial to a cost effective ETS and RES. These in turn must combine with EU market rules that incentivise investments in low carbon and renewable resources regardless of future fossil fuel prices. **Q9** Key technologies include zero-energy buildings (ZEB), large-scale Renewables balanced across relevant geographic areas with high performance transmission areas. These – with aggressive Energy efficiency and demand response – are crucial pillars of a low carbon future. • ZEB will lead to huge reductions energy demand, especially for heating, air conditioning and hot water, and boost renewable demand and supply. Considering 40% of buildings in 2060 years time will be built after 2010, and that all buildings can produce negawatts and customer side generation – ZEBs will be one of the most important technologies and a fundamental part of EU energy infrastructure. • Smart grids are important but must be combined with smart pricing and policies, aimed at two main goals: (a) to save energy, and (b) to permit the integration of low carbon supply- and demand- side resources. Smart Grid technologies will only deliver this in combination with policy support, targeted programmes, customer outreach and education, and adequate funding. • Storage is a key technology (particularly combined with electric



vehicles) enabling storage of renewable power to avoid curtailment and effective system balancing across large areas. The EU institutions should continue to fund and support the Strategic Energy Technology plan. **Q10** The announcement of a single European power grid and market that maximizes the full use of Europe's renewable resources. This will decrease the cost of power and cut our reliance on fuel imports, drive smart grid innovation, job creation and achieving our climate goals (a project of European Interest). The build out of the North Sea grid, the France Spain interconnector and a strong central regulator will be key components of this. This should include clarity on the future arrangements for renewables targets beyond 2020 and clarity on the timetable for retiring existing coal – through the adoption of Emissions Performance Standards. Neighbourhood and accession policy must take into account “coal leakage” into neighbouring countries. • A heads of state commitment to efficiency first as a foundation of EU energy infrastructure. Efficiency investments and technologies must be viewed as strategic energy resources, and as alternatives to generation, transmission, and distribution investments. This involves ensuring 20% savings by 2020, and half of the EU's 80% GHG reduction target by 2050. Two key early steps should be i) high efficiency standards applied to both new and existing public buildings, infrastructure and public purchases of products and services; ii) All EU regulators must commit to prioritise transmission alternatives such as distributed generation, demand response and energy efficiency, if they offer comparable reliability at lower total costs than conventional transmission. **Q11** • The EU should open up new opportunities for the use of domestic offsets – which could be part of a package with a binding EE target and a tightened ETS 30% cap. • Tighter standards for international credits to ensure that emissions reductions are additional to BAU. Use of international credits should be limited to ensure emissions reductions within the EU. • Links to other emissions trading systems should only be allowed where such systems are as strict or stricter than the EU in terms of setting baselines, and reporting and verifying emissions reductions. **Q12** The EU must commit to a framework that allows investors in renewable resources to recover costs in periods where short run system marginal prices are very low (or where output based subsidies are involved, negative). Companies and future supply chains need certainty of demand and investment time horizons. The current carbon prices and fossil fuel volatility do not grant this certainty through to 2030 and 2050. ETS complementary policies, market reforms, funding structures are needed for this, such as: Deeper renewables mandates, extending beyond 2020, which would allow renewables industries and supply chains to continue growing within Europe; • Emission Performance Standards should apply at least to major new power generators, to avoid the “lock in” of new unabated coal plants in the near term and mid term periods. • Continuing commitments to deeper energy efficiency investments beyond 2020, so that progress on efficiency, and the growth in efficiency delivery infrastructure continues; • Public funding that leverages large scale private investments in low carbon resources. This can be done via by a dedicated bank (or programme within the EIB) to aggregate investments and blend private finance with public funding. • Allowing cross border forward capacity auctions to procure the right mix of renewable resources and backup, by allowing demand side resources to compete with supply, with payments that reward low carbon and price out unabated coal. • A 2030 target must be robust enough to unleash large renewables investments beginning as early as 2015. It must trigger action now that avoids long term lock in to technologies that are not sufficiently low carbon. **Q13** The winning economic strategy for Europe in terms of job creation, competitiveness, innovation and energy security depends on integrating the twin objectives of forging a single European energy market and attracting investments, especially in energy efficiency, that truly deliver a low carbon energy system for a low carbon economy. • The EU should work towards mechanisms that are binding or have the same effect as a binding target for economy wide or sectoral energy efficiency to unlock Europe's energy

saving potential. The current measures are clearly proving inadequate. The target can be achieved cost effectively by using domestic offsets or carbon auction revenues to finance energy savings measures to comply with the target, whilst maintaining a robust carbon price under the ETS by tightening the cap to 30 percent. • Both at the EU level, and at the Member State level, one of the most powerful available tools is the opportunity to reinvest carbon auction revenues to accelerate investments in energy efficiency and low carbon resources. This will push ahead the low-carbon, resource efficient economic transition that Europe seeks, lower energy bills and enhance European competitiveness. • The EU should integrate energy markets and regulatory frameworks to enable carbon reduction goals with EU's neighbors. The EU should integrate criteria for energy efficiency, clean technologies and low carbon energy into bilateral partnerships and cooperation activities, consistent with the EU domestic goals. **Q15** ETS impact can be substantially augmented through a "cap and invest" strategy which recycles auction revenues into end-use energy efficiency. This also reduces the cost to the consumer per tonne of carbon avoided. Even with CO<sub>2</sub> at \$2.00 per tonne, the 10 RGGI states of the US Northeast have raised enough revenue from auctions to double spending on energy efficiency across the region, reducing carbon at a societal cost of negative \$50 to negative \$100 per ton, and saving power consumers between \$2 and \$3 for every dollar invested. . It does not take a high carbon price, or a huge fraction of allowance revenue to make a low-cost, high-value difference on the demand side. **Additional Comments** Please find attached a document presenting our Roadmap 2050 project and the Energy Savings 2020 contributing study.

**66441154246-76 Irish Wind Energy Association Q8** It is important to distinguish between EU policies that have a direct impact on the markets for renewable energy technology (The Renewables Directive) and those policies that have an indirect impact on these markets (the Emissions Trading Scheme). The expansion of renewable energy is having a significant impact on emission reductions: in 2009 wind power alone avoided 106MtCO<sub>2</sub>e. In 2020 wind power will avoid 333MtCO<sub>2</sub>e. This is equivalent to roughly 29% of the EU's 20% target. Those greenhouse gas reductions delivered by wind energy (and other renewables) are a result of the national measures put in place in accordance with the EU Renewables Directive. **Q9** In the discussion about technology, a clear distinction must be made between i) primary energy technologies, e.g. coal, gas, oil, nuclear, wind power, ii) energy carriers, e.g. electricity and hydrogen, and iii) end-of-pipe technologies, e.g. efficiency measures, fuel cells, insulation, smart grids. Hydrogen is only as „green" as the energy used to produce the hydrogen and electric vehicles will only be carbon-free if the primary energy consumed to produce the electricity is carbon-free. The Heads of State have committed to reducing greenhouse gas emissions by 80-95% by 2050. 2050 may seem a long time from now but in the power sector 2050 it is only one investment cycle away, which means we must act today and provide the markets with clear signals on technology choice. The European Union could continue policies that have proven successful in the past in delivering a transformation of our power sector: the 2001 RES-E Directive and the 2009 Renewables Directive – and agree on an ambitious, binding 2030 targets for renewable energy that are compatible with the needed carbon reductions in the power sector. **Q10** Given the successful renewables policies of the European Union – the 2001 RES-E Directive with its 21% renewable electricity target for 2010, and the 2009 Renewables Directive with 34% renewable electricity in 2020 - the European Union should agree on an ambitious 2030 renewables target. This should be adopted in good time, e.g. in 2015, before the current legislative framework (the 2009 Renewables Directive) ends, to provide investors with a clear direction and investor certainty. The 2030 legislative framework must be accompanied by measures to ensure that the infrastructure – in particular cross-border interconnectors – are developed to support the change in technology mix, just as

our infrastructure was changed to support the large build-up in nuclear power in the 1960s and 1970s. **Q12** The Roadmap should consist of the following elements: The Roadmap should indicate pathways to reach 80-95% GHG reductions by 2050, including carbon objectives for 2020, 2030, 2040 and 2050. These pathways must be broken down on sectors, including a carbon pathway for the electricity sector that reaches zero- carbon in 2050. The electricity sector pathway must be accompanied by an analysis of the viable power technology mixes to reach that carbon pathway. It is crucial that this analysis takes into account the large amount of existing and ageing power plants that will be retired over the coming decades. Given the successful renewables policies of the European Union – the 2001 RES-E Directive and the 2009 Renewables Directive – the Roadmap should also include a recommendation for the level on an ambitious 2030 renewables target. **Q13** These co-benefits mentioned - sustainable growth, extra jobs, accelerated innovation, cleaner air, reduced import dependence, increased energy security and lowering our vulnerability to external energy shocks – should be given higher visibility and priority in the EU's climate change strategy. The May 2010 communication from the Commission made a good start, but needs to be clearer so that the focus of future impact assessments shifts from the simple “cost” to the “cost and benefits” of climate policies, including the cost and risks of doing nothing. **Q14** Measures must be introduced to ensure training that can allow labour mobility from yesterday's energy technologies to modern technologies with an export potential. **Q15** In the year 2000, renewables accounted for 20% of newly installed power generating capacity in the EU, mainly wind at 19%. In 2009 renewables accounted for 62% of newly installed power generating capacity in the EU. More wind power capacity was installed than any other generating technology, 39% of the total. Wind power is now generating approximately 5% of EU electricity, with renewables in total accounting for 20%. We will most likely meet the 2001 Directive target of having 21% of our power coming from renewable energy sources in 2010. The binding target approach has worked for renewable electricity since 2001 and for renewable energy since 2009. We do not have time for experiments or can afford the risk of policy failure. The successful EU policies should be continued through a stable EU legislative framework beyond 2020.

**68861821910-84 Finnish Energy Industries - Energiategollisuus ry** **Q9** In order to reach a low-carbon future diverse measures as well as existing and new technologies are needed. All low-carbon or carbon-free energy sources and increased energy efficiency need to be supported. CHP will have a substantial effect on the use of primary energy and on the emissions. CHP creates possibilities for the cost-effective use of biomass. Key areas for the development are: • renewable energy technologies incl. the use of biomass, • integration of energy chains of society and utilisation of combined heating, cooling and power technologies, • development of next generation nuclear energy, • smart electricity networks, • electric vehicles and infrastructure needed (incl. fuel cells), The EU climate strategy should focus on improving the overall innovation, investment and operation conditions for companies. The level of public and private funding for energy research and development must be increased. **Q10** New legislation should not be completed before the existing legislation and programmes are implemented. The energy taxation directive should be updated to correspond to current situation and needs. The non-ETS sector should have a CO<sub>2</sub>-based tax with a tax burden equal to the burden caused by EU ETS. Revenues generated from the auctioning of allowances should be used for implementing the carbon-neutral future. State subsidies should be harmonised at the EU-level. In the longer term the target must be to reduce subsidies. EU needs a strategy for heating and cooling. Such a strategy is necessary to fully exploit the advantages of cogeneration (CHP) and district heating/cooling as well as other advanced technologies such as heat pump. R&D (see the previous answers) should be in focus. We do

not support the unilateral tightening of EU's emission target from 20 % to 30 % by 2020 or binding energy saving targets. **Q11** A global agreement is the only way to achieve results in the climate change abatement, to offer enterprises a level playing field and to create international markets for green technologies. A wide international agreement might not be reached during the next years. Regional schemes could be the next step to create a global price for CO<sub>2</sub>. Countries need to have the same goal (eg. 2 degrees) and relevant countries have to implement country-specific emission targets (eg. Copenhagen Accord). Meeting these two preconditions will make it possible to link regional or country-level mechanisms together, eg. with emissions trading schemes. Project mechanisms play important role in creation of a global market for CO<sub>2</sub>. The EU needs to be active in UNFCCC and in bilateral co-operation to safeguard the use of credits. Instead of quality restrictions it may be relevant to analyse the regional use of mechanisms. It is important to simplify the international rules of the mechanisms. **Q12** We support GHG target for 2030 and 2050 as a part of int. co-operation, but not the tightening of EU target by 2020. We are taking actions to reach our national strategic goal, according to which the production of electricity and district heat may be carbon neutral by 2050. Reduction of GHG emissions should be the main target. The cost-efficiency shall not be diminished by using other competing targets. Encouraging investments needs eg.

- A consistent long-range energy and climate policy
- A global price for CO<sub>2</sub>
- A functioning fuel market
- An open European electricity market
- Removing of barriers to the investments

Developing a streamlined European approach towards the licensing of power plants would be useful in order to promote investments. The principle of a MS's right to sovereign energy decisions concerning energy sources and structure of energy supply is crucial in order to achieve the overall European energy policy goal in a cost-effective way. **Q13** When reaching for more sustainable growth it is essential to ensure safe, secure, sustainable and affordable energy for all, businesses and consumers alike. Without safeguarding these overall goal of European energy policy it is not possible to maintain and improve competitiveness of European business and industry and the welfare of citizens. Focus shall also be in R&D. Together with technological development there is a need to develop skills and human resources. In many areas of the energy field there is a need to increase education in order to guarantee the availability of skilful people for the investments, operation and maintenance of the new energy infrastructure. New ways to produce energy (for example bioenergy and wind power) could create extra jobs. However, it must be ensured that climate and energy policy does not weaken the competitiveness of European industry and reduce jobs at the same time. **Q15** Very efficient CHP and district heating are widely used in Finland. The efficiency of the CHP-power plant can be over 90 percent. Extensive use of CHP has significantly reduced the local environmental impacts and CO<sub>2</sub> emissions. CHP is a cost-effective way to increase the use of renewable energy in energy production. Finland is a forerunner in utilising bioenergy. The share of bioenergy is increasing; nowadays it is around 20 % of primary energy and 10 % of electricity. Experiences during the past three decades have proven nuclear power to be safe, competitive and reliable source of clean electricity in Finland. Finland is pioneering the world's first permanent high-level waste storage facility. We prefer voluntary agreements (VAs) for improving energy efficiency. VAs have been successfully used in energy production and consumption in Finland. Finland participates in Nordic electricity market that ensures the best use of Nordic electricity generation mix. **Additional Comments** The Finnish Energy Industries (ET) is willing to take the required action to reach its national strategic goal, according to which the production of electricity and district heat in Finland may be carbon neutral by 2050. Electricity and district heat can be produced with very low emissions, replacing fossil fuels in heating, transportation and industry. Thus, electricity will play a bigger part in the future than today. Electricity and district heating should be seen as a solution to the energy and climate challenges. The electricity industry's European



organisation, Eurelectric, has a similar pan-European study on the production and use of electricity called Power Choices. The Finnish Energy Industries supports EU's long term target to reduce green house gas emissions with 80-95 % by 2050 as a part of international co-operation. Reaching the target calls for new energy investments. Energy investments that tie up a lot of capital cannot be implemented without a stable and predictable operating environment. A carbon-neutral energy future requires a goal-oriented and consistent energy, climate and environment policy. ET has answered to the question how energy will be produced and used in Finland while meeting the challenges of climate change and energy security as well as maintaining energy as the basis for Finnish welfare. In addition to reduction of direct emissions, indirect emissions may be reduced by using electricity and district heating in place of fossil fuels in transportation, heating and industry. The Finnish Energy Industries' publication 'Carbon neutral vision for electricity and district heat for 2050' is available on the internet at: [www.energia.fi/en/publications/vision2050.html](http://www.energia.fi/en/publications/vision2050.html)

**69382094718-43 Carbon Capture & Storage Association Q9** To tackle climate change, all low carbon technologies will be needed. However, European energy and climate goals can only be met in an efficient, cost-effective and timely manner with the widespread deployment of CCS, as fossil fuels supply the bulk of Europe's energy needs and will remain the backbone of Europe's energy supply for the foreseeable future. Failing to deploy CCS will impose a significant additional financial burden on Europe. The Commission's own impact assessment found that not deploying CCS in Europe resulted in a 40% rise in the cost of meeting climate change objectives by 2030. CCS is also key to maintaining a balanced, competitive European economy. It is the only technology that can reduce CO<sub>2</sub> emissions at the scale required from many CO<sub>2</sub> intensive industries, including the cement, iron and chemicals sectors. The IEA found that to limit global temperature rise to less than 2°C, by 2050 half of the total deployed CCS will be in the non-power sectors. **Q10** Recognising the importance of CCS, the 2008 Council of Ministers called on the Commission to establish a 10 – 12 demonstration CCS projects operating by 2015. The CCSA believes that the EU's objective must be to deliver as many projects as possible as quickly as possible. Considering project investment timelines for the demonstration projects there can be no further delay to the NER300 process. In addition projects urgently need clarity on the regulations they will be operating under and outstanding issues must be effectively resolved to enable investments to proceed. The early projects are just a first step in the deployment of CCS and serious thought needs to be given now on how to support the deployment of the next generation of projects. Furthermore account needs to be taken of the opportunities provided by early projects to the contribution to future CCS infrastructure and project clusters which will enable future projects to be delivered more quickly and cost-effectively. **Q11** Achieving global climate goals requires the widespread deployment of CCS. The IEA estimate that half of the 100 CCS projects that need to be deployed by 2020 should be in developing countries. To bring CCS projects to fruition internationally, funding for CCS must come from the carbon market and international funding sources that are recognised under the UNFCCC. Crediting of CCS projects in international carbon markets (through a reformed CDM, sectoral crediting or other means) must be made possible post-2012 to enable the development of low-cost CCS opportunities. However, market mechanisms alone are insufficient to drive early, commercial scale development of CCS in the power sector where the technology will be needed the most. Additional public funding will be necessary. The hurdles of early implementation will not be overcome without significant and distinct financial support mechanisms in addition to the incentives provided by the international carbon market. **Q13** Energy Security should remain a core objective of European energy policy. CCS has a crucial role to play in maintaining security of supply by enabling abundant, affordable fossil fuels to contribute to Europe's



energy needs and deliver deep cuts in CO<sub>2</sub> emissions. Sustainable jobs, growth and innovation will be critical to the future prosperity of Europe. Continued leadership on CCS will enable Europe to deliver on this. The capital investment in capture, transport and storage needed suggests a global CCS market worth more than \$5 trillion by 2050 (similar in size to today's oil industry). In the UK alone, the government has estimated that CCS could be worth up to £6.5bn per year by 2030, creating up to 100,000 jobs. CO<sub>2</sub> intensive manufacturing industries, iron, cement, chemicals, will in future be unsustainable without CCS. The development of CCS infrastructure will enable the longevity of regional industries and protect the existing jobs and prosperity related to these industries.

**69545381134-55 Royal Dutch Shell plc Q8** EU ETS (European Emission Trading Scheme)

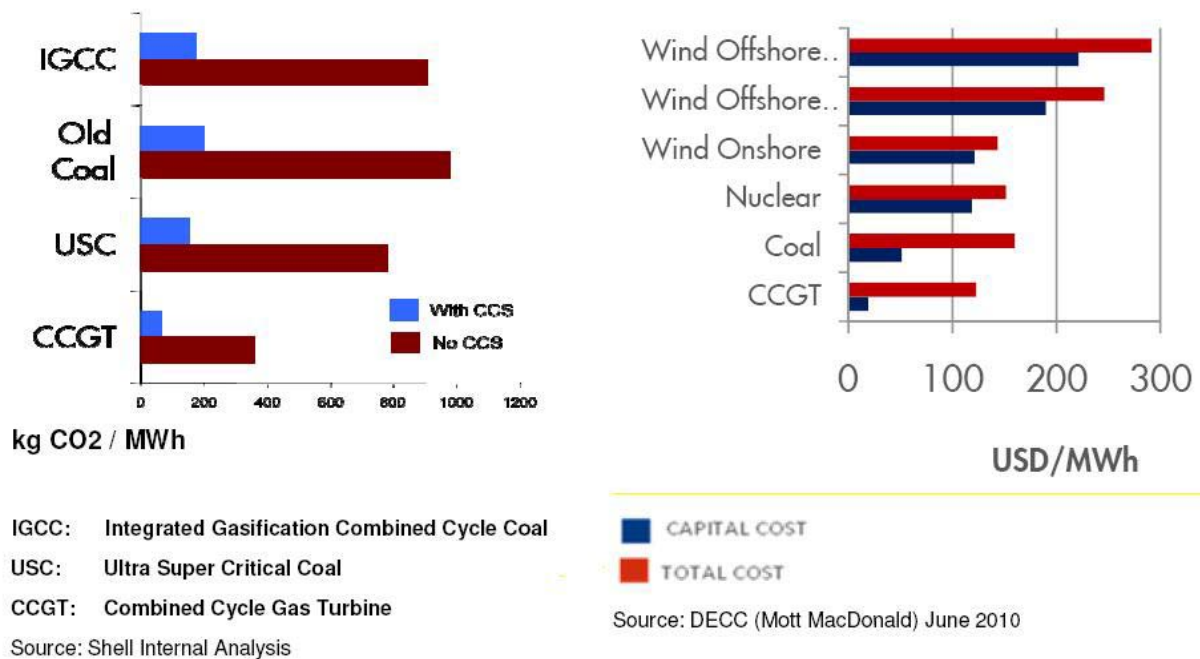
Directive: The EU ETS is the key instrument in the European climate policy covering almost half of the Community's CO<sub>2</sub> emissions. Shell supports cap-and-trade systems such as ETS as the most effective instrument to reduce emissions from large stationary sources. The system introduces a cost for emitting CO<sub>2</sub> and is designed to deliver a clear environmental outcome. In the second trading period of the EU ETS, however, the recession led to a drop in emissions and a surplus of allowances in the market, which is driving down the carbon price, and investments in mitigation measures could be delayed. The EU should consider the need to strengthen the ETS to deliver a robust carbon price. Shell recognizes the logic that the reduction in EU emissions as a result of the recession calls for a further tightening of the EU cap if we are to meet the aspiration for energy system investment that the current cap initially implied. But a system-wide shift to 30% may be an over-reaction to a problem that principally exists in the Emissions Trading System (ETS). In both the road transport and buildings sector, the focus is intensity based and the recession has had little if any impact on this – so the job still remains to be done and the challenge has not diminished. By contrast, the ETS is an absolute emissions system and the recession has had a significant impact. The current carbon price could be supported by a targeted recalibration of the ETS in the period 2013 to 2020 [or by implementing an EU wide reserve price for allowances for Phase IV and beyond]. But such action should not be implemented until there is a better understanding of the impact of the recession and the shape of the recovery. CCS Directive: CCS has the potential to play a major role in mitigating GHG emissions. According to the International Energy Agency, CCS could deliver up to 19% of the CO<sub>2</sub> emission reductions necessary to prevent dangerous climate change by 2050. The successful and swift implementation of the EU demonstration program is key to enable the large-scale commercial deployment of CCS, drive down the costs, gain public support, and develop the building blocks of the infrastructure that will be required. The early commercial availability of CCS is critical to support the progress of the international climate negotiations towards a global agreement. CCS would offer major emerging economies and developing countries a key mitigation tool to reduce emissions and agree to reduction targets. As a key transformational technology it should be considered eligible under a program such as the Clean Development Mechanism (CDM). Fuel Quality Directive / Renewable Energy Directive: An integrated approach is required in the road transport sector that involves action by all three main stakeholder groups that have the capacity to influence CO<sub>2</sub> emissions from the road transport sector, namely providers of energy or fuel, providers of vehicles, and users of road transport vehicles. As liquid fuels remain the key energy in transport for the foreseeable future, biofuels provide the only immediate and commercial option to reduce CO<sub>2</sub> emissions from transport at scale for the next 20 years. The European Fuel Quality Directive and the Renewable Energy Directive provide for the world's most ambitious set of sustainability criteria for biofuel, including that biofuels should deliver substantial GHG reductions and should not come from areas with high conservation value. Priority should be given to making EU sustainability requirements work

well in practice and to encouraging their uptake elsewhere. EU policy should encourage and reward biofuels and biocomponents that reduce GHG emissions and are produced from sustainable sources that protect social and environmental needs. Increased biofuels in transportation fuels need to go hand in hand with the development of engine technology to consume these fuels. The scrappage rate of cars and trucks will set a natural limit for the speed of introduction. However, EU policy should not mandate the deployment of immature renewable technologies through the provision of subsidies. Support and funding should be provided to enable the development of early stage low carbon technologies, but subsidies should be withdrawn once the technology reaches commercial scale. In the UK the mandated large-scale deployment of offshore wind is solely reliant on government subsidies, making it one of the most expensive forms of energy production (we estimate at \$400/tonne CO<sub>2</sub>). Onshore wind in the UK still continues to receive subsidies despite being commercially viable. Please also refer to question no. 9.

**Q9 Natural Gas** Natural gas is a vital part of a low carbon future for the following reasons: Abundant: The past few years have seen major improvements in gas supplies and it is estimated that 250 years of global reserves are available. Much of this is due to the growth but a critical pillar has been the growth of LNG. This growing abundance of natural gas resources enhance gas supply security dramatically and so will reduce long-term price volatility which is also a concern of governments. Affordable: The cost competitiveness of natural gas has continued - and this is especially compelling in the power generation sector. We all know that with budget deficits and government debt at historically high levels there is more need for strict budget discipline and most countries will find that natural gas is far more affordable than any other source of electricity, especially in front-end investment terms. The relative capital cost of power generation compared to gas is: Gas 1; Coal 2 to 3; Nuclear 5; Onshore wind 7 to 10 and Offshore wind 10 to 15. Gas power plants can normally be constructed in about two years, much quicker than coal (52-58 months) or nuclear plants (54-60 months).<sup>9</sup> Acceptable: For many EU countries, it will be impossible to meet their 2020 emission reduction targets without more natural gas so it should be getting more recognition and political support. The IEA say coal fired power is responsible for the fastest growth in CO<sub>2</sub> emissions worldwide. Conversely, modern gas plants emit between 50% and 70% less CO<sub>2</sub> than coal plants per kilowatt of electricity generated. So, natural gas replacing coal is the fastest and cheapest way to reduce CO<sub>2</sub> emissions. The diagrams below illustrate the case for greater use of gas.

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<sup>9</sup> From Royal Dutch Shell internal



Gas-fired power stations & CCS Adding CCS to gas-fired power stations brings CO<sub>2</sub> emissions down to close to zero. And Shell analysis shows that a reduction over 90% CO<sub>2</sub> emissions costs about \$60-\$120 per ton. By comparison, offshore wind – at \$275-\$400 per ton – costs roughly three-and-a-half to five times as much. A stronger focus on natural gas would cut greenhouse gas emissions immediately, and buy society time for learning curves and supply chain developments to allow a later but cheaper transition to new nuclear and wind electricity generation. The following elements are critical to ensure that gas becomes a key component of a national or regional energy policy which delivers a secure, diverse, low-carbon power mix:

- A robust and transparent CO<sub>2</sub> price is required to deliver the right incentives and market price signals for investment decisions which will contribute towards a low-carbon energy sector and ensure that gas is competitive against coal through the implicit avoided price of CO<sub>2</sub>;
- Reform of electricity markets. Shell believes that an open and transparent electricity market with a robust CO<sub>2</sub> price signal will provide the necessary investment and consumption choices to drive towards an optimum low carbon generation mix. Reforming electricity market regulations should ensure that funding for low CO<sub>2</sub> technology is both disciplined and prescriptive to avoid misuse of subsidies giving disproportionate commercial advantage to immature technologies. Regulations should also establish locational marginal pricing, which will demonstrate – amongst other things - the lower transmission costs offered by gas-fired power plants sited closer to demand centres, and time-of-day pricing, which benefits mid-merit and peak generators such as gas-fired power plants. Because of foreseeable market failure due to the over-representation of renewables and their inherent intermittency, significant thermal generation reserve capacity will need to be maintained, and in this regard capacity payments will need to increase in order to incentivise back up generation; The application of CCS to gas plants is essential if gas is to become an important destination fuel. The economics favour the application of CCS on gas-fired plants over coal-fired plants, furthermore, the technology is feasible and the storage requirements are half those of an equivalent coal plant. However, it won't happen overnight and in the first instance it requires a long-term, predictable investment environment, supported by a robust carbon price. The early stage demonstration phase requires support through RD&D funding and targeted subsidies;
- New commercial contracting structures to deal with concerns on pricing volatility, security of supply, and value upsides. Natural gas is a key component of a

low-carbon energy mix, but one of the major concerns of investors is managing perceived price volatility of gas and security of supply. Long-term supply deals provide opportunities to ease some of this uncertainty and provide a more conducive environment to invest in gas power plants through the potential for innovative pricing structures and bundling risk-management products with supply deals. Carbon Capture and Storage Carbon capture and storage is one of the most effective ways to tackle CO<sub>2</sub> emissions over the coming decades is Carbon Capture and Storage (CCS). This technology could provide around one fifth of the CO<sub>2</sub> mitigation effort needed by 2050. Its prompt global deployment, including in developing countries, is critical to tackle CO<sub>2</sub> emissions. Please also refer to question no. 8. Biofuels for Transport There is an urgent need to reduce emissions from the road transport sector, as this sector alone accounts for about one fifth of the global CO<sub>2</sub> emissions and is growing fast. The number of cars and trucks could increase from around 900 million today to 2 billion in 2050. Tackling CO<sub>2</sub> emissions from road transport will include developing more efficient engines, lighter vehicles, better infrastructure, more economical driving, new lubricants, more efficient operation of commercial vehicles and lower CO<sub>2</sub> fuels including the engine technology to consume higher biofuels blends. Electric and hybrid cars are expected to become increasingly common in the future, but biofuels are the most realistic, commercial and significant way to reduce CO<sub>2</sub> emissions per unit of energy in road transport over the next 20 years. Policy makers should encourage and reward biofuels and bio components that reduce GHG emissions and are produced from sustainable sources that protect social and environmental needs. Please also refer to question no. 8. **Q10** Generally, addressing climate change requires an economy wide approach and should be tackled within the context of economic growth and energy policy (availability and security of supply) objectives. Action is required in all sectors, including power generation, industry, transport and buildings. Changing consumer behaviour is also essential. Ensuring gas is a strong player in the energy mix, not only in the coming decade but also as a destination fuel with the application of CCS, will be key to a successful transition. The EU policymakers need to ensure that the policy framework is complete, i.e. focuses across all sectors and along the full technology path (discover & develop then demonstrate & deploy). The policy framework should enable the necessary changes to take place. What the EU can do to keep the momentum (please also refer to questions no. 8 and 9):

- Consider the need to strengthen the ETS to deliver a robust carbon price. The current carbon price could be supported by a targeted recalibration of the ETS in the period 2013 to 2020 [or by implementing an EU wide reserve price for allowances for Phase IV and beyond].
- Provide for a successful and swift implementation of the EU demonstration program, which is key to enable the large-scale commercial deployment of CCS, drive down the costs, gain public support, and develop the building blocks of the infrastructure that will be required.
- Give priority to making EU sustainability requirements for biofuels work well in practice and to encouraging their uptake elsewhere. Policy makers should encourage and reward biofuels and bio components that reduce GHG emissions and are produced from sustainable sources that protect social and environmental needs.
- Recognise the role of natural gas providing a fast way to decarbonise now, and lower carbon energy with CCS in the longer term.

**Q11** The EU approach is currently linked to the Kyoto Protocol and therefore is open only to the Kyoto mechanisms in terms of linkage with other systems. In the medium term, we encourage the EU to use the full flexibility offered by the Kyoto Protocol, i.e. CDM, JI, AAU etc. and to link with other national approaches that are based on the Kyoto Protocol as well (e.g. NZ), if for no other reason than to demonstrate how this would work and the benefits that can be delivered to both systems. In the longer term, linkage will depend on the shape of the international agreement and the flexibility offered. A broad open system without a strong compliance mechanism (e.g. pledges under the Copenhagen Accord) does not offer a sound foundation for linkage. In such a world, bilateral and limited multilateral agreements offer a



way forward, with the EU forging links with similarly robust compliance based approaches in other regions. **Q12** It is crucial for any “climate change” programme to state clearly the long-term environmental goals and then stay the course. Investment in energy infrastructure is a long-term undertaking. To the extent that programmes include on-off dependencies based on reviews and assessments of an unknown nature, the necessary long-term investment will be discouraged. Rather, business will focus much more on short-term compliance and less on innovation and long-term investment. To further strengthen investment certainty, policies should be as efficiently designed as possible and should • Ensure a robust carbon price is in place to give a signal to investors; • Have long-term low carbon policies in place to give assurance to investors; • Confirm Phase IV of the EU ETS from 2020 onwards; • Target those parties that are able to take direct action to comply. It is inappropriate, and unworkable, to impose requirements where the ability to comply depends on the decisions and actions of third parties that are beyond the control of the obligated party; • Provide requirements that are achievable by the obligated party; • Avoid double regulation of the same emissions; and • Seek to incentivise lower-carbon energy/technology, but not specify technology pathways (i.e. not picking technology winners). **Q13** Key to the challenges will be to ensure sustainable growth whilst maintaining effective emissions reductions, and not just in the EU but advocating this approach globally. Please refer to question no.10. **Q15** NER 300 The EU ETS Directive post 2012 foresees up to 300 million allowances in the new entrant reserve to be made available until 31 December 2015 to help stimulate the construction and operation of up to 12 commercial demonstration projects that aim at the environmentally safe capture and geological storage (CCS) of CO<sub>2</sub> as well as demonstration projects of innovative renewable energy technologies, in the territory of the Union. The intention is to fund a portfolio of CCS projects that test various capture and storage options in a variety of member states. Natural Gas Only a few years ago, it looked as if North America’s domestic gas production would decline. Today, instead of declining, production has increased dramatically, as a result of our ability to unlock vast tight gas resources. The resource base is now big enough to cover North America’s current gas consumption for well over a century. Other nations are now looking to replicate the North American gas boom. There is currently no commercial unconventional gas (UCG) production in Europe. At this time, it is not evident which areas of Europe will ultimately host commercial UCG production. To better assess UCG potential will first require early investment in seismic operations, exploration drilling and geological studies across many potential areas, followed by significant investment in appraisal drilling and production testing. It is estimated that 20-40 wells (exploration, appraisal, pilot) are required to prove commerciality in many basins. Commercial success is not guaranteed. Exploration and production companies with diversified portfolios and revenues are better able to absorb this exposure, but they will also need positive support from policymakers (e.g. the right fiscal framework, and permitting and other regulatory conditions) to succeed.

**70309834043-10 Naturefriends International Q9** While technologies play a key role, they should not be regarded as an objective in themselves, but as a means towards clearly defined ends. Strong policy signals such as carbon taxation and binding reduction targets are necessary to guide developments and induce simultaneous changes in consumption patterns. Impacts of new technologies must be carefully assessed to avoid creating new problems in the future: Biofuels can pose severe problems for ecosystems and biodiversity and should only be promoted under strict sustainability criteria. Nuclear power poses severe problems for safety, security and waste disposal and should not be considered a solution. Electric vehicles might offer part of the solution if integrated into a fully renewables-based electricity system, but should not deflect from the fundamental changes that can be achieved through urban planning, promotion of telework, lower-impact leisure activities etc. **Q10** Sufficiently

ambitious, binding targets, provide crucial guidance to all parties involved. As an overarching objective, the EU should aim to reduce its ecological footprint by 50% over the next 20 years. The adoption of a 40% 2020 GHG reduction target as well as of binding energy savings objectives would provide crucial marks towards this direction. Efficient resource use should be clearly reflected in taxation and fiscal measures, for example through the introduction of road pricing and a shift of taxation from labour to resource use. At the same time, low-carbon infrastructures must be developed, particularly the upgrade of energy grids for increased integration of decentralized renewable resources. Sustainable resource use is fundamental for safeguarding the long-term basis of our economic prosperity. It must be firmly established as a guiding principle for policy development, including systematic climate proofing of EU budgets and funding schemes. **Q11** The EU ETS plays a central role in the development of the low-carbon economy. However, it can only provide the necessary incentives if reduction objectives are sufficiently high. The adoption of tight caps for the next trading period (2013-2020) and full auctioning of permits will be key to establishing the right incentives. Overseas activities may not decrease the momentum for change to a low-carbon economy at home. A key improvement is the inclusion of the aviation sector from 2012 onwards. Aviation accounts for 4.9% of human induced climate change, and global air traffic is predicted to multiply by six until 2050. The new legislation must be fully implemented, covering all incoming and outgoing flights, and its ambition upgraded to fully reflect aviation impacts, including the adoption of stricter reduction targets, full auctioning of permits, and appropriate consideration of non-CO2 emissions. **Q12** The trajectory towards a low-carbon Europe in 2050 must be set as soon as possible to create momentum for change and ensure the right pathways are taken. Ambitious short- and midterm objectives put Europe on the right track and avoid more costly adaptations later. NFI therefore calls for the adoption of a more ambitious 40% GHG reduction target already by 2020. Mid-term targets can then be formulated based on a scientifically informed debate about the required trajectory towards 2050. Adequately ambitious legislation and policy are crucial to ensure the timely achievement of set objectives. **Q13** Given the vast humanitarian, social and economic cost related to climate change, and the need to safeguard the natural resource base for our future well-being, halting global warming should clearly be the principle goal against which to measure policy choices. Energy efficiency and energy savings are clearly the fastest and most cost-effective ways to meeting this objective, and could at the same time significantly reduce the EU's need for energy imports, boost the creation of green jobs, reduce fuel poverty, improve health and well-being and mitigate related environmental problems such as air pollution, acid rain and eutrophication. **Q14** Many sectors are causes and sufferers from climate change at the same time. Tourism, for example, might be severely affected by changing weather and ecosystem degradation, while at the same time being a major contributor to global warming. It is therefore crucial to ensure adaptation measures provide sustainable solutions. The restoration of coastal areas that provide flood protection while maintaining ecosystems and creating low-impact tourism opportunities illustrates a regional development that can satisfy environmental, economic and social requirements at the same time. EU policies and funding schemes should systematically be "climate proofed" in this sense, for example by focusing CAP reform on the preservation of natural resources and low-impact practices, increasing efforts towards the protection of Natura2000 areas and developing a sustainable EU tourism policy that puts the preservation of natural and cultural resources first. **Additional Comments** Low-carbon Europe must become a cross-cutting vision for EU economic policy. We would therefore like to highlight the need to coordinate this strategy with other initiatives, particularly the Resource Efficiency Roadmap currently likewise under preparation, in order to insure their best possible integration and synergies.

**710687598-46 European Wind Energy Association** **Q9** Renewable energy technologies, particularly wind power. Important to distinguish between i) primary energy technologies e.g. coal, wind power, ii) energy carriers e.g. electricity and hydrogen, and iii) end-of-pipe technologies e.g. efficiency measures, smart grids. Electric vehicles will only be carbon-free if the energy consumed to produce the electricity is carbon-free. The Heads of State 2050 commitment will only be possible if all electricity is carbon-free. Due to the long lifetime of power plants, the commitment by HoS means that no new carbon-emitting power plant can be built after 2020. The simple approach is to introduce a technology neutral EPS of zero g CO<sub>2</sub>/kWh for new power plants and let the markets decide. Given the political challenge of getting support for such a policy, the EU could instead continue policies that have successfully transformed our power sector: 2001 & 2009 Renewables Directives – and agree an ambitious, binding 2030 target for renewable energy **Q10** The introduction of a technology neutral Emissions Performance Standard (EPS) of zero g CO<sub>2</sub>/kWh for new power plants by 2020. Alternatively, given the successful renewables policies of the European Union – the 2001 RES-E Directive with its 21% renewable electricity target for 2010, and the 2009 Renewables Directive with 34% renewable electricity in 2020 – the European Union should agree on an ambitious 2030 renewables target. This should be adopted in good time, e.g. in 2015, before the current legislative framework (the 2009 Renewables Directive) ends, to provide investors with a clear direction and investor certainty. The 2030 legislative framework must be accompanied by measures to ensure that the infrastructure – in particular cross-border interconnectors – are developed to support the change in technology mix, just as our infrastructure was changed to support the large build-up in nuclear power in the 1960s and 1970s. Move to 30% GHG reductions by 2020. **Q11** Reinforcing international carbon markets is commendable, but discussing linkage at this stage seems premature as it requires well developed markets, with high and similar degrees of environmental integrity, including ensuring that the linked systems, as a minimum, are based on 100% auctioning. The ETS has been severely hit by the economic crisis in its ability to reduce emissions, and promote renewable electricity. A solution needs to be found prior to any linkage considerations. Other carbon markets are still poorly developed and have low environmental standards. On international credits, the guiding principle for the EU must be the scientific recommendation of reducing domestic emissions in the industrialised nations by 25-40% by 2020. Any external credits must be additional to these domestic efforts. **Q12** The Roadmap should indicate pathways to reach 80-95% GHG reductions by 2050, including carbon objectives for 2020, 2030, 2040 and 2050. These pathways must be broken down on sectors, including a carbon pathway for the electricity sector that reaches zero-carbon by 2050. The electricity sector pathway must be accompanied by an analysis of the viable power technology mixes to reach that carbon pathway. Included in the Roadmap should be an analysis of the level of a technology neutral Emissions Performance Standard (EPS) (CO<sub>2</sub>/kWh) for new power plants, needed to achieve a carbon-free/100% renewable power sector by 2050. Given the successful renewables policies of the European Union – the 2001 RES Directive and the 2009 RES Directive – the Roadmap should also include a recommendation for the level on an ambitious 2030 renewables target. Move to 30% GHG reductions by 2020. **Q13** These co-benefits mentioned – sustainable growth, extra jobs, accelerated innovation, cleaner air, reduced import dependence, increased energy security and lowering our vulnerability to external energy shocks – should be given higher visibility and priority in the EU's climate change strategy. The May 2010 communication from the Commission made a good start, but needs to be clearer so that the focus of future impact assessments shifts from the simple “cost” to the “cost and benefits” of climate policies, including the cost and risks of doing nothing. **Q14** Integration of adaptation policies in the Common Agriculture Policy (CAP), should be accompanied by mitigation measures as well. Most wind turbines in Europe are built on

agriculture land and provide farmers with additional income and important income diversification. Thermal power plants and their access to cooling water should be considered by the European Commission, as part of an analysis of the potential impact on electricity infrastructure of climate change. Measure must be introduced to ensure training that can allow labour mobility from yesterday's energy technologies to modern technologies with an export potential. **Q15** In the year 2000, renewables accounted for 20% of newly installed power generating capacity in the EU, mainly wind at 19%. In 2009 renewables accounted for 62% of newly installed power generating capacity in the EU. More wind power capacity was installed than any other generating technology, 39% of the total. Wind power is now generating approximately 5% of EU electricity, with renewables in totoal accounting for 20%. We will most likely meet the 2001 Directive target of having 21% of our power coming from renewable energy sources in 2010. The binding target approach has worked for renewable electricity since 2001 and for renewable energy since 2009. We do not have time for experiments or can afford the risk of policy failure. The successful EU policies should be continued through a stable EU legislative framework beyond 2020.

**7410939793-88 BASF SE Q9** BASF underlines the importance of achieving further improvements in the non-ETS sectors to reach the long term targets, as they constitute more than half of current CO2 emissions in the EU. BASF and the chemical industry offers numerous innovative products and solutions for energy and resource efficiency and is therefore a crucial contributor to climate protection. The chemical industry is a cross-sectional industry that delivers its products and technologies to almost all sectors including those with high GHG emission abatement potential. As shown in our recently updated corporate carbon footprint, BASF products make a positive net contribution to climate protection as they can save three times more CO2-e during their use phase compared with CO2-e emissions during production and disposal of all BASF products. A large share of these savings is achieved in the building and construction sector by using our insulation materials or our additives for the cement industry. **Q10** Emissions are to be cut where it costs the least. The ultimate tool is a global carbon market with freely traded emission allowances at a single global price. We must get back to the basic logic and rationale of carbon trading, namely cost optimisation of reductions, and not look upon carbon trading as a tool to achieve other policy objectives. We acknowledge that a true global carbon market cannot be achieved without a comprehensive global climate agreement. In case of persistent failure to achieve a comprehensive international climate agreement measures to protect jobs and competitiveness in EU must be continued and enforced. The sheer scale of investment needed in renewable energy and energy infrastructure means that the public sector must take a large share of the responsibility. Subsidies, tax credits and public sector financing are all tools that will have to be used. Options to harmonise and centralise such schemes must be considered in order to avoid distortion of competition. **Q11** At international level, equal framework conditions are needed as regards scope, quality and costs of reduction obligations for industrial sectors engaged in global competition. Unilateral European action towards a global climate policy does not deliver the desired results. So as long as efforts fail to lay down comparable rules and burdens for all, production relocations to countries with lower cost burdens on energy will be inevitable resulting in carbon leakage and job leakage. In order to prevent such developments, it remains essential also in the future to limit burdens from climate policy instruments for industrial production. Given this threat of carbon leakage, it is even more important to maintain the "exposed sector" approach in the EU ETS. Driving forward climate protection in developing countries requires the transfer of funds and know-how. But funds needed for international climate protection measures must not be sourced unilaterally from European industry. **Q12** Whilst Europe must be willing to take the lead towards a new low-carbon



economy, it cannot move alone. The 2050 EU targets cannot be decided upon today unless they are accompanied by similar strong commitments from our main trading partners. Otherwise they would not have a true effect on climate change mitigation and could not be achieved sustainably; Soft intermediate targets should be carefully defined. Cost efficiency, prevention of carbon leakage, public sector financing and a move towards compliance on the EU level are key considerations in achieving our objectives without seriously endangering EU employment, competitiveness and overall wealth. In this context, the main objective of the roadmap must be to show a feasible and realistic trajectory to meeting the 2050 ambition level in the most cost-effective way. This feasible trajectory must be designed on the basis of very thorough impact assessments giving special consideration to availability of financing, skills and resources. **Q13** The 80 to 95 % reduction target has never been subject to a proper impact assessment. An EU commitment at these levels could only be considered if part of a legally enforceable, international climate agreement that demands equal efforts from all other industrialized and the main developing countries. We agree that the overall objective should be to halve global GHG emissions by 2050 compared with 1990. Unilateral action would significantly impede European employment and competitiveness and would only modestly contribute to mitigating climate change, as the EU's share of global emissions is rapidly decreasing. But further unilateral action may lead to increased global emissions as certain energy intensive production would move from the EU to countries with higher carbon intensity in the electricity mix. As production leaves the EU, companies are less likely to continue to invest in low-carbon solutions. All efforts must focus on achieving a comprehensive global climate agreement. **Q14** See answer to question 10: Any future regulatory approach must ensure that emissions are cut where it costs the least. The ultimate tool to attain this objective is a global carbon market where emission allowances are traded freely at a single global price. In a functioning market, the carbon price would equal the global marginal carbon abatement cost. We must get back to the basic logic and rationale of carbon trading, namely cost optimisation of reductions, and not look upon carbon trading as a tool to achieve other policy objectives.

**74190171808-22 Lafarge SA Q9** We believe that a portfolio of all the technologies mentioned above should be taken into account at EU level. Special attention should be given to the following: - energy efficiency achieved through BAT - support for low carbon fuels at competitive prices - avoid the impact of windfall profits on electricity prices to be paid by energy (power) intensive industries - economic support to the development of CCS technologies (for process CO<sub>2</sub>). Zero emissions or low emissions buildings : a look at how to incentivise home owners and property developers to improve further energy efficiency in buildings should be considered leading either to EU measures to be accepted and implemented by Member States. Cement producers are an indispensable link in the producing zero emissions or low emissions buildings down the value chain. **Q10** EU should pay particular attention to 2 key parameters: (1) build up a realistic path towards low carbon and energy performance and (2) develop consistent policies (avoid contradictory policies as, for example, those resulting from the Biomass Action Plan or those which might occur as a result of bilateral agreements). Fairness and a balanced contribution from the different sources of emissions should also be key objectives (balancing industry's contribution with the contribution from transport and buildings). In trying to develop a truly global agreement, sectoral agreements may pave the way along a realistic path. **Q11** We consider that all the tools mentioned should be put to good use but it must always be kept in mind that carbon leakage is a flaw that may seriously jeopardise the effectiveness of the EU-ETS. Further crediting systems may prove useful such as the development, under Article 24a ETD, of domestic projects (see Q. 15 below) as they will trigger further emission reductions. What is



needed is a global agreement between all major GHG emitting emissions (e.g. G8/20 zone), particularly the USA and China, with the view to put in place a global crediting scheme. Bilateral agreements may lead to a piecemeal approach and even contradicting policies. These should not be the preferred policy. **Q12** Realistic milestones along a realistic path may help to plan investment. Long term predictability and reliance is essential in highly capital intensive industries such as the cement industry where capital cost is € 150 million per million tonnes of capacity (i.e. first return on investment after 3 years of turnover). In designing the path and determining the milestones it is essential to make the targets relative to the international context. A unilateral EU approach would soon prove inadequate and again lead to carbon leakage and inconsistent policies. An interim target to be reached in 2030 would be a useful indicator provided that, by then, a global agreement has been reached. Unilateral actions, however morally laudable, would not lead to an efficient policy to combat climate change. **Q13** Sustained and sustainable growth and job creation are essential to the EU's economy and a prosperous EU, including in its manufacturing sector, is a pre-condition for the successful development of other policies such as those on innovation. Maintaining manufacturing skills and technological excellence in the EU is in fact only feasible if the manufacturing industry can prosper in the EU. In this context two policies are also relevant: • increase energy security and lower the EU's vulnerability to external energy shocks; • stimulate and speed-up innovation and investment in innovation and protect investors from the risk of a technological setback. **Q14** Main sectors at risk seem to be those directly impacted: agriculture and food industry, building sector, infrastructure sector and possibly the energy sector EU should seek to develop new innovative mechanisms to fund infrastructure works. Special attention is required to assure the availability of key products like cement or aggregates as the demand for which may grow for adaptation works as a result of extreme climatic phenomena and the prevention of the consequences of climatic changes Policies to put in place to assist or speed-up adaptation to climate change should not detract EU or State aids from the main point of focus which should primarily be technological change in relation to mitigation. What is needed are measures to stimulate and increase investment in infrastructure where the technologies is already available in the market place (e.g. flood protection, water management, optimisation of land use..)**Q15** Co-processing waste in the cement industry is a success story : the use of waste and biomass instead of fossil fuel in the cement industry reduced european absolute emissions by 11Mt/year in 2008. EU support for developing with Member States a mechanism for rewarding savings achieved through co-processing of waste in cement plants should be seriously considered. The potential is big as today the energy from co-processing represents only 22% of the energy sources used in the European cement industry.

#### **7574621118-27 Community of European Railway and Infrastructure Companies **Q9****

Electrification of the transport sector is a key technology which has been used by the railway sector for 100 years. Further electrification of rail routes should be made a priority as the technology is easily available. Shifting more transport from less environmentally friendly modes, as well as further developing the electrification of the rail network, should be a priority to reduce the environmental impact of transport with relatively low investments. Relying on technical improvements is not sufficient to reach the levels of reductions needed. As stated by the Commission in its report "EU Transport GHG: Routes to 2050?", market-based instruments are the first best and most efficient approach in order to reach the levels of GHG reductions needed to meet the EU climate change goals. The report says that "if non-technical options were taken up in addition to technical options, GHG emissions from transport could be reduced by around 89% by 2050 compared to 1990 levels." **Q10** Transport is the only sector in which emissions continues to rise. As a consequence, it could undo any

good work done in other sectors in the path towards a lower carbon economy. The Commission study “EU Transport GHG: Routes to 2050?” stresses that market-based instruments have to be set up alongside technical and technology development in the transport sector, if the EU wants to meet its 2050 GHG reduction goals. Key initiatives to pursue include:

- A single binding transport target for transport GHG emissions.
- A comprehensive framework to internalise all the transport external costs from all modes.
- Transport investments should be prioritised according to their environment benefits to the society.
- TEN-T including mandatory CO2 assessment of infrastructure projects.
- CO2 differentiated energy taxation (a non-transport measure which could have a very positive impact on addressing the decarbonisation of the transport sector).

**Q11** Please refer to the response under question 8. In addition, CER would like to emphasise that it is essential that a substantial part of the revenues generated by the auctioning of allowances should among others, support sustainable modes of transport in Europe given the level of emissions reduction needed in transport.

**Q12** A single binding transport target to reduce GHG emissions and getting the right price signals through a full internalisation of all external costs in all transport modes are two key instruments to create a stable framework with clear reduction goals in transport. This is key to have predictable investments, and to provide business incentives. Such a framework would prioritise investments in low carbon transport modes, better demand and capacity management, as well as supporting green jobs. Furthermore, indicating clearly what the targets would be in steps between now and 2050 would allow users, operators and investors to plan ahead with greater certainty on what would be expected.

**Q13** Sustainable growth and the decarbonisation of the transport sector should be priorities in future EU climate initiatives in order to meet the EU GHG reduction targets. Transport is the only sector where emissions are growing since 1990, offsetting the reduction gained in other sectors. Creating new ‘green’ jobs will ensure greater ‘buy-in’ from the public as a whole, so focusing investment to create jobs whilst reducing emissions will improve the likelihood of the roadmap being followed. Moreover, CO2 reduction should be the priority within EU transport programmes such as the Marco Polo Programme. Likewise, environmental performance and contribution to decreasing CO2 emissions should be integrated into the assessment of TEN-T projects.

**Q14** The transport sector is very vulnerable. Rail infrastructure and rolling stock will have to adapt to changing weather conditions as well as more frequent and extreme climatic events. To tackle long term effects of changing weather conditions, new financial mechanism should be introduced to encourage climate proof infrastructure (e.g. to allocate funds for transport infrastructure) and could be included in existing policies such as regional policy, cohesion funds and TEN-T. In the short-term, when natural catastrophes provoke a crisis in the transport sector, the European Commission should be able to declare an ‘emergency status’ which would oblige Member States to take actions. Finally, adaptation should be supported by mitigation measures; clear objectives in terms of decarbonisation of transport are crucial to allow long-term investments and planning.

**Q15**

1. Largest modal share of railways achieved in Switzerland thanks to key measures such as the heavy vehicle fee (HVF). Revenues invested in sustainable transport to offset negative externalities. The Gotthard Tunnel breakthrough was funded via the HVF, clearly demonstrating the benefits that can be achieved through charging external road freight costs.
2. SNCF rail freight multimodal services to Supermarket Monoprix (combined rail freight and road transport for the last mile) provided after 2 years both business-wise (increasing demand of wagons) and environmental-wise (decrease of emissions) benefits
3. Italy's newest high speed route (Rome to Milan) directly competes with the air connection providing potential environmental benefits
4. Inexia has carried out a global carbon footprinting of a high-speed line and will use it for future railway lines. Benefits are socio-economic (increase of rail passengers) and environmental (Rhin-Rhone highspeed line to become carbon neutral in 12 years)

**Additional Comments**

1. "Assessing the case for a

cap-and-trade system for transport GHG emissions. The EU ETS is an important piece of legislation which should serve as a model for reducing emissions by applying an overall cap. The situation of not having a binding target and mechanism specifically to reduce transport emissions will ultimately impede the EU in achieving its EU climate protection objectives. In order to be effective, EU policies should aim at reaching concrete targets. When it comes to transport, as CO<sub>2</sub> intensity varies greatly between transport modes, pursuing mode-specific targets is an economically inefficient approach. Therefore, CER advocates a separate cap-and-trade system for surface transport (for details, please see the document attached). 2. “Moving towards Sustainable Mobility: Rail Sector Strategy 2030 and beyond”. The railway system is currently the transport mode with the lowest specific CO<sub>2</sub> emissions on average. Despite its obvious CO<sub>2</sub> advantage, the railway sector is not complacent and seeks on the contrary to improve its position as the lowest CO<sub>2</sub> emitter. Together with UIC, CER has committed to reach the following targets (for details, please see the document attached to the consultation).

**75818824519-45 Confédération des Industries agro-alimentaires de l'UE** **Q8** Directive on cogeneration CHPs can play an important role in the EU in lowering carbon emissions. However, in order to encourage investments into this technology, long term stability is needed for investors. The Directive on Cogeneration should provide this stability. Regulation on substances that deplete the ozone layer Although HFCs are a very small source of GHG emissions in the food industry (accounting for around 0.2% of the sector's emissions), the food industry is gradually moving towards alternative refrigerants as they become technically and economically viable, safe and energy efficient. Where viable alternatives are not yet available, the food industry fully supports the objective of preventing HFC emissions through an advanced containment regime. Waste Framework Directive Prevention and environmentally beneficial ways to treat waste can contribute to carbon savings. One of the ways of preventing waste is the production of by-products that is already a successful practice in the EU food and drink industries. However, this could be further encouraged by harmonised implementation of the Waste Framework Directive particularly that of Article 5 defining the by-products. **Q9** Self-generation of low-carbon energy on-site An important option to consider is increased self-generation of low carbon energy on-site. Due to the agricultural nature of raw materials used in the food sector, there is technical potential in several sub-sectors to generate bio-based, carbon-neutral energy from by-products and waste (e.g. by anaerobic digestion). At the same time, these by-products serve important alternative purposes along the food chain, e.g. animal feed. Renewable energies also include, amongst others, wind turbines and solar heat. Cogeneration Energy efficient technologies Low carbon energy supply **Q10** Breaking down investment barriers Financial support schemes are needed to overcome existing investment barriers. Help investments in CHP by avoiding regulatory risks for operators Spreading existing best practices across industry Public authorities and energy agencies should help promoting energy efficiency at the level of SMEs (e.g. provision of free energy audits and other relevant expertise) **Q11** CIAA wants to see a single global comprehensive legal instrument to replace the Kyoto Protocol, covering major developing and developed countries as the way forward. Importance of market mechanisms: CIAA underlines the importance of carbon markets including cap and trade systems and other market mechanisms for achieving ambitious global mitigation objectives in a cost-efficient manner and for driving low carbon investments. A weak carbon market, with low carbon prices, could undermine ongoing efforts under the EU emissions trading system and domestic investments in low carbon technologies. **Q12** Breaking down investment barriers : - Overcome the issue of long pay-back periods - Availability of investment funds - Helping the commercial competitiveness of emerging technologies - Avoid investment uncertainty - Help addressing gas and electricity price volatility Encourage R&D and innovation

Technological developments are expected to deliver significant GHG savings. Authorities and the industry should work closely to align research and development (R&D) with industry's needs and to implement the results of beneficial R&D. Particular attention must be paid to improving the commercial competitiveness of emerging technologies. International agreement There is a need to create an environmentally effective and globally equitable legal framework on climate change which will enable the sector to deliver continuous cuts in GHG emissions without compromising its vital contribution to the nutritional, economic and social wellbeing of a growing world population A legally binding, long-term policy framework on climate change is necessary to provide industry with legal certainty for their business operations and with the right incentives for large-scale investment in low-carbon technologies, products, services and infrastructure. **Q13** 1. Although not listed here, food security should be seen as a major benefit of sustainable development. 2. Energy security **Q14** The food and drink sector, in providing this vital nutritional contribution to humankind, crucially depends on healthy eco-systems in which its raw materials are grown. The sector is particularly vulnerable to the harmful consequences of climate change on the availability of agricultural raw materials, both in terms of quality and quantity. Climate change is expected to have a profound impact on food production. Rising temperatures, altered rainfall patterns and more frequent extreme events will increasingly affect agricultural productivity. While climate change will affect different regions in a different manner, effects such as extreme heat, drought, salinity and flooding will exacerbate stresses on crop plants and will affect soil fertility, water availability and the incidence of pests, diseases and weeds. CIAA is of the opinion that progress should be made on the Agricultural Chapter under the Ad-hoc Working Group on Long-term Cooperative Action (LCA). It is key for the Food and Drink Industry to ensure a sustainable agriculture, to support adaptation measures to climate change and as such contribute to safeguarding food security. **Q15** Long-term energy efficiency agreements In several EU Member States, the food and drink sector is participating in Long Term Agreements (LTAs) on energy efficiency between government and industry. Industrial audits in France

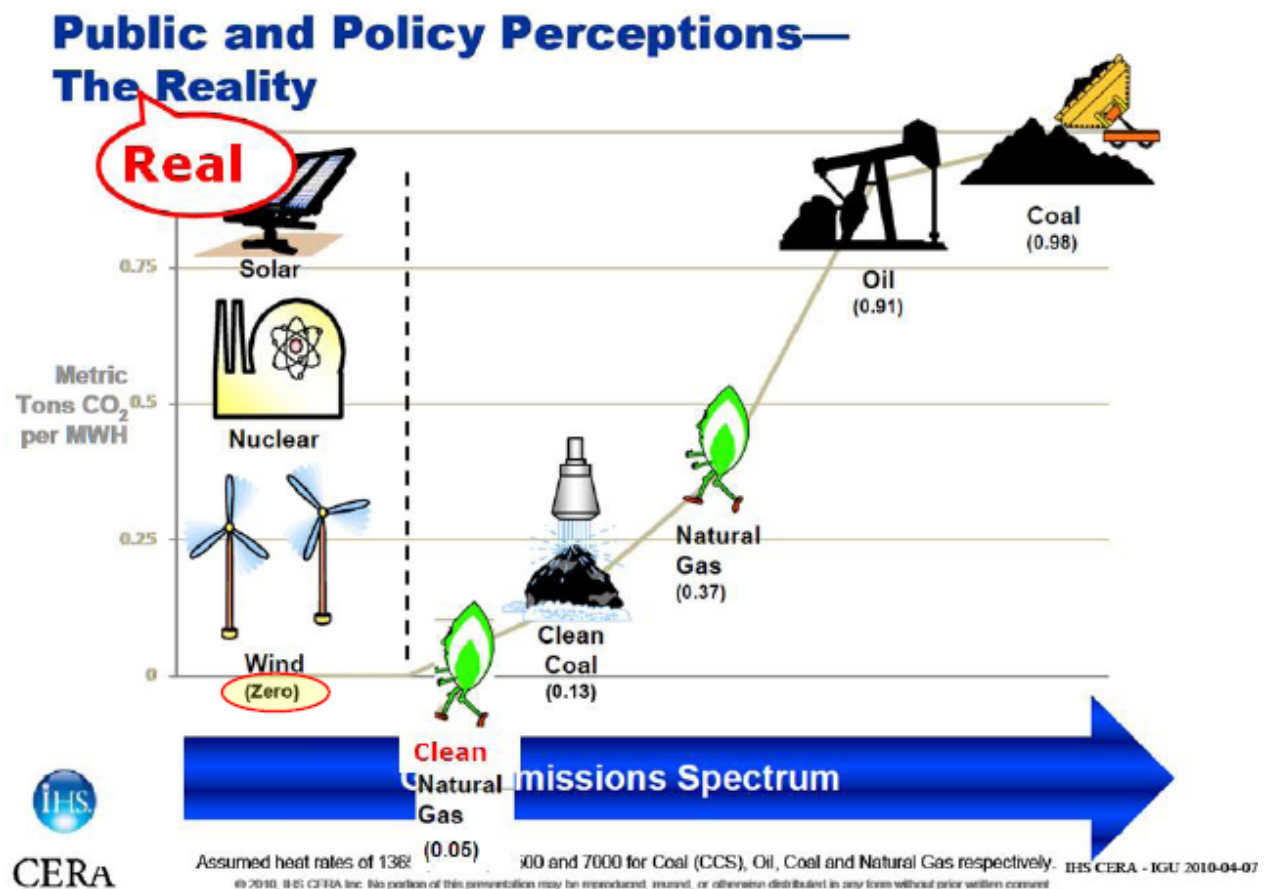
**76130992074-15 Gas Infrastructure Europe Q8** See response to question 9 **Q9** GIE is committed to contributing to a sustainable, competitive and secure EU gas market. This will undoubtedly mean reducing CO2 emissions on an equitable way across the EU. GIE agrees with the 6th Fossil Fuels Forum that "a low-carbon economy does not have to mean a low-fossil fuel economy"<sup>10</sup>. "Decarbonisation is a requirement on the energy produced and does not contradict a continued use of fossil fuels". Therefore a low carbon economy does not mean the end of fossil fuels within the EU energy mix; rather, new ways need to be found to continue the use of fossil fuels but with greater efficiency and lower CO2 emissions. Thinking about a future low carbon economy without fossil fuels would not be very realistic. Natural gas is the cleanest, most efficient and versatile of the fossil fuels, making it a unique choice in the path towards a lower carbon energy mix and sustainable future. More importantly, the abundance of natural gas, its competitive cost of supply, its immediate availability and the flexibility to enable renewable energy clearly favours it as the best source to address emission reductions at the lowest cost. The broad scale of already available high efficient technologies for gas needs to be highlighted. For instance, cogeneration or combined heat-and-power (CHP) have an efficiency higher than 80%. Gas technologies might be also favoured as they can be applied not only by the big industry but also by the SMEs as well as by the domestic consumers. Whilst GIE has no comment on the likely effectiveness of the individual measures listed in question 7, GIE would like to underline the importance of the CCS directive. CO2

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<sup>10</sup> European Commission conclusions for the 6th European Fossil Fuels Forum [ener.ddg1.b.3/JP/sc A(2010)802203]



Capture and Storage is one option within the portfolio of measures to reduce greenhouse gases. CCS, in parallel with energy efficiency improvements or development of renewable energies, contributes to CO<sub>2</sub> reduction, and then to meeting the EU agreed climate targets. The European Commission considers CCS as a key element of its energy strategy and « believes that after 2020 all new power plants using coal, and most likely gas as well, should be built and operated with CCS, whereas capture-ready plants built in the previous period (before 2020) should be “retrofitted” »<sup>11</sup>. This vision provides the advantage of a very strong support to European CCS projects in the years to come. Indeed, the availability of CCS at competitive cost would allow developing not only economically competitive «clean coal» but also «clean gas». Moreover, as CO<sub>2</sub> formed by gas combustion is only the half of CO<sub>2</sub> formed by coal combustion, the need of CCS is divided by two when replacing coal by gas. In our opinion, «clean gas» would represent, without doubts, the cleanest fossil fuel option in the market. We have to consider that fossil fuels will remain necessary for several decades and consequently CCS has a strong role to play. CCS will be vital to sustain worldwide economic growth whilst mitigating the harmful effects of CO<sub>2</sub> emissions. As the International Energy Agency concluded, without CCS, the cost of achieving a 50% reduction in CO<sub>2</sub> emissions by 2050 will increase by 70%.<sup>12</sup> Considering the storage part of this new business to come, Storage Operators can take advantage of their existing competencies to build a new business line which is close to their current activity. However, it is worthwhile considering that many problems, difficulties and threats have to be resolved when developing CCS activities; public acceptance, funding, CO<sub>2</sub> prices and a risk of over-regulation hindering the natural development of this technology are factors which should be carefully taken into account.



<sup>11</sup> Pg 10, Sustainable power generation from fossil fuels: aiming for near-zero emissions from coal after 2020 (COM 2006)843

<sup>12</sup> From 2005 levels, IEA CCS Roadmap 2009

Natural gas is considered as the bridge fuel to a low carbon economy. As it can be seen in the above graph, clean gas is the fossil fuel with the lowest CO<sub>2</sub> emissions. Moreover, natural gas is providing the flexibility required to back-up the increasing amount of renewables. If we consider these two advantages for the clean natural gas (low emissions and flexibility) with the already well known three A's (Abundant, Affordable and Acceptable), definitely, natural gas not only must be considered as a transition fuel, but also as a destination fuel for the long run. Additionally, the carbon footprint of natural gas can be reduced by the use of biogas. Furthermore, new developing technologies, such as Compressed Air Energy Storage (CAES) or production of synthetic gas ("power to gas") would trigger new ways of using the existing and new infrastructure to provide low carbon energy storage using the know-how of UGS companies. GIE considers that meeting the EU's very ambitious commitments towards a low-carbon economy by 2050 will require parallel development of energy efficiency measures, the development of renewable energy sources and the deployment of carbon capture and storage (CCS). Most importantly, these developments will have to be accompanied indeed by a significant development of new natural gas infrastructures. By 2050, natural gas offers the opportunity to be used either alone or better in conjunction with CCS and new developing technologies to help decarbonise the energy sector and to provide an affordable flexible back-up to the increasing renewables sector. **Q10** Over the next decade, significant investment will be needed to ensure a transition to a low carbon economy, most of those investments being in terms of energy infrastructure. In the context of the current economic crisis, this will be challenging, and requires that current low-carbon energy sources and technological solutions will need to take central stage. In terms of initiatives, GIE considers that the following priorities have to be considered for a successful Roadmap 2050: a) Completion of the internal market in electricity and gas Development of the right electricity and gas infrastructures in a timely manner is critical. Gas infrastructures are needed to ensure a liquid, competitive and secure EU gas market. GIE would like to emphasise that gas infrastructures are "market facilitators" which enable the completion of the internal market. A real internal gas market is the key to a more sustainable and efficient market with lower CO<sub>2</sub> emissions. A sound investment climate together with a stable and predictable regulatory framework providing the appropriate incentives for investment constitute the prerequisite for the development of new gas infrastructure which will trigger further market integration and enhance security of supply. A proper regulatory framework will help to respond to many infrastructure challenges without resorting to extraordinary tools. GIE would like to reiterate that gas infrastructure investment entails long-lead times and thus requires long-term visibility. Regulatory frameworks should therefore be clear, in-keeping with the longer-term policy perspectives and consistent across borders. This should be recognized as a prevailing principle spanning to all infrastructure projects. b) Consistency between the Climate and Energy Strategies of the European Commission. Natural gas infrastructures require capital intense investments which are paid-back over a period of 30-50 years. The European Commission considers on one hand that there is a need for modernizing and developing gas infrastructures, but on the other hand it advocates at the same time scenarios with a decline in gas demand in the medium and long term, considering the role of gas only as a bridge fuel to a low carbon economy<sup>13</sup>. GIE would like to call for a more clear and coherent view from the European Commission in order to ensure a sound investment climate and avoid uncertainty. This uncertainty is damaging to investor's confidence and restricts new investment. Given IEA predictions<sup>14</sup> that oil and gas will play an important role in the EU energy mix for decades, it is important, as outlined above, that clear and predictable demand signals are sent to the investment community now to allow for the diversification of routes and sources. Without these clear and predictable

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<sup>13</sup> Pg 20-22, Energy infrastructure priorities for 2020 and beyond (COM 2010) 677

<sup>14</sup> IEA WEO 2010

demand signals, investment will go elsewhere, leaving the EU with a potential energy shortfall given the dash for energy by China and India; for example, in back-up capacity of intermittent renewable energies for which gas is especially well-suited. A consolidation of both EU energy and climate policies in order to set a clear long-term energy strategy that is realistic as a foundation for a low-carbon economy is therefore crucial. c) Recognition that gas will continue playing a critical role in the EU energy mix for decades. This is important given that one third of EU electricity generation capacity will need replacing by 2020 according to the Commission's own analysis.<sup>6</sup> There must be recognition of the fact that gas:

- has a much lower capital cost per installed MW (50% the cost of a coal plant, 20% the cost of a nuclear plant and 15% of wind generated energy).<sup>7</sup>
- Gas power plants can normally be constructed in about two years, much quicker than coal (52-58 months) or nuclear plants (54-60 months).<sup>8</sup>
- Gas-fired power plants are much more flexible (higher energy efficiency) than nuclear plants.

d) Measures to ensure clean, efficient and affordable back-up for intermittent renewable energy sources. This could mean replacing old coal-fired power plants by CCGTs. Moving from coal to gas in power generation is almost twice as big a step in terms of emissions reductions compared with moving from gas to carbon-free renewable energy sources. **Q11** ETS should fulfil its role of moving the energy industry towards a lower economy. CO<sub>2</sub> prices should be at the right level to incentivise the development of low-CO<sub>2</sub> technologies, as for instance, CCS. However special attention should be paid to this mechanism in order to avoid excessive complexity and fragility as well as to avoid putting a serious strain on the competitiveness of the European economy in general and of the energy industry in particular. **Q12** GIE would like to stress, by way of example, that a switch from coal-fired to modern gas-fired power plants could alone meet the 2020 CO<sub>2</sub> emissions reduction target in the EU. Replacing coal fired power plants by gas fired power plants, results in significant emission reductions. In addition, gas fired power plants are a good response to the need of back up generation in the development of renewable energy production through wind and solar farm owing to the intermittency and unpredictability of these sources. Finally, with a possible extension of nuclear power generation in some of the Member States, gas fired power plants gain importance for peak shaving. Due to their important variation of load factor, new gas fired power plants will need a high level of flexibility from gas infrastructure, which will require additional storage, LNG and transmission infrastructure **Q13** From the perspective of natural gas infrastructure operators, priority should be given to the following actions: - ensuring a sound investment climate for energy infrastructure development - replacing coal with gas as a source of electricity generation in order to quickly and cheaply lower CO<sub>2</sub> emissions within the EU. - recognition of the benefits of natural gas within a low carbon economy. Natural gas is the cleanest fossil fuel and, if it is associated with CCS or other new developing technologies, it is without doubts, not only a transition fuel to a low carbon economy, but also a destination fuel for the long run. - Recognition of the key role to be played by gas infrastructures. Gas infrastructures are market facilitators and therefore the backbone of a more interconnected, liquid, competitive, sustainable and secure EU gas market. - Increasing amount of renewable energy is expected to be installed. In order to back-up the intermittent production, an enormous flexibility is necessary in both the electricity and gas networks. Gas is storable, that's why LNG and underground gas storages have a key role to play to provide this flexibility, both on gas and electricity networks (thought CCGT and other developing technologies using gas as an energy carrier). The Roadmap to 2050 should clearly recognise this requirement to achieve a successful low carbon economy by 2050. - Diversification of routes and energy sources to the EU energy market are key policy elements within an inter-dependent environment. **Q15** As the example of the United States shows, the development of unconventional gas is an evidence of a successful story. This new technology has evolved very quickly during the last

years and it accounts now for 50% of the total gas production. This is a good example of how new technologies can be commercially viable in a short period of time. If CCS could follow this example, the EU could more easily achieve its low-carbon target by 2050. Better promotion and incentives for CCS development would unlock the potential associated to clean fossil fuels. Clean gas, underpinned by the appropriate gas infrastructure, would definitely help to drive the EU energy market into a decarbonised economy by using an abundant, affordable, competitive, flexible and acceptable fuel as natural gas. Natural gas, CCS and natural gas infrastructure would ensure low carbon emissions, back-up for renewable energy productions and competitive prices for the EU consumers. It also has to be pointed out that the outcomes from research in new energy technology developments concerning gas will make a major contribution to achieve low-carbon targets. In this sense, new technologies, such as the production of synthetic gas (“power to gas”) and the compressed air energy storage (CAES), among others, will help define gas as an essential component in the future low-carbon economy framework by using existing and new gas infrastructure and the available technology developments. These options would also bring new high-tech employment and would reinforce the energy sector as well as the associated manufacturing sectors. Moreover, a special attention should be paid on how other countries in World, and in particular the major CO<sub>2</sub> emitters handle these climate issues.

**77608353460-77 RWE AG Q9** Most important technologies are renewables, nuclear and CCS. Swift deployment of these technologies requires a level playing field among member states and energy policies which follow a technologically open approach i.e. do not discriminate against specific low carbon technologies. Low carbon electricity generation is key to achieving emissions reductions in other sectors such as heating and transport. **Q10** The EU should vigorously strive for • A Post-Kyoto agreement with a fair burden sharing for all countries, including emerging markets and priority for market based mechanisms for climate protection. • A carbon trading scheme which comprises all major industrial countries with a clear perspective to further extension to emerging markets and developing countries. • Include all sectors into climate protection efforts, esp. transport. • Work on public acceptance for new infrastructure which is necessary for a low carbon infrastructure. **Q11** • As long as there is no global carbon trading in place, JI/CDM should remain instrumental as a cost efficient and market based mechanism for climate protection. JI/CDM are proven and efficient mechanisms for climate action which should be further developed and made more widely applicable. • Instruments and mechanisms for achieving co-benefits between climate and biodiversity / wood-protection (REDD+) are promising approaches that should be pursued. • Bilateral and / or multilateral links between EU-ETS and other trading schemes are desirable, e.g. Japan, REGGI or other future trading schemes, as a transition to a global carbon market. **Q12** A mid-term objective would be desirable based on the existing legal framework. Any additional ambition for future climate action presupposes a Post-Kyoto agreement which is compatible with the criteria laid out in Art. 28 of the ETS-Directive. Any target must be backed by appropriate policies to ensure delivery in an economically efficient manner. **Q13** • Sustainable growth should be the top-priority. Sustainable growth includes all the mentioned potential co-benefits of climate action. • Sustainable growth can be ensured by a fair global burden sharing for climate protection and a clear priority for market based mechanisms. • Unilateral additional ambitions and efforts for climate action negatively affect Europe’s industrial base while the industry is supposed to be among the frontrunners of climate friendly technology. Unilateral ambitions are likely to slow the pace of innovation and narrow export chances for advanced technology. **Q14** • The civil sector is potentially the most vulnerable sector. In the industry, there is no clear evidence for any sector to be most vulnerable. • Climate change impacts vary greatly among different climatic and geographic regions within the EU. •



Vulnerability and resilience of specific industry sectors equally vary greatly. • Consequently, specific adaptation policies and plans should be left with member states. The EU can be instrumental in facilitating and coordinating national efforts. • Adaptation energy sector and other industries is expected to be delivered by market forces. Governments may need to facilitate and coordinate. • Adaptation in the civil sector is likely to require public action and provisions for public safety from natural hazards. **Q15** • There are many model projects in place and the nearest challenge is to fully implement and to give time to mature. • EU-ETS basically is a success story that could serve as a blueprint for carbon trading in other regions of the world or even globally. • There is plenty of evidence for positive economic and social side effects initiated by CDM projects which branch out beyond the immediate purpose of climate protection. • An overview over RWE's initiatives to further progress towards a low carbon economy is attached (excerpt from Eurelectric's Energy Wisdom program). **Additional Comments** With the ETS as a lighthouse project the EU has created a coherent framework for efficient and effective climate protection which may be a model for the world. At the present point of time it is important that the EU carefully ensures the integrity of the framework in place. The EU should care to avoid additional redundant and conflicting climate regulations from the member states' side. It would be politically wise to give the existing framework sufficient time to mature and to deliver desired objectives.

**776106236-67 UITP - International organisation for public transport Q9** None of the above cited technologies actually impact the transport sector. In general it should be noted that technological solutions to reduce CO2 emissions are only one part of the solution, with 20-30% being average before 2050 until fleets become substantially cleaner and more efficient. Technology only pathways, especially in transport, are also usually expensive per tonne of carbon reduced. Managing demand better and encouraging modal shift to efficient, low carbon mass transport modes offers affordable options for policy makers in the short and medium term and significant reductions in CO2 emissions from transport can be achieved by shifting modes to low-carbon transport modes (rail, public transport, cycling, walking) and avoiding motorized trips with better urban planning and walkable communities. **Q10** Setting targets for reducing CO2. Specific targets for CO2 emissions for long-distance, urban transport, freight and passenger transport, with incentives and rewards for improvement. Transport does not easily fit into one category as the markets and opportunities for CO2 reductions differ greatly across the sector, this needs to be recognised as they require specific policy measures. A growing proportion of the EU's carbon emissions come from urban areas and yet it is here that there are possible alternatives. Targets could be set for urban mobility: access to jobs via mass and individual transport and a target modal split across the modes could catalyse a shift to low-carbon transport modes (rail, public transport, cycling, walking) as well as addressing mobility behavior. Technology combined with behavior change are key aspects for drastically reduce CO2 emissions in transport. **Q11** Public transport needs to be recognised as a low carbon technology and therefore be able to benefit from investment from the credits of any auctioning of credits from aviation trading. Countries are required to report on where credits have been spent and that they 'should' be spent on low carbon technology. From the point of view of UITP this would lead to more sustainable integrated transport networks. **Q12** A long-term planning which is maintained/ensured is crucial as this results in a more stable environment to work. Such long-term planning should be based on the principles of workability, practicability and affordability. **Q13** 1. Sustainable growth 2. Green and local job creation 3. Increase energy security by reducing dependence on fossil fuels and increase renewables **Q14** All sectors will be vulnerable – primary resource supply from the developing world will impact Europe's economy as well as obvious sectors such as agriculture. However Europe's transport supply industry is slow to innovative developments

compared to developments from the BRICs countries in particular and risks cheaper imports. For example there are few electric city buses on the market. Subsectors of the road transport industry such as bus production could be hampered by too stringent CO2 emission levels implemented for all heavy duty vehicles (HDV) categories. **Q15** - Doubling public transport market share worldwide: UITP project, 2025 - Doubling public transport project in Sweden. - Experiences in London or Stockholm with introduction of congestion charging, (setting a city/metropolitan wide CO2 per capita target) the use of alternative fuel in Stockholm. - The public transport sector is also committed to continuous improvement – UITP Sustainable Development Charter has 170 signatories who make a voluntary commitment to monitor, measure and report on their own performance in environmental, social and economic terms. **Additional Comments** The public transport sector is committed to low carbon economy. The signatories of the sustainable development charta is uploaded as additional document.

**79628483345-37 Barilla Center for Food & Nutrition** **Q9** The only way to build a low carbon economy is to use the complete portfolio of technology. But one potential source of significant carbon capture is through soil sequestration. The EU should promote further research into this area. As a naturally-occurring technology, the use of soil could be an effective tool in the search for a low-carbon economy. **Q10** The importance of food and agriculture in the roadmap for a low carbon economy should not be underestimated. As mentioned above, technologies related to soil-use already provide potential for carbon capture. However with regard to lowering the existing levels of emissions, it is clear that as one of the main sources of carbon, the agricultural sector must alter its behavior. The BCFN promote a Double Pyramid approach which supports the production and consumption of foods which have the least impact on the planet and are healthiest for human consumption. One important initiative the EU environment officials could take, in tandem with those dealing with human health, is to promote such an approach at a European level. **Q13** A sustainable level of growth should be the chief objective for an EU Roadmap. Not only it should focus on economic benefits for citizens, but also ensure a higher standard of living through improved health and access to food. **Q14** As one of the main sources of emissions the agriculture industry will have to drastically change its behavior and there may be a detrimental impact on jobs in the sector. The EU should ensure that any integration of environmental requirements in the revised Common Agricultural Policy, post 2013, should take account of this impact and provide support and incentives for farmers and food producers wishing to reduce emissions. **Q15** Adopting the Mediterranean diet as an interesting climate smart diet – good for you and good for the environment (do to a lower carbon footprint). This is well explained with the BCFN Double Pyramid: <http://www.barillacfn.com/en/pyramid-introduction>

**83923664694-38 Climate Alliance of European cities with indigenous rainforest peoples** **Q9** Development of a more decentralized energy system is essential for security of supply, better efficiency and renewable energy. Technologies increasing energy efficiency especially in buildings but also in equipment, vehicles etc. should be a priority. Also smart grids and development of electricity storage are important to allow much greater share of renewable energy in the future. Therefore, priority in assigning funds should be given to such technologies instead to end-of-pipe technologies like CCS or unsustainable ‘solutions’ like nuclear power. **Q10** There are already series of legislations put in place. However, more emphasis should to be placed on creating necessary framework conditions for local governments to tackle their challenges. Some 80 % of the CO2 emissions derive from cities, meaning that many of the solutions need to be implemented locally. For local governments a current key EU initiative is the Covenant of Mayors ([www.eumayors.eu](http://www.eumayors.eu)) offering political support and recognition. This is a good start. However, involving local governments should

be mainstreamed and not tackled by a single initiative. Opportunities for development of coherent policies at EU, national and local levels should be created, for example by accompanying systematically local authorities in the implementation of new technologies including the political process. One next step could also be the development of tools to monitor concrete action with the aim to quantify local action (and therefore contribution to the achievement of European targets). **Q12** A roadmap should consist of steps. As a first step it would be important to reach the goals set for 2020. To give an example from Climate Alliance: To help the work of our members, our organization has set a strategic (long term) goal which is halving the per capita CO<sub>2</sub> emissions by 2030 (baseline 1990). In addition we have a reduction target of minus 10 % every 5 years. This helps to design and implement actions in a more short term and fitting the work with the local planning and election processes. More information: [www.climatealliance.org](http://www.climatealliance.org). **Q13** Policies following the vision of high energy performance and decentralised energy supply based on renewable energy will lead to all benefits mentioned above, so no prioritisation is necessary. Coherent and ambitious approaches are necessary. Funding should support such policies instead of large-scale infrastructure. To support such developments, a concrete example could be the creation of a “small-scale ELENA programme”: supporting preparation of projects requiring smaller (but nevertheless for many local authorities not realisable) investments, work on the provision of tools which allow simplified feasibility studies etc. The ‘Smart Cities’ initiative should be developed in a way that a large number and broad range of local authorities will be able to benefit. **Q14** Cities suffer more and more of the extreme weather events, which often destroy infrastructure within a short time, leading to injuries and deaths. Municipalities and regions should take on a leadership role in adaptation, as many of the solutions are local e.g. land use planning and building regulation. Both adaptation and mitigation should be mainstreamed into the planning policy. EU and national governments have an important role in adaptation for example via national adaptation plans. These could be effective and help cities if prepared in cooperation between the different levels of government. Funding for adaptation projects is also needed: improving understanding, coherent approaches, finding common solutions etc. However, political emphasis should be given to the mitigation efforts in Europe and to support developing countries in their adaptation strategies, they are the most vulnerable to climate change impacts. **Q15** Many of the 1,500 members in Climate Alliance are success stories. Small LAs are active (Stetteldorf am Wagram (AT): <http://www.klimabuendnis.at/start.asp?id=229762>, or Beckerich (LU): [http://www.eurosolar.de/de/index.php?option=com\\_content&task=view&id=953&Itemid=269](http://www.eurosolar.de/de/index.php?option=com_content&task=view&id=953&Itemid=269)), but also many bigger cities belong to the pioneers in sustainable energy (use and supply): Frankfurt (DE) in the field of energy efficiency, passive housing, incentives for saving electricity, etc...: [http://www.frankfurt.de/sixcms/detail.php?id=2809&ffmpar\[id\\_eltern\]=2809](http://www.frankfurt.de/sixcms/detail.php?id=2809&ffmpar[id_eltern]=2809), Munich (DE) as one of the first big cities to adopt a 100% renewable goal: <http://www.muenchen.de/Rathaus/referate/rgu/umweltdaten/energie/39004/index.html>, or The Hague (NL) with a lot of pioneering projects and innovative funding mechanisms: <http://www.denhaag.nl/en/residents/nature-and-environment/to/CO2-neutral-in-2050.htm> Please find many more activities of our members here: [http://www.climatealliance.org/member\\_activities0.html](http://www.climatealliance.org/member_activities0.html) **Additional Comments** Climate Alliance’s response to the European Commission stock taking document “Towards a new energy strategy for Europe 2011-2020” entitled “2011-2020: Setting the Course for a Decentralised and Renewable EU Energy Future 2050” contains more proposals relevant to this consultation as well: <http://www.climatealliance.org/533.html>

**8402170864-02 Deutsche Post DHL Q8** Proposal for a revised Eurovignette Directive Road transport patterns are determined by customer demands and regulatory requirements that make a shift to the cheapest time zone impossible and disconnected to any business reality. The Proposal is based on the incorrect assumption that a simple increase of costs of road transport would influence road transport patterns and achieve more sustainable transport. Without viable alternatives, road freight will only become more expensive. By obliging commercial vehicles to pay for congestion costs, the Proposal is inefficient and discriminatory since passenger cars representing 90% of road users are excluded from its scope (cf. Transport Research Center (AVV) – Dutch Ministry of Transport). By eroding the financial capacity of road transport operators to invest in new and cleaner vehicles, Intelligent Transport Systems and training (e.g. eco-driving), the external cost charges proposed will ultimately have an adverse effect on the greening of road transport. Without strict earmarking provision, the Proposal will be discriminatory vis-à-vis road freight users. **Q9** Greening commercial vehicle fleet In the medium/long-term, electric vehicle technology could particularly benefit LCV fleets providing short-haul trucking and delivery services, especially for night-time deliveries within cities. Large fleets of electric vehicles can also play a major part of any future smart grid: the batteries would be charged during periods of low demand (e.g., nighttime) or high supply phases of electricity (e.g., strong and steady wind). If there were a high demand but a low supply of energy, the vehicles would serve as a source of energy (as long as they are not running at the same time). Electric vehicles, but also biogas, hybrid, hydrogen and fuel cell vehicles, may be up to 3 or 4 times more expensive than regular vehicles, which considerably limits their rapid deployment and positive impact on the environment. There is therefore a need to promote financial (e.g., tax and charges rebates) and in-kind (e.g., privileged access to city center) incentives for end users of commercial vehicles to ensure rapid deployment of greener vehicle solutions, aerodynamic features and ITS devices. **Q10** Any further regulated cost increase will not help to stimulate the switch to greener supply chains. In particular, transport patterns are driven by customers' and regulatory demands (e.g. opening hours of shops, night-driving bans, etc.) and the availability of infrastructure and reliable transport services. The EU needs to combine the positive effects from the completion of the Single Market with targeted and smart funding and incentives. EU infrastructure funding should focus on real bottlenecks and on the major trade lanes according to a cost/benefit approach. The 8th Research Framework Programme should deliver solutions easy to implement on the market and improving the efficiency and environmental performance of supply chains. Companies who want to deploy and/or use greener technology need to have access to quick financial or other incentives. This should apply in particular to the users of transportation vehicles. **Q11** EU ETS for aviation is in principle a more cost-efficient instrument to reduce aviation emissions than taxation or charges. However, as aviation is a global sector by nature, a global solution at ICAO level would have been preferable and should continue to be the objective. It is crucial that non-EU operators remain subject to exactly the same requirements if they operate to/from/within the EU as EU operators, with a view to avoid distortion of competition. Aviation is an energy intensive sector, with no alternative for kerosene in the foreseeable future. It is a sector which is at significant risk of "carbon leakage" in case of high levels of auctioning. This is in particular the case for air cargo where operators could introduce an additional stop outside the EU (to reduce exposure to EU ETS) or where non-EU hubs will be favored and cargo be diverted via those non-EU hubs. Activities will be moved outside the EU, but the emissions remain the same or even increase. Therefore, the level of auctioning should remain stable at maximum 15% until 2020. In addition, the EU must speed up the creation of the Single European Sky, which would enable to cut CO2 emissions of aviation by up to 12%. **Q13** Sustainable growth is the condition for the wealth of the society and for an energy-efficient economy. The lack of a truly harmonized Single Market for all



modes of transport is hampering a seamless and more environmentally-friendly cross-border transport flow, which costs time, money and energy and keeps retail prices high. In principle, no new burdensome transport or environmental regulation should be proposed, while the EU fails to remove protectionist measures (e.g. road cabotage) or to complete liberalization of transport markets (e.g. rail). By making each mode of transport more efficient and sustainable, co-modality will help greening the supply chain while satisfying the customers needs at the same time. Obligation of modal shift or of intermodal transport is not a realistic approach since the best supply chain option must be set up on a case-by-case basis depending on the type of freight, volume, distance, costs, availability of the infrastructure and of the reliability of the transport services. Forgetting the complexity of the supply chain will be counter-productive and will threaten the competitiveness of the economy and the wealth of the society. **Q14** To internalize the external costs for each mode of transport, a comprehensive impact assessment should be undertaken taking into account: 1. all measures already in place for reducing the external costs concerned (e.g. fuel taxes, tolls, VAT, tax, etc.) in order to avoid transport operators paying twice for the same external costs; 2. the positive effects of each mode of transport on Europe's economy and society (in terms of competitiveness, sustainability and jobs) as well as the negative effects of each mode of transport on the environment; 3. other alternatives measures to tackling the external costs of each mode of transport (e.g. completion of the Internal Market for freight transport services, efficient road traffic management systems, rail freight dedicated network, cleaner fuel and vehicles, eco-driving, fiscal incentives for the cleanest vehicles, noise barriers, etc.); and 4. consistent assumptions and data to establish a formula ensuring accurate cost calculation. Internalization of external costs should go with strict earmarking provisions for the mode of transport concerned in order to reduce the external costs covered. **Q15** Deutsche Post DHL was the first logistics company to commit to reduce by 30% carbon emission for each letter, parcel or container by the year 2020 compared to 2007. Our program GoGreen has three main areas: ☐ Vehicles: driver training; hybrid and electric trucks; speed limitation; aerodynamic devices (e.g. teardrop trailer gives a CO2 reduction of 10-15%); ☐ Real Estate: deployment of efficient lighting and heating systems; solar panels; smart meters; water management should save about 10 to 20% energy costs and emit 30% less CO2 per area unit); ☐ Network: consolidation points such as "Packstation" or consolidation centres to deliver a city or big economic centres; route optimization; modal shift where possible; load factor and capacity optimization. These actions require high investments and have a long return on investment period, therefore incentives would speed up the greening of the supply chain for the benefit of the entire economy. Considering the large scope of topics which have an impact on logistics business starting from transport, environment and energy to ICT, an integrated approach to define policy for the logistics industry is required. **Additional Comments** business model as well as the range of advanced solutions and technologies that will be used by logistics service providers. This is one conclusion drawn by the study "Delivering Tomorrow: Towards Sustainable Logistics" ([http://www.dpdhl.com/content/dpdhl/en/logistics\\_around\\_us/trends/sustainable\\_logistics.html](http://www.dpdhl.com/content/dpdhl/en/logistics_around_us/trends/sustainable_logistics.html)), which Deutsche Post DHL released in October 2010. The study is based on in-depth research and contributions from international experts as well as a representative survey of 3,600 business customers and consumers worldwide. Sustainability, especially the reduction of carbon emissions, is already a central aspect of Deutsche Post DHL business and an integral part of our corporate strategy with our GoGreen Program. Customer worldwide increasingly demand greener logistics and are thus the best indicators for us that we are on the right track. According to the study, the logistics industry will be key to comprehensive carbon reduction efforts in most sectors due to its unique expertise and positioning along the supply chain. In addition to its strategic economic importance, logistics will increasingly be seen as essential

to achieving lower carbon emissions across the economy. That is a chance and a challenge as well for logistics service providers: Companies rated best-in-class in terms of environmental, social and governance practices outperform low-sustainability companies by up to eight percent. Furthermore, logistics will no longer be viewed as a commodity, where offering the cheapest solution rules. As a result, the leading logistics companies of the future will be those that provide sustainable services. The study also shows that significant carbon reductions can already be achieved within the logistics sector without waiting for major technological breakthroughs for instance by making distribution networks more efficient, using the right modes of transportation and by managing load capacities and routes more efficiently. Effective and efficient CO<sub>2</sub> reduction depend on reliable carbon accounting and controlling, but there are a lot of challenges to be overcome. Without international standards or independent data providers, calculating emissions is especially costly and complex. Therefore, independent institutions are needed in order to create transparency and, thus, allow companies to judge the emissions level of their subcontracted services (e.g., via programs like Smartway in the U.S.). The report aims to show how business innovation and green demand can drive a carbon-efficient industry and lead to a low-carbon economy. Carbon pricing mechanisms will accelerate a market-based dynamic toward more sustainable solutions. Deutsche Post DHL has seen over the past years that both factors, the acceptance of higher prices and the sense for climate protection, influences its business. For example, the number of GoGreen CO<sub>2</sub> neutral shipments by Deutsche Post DHL almost quintupled from 2008 to 2009 – from 145 million to 704 million. The report identifies seven key developments for a sustainable logistics industry:

1. Logistics counts – it is not a commodity Logistics is not only a chief catalyst of global trade and a defining component behind value creation. It is also a business of strategic importance in the move towards a low-carbon economy.
2. Technological change will be achieved through a concerted drive from companies, governments and financial institutions Given the higher price tag attached to new technologies, mutual support and long-term-planning by key players is essential.
3. Collaboration will increasingly be seen as an enabler to attain sustainability; even erstwhile competitors will cooperate more closely As carbon emissions reduction becomes a priority for suppliers, business customers and logistics companies, cooperative business models will expand both vertically and horizontally along the supply chain.
4. Business models of logistics companies will change as sustainable innovations open up new opportunities A number of technologies and concepts, currently focused primarily on making logistics more sustainable, will also provide new ways for logistics companies to do business.
5. CO<sub>2</sub> labeling will become standardized CO<sub>2</sub> labels allow customers to compare green products. Transparency will raise confidence among logistics customers and end consumers when making climate-friendly choices.
6. Carbon emissions will have a price tag As reducing carbon emissions becomes more important for companies, governments and customers, it will become part of a business's accounting and decision making process. This will increase the demand for a price to be attached to CO<sub>2</sub> emissions.
7. Carbon pricing will lead to more stringent regulatory measures Companies will only accept a price tag on carbon emissions if governments ensure a level playing field.

Facts and Figures on sustainable logistics taken from the study "Towards Sustainable Logistics":

- In 2009, the logistics industry generated roughly 10 percent of Europe's GDP.
- 63 percent of business customers believe that logistics will become a strategic lever for CO<sub>2</sub> abatement.
- Up to 80 percent of warehouse energy consumption is due to lighting.
- 84 percent of consumers in China, India, Malaysia and Singapore say they would accept a higher price for green products – compared to only 50% in Western countries.
- Out of 1.62 billion tons of truck emissions in Europe, roughly one quarter are caused by trucks running empty – often due to legal requirements.
- While trucks represent just 20% of the entire Deutsche Post DHL vehicle fleet, they account for 80

percent of the Group's road emissions. □ Aerodynamic drag is responsible for 40 percent of the fuel consumption of heavy duty trucks at motorway speeds.

**84973761187-60 EuroCommerce Q8** Housing, food & drink and mobility are the areas with the greatest environmental impacts from a life-cycle perspective. These three sectors account for two-thirds of the environmental impacts of private consumption. Therefore future efforts should focus around these sectors. One of the key elements for a low-carbon future are renewable energies, provided these are used in a sustainable way. One important aspect which must be addressed are the “regular conflicts” between environmental issues and the Internal Market. Over the years, it has become increasingly common for the basic principles of the Internal Market to be overruled on the grounds of environmental protection. There is also a regular shift of responsibility from the producer to the distributor. A striking example concerns the recast of the WEEE (Waste Electrical and Electronic Equipment) directive. All Member States are insisting on maintaining a national approach over a community approach to placing goods on the market as proposed by the Commission. Efforts should also be undertaken to ensure that technologies and environmentally friendlier products are not subject to anti-dumping duties as was the case for energy efficient light bulbs. **Q9** Only a global overarching strategy and a mix of all the different technologies can help the EU reach its objective. When assessing the environmental impacts of the commerce sector, one should look at the whole supply chain. An isolated view on actors should be avoided. Instead, the focus should lie on the footprint of products. At first sight the energy consumption within the commerce sector may seem high, it nonetheless remains limited in relation to the total contribution of the services sector to the total EU energy consumption. Therefore the focus of the commerce sector will be on improving the energy efficiency of its stores and activities as well as our transport fleet. The sustainability reports of most companies already include levels of CO<sub>2</sub> emissions as well as reduction targets. EuroCommerce also provides its members with a platform to share information on initiatives to resolve climate change concerns and exchange best practice. The challenge for the commerce sector is to balance those needs in order to achieve sustainable solutions, which benefit our stakeholders, customers and the environment. However, incentives are needed for example in the field of transport to use more silent vehicles, safer modes of transport or more environmentally friendly means; the current approach of the EU, namely extra charging is not the right incentive. Increasing the cost of road transport (by infrastructure charging, internalisation of external costs, etc) will not make transport greener in Europe unless alternative modes or fuels are available and greener technologies are encouraged. Therefore alternative policy measures for sustainable transport should be considered by the EU, rather than the option of raising for example road freight transport costs alone. Effective, fair conditions for competition between modes of transport are essential. Any environmental subsidies should be based on the real environmental effect of any mode of transport. The EU could promote sustainable alternative fuels and energy sources in private and public transport, promote clean technology in transport as well as research and development and furthermore provide real incentives to invest in the newest and cleanest of technology. **Q10** An international, binding agreement on climate change must be sought. It ought to include all major emitters (industrial, emerging and developing countries) so as to ensure a global level playing field while nonetheless allowing different targets depending on capability. Meanwhile, Europe must continue to persevere and show leadership on climate change. Energy consumption varies depending on Member States. Besides climate conditions, an important factor is the price of energy. Innovation in energy efficiency is essential. More incentives, especially at EU level need to be encouraged. Generally, there are insufficient incentives or rewards for companies investing in energy efficiency or greener technologies. For example, improving store energy efficiency requires the convergence of the

environmental objective of sustainability and the economic objective of cost savings. Today some green technologies applied to stores require significant investment with relatively low return in terms of environmental and economic benefit. For example, the use of renewable energies in stores, such as photovoltaïque. In the field of transport the same problems exists. Freight road transport is put under a lot of pressure. Instead of providing incentives to invest in green technologies, the sector is being penalised by different charging schemes. In the short term promotion of good practices, existing knowledge and clean technology could be useful. This includes further developing PPP and local partnerships such as the covenant of mayors or other regional and local tools. We would like to stress that the market needs time to both develop and to up-take new technologies. Particularly with the current crisis, new investments have slowed down. **Q12** The commerce sector is an energy user. Most of our consumption is electricity which is needed to lighting, ventilation, heating and air-conditioning and food cooling and refrigeration. In order to encourage companies to invest in energy efficiency and green technologies, predictability and legal certainty are essential. This implies a better coordination among different EU strategies. Moreover, these green technologies need to be made more affordable, especially for smaller companies. When designing EU policies and developing new technologies it is important to look into the use of raw materials so that they are used in the most efficient and sustainable way. **Q15** As a sector, commerce is also innovating: the most recent example is the setting up of REAP (the Retailers' Environmental Action Programme). This initiative has enabled all stakeholders to share good practices on subjects such as energy efficiency of stores, marketing and effective communication etc in the Retail Forum. Moreover, the retail members of REAP have, on an individual basis, identified some environmental targets that they have committed to carry out. All these commitments can be found in the Matrix of environmental Action Points (MAP). Many of the same companies and associations – but others also – have furthermore signed up to the retail environmental sustainability code which was officially presented to Commissioner Potocnik at the Retail Forum annual event in June 2010. After one year of existence, the first results are very positive and stakeholders are keen to continue. However, REAP only represents a fraction of all the commitments and actions that the commerce sector is taking in the field of environmental and energy sustainability.

**85103504511-82 ActionAid** **Q9** ActionAid believes that the EU must through a variety of tools proactively encourage energy efficiency in e.g. transport, renewable energies as well reduction in energy consumption. However, all European policies aiming to reduce carbon emission must ensure that they are coherent with the EU's development objectives, comply with relevant international human rights law, including ILO standards, and are developed using the best available science and utilising a precautionary principle in their implementation. Reducing carbon emission can not take place in ways which threaten the rights of poor and marginalised communities around the world. **Q10** A focus on energy efficiency Investments in low-energy solutions for industry and private consumption. Ultimately energy consumption needs to be reduced if we are to seriously have a low carbon economy by 2050. Harmful industrial first generation biofuels must be removed from EU blending targets for transport fuels, There should be a freeze on further expansion of consumption and production of biofuels from 2010 levels. **Q11** The EU should not extend the Emissions Trading System for three main reasons. First, a single trading partnership assumes a free flow of emissions credits in a multinational carbon market – but standards within each regional and national system could be very different. This risks a race to the bottom: the country with the lowest standards (for instance high percentages of poorly verified offsetting) would effectively set the benchmark for everyone else. Second, greenhouse gas concentrations are rapidly increasing: there is no room for error in policy decisions. There are



already concerns about the efficacy of market based clean development mechanisms. Even at present rates of fossil fuel use, the 2°C temperature ceiling will be breached in the next fifteen years. Finally, any increase in the scale of the carbon markets is also likely to popularise the use of highly complex financial instruments – risking a burst carbon bubble with economic, political and environmental consequences. **Q12** ActionAid wants to ensure that any intermediate targets do not detract from the urgent actions needed to meet the 2020 targets. **Q13** ActionAid believes that 80% to 95% cuts by 2050 are dependent on the EU setting strong, binding 2020 targets in line with climate science, historical responsibility and sound financial practices. Priorities include: • Substantial shift to renewable energy sources including wind, solar etc in the EU for domestic and commercial use. • Stringent energy efficiency standards for auto and infrastructure sector in the EU • Policies that encourage private sector to invest more in clean energy sources • Support for public awareness activities on the need for changes in consumption and lifestyle • The EU budget and cohesion policy to earmark significant amount of funding for developing countries to adopt clean energy sources for development through technology transfer and technology development for climate mitigation. **Q14** ActionAid strongly believes that the agricultural sector is already, and will continue to be heavily affected by climate change, and that EU investments should be made into ensuring that agricultural sectors in developing countries, especially small holder farmers who get affected by food insecurity and hunger, are properly supported to be prepared for further climatic changes, including the changes in crops, developing new seeds of local varieties (not genetically modified), improved irrigation and production methods, strengthened extension services and market linkages, timely weather information, empowering local institutions etc that farmers will need to adapt to further climate change. **Additional Comments** ActionAid appreciates the efforts by DG Climate and the EC more broadly to cut carbon emissions and tackle climate change. We do however feel very strongly that any carbon emission measures taken by the EU should be tested against a set of human rights, development and gender criteria to ensure that carbon cutting efforts do not take place at the expense of people's human rights and development in the developing world, as is currently the case with biofuels. To this effect, we would like to remind DG Climate of the Lisbon Treaty obligation to respect policy coherence for development. This is an obligation for all DGs, not just DG Development.

**85246854723-63 Confederation of Industry, Czech Republic** **Q9** Not so much is readily available while breakthrough technologies will be needed. Certainly, in the meantime, nuclear fission should be further developed and fusion could be a great contributor for low carbon future. The indicated technologies above are very inconsistent from petty issues to "elephant" ones. **Q10** Apparatus grown biomass/emulation of natural processes would be of great importance and their development is not very much advancing. **Q11** instead of this inefficient trading system a simple carbon tax should be introduced to gather money for research and development of low carbon technologies and for adaptation purposes **Q12** no - setting targets even does not initiate solutions keep in mind please: Strive for the highest ATTAINABLE aim! The EU targets are too far from attainable and they would rather de-motivate. **Q13** Energy security and eliminating energy poverty have crucial importance. the other issues should be considered from the perspective of these issues **Q14** energy intensive process industries as such - the EU CC policy drives them out of the EU! **Q15** If there are any, the could help

**85417193379-05 AIR LIQUIDE Société Anonyme pour l'Etude et l'Exploitation des Procédés Georges Claude** **Q9** The EU will probably need a combined and simultaneous portfolio of all these technologies to develop a low carbon economy. Air Liquide believes hydrogen as an energy carrier, carbon capture and storage for power production and industry

production (steel, cement&), second and third generation biofuels, renewable energies especially photovoltaic will play a key role if combined on a same development path. The development of hydrogen would typically align the needs to develop jointly CCS technologies, hydrogen and battery infrastructure, fuel cell. As these technologies are very diverse, have different entry barriers, and different maturity stages as they progress through an initial learning and cost curve; they require adapted policy incentives. The EU Climate action policies should be based on a relevant balance between constraints on emissions (cap and trade, taxes, regulation&) and incentives (public support to R&D programs, to pilot projects, subsidies, tax credit, loans&). **Q10** A carbon price is one important signal for technology development and deployment but it needs to be complemented with other policy incentives. For hydrogen, in the next 5 to 10 years, priority should be to support the development of the required infrastructure, key for the whole hydrogen energy economy, which will be required to achieve a full decarbonisation of the transport sector. Furthermore, the use of hydrogen fuel cell technologies is not today stimulated by a European Directive or by market regulation. To implement CCS projects, development and implementation of a sustainable regulation is critical to provide the security required by companies to commit to the large financial efforts required, as well as clarity of remaining open questions especially around the storage of CO2 and long term liability commitments associated to it. Storage fees or any other regulated form of subsidies could also be created to incentivize cities or regions to accept to store CO2 underground.**Q11** Rules related to the use of Clean Development Mechanisms should be clearly defined by the EU as soon as possible.**Q12** Defining the pathway between now and 2050 on the reduction of GHG is crucial. Setting realistic objectives for 2030 and beyond is better than changing the goalpost for 2020, which from an investment perspective is relatively soon. Stability of objectives is considered to be of utmost importance, as well as harmonization and centralization of regulations to avoid distortion of competition between Member States and between industrial players. In this context, a stable framework at EU level could consist in investing in priority financial resources on industrial deployment (infrastructure, pilot projects &) and on R&D in order to deliver significant reductions early enough to create the momentum. Realistic 2030 targets will give the European industry time to prepare for long-term investments, escalating with the availability of new technologies.**Q13** One of the goals of the EU in dealing with this climate change issue should remain to maintain European competitiveness. We believe Europe should focus on mastering complete industries (photovoltaic, hydrogen&) or at least main technologies involved. The EU should then foster innovation in order to compete with all other international players in the race for technologies and Intellectual Property Rights. Other countries, who have not taken such binding agreement or who do not have GHG emissions reductions targets, are however developing strong skills and low carbon technologies. In this context, the achievement of its emissions reduction objectives should be used to develop proprietary European skills, technologies and patents. In order to do so, Europe shall not focus only on GHG emissions reduction targets but also on different kinds of incentives as described in questions 9 and 10. Industry shall not be seen only as part of the problem but as a solutions provider. **Q15** Some of the success stories Air Liquide wants to underline are: - Development of oxygen business after the organochlorines were prohibited. - Development of hydrogen to desulphurize fuels - Glass furnaces conversion to oxygen in order to reduce NOx emissions. In these three first examples, we see how a new regulation can turn into innovation and new businesses. - EU coalition initiative: 30 companies have worked together to analyze the potential of different power-trains in road vehicles (initiative to promote the wider use of hydrogen as an energy vector, 2010) and the subsequent in progress discussion for a first country wide demonstration project of the H2 infrastructure, in Germany, called H2 Mobility, which needs to be supported. - Creation of European platforms such as Zero Emission Platform, or Joint

Technology Initiatives such as Hydrogen and Fuel Cell JTI are very useful. **Additional Comments** A Carbon Capture Storage tools box could be very useful. This tools box would include: - An exhaustive CO2 storage mapping which permits each potential CO2 emitter (even the small ones) to consider the pros and cons of CCS and, for this, perform a first economical analysis for a retrofit or a new plant installation taking into account such technology. - A regulation guide to help industrial emitters to know and follow the full process for pipe routing and CO2 storage permitting. This tools box could be supported by UE.

**85945103744-47 FEDERAZIONE ITALIANA PER LA CASA Q9** The main effort will be in housing existing stock refurbishment and in low cost /low energy technologies for new buildings. **Q10** To create a new deal for the economic development of green technologies. To work to create a different consumer's attitude (the social housing can be a good experimentation and diffusion exemple, and also the school can have a important multiplier effect. **Q12** A Good idea is proposed by the Commission: "Mechanisms will be proposed by the Commission to align existing international agreements (notably in the gas sector) with the internal market rules and to strengthen cooperation between Member States for the conclusion of new ones. **Q14** The main strategy will be directed to the urban dimension: the transport, housing, energy policies will be better developed in a urban integrated approach. **Q15** Please visit our website [www.powerhouseeurope.eu](http://www.powerhouseeurope.eu) for succes stories and suggestions.

**87605142968-84 European Trade Union Confederation Q10** The transition towards a low-carbon economy will significantly change the way in which manufacturing and work processes are organised. Income, jobs and working conditions are likely to change most profoundly in sectors which emit the highest levels of greenhouse gases and in which these emissions are difficult to convert, such as in the electricity, automobile as well as the iron and steel sector. Consequently, from the ETUC's perspective, the action is necessary to avoid negative social and economic consequences for people and allow them to benefit from the potential of growth and employment the low-carbon transition may bring about (for the rest of this comment see the attached pdf document). **Q13** For the ETUC, the EU's energy policy measures must lead to more sustainable growth, focusing on promoting the creation of sustainable green jobs, in other words quality jobs. The transition towards a low-carbon economy will significantly change the way in which manufacturing and work processes are organised. Thus, the ETUC demands that the European Commission mainstreams employment, vocational education and training issues in its sectoral policies. Several sectors, such as electricity and gas, are experiencing an aging workforce, which can have a negative effect on realizing many of the ambitious objectives the EU sets itself. The lack of this dimension in the recently published Energy Strategy 2020 is unacceptable. Without qualified men and women Europe's energy future will not be realized (for the rest of this comment see the attached pdf document). **Q14** From the ETUC's perspective, adaption policies should focus especially on energy related to industry and buildings, as well as transport. Industry. A major challenge of the low-carbon transition is the reduction of short term loss of competitiveness due to, for example, higher energy prices as a result of an imposed domestic carbon price. In order to avoid negative effects for European growth and employment through "carbon leakage", climate change legislation must contain strong provisions addressing international competitiveness. Such provisions must include among others social dialogue between government, industry and trade unions at national and EU levels and investment in low-carbon production technology as well as education and training (for the rest of this comment see the attached pdf document).

**8845159637-62 Verband der Chemischen Industrie, e.V. Q9** • zero emission buildings • smart grids • electrical vehicles • renewable energy technologies **Q10** Emphasis should be given to the ratification of a binding international climate protection agreement including commitments of all industrialised countries as well as advanced developing countries. Such a regime has to create a level playing field and, consequently, must provide for comparable and binding reduction requirements not only for EU but also for relevant non-EU member States. Potential further reduction targets have to correlate with technically feasible and economically justifiable reduction possibilities; further reductions should only be accepted if the agreed level is reasonable in terms of competition. The EU should not unilaterally intensify its climate protection efforts. Climate change is a global challenge that needs to be addressed internationally. **Q11** At international level, equal framework conditions are needed as regards scope, quality and costs of reduction obligations for industrial sectors engaged in global competition. European go-it-alone action towards a global climate policy cannot bring the desired results. As long as efforts fail to lay down comparable rules and burdens for all, production relocations to countries with lower cost burdens on energy will be inevitable – resulting in carbon- and job leakage. In order to prevent such developments, it remains essential also in the future to limit burdens from climate policy instruments – and esp. EU ETS – for industrial production. Driving forward climate protection in developing countries requires the transfer of funds and know-how which must not be sourced unilaterally from European industry. Most importantly, the auctioning share in emissions trading must not be increased and sectors with risk of 'carbon leakage' must continue to receive free allowances. **Q12** Technology is the basis to ensure the transition to a sustainable low carbon economy. The development and deployment of new technologies is therefore essential and requires huge amounts of investment. For the most part this will have to come from the private sector. On that account, industrial capital should be kept where it is needed most in order to achieve that transition. Predictability and certainty through stable political conditions are a prerequisite for investments and thus for stable investment in low carbon technologies. **Q13** The European chemical industry offers numerous innovative products and solutions for energy and resource efficiency and is therefore a crucial contributor to climate protection. Energy-intensive production such as the chemical industry is at the beginning of the value chain. Its industries provide indispensable materials for future-oriented high-tech-products, e.g. for climate protection. Nowhere else are input materials for the further industrial value chain manufactured with better energy efficiency than in Europe. (see additional comments) **Additional Comments** (related to 13) Tightening reduction goals in the EU even more ambitiously basic industries can no longer manufacture at competitive conditions at home; innovative products will need to import their materials from countries with production facilities of lower energy efficiency. This would lead to more greenhouse gas emissions globally. Innovation is the key to realizing more ambitious reduction targets. The chemical industry provides efficient solutions for climate protection. Already now, CO<sub>2</sub> savings enabled by innovative products from the chemical industry are more than twice as high as emissions caused in the production of these products. European regulation should therefore create innovative-friendly preconditions. To stimulate innovation the EU should also recommend Member States to introduce fiscal incentives for research.

**88980385100-51 FuelCellEurope Q8** The Strategic Energy Technology Plan (SET PLAN) in promoting the deployment of low carbon technologies is also important to consider in the framework of this roadmap 2050. An integrated strategy, taking into account the parallel efforts developed in the SET PLAN or in the Innovation Union and the related flagships initiatives (ressources efficient europe in particular) will be an important factor for the success of the roadmap and the GHG emissions reduction objectives. **Q9** Fuel Cells are the most



efficient energy conversion devices demonstrated in transport and operational in many stationary energy applications. They are electrochemical devices that can be operated with zero carbon emissions and therefore represent a key enabling technology for a decarbonised European energy and transport system in 2050. See details in the position paper attached. EU has a key role to play for the deployment and development of fuel cells and hydrogen technologies, to support the market uptake of these low carbon technologies. Market forces alone will not be sufficient and public support will be needed to overcome the market barriers entry. EU in particular can provide: financing support, leverage public and private funding, develop facilitating regulations, codes and standards and create the critical mass to achieve economies of scale, avoiding duplication of RTD&D efforts in Europe. **Q10** Successfully implement the SET PLAN and provide adequate financing mechanisms to support this implementation - Successfully deploy key demonstration projects, flagship initiatives and programmes, to kick start the market for low carbon technologies by 2020 and prepare for 2050. **Q12** - Setting mid-term objectives and key performance indicators (KPI) would be key to assess the efforts and success of the actions undertaken. These milestones could be compulsory to ensure the compliance with the objectives and eventually adapt the efforts and measures. - A long term vision is important to secure financing as changing political environments strongly impact the level of investments in new technologies: high risks technologies. Public funding and stable political environment help reduce the financial risk of investors. - Public-private structures, innovative financing mechanisms (EIB, RSFF) are good examples that could be replicated to encourage investment in low carbon technologies. Yet the barriers entry for SME or start up to access these funds are high. **Additional Comments** Please find attached the contribution by FuelCellEurope to the consultation on the Roadmap 2050 (position paper).

**91650013720-46 European Renewable Energy Council Q8** On RES Directive: With its adoption of a binding 20% RES target, the EU has made a binding commitment to reach one fifth of its energy consumption from RES by 2020. It is of utmost importance that this commitment is put into practice in all 27 Member States & that the right framework conditions are set to enable a strong growth of RES. By supporting all renewable energy technologies Europe will ensure the technological & market leadership of the European RES industry. On ETS: Carbon prices could be an important driver for changing our energy economy, together with robust national schemes for renewable energy. But with a current GHG reduction target of 20% by 2020, the EU carbon price is simply too low. Moving to at least 30% is the most effective way to tighten the emissions cap and establish the high and stable carbon price, necessary to make the shift to a renewable energy economy. EREC therefore calls for an immediate unilateral move to at least 30% GHG reduction by 2020. **Q9** We certainly do agree that the EU will need a diverse portfolio of renewable energy and efficiency technologies in order to build a truly sustainable economy. A wide range of renewable energy technologies is already available today, reliable and capable of providing all energy services from transport solutions to heating and cooling as well as electricity generation. As our publication RE-thinking 2050 has shown, a broad range of renewable energy technologies is the solution to the challenges of climate change, security of supply and competitiveness. We will need all of these technologies in order to move to a sustainable economy by 2050. Reaching 100% RES by 2050 already means a reduction of more than 90% of energy-related CO2 emissions. Therefore, what is needed is not an undefined low-carbon rhetoric, but a stable legislative framework for renewable energy up to 2030 and a clear vision for achieving 100% RES by 2050. **Q10** I. Commitment to a truly sustainable economy by 2050: 1. Clear vision for achieving 100% RES by 2050 2. Set new RES targets for 2030, building on the RES Directive 3. Establish a grid plan for a fully-interconnected EU network



4. Develop a strategy ensuring that all new buildings as of 2020 & all buildings become net-zero & positive energy as of 2030 5. Impose strong efficiency standards for the transport sector & switch to biofuels & EV II. Delivering 2020 targets: 1. Ensure full implementation of the RES Directive & 3rd internal market package 2. Improve network conditions & move to a pan-European integrated grid. This includes internal grid reinforcements on transmission & distribution level, enhanced interconnectivity, trans-national offshore grid, uptake of smart grids & other demand side measures 3. Ensure full implementation of the EPBD (2010/31/EU) 4. Align the next MFF & FP8 to the political priorities by ensuring that an appropriately higher share of funds is devoted to RES

**Q11** The ETS has not yet proven to be a strong instrument to reduce emissions. A solution needs to be found prior to any linkage considerations. Other carbon markets are still poorly developed or have low environmental standards. Reinforcing international carbon markets is commendable, but discussing linkage is premature as it requires well developed markets, with high and similar degrees of environmental integrity. On international credits, emissions reductions in the EU should always be preferred and represent the bulk of reductions, so as to help the EU keep its first-mover advantage in renewable energy technologies. Bilateral agreements presuppose the existence of a demand for international credits, which will not be the case under the current ETS cap (20%). While sectoral crediting mechanisms are an interesting option, the position of developing countries at recent UNFCCC meetings suggest they will be difficult to develop in the short term.

**Q12** Binding commitments which are translated into stable policy frameworks are vital to encourage investments in renewable energy technologies. As investment decisions in the energy sector are of a long-term nature and as 2020 is at our doorstep, the European Union should quickly proceed with fixing renewable energy targets for 2030. A political discussion should take place between representatives of Member States, the renewable energy industry, NGOs, the European Parliament and Commission on the 2030 horizon in order to set the right interim step towards a 100% renewable energy supply by 2050.

**Q13** The co-benefits mentioned - sustainable growth, extra jobs, accelerated innovation, cleaner air, increased energy security and lowering our vulnerability to external energy shocks – should be given higher visibility and priority in the EU's climate change strategy. The May 2010 communication from the Commission made a good start, but needs to be clearer so that the focus of future impact assessments shifts from the simple "cost" to the "cost and benefits" of climate policies.

**Q14** No amount of adaptation will enable us to withstand the consequences of climate change should we not mitigate today. Adaptation should not deter us from immediate, sufficient and economically beneficial mitigation (as established, the cost of immediate action being lower than that of inaction), especially for industrialised countries.

**Q15** All forecasts on the expansion of renewable energy have consistently been surpassed. PV for example, reached a cumulative installed capacity of 16 GW in the EU in 2009. This is more than five times higher than the target foreseen for 2010 in the 1997 EU White Paper. Geothermal heat has, at the same time, already exceeded three times the installed capacity projected in the White Paper, while wind energy exceeded its target of 40 GW by more than 80 per cent currently accounting for 85 GW. Within just two decades, renewable energy has developed from an alternative energy source in a niche market to one of the most important energy sources worldwide and a driving force for a sustainable 21st century economy. By the end of 2009 the RES sector secured about 11% of final energy consumption, provided one-quarter of the EU's binding 20% GHG reduction target (or 7% CO<sub>2</sub> reduction against 1990 emissions), over 550,000 high quality jobs, and had an annual turnover exceeding €70 billion.

**Additional Comments** In addition to the above given answers, EREC would like to add that enhanced funding for R&D&D in renewable energy technologies is not only important for meeting the EU's 2020 commitments, but to cutting GHG emissions by at least 80%-95% and making renewable energy the mainstream source of EU energy supply by 2050. Hence,

besides the points mentioned under question 10), it is vital to ensure the full implementation of the SET-Plan Industrial Initiatives on renewable energy. Moreover, and as requested as well by the European Parliament the Commission shall come forward with new European Industrial Initiatives (EIIs) in the SET-plan complementary to the windpower, solarelectricity and bioenergy EIIs in order to exploit the great potential of other renewables technological avenues, namely geothermal and solar thermal, hydropower and ocean energy as well as to include the existing renewables heating and cooling platform.

**93038071152-83 European Confederation of Iron and Steel Industries** **Q9** The emission reductions envisaged for 2050 cannot be achieved with the means of the current technological level. Consequently, the currently existing materials based society must be optimised, whilst fundamental research leading to a matter based society must be supported. Material based society: For all measures, the whole value chain must be taken into account on whose full integration the EU's competitive advantage rests. Example: Bundle government investments and industry support measures to create system of renewables based electricity & DC interconnectors & smart grids & smart electric cars (car mass market) & smart household appliances. Example: Develop sustainable biofuels for car prime market & related supply infrastructure. Matter based society: Fund fundamental basic R&D and invest by governments in large scale research engines (quantum physics, astro physics, genetics). Develop basis for fully immersing virtual reality environments (to reduce personal transport). **Q10** Short term, mid term (material based civilisation): First, lock equipment suppliers and industry in a positive feedback loop: Technically meaningful benchmark systems & R&D support & investment support. Second, provide major financial support for R&D in breakthrough techniques for carbon intensive industrial manufacturing processes. Thirdly, governments must invest in huge infrastructure programs (especially energy, see answer to question 8 para 3). Four, give political, legal and financial support for real material loop closing recycling (currently the planned the implementation measures for Revised Waste Framework Directive blur the recycling concept by adding combustion to the recycling activities In all of this provide that support and coordination covers the whole value creating chain (from raw materials to recovery/recycling) on which the EU's competitive advantage rests. **Q11** Sectoral crediting systems should not be pursued. These place financial risk on developing countries (CDM creates stable and known income) and political risk on developed countries (developed countries could define sectoral crediting initiatives as their contribution to the international efforts). Instead CDM should be improved to make it more robust in terms of environmental integrity and competition distorting subsidising effects (esp. additionality). The UNFCCC CDM Board must be strengthened and not overruled by unilateral decisions on CDM issues. Bilateral crediting schemes are also not a good way forward. They will dry up the CDM project pipeline. They tend to undermine the concept of equal burdens for globally traded products. They can hardly be subject to neutral third party effect and compliance monitoring. The Community's ETSD should continue to use benchmarks which should employ technically meaningful benchmark values (also see nr 8). **Q12** Objectives: For industry, emission cap objectives are not the most effective choice. They tend to produce leakage at high cost instead of real reductions. Technology targets and R&D objectives are the better choice. Encouragement of investments: See answer to question 10. Pick up of existing technologies can be fostered by tax reductions related to such investments. **Q13** The current technological level of our civilisation cannot produce the emission cuts indicated. If these targets were forced through based on the current technologies, the EU would collapse. See also answer to question 9. **Q14** Most vulnerable are renewable energy systems, biomass production and agriculture. Consequently, nuclear and fossil fuel based baseload electricity and heat production capacity must be maintained. In addition entirely new forms of energy

production must be investigated by fundamental research (e.g. CERN, ITER, ...). **Q15** The main and predominant CO2 issue is energy generation. If there were an affordable CO2 free energy source the CO2 issue would be solved; the remaining emissions from materials production would be below the envisaged thresholds. In obtaining such an energy solution the role of materials will be crucial, which calls for maintaining a strong materials industry in the EU. Steel is particularly important because it is not only the predominant construction material in the energy sector but is also needed for its unique physical properties, e. g. transforming electricity in motion (motors) or enabling high temperature-pressure machines (efficient biogas turbines).

**93187564345-50 YM CONSEIL** **Q9** FUEL CELL, ZERO EMISSION BUILDINGS, RENEWABLE ENERGY TECHNOLOGIES, ECO CONCEPTION IN INDUSTRIAL PROCESS **Q13** LOWERING OUR VULNERABILITY TO EXTERNAL ENERGY SHOCKS **Q14** TO INCLUDE IN ALL INDUSTRIAL PROCESSING COST OF LOST OF ECOLOGICAL SERVICES or EVALUATION OF "BIODIVERSITY FOOT PRINT".

**953933297-85 Association Française des Entreprises Privées** **Q9** Companies believe that a portfolio of all the technologies mentioned above should be taken into account at EU level. In order to determine a hierarchy for their implementation, a diagnosis should be established in order to define the technologies to be first implemented at regional level given their respective GHG abatement marginal costs (based on full costs). Economic actors wish to underline that EU Climate action policies should be based on a relevant balance between constraints for emitters and incentives in order to make new technologies available on the market (see also Additional Comments in question 15) **Q10** Companies wish to recall that at least half of total annual allowances for 2013-2020 ETS period are expected to be subject to auctioning (a little more than 1 billion allowances every year) without taking into account the aviation sector. With an average price of 28 € / allowance, the auctioning revenues going back to Member States will be very significant. Those revenues represent a unique opportunity in the next decades for the European Union in order to boost all the technologies identified by the diagnosis mentioned in question 9/. In fact, the resources generated could really enable EU to compete with all other international players in the race for technologies and IPRs. This implies two important commitments by Member States: - Use revenues in priority for R&D on technologies and their implementation (for instance, transfer of a significant part of such revenues to EIB) - Coordinate their R&D efforts if possible through additional contribution to the UE budget dedicated to R&D **Q11** In order to boost international carbon markets, companies consider it essential that the EU continues to require that developed countries commit themselves to comparable efforts and that developing countries implement appropriate actions according to their respective responsibilities and capacities, should a possible tighter target in 2020 be set. In fact, if constraints are the main drivers of new carbon markets, they should be shared worldwide in order to avoid unbearable competitive distortions. Companies believe that bilateral agreements recognising international allowances and sectoral crediting should be favoured if they are focused on specific countries. **Q12** The interesting aspect about this consultation on the "2050 roadmap" is to highlight the importance of the pathway between now and 2050. In fact, international negotiations currently focus more specifically on GHG reductions at determined years (e.g. 2020 and 2050) rather than on cumulated GHG reductions between those years while climate change is caused by cumulated emissions. In fact, companies feel that up to now, the European Commission tends to consider that GHG reductions should be linear while other reduction patterns are possible. And those various possible patterns should be the main subject at stake within this consultation. In this context, a stable framework at EU level should consist in investing in priority financial resources on R&D in order to deliver middle-term significant

reductions rather than costly short-term low emission reductions. **Q13** Companies believe that drastically reducing GHG emissions by 2050 as targeted by the EU will mainly result in a large amount of additional costs for all actors in the EU. Using the driver of benefit seems less reliable considering all the uncertainties identified in most of the studies dedicated to green growth. On the contrary, building long term policies on the cost of inaction seems more reliable. Considering global competition issues, top priority should be devoted to ensuring a cheap decarbonised electricity for all economic actors located in the EU as it is one of the last factors of the EU territory which can be viewed positively by investors. It is also the main energy product for which supply dependency can be moderate in the case of nuclear energy. At the same time, actions may be implemented on energy efficiency. **Q14** At this stage, main sectors directly at risk considering the impacts of climate change seem to be agriculture and food industry, building sector, infrastructure sector and possibly the energy sector if new climate conditions require new processes to produce energy but also the industrial sector at large (e.g.: mitigation costs for reducing impacts of major climate accidental events on industrial units, costs in case of energy efficiency losses...). Companies recommend that EU public policies regarding adaptation be set according to the regional characteristics of the EU territory.

**Additional Comments** The EU 2050 roadmap should be defined in the context of the Energy 2020 Commission Communication. Economic actors would like the 2011 Communication on the 2050 roadmap to demonstrate evidence of this coherence. This approach should be consistent with the key principles of sustainability and inclusivity. Companies consider that up to now EU policies have been focused mainly on regulations and constraints and not on the issue of boosting R&D with private actors. Such R&D policy should be more driven at EU level and/or be coordinated between Member States so as to enable EU to compete with all the other countries (Japan, US, China...) investing on technologies and therefore on intellectual property rights (IPRs). In this respect, time to market for those emerging technologies is critical: EU R&D State Aids guidelines and policies must have a more proactive approach in supporting development and investment of industrial units (not only pilots but also industrial phases just before mass production) with mid-term return on investment (for instance, massive funding of EIB for diversified financial tools: equity, subsidies, grants with royalties...). As mentioned in question 9, companies believe that in order to stick to the very ambitious EU 2050 target (-80 % to -95 % compared to 1990), resources should be invested in actions in a very balanced way taking into account: the maturity of the technology, their abatement costs and the intensity of GHG reductions they enable in a larger sustainable and inclusive approach (e.g.: energy efficiency, natural resources preservation, feedstock, life cycle analysis, rigorous assessment of carbon leakage...). In the current international context, AFEP believes that the EU should not continue alone a second commitment period under the Kyoto Protocol until 2020 because it would not encourage other reluctant countries to join the effort. On the contrary, in this case, all other parties will tend to wait for 2020 in order to set up an international agreement instead of defining one if possible for 2015. Furthermore, AFEP recalls that Kyoto mechanisms including CDMs can still be used without such a second period.

**96119922103-43 GDF SUEZ Q9** All technologies have a role to play in the transition towards a low-carbon economy. Policy decisions must neither impede nor impose the development of a particular technology. The emergence of clean technologies should be based on market principles. Clean fossil fuel technologies must not be disadvantaged compared to RES. Technologies using nuclear and fossil fuels have a role in the EU energy mix and will continue to do so. Natural gas is the cleanest fossil fuel currently used and has notably and important role to play in a low-carbon economy. The commercial deployment of CCS both for coal and for natural gas will further contribute to the reduction of the environmental



impact.**Q10** The EU should ensure a stable, transparent and foreseeable regulatory framework, which is a prerequisite for giving the right signals at the right time to investors. Only coherent and gradual policy steps will allow the industry to preserve competitiveness and reliability. EU climate change policies should be coordinated with other policies i.e. environment, energy, internal market, competition, etc. Consistent and coherent Member State policies must be pursued to ensure competitiveness, security of supply and achievement of long-term energy and climate objectives. The EU must pursue international coordination of climate actions so that any new binding measures in Europe are accompanied by comparable efforts in other major countries, to avoid carbon leakage (cf. EU competitiveness). Increasing energy efficiency across all sectors must be a priority, as well as continued R&D efforts.**Q11** GDF SUEZ believes that the first element of EU policy should be to involve other developed or emerging countries in joint efforts to reduce emissions through linking of regional or local Emission Trading Systems, so as to reach at some point in time a global carbon market. In the meantime, collaborative efforts with developing countries should be pursued in the largest international framework possible. Should UNFCCC talks collapse, the EU should seek agreements on bilateral or regional basis to replace Kyoto mechanisms, based on the experience acquired through the mechanisms, guaranteeing environmental integrity and efficiency. Sectoral crediting mechanisms could be envisaged provided they are based on sound principles, effective monitoring and compliance mechanisms. It is also important that the Commission pursues a negotiating strategy which does not result in an assumption by other parties that the negotiations are in terms of 20%+ GHG reductions for EU and 0+ for non-EU.**Q12** GDF SUEZ considers that setting mid-term objectives is less essential than the existence of a sound and stable regulatory framework, which would enable businesses to make huge long-term capital investments in low carbon technologies. In any case, should mid-term objectives be devised, they must be set through an open and transparent discussion involving all stakeholders from the outset, so as to ensure the technical feasibility and economic viability of the objectives as well as their social acceptance. In general, an objective should not prejudice the composition of the energy mix. A timeframe for phasing out of subsidies for both fossil fuels and RES would be useful, taking into account the maturity level of the various technologies.**Q13** GDF SUEZ considers that the EU actions must concentrate on the global objective of limiting temperature increase to 2°C in socially and economically feasible conditions. However, no particular positive consequence can be prioritised on its own. EU must seek to maximise the benefits of all actions undertaken while carefully managing the many risks involved. In particular competing objectives should be avoided. The measures taken for the transition towards a low-carbon economy must not impact the competitiveness of the EU, and must contribute to the well-being of its citizens. European Commission's 2050 roadmaps should also be devised through transparent impact assessments of the expected effect of emission reduction policies on prices (both for households and the industry), of which citizens should be aware.**Q14** Businesses are best placed to evaluate the risks linked to their activities, including climate risks. The role of the EU could be (as it currently is) to foster mitigation policies and support to clean energy and energy efficiency, thereby limiting the increase in Climate Change, and reducing the need for adaptation. As for our activities, e.g.: Low hydrology can reduce hydro production and make fossil fuel installations operate more Floods threaten power and water plants and support facilities (e.g.data centres) located mainly near rivers Heat and cold waves degrade efficiency, reliability and availability of energy facilities Storms are a risk e.g. for electricity transmission lines, methane carriers and off-shore production platforms. This can also impact our natural gas suppliers Saltwater from rising sea levels can intrude coastal aquifers, requiring alternative resources and/or costly treatment such as desalination**Q15** GDF SUEZ is actively carrying out research in CCS and as part of EU's 2009 Energy Recovery Plan, jointly with



E.ON, launched an industrial-scale CCS demonstrator project in the Netherlands. The aid granted by the EU and the Netherlands has a critical and positive impact on the success of the project. The legal framework applicable to transport and storage will also be critical. Licensing regimes, long term liability, infrastructure planning and the cost of CO<sub>2</sub> all play important roles in CCS business models. We also develop the Green Unit Polaniec biomass power plant in Poland, which will reduce CO<sub>2</sub> emissions by 1,2 million tons per year. This plant, in operation by end 2012, will strengthen Poland's commitment to produce more than 15% of its electricity from RES by 2020. GDF SUEZ also develops solar energy projects, is the leader in the development of waste as a fuel for electricity generation and has a long experience, valuable skills and know-how in the nuclear field. **Additional Comments** In general, GDF SUEZ considers that Commission 2050 roadmaps must be based on a detailed economic evaluation and technical feasibility of different policies and options, so as to enable the use of instruments that are most cost-effective in reducing GHG emissions. Similarly, the PRIMES studies would provide a useful global picture but need to be further documented, since some of the assertions are used without the corresponding background explanation. There is also a need for horizontal coordination of policies at European and at local levels (cities, rural development policies). Instead of a sector by sector approach, looking into trans-sectoral solutions that optimise combined water/energy/waste solutions can be more effective. Technological development will be crucial and it must be market-driven. Access to financing, including EU funds and e.g. from auctioning of carbon allowances, will be a crucial issue. The European Commission could also clarify its policy on infrastructure investments. In its recent Communication "Energy 2020 – A strategy for competitive, sustainable and secure energy", the Commission evaluates the needs for energy investments by 2020 at about EUR 1 trillion to update, expand and strengthen infrastructures. The sources of this financing should be clarified further, especially considering that some infrastructure projects bring major public benefits but have fewer market-driven incentives. Finally, it is of note that in 2011 the European Commission plans to adopt several documents that relate to the issue of GHG reductions by 2050, e.g. "Low carbon economy 2050 roadmap", "Energy Roadmap 2050", "Roadmap to a Resource Efficient Europe", White Paper on the future of transport, etc. GDF SUEZ fully recognises the importance of addressing different aspects of the transversal issue of GHG reductions and would like to highlight the importance of coordination between different entities of the European Commission that are concerned and the involvement of all stakeholders from the outset through an open and transparent discussion so as to ensure a coherent approach and the technical and economic viability of the future policies, as well as their social acceptance.

**9624415524-28 UNIFE Q9** In the transport sector low-carbon mobility solutions already exist. Electrically powered trains have the technology needed for emission-free mobility and railways can play a vital role in a future low-carbon transport system. Therefore, electrification should be extended to all major lines of the network. Apart from investing in new technologies, the EU should adopt policies that promote a modal shift to rail and other forms of sustainable transport, so the technologies that already exist can be used more widely. Even though railways already represent a low-carbon form of transport, their efficiency can still be increased, for instance through technology that helps recuperate braking energy. The European rail industry therefore proposes a JTI for rail to make the necessary R&D effort for the development of new emissions-reducing technology possible. **Q10** The transport sector is one of the biggest sources of emissions and, with economic growth, demand for transport will increase. It is therefore essential to reduce the CO<sub>2</sub> impact of transport activities. Rail already provides a low carbon alternative to road transport. The attractiveness of rail transport should be increased however through the provision of good infrastructure throughout the Union.

Investments in infrastructure and rolling stock should be accompanied by a further liberalisation of the rail market and the creation of a true and fully interoperable Single European Railway Area. Moreover, a level playing field with other modes of transport must be created to increase the competitiveness of rail transport and a single CO<sub>2</sub> target for the transport sector should be set. **Q12** A single binding transport target to reduce GHG emissions and getting the right price signals through a full internalisation of all external costs in all transport modes are two key instruments to create a stable framework with a clear reduction goal for the transport sector. The shift from CO<sub>2</sub> intense transport modes such as road transport to low carbon modes such as rail would have a great impact on the overall CO<sub>2</sub> balance of the European Union. A stable framework is essential to have predictable investments, to provide business incentives, as well as to shift towards environmentally friendly investments. Such a framework would prioritise investments in low carbon transport modes, better demand and capacity management, as well as supporting green jobs. Furthermore, indicating clearly what the targets would be between now and 2050 would allow users, operators and investors to plan ahead with greater certainty. **Q13** Most objectives are interlinked and by achieving one the other is automatically attained too. In the transport sector, rail can contribute to sustainable growth, clean air and reduce European dependency on fossil fuels, depending on the source of the electricity used to power the trains. Given that the transport sector is the only sector from which emissions are still growing, decarbonising transport should be a priority for Europe. **Q14** The transport sector is very vulnerable to the impacts of climate change. Rail infrastructure and rolling stock will have to adapt to changing weather conditions (sea rise level, increasing temperatures...) as well as more frequent and extreme climatic events (heavy snow falls, heat waves, storms, flooding, etc.). To tackle long term effects of changing weather conditions, new financial mechanism should be introduced to encourage climate proof infrastructure; for instance a climate proof criterion to allocate funds for transport infrastructure could be included in existing policies such as regional policy, cohesion funds and TEN-T. Adaptation should be supported by mitigation measures; clear objectives in terms of decarbonisation of transport are crucial to allow long-term investments and planning. **Q15** Taking the Eurostar between London and Paris produces 90% less emissions than taking the plane on the same route. Freight transport on rail emits up 15 times less CO<sub>2</sub> than freight transport on the road, underlining the importance of modal shift. Switzerland enshrined modal shift into their Constitution. Measures include, among others, charging for the external effects of road freight. Under the Heavy Vehicle Fee, the largest modal share of railways in the European transport corridor was achieved (66% in 2006), reflecting the move towards an environmentally sustainable transport system. In addition, the HVF had no negative effect on the economy. The French Supermarket Monoprix launched a call for tender to test rail freight for supplying some Parisian retail stores. SNCF has been chosen to provide a multimodal solution, combining rail freight and road transport (natural gas-powered trucks) for the last mile, leading to a CO<sub>2</sub> reduction of 25%.

**97535421274-21 European Two-wheel Retailers' Association** **Q9** The transport sector is a major user of fossil fuels and is responsible for 29% of all total greenhouse gas emissions in the EU. ETRA therefore considers that building a low-carbon future must feature transformation of the transport sector as a priority. Electric vehicles including electric bicycles, scooters and motorcycles are one of the components of a sustainable transport sector. Electric two- and three-wheelers constitute an available and efficient means of transport which have the potential to replace a number of car trips. However to fully exploit the potential of these vehicles, it is necessary to systematically include them in European mobility policies such as the upcoming White Paper on Transport Policy and in urban transport policy, electromobility policies, ... . Furthermore ETRA calls on the Commission

not to overlook “low-tech” solutions such as traditional bicycles which have many benefits not only for the environment but also for public health and social cohesion. **Q10** ETRA supports an integrated approach toward a low carbon economy, combining investments in renewable energies, energy efficiency and innovation. As explained above two-wheelers have a key role to play in making transport more efficient, and the initiatives to foster their use belong to a number of different fields. Providing the necessary infrastructure for cycling increases the number and safety of cyclists. The funding and legislative framework for this can be provided through existing instruments such as TEN-T policy and regional funds. Technical specifications are also key for the roll-out of electric vehicles and type-approval and future CEN standards will need to be adapted to technological change. Employment in the bicycle sector will also need to be addressed to fully exploit the potential of two-wheelers and green employment strategies focusing on training for instance through the European Qualifications Framework and information on the sector’s job potential will be needed. **Q12** Companies investing in low-carbon technologies such as electric bicycles need a predictable environment to start and develop their businesses. This includes technical specifications adapted to innovative vehicles, which otherwise run the risk of being excluded from the market. Multi-annual funding programmes with easy access for SMEs can help start up businesses. As framework conditions to encourage cycling, funding for infrastructure is essential and making the construction of cycle infrastructure a legal requirement for all investment in road infrastructure will help mainstream cycling into long-term infrastructure planning. A mid-term objective for 2030 will help monitor progress and could feature quantifiable objectives for the percentage of infrastructure funding spent on cycling infrastructure and the share of urban trips made by (electric) bike. **Q13** To ETRA, the term “sustainable growth” refers not only to environmental issues, though the shift to a resource-efficient society is one aspect of this. It also includes the provision of decent, stable jobs which contribute to social inclusion in a healthy society with a high-quality of life. Cycling and the bicycle business can contribute to all these aspects. To maximise these benefits, the elements described above to promote the use of cycling and employment in the bicycle business are of course highly relevant. But more importantly a change in the culture of mobility is needed, particularly in countries where the passenger car is considered a status symbol. This includes promoting other modes of low-carbon transport such as walking and public transport, and removing obstacles to cycling such as prohibitive VAT rates on bicycle products and services. **Q14** With the development of alternative propulsion modes (alternative fuels, electric vehicles, hydrogen cells and hybrids), the transport sector will be subject to deep transformations in the coming years. The automotive industry in particular will have to face restructuring and job losses. ETRA believes that there are many synergies possible between the automotive and the bicycle sector. A number of players from the automotive industry are in the process of entering the electric bicycle market. Alongside this, there is potential for retraining workers from the car industry to work in the traditional bicycle business, building on their existing technical knowledge. This calls for anticipation of change in the field of employment and education policy. The uptake of cycling also requires anticipation in urban planning and road safety policies. In these fields the EU has a key role to play in coordinating and encouraging Member States to act. **Q15** The shift to a low-carbon economy using sustainable transport has already been initiated at local level in several cities such as Copenhagen which became a cycling-friendly city through significant investment in cycling infrastructure or London, where the congestion charge has helped to lower the levels of motorised transport in the city centre and increase the use of alternative transport modes. Examples of best practices and practical policy tools for increasing levels of cycling in cities were compiled for the Presto project (<http://www.presto-cycling.eu>). At national or community level, there are for the moment no success stories which could serve as examples

to mainstream alternative modes of transport in mobility policies. ETRA therefore urges the EU to take a leading role in steering the transition towards a low-carbon economy based on sustainable growth as described above.

**97914681026-14 Société Nationale des Chemins de Fer Français Q8** SNCF would like to comment the above legislative text: - the proposal for a revised Eurovignette directive: The European Commission has adopted in July 2008 to allow the internalisation of 3 external costs (noise, air pollution and congestion) in road charges for HGV. This proposal, which excludes CO<sub>2</sub>, accidents and light vehicles is currently under discussion by the European legislators. The railway sector and SNCF favours the rapid adoption of the proposal for a revised Eurovignette directive, in order to adopt the principle of internalisation of external costs. However, SNCF keeps the mid-term objective to internalise all external costs for all transport modes. - the regulation to reduce CO<sub>2</sub> emissions from passenger cars: SNCF wishes to address the limit of technologic improvement, when it is disconnected to a coherent policy. As noted by the TERM 2009 report of the European Environment Agency (2010: 8), the benefits of the reduction of CO<sub>2</sub> emissions can be off-set in particular by an increase of the use of the vehicles. “Some issues have already been addressed via the Climate Action and Renewable Energy Package such as putting new passenger cars on a trajectory towards reducing emissions to 95 g CO<sub>2</sub>/km by 2020, which is close to half of 1990 levels. Unfortunately, traffic levels are growing at around the same rate as we see average fleet emissions declining, meaning the net effect may still be far from what we want. There are initiatives to include vans and, with a longer time perspective, trucks into emissions regulations. But without complementary measures there is still a risk that some of the improvements will be balanced by the growth in traffic.” (EEA, 2010:8) SNCF considers crucial and urgent that EU policy be developed with ambition, on: - a climate/transport package (on the model of the existing climate-energy package) designed to respond to the challenge of climate change without restricting mobility. As with energy, such a package will send a strong signal to transport providers and users; - carbon taxation, for the use of fossil energy, both for individuals and industries (that are not already subject to ETS); - sustainable financing for the building of a Trans-European Network contributing to the fight against climate change thanks to the revision of the TEN-T guidelines will provide sustainable financing. - the introduction of «intelligent transport pricing» to guide the process of change towards eco-responsible behaviour. Within the mechanism of market operation, prices must send a clear signal and reflect all the real internal and external costs imposed on society by the mobility choices we make. **Q9** The transport industry has yet to come forward with a coherent response to European environmental goals and challenges. Despite the innovations and energy efficiency improvements seen in each mode, the stated targets, and specifically those for emissions reductions, will not be achieved under today’s conditions. As well as the individual behaviours are sensible to price, research and innovation are sensible to these signals. Thus, technology will only be a true support for the fight against climate change, only if the price signals on the transport market promote the most environmentally friendly modes. On the technological choices, all of the technology quoted in the question can be interesting, according to the local situations, objectives and use. For every one of them a cost-benefit analysis must be pursued, to verify that the choices are proportionate and appropriate to the foreseen specific use. In the case of transport, some innovations that encourage CO<sub>2</sub> gains should be promoted, as: - hybrid motors for traction such as the bi-modes locomotives (electric and diesel) to avoid changes of locomotives and avoid having diesel engines circulating on electrified lines; - further developing the electrification of the rail network; - alternative energies such as photovoltaic, solar and geothermal energy for buildings; - electric vehicles for short distance trips (the longer one being operated by train); - real

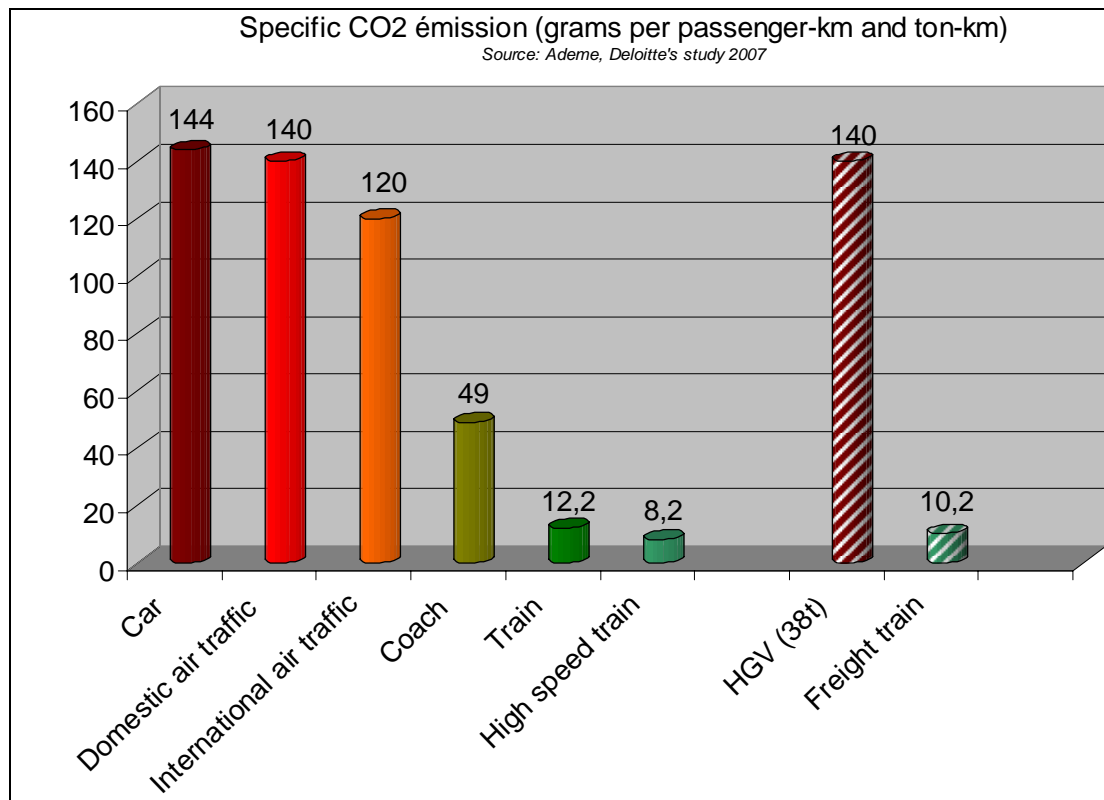


time intermodal information and integration of the transport chain, to provide better services and generate a modal shift towards cleaner transport modes. For example, SNCF combines its expertise of train travel with those of its subsidiaries: Keolis for urban transport by bus, trams or automatic metro and Effia for the management of parking services mainly dedicated to the access of train stations. In 2007 SNCF set up a common entity aiming at improving intermodality through better coordination along the transport chain (consistent timetables, real-time information, etc.). Together with local authorities, SNCF also develops investments in stations to transform them into multimodal exchange centres. SNCF also develops new transport solutions through bicycles rental schemes or car pooling such as in Lille while many other projects are ongoing in other French cities. Economic benefits of these actions are manifold: better quality of travelling, decrease of congestion through modal shift. **Q10** SNCF believes that the EU should pursue the following initiatives rapidly and simultaneously: - EU commitment to reduce CO<sub>2</sub> emissions of 30% by 2020, even without the conclusion of an international post-Kyoto agreement; - a climate/transport package (on the model of the existing climate-energy package) designed to respond to the challenge of climate change without restricting mobility. As with energy, such a package will send a strong signal to transport providers and users; - carbon taxation, for the use of fossil energy, both for individuals and industries (that are not already subject to ETS); - the introduction of «intelligent transport pricing» and the internalisation of all external costs for all transport modes to guide the process of change towards eco-responsible behaviour. Within the mechanism of market operation, prices must send a clear signal and reflect all the real internal and external costs imposed on society by the mobility choices we make; - achieve through the revision of the TEN-T guidelines a Trans-European Network contributing to the fight against climate change. In its contribution to the public consultation on the future of the TEN-T network (August 2010), SNCF has recommended: 1. that the objective of the European Commission to decarbonise transport appears more clearly as the main strategic orientation. Thus, SNCF recommended the use of an indicator to evaluate the “carbon intensity” of the axes and projects, allowing to classify them and to identify the most performing ones, by traffic type. 2. that complete carbon assessment of TEN-T projects become mandatory, for all modes, on the entire route. For the first time in France, greenhouse gas emissions resulting from phases of conception and realisation of the new high-speed railroad infrastructure (line Rhine-Rhône) but also stations, supplementary trains but also maintenance installations, were examined closely. These results were then completed by the estimations of greenhouse gas emissions during the first 30 years of commercial exploitation and maintenance of the new line after its opening, taking into account the forecast number of passengers (including the additional passenger linked to modal shift from air or road to rail). This carbon assessment indicates the time needed to neutralise the emissions generated by the conception, the construction and the operation of the line in particular thanks to through modal shift<sup>15</sup>. 3. that TEN-T help reaching a greater fossil fuels independence. TEN-T must prepare the European transport system to the evolutions of the energy sector. In order to be more sustainable, TEN-T must enable an energy-efficient mobility and reach greater fossil fuels independence of the transport system. - CO<sub>2</sub> labelling to provide information to the customers on the CO<sub>2</sub> emissions linked with their journey/good transportation. These practices have been initiated in France by the environment “Grenelle I and II” bills; - an ambitious and coherent framework for technological research and for the promotion of clean transport technologies

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<sup>15</sup> In the case of the Rhin-Rhône High Speed Line, emissions avoided thanks to the modal shift are going to become superior to emissions generated by the conception, the construction and the operation of the LGV as from its 12th year of operation. The LGV will thus have carbon profitability" as from 2024 which is going to increase year by year. Over 30 years, it is 3 895 000 tons of CO<sub>2</sub> that will have been avoided.

through the future Strategic Transport Technologic Plan, which should identify key new technologies in all transport modes and support research through a better governance and increased financial and human resources. **Q12** Prices transmit capital information to economic agents and direct their action. Price signals must thus be stable, consistent and in conformity with the transport policy taking into account the major challenges of GHG and energy consumption. In addition, the price of external costs, in particular CO<sub>2</sub>, has to increase to successfully reach the reduction objectives. Just like individual behaviours are sensible to price, research and innovation are sensible to these signals. Thus, investment in low carbon technology will be a true support for the fight against climate change, only if the price signals on the transport market promote the transport modes, which generate the least GHG emissions. To encourage investment in low carbon technologies, the future Strategic Technologic Transport Plan should, on the model of the existing SET-Plan for energy, help the improvement and commercialisation of existing technologies as well as support the development of new low carbon technologies, through the identification of key new technologies, a better governance method and increased financial and human resources. The economic performance of the European Union and the accessibility of its population to the transport system must also be major political objectives of the European transport policy. **Q13** SNCF shares the view developed by the TERM 2009 report of the European Environment Agency (2010), that all measures to decarbonise transport should be adopted fully, rapidly and simultaneously. The European Environment Agency (EEA) identifies 3 sets of measures ('improve', 'avoid' and 'shift') that have to be pursued to enable the EU to reach its objectives of CO<sub>2</sub> objectives by 2050. Professor Jacqueline McGlade, Director of the EEA sums this statement noting that: "None of the scenarios considered in this report would realise the 80 % cut in CO<sub>2</sub> emissions by 2050 from 1990 levels regarded as necessary to keep global temperature increase below 2 °C. However, the greatest savings potential arises from a combined package, in which technological improvements that reduce fuel consumption are used alongside measures to shift journeys to lower emission modes and to avoid the need to travel altogether. Achieving the desired reductions requires that we implement a package of policy measures that does not rely solely upon technology. This includes measures such as high density, mixed use land planning, whose impacts may not be felt in the short term. Indeed, because such effects are so distant in time, we need a common vision for sustainable transport and mobility to guide planning." (EEA, 2010:7) SNCF believes that the EU should not rely only on technology to decarbonise transports: The greenhouse gas emissions of transport, in particular of CO<sub>2</sub>, represent more than the quarter of the global CO<sub>2</sub> emissions of the European Union (27% in France). Moreover, these emissions regularly increased since 1990 contrary to the emissions of other economic sectors (industry, agriculture) as rightly mentioned by the Commission in its Green Paper on the future of transports (2009). Beyond the concrete commitments undertaken by the European Union within the framework of the climate-energy package, the objective is to reduce by 80% to 95% the emissions of all greenhouse gases in France and Europe by 2050 in order to limit climate warming to 2°C. However, the transport sector endangers the emission reduction objective in France and in Europe in spite of existing or future technological innovations (intelligent transport systems, more energy efficient vehicles, more powerful motorizations, introduction of agrofuels...). Those innovations, alone, will not be sufficient to reverse the current trend.



The railway mode has higher energy efficiency than other transport modes thanks to weak frictions between wheel and rail (conventional train, tram-train, subway, tram, TGV), as the above graph underlines it for France. The CO2 emissions being directly related to the consumed quantities of gazoil or electricity, the railway mode presents a very favourable CO2 assessment, as soon as the occupancy rates of the trains are sufficient. Taking into account the climatic urgency, any measure aiming at supporting the modal shift towards less emitting modes must be promoted. A greater inter-modality, pulling together the benefit of each transport modes on their most pertinent markets, must be supported. Finally the internalisation of all external costs of all transport modes is essential to promote a sustainable mobility. The price of external costs, in particular CO2, has to increase to successfully reach the reduction objectives. **Q14** Transport is responsible for 25% of EU GHG emissions. These emissions regularly increased since 1990 contrary to the emissions of other economic sectors, as rightly mentioned by the Commission in its Green Paper on the future of transports (2009). The climate change (and the climatic consequences it has: flooding, increase of sea level, extreme climate events, etc.) will have an impact on the transport sector. The fixed rail infrastructure will have to adapt (see level, extreme temperatures, storms, etc.), as well as the rolling stock (i.e. adaptation to extreme temperatures). Research and Development should thus be fostered on these issues. The adaptation should also entail a policy to reduce the consumption of fossil fuels that generates GHG, to mitigate climate change. That is why there should be at the European level an ambitious EU transport policy, with clear objectives in terms of decarbonisation of transport. All transport policies and programmes should therefore include “climate prerequisites” (climate change mitigation and/or adaptation measures). On more general terms, all policies and EU funding programmes should include consistent and coherent minimal requirements in terms of fight against climate change, for the projects to be eligible to EU funding. **Q15** - - modal shift thanks to high speed development: According to a recent Commission study, international train journeys have increased by 27% between 2001 and 2007 mainly thanks to the development of high-speed links between France and neighbouring countries. High-speed services have helped trains to gain a stronger modal

share compared to air or individual car on journeys such as Paris-London, Paris-Brussels or Brussels-London thanks to better travelling times, improvement of services and better access to city centres. High-speed services also present economic benefits for European business and cities by offering better connections, boosting economic growth while having a very low CO2 impact (only 2% of the CO2 emissions due to transport in France come from rail). In France, TGV has a volume policy for environmental and economic performance reasons. In 2008, the average TGV occupation rate was of 77%. Investments in new trainsets such as TGV Duplex (double-decker high-speed trains) help TGV improve its environmental and economic benefits. Example: the high speed line linking Paris and Marseille (750 km) in 3 hours, which came into service in 2001, is a success in terms of: • Business (the traffic increased by 33% in 3 years<sup>16</sup>, i.e. 4.5 million passengers), • Fight against climate change (modal shift from air to rail -40% of the new rail passengers- and road to rail -26% of the new rail passengers) •

Employment and economic growth (estimation of 19 000 permanent jobs created, positive effect on accessibility, the image and tourism in the near-by regions) - Modal shift and urban logistics Being present along the logistics chain, SNCF develops sustainable logistics solutions. SNCF has developed innovative combined transport solutions, for instance with French retail chain Monoprix or by testing innovative last mile solutions such as urban freight delivery bicycles. Example: in 2006, Monoprix has launched a call for tender to test rail freight for the supply of some Parisian retail stores. SNCF has been chosen to provide a multimodal solution, combining rail freight and road transport (natural gas-powered trucks) for the last mile. 2 years after the set-up of this multimodal offer, the benefits are diverse: •

For the business (Monoprix has extended its demand to 20 wagons per day – almost a full train – and increased the number of Parisian retail stores concerned from 27 to 85) •

Environmental benefits (decrease of 25% of CO2 emissions of the emissions of CO by 7, NOx by 2, PM by 16) - CO2 labelling SNCF developed together with the French Agency for environment and energy (Ademe) a CO2 comparative tool from 2006 onwards on its website Voyages-sncf.com. For the same journey, it compares CO2 emissions, price & duration for different modes (train, air, individual car). It is used by 1.2 million persons a year. Since February 2009, an estimate of their CO2 emissions from their freight traffic is given on the invoices of Fret SNCF customers. For the first time, a global carbon footprint of a high-speed line (see below) has been carried out by Inexia, an engineering subsidiary of SNCF. This method will be used for the evaluation of the future railway lines. Example: the first global rail carbon footprint confirms that the new high speed line “Rhin-Rhone” contributes to the objective of sustainable development: • Socio-economic benefits (estimation of 1,5 million new rail passenger every year), • Fight against climate change (the Rhin-Rhone high speed line will become carbon neutral within 12 years. After this period, the CO2 emitted both for the initial construction work and the traction energy for the operation of the rail services will be offset. Thus on a 30-year period, 3 895 000 tonnes of CO2 equivalent could be avoided.) SNCF is developing since early 2010 a simulator of CO2 emissions covering all transport modes. This tool will be available to all users (metro, tram, train, bus or car users) but also to public authorities and to SNCF. This system will ease the integration of the ecological factor within the economic equation of all projects and transport services. -

Innovation through investment in research and in green transport SMEs 20% of the SNCF budget for innovation and research is dedicated to sustainable development. Topics investigated are reduction of energy consumption (energy efficient driving, storage and re-use of energy recovered from braking, etc.), alternative energies (hybrid motors for traction, photovoltaic, solar and geothermal energy for buildings, experiments on bio-fuels) as well as reduction of noise outside and inside trains. In 2007, SNCF created its corporate venture fund

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<sup>16</sup> The traffic on the new high speed line has risen above 20 million passengers in 2004, compared to 15 million in 2000 before the high speed train services started (2007 assessment).



-Ecomobilite Partenaires- dedicated to support start-ups involved in sustainable mobility. The Fund has been provided with 15 million euros of equity and has made investments involved in car sharing, car pooling, the development of electric vehicle, photovoltaic and last mile logistics. - Energy Efficiency SNCF has developed an energy efficiency programme for both operations and buildings. As for the former, the improvement of occupancy rates in trains strongly contributes to better energy efficiency and lower climate-related impact. SNCF is launching a three-year program to equip nearly a thousand traction units with energy metering devices to save electricity. As for the latter, from 2009 onwards, SNCF will equip 500 000 m2 of roofs with photovoltaic solar panels. New stations are conceived from an energy-efficient point of view. For example the new Achères station (Ile-de-France region) will achieve a 64% reduction in energy consumption and 84% reduction in CO2 emission. -

Continuous improvement and day-to-day action and promotion of green behaviours SNCF has initiated measures, practices and trainings to encourage its employees to adopt sustainable behaviours: trainings for eco-driving, SNCF purchase policy, setting-up of sustainable practices in all SNCF units, etc..

**982553393-31 Friends of the Earth Europe Q9** -The future EU energy system must exclude the use of nuclear – as no long term solution has been found for nuclear waste, and the risk of accident is unacceptable. Carbon Capture and Storage is also unsuitable, as it would require increased energy consumption and dependence on fossil fuels. Oil and gas companies should not receive EU taxpayers’ money for its development -Energy consumption of the existing building stock should be drastically reduced by tripling renovation rates and agreeing on “deep renovation” standards comparable to the “passive house standard” - “Intelligent” technology (smart meters, sensors, internet-connected communication systems) is crucial to help provide exact information about what is happening at any given moment in the power system. Network operators must be mandated to use this minute-by-minute information to safely integrate much higher shares of renewable and cut energy consumption and CO2 emissions, thus making a sustainable energy system possible **Q10** -The EU must urgently increase its 2020 emissions target to at least 40% by 2020 - the upper ‘safe’ level set by the Intergovernmental Panel on Climate Change – and ensure that these cuts are domestic - A mandatory economy-wide energy savings target would combine efficiency with transparency, eliminating the risk of offsetting scandals or misjudged emission caps. Industry would gain, as mandatory energy savings standards push down production costs and lead to more efficient and competitive products. Millions of green jobs could be created -EU energy taxation - currently worth €240 billion per year – must be revised so that the focus is on CO2 values rather than the energy content of fuels. Including the EU-ETS sector would give a powerful incentive to change business models and cut emissions -Tougher standards must be set up to ensure that companies are not able to trade and offset their emissions rather than changing their business models – as is presently the case in the EU-ETS **Q11** Friends of the Earth Europe strongly urges the EU not to extend the Emissions Trading System for three main reasons. First, a single trading partnership assumes a free flow of emissions credits in a multinational carbon market – but standards within each regional and national system could be very different. This risks a race to the bottom: the country with the lowest standards (for instance high percentages of poorly verified offsetting) would effectively set the benchmark for everyone else. Second, greenhouse gas concentrations are rapidly increasing: there is no room for error in policy decisions. Even at present rates of fossil fuel use, the 2°C temperature ceiling will be breached in the next fifteen years. Finally, any increase in the scale of the carbon markets is also likely to popularise the use of highly complex financial instruments – risking a burst carbon bubble with far greater economic, political and environmental consequences than the subprime crash.**Q12** -Building a low consumption, renewable based

energy system is conditional on strong and effective 2020 targets. FoE Europe calls on the Commission to focus on improving, and meeting, 2020 targets before looking ahead to 2030. Otherwise, the risk is to put off tough decisions – such as the urgent need to increase the EU's emissions reduction target - with no guarantee that political conditions will be more favourable in the future -The EU must set a domestic emissions reduction target of 40% by 2020 to drive investment. In the EU ETS sector, misjudged CO2 caps and offsetting remove any obligation to revise business models -The 20% energy savings target for 2020 must be made mandatory to deliver its major socio-economic and environmental benefits -The EU's energy system must be built on workable, sustainable, technologies. Therefore it is crucial to use R&D to improve proven technologies (wind, solar, energy savings) rather than nuclear and CCS

**Q13** FoE Europe believes that 80% to 95% cuts by 2050 are largely dependent on the EU setting strong, binding 2020 targets in line with climate science, historical responsibility and sound financial practices. Priorities include: -A domestic greenhouse gas emission reduction target of at least 40% by 2020 -An ambitious binding target for renewable energy in line with the 40% target -An binding overall target for energy savings across all sectors in line with the 40% target -The binding phase out of nuclear, coal and oil fired power generation -The EU budget and cohesion policy to earmark significant amount of funding for climate mitigation and adaptation measures -An overall carbon tax (e.g. through a revised Energy Tax Directive) to create a stable environment for investment in energy savings and renewable energy -Regulations and subsidies to promote the reuse and recycling of materials -Support for public awareness activities on the need for changes in consumption and lifestyle

**Q14** General “climate proofing” guidelines are required: -European payments must be assessed, prior to implementation, to ensure that they do not produce negative effects or undermine European climate, energy, biodiversity and resource objectives. -The EU's energy system is heavily dependent on CO2 intensive fossil fuels, with unacceptably high transformation losses in electricity production. The EU must switch to a high efficiency, high renewable energy system in line with a 40% emissions target for 2020 -Unsustainable farming practices and mono-crop production make EU agriculture vulnerable. CAP must abandon its focus on global markets and invest in locally adapted production and farmer knowledge, build up biodiversity and soil organic carbon content -People on low incomes will generally be most affected by climate due to lack of resources to adapt. EU Climate policy policies must counter inequalities within Europe, e.g through insulation improvements to existing buildings

**Q15** -The Energy Service Company model can provide upfront finance for energy savings. ESCOs sign a deal to reduce (at their own expense) monthly energy bills. A difference between the reduced energy use, and the amount saved by the consumer goes to cover the investment costs -When Denmark launched feed-in-tariffs for wind power, development ran into public opposition. In response, the Government allowed local communities to co-invest in wind farm development. Because feed-in-tariffs ensured better and safer rates of return than banks or stock markets, public response was extremely enthusiastic -In the wake of the 2008 economic crisis, the EU put together a €3.98 billion recovery package. Unspent funds now amount to €114 million. The EU's intention is to ‘multiply’ this money by using it as a guarantee for additional public and private funds. The anticipated result: up to €500 million in very low interest loans and a model that - with strict transparency criteria - must be expanded

**Additional Comments** FoE Europe considers the following recommendations are key priorities to put the EU on track to cut emissions by 95% by 2050 and build a high efficiency, high renewable energy system: 1) Climate policy •The EU is dangerously over reliant on the Emissions Trading System which is not delivering the required level of emissions cuts. FoEE recommends that the EU must: End the reliance on the EU-ETS. Priority should be given to other policy options, such as regulation, taxation and subsidies which are able to deliver the scale and speed of emissions reductions that are necessary to avoid catastrophic climate

change •The most dangerous loopholes in the EU-ETS must be removed by ending overseas offsets, stopping free permits to polluters, introducing a much tighter cap, and preventing the use of banked permits from earlier phases of the EU-ETS scheme. Auctioning money must not be used to subsidise fossil fuels, such as state aid for new coal power plants, or false solutions such as nuclear power or CCS •The EU-ETS must not be expanded by either linking with schemes outside of the EU or instituting sectoral trading with developing countries. Carbon markets cannot be a replacement for mandatory targets under a binding international climate agreement, and adequate and appropriate public funding for climate finance in developing countries •The EU-ETS should not be used as an argument to prevent other policies such as setting binding energy savings targets or to prevent any other measures at national level such as national climate laws to tackle industry or industry sector emissions

2) Fuels and energy policy •The 2020 energy savings target must be made mandatory: Based on current efforts, the EU will miss its 2020 primary energy saving target by about half, despite the fact that practices and technologies to reach this or even a higher target already exist – and despite the widely understood benefits that closing the gap would entail such as potential cost savings of up to €78 billion annually by 2020, a million new local, permanent jobs, improved security of supply, greater economic competitiveness and improvements in comfort, air quality, health and quality of life. Saving energy is also acknowledged as the best option for the EU to meet its climate targets in a fast, cost-effective way: meeting the current 2020 target would deliver about 800 million tons of CO<sub>2</sub> reductions, according to the EU Commission. The EU must therefore set a mandatory 2020 energy savings target to reassure investors and help ensure that benefits are delivered •Biofuels: EU countries' promotion of biofuels threatens to undo the stated aims to reduce GHG emissions from transport and the energy sectors – in many cases contributing more GHG emissions through indirect land use change than the fossil fuels they seek to replace. Recent studies have shown that around 9% of transport energy will come from first generation food crops by 2020, which will emit as much as 167% more greenhouse gases than if fossil fuels were used (<http://www.goo.gl/8XA8>). National and European biofuel targets must be revised to reflect the unsustainability of biofuel expansion on total GHG emissions – as well as negative impacts on biodiversity and communities at threat from land grabbing and food insecurity. The unaccounted emissions from ILUC must be incorporated into the R.E.D. by including robust and precautionary ILUC 'factors' for biofuel feedstocks. A more effective approach to reducing emissions in transport requires investment in dramatically increasing energy efficiency in transport •The Fuel Quality Directive: In order to achieve the anticipated 10 % reduction of greenhouse gas emissions (GHG) from production of fuels by 2020 the review of the Directive in 2011 must:

- 1.Result in the inclusion of separate, scientifically proven default GHG value for fuels deriving from tar sands for Article 7a implementation methodology
- 2.Result in increasing the legally binding GHG reduction target from current 6% to the initially proposed 10%
- 3.Result in the inclusion of obligatory reduction of gas flaring and venting by fuel producers as a method towards achieving the GHG reduction target of the Directive

•Nuclear power must be phased out because of concerns about the safety of nuclear generation and the ability to safely dispose of and store nuclear waste over very long time scales, as well as its potential for contributing to the proliferation of nuclear arms. Nuclear power is too costly a source of electricity relative to other generation options •Carbon Capture and Storage is an unproven technology which would require increased energy consumption, thus locking the EU into lasting dependence on fossil fuels. The result: CCS is not a solution to climate or the economic crisis and it will not contribute to reaching of a low carbon economy. The EU should subsidise renewable energy and energy savings development instead

**9832909575-41 Greenpeace European Unit Q9** Power&heat: RES technologies and CHP, interconnection and storage capacity and smart grids. The RES Directive should be implemented, and the framework should be kept in place also beyond 2020. Regulation and appropriate incentives should be established for an interconnected and flexible electricity grid system. Current support for nuclear power and CCS for fossil fuel-based power generation should be phased out. Industry: Significant reductions can be achieved with product and material substitution and improved chain efficiency. Innovative technologies, such as magnesium oxide cement clinker and coke free steelmaking could significantly reduce emissions. The EU should raise its GHG target to 30% and an EU finance instrument for innovative technologies should be established. Transport: More efficient and lighter vehicles, road vehicles run on batteries and trains powered by renewable electricity. Set stringent efficiency standards for all types of transport vehicles. **Q10** Greenpeace assessed that globally, with current technologies, 80% reduction in GHG emissions can be achieved by 2050 compared to 1990 levels. The EU's roadmap for 2050 should be in line with this global goal, meaning to reduce emissions in the EU domestically in the upper end of the agreed 80-95% GHG emission reduction range for 2050. Early action is required keep the possibility for ambitious long-term emission reduction open. Therefore a focus on ambitious EU targets for 2020 is essential, including a move to an unconditional 30% GHG emission reduction target for 2020, and a strict 80 grams per kilometre target for passenger cars. EU Member States should adopt ambitious National Renewable Action Plans for Renewable Energy. At the same time, Europe should aim for 100% renewable energy supplies by 2050 with a flexible power station mix to complement variable renewable electricity, and interconnected smart infrastructure.**Q11** The Commission's estimate for 70% domestic reductions by 2050 (COM(2010) 265 final) is based on the assumption of significant possibilities for 'offsetting' in third countries. In the light of delivering adequate certainty to stay below 2°C increase, global emissions should reduce over 80% by 2050. In this context, Greenpeace believes that after 2020 the options for 'offsetting' emissions in third countries should be limited. For the short term, linking of the EU ETS with market mechanisms for industrial and energy emissions could play a role. When linking markets, stringent quality criteria (system design, accounting, compliance and allocation, no forestry) should be established, and the number of external allowances that can be used for compliance under EU ETS and the ESD should not exceed a quarter of total effort until 2020. The linking of carbon markets should not undermine domestic early action required until 2020 to stay on track with achieving the 2050 goals. **Q12** We support clarification of the ambitions for 2050. Assessment of reduction pathways and tech development towards 2050 should inform current decisions. We are against 2030 targets for GHG reduction or technology; this diverts attention away from action before 2020. From a theoretical physical viewpoint reductions could be delayed up to 2030, and then reduced very quickly thereafter. However, in reality the very rapid reductions which would then be required after 2030 are very likely not feasible. Assume that we would want to stay within a GHG budget of 1,750 GtCO<sub>2</sub>eq (which implies a probability of exceeding 2°C of between 20% and 55%). If emissions were to peak by 2015, the annual emission reductions for subsequent years were equivalent to 3.6% against 1990. For 2025, these annual emission reductions were already beyond 10%, clearly outside of what we can imagine (see upload doc). A realistic EU domestic pathway could be 30% by 2020, 52% by 2030, 73% by 2040, and 95% by 2050.**Q13** A significant part of the measures needed have low or negative costs. However, several obstacles prevent these measures from taking place. These include a lack of knowledge, institutional barriers, fossil fuel subsidies, difficult access to capital. Designing the right policy framework is the challenge for the EU. Priority should be minimum EU minimum standards for taxes on carbon and energy, including a ban on tax breaks and subsidies for fossil-fuels. Improved taxation is crucial to achieve energy security and lower



use of natural resources. Stronger carbon and energy taxation would have a positive employment effect, because labour-intensive production would gain advantage. The benefits increase if member states would use revenues to reduce labour costs or support green technology development. And, specific binding targets and standards to support energy savings and renewable energy are crucial to enable newer technologies to mature and to overcome financial and awareness barriers. **Q14** According to the European Environment Agency, for the Mediterranean basin, in particular, increasing mean temperatures and decreases in water availability are expected to exacerbate current vulnerability to droughts, forest fires and heat waves. Meanwhile, in north-western Europe, low-lying coastal areas face the challenge of sea-level rise, river-floods and an increased risk of associated storm surges. Coastal and river-flood-prone areas across Europe are particularly vulnerable to climatic changes, as are cities and urban areas. Mountain areas face reduced snow cover, potential negative impacts on winter tourism and extensive species loss. In addition, permafrost degradation in mountain regions may create infrastructural problems. **Q15** In 1996, Greenpeace has taken the lead in car technology by producing the SmILE, a modified Renault Twingo, which was almost 50% more efficient than its conventional counterpart at that time. In 1992, Greenpeace contributed to the development of Greenfree, with an East German company DKK Scharfenstein. The company was the leading household appliance manufacturer in the former East Germany. After reunification it faced severe problems. Greenfreeze uses hydrocarbons for is entirely free of ozone destroying and global warming chemicals. Since 2005, Greenpeace and EREC publish the Energy [R]evolution scenario. The DLR Institute for Technical Thermodynamics is the research institute behind the analysis which supports the scenario. EU-27: <http://www.greenpeace.org/eu-unit/press-centre/reports/EU-Energy-%28R%29-evolution-scenario> **Additional Comments** The attached illustration shows that from a theoretical physical viewpoint emission reductions could be delayed up to 2030, and then reduced very quickly thereafter. However, in reality socioeconomic and technological constraints make such reductions highly unlikely to happen. The very rapid reductions which would be required after 2030 are very likely not feasible. Assume that the world would want to stay within a GHG budget of 1,750 GtCO<sub>2</sub>eq (which implies a probability of exceeding 2°C of between 20% and 55%). If emissions were to peak by 2015, the annual emission reductions for subsequent years were equivalent to 3.6% against 1990. For 2025, these annual emission reductions were already beyond 10%, clearly outside of what we can imagine (see upload doc). A reasonable domestic reduction pathway could be 30% by 2020, 52% by 2030, 73% by 2040, and 95% by 2050. Additional comments: CCS should not be considered for fossil-fuel power generation Studies point to major economic and technical risks associated with carbon capture, transport and storage. A recent article identifies main carbon capture obstacles such as impurities in the gas, handling of large volumes of gases, handling toxic chemicals, greater losses in efficiency, and reduced ability to follow load (Hirschhausen et. al., 2010). The costs of pipeline transport have large uncertainties, mainly due to the unknowns surrounding possible future network, which remains undefined and requires quantification and qualification of storage sites first (Herold et. al., 2010). Also many political and legal risks remain: according to Boeuf (2003) a range of issues needs to be addressed before a proper structure of public-private partnership can be elaborated. Only a handful of operations for storage are underway (Sleipner Field, Salah). New studies find a strong decline in estimated storage potential (Gerlings et. al, 2010, Holler, 2010). Publications also point to high uncertainties with injection rates and required reservoir volume (Ehlig- Economides, Economides, 2009). Based on this and other literature and the current development rate full scale deployment by 2020 of both capture, transport and storage is disputable, and a 2030 date seems to be a more realistic timeframe. Because of limited carbon storage space and the alternatives already available in the power sector, CCS should



not be considered for fossil-fuel power generation. Nuclear energy does not help mitigating climate change • Nuclear energy is an expensive diversion from the safe and sustainable technologies such as renewable energy and energy efficiency. • No proven final solution exists for dealing with radioactive waste • Expanding nuclear power internationally would hugely increase the risks from terrorism and nuclear weapons proliferation • Nuclear power plants cannot be built in time to make even the smallest difference for emission reductions in the short term The Massachusetts Institute of Technology (MIT) and other studies estimate that for nuclear power to have any effect on global warming, we would need to build a minimum of 1,000 reactors worldwide. This is a wildly unrealistic scenario and investors refuse to buy into nuclear power's dubious economics. After half a century of producing deadly long-lived radioactive waste, not one country in the world has a method of isolating these wastes from the environment for the hundreds of thousands of years they will remain a threat. Monitoring and maintaining waste dumps over a period spanning 20 times the length of known civilisation is an unacceptable burden to place on all future generations – with no guarantees of long-term safety.

**98345631631-22 European Insulation Manufacturers Association** **Q9** The development of appropriate technologies is essential for ensuring the development of a low carbon economy. But it is also essential to deploy these technologies in the correct order: it is key to ensure that emphasis is placed first place in the reduction of energy demand, rather than focusing on generation and transmission of energy that could be wasted at the final stage. Zero emission buildings are attainable cost-effectively, and are key in order to reach EU climate targets while creating jobs, protecting consumers from high energy bills and ensuring EU energy security of supply. Technologies for drastically reducing the energy consumption of our buildings are already there, but they need to be coupled with innovative solutions in training, financing (the deployment of new technologies is often related to larger investments that need specific financial instruments) and communication (raising social awareness). Additionally, R&D in building renovation has to be promoted. **Q10** Long-term targets are feasible only if ambitious action starts immediately. Given the current economic downturn, focus should be placed on cost-effective measures that provide the largest potential for reducing emissions. A recent Ecofys and Fraunhofer study shows that the EU has sufficient energy savings potential to realise its 20% energy savings target in 2020, and 85% of this potential consists of measures that are cost-effective. Among those, measures for improving the energy efficiency of EU buildings are in the frontline and technology is immediately available. In order to fully tap the potential of buildings for contributing to a low-carbon economy, Eurima calls for an ambitious EU building policy with the aim of reducing the energy consumption of the EU building stock by 80% in 2050. This could be achieved if gradually increasing binding targets for the deep renovation of the EU building stock are put in place, starting as soon as possible. **Q12** Taking as basis our proposal for a EU policy objective of reduction of energy demand from the EU building stock by 80% in 2050 (see reply to question 10), Eurima believes that this overall objective should be accompanied by the establishment of intermediary targets, measurable and verifiable by high-quality Energy Performance Certificate schemes (EPCs). These schemes should not be uniformised at EU level, but the quality degree of the certificates should be equally high for all EU Member States. EPCs could be used to create a roadmap towards a zero-energy built environment by 2050. For example, 80% of all the building stock should be A-rated by 2040, 60% A-rated by 2030 and 30% A-rated by 2020. Member States, regions and municipalities would have full flexibility as to the sectors to be targeted, and the measures to be implemented. **Q13** Ambitious action in EU buildings could bring significant improvement in all of the areas mentioned. The construction industry is the biggest industry sector in the EU, and is therefore key for ensuring sustainable growth and

creating jobs (20% more energy efficiency, including buildings, could create 1 million jobs in the EU). In addition, putting an end to waste of energy and emissions coming from buildings would drastically increase our energy security and would make energy prices less vulnerable to external energy shocks, which would be for the direct benefit of EU citizens. An ambitious programme for the deep renovation of the EU building stock would undoubtedly contribute to the deployment of a strong EU industry of energy efficiency, accelerating innovation.

**Additional Comments** A low carbon economy should start by addressing those sectors that can reduce their CO2 footprint most significantly and in the most cost-efficient manner. In addition, a low carbon society should also be an energy efficient one. Buildings, which currently represent 36% of the EU's total emissions and consume 40% of EU energy, are clearly the 'low hanging fruit' in this sense. It is widely acknowledged that long-term climate targets cannot be achieved if no bold actions are undertaken in the building sector. Therefore, Eurima proposes an ambitious EU building policy as a key element of the EU strategy for a low-carbon economy. This initiative would set long-term targets (providing security for investors) and ambitious yearly programmes fostering deep renovation of existing buildings, with an aim of reducing energy use from buildings by 80% in 2050. Although the recent legislation has helped to tap into the huge energy saving potential of the building sector, Eurima believes the EU effort should:

1. Ensure that the general ambition level regarding energy efficiency in buildings remains high especially through the set-up of a binding energy efficiency target;
2. Ensure that the potential of existing buildings is being tapped (more than 80% of buildings in Europe are already built and will still exist in 2050) through the establishment of binding targets towards deep renovation of the existing building stock;
3. Develop political schemes to make the theory become practice. Those policies must address the way financing should be generated and how the skills related to deep renovation of EU buildings can be developed.

**98438514686-68 Rohöl-Aufsuchungs-Aktiengesellschaft Q9** RAG is committed to contributing to a sustainable, competitive and secure EU gas market. This will undoubtedly mean reducing CO2 emissions on an equitable way across the EU. RAG agrees with the 6th Fossil Fuels Forum that "a low-carbon economy does not have to mean a low-fossil fuel economy"<sup>17</sup>. "Decarbonisation is a requirement on the energy produced and does not contradict a continued use of fossil fuels". Therefore a low carbon economy does not mean the end of fossil fuels within the EU energy mix; rather, new ways need to be found to continue the use of fossil fuels but with greater efficiency and lower CO2 emissions. Thinking about a future low carbon economy without fossil fuels would not be very realistic. Natural gas is the cleanest, most efficient and versatile of the fossil fuels, making it a unique choice in the path towards a lower carbon energy mix and sustainable future. More importantly, the abundance of natural gas, its competitive cost of supply, its immediate availability and the flexibility to enable renewable energy clearly favours it as the best source to address emission reductions at the lowest cost. The broad scale of already available high efficient technologies for gas needs to be highlighted. For instance, cogeneration or combined heat-and-power (CHP) have an efficiency higher than 80%. Gas technologies might be also favoured as they can be applied not only by the big industry but also by the SMEs as well as by the domestic consumers. Natural gas is considered as the bridge fuel to a low carbon economy. Clean gas is the fossil fuel with the lowest CO2 emissions. Moreover, natural gas is providing the flexibility required to back-up the increasing amount of renewables. If we consider these two advantages for the clean natural gas (low emissions and flexibility) with the already well known three A's (Abundant, Affordable and Acceptable), definitely, natural gas not only must

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<sup>17</sup> European Commission conclusions for the 6th European Fossil Fuels Forum [ener.ddg1.b.3/JP/sc A(2010)802203]

be considered as a transition fuel, but also as a destination fuel for the long run. Additionally, the carbon footprint of natural gas can be reduced by the use of biogas. Furthermore, new developing technologies, such as the production of synthetic gas (“power to gas”) would trigger new ways of using the existing and new infrastructure to provide low carbon energy storage using the know-how of UGS (Underground Gas Storage) companies. RAG considers that meeting the EU’s very ambitious commitments towards a low-carbon economy by 2050 will require parallel development of energy efficiency measures, the development of renewable energy sources and the deployment of carbon capture and storage (CCS). Most importantly, these developments will have to be accompanied indeed by a significant development of new natural gas infrastructures. **Q10** Over the next decade, significant investment will be needed to ensure a transition to a low carbon economy, most of those investments being in terms of energy infrastructure. In the context of the current economic crisis, this will be challenging, and requires that current low-carbon energy sources and technological solutions will need to take central stage. In terms of initiatives, RAG considers that the following priorities have to be considered for a successful Roadmap 2050: a) Completion of the internal market in electricity and gas Development of the right electricity and gas infrastructures in a timely manner is critical. Gas infrastructures are needed to ensure a liquid, competitive and secure EU gas market. GIE would like to emphasise that gas infrastructures are “market facilitators” which enable the completion of the internal market. A real internal gas market is the key to a more sustainable and efficient market with lower CO<sub>2</sub> emissions. A sound investment climate together with a stable and predictable regulatory framework providing the appropriate incentives for investment constitute the prerequisite for the development of new gas infrastructure which will trigger further market integration and enhance security of supply. A proper regulatory framework will help to respond to many infrastructure challenges without resorting to extraordinary tools. RAG would like to reiterate that gas infrastructure investment entails long-lead times and thus requires long-term visibility. Regulatory frameworks should therefore be clear, in-keeping with the longer-term policy perspectives and consistent across borders. This should be recognized as a prevailing principle spanning to all infrastructure projects. b) Consistency between the Climate and Energy Strategies of the European Commission. Natural gas infrastructures require capital intense investments which are paid-back over a period of 30-50 years. The European Commission considers on one hand that there is a need for modernizing and developing gas infrastructures, but on the other hand it advocates at the same time scenarios with a decline in gas demand in the medium and long term, considering the role of gas only as a bridge fuel to a low carbon economy<sup>18</sup>. GIE would like to call for a more clear and coherent view from the European Commission in order to ensure a sound investment climate and avoid uncertainty. This uncertainty is damaging to investor’s confidence and restricts new investment. Given IEA predictions<sup>19</sup> that oil and gas will play an important role in the EU energy mix for decades, it is important, as outlined above, that clear and predictable demand signals are sent to the investment community now to allow for the diversification of routes and sources. Without these clear and predictable demand signals, investment will go elsewhere, leaving the EU with a potential energy shortfall given the dash for energy by China and India; for example, in back-up capacity of intermittent renewable energies for which gas is especially well-suited. A consolidation of both EU energy and climate policies in order to set a clear long-term energy strategy that is realistic as a foundation for a low-carbon economy is therefore crucial. c) Recognition that gas will continue playing a critical role in the EU energy mix for decades. This is important given that one third of EU electricity generation capacity

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<sup>18</sup> Pg 20-22, Energy infrastructure priorities for 2020 and beyond (COM 2010) 677

<sup>19</sup> IEA WEO 2010

will need replacing by 2020 according to the Commission's own analysis.<sup>20</sup> There must be recognition of the fact that gas: § has a much lower capital cost per installed MW (50% the cost of a coal plant, 20% the cost of a nuclear plant and 15% of wind generated energy).<sup>21</sup> § Gas power plants can normally be constructed in about two years, much quicker than coal (52-58 months) or nuclear plants (54-60 months).<sup>22</sup> § Gas-fired power plants are much more flexible (higher energy efficiency) than nuclear plants. d) Measures to ensure clean, efficient and affordable back-up for intermittent renewable energy sources. This could mean replacing old coal-fired power plants by CCGTs. Moving from coal to gas in power generation is almost twice as big a step in terms of emissions reductions compared with moving from gas to carbon-free renewable energy sources. **Q11** However special attention should be paid to on the competitiveness of the European economy in general and of the energy industry in particular. **Q12** RAG would like to stress, that a switch from coal-fired to modern gas-fired power plants could alone meet the 2020 CO2 emissions reduction target in the EU. Replacing coal fired power plants by gas fired power plants, results in significant emission reductions. In addition, gas fired power plants are a good response to the need of back up generation in the development of renewable energy production through wind and solar farm owing to the intermittency and unpredictability of these sources. Finally, with a possible extension of nuclear power generation in some of the Member States, gas fired power plants gain importance for peak shaving. Due to their important variation of load factor, new gas fired power plants will need a high level of flexibility from gas infrastructure, which will require additional storage and transmission infrastructure **Q13** From our perspective priority should be given to the following actions: - Increasing amount of renewable energy is expected to be installed. In order to back-up the intermittent production, an enormous flexibility is necessary in both the electricity and gas networks. Gas is storable, that's why underground gas storages have a key role to play to provide this flexibility, both on gas and electricity networks (thought CCGT and other developing technologies using gas as an energy carrier). The Roadmap to 2050 should clearly recognise this requirement to achieve a successful low carbon economy by 2050. - Replacing coal with gas as a source of electricity generation in order to quickly and cheaply lower CO2 emissions within the EU. - Recognition of the benefits of natural gas within a low carbon economy. Natural gas is the cleanest fossil fuel and it is without doubts, not only a transition fuel to a low carbon economy, but also a destination fuel for the long run. - Ensuring a sound investment climate for energy infrastructure development - Recognition of the key role to be played by gas infrastructures. Gas infrastructures are market facilitators and therefore the backbone of a more interconnected, liquid, competitive, sustainable and secure EU gas market. - Diversification of routes and energy sources to the EU energy market are key policy elements within an inter-dependent environment. **Q15** As the example of the United States shows, the development of unconventional gas is an evidence of a successful story. This new technology has evolved very quickly during the last years and it accounts now for 50% of the total gas production. This is a good example of how new technologies can be commercially viable in a short period of time. It also has to be pointed out that the outcomes from research in new energy technology developments concerning gas will make a major contribution to achieve low carbon targets. In this sense, new technologies, such as the production of synthetic gas ("power to gas"), among others, will help define gas as an essential component in the future low carbon economy framework by using existing and new gas infrastructure and the available technology developments. **Additional Comments** In the past few years we have observed that big changes in the energy-sector have started that will have huge impacts in the

<sup>20</sup> Pg 3, Energy 2020: A strategy for competitive, sustainable and secure energy (COM 2010) 639

<sup>21</sup> Mott MacDonald for DECC, June 2010

<sup>22</sup> From Royal Dutch Shell internal analysis

coming years and decades on the energy value chain. Fluctuating Renewables like wind, solar and hydropower are not able to provide the required Flexibility of Energy-Demand. Energy-Storage and Just-in-time-Energy-Distribution will be the core-issues of the upcoming sustainable energy system. It is not energy itself, it is the energy carrier! In this context, it is essential to consider the best future investments and fundings in Energy-Infrastructure. We are convinced that there is no optimal general solution for Europe. The policy should be clear about the best options with respect to the physical-constraints and using existing well-proved technologies. This must be the basis for investment- and funding-decisions. What do we mean by that? e.g. Energy-Density is one important aspect! It is clear that storage of electrical power is very inefficient. Many people think about batteries and improvement in battery-technology. Yes, batteries have their application area, but batteries are not capable of large scale energy storage, simply because of the poor energy density. Energy-Storage in the form of Underground Gas (SNG) Storage is a proven technology very efficient and cheap, simply because of the very high energy density of compressed methane. Transportation of energy in the form of electricity via cable is also very inefficient, but necessary in many cases. Transportation of energy in the form of gas via pipelines is most efficient and cheap proven technology. So a link between renewables - electrical power - and natural gas - would be desirable to solve greenhouse-gas issues, supply and demand issues, and efficient funding issues. The paradigm is POWER to GAS. So our clear statement is: Gas is not a transition energy - Gas is the future energy. Methane does not care about its origins. There are technologies (view appendix) available to transform Power to Gas. The future will prove which technology is best, but to make this concept feasible Europe needs a change in the overall paradigm. The opportunities are obvious: Existing Infrastructure (Power and Gas with Storage) can be used for decades. Less additional power-infrastructure is needed. Fluctuating Electricity production coming out of Renewables can be smoothed out. Predictable price-forecasts are achievable. Please find below links and pdf's to relevant publications. Unfortunately some of them are only in german language.

<http://www.solar-fuel.net/en/the-challenge/>

[http://www.solar-](http://www.solar-fuel.net/fileadmin/user_upload/Publikationen/ZSW_JB2009_20SchwerpunktEnergiespeicherung.pdf)

[fuel.net/fileadmin/user\\_upload/Publikationen/ZSW\\_JB2009\\_20SchwerpunktEnergiespeicherung.pdf](http://www.solar-fuel.net/fileadmin/user_upload/Publikationen/ZSW_JB2009_20SchwerpunktEnergiespeicherung.pdf)

<http://www.uba.de/uba-info-medien/3997.html>

[http://www.ooe.gv.at/cps/rde/xbcr/SID-F9A43533-E5FA87E3/ooe/05\\_Krajete.pdf](http://www.ooe.gv.at/cps/rde/xbcr/SID-F9A43533-E5FA87E3/ooe/05_Krajete.pdf)