

Contribution ID: 59

Type: Paper

Road to maritime sector decarbonization

Wednesday, 15 June 2022 17:00 (20 minutes)

Ecospray is actively working on projects for carbon capture, using three different technologies for removing CO₂ from exhaust gas:

- Fuel cells, for removing and concentrating CO₂
- Amines scrubbing, for chemical removal of CO₂
- Calcium hydroxide scrubbing, for CO₂ chemical removal and permanent carbon mineralization

Ecospray is developing Molten Carbonate Fuel Cell technology (high temperature cells operating with molten carbonate as electrolyte) as a unique solution that reduces costs and environmental impact coupling carbon capture with energy production.

In the current stage of development, with also a specific laboratory in partnership with Genoa University, our Carbon Friendly Fuel Cells are designed to be fueled with ammonia or methane, producing energy very efficiently and acting as CO₂ concentrators too.

The low concentrated CO₂ in the exhaust gas of engines can be fed to the cathode and up to 90% of the CO₂ is then captured and therefore transferred to the anode. The resulting concentrated CO₂ can be easily separated and liquefied for further usage.

Ecospray aims to achieve with this project, started in 2019 with several European partners, the first large-scale maritime implementation program of CO₂ capturing technologies.

In the Amines scrubbing technology, part of the exhaust gas is extracted downstream the existing DeSO_x tower and sent to an additional reactor where an amine solution flow is recirculated in a closed loop process, absorbing the CO₂ from the gas stream. When amine flow is regenerated, CO₂ is captured and liquefied (for onboard storing)

In the last project CaO/Ca(OH)₂ is bunkered and stored onboard as a solid bulk powder. It is mixed with water and injected directly into an auxiliary dedicated scrubber, absorbing CO₂. As a result, the environmentally safe product containing captured Carbon, is discharged overboard.

Deadlines for onboard or prototypes in Ecospray laboratories testing are all fixed for middle 2022.

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Session Classification: 3B

Track Classification: Environment protection and ship energy efficiency