

**Carbon Capture, Utilisation and Storage:
Opportunities, challenges and pathways to Net Zero**

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**Carbon Capture and Valorization: an Overview of ENEA's
Infrastructures and Activities**

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To address climate change, the European Union, through the European Climate Law, has set the ambitious goal of achieving climate neutrality by 2050. In this context, hydrogen is widely recognized as a promising energy carrier that could play a key role in accelerating the energy transition.

According to the report Hydrogen Roadmap Europe: A Sustainable Pathway for the European Energy Transition, hydrogen could contribute to reducing CO₂ emissions by approximately 560 million metric tons and potentially cover around 24% of Europe's energy demand by 2050.

In this presentation, an overview of ENEA's activities in the field of hydrogen production and CO₂ capture and valorization will be provided. In particular, laboratory- and pilot-scale processes will be briefly discussed, including biomass gasification coupled with CO₂ capture, namely Sorption-Enhanced Gasification (SEG), Sorption-Enhanced Methane Steam Reforming (SESR), and Dry Reforming of Methane (DRM).

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Keywords: *CO₂ capture and valorization, hydrogen production, Sorption-Enhanced Gasification (SEG), Sorption-Enhanced Methane Steam Reforming (SESR), Dry Reforming of Methane (DRM).*

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