Press release
Genoa, 15 June 2022

Ecospray launches three new carbon capture technologies in the maritime sector

Archetti: "The path towards decarbonisation will be characterised by a series of different solutions, with the first on-board tests taking place by the end of 2022"

Reduction of CO_2 emissions through the use of amines, calcium hydroxide or molten carbonate fuel cells: these are three innovative carbon capture technologies developed by Ecospray for the marine sector, and presented today in Genoa.

For shipping, the goal of zero CO_2 emissions by 2050 set by the *IMO-International Maritime Organization* is very clear, but the roads that lead there are less so. The vision of Ecospray was clearly articulated today by the president, **Maurizio Archetti** during the NAV conference in Genoa.

Speaking alongside Barbara Bosio, Professor of Applied Physical Chemistry at the University of Genoa, at the event organised by *ATENA-Associazione Italiana di Tecnica Navale (Italian Association of Naval Technology)* uniting leading experts in technologies for shipping from 15 to 17 June, Archetti described the company's three solutions in detail, explaining how these are the result of extensive research and development by Ecospray, which already boasts extensive experience and has achieved significant results in the sector.

"At the heart of everything is our belief that there is no one-size-fits-all solution to reducing emissions. Studied and developed in collaboration with leading universities and research centres - the Department of Civil, Chemical and Environmental Engineering of the University of Genoa for the fuel cells, the Department of Earth Sciences of the University of Turin for the carbon capture technologies using amines and calcium hydroxide - each of our three technologies, which are at different stages of development, can be implemented in different contexts. Factors such as the size and type of ship, the route it sails and the space available on board have a major effect on the scope of application" Archetti explained.

Ecospray believes that carbon capture and storage (*CCS*) systems are an essential solution for the shipping industry, especially with regard to the first target in terms of emissions - a 40% reduction by 2030 - which is an intermediate step on the journey towards the zero-emissions goal set by the IMO for 2050. These systems will also help to keep the global temperature rise below the 2°C threshold.

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"CCS systems appear to be a useful and practical solution for companies, in that they prevent the cost increases following the introduction of anti-emissions taxes", continued Archetti, going on to illustrate the three technologies studied by Ecospray.

1. **Carbon capture with amines**

The absorption of CO_2 through the use of amines is the first technology that can be implemented both in terms of "readiness" and with regard to the potential sectors for application. Indeed, this technology is based on an approach that is already well-established in other industrial sectors, which Ecospray has also rendered usable in the marine sector, thus reducing the environmental impact and energy consumption of ships. The latter are two factors that are of lower priority in sectors such as the oil industry, but which become essential as soon as the technology is installed on board a ship - reliability is undoubtedly the greatest advantage of this solution, along with the non-hazardous nature of the chemicals used.

2. **Carbon capture with calcium hydroxide**

The absorption of CO_2 using calcium hydroxide appears to be the best technology available at present in terms of the capital required for the application and use of this technology. This system requires space for the bulk storage of the chemical reagent on board, but not that of the CO2 itself: it is therefore ideal for installations on bulk carrier ships.

3. **Carbon capture with molten carbonate fuel cells (MCFC)**

Technologies based on Molten Carbonate Fuel Cells (*MCFC*) enable the capture of CO_2 at the same time as energy production. As such, these technologies are considered strategic in the context of the energy transition, precisely due to their capacity to capture the carbon dioxide in exhaust fumes and generate additional clean energy.
This is undoubtedly the most technologically complex solution, but it is also that which guarantees the best results in terms of reductions in emissions, as well as keeping operating expenses low for companies. The ideal application for these technologies is not limited to a particular type of ship: they can be used on all types of engines (2-stroke and 4-stroke) and with all fuels, HFO / LNG.

Time-frame

"We are working on preparing pilot projects for the two CO_2 absorption technologies that use chemicals, which are already being tested: our goal is to perform the first on-board trials by the end of this year, with the next phase scheduled for 2023. In terms of MCFC technologies, meanwhile, we expect to have the first fuel cell prototypes ready by the end of 2022, with a view to testing these on board ships next year" – announced the president of Ecospray during his speech.

About Ecospray

From research to development, Ecospray specialises in the creation of integrated solutions for the sustainable conversion of marine and land-based industries, as well as for the reduction of dependence on fossil fuels. Founded in 2005, Ecospray has been part of the Carnival Group since 2013, operating at global level to offer systems designed to render industrial processes more sustainable through the purification and treatment of polluting emissions.

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