

First a payer, then a player

The block of granite which was an obstacle in the pathway of the weak became a stepping-stone in the pathway of the strong" (Thomas Carlyle). **Barry Parker** examines the impact on shipping from proposed environmental initiatives

Throughout much of December 2009 greenhouse gases, especially carbon dioxide (CO₂), received global attention as world leaders gathered in Copenhagen for the UN Framework Convention on Climate Change.

Not far from the Bella Conference Centre overlooking the Danish capital's inner harbour, executives at the Maersk Building, headquarters of publicly traded shipping behemoth

A P Moller-Maersk, were making significant news of their own, deliberately timed to coincide with the climate convention.

Pros and cons

Within the maritime industry the financial cost of climate change has received considerable attention, as well as much speculation about possible outcomes such as a cap-and-trade scheme or a levy on bunker sales, and whether jurisdiction will be regional or industry-wide. At an aggregate level, shipping, like other transport modes, will be a net payer, although the exact mechanisms will be subject to political thrashing. Neither marine nor aviation fuels were specifically included in the [Copenhagen](#) agenda.

Yet conversely, the broader environmental picture has an influence on shipping revenues, as well as, potentially, on reapportioning finance costs. As the climate talks began, Maersk Tankers announced that it would join two Finnish utilities, Fortum and Teollisuuden Voima (TVO), in a 'carbon capture and storage' (CCS) demonstration project. Maersk is investigating the possibility of transporting waste carbon gases, in liquid form, from TVO's 565 MW coal-fired Meri-Pori power plant along the west coast of [Finland](#) to a subsea storage site, most likely a depleted oilfield in the North Sea.

The aim is to capture, transport and store in excess of 1.2 million tonnes of CO₂ per year. The partners are also exploring the potential use of CO₂ for Enhanced Oil Recovery (EOR).

Subject to successful development, the project will seek qualification for funding under the EU's CCS Demonstration Programme. Selection for this funding is expected to take place in 2011, with the final investment decision in 2011-12. The project is intended to be in operation by 2015.

New market?

Technically, Maersk would utilise existing pressurisation and refrigeration technologies currently used to transport liquified petroleum gas (LPG) and liquified natural gas (LNG) to keep the waste carbon cargo emissions in a liquid state. According to estimates, a dedicated vessel designed to transport waste carbon emissions would cost between USD80 million and USD100 million.

Many hurdles lie ahead in the voyage from press release to steel-cutting, not the least of which is proving the viability of multiple nodes in the carbon capture technology and the feasibility of undersea storage, which has its own set of geological challenges. Yet the potential for such specialist vessels, which could create new business divisions for Maersk, is enormous. Importantly, if construction of these vessels moves beyond the demonstration phase, new sources and structures of finance would be required.

New finance structures

If the Meri-Pori project moves ahead it is likely to be linked with the first financing for liquid CO₂ vessel assets. Up to 80 per cent of the cost of selected CCS projects could be funded under the EU's European Energy Programme for Recovery (EPR), which entered into force in August 2009.

Like the inchoate technologies for carbon capture, the financial structures surrounding marine transportation of liquid carbon gas have not been proven out. In the new decade, financial engineers, bankers and lawyers will have the opportunity to work out the details and funding flows of the over-arching and ultimate paradigm, in which carbon credits, taking on real values, will play a role.

required freight rates' (RFRs) of the new carbon-carrying vessels will not be determined in a vacuum; they will be linked to the dynamics of a broader carbon market into which shipping will be paying. Over the past four decades, creating value in recycling and disposal markets has been a continual challenge. Christian Ingerslev, director of Maersk Tankers Gas, has been widely quoted as saying: "Our ambition is to be the garbage collectors of the North Sea."

Norway-based and Oslo-listed I M Skaugen, a specialist in gas tankers, is reported to be in discussions with utilities in the [UK](#) regarding similar carbon disposal projects, and Teekay Gas Services, a unit of New York Stock Exchange-traded Teekay Corporation,

has also been linked to these projects. In the [UK](#), government approvals of new coal-burning power facilities have been conditional upon a CCS component.

In recent months, carbon credits in the EU market have been priced at between EUR13 (USD18.6) and EUR14 per metric tonne. A group of presentations at a December conference hosted by the International Emissions Trading Association (IETA) showed wide-ranging expectations for a carbon price 10 years out. Indicative of the uncertainty surrounding the market's future, price projections range from EUR15 per metric tonne to EUR40 and above, suggesting a weak short-term market for carbon credits but with upward tendencies going forward.

Unlike a mandatory disposal fee - the type of levy that landside garbage collectors must pay - the cost of shipping CO2 must be evaluated against these highly uncertain market values. A 'back of the envelope' calculation suggests that three vessels, at USD90 million each, could require an aggregate USD20 million to USD25 million per year in carbon waste-based revenues to break even in the early years. Based on yearly delivery of 1.2 million metric tonnes, daily breakevens would require pricing of USD16 per tonne to USD21 per tonne - roughly in line with current suggested carbon prices.

The inclusion of the vessels within the proposal for a broader demonstration at the Meri-Pori power plant provides a hint that their financing might be an integral part of the larger CCS project, albeit probably ring-fenced. This may follow the template of high-profile gas projects such as the Qatari LNG production schemes. Vessels owned by Qatar-based Nakjilat - some in conjunction with major shipowners - have attracted long-term asset-based financing against lengthy contracts from shippers Rasgas and Qatargas. As CO2 becomes a real trade, structuring professionals will face the perennial balancing act of building a supply chain with a value greater than its individual parts, yet making each link in the chain financeable in its own right, similar to what currently exists in the LNG sphere. A nascent spot market in LNG cargoes has developed, supported mainly by temporary mismatches between vessels that have been delivered from shipyards prior to the readiness of intended gas supply chains.

Critical contracts

However, for the developing market in carbon-capture transport, long-term contracts with minimum offtake levels and freight prices - either directly or through 'backstop' agreements - will be critical. A firm transport contract for the CO2 vessels, with specified minimum volumes to be provided by Fortum and TVO, would be a requirement, along with a financial set-aside to develop and implement new technologies, in the face of a probably volatile commodity market - not unlike that for LNG - where commodity prices have dropped substantially. In the absence of such a contract, the economic incentive to transport the CO2 would disappear if the carbon price dipped below the freight rate; it would be cheaper for the utilities to pay for the right to pollute through a cap-and-trade programme rather than transport the gas.

Caroline Angoorly, head of environmental markets for North America at investment bank JP Morgan, stated in a March 2009 conference sponsored by the Natural Resources Defense Council that project economics benefit from "offtake price certainty". She added that credit rating agencies rating project debt need to look closely at "downside commodity scenarios" as part of due diligence.

As for pipeline projects, Angoorly said that they require economic incentives that may take the form of grants, loan guarantees and performance guarantees, but that a "right, clear market signal" with "a credible market price on a tonne of carbon" must also be considered. Other bankers have offered similar prescriptions for developing markets.

Green infrastructure

Investment in the Maersk tankers, (if it happens), tied to investments in coal-fired power plants, is a small subset of the expected trillions of dollars to be invested in green infrastructure in the coming decade. Paul Ezekiel, then managing director for the global carbon trading unit at Credit Suisse, commented at the same conference in March 2009 that: "Decarbonising the economy will require disruptive capital flows" and "a fundamental restructuring of energy infrastructure". As a practical matter, bankers are likely to insist that the new vessels have flexibility to haul LPG or ammonia, or, perhaps, LNG.

start infrastructure investments, typical of any developing market. Besides the EU demonstration projects, to which EUR1.1 billion has been allocated - approximately 5 per cent of which would be directed towards projects in [China](#) - [Australia](#) has allocated USD2 billion for building power plants with CCS capabilities.

Oslo-based Det Norske Veritas (DNV), a business that provides risk-management services including vessel classification, is assisting the EU in co-ordinating the likely network of projects that will emerge. In early September 2009 DNV announced standards for transmission via pipeline of CO2. The United States and [Canada](#), through economic stimulus packages, have set aside more than USD3 billion and CAD600 million (USD575 million) respectively for the funding of demonstration projects. With carbon issues getting worldwide attention as countries seek to ratify an international treaty and implement it within their legal frameworks, bankers can expect demonstration projects in the pipeline mode to help assess the potential for funding projects in that sector.

In the pipeline

One large landside project that could provide maritime parallels for Maersk and other potential players is a carbon-capture pipeline contemplated in the oil-producing region of Alberta, [Canada](#), in which the province is creating a CAD2 billion carbon-capture fund. Calgary-based privately held oil recovery specialist Enhance Energy has signed a letter of intent to process gas and construct a pipeline. In the CAD495 million Alberta project, CO2 would be isolated from a fertiliser plant and a bitumen-processing facility near [Edmonton](#), pumped over 100 miles (161 km), and finally injected into spent oilfields located in southern Alberta. The majority portion of funding for the pipeline - described by Enhance Energy as being part of a larger partnership to handle industrial waste gases - would come from the Alberta government.

In this pipeline project, the province of Alberta expects to earn a return on investment through royalties on EOR at the two facilities. Both facilities would pay penalties in the absence of disposal of carbon gases. The incentives differ greatly from the Finish utility project, in which value is tied to savings rather than payment for the right to pollute.

For energy projects sited adjacent to water where waste carbon is generated, planners will evaluate both shuttle tankers and undersea pipelines. The comparisons will be similar to those undertaken in connection with the transportation of offshore crude oil to shoreside refineries, where startup or short-lived fields often dictate the use of shuttle tankers.

Chinese takeaway

In coming years, carbon-capture tankers may present a growth opportunity for Chinese shipbuilders; economic expansion in [China](#) (and [India](#)) will be predicated on huge growth in new coal-fired power-generation facilities. Once a climate change template coalesces, [China](#) will be the recipient of credits from developed nations that will fund CO2 mitigation. Where power plants are situated in coastal areas in the BRIC countries - [Brazil](#), [Russia](#), [India](#) and

[China](#) - fleets of 'garbage collectors' will be kept busy in shuttle trades. With new fleets may come new financial entrants, bringing environmental expertise to the maritime finance markets, particularly where vessels are tied to bigger projects. In a noteworthy deal completed in December 2009, JP Morgan acquired EcoSecurities, a specialist in the carbon markets that had been listed on London's Alternative Investment Market.

Private equity has also staked out a place in the funding landscape; former members of the Credit Suisse team have landed at Eko Asset Management Partners, whose investors include the deep-pocketed Wolfensohn and Rothschild interests.

Tradition Financial Services, a subsidiary of Compagnie Financiere Tradition - a leading broker in the EU carbon markets - is also a potent force in the market for both coal swaps and maritime freight derivatives. Evolution Markets, another broker in the carbon sphere, has a presence in the market for tanker derivatives. Yet another force to be reckoned with is shipping magnate Peter Georgiopoulos, who, together with members of the Teryazos family - previously active in shipping in [Montreal](#) - announced in 2008 the formation of Green Maritime Partners. However, to date, no investments have been announced.

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*credit - IHS Jane's/ P Allen:
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Maersk is investigating the possibility of transporting waste carbon gases from TVO's Meri-Pori power plant in [Finland](#) to a subsea storage site.

*credit - A P Moeller:
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