

Consultative Communication on the future of Carbon Capture and Storage in Europe

- 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

Not necessarily.

The current Climate&Energy Package has set targets for carbon reduction, increased renewable penetration and improved efficiency performance. These targets are the prime and successful driver for decarbonisation of the electricity sector. Next to this, the Energy Roadmap 2050 sets the direction of travel beyond 2020. It is the market that will need to deliver the required changes in the electricity generation. A national roadmap dictating the shape of these changes could distort the market and could cause suboptimal decisions.

The model of target setting should be kept as prime driver and extended to 2030 with a new set of binding targets.

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

Yes. The necessity of CCS to achieve the 2050 objective for carbon reduction is underlined in many reports, most notably the International Energy Agency's analysis suggesting CCS will contribute around one-fifth of required emissions reductions in 2050. The objective of 80-95% carbon reduction requires a fully decarbonised electricity sector.

CCS on coal has already been identified as essential, with restrictions on unabated coal in place. While fuel switching to gas will contribute to short term carbon reductions, gas is expected to provide reliable, firm generation capacity into the 2030s and beyond. If significant amounts of unabated gas generation are running at relatively high load factors in the 2030s then it will be extremely challenging to meet 2030 power sector decarbonisation ambitions and subsequent 2050 binding carbon reduction targets.

For example, even in a scenario in which half of all the UK's electricity output is zero carbon and the other half is highly efficient gas generation, then it will still be challenging to decarbonise the power sector much below 150g/kWh. This illustrates the importance of developing CCS on gas and ensuring there is suitable economic support in place for its deployment as well as appropriate incentives in place for other low carbon technologies.

National, or even European strategies, for the development of CCS can be an important measure in addition to the above. Such strategies should in particular support the development of shared offshore storage and transport facilities.

- 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?

The ETS is not functioning at the moment. The price incentive is too small. It is important to fix the ETS quickly and thoroughly to make long-term climate policy work.

All structural measures to fix the ETS that are currently being considered will have an effect on the carbon price. This price effect needs to be substantial in order to fully incentivise CCS.

CCS however requires large scale demonstration before it can be widely deployed at commercial scale. Such demonstration of first of a kind CCS projects will not be able to rely on the carbon price, certainly not in the near or medium term . As such, alternative capital and operating support in the area of RD&D, like the NER programme, or other contractual arrangements such as loan guarantees, risk-sharing instruments or tax breaks/rebates which can help to reduce investment risks for CCS developers and make financing easier, are of the utmost importance if CCS is ever to become available on a large scale.

- 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 approaches¹
 - b. an Emission Performance Standard
 - c. a CCS certificate system
 - d. another type of policy measure

All the above mechanisms have their downsides, but could indeed be effective in partially supporting CCS deployment.

a) *Funding similar to the NER mechanism or EEPER package would signal continued support for CCS. Although the ultimate level of funding available under such a mechanism is uncertain, successful projects can be assured of securing the level of funding they require. If this option is pursued then the evaluation criteria for rewarding funding should be revisited as the original NER criteria presents a bias against gas CCS, an application that will be critical for many Member States to achieve their decarbonisation objectives. This can be overcome by focusing on the amount of clean electricity produced instead of the amount of carbon stored.*

b) *An EPS set at a level that requires the installation of CCS should be approached carefully. While this sends a clear regulatory signal, a policy that mandates CCS can only be effective if there are suitable mechanisms in place to bridge the economic gap facing CCS projects. Experience with mandating new coal-fired power stations over 300 MW to demonstrate CCS has shown that this alone does not provide sufficient incentive for developers to install CCS.*

In the UK, the restriction on unabated coal has been implemented through planning legislation and will be “backstopped” in the forthcoming Energy Bill with an EPS set at 450 g/kWh. This restriction alone has not resulted in CCS projects moving forward as they are still limited by the cost and risk of being

¹ Taking into account complementarity with the European Structural and Investment Funds (ESI), as set out in the Common Strategic Framework annexed to the Commission proposal for a Common provisions regulation of the ESI Funds

the first movers on these projects. In Norway, an obligation to fit CCS has the result that no investments in CCGT are made or expected to be made.

Moreover, the EPS has created considerable policy uncertainty for CCGT developers. As it stands, CCGTs will be grandfathered at the EPS in place at the time of consent. This commitment to grandfathering is a critical part of any EPS policy intended to incentivise CCS. Investors must be assured that decisions they take to include or exclude CCS due to the EPS in place at the time of consent will be stable for the lifetime of the plant. CCGTs will be built carbon capture ready in accordance with EU and UK requirements for fossil fuel plants, and such a requirement can support the future implementation of CCS. The decision to retrofit these stations with CCS in the future should be based on economic viability of such a retrofit; it should not be something that is mandated through a change to the EPS.

It must be noted however, that political support for an EU-wide EPS does not exist, which makes opting for this policy tool highly risky.

- c) A certificate scheme is undesirable as it does not provide sufficient price certainty for CCS developers to make investment decisions.*
 - d) A combination of a well-functioning ETS and low-carbon support schemes can provide the correct investment certainty for CCS. The UK's proposed feed-in tariff for CCS is a leading example of a low carbon support mechanism that will give long term revenue certainty to CCS projects. However, before projects can move to a position where support targeted at operational expenditure alone is sufficient, capital grant support will be required to ensure an initial series of demonstration projects can proceed.*
- 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?

In the UK there is already this requirement for both coal-fired generators and for CCGTs. This helps to avoid carbon lock-in, although it can provide a mixed signal if energy utilities do not have certainty about whether they will be required to retrofit CCS over the lifetime of the plant. An example of this is the land that new CCGT developers must procure to meet CCS-ready requirements. This can be a significant cost if the project never retrofits CCS during its lifetime. As such, it is important to ensure utilities have clarity as to whether CCS will be required during a plant's lifetime and/or that sufficient economic drivers are in place to allow utilities to make these retrofit investments.

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

Possibly. The simplest way to control CO₂ emissions overall (including industrial emissions) would be to force a reduction in CO₂ emissions per barrel of oil or oil equivalent, including gas and all other condensates and liquids". The EU could then require primary producers to demonstrate that they captured a proportion of the emissions from their production. This would start at a low number and rise to 100% as cumulative global emissions approached the trillion tonnes that is believed to give a 50% probability of no more than a 2 degree C rise in global temperatures.

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

Return on investment and the business models which involve the joining up of the low return, low risk utilities with high risk, high return oil companies (who have the geological storage expertise). It would be better to break the link and have transport (and maybe storage) regulated as long as storage is not associated with EOR.

The development of shared offshore transport and storage infrastructure can be supported with the correct ownership model. In the UK for example, the regulated companies make a modest profit through a regulated asset value model. Such a regulated asset value model could be used to build CO₂ transport infrastructure and possibly also for storage assets as well.

- 7) How can public acceptance for CCS be increased?

The public accepts CCS when it is done offshore (e.g. Snovit and Sleipner). If CCS projects avoid onshore storage and minimise onshore transport by being located on the coast public acceptance is not anticipated being a problem. Once initial projects have been successful public acceptance is likely to filter down.

Furthermore, SSE would like to raise the following:

- *Section 2 claims that [since 2007] the relevance and importance of CCS has increased. In fact it hasn't, the relative importance of CCS to member states has actually decreased as they struggle to meet their renewable targets. The disappointing result of the first NER round and the cancellation of many of the EEP projects also points to the fact that many member states are struggling to find the capital to finance CCS demonstration.*
- *In section 2.2.2 footnote 14 correctly distinguishes baseload operation from peaking plant (referred to as "Balancing Power"). However, in a UK context many thermal stations run as "mid merit" with load factors of 50-60%.*
- *On p.10 the document correctly points out that European coal assets are 30-55 years old and so nearing the end of their operational lives. It also correctly points out that gas assets are typically <20 years old. However, it implies that the gas assets therefore have a significant remaining operational life. In fact gas assets operational lifespan is typically only 20-25 years vs 30-50 years for a coal asset so many of the European gas assets are nearing their end of operational life as well. Furthermore, the poor profitability of gas generation as reflected in low to negative clean spark spreads has led to the mothballing or closure of many CCGTs.*
- *The document highlights that an EPS may encourage fuel switching rather than CCS construction and yet espouses the benefits of a high carbon price to encourage CCS. This is inconsistent as energy utilities can respond to both a tight EPS and a high carbon price either by building CCS, by switching to lower carbon fuels (or even by reducing load factors), or by investing in low carbon forms of electricity.*
- *The document states that CCS is at a "crossroads" (section 5) This implies that CCS has a choice. In fact CCS may be approaching a cliff edge. CCS needs to be urgently demonstrated i.e. in the next few years, on a commercial scale or companies may not consider the technology in the low carbon equation – turning instead to other forms of low carbon generation*