eccsel erate

An ECCSEL ERIC project

Wednesday, April 28th, 2021

14.00-15.00 CET

WEBINAR

Sustainable CCU technologies relevant for Europe and ECCSEL

REGISTER HERE

https://rebrand.ly/ECCSELwebinar4

Speakers

Anastasios Perimenis, PhD – CO_2 Value Europe, Secretary General

Elvia Chavez, PhD – Sintef Energy Research, Research Scientist

Q&A session: Alberto Pettinau, PhD – Sotacarbo, Scientific Director

WHAT WILL YOU LEARN

Progress of CCU in the European contex

Carbon Capture and Utilisation (CCU) is gaining increasing attention as a solution to achieve EU's ambitious climate goals for 2030 and 2050. Reusing CO_2 will (i) reduce net emissions in various economic sectors (ii) provide an alternative carbon feedstock and (iii) increase circularity approaches within industrial processes. Recent scientific literature provides evidence on the important role CCU can play in the transition to a more renewable and zero-emission economy. At the same time, many high TRL and pre-commercial projects are expected to come into operation in the coming 3-4 providing evidence of the scalability of CCU technologies. Support through funding schemes like the Innovation Fund and Horizon Europe is essential; equally important is the correct signal that policy should give to industrial actors who are ready and willing to scale up their processes. The current regulatory framework is very complex and with many new legislative packages and an extensive review of existing ones. It is essential to ensure that this framework is consistently supportive of the deployment of CCU technologies and the market uptake of CCU products. CO_2 Value Europe, the European Association representing the CCU community, is working to highlight the essential role of CCU in the transition to a sustainable economy and invites all pioneer actors that want to contribute to this goal to join forces.

CCU and their sustainability impact

Through the application of CCU technologies, captured CO_2 can be converted into useful products, potentially substituting products that currently rely on fossil fuels extraction. The potential of CCU to achieve a large net reduction of CO_2 emissions appears to be limited, but other aspects can be considered that justify research and development efforts in this area. For instance, adding utilization to a carbon capture project could improve the overall profitability and CCU is also promising when the CO_2-derived product can reasonably displace the incumbent product. In this talk, an approach to assessing the sustainability of CCU systems is presented. One of the key parameters considered is climate change mitigation, evaluating the net impact in terms of CO_2 emissions based on the estimated CO_2 uptake of a product and the time that the $CO_2$is expected to be stored. The potential of CCU options to mitigate CO_2 emissions is generally low, relative to the scale of global emissions, but CCU can play a role for hard-to-abate sectors like aviation and steel production. Other aspects such as the energy required for the process and the economic benefits also need to be considered when evaluating the long-term potential of CCU options. Lastly, a series of case studies will be briefly presented, concerning CCU technologies that have reached a high level of technical maturity, have been demonstrated at an industrially relevant scale and/or are in the process of being commercialized.

For further information visit our website

eccsel.org

eccsel.org/about/eccselerate/

ECCSEL ERIC (European Research Infrastructure Consortium) was established in June 2017 as a permanent pan-European distributed research infrastructure, with the main objective of enhancing European science, technology development, innovation and education in the field of CCUS, in order to combat climate change.

ECCSELERATE project is aimed at increasing the accessibility to the excellent network of facilities already established in ECCSEL ERIC for a wider user group, part of the research and industrial community.

KEYNOTE SPEAKERS

Anastasios Perimenis
is Secretary General at CO_2 Value Europe, the European Association representing the Carbon Capture and Utilisation (CCU) community. He holds a PhD in Bioengineering from UCL, Belgium and Master's in Chemical Engineering from NTUA, Greece and Environmental Engineering from TUHH, Germany. Over the last 10 years, Anastasios has conducted fundamental and applied research in Germany and Belgium (e.g. biorefinery development, waste valorization) and has also been responsible for EU & International funding at ULB, Belgium. He joined CO_2 Value Europe in September 2019 to support the technical intelligence of the Association, raise awareness over the potential of CCU for climate mitigation and help develop the CCU industry. He has been Secretary General since November 2019, coordinating the activities of the Association.

Elvia Chavez
is Research Scientist at SINTEF Energy, Norway. She holds a PhD in Material Physics from Université du Maine, Le Mans, Institut des Molécules et des Matériaux du Mans (IMMM), France, in collaboration with the European Synchrotron Radiation Facility (ESRF), France. She worked at the Norwegian University of Science and Technology (NTNU), Norway, in collaboration with SINTEF Petroleum, Norway, on the CO2PLUG project, which is financed by the Norwegian Research Council. Some of her research topics in this project were on the nano and micro scale study of cements and on the problems of cement integrity when exposed to CO_2-brine at high pressure and temperature. Currently, she is working in SINTEF Energy, where she is part of the ECCSELERATE project, investigating the sustainability potential of CO_2 Capture and Utilisation system.

WHAT IS CCUS?

Carbon capture, utilisation and storage, or CCUS, is an important emissions reduction approach that can be applied across the energy system, in both power generation and industrial sectors.
CCUS encompasses methods and technologies to remove CO_2 from the flue gas and from the atmosphere, followed by recycling the CO_2 for utilization and determining safe and permanent storage options:

- **Capture** technologies allow the separation of CO_2 from gases produced in electricity generation and industrial processes.
- After capture, carbon dioxide must be **transport**ed to the storage or utilization site. CO_2 is an inert gas and can be easily handled and transported in high-pressure pipelines. Alternatively, it can be transported in industrial tanks by ship, rail and truck.
- There are several possibilities for long-term CO_2 **storage** in safe conditions. Generally, CO_2 is stored in carefully selected geological rock formations that are typically located several kilometres below the earth's surface.
- **Utilization** technologies allow to use CO_2 to make valuable products, such as clean fuels, building materials or consumer goods. A clear example of circular economy, where the CO_2 becomes a raw material rather than a waste by-product.