Press release

FOR IMMEDIATE RELEASE

DNV and PSE report on ship carbon capture & storage

Maritime CCS "feasible and can reduce emissions by 65%"

OSLO and LONDON, 11 February 2013. Det Norske Veritas (DNV), a leading classification society, and Process Systems Enterprise Ltd. (PSE), a global provider of advanced process modelling technology, today have released the results of the Maritime CCS (carbon capture and storage) project.

The project, now formally concluded, has successfully developed a concept design for on-board chemical capture, liquefaction and temporary storage of CO_2 for ships in transit until discharge into transmission and storage infrastructures at the next suitable port. The results show that the concept is technically feasible and capable of reducing maritime CO_2 emissions by up to 65%. For a VLCC tanker, this could correspond to capturing more than 70,000 tonnes of CO_2 per year, transforming them from emissions to a tradable product.

"In response to more stringent environmental regulations and complex market conditions, we see an increased demand for innovative solutions towards higher efficiency and greener operations," says Nikolaos Kakalis, Head of DNV Research & Innovation Greece. "Our R&D activities, such as the carbon capture initiative which is completely new in the field of maritime transportation, pave the future towards next-generation solutions for achieving more energy-efficient, environmentally friendly and sustainable maritime transportation".

Prof. Costas Pantelides, Managing Director of PSE, says "This has been a challenging design problem with tight constraints. Applying a model-based engineering approach has been key to exploring the process decision space rapidly and effectively, and developing technically feasible and economically viable solutions."

Maritime CO_2 emissions are estimated at over 1000 million tonnes per year, or 3% of total emissions, and are expected to reach 2000 to 3000m tonnes by 2050. The UK government has included maritime emissions in the reduction targets set by the Climate Change Bill, and the International Maritime Organisation is expected to drive a reduction in emissions from international shipping. Because ship emissions are concentrated – unlike other forms of transport – the potential to capture CO_2 at source has been the key focus of the project.

The Maritime CCS project was jointly financed by the two partners, the UK's Technology Strategy Board and the Research Council of Norway under the Eurostars initiative. The project took into account the unique challenges posed by the maritime environment – constant movement, limited space and access to utilities, stringent safety requirements and the need for energy efficiency.

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For more information, or to schedule an interview, call DNV Research & Innovations Communication Manager Christine Fløysand on +47 91157914 or email Christine.floysand@dnv.com.

About Det Norske Veritas

Det Norske Veritas AS (DNV) is an independent foundation with the objective of safeguarding life, property, and the environment, and is a leading international provider of services for managing risk. DNV Maritime is a world-leading classification society that assists its customers within the maritime industry to manage their risks in all phases of a ship's life, through ship classification, statutory certification, fuel testing and a range of technical, business risk and competency-related services. DNV's current share in the class market is 16% of the world fleet of new builds and ships in operation. One of the most important competitive advantages of DNV is our investment in research and innovation. DNV Research & Innovation Maritime, based in Oslo headquarters and in the Piraeus, Greece hub, develops technologies, tools, and services. Many of the technology solutions developed by DNV have been so precise that they have helped define internationally recognised standards. DNV has extensive experience with maritime air emissions reduction measures as well as risk-based design of state-of-the-art technologies for integrated solutions.

About Process Systems Enterprise Ltd

PSE (www.psenterprise.com) is the world's foremost provider of Advanced Process Modelling software and services to the process industries. Companies apply advanced process models to explore the process decision space rapidly and effectively, in order to reduce uncertainty and make better, faster and safer design and operating decisions and capture process intellectual property [IP]. The company is a leading supplier of modelling technology and know-how for carbon capture and storage (CCS) R&D.

PSE's gPROMS® is the world's leading Advanced Process Modelling platform. It provides the underlying modelling, solution and optimisation engine for PSE's general process engineering tools such as gPROMS® ModelBuilder® and the Advanced Process Libraries, and domain-specific products that include gSOLIDS®, gCRYSTAL®, gFUELCELL®, gCCS® and gFLARE®.

Use of PSE's technology and services results in faster innovation, improved process and product designs, enhanced operations, reduced risk, more effective R&D and experimental campaigns and better capture and transfer of corporate knowledge across the organisation.

PSE's global customer base of Fortune 500 process companies is served by operations in the UK, USA, Japan and Korea, and agencies in Saudi Arabia, China, Thailand, Taiwan and Malaysia. PSE is a spin-out of Imperial College London, and its software is used for research and teaching in over 200 universities around the world.

The company's own ability to innovate was recognised with the award of the prestigious Royal Academy of Engineering MacRobert Award for Engineering Innovation, the highest UK engineering prize.