



Transparency Register

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As the second largest power player in Europe for installed capacity, and one of the developers of early CCS demonstration projects, Enel Group welcomes this consultation and wishes to provide its contribution to the debate.

Executive summary

- **Decarbonization in Europe is possible and CCS is one of the main enabling conditions**

The role of the power sector in decarbonization is essential as its emissions account for over 35% of total EU emissions. Moreover, electricity has the potential of substituting other fuels on the demand side, thus contributing to the decarbonization of the rest of the economy. Analyses from the European power sector show that decarbonization in the EU (e.g. reduction of 80-95% of GHG emissions by 2050 vs 1990 level) is possible under certain conditions. One of the most important is the wide-scale availability of CCS after 2030 (Eurelectric, 2013¹).

- **Progress has been made but there still remain barriers to be overcome**

Europe is highly supportive of CCS and in some Countries there have been significant developments in the last years to foster this technology. Despite the progress made, however, the EC policy objective of having up to 12 commercial-scale demonstration plants operating in Europe by 2015 is no longer achievable, with 4–5 projects operating in the next 5–6 years being a more realistic scenario. The main barriers we see at the moment are, in order of importance: i) **no business case** for the power industry: CCS is presently far from being a commercially viable activity and its cost-competitiveness would be based on a carbon price well above current levels and expectations; ii) **lack of regulatory framework**: Dir.2009/31/EC provides a solid framework for CCS but delays with the transposition at Member State level and some specific provisions such as the modalities of handover of responsibilities to Member States ended up to increase uncertainties and perceived risk for project operators; iii) **lack of public funding**: both the NER300 and EEPR programs have proven to be insufficient to support the CCS deployment in the EU and the additional financial support promised by governments was made available only in a couple of cases (the Netherlands and the UK; iv) **lack of public acceptance**: CCS is still surrounded by a climate of suspicion in the EU public opinion especially due to limited knowledge.

¹ Power Choices reloaded, available at http://www.eurelectric.org/media/79057/power_choices_2013_final-2013-030-0353-01-e.pdf



- **The EU ETS is the best policy option to support all the low carbon options**

We are in favor of market approaches and still believe the EU ETS should remain the cornerstone of the EU climate and energy policies. In our opinion the most efficient way to achieve a low-carbon economy by 2050 is to adopt a technology-neutral policy approach based on unambiguous and firm CO₂ price signals. This is why we advocate for the EU ETS to be revised as soon as possible through both a short-term fix such as backloading and a long-term structural reform including an increase of the annual reduction of the cap and a quantity-based supply adjustment mechanism (see *our responses to the EU consultations on review of the auction time profile for the EU ETS – closed on February 28, 2013 - and on structural options to strengthen the EU ETS – closed on October 16, 2012 - respectively*).

- **A proper regulation is required to accelerate the CCS market readiness**

CCS is a technology at the early stages of being scaled up to full-scale projects. Costs still remain prohibitively high and the carbon price alone is not sufficient to drive the levels of investment that are required. If the EU attaches a strategic value to CCS, financial support is necessary to allow for the technology to become commercially viable. We propose to establish a “**first-of-a-kind**” fund targeted to cover the financial risk of the early movers investors in low-carbon technologies including CCS, innovative renewables, smart grids. As for CCS such a fund should be able to cover a limited number of projects addressing different types of technologies and characteristics occurring across Europe.

- **A few large-scale projects should be realized by means of industrial partnerships**

An open paradigm should be implemented to further develop CCS technologies, driven by open, cost-effective and spread access to the technology. To this aim industrial partnerships, consortia, etc. should be fostered to help concentrating efforts by operators on a few large-scale projects (instead of multiple projects).

Consultation questions

1) Should Member States that currently have a high share of coal and gas in their energy mix as well as in industrial processes, and that have not yet done so, be required to:

a. develop a clear roadmap on how to restructure their electricity generation sector towards non-carbon emitting fuels (nuclear or renewables) by 2050

b. develop a national strategy to prepare for the deployment of CCS technology



We believe the EU regulator should work to set a common European framework of climate and energy policies, compatible with the completion of the Internal Energy Market, leaving Member States free to select the priorities that fit the national energy and industry agenda at best. The definition of clear national strategies consistent with the EU policies should give a “plus” in particular whenever the EU support is granted through funding.

2) How should the ETS be re-structured, so that it could also provide meaningful incentives for CCS deployment? Should this be complemented by using instruments based on auctioning revenues, similar to NER300?

In our view the EU ETS should remain the cornerstone of the EU climate and energy policies and therefore continue to be the main policy option to foster all low-carbon technologies including CCS. We strongly advocate for the EU ETS to be revised as soon as possible, through both a short-term fix such as backloading and a long-term structural reform including an increase of the annual reduction of the cap and a quantity-based supply adjustment mechanism (see our responses to the EU consultations on review of the auction time profile for the EU ETS – closed on February 28, 2013 - and on structural options to strengthen the EU ETS – closed on October 16, 2012 - respectively).

However technologies like CCS being not commercially viable are evidently not suitable to be supported by a market approach, at a time when the carbon price is significantly lower than what was expected at the moment the EU ETS was designed.

According to IEA estimates, cost competitiveness of CCS should rely on a carbon price ranging from €30 to €100/tCO₂ stored². Moreover IEA reported that the current cost of capture (without transport and storage), based on existing technical engineering studies, is in the order of 40 €/tCO₂³ avoided for coal power plants and 80 €/tCO₂ avoided for natural gas power plants.

In such a context our view is that CCS needs to be supported with accompanying measures, additional to the EU ETS. Many regulatory policies have been proposed so far but most have in common i) the potential of being distortive per se for the carbon market or at least ii) the need of being carefully managed to prevent mutual influences (see also question 3).

We support the establishment of funding programmes and namely a **“first-of-a-kind” fund** targeted to cover the financial risk of the early movers investors in low-carbon technologies including CCS, innovative renewables, smart grids. As for CCS such a fund should be able to cover a limited number of projects addressing different types of technologies and characteristics occurring across Europe in terms of, e.g., available storage reservoirs. We recommend that funds be conveyed, as well as operator efforts, towards few large-scale projects, relying on an open paradigm to spread access to the technology. To this aim promoting also technology partnerships and industry consortia could be advisable.

² “World Energy Outlook” IEA, 2012, “Cost and Performance of Carbon Dioxide Capture from Power Generation” working paper IEA 2011, available at: http://www.iea.org/publications/freepublications/publication/costperf_ccs_powergen-1.pdf, “A policy strategy for carbon capture and storage” Information paper IEA 2012

³ This assumes a pulverized coal plant operating as base load. The cost in USD is 55. Assumed currency exchange rate of 1\$ being equivalent to 1.298 €. The 55 USD/ton estimate is in line with estimates by the European Technology Platform for Zero Emission Fossil Fuel Power Plants, which estimated a range of 30- €40/tCO₂ avoided cost. Natural gas CCS would need a carbon price of around 90€/tCO₂.



Auctioning revenues could certainly be used to feed the fund and we hope that the expected ETS reform can soon create a framework for this contribution to be significant.

3) Should the Commission propose other means of support or consider other policy measures to pave the road towards early deployment, by:

a. support through auctioning recycling or other funding approaches

b. an Emission Performance Standard

c. a CCS certificate system

d. another type of policy measure

We are in favor of option "a" (see question 2) but do not support neither EPS nor CCS certificate systems.

The debate in the UK concerning the proposal of an Emissions Performance Standards (EPS) for coal-fired power stations in the framework of the electricity market reform showed that EPS could have a number of negative and unintended consequences. By removing the option of investing in coal-fired power stations a European EPS could undermine the principle that Member States are exclusively responsible for their energy mix, and the right for utilities to develop balanced portfolios of plants. This will ultimately impact on energy security as well as on electricity prices for consumers.

The example of California, mentioned in the consultative communication is also interesting. The EPS of 500 gCO₂/kWh (proposed under the Clean Air Act) is applicable for new power plants and is unfeasible at reasonable costs, from currently operating plants. One of the strongest criticism that has been raised is that the provision will encourage operators to indefinitely extend the life of existing coal plants, with no results in promoting CCS and reducing emissions.

Concerning a CCS certificate system, we are convinced this system is not suited to be applied in Europe because there would be, at best, only a limited number of plants equipped with CCS on the supply side and a huge number of companies on the demand side.

4) Should energy utilities henceforth be required to install CCS-ready equipment for all new investments (coal and potentially also gas) in order to facilitate the necessary CCS retrofit?

We think we have to stick to what is envisaged in both CCS and IED Directives (Dir. 2009/31/EC and Dir.2010/75/EC). All combustion plants should have suitable space on the installation site for the equipment necessary to capture and compress carbon dioxide provided the following conditions are met: suitable storage sites are available, transport facilities are technically and economically feasible, it is technically and economically feasible to retrofit for carbon dioxide capture (art.36 IED).

5) Should fossil fuel providers contribute to CCS demonstration and deployment through specific measures that ensure additional financing?



Fossil fuels providers share responsibilities in generating CO₂ emissions with fossil fuel users and therefore we agree in principle with this proposal. However, implementation details should be further investigated.

6) What are the main obstacles to ensuring sufficient demonstration of CCS in the EU?

As far as CCS is concerned, we believe the following barriers still remain to be overcome, listed in order of importance:

1. no business case for the power industry
2. lack of regulatory framework
3. lack of public funding
4. lack of public acceptance

CCS is not presently a commercially viable activity and still remains out of the money for the power industry in the near term (see also question 2). On the technology side, implementation of CCS on commercial scale presents significant “early movers” risks which prevent manufacturers from providing fixed prices or performance warranties before the technology is proven at scale. Since energy penalties at scale are expected to be unaffordable, CCS deployment seems more likely in the short term for industry with lower cost of capture such as natural gas extraction, fertilizer, synfuels and ethanol production.

These factors are made even more decisive by the recent collapse of the EU ETS price. As previously said, feasibility of CCS was anchored to a CO₂ price in the range 30 -100/€tCO₂ stored well above the current one.

While developing the appropriate conditions that would ensure the business case for CCS, there is a risk of loss of storage capacity. To avoid this situation early movers should be incentivized to retain the storage capacity available for CCS. In this sense additional safeguards regarding research/storage permits, compared to those provided in the CCS Directive, should be established.

EEPR and NER300 funding programs have also not delivered as expected. Phase 1 of NER300 awarded over €1.2 billion (out of the €1.5 billion available, 200 million EUAs) to 23 innovative RES projects with no CCS projects being awarded, despite the 13 that had applied. Member States were unable to confirm the projects for various reasons including “funding gaps” and problems with projects not being “sufficiently advanced to allow for confirmation within the timeframe of the first call for proposals”.

Phase 2 of NER300 now covers the equivalent of 100 million EUAs to be added to approximately € 288 million remained unspent from NER300 phase 1. If nothing substantial changes in the next months to build confidence in project developers, it is very likely that, once again, no CCS project will be selected.

The delay in the transposition of the CCS Directive at Member State level has also contributed to cause problems for several CCS demonstration projects. Moreover the Directive, although necessary condition to develop a comprehensive regulatory framework, did not solve issues like the attribution of responsibilities between authorities and project developers.



Public perception and acceptance are other significant barriers for CCS. CCS is in many cases perceived in opposition to the renewable energy sources and benefits of CO₂ abatements were often overcome by an over-estimation of the environmental risks.

7) How can public acceptance for CCS be increased?

Public acceptance is a key factor for successful implementation of CCS. Lessons learned in this and other environmental fields suggested that stakeholders characterization and engagement is necessary from the initial stages of project development in order to enable their participation in key project decisions, namely those with relevant impact on the territory such as the transport and storage configuration.

The communication campaigns performed by project developers, focused mainly on the acceptability of specific projects, must be supported by effective communication and outreach programs promoted by local, national and European institutions, associations and civil society groups aimed at developing awareness of the technology itself and climate change related topics. In terms of the content, when communicating CCS, it is important to focus not only on the technology itself but on its contribution to the de-carbonization of the economy and thus to a balanced energy mix which necessarily includes also renewable and other energy sources. However it is crucial not to associate CCS only with further development of coal plants as the technology can be implemented also to the gas and other fossil fuel power plants, but also to the gas refineries and other industries in order to mitigate CO₂ emissions.

A full access to the environmental information should be ensured during the operation of CCS projects seeking active involvement of different stakeholders including but not limited to researchers, local administrators, citizens organizations in monitoring committees.

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