

The SCOT project's reaction to SET paper 9 on Carbon Capture and Storage and Carbon Capture and Utilisation:

SCOT is a European FP7 project that aims to accelerate the market uptake of Carbon Capture and Utilisation (CCU) products within Europe (www.scotproject.org). As such SCOT is pleased the SET paper is focussing attention on CCU.

The SCOT project is broadly supportive of the SET plan's Issues Paper No.9¹ and we support the objectives and targets set out in the document for CCS.

Feedback on the objectives and targets for CCU

In relation to the objectives and targets focussed on CCU, the document states:

By 2020:

- Completed feasibility studies for the use of captured CO₂ for fuels and value added chemicals;
- At least 4 pilots on promising new technologies for the production of value added chemicals from captured CO₂;

Feasibility studies and pilot projects are highly necessary to accelerate the market uptake of CO₂ utilisation within Europe. However, as the market for CO₂ utilisation products is at an early stage, we would suggest that feasibility studies should not be limited to just fuels and value added chemicals. The creation of building materials for example may also be an interesting market for CO₂ utilisation in Europe. We would therefore suggest amending the text to the following:

- **Completed feasibility studies for the use of captured CO₂ for additional value creation in CO₂ utilisation supply chains e.g. fuels, value added chemicals and mineralisation products**

Similar to the point above, we would suggest that the pilots are not limited to value added chemicals. We would therefore suggest amending the text to the following:

- **At least 4 pilots on promising new technologies that utilise CO₂ to create value added products**

In addition we would strongly recommend that a CO₂ utilisation assessment report is undertaken by each member state within Europe. We would therefore recommend the following text is added:

- **Completed CCU assessment studies, analysing the need for and potential of CCU, for each member state that consider the member state's CO₂ resources, and what they may be able to achieve in terms of CO₂ utilisation by 2030 and 2050.**

General feedback

Encouraging markets that use renewable feedstock is a direct response to the compelling evidence that "smart solutions" are required to enable the transition to a low carbon circular economy and shape tomorrow's world. *Carbon capture and utilization (CCU) (as well as CCS and as bio-based initiatives) is one of the pillars of such a global vision and therefore we applaud the positive attention in the SET paper,*

We agree that CCS, CCU and biobased initiatives are not the same and separating them clearly gives the right focus to each of them. However today, all these initiatives are considered as separated from each other, which is detrimental for achieving a low carbon circular economy.

¹ https://setis.ec.europa.eu/system/files/issues_paper_action9_ccs_ccu.pdf

We therefore recommend a more holistic approach, which systematically build on synergies and complementarities between these initiatives.

Such an integrated approach will ultimately strengthen individual business models thereby contributing to mutual benefits while enabling a more coherent regulatory and policy framework. For instance (not limited to),

- Building CCS infrastructures that will make the deployment of CCU technologies location-independent;
- Using by-products from the bio-based economy as feedstock for the CO₂-based economy will enhance the sustainability of the overall value chain;
- Using CCU technologies to produce biomass feedstock might also contribute to a more sustainable bio-based sector.

Carbon capture and utilisation is a multiple value creation path, ***not limited to EOR***, leading to a wide range of products including added-value fine chemicals, monomers and polymers, synthetic fuels, construction materials and a variety of direct uses in a variety of sectors. In order to understand the contribution of each of these routes to a carbon neutral world, more emphasis must be given to Life Cycle Analysis. **Especially EOR and new synthetic fuels must be analyzed critically to weigh their contribution to a lower emissions world.** This is typified by the phrase in the Set document that states 'Enhanced hydrocarbon recovery, especially enhanced oil recovery (EOR) combined with permanent storage is currently the only available large scale carbon capture and use (CCU) option which would actually remove relevant volumes of CO₂ permanently from the atmosphere.' Which is true – but it is only by due consideration of cradle-to-grave analysis which includes downstream refining and eventual combustion of the additional hydrocarbons that have been recovered, that the actual impact on atmospheric CO₂ can be determined. This approach is necessary for all CO₂ utilisation processes.

As for CCS, as for the bio-based industry, and more generally, as for any new innovative technology, bridging the gap between fundamental and applied research is one of the main barriers towards an industrial-scale deployment. It is crucial to accelerate the time-to-market. This is a multiple step approach.

- The first step consists in advanced R&D to address the technological gaps and to provide pilot-scale level solutions. It mainly involved R&D centers and universities. Enhanced cross-border collaboration must be encourage.
- The second step integrates all aspects of CCU including legal and regulatory, health and safety, the environment, infrastructure and technology. We must therefore establish an optimal portfolio of large-scale demonstration projects involving, if need be, CCS infrastructures, bio-based plants, etc. to kick-start and accelerate the market uptake of CCU products, processes and services. This second step will shed light on overall business models thereby contribute to bringing costs down, to building public confidence and ensure further commercialization of 'smart' technologies.

Altogether, these 'smart solutions' will create new opportunities for economic growth, greater innovation and boost competitiveness, whilst supporting the transition to a circular, low-carbon economy. They can also help to support de-carbonization and resource efficiency agendas, and provide a route to become less dependent on imports of fossil fuels, which helps to safeguard industrial competitiveness. Finally, they will provide a route to decouple economic growth from damaging environmental impacts, which aligns with our aims for a low-carbon circular economy.

For more information on CCU potential and the future of CCU please see:

www.scotproject.org

and

SCOT vision document