

Technologies and Policy Proposals for a Low-Carbon EU Economy by 2050

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INFORMATION PAPER

10 February 2012

Introduction – Moving to a Competitive Low Carbon European Economy

Members of the American Chamber of Commerce to the European Union (AmCham EU) reviewed with interest the European Commission’s ‘Roadmap for moving to a competitive low carbon economy in 2050’ (COM(2011) 112/4), released in Spring 2011.

The Roadmap models the economy over the coming 40 years and suggests that further policies will be needed if the EU is to achieve an 80% domestic emissions reduction by 2050 (in line with the recommended overall reduction target for developed countries set by the UN’s Intergovernmental Panel on Climate Change). Such policies will require careful analysis of the impact on the EU economy and competitiveness. Indeed, as stated in the Roadmap, policy makers ‘will have to go into greater depth on costs, trade-offs, and uncertainties’.

This paper presents our initial contribution to these analyses in the form of sector specific policy suggestions, all of which are based on the following overarching principles:

- Climate change is a global problem and requires global solutions. Europe cannot progress in isolation.
- EU funds should be allocated in alignment with EU climate ambitions.

- Some technologies for reaching a low carbon economy are ready and need investment security to flourish.

With these considerations in mind, this paper will look at how to finance the transition to a low-carbon economy and different sectoral perspectives on policies needed to encourage a low-carbon economy.

I. Financing the Low-Carbon Economy

AmCham EU stresses the importance of policy stability when looking at long-term investments. Availability of capital is very important, however, it is the certainty provided by clear, consistent and predictable policies which really makes a difference. This is particularly the case with regard to political and economic risk. Private capital flows may be unlocked if policies make this investment risk acceptable and:

- Ensure sustainability over the duration of the investment period,
- Bridge the financial gap new technologies encounter as they mature and become competitive, moving R&D funding towards commercialisation,
- Make investment more commercially attractive, and
- Avoid administrative and permitting barriers.

A. A Sustainable EU Budget

The proposed Multiannual Financial Framework (MFF)'s leading principle is to support the Europe 2020 Strategy. While this is a step in the right direction we urge an increased focus on identified priorities to develop a competitive and greener economy, such as R&D and investment into efficient infrastructure. Focusing on these objectives in the short-term will also help us meet the goals of the Roadmap.

AmCham EU has the following recommendations:

- **Align EU budget allocations with Europe 2020 priorities.** Policies and funding mechanisms provide a key to stimulating growth and jobs. AmCham EU favours productive public spending, and would like to see bold allocations to a few focused areas such as the green and digital economies. AmCham EU believes that the proposal to use structural funds in the 2014-2020 MFF in order to target a limited number of priorities, including innovation and the competitiveness of the EU, is a positive step forward.

- *Innovation through flexible R&D programmes.* Europe often lags behind other regions on fostering a culture of risk-taking and innovation. During the last decade, the EU failed to increase R&D investment as a share of GDP. There are also discrepancies within the EU, both among countries and sub-regions within countries, with respect to R&D capacities. AmCham EU supports the significant increase proposed for the R&D budget (Horizon 2020), of up to €80 billion. Innovation can deliver solutions to the challenges facing European societies by, for example, development of LCT. In this respect, effective implementation of the Strategic Energy Technology (SET) Plan, endorsed by the Council in June 2011, will also help the EU position itself as a low carbon technology leader.

AmCham EU welcomes the introduction of a Common Strategic Framework, in particular a single entry point for access to funding. A simpler and more efficient structure and a streamlined set of funding instruments will increase participation.

- **Efficient infrastructure investment through a mix of pan-European and local schemes.** All funding instruments should be directed at improving Europe's competitiveness and providing new job opportunities in a healthy and sustainable low-carbon economy. The EU should continue using decentralised funding schemes, such as the structural funds, to spur investment in innovative technologies (local high-tech & large cross border projects) and develop flexible centralised programs such as the 'energy infrastructure fund' of the European recovery plan. In addition, these funding schemes could be used to help seize energy efficiency opportunities.
 - *Connecting Europe Facility.* We welcome the creation of an infrastructure fund using several financing instruments. In particular, we support the proposed Connecting Europe Facility for transport, energy, and ICT infrastructure, included in the 2014-2020 MFF. It is a significant step towards delivering common projects with European value and supporting the completion of the Single Market. We call on the Council and the Parliament to endorse the ambitious proposal and supporting guidelines, and deliver a high-level of related financial commitment. We also suggest facilitating the permitting processes on priority infrastructure projects and interconnections, to deliver the best return on European funds.

B. Green Public Procurement (GPP)

EU public procurement laws already strike a balance between ‘pure’ competition and secondary objectives. The primary purpose of public procurement is to provide the contracting authority with ‘value for money’, to spend public resources wisely and ultimately save the taxpayer’s money.

To that end, procurement should take into consideration not only short-term opportunities for cost savings, but also drive long-term investment in sustainable products and services including considerations of life-cycle costing. Other public policy objectives should remain the exception, not the rule, and should only be adopted if there is broad consensus about their value to society and if they are clearly defined.

Fostering sustainable markets is a key policy objective of green public procurement (GPP). Use of GPP will encourage industry to commit resources to green R&D to bring solutions to the European market and enable the EU to meet its objectives in energy efficiency, renewable energy and the reduction of greenhouse gas emissions.

It is important that the legal framework remains user-friendly. GPP criteria need to be clearly defined, simple and product-specific and should be established and updated together with business in a transparent and efficient process.

II. Leveraging Technologies for a Low-carbon Economy - Now and in the Future

i. Wind Energy

Wind energy requires large upfront investments. Turbines, foundations, electrical equipment and grid-connections account for up to 75% of total production costs and off-shore wind turbines incur three times the maintenance costs of their land-based counterparts. In order to encourage these large investments, the EU could fund offshore demonstration projects. This would leverage private investment, reduce risk (encouraging additional investment), ensure that offshore wind meets its potential and help deliver on the goals of a low-carbon economy.

There is growing demand for so-called grid ancillary functions. Ancillary functions stabilise the grid or local network connected to a wind farm. Currently, conventional generators or other grid infrastructure hardware fills this function. Modern wind turbines can, however, provide voltage control, frequency control and reactive power even when there is no wind, but they also cost more. To encourage overall efficiency, Germany pays a per-kilowatt-hour price to wind farm operators to incentivise use of smart electrical wind turbines. We suggest a similar pan-European Directive to incentivise ancillary services for wind turbine technology.

ii. Solar Energy

Solar photovoltaic panels have no direct CO₂ emissions during operation, a light carbon footprint and they produce electricity for 25-30 years. Furthermore, the solar sector created around 300,000 jobs in Europe in 2011 alone. With fast and constant cost reductions, solar energy is expected to become competitive in the coming years and to be an integral part of Europe's low-carbon energy mix. Therefore, we believe that EU policies should focus on removing the remaining barriers to the development of this technology.

Solar energy also requires upfront investments and EU institutions should propose instruments to incentivise and facilitate these investments. The grid infrastructure should also be adapted to allow input of renewable energy at all voltage levels. Finally, AmCham EU believes that a more transparent electricity market is needed to show the benefits and shortcomings of different energy generation options.

iii. Advanced Renewable Fuels for Transport

Under the Renewable Energy Directive, Member States must ensure that at least 10% of the energy used in transport comes from renewable sources by 2020. Biofuels must meet increasingly high hurdles of sustainability. In absence of legal certainty on the implementation of the indirect land use change (ILUC) criteria, most Member States continue to rely on, and provide favourable treatment to, first generation biofuels. Consequently, investment in production capacity for advanced biofuels relying on non-food feedstock lags behind the rest of the world. The Commission should take urgent action to ensure:

- Legal certainty with regard to (Indirect) Land Use Change in the context of the RED
- Non discrimination of advanced biofuels in Member State national legislation

iv. Supply Side Energy Efficiency

About one third of the EU's climate and energy efficiency goals could be achieved through supply-side measures. The two measures that would deliver the largest benefits are smart grids and combined heat and power (CHP). AmCham EU believes that supporting supply-side energy efficiency measures would complement the proposed Energy Efficiency Directive's aim to step up efforts to use energy more efficiently at all stages of the energy chain

v. 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 (ORC) can capture waste heat from gas turbines and compressors and contribute to an increase in electricity efficiency of approximately 10%.

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 by removing the deployment barriers, such as:

- Grid access/feed in obligations (electricity networks, heat networks),
- Lack of the right incentives for efficiency measures (refurbishment/retrofit),
- Pricing rules (if e.g. heat tariffs – that are regulated and do not consider efficiency improvements), and
- No recognition of waste-heat-to-power technologies (e.g. ORC)

vi. Smart grids

Government policies have proven critical to jump-start investment in smart grids, yet additional support is needed. We urge policy-makers and regulators to:

- Establish performance targets, such as peak load reduction standards, encouraging utility investment in demand response,
- Recognise distribution system efficiency improvements within energy efficiency standards and targets,
- Encourage utilities to take a more ‘end-to-end’ approach and work closely with network operators to develop customer-focused solutions,
- Adopt rate policies, such as decoupling or performance-based rate making, which will compensate utilities for electricity demand reductions due to energy efficiency,
- Require utilities to offer residential customers variable rate structures; these price signals are essential to realising the potential of smart grid-enabled demand response technologies,
- Encourage night-time (off-peak) charging of electric vehicles, require utilities to offer discounted rates, reflecting the lower marginal cost of night-time generation,
- Ensure that utilities provide consumers with timely, relevant electricity usage data, and protect this data from unauthorised use while maximising the availability for consumer comparison to drive behaviour change,

- Provide a range of dedicated incentives across the entire value chain for the deployments of grid technologies, such as increased innovation stimulus for distribution network operators (DNOs), tax credits and energy efficiency programmes, to help with the purchase of smart appliances and in-home energy management devices, and
- Encourage the implementation and incorporation of distributed generation, thus reducing the transmitted load and transmission losses.

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 Distribution Systems Operators (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.

vii. Power Generation Efficiency

The International Energy Agency estimates that of all the effort required to deliver a 50% reduction in global emissions by 2050, a further 7% will need to come from improving the thermal efficiency standards at our power stations, notably coal and gas-fired power plants.

Most of Europe's coal plants operate at 37-38% thermal efficiency levels and gas turbine plants an average 52%. Best available techniques (BAT) deliver efficiency improvements of 9% and 6% respectively. Furthermore, when installed on a coal plant, CO₂ emissions can be reduced by up to 13%.

Significant CO₂ savings could be made by either retrofitting power plants aged between 20 and 30 years or using best available techniques for new power plants. The fact that such techniques are not currently applied, suggests that the ETS price signal does not sufficiently encourage such investments in the power sector. Therefore, we encourage additional incentives for new and existing plants to deploy BAT where efficiency improvements would make business sense.

viii. Automotive Industry

The Roadmap identifies three key factors on the path to more sustainable mobility throughout Europe: vehicle efficiency, the use of cleaner energy and better use of mobility networks. The automotive industry is at the forefront of technological progress to address all these, but requires regulatory support to continue to act as an enabler of this positive change.

- **Improved vehicle efficiency.** For the foreseeable future, the internal combustion engine will remain the main propulsion system in ground transport. Tremendous efforts have already been made and continue to be made in this field. This was, and will continue to be, achieved through the permanent improvement of existing and new technologies, materials, etc. As the development cycles in the automotive industry are very long and capital intensive, the industry needs a high degree of predictability and sufficient lead times to achieve these goals in the most cost effective manner possible, allowing the European vehicle industry to maintain its global competitiveness.
- **Use of cleaner energy.** There is no silver bullet, only a number of alternatives are available and all have their pros and cons, such as electricity (from fuel cells or batteries), sustainable biofuels or various alternative hydrocarbons such as compressed natural gas (CNG)/liquid petroleum gas (LPG) that emit less CO₂ than conventional fuels. While electric vehicles currently garner significant attention, it must be reiterated that they are still a long way from gaining a major market share. Several competing technologies in this field (battery electric vehicles with and without range extenders, fuel cells, plug-in hybrids) are under development and will cover different customer requirements. Nevertheless it is expected that by 2020-2025, a maximum of 3-10% of the vehicle market will be electrically chargeable vehicles. CO₂ savings will be maximised if the well-to-wheel impact is clearly addressed at all stages of the fuel and energy chain. Low carbon energy (such as renewables) is key to realising the full CO₂ savings potential.
- **Improved use of the mobility network.** Consumers should be given the option to combine the modes of transport that best fit their individual mobility needs (co-modality). This will automatically lead to the most cost-efficient approach. The automotive industry is contributing its share by developing new vehicle concepts and technologies (e.g. small, light weight vehicles, driver assistance systems, vehicle-to-vehicle communication tools to help prevent traffic jams, etc.). Obviously, this requires an integrated approach that includes contributions from the other stakeholders in the transport sector such as customers, infrastructure providers, governments and standardisation bodies to become as effective as possible.

AmCham EU urges policy makers to support these efforts through realistic targets based on technology neutral considerations and long-term stability in the regulatory framework in order to facilitate the extremely long development cycles in this field. In addition, the automotive industry suggests support for R&D and market implementation in the fields where a wider market penetration is desired but cannot be achieved through market forces alone.

ix. Aviation Industry

Aviation is a part of the transport mix and a major part of the emission reduction debate. Aircraft manufacturers are contributing solutions such as building more efficient airplanes and delivering incremental technology improvements. New emissions-reducing technologies, such as new generation engines and composite materials, play an important role in this process. However, it is critical that governments implement operational procedures that allow for efficiency gains. Bringing about the Single European Sky (SES) through the Single European Sky ATM Research (SESAR) Programme will reduce the environmental impact of flights through better routing. In this regard, AmCham EU supports the urgent message of the Future of Transport White Paper for the need to complete the Single European Sky and fully deploy SESAR.

Sustainable biofuels will play a central role in addressing emissions from aviation. While the technology of flying aircraft on 50% biofuels was successfully demonstrated during a number of test flights, and the approval of biofuels for use in commercial aircraft was recently granted, major barriers to the commercialisation and use of sustainable aviation biofuels remain. To address these barriers we suggest:

- **Practical guidelines.** Clarification is needed on how to implement the ‘zero rating’ provision for biofuels in the aviation Emission Trading System (ETS) Directive in a manner that is consistent with the way the aviation fuel distribution system works. We support a purchase-based methodology as indicated by the Regulation on ETS Monitoring and Reporting.
- **A single consistent framework.** Integration of existing instruments including R&D and incentives into low carbon vehicles and fuels into a consistent framework would allow all carbon reduction technologies to compete on an equal basis. This would enable investors to respond to demand for sustainable aviation biofuels.
- **Globally harmonised standards to ensure that sustainability criteria are equally applied across the industry.** A patchwork of standards would inhibit the development of a commercially viable market.

x. The Built Environment

Making the most of policy measures that promote energy savings at an early stage is essential if the EU is to putting Europe on track to deliver its 20% energy efficiency target by 2020 and its ambitious Roadmap objectives. AmCham EU supports policies that will increase renovation rates for existing buildings. Due to the long life of buildings, these measures need to be in place as soon as possible. Clear distinction needs to be made between measures to reduce consumption, to reduce carbon and to reduce stress on distribution systems.

The public sector should lead by example. Public buildings are a very visible part of the European building stock and the public sector renovation target of 3% annually is a good start. However, such a target is needed for all existing buildings. AmCham EU calls on Member States to set ambitious renovation targets at national level. We suggest that the EU lead this effort starting with renovation plans for its own buildings in Brussels, Luxembourg and Strasbourg. During residential or commercial renovations, distributed intelligence must be encouraged to facilitate the more rapid and effective adoption of Smart Grid and distributed generation.

AmCham EU welcomes the European Commission's proposal to bring forward legislation to overcome barriers to Energy Performance Contracting (EPC) in the EU Member States. All Member States should integrate measures to encourage Energy Service Companies (ESCOs) in their energy efficiency action plans; it should no longer be an option. This provision must be strengthened during the legislative negotiations on the Energy Efficiency Directive (EED).

It is essential to raise awareness in the public and private sectors for energy performance contracting, and to address accounting and budgeting rules that can prevent or discourage EPC. Ideally, an ESCO contract should last over multiple years (e.g. 10 years or more) with no upfront investment costs and aim at existing building stock where the biggest energy saving potentials can be found. AmCham EU supports financial incentives for energy efficiency investments, as there are many market barriers and disincentives for such investment, particularly in the building sector. We support further energy efficiency funding through the Cohesion Policy Funds. We encourage increasing the percentage of funds that can go to projects delivering energy efficiency improvements, but the EU should also focus on making Member States fulfil their objectives, by making it mandatory to spend a specific part of the funding on energy efficiency.

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AmCham EU speaks for American companies committed to Europe on trade, investment and competitiveness issues. It aims to ensure a growth-orientated business and investment climate in Europe. AmCham EU facilitates the resolution of transatlantic issues that impact business and plays a role in creating better understanding of EU and US positions on business matters. Aggregate US investment in Europe totalled €1.4 trillion in 2009 and currently supports more than 4.5 million jobs in Europe.

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