

Carbon capture from ships at sea

New technology that can capture carbon emissions from ships at sea and store them until they reach port is being developed by a UK company.

The project

The UK Government has included maritime emissions in the carbon reduction targets set by the Climate Change Act. With CO₂ emissions from the shipping industry expected to increase threefold by 2050, pressure is mounting to find new ways of capturing and storing harmful emissions.

The £1.1m Maritime CCS (carbon capture and storage) project aims to develop a blueprint design for an on-board process to capture and temporarily store CO₂ emissions until they can be discharged into transmission and storage infrastructures at the next suitable port.

Process Systems Enterprise Ltd, the lead UK partner in Maritime PSE has received £360,000 from the Technology Strategy Board to pursue designs of the new technology and is working with Norwegian partners Det Norske Veritas SA (DNV) and the Norwegian Research Council as part of the Eurostars initiative.

About Maritime CCS

The project will use PSE's model-based innovation (Mbi) software technology and approach, in which mathematical models are applied to simulate the behaviour of complex physical processes.



‘This is a challenging design problem with tight constraints, and the application of our model-based innovation technology will be key to developing technically feasible and economically viable solutions.’

Professor Costas Pantelides, Managing Director of Process Systems Enterprise Ltd

With a virtual model of the process it is possible to explore many different design aspects of the process design, see the effects of changes and find optimal design solutions before a single pound is spent on expensive physical prototypes.

Norwegian project partner DNV (Det Norske Veritas) brings its extensive knowledge of shipbuilding to the project. As well as incorporating the design into existing vessels it is also developing new international standards for carbon capture and storage in new build ships.

The business application

The concept of maritime carbon capture is completely new in the field of maritime transportation, with no current end-to-end solution.

Although the big tanker and bulk carrier fleets include a large number of ships, fuelled by the growth in global trade, ship owners will in the future have to give more consideration to the industry's environmental impact.

The Maritime CCS project will target the machinery manufacturing and systems integration markets for new ship builds of any type. The project partners believe that new legislation to cut carbon emissions from shipping will ultimately drive the adoption of new technology.

Maritime CCS's designs will be of interest to shipping companies, shipbuilders, maritime engineering companies and process licensors aiming at a maritime market. The market impetus will come from ship owners who should be in favour of adopting carbon capture and storage when placing new contracts with yards.

The project estimates an income of around £1m per application. Applications would come initially from new builds, with later income from ship retrofits. A conservative estimate at 'steady-state' for a market of this nature would be 50-100 applications a year, resulting in a very large income stream.

In late 2010 the project will come to the end of its first phase. Once the technology screening is complete and the project is closer to the actual design phase the partners will engage with manufacturers regarding the potential for providing the systems or their components to shipbuilders.

About EUREKA Eurostars

EUREKA Eurostars is the first European funding and support programme specifically directed at innovative intensive and research performing small and medium-sized enterprises (SMEs). Its purpose is to provide funding for market-orientated research and development, specifically with the active participation of R&D-performing SMEs.

The Eurostars programme is a Eureka Network initiative. As an EU programme, each national government funding its own participants directly. Currently 27 countries are actively participating through the EUREKA network of national offices. In the UK the Technology Strategy Board is the funding body. Between 2009 and 2012 the Technology Strategy Board is investing £3 million through the Eurostars programme.

Key features

- To qualify for Eurostars funding a project must involve at least two organisations from two different participating countries.
- Eurostars funding is for high growth SMEs, defined as those companies that can show they deploy 10% of their staff or turnover to R&D (SME according to EU definition). There are additional rules for micro companies with fewer than 10 employees.
- SMEs, large companies, universities research centres can participate in the Eurostars project consortium however UK academics, educational institutes and large companies are not eligible for funding.

The main consortium partner must be an R&D-performing small or medium-sized enterprise.

For further information go to:
www.eurostars-eureka.eu



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Project partners: Process Systems Enterprise Ltd (UK) / Det Norske Veritas SA (Norway)

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