

## EPPSA Position Paper on the European Commission's Energy Roadmap 2050



European Power Plant Suppliers Association



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*The European Power Plant Suppliers Association (EPPSA) is the voice, at European level, of companies supplying power plants, components and services. EPPSA members, located throughout Europe, represent a leading sector of technology with more than 100 000 employees and annual revenue of over €30 billion. EPPSA actively promotes technologies for highly efficient and sustainable power generation in a carbon constrained world. EPPSA believes increased investment in Research, Development and Demonstration is a key factor in driving EU competitiveness as well as ensuring affordable near zero emission power supplies.*

***Virtually all power plants in the EU are built by members of EPPSA, or equipped with their components.***

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EPPSA – The European Power Plant Suppliers Association – EPPSA a.i.s.b.l.  
Avenue Adolphe Lacomblé 59/8 | 1030 Brussels | Belgium  
[info@eppsa.eu](mailto:info@eppsa.eu) | Tel: +32.2.743.29.86 | Fax: +32.2.743.29.90  
[www.eppsa.eu](http://www.eppsa.eu)

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## Executive Summary

This paper is a response from the European Power Plant Suppliers Association (EPPSA) to the European Commission's Energy Roadmap 2050, a paper providing a practical, independent and objective analysis of different pathways to achieve a low-carbon economy in Europe. It looks at how the EU energy system can be decarbonised by 2050 in line with the energy security, environmental and economic goals of the EU. In this context, EPPSA sees an important role for flexible and efficient power generation in a low-carbon energy system.

### **AN OPEN, FAIR AND COMPETITIVE MARKET**

The European Union pursues a competition policy which should lead to undistorted competition within the Single Market by ensuring that all technologies compete equally and fairly on their merits. Competition results in several advantages e.g. affordable prices for consumers and businesses, and is a decisive factor for innovation. Therefore, there is a necessity for a compatible, fair and standardised regulatory framework for the policy on decarbonisation of the energy sector.

Increased prosperity has led to increased consumption of energy. This challenges the security of supply and sustainability of the energy system. The solution is to have well-balanced market conditions for all generation technologies.

EPPSA calls for the urgent implementation of an open, fair and competitive energy market. It is essential to correct the current policy framework and ensure a level playing field for all low-carbon energy technologies. A successful demonstration of available technologies is a precondition for commercial deployment; supplemented with a secure environment for long-term investment. EPPSA favors the demonstration of new technologies and a wide dialogue including all possible stakeholders so as to provide better information for these technologies.

## **ENERGY EFFICIENCY**

Energy efficiency has to take over the substantial part of the CO<sub>2</sub> reduction as Carbon Capture & Storage (CCS) is delayed. The EU has been committed to the strategic of energy efficiency direction by launching the Action Plan for Energy Efficiency and the Energy Efficiency Directive. EPPSA also believes that the target of a

20% reduction in primary energy use compared to projected levels can be mainly achieved by improving energy efficiency. This includes both the efficiency on generation and consumption of energy. EPPSA calls for the implementation of a deadline for power plants to reach a minimum efficiency standard. A successful finalisation of programmes including monitoring would raise the average efficiency for power generation in the EU.

## **THE IMPORTANCE OF FOSSIL FUELS AND CCS TECHNOLOGY**

EPPSA encourages the European Commission to have a close monitoring of consumption development. This will be followed by strategic adaptation since the demand must equal supply at all times. For the above to be implemented, it is important to respect the triangle of renewable energy sources, back-up power provided by fossil fuels and energy storage. To this direction, EPPSA encourages the idea that flexible, conventional plants are an ideal partner to renewable energy sources. Fossil fuels will remain on the foreground of electricity generation and energy consumption until 2050 and beyond. Consequently, it is indispensable to make coal-fired power plants cleaner. It is vital that a fossil-fuelled power generation plant should be equipped with CCS because this technology is seen as one of the most promising solutions to reduce CO<sub>2</sub> emissions. EPPSA urges the European Institutions to seriously consider the soonest possible deployment of CCS to meet climate targets and to encourage European industry to continue their efforts to develop and deploy this technology.



## Introduction

This paper is an initiative of the European Power Plant Suppliers Association (EPPSA). EPPSA is the voice, at European level, of companies supplying power plants, components and services. Almost all existing Power Plants in the EU have either components from or were built by EPPSA Members.

EPPSA welcomes European Commission's decision to launch the Energy Roadmap 2050, an initiative that shapes a vision and strategy of how the EU energy system can be decarbonised by 2050.

This paper intends to develop for the reader a more complete understanding of the major importance of conventional power generation in the energy mix and how it can contribute to a sustainable, energy efficient system resulting in global competitiveness of the European industries and offer end-user affordable electricity prices. This should be done by partnering Renewable Energy Sources, fossil fuelled power plants, energy storage and demand side management.

The approach is done in three steps: An open, fair and competitive market, energy efficiency and the importance of fossil fuel and more particularly of the CCS technology. EPPSA believes this approach will contribute to the set climate objectives of the European Commission for 2050.

## The Three Essential Steps

### 1. An open, fair and competitive market

EPPSA shares the belief of an open, fair and competitive European market in which low-carbon technologies such as Carbon Capture & Storage (CCS) play a significant role in reaching the objectives set. The open access to a competitive market is one of the paramount aims of the founding fathers of the European Community. The European Union (EU) pursues a competition policy intended to ensure undistorted competition within the single market (EC, 1957). Therefore, there is a necessity for a compatible, fair and standardised regulatory framework for the policy on decarbonisation of the energy sector in Europe by 2050. Competition is the decisive driver of performance and innovation. Companies do not want to lose market share thus new ideas tend to flourish. It is a beneficial market design because it provides a wide range of products at affordable prices.

It is a fact that the increased prosperity of people, industries and economy has led to a significant increase in energy consumption providing more comfort. However, at the same time, this challenges the security of supply and the sustainability of the energy system (part 1, p6 EC, 2011). The Energy Roadmap 2050 acknowledges that the current energy system is unsustainable due to lack of security of supply and competitiveness risks related to high energy costs and underinvestment (part1/p7, EC, 2011). There is not a single adequate energy source that is abundant and has no drawbacks. Thus all available technologies are needed to generate electricity according to demand. Flexible sources of generation can provide the additional load required by the intermittency (U.S. Department of Energy, 2011).

EPPSA believes that in order to boost competitiveness and to provide adequate security of supply at the same time, the solution is to have well-balanced market conditions for all generation technologies. In other words, when a technology reaches maturity, subsidies should be eliminated. EPPSA acknowledges the justified significance of applying subsidies in generation technologies that need to be protected. The subsidies should be there to move technology forward into commercial demonstration and subsequently to grid parity. They should lead towards competition establishment and therefore to lower the prices of electricity for industrial, household and services consumers. It is obvious that the EU should carefully manage subsidies and feed-in tariffs in order not to impose further burdens that can distract from leading to competition and cost-reduction. This call becomes even more imperative if we take into account what the Energy Roadmap 2050 indicates: by 2050 average electricity prices will increase by 33.8% according to the best case scenario (Diversified Supply Technologies)- from 109.3 €/MWh in 2005 to 146.2 €/MWh in 2050 (part1, p38, table 10, EC, 2011).

A well-functioning internal market would be vital to encourage investment where it is most cost-effective. To this direction, we strongly encourage the statement of the Roadmap concerning what is of added-value for the EU: *“from an economic perspective, many energy system developments can best be achieved on an EU-wide basis, encompassing both EU and Member State action while respecting their respective competencies. An EU wide market can facilitate the balancing of the electricity system ... and encourage RES production where it economically makes most sense. Large scale investments require big markets which also justify one EU wide approach”* (part 1, p20, EC, 2011). The challenge is not only to achieve a sustainable and secure low-carbon energy mix in a competitive market but to convince civil society that this is an attainable objective. The widest possible debate among the European public will be necessary for energy transition. EPPSA believes the Roadmap can be effective in launching this dialogue, but it must promote engagement at every level –personal, community, regional, national, at EU level. The EU should take the responsibility to lead the global decarbonisation of the energy system, along with policies and actions that do not jeopardize the competitiveness of the global market so they must be aligned with global action.

In conclusion, EPPSA calls for the urgent implementation of an open, fair and competitive energy market that will lead to the substantial decarbonisation of the energy sector by 2050 and at the same time will provide cost savings without threatening the sustainability and the security of supply. To achieve this, we need all generation technologies to be used in a fair and competitive way. It is also of paramount importance to have limited subsidies or only until a break-even point. To this direction, the EU should be open to integrate each generation technology and Member States should be flexible enough to choose according their own potential, their own resources. It is therefore essential to correct the current policy framework with additional financial incentives and ensure a level playing field for all low-carbon energy technologies. A successful demonstration of available technologies is a precondition for commercial deployment, but without a secure environment for long-term investment demonstration projects will not happen. Apart from this, investments are vulnerable to public non-acceptance: public skepticism often greets new technologies. Public acceptance is a key to successful technology implementation. EPPSA favors the demonstration of new technologies and a wide dialogue including all possible stakeholders so as to provide better information for these technologies.

## 2. Energy Efficiency

Energy efficiency has to take over the substantial part of the CO<sub>2</sub> reduction as the commercial availability of CCS is delayed, to be started now. Roadmap 2050 also highlights the importance of energy efficiency: *“a substantial speeding up of energy efficiency improvements from historical trends is crucial for achieving the decarbonisation objective... a key ingredient in all the decarbonisation pathway”* (part 2, p10, EC, 2011). The EU has been committed to the strategic of energy efficiency direction by launching the Action Plan for Energy Efficiency and the Energy Efficiency Directive. EPPSA also believes that the target of a 20% reduction in primary energy use compared to projected levels can be mainly achieved by improving energy efficiency. This includes both the efficiency of generation and consumption of energy.

A resource-efficient Europe is a flagship initiative of Europe 2020 strategy. Efficiency is particularly important for energy sources which are limited such as coal and gas because intensive use of these resources threatens the security of supply (EC, 2011a). If the industry is encouraged to develop and deploy high efficient technologies then resources are saved, production costs are reduced, import dependency is lowered, export capability of the European Power Industry is supported and this is essential to survive in the difficult global market environment. Until 2030 about 65 to 75% of the consumed electric energy will be produced by conventional technologies: nuclear and fossil primary energy sources assure our energy supply, the fossil part however will emit CO<sub>2</sub>. Apart from the positive decarbonisation impacts, energy efficiency provides significant gains from an economic point of view. Energy efficiency contributes significantly to cost reduction in power generation: fuel prices will rise depending on a large number of influences including political decisions, natural disasters and political conflicts. A reasonable improvement of generation efficiency is therefore necessary to compensate such uncertainties as much as possible. According to research, reducing EU greenhouse gas emissions by just 75% by 2050, without the strong investment drive in energy efficiency would push the total cost of energy up by an additional 2% of GDP (Eurelectric, 2010).

For the aforementioned reasons energy efficiency should be effective. The NO<sub>x</sub> reduction programme applied in various EU member countries during the eighties and nineties and can be taken as a model. EPPSA calls for the implementation of a deadline for power plants to reach a minimum efficiency standard. A successful finalisation of the programme would raise the average efficiency for power generation in the European Union. Energy efficiency can be monitored and achieved through CO<sub>2</sub> ELV's. Roadmap 2050 states that the importance of electricity will almost double from current levels to become the most important final energy source (part 1, p27, EC, 2011).

The crucial issue for any decarbonisation strategy is therefore the full decarbonisation of power generation. In this respect, improving energy efficiency is substantially supporting the transition and in any case the way of no regret.

### 3. The Importance of Fossil Fuels and CCS Technology

As Energy Roadmap 2050 states (part 1, p26, EC, 2011) a significant reduction in primary energy consumption is expected under all decarbonisation scenarios, a decrease of 32–41% by 2050 compared to 2005. This will come as a result of energy efficiency policies and smart grid deployment. EPPSA encourages the European Commission to have a close monitoring of consumption development which will be followed by strategic adaptations so as the demand to be covered by supply at all times. For the above to be implemented, it is important to respect the triangle of renewable energy sources, backup power provided by fossil fuels and energy storage. In case the required storage capacity is difficult to be realised, it is important to have more fossil fuel based capacity in order to maintain system security. To this direction, EPPSA encourages the idea of flexible, conventional plants being an ideal partner for renewable energy sources. As Energy Roadmap 2050 utters, fossil fuels, according to all scenarios, will have a significant share in electricity generation by 2050 (part 2, p22, table 26, EC, 2011). Back-up power stations are needed even in 2050, especially if nuclear technology would be phased out. At the same time, their equivalent percentage in primary energy consumption will fluctuate between 34.8% and 51.6% (part 1, p26, table 5, EC, 2011). It is clear from the above that fossil fuels will remain in the foreground of electricity generation and energy consumption until 2050 and beyond. Coal, probably being the most CO<sub>2</sub> emitting fuel for power generation, still has strong reserves and some countries such as Poland and Germany deeply rely on this resource. Moreover, coal has the advantages of being easy to store, transport, convert and is economical. For these reasons, the power generation industry will surely continue to burn fossil fuels, especially coal, within the next decades. That is why it is essential to make coal-fired power plants cleaner (Kerlero de Rosbo, 2010).

In this context, for the reliable, low-carbon, demand following generation of electricity, it is vital that a fossil-fuelled power generation plant should be equipped with CCS. Carbon Capture and Storage (CCS) technology is seen as one of the most promising solutions to reduce CO<sub>2</sub> emissions. The importance of CCS to address climate change is highlighted by the IEA's Energy Technology Perspectives 2010 which shows the technology deployment needed to cut CO<sub>2</sub> emissions by 50% by 2050. This work indicates that CCS is expected to contribute to 19% of the total emissions reduction in 2050, resulting in annual emissions reductions from CCS of over 8 GtCO<sub>2</sub> in 2050. According to the Roadmap 2050, CCS as a credible and commercially viable technology could lead to a lower additional annual average total cost by 0.26% of GDP compared to the reference scenario (part1, p41, table 12, EC, 2011). The inclusion of CCS in a portfolio of emission reductions' initiatives is also the lowest cost approach to delivering emission reduction goals. The IEA found that attempting to reduce emissions without CCS drove up the costs of cutting CO<sub>2</sub> by over 70%.

CCS is essential if we are to cost-effectively stabilise GHG concentrations in the atmosphere at an acceptable level and meet the reduction targets by 2050.

Roadmap 2050 indicates the high importance that CCS will have in all decarbonisation efforts by 2050. However, as described by all decarbonisation scenarios (part 2 p28, EC, 2011), this is not happening necessarily before 2030. This delay in full deployment of CCS will hamper the achievement of climate targets. Furthermore, this delay will provide a major setback to investment incentives not only for CCS but also for other technologies. With this in mind, EPPSA urges the European Institutions to seriously consider the soonest possible deployment of CCS to meet climate targets (the major part of electricity will be generated through fossil fuels until 2030) and to encourage European industry to continue their efforts to develop and deploy this technology. Otherwise, this technology will die out in Europe and will be supplied from abroad if needed in the future. This will be a further detriment to the export capability of European industry. Indeed, the IEA CCS roadmap shows also that a great deal needs to be accomplished in the next 10–15 years if CCS is to make a meaningful contribution to global GHG reduction efforts by 2050 (IEA, 2010). However, EPPSA points out that CCS technology is already in demonstration at several sites around the world. We expect their scale-up and commercial availability by 2015. Deployment of CCS facilities at all new fossil-fuelled power plants will be needed by 2020 in order to avoid further detrimental accumulation of CO<sub>2</sub> in the atmosphere. The feasibility of the earlier implementation of CCS has been pronounced by Commissioner of Energy Günter Oettinger who stated that *“by 2015 the demonstration plants can run on a larger scale and by 2020 the new technology (CCS) can be commercially competitive”* (Oettinger, 2011).

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EPPSA expresses its strong concerns related to the lengthy procedure of implementing CCS. Urgent actions need to be taken because:

As the EU is far from reaching its 20% objective for GHG emissions reductions, CO<sub>2</sub> emissions from fossil fuel plants must be cut in order to meet the 2020 targets set by the EU. This should be done as soon as possible and can be done through deploying CCS.

To meet the target of stabilising concentrations at 450 ppm CO<sub>2</sub>, CCS will have to be deployed much earlier than 2030. According to an OECD research, for achieving the ambitious climate stabilisation goals, the implementation of the least-cost already available solutions should start immediately (OECD, 2008).

If the EU does not apply this technology soon, there are credible concerns that European industry will fade out and will be overtaken by other regions in due course. This will hamper European technology know-how and most probably will seriously harm the export ability of European industry as BAT for the world will come from Asia, where there is a better regulatory environment for research, development and demonstration.

EPPSA is also concerned about the social impact that this degradation on the European industry may have. In case BATS are coming from outside Europe, we fear that this will have a negative implication to the employment and will further deteriorate the quality of jobs. Having in mind that CCS lacks of public acceptance, EPPSA fully supports the need for a better communication with the concerned public and stakeholders concerning the possible dangers the delayed CCS deployment has.

To this direction, EPPSA enthusiastically supports the European Council agreement of 2007 to stimulate the construction and operation of a set of CCS demonstration projects by 2015. The European Union portfolio of demonstration projects is an initiative aiming to unite public and industrial efforts in the common goal of advancing the large-scale deployment of CCS. It is considered feasible that by 2020, or soon afterwards, CCS will be functional in an Emission Trading Scheme (ETS)-driven system. The European Commission has established a strategy to support the development of these CCS demonstration projects, including the launch of a European Industrial Initiative on CCS and the co-financing of up to seven large-scale projects through the European Energy Programme for Recovery.

Three main issues still remain to be resolved in order to ensure CCS technology deployment: financial competitiveness, regulatory framework definition and stability, and socio-political acceptance. As sources of uncertainty, these issues linked to the innovative status of the technology are also critical threats to any CCS project's completion and need to be addressed.

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EPPSA  
European Power Plant Suppliers Association  
Avenue Adolphe Lacomblé 59  
B-1030 Brussels  
Phone +32 2 743 29 86  
Fax +32 2 743 29 90  
[www.eppsa.eu](http://www.eppsa.eu)