APM Terminals and the Eco-Efficiency Philosophy

- Nordic Ports: Taking the Environmental Lead
- Ports’ Key Role in the Sustainable Logistics Chain
- Making EFFORTS to be Good Neighbours
Welcome to Stockholm – the European Green Capital of 2010

Stockholm is the first city to be named European Green Capital – a completely new distinction introduced by the European Commission. As many as 35 cities competed for the title. The provision of sustainable transport solutions, the green and blue areas in the city, innovative solutions to noise pollution and abilities to collaborate with different partners in environmental issues were some of the aspects taken into account.

Stockholm is also one of the world’s leading ports when it comes to environmental issues. For several years we have been actively driving long term efforts to reduce our environmental impact on the surrounding region, the Baltic Sea region and also globally. Results of these efforts include the reduction of carbon dioxide emissions by a whole 45 percent since 2005. We are now raising the bar even further when it comes to green issues.

In February 2010 we will be the GreenPort hosts. A warm welcome awaits you in Stockholm!
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We add the “E” to your RTG
Electrification of Rubber Tyred Gantries

Converting a conventional RTG into an electrical one (E-RTG™) means to shut down the diesel generator and to power the RTG with electrical power only. This conversion is now made possible with two different complete RTG electric power solutions developed by Conductix-Wampfler: Motorized Cable Reel Solution and Conductor Bar Solution.

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**Port Botany container terminal “ticks the green boxes”**

Port Botany’s Container Terminal expansion has passed its compulsory first year environmental audit, exceeding all compliance requirements and winning an unqualified endorsement for a raft of environmental management initiatives.

“The $1 billion Port Botany Terminal expansion is into its second year. This tick of approval shows significant construction progress has been achieved without any major impact on the local environment,” said Mr Tripodi.

The First Annual Independent Environmental Audit found a high level of compliance with the ‘Minister’s Conditions of Approval’ as well as with the Department of Environment and Climate Change environmental protection licences, and other permits and approvals.

Mr Tripodi said the project consortium, J Close, M Inster and M Tripodi, have invested a large amount of resources and dedicated environmental professionals to ensure the third terminal project meets its environmental licence requirements.

“This includes employing over eight, dedicated, on-site environmental staff supported by a team of specialists ranging from marine scientists and bird experts, to soil and landscape advisors and noise and vibration engineers,” Mr Tripodi said. “Parsons Brinckerhoff, the independent project verifier, also employs an environmental specialist full time on site.”

The Terminal Expansion works are scheduled for completion in 2011.

**WPCI update and call for OPS website volunteers**

Fifty-five ports from all over the world have come together to form the World Ports Climate Initiative. Under the leadership of the IAPH they have committed to jointly reduce the threat of global climate change.

In support of this effort a number of projects are being progressed, led by volunteer WPCI member ports. A reported in the last edition of GreenPort Journal significant progress has been made with a number of projects in particular:

- Carbon footprinting (led by Port of Los Angeles)
- Environmental Ship Index (led by Port of Rotterdam)
- On-shore Power Supply (led by Port of Gothenburg)
- Progress on these projects and on ‘Intermodal T transport’ led by the Port of Amsterdam will be presented at the IAPH Africa/Oceania Annual Conference.

**Nov-2009: WPCI Europe Regional Meeting in Hamburg**

A meeting is being held in Hamburg on 16-18 Nov 2009. The IAPH is dedicating the morning of one day out of its three day programme to the WPCI. The meeting is hosted by Hamburg Port Authority. The Onshore Power Supply (OPS) project has developed a ‘Guidance Document’ to assist in assessing the feasibility of OPS at a particular site, and in its implementation. Work is now commencing on developing a website to provide practical on-line guidance.

The project team are seeking volunteers with or without experience of OPS, to act as pilots for the website, providing their feedback on its content and user friendliness. If you are interested please contact Susann Dutt at the Port of Göteborg (susann.dutt@portgot.se).

**Port Botany promotes green initiatives for World Maritime Day**

A healthy, growing port and a cleaner, healthier environment are compatible goals, as the Port of Charleston demonstrated at a “World Maritime Day” event; an annual event sponsored by the International Maritime Organization (IMO).

At the South Carolina State Ports Authority’s (SCSPA) Wando Welch Terminal, the U.S. Coast Guard joined various maritime businesses that showcased projects to reduce the port industry’s impact on air emissions. Tugs, a dredge, cranes, a pilot boat, trucks and rail were all featured as examples of cleaner operations.

“It is important to protect the environment as we efficiently move billions of dollars in cargo through this port,” said Jim Newsome, president and CEO of the SCSPA. “The port industry recognizes that we can grow business and be a good steward of our natural environment.”

The SCSPA and several private companies are working in partnership with the Charleston Metro Chamber of Commerce, the S.C. Department of Health and Environmental Control, the S.C. Trucking Association, the EPA and the American Lung Association. Together, they have partnered on more than $5 million in various projects aimed at reducing diesel emissions. These projects include idle reduction devices and filters on trucks, repowering 57 pieces of cargo-handling equipment and repowering two local tug boats and a dredge. These projects alone will eliminate more than 2,500 tons of pollutants and reduce fuel consumption.

“Collaboration between the public and private sectors is making Charleston port operations cleaner and greener, while saving money and generating jobs,” said Newsome.

The U.S. Coast Guard, in cooperation with several additional federal agencies, is hosting parallel events in port communities across the nation to bring attention to the many environmental initiatives within the maritime community to reduce the effects of climate change.

**On-shore power supply at the Port of Gothenburg**

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Harbour Masters Committee launch “The Chain” video

GreenPort 2010 will be the first event where the video production “The Chain”, the European Harbour Masters’ Committee are aiming to create awareness of the effects of individual operations on the nautical chain, and of the importance of sharing information and knowledge.

A stronger nautical chain can contribute significantly to greater efficiency in maritime transport, increased safety and, perhaps most importantly, to a reduction of vessel emissions and use of fuel. Ingrid Römers, EHMC Secretary explains that a number of developments have made it necessary to raise awareness:

- ever-increasing importance of efficiency and faster turnaround times in ports
- ever larger vessels operated without adequate crew size
- increasing mixes of different nationalities on board
- unfamiliarity of crew members with the port or terminal due to rapid turnover of crews
- diminishing number of people with a nautical background working in ports
- A ll these developments tend to put stress on the links in the nautical chain, creating serious problems such as:
  - ships arriving at port only to find berths are occupied meaning unnecessary fuel has been consumed
  - increased numbers of unnecessary incidents resulting in a sharp increase of P&I premiums
  - increased turnaround times due to improper planning, caused by incorrect information and unknown mooring configurations
  - loss of cargo volume due to incorrect out of date nautical and terminal information.

By creating awareness of the effects of individual operations on the nautical chain and awareness of the importance of sharing information and knowledge, these problems can be solved.

The Chain offer an insight in the jobs of all the partners who are involved in a vessels’ voyage, bringing it into port, mooring and preparing for loading and unloading. Understanding and appreciating each others’ work will translate into better cooperation in the chain, something the European Harbour Masters consider of great value to vessels and port clients.

www.harbourmaster.org

Heating without emissions

The HHLA Container Terminal Tollerort (CTT) at the Port of Hamburg uses exhaust heat from a sewage treatment plant to provide heating. This system enables Hamburg Hafen und Logistik (HHLA) and Hamburg W ater to reduce costs and save 1 000 tons of climatically harmful CO₂.

The new office building at CTT is heated by surplus heat from the Köhlbrandhöft sewage treatment plant, which lies in close proximity to the container terminal. Such cooperation is advantageous for both parties: the utilization rate of energy generated by the sewage treatment plant is boosted whilst providing a cheap energy source for the container terminal.

Here are also distinct ecological benefits. To produce the required 2 million kilowatt hours of energy required, large quantities of fossil fuels would be burnt, creating 1000 tons of carbon dioxide. “Today, we already cover the sewage treatment plant’s energy needs for sixty percent with energy gained from the sewage process itself. Due to the heat supply installed in Container Terminal Tollerort, we can use the sewage sludge even more efficiently”, says Dr. Michael Beckeert, CEO of Hamburg W ater.

Hamburg W ater and HHLA received part of the finance for building the 1.5-km of hot water pipes and emission-free heating of the CTT building from the Hamburg Ministry of Urban Development and the Environment (BSU) under the Hamburg Senate (state government) programme “Companies Conserving Resources”.

Kotka joins EcoPorts network

Kotka ecoport is a project launched by the Port of Kotka as part of the City of Kotka and its EcoKotka project. Kotka ecoport considers the environment in all operations of the port based on a life cycle approach, meaning that all stages from design and construction, to commissioning and decommissioning, are taken into account in the operations. The goal is to arrange the port’s operations so that other stakeholders can also work in a sustainable manner. Ecoport provides an opportunity to utilise the experiences and knowhow possessed by the port on its own development projects in preparation, planning, implementation, constant improvement, stakeholder relations and in case-specific, innovative solutions.

Kotka ecoport aims at the efficient use of energy and materials. In addition to the efficient use of resources and recycling, all planning will take into account swift modifiability as the circumstances change. The port aims to reduce its own energy consumption and use recycled materials in the port structures.

www.kotkanlaiva.fi

Cork achieves ISO 14001

The Port of Cork Company has been awarded the international environmental standard ISO 14001 certification which acknowledges the Port’s positive commitment to the environment. ISO 14001 is an internationally recognized standard which identifies performance requirements for an environmental management system.

Speaking at the presentation, Chief Executive of the Port of Cork Company, Brendan Keating said, ‘We have set ourselves a series of objectives across a full spectrum of our operations and have committed to a wide range of tasks and actions in achieving them. Since 2006 the Port of Cork Company has made significant progress in managing and reducing the impact of port operations on the environment. A chieving the international ISO 14001 Certification marks a further milestone in the development of the company, and the Port of Cork’s continuous drive towards environmental sustainability.’

ISO 14001 enables an organisation to develop and implement a policy and objectives, which take into account the requirements; legal and otherwise, that the company subscribes as well as information about significant environmental aspects. It applies to the environmental aspects that the organisation identifies, both those it can control, and those which it can influence.

The Port of Cork has been actively working on environmental management systems since 2004 with the assistance of the EcoPorts Foundation. This opened up the possibility to establish a Certifiable Environmental Management System within the Port of Cork Company, which was achieved in 2006.

The Port of Cork Company was the first port in Ireland to achieve the PERS (Ports Environmental Review System) Certification and is the second in Ireland to received ISO 14001.
Every terminal should be this green (...but not just from envy)

APM Terminals is proud to introduce the Green-powered APM Terminals Rotterdam; using renewable, natural wind-generated electricity to power the gantry cranes, refrigerated containers and buildings, we will reduce CO2 emissions by 45% per year.
**Houston clean air funding**

A $9 million SmartWay Diesel Emission Reduction Act (DERA) was awarded to the Houston-Galveston Area Council (H-GAC), following the efforts of the Port of Houston Authority (PHA), H-GAC and the Environmental Defense Fund (EDF).

The funding is an important element in PHA’s Clean Air Strategy Plan efforts and will help tackle emissions from the goods movement sector, including drayage trucks.

Drayage trucks are diesel-fuelled, heavy-duty trucks that transport shipping containers. The DERA award will fund a bridge loan program that provides resources for retrofits or for newer, less-polluting trucks. The program targets owners of the more than 3,000 trucks operating at the Port of Houston.

Over the life of the program, the following emission reductions are anticipated: 1,638 tons of nitrous oxide; 26.7 tons of particulate matter; 27.4 tons of volatile organic compounds; 239 tons of carbon monoxide; and 3,636 tons of carbon dioxide.

**Fly ash through Tampa**

The Tampa Port Authority has announced that Separation Technologies LLC, the world’s largest benefactor of fly ash, will begin a series of large export shipments of the cement supplement from the Port of Tampa to Panama. Fly ash is an environmentally-friendly additive in cement that improves its durability and performance.

Bulk shipments by Separation Technologies in support of a major hydro-electric dam project on the Changuinola River, Panama, are expected to total approximately 170,000 tons. The project will be conveyed in a dust free process from truck to closed hatch vessel for loading via pneumatic transfer using a standard cement discharge hose.

**Gothenburg-Drammen rail link re-opens**

The Port of Gothenburg is expanding its range of rail shuttles by once again offering a shuttle service to Drammen in Norway. The first departure will be at the beginning of November and is part of a joint venture with Green Cargo and H. Strand/Rail Terminal Drammen. The rail shuttle will operate at night in both directions with five departures each week.

"Norway has, for a long time been a priority area for shuttle traffic and we are extremely pleased to once again include this route in our shuttle system," says Stig-Göran Thorén, head of rail operations at the Port of Gothenburg.

"We already have customers who have opted to transport their freight using this shuttle and our hope is that more operators and forwarders will realise the benefits of rail transport on this route," says Stig-Göran Thorén.

Norway and the Oslo region make up a very important catchment area for the port and the new shuttle to Norway is the result of co-operation between the Port of Gothenburg, Green Cargo and H. Strand/Rail Terminal Drammen. They now hope to develop the system further, with transhipment in Drammen for onward movement by rail to other destinations, including Trondheim.

The number of rail shuttles has risen significantly since the Port of Gothenburg began investing in rail-based freight transport just over 10 years ago. With the new service to Norway, there are now 26 shuttles to and from the port.

Freight transport by rail is an environmentally smart option. In 2008 alone, transporting freight by rail led to a reduction in carbon dioxide emissions of 48,000 tonnes compared with transport by road. This is equivalent to driving 10,000 times around the world by car.

**African Ports Conference in December**

A maritime experts from the African continent will meet in Durban, South Africa on the 10th and 11th of December for the 35th African Ports and Maritime Conference. The conference will chart ways of enhancing regional integration in the drive to economic sustainability espoused by its leadership.

The experts, drawn from all major ports in the continent, regional economic commissions, shippers and transporters will be attending the 35th African Ports and Maritime Conference, organised jointly by the Port Management Association of Eastern and Southern Africa (PMAESA), and the Transnet National Ports Authority (NPA) of South Africa, with the support of Ship Operators and Agents of the continent.

The conference, to be held at the ultra-modern International Conference Centre in Durban, is a popular year-ender for industry executives because of the relevance of the themes which cut across the maritime spectrum and the high calibre of attendees. The theme this year is “Linking Ports to Corridors to enhance Regional Integration.”

The conference will also be focused on the issues related to Climate change in connection with the preparation of the upcoming World Climate Change Conference which will take place in Copenhagen, also in December, and in connection with the launch of the Africa Green Port Initiative scheduled in 2010.

The Secretary General of PMAESA, M. Jerome Ntabekwara, has sent out an appeal to all stakeholders in the transport sector, whose deliberations could hold the key to unlocking the continent’s latent potential, to register for the conference. “By bringing these experts together, we provide a platform for exchange of ideas and best practices which should enable many of the players to harmonise their activities for the better exploitation of the resources within our continent.”

**Shore power for cruise ships in Vancouver**

The shore power installation at Port Metro Vancouver, the home port of the Vancover-A laska cruise, is the result of a $9-million cooperative initiative between the Government of Canada, the British Columbia Ministry of Transportation, Holland America Line, Princess Cruises, BC Hydro and Port Metro Vancouver.

"Shore power in British Columbia sets a new transportation and energy standard by being the first of its kind in Canada," said British Columbia’s Minister of Energy, Mines and Petroleum Resources, Blair Lekstrom. "This will help contribute to better air quality in Vancouver and the Lower Fraser Valley airshed, and will bring us closer to our government’s goal of reducing greenhouse gas emissions by one-third by 2020."

“We are fortunate to have a reliable system of clean hydroelectricity in our province and we strive to provide our customers with energy solutions that are environmentally and socially responsible,” said Bev van Ruyven, executive vice-president, Customer Care and Conservation, BC Hydro.

“BC Hydro is pleased to help the port power cruise ships in an environmentally friendly way and realize the benefits of clean energy,” Princess Cruises and Holland America Line have pioneered this technology within the cruise industry. Both have invested significantly in outfitting their fleet with onboard shore power equipment currently on nine Princess Cruises ships and six Holland America Line ships. Four Princess ships and one Holland America ship will use shore power in Vancouver during the 2009 Alaska season.

**Port Metro Vancouver**

For more information, visit www.portmetrovancouver.com
Job creation at the Port of Tampa

A review of the fiscal year 2009 capital program implemented by the Tampa Port Authority shows the Port of Tampa’s commercial importance and economic impact as one of the region’s largest job creators.

This current fiscal year’s development projects, such as dredging, construction and major expansions of terminal facilities at Port Redwing and Hookey’s Point, represent nearly $83 million in capital expenditures and nearly 1,500 new construction-related jobs in the region. Resulting from these projects alone will be an estimated $62 million in personal income and $4.6 million in state and local taxes, the review noted.

The review by the Tampa Port Authority, transportation and economic consultant firm Martin A. Associates, reflects the complex nature of the Port of Tampa, saying that the port’s impact “cannot be reduced to a single number.” The Port has six major lines of business: bulk cargoes, break bulk cargoes; containers; ship building and repair; cruise operations; and industrial real estate.

Expanding super-post-panamax capability

D P World Southampton has announced plans to increase its capability to handle super-post-panamax vessels. The terminal has commenced discussions with suppliers with a view to ordering additional super-post-panamax cranes, with a 22 container outreach, which will operate alongside the existing cranes of the same class.

The terminal has also commenced a programme of civil works to extend the wider gauge crane rail to the end of berth 204. These works will enable the super-post-panamax cranes to operate along 1075m out of 1350m of the terminal’s deep-sea quayline.

A part of this upgrading process, the company will also decommission the three cranes which were suspended from operation, and have been parked up on berth 204, following the boom collapse accident in July this year.

$3.5 million to help cut diesel pollution in Baltimore

The US Environmental Protection Agency (EPA) has announced that the Port of Baltimore will receive $3.5 million in Recovery Act funding to help clean the air in and around the Port. The Port will use the funds for clean-diesel technology in essential equipment used for harbour operations, creating jobs and protecting the health of Baltimore communities.

The Port of Baltimore was selected from projects competing for a share of $16.1 million. EPA’s mid-Atlantic region received 40 grant applications. The Port was one of seven applicants that won funding.

The funding will support collaboration with the Baltimore Port Alliance’s environmental committee in extensive outreach to the maritime community with solid information about ways, and technologies, to cost-effectively reduce air emissions. It will also assist with the installation of clean-diesel technology in 142 pieces of diesel-powered equipment used for port operations: two tugboats, seven locomotives, 50 short haul trucks, and 83 units of cargo handling equipment. The technologies include nine engine repowers, 43 vehicle and equipment replacements, 83 exhaust controls, and seven idling devices.

Air emissions cut at Portland

The Port of Portland, Oregon has, over the past year added shore-side power (cold-ironing) at three of its marine terminals. The ability of a ship to “plug in” reduces fuel consumption and carbon dioxide emissions while vessels are docked and running on electric power.

Terminal 2, is home to the “Essayson” and the “Yaquina,” federal hopper dredges owned by the US Army Corps of Engineers and used for navigation channel maintenance at West Coast ports. Before they moved to the terminal late last year, utilities were upgraded to allow the ships to plug in to shore side electrical and fluid services so that they can shut the engines down while docked.

At Terminal 4, in late June, the ITB Baltimore docked at Berth 401, and Port electricians were able to hook it up to shore side power. A new electrical upgrade at the terminal allows a higher amp electrical service to better meet the ship’s power needs. Besides reducing emissions and fuel consumption, the accommodation provides a source of temporary revenue for the Port.

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In Association with: ESPO and EcoPorts Foundation

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The 5th International Ports and the Environment Conference and Exhibition

STOCKHOLM
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EFIP welcomes the Port of Ghent

The European Federation of Inland Ports (EFIP) welcomed the Port of Ghent as a new member at its Annual General Assembly in Mantova, Italy, in October 2009. Wily Robins, EFIP President stated: “This membership can be considered as a real asset for EFIP. It is a very important signal for the further development of the Seine Scheldt project and proves the interest of Ghent for its hinterland. At the same time, if Ghent wants to develop its inland waterway activities, it will have the opportunity within EFIP to be updated of policy developments and to exchange best practices with other inland ports.” The CEO of the port of Ghent, Daan Schaack commented: “The upcoming Seine-Nord project, offers plenty of opportunities for the port of Ghent. Being an intermodal nodal point, Ghent has very good hinterland links via IW T, rail, pipelines and road. With a 20 million throughput by IW T, Ghent is an important inland port. Promoting sustainable transport is one of Ghent’s main goals and another reason to join EFIP.” EFIP’s Director Isabelle Ryckboest added: “I am happy to welcome the port of Ghent to EFIP. The forthcoming Seine-Scheldt connection will give the seaport of Ghent an inland navigation express link with Paris and will as such boost its growth potential in inland navigation. Ghent will be one of the main access points to the Seine-Scheldt connection. Moreover EFIP and its members will be able to use Ghent’s expertise when it comes to integrating the port into the town. A subject EFIP wants to work on during the coming year”.

www.portofghent.be

North Carolina Ports showcase greener port operations

A recent demonstration at the Port of Wilmington displayed some of the latest technology showcasing the North Carolina State Ports Authority’s commitment to more environmentally friendly operations at the Ports of Wilmington and Morehead City, and the NC International Terminal.

Attendees got a firsthand look at the newest technology in diesel/electric hybrid terminal tractors, the Pluggable Hybrid Electric Terminal Tractor (PHE TT), a charge sustaining series hybrid. The 200 horse power diesel engine has been replaced with a 40 horsepower Tier 4 interim genset. In independent third party testing: fuel consumption was reduced an average of 50% while emission of NOx and particulate matter by 77% and 82% respectively. Attendees also received the latest information about ongoing emissions control programs for the NC State Ports operating equipment, including biodiesel fuel and biodegradable lubricants.

Biodegradable lubricants which include hydraulic oil, gear oil, food grade lubricants, greases, and aerosols provide a renewable alternative to petroleum based lubricants thus protecting the environment, while delivering superior lubrication. The Ports Authority uses ultra low sulphur diesel (ULSD) as its primary off-road diesel fuel, and a blend of 20% bio-product, 80% ULSD in port operating equipment. Bio-product such as soy biodiesel is a non-toxic, clean burning and environmentally friendly fuel product made from renewable soybean oil. Using biodiesel is estimated to reduce overall diesel consumption as well as emissions of particulate matter, hydrocarbons, carbon monoxide; carbon dioxide and sulphur dioxide by as much as 20% annually.

www.ncports.com

Oakland’s truck ban exceeds regulations

The Oakland Board of Port Commissioners adopted a strict truck ban effective January 1, 2010 to help clear the air. Port Board President Victor Uno said, “This is another step that clearly demonstrates our commitment to a healthy community. The strict truck ban will help us achieve our goal of reducing the health risk from diesel pollution from seaport sources.” The Port of Oakland ordinance that includes the drayage truck ban will go through a second reading on October 20, 2009.

As of January 1st, 2010, drayage trucks with engine year models earlier than 1994 will be banned at the Oakland seaport. Drayage trucks with engine year models between 1994 and 2003 have to be retrofitted with diesel particulate filters to enter Port of Oakland maritime facilities. The Port of Oakland’s drayage truck ban goes well beyond the requirements of the California Air Resources Board (CARB) regulations by establishing a turn-away requirement for non-compliant trucks at the seaport. The CARB regulations allow non-compliant trucks to serve the seaport as long as certain information about each truck is recorded and reported to CARB for enforcement. The Port of Oakland truck ban would require that the seaport facility operator deny entry to drayage trucks, with very limited exceptions, for those who cannot demonstrate compliance with the CARB January 2010 clean trucks deadline.

The Port of Oakland will continue coordinated outreach to the seaport trucking community and maritime terminal customers to provide the latest information about the CARB regulations, the drayage truck ban and other important information regarding the Port’s Maritime Comprehensive Truck Management Program.

www.portofoakland.com

20% ‘green’ energy in electric power contract

The Port Commission of the Port of Houston Authority is considering awarding a contract for $19.8 million to Just Energy Texas L.P. for the purchase of deregulated electric power to be used Port of Houston Authority-wide, from 2009 to 2012. The contract will include 20 percent renewable energy. Such an amount of “green” energy is enough to power approximately 200 homes for an entire year.

November 2009 GreenPort 11
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International Conference & Exhibition

31 May - 2 June 2010

Organisers: EWP Communications

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www.danubesummit.com
Hams Hall wins environmental award

A sociated British Ports’ (ABP) Hams Hall intermodal rail freight terminal has won an Environmental Innovation Award at the 2009 Rail Freight Group Awards held in London. The award is given to a freight industry company which has pioneered and invested in environmental schemes.

A gainst stiff opposition, A BP won the award for reducing fuel consumption and lowering the emissions from their reachstackers. Martin Philpott, A BP’s Manager of Inland Operations said: “In an ever changing and competitive world, reducing operating costs linked with concern for the environment is of paramount importance to us.”

“The improved performance has resulted in a one-third reduction in fuel consumption and an annual financial saving of around £84,000. A BP also saved 163,000 litres of fuel which would have produced a further 436 tonnes of CO₂ emissions.”

Since A BP acquired the 11-hectare Hams Hall Terminal in 2002, an ongoing expansion programme has seen operational capacity treble. Hams Hall can load and unload up to 1,000 containers a day. Situated four miles outside Birmingham, the terminal is adjacent to the Nuneaton – Birmingham rail line, which links into the rail network covering a range of UK ports and the Channel Tunnel. The location of A BP Hams Hall also provides easy access to M 1, M 6, M 42 and M 69 motorways.

New-generation, eco-friendly vessels

M itsui O.S.K. Lines has formed the concept for its next-generation vessels by building on and refining existing technologies it has developed and adopted.

The first new concept is a next-generation, environmentally friendly car carrier; “ISHIN-I,” which stands for “Innovations in Sustainability backed by Historically proven, Integrated technologies.” While in port, and during loading and unloading, ISHIN-I achieves zero CO₂ emissions. It further develops the use of renewable energy for conventional car carriers, realising its zero emission goal by adopting large-capacity solar-power panels and rechargeable batteries.

When under way, it reduces CO₂ emissions by 50 percent, using multiple new technologies to greatly reduce the vessel’s burden on the environment. The ship achieves a 41 percent reduction, in comparison (per unit) to conventional vessels (PCT C with a capacity of 6,400 standard passenger cars).

Therefore, for larger vessels in the future, CO₂ emissions can be reduced by 50 percent.

MOL is also continuing to work on more concepts for other next-generation vessels such as: ferries, bulkships, tankers, and containerships. www.mol.co.jp/ishin

Polzug’s ‘Golden Environment’

W alter Schulze-Freyberg, Managing Director of Polzug Intermodal GmbH, has been awarded its logistics prize by BF Bahnen (the Federation of Managers of German Rail Companies). The Federation confers its ‘Golden Environment Rail’ for outstanding services to rail transport. The award was bestowed during a ceremony held in Hamburg under the motto ‘Rail Transport - Contributing to Climate Protection’.

Polzug is a leading supplier of rapid, sustainable rail transport between the Northern European container ports and Central and Eastern Europe. Polzug is a joint venture between Hamburger Hafen und Logistik A G (HHLA), PKP Polish State Railways and Deutsche Bahn A G.

Polzug was the first private rail company to develop block container train links between ports in Northern Europe and Poland. Today, its transport services extend well beyond Poland, into the CIS States, the Caucasus and as far as Central Asia. Polzug accordingly plays a crucial part in transporting rapidly growing quantities of goods from the Northern Sea ports of Hamburg, Bremerhaven and Rotterdam to the emerging national economies of Eastern Europe in a way that conserves the climate. Since being founded, Polzug has already managed to save 200,000 tons of climate-harmful carbon dioxide.

Environment: priority for supply chain

The recent Council of Supply Chain Management Professionals’ Annual Conference in Chicago discussed how the environmental impact of the global supply chain can be managed in the future.

While manufacturers, retailers and their logistics service suppliers continue to struggle with the challenges presented by the recessionary effects on volumes and costs in their supply chains, it is clear that they have not lost sight of their responsibilities to care for the environment. Government policy and regulation, carbon footprint measuring, consumer demand trends and means of emission control, as well as other aspects of sustainability were addressed at the conference.

Sharon Bringelson, Divisional VP International at Sears pointed out that many green initiatives save costs rather than increase it, and that these policies, when enacted, can bring positive results more quickly than sometimes expected. She emphasised that ‘green’ was not just a short-termfad nor policies concocted simply as PR exercises.

James Barr, VP of Government Affairs at Ryder Systems, commented that while the development of green policy has been slower than expected due to the recession, recent data indicates that 75% of supply chain end-users still see environmental matters as either ‘important’ or ‘very important.’

M. Barr emphasised that his company like many other service providers have developed a whole array of green measures in response to customer demands, including carbon footprint metrics, ISO 14000 accreditations and fuel management schemes. H owever, while market awareness of the issues continues to grow, there is an urgent need for governments, both at the domestic and international level, to dispel regulatory uncertainty to assist providers in complying with uniform standards.

David Miller, VP of Global Policy and Economic Sustainability at Con-way, further stressed the need for regulatory clarity. Within the US, variable state laws cause problems for transport operators. In addition, many emissions and other performance targets are way too low to be reasonably achievable. M. R. Miler called for more consultation with industry before hard and fast laws are put in place that will put an undue cost burden on operators and their customers.
Siwertell coal unloader for Itaquí...

A Siwertell coal unloader ordered to discharge coal in Porto do Itaquí, Brazil, offers environmental, technical, and efficiency benefits.

In July, Cargotec secured an order for a Siwertell 790-D screw type, continuous ship unloader from UTE Porto do Itaquí Geração de Energia SA, Brazil. The unloader is guaranteed to have a rated capacity of 1,000 tph and to be able to unload ships of between 30,000 dwt and 100,000 dwt part loaded.

As well as the ship unloader for handling coal, the contract includes spare parts, supervision of installation, commissioning, start-up, testing, and training. The unloader will be assembled in Porto do Itaquí, and is expected to be ready for start operation at the end of 2010.

“The customer chose Siwertell equipment for three main reasons: environmental, technical, and design concept to the old existing loader,” explains Douglas Witches, Sales Manager for bulk terminals.

“Firstly, the environmental benefits are that it doesn’t allow spillages or dust to escape. Secondly, the unloader’s low machine weight and low wheel loads are technical advantages because the existing jetty has a limited load capacity. Thirdly, the high capacity of the equipment means that it is highly efficient, which produces cost savings.”

www.macgregor-group.com

...and alumina ship loader for Brazil

• A Lunorte, one of the world’s largest alumina producers has opted for a newly designed, Siwertell alumina ship loader from Cargotec to come into operation at the end of this year. With environmental benefits and impressive efficiency, the ship loader is designed to load Kamsarmax-type vessels up to 80,000 dwt and is destined for a production plant in Barcarena, Para, located in Northeast Brazil. The plant, owned by A Lunorte, had an annual production of 1.6 million tonnes of alumina in 2000, which, by 2006 had increased to 4.2 million tonnes. Its latest planned expansion will increase this figure to around 6.3 million tonnes per year.

Cargotec was contracted to replace the company’s existing belt-type ship loader, which needs to be changed because of problems related to high dust emissions. “Cargotec’s new Siwertell ship loader is built on a different capacity,” says Jonas Fack, sales director for bulk terminals.

“Weith this new wave of members, our industry knowledge and experience grows once more, equipping us with tools to further improve the scope of cooperation in the ports sector on crucial issues such as safety, environmental protection, technological innovation and regulatory reform,” says PEM A President, Otoniel Popesco.

www.pem.org

Auramarine new ballast water treatment systems

A uramine Ltd, a leading manufacturer of heavy fuel oil supply systems and other auxiliary units for marine and power station engines is now applying its wide-ranging experience in liquid flows to a new sector that benefits the environment.

A uramine is bringing out A uramine Crystal Ballast, Ballast Wa ter T reatment System (BW T S). Thanks to technological innovations featured in this system, it is energy-efficient, compact and easy to install. Additionally, A uramine’s solution does not affect the time required for ballasting or de-ballasting operations, or increase the duration of port calls.

A uramine’s solution is based on the use of UV energy. T he UV-C solution presents many advantages, and the technology concerned is already familiar. It is already used in treating drinking water and wastewater. T he advantages of using UV radiation, a purely physical disinfection process, are that no harmful by-products are formed in the process, nor does it require the production or storage of chemicals on board.

www.aurarine.com

Bio fuels and electricity from algae

Technoplex Inc., a port technology consultancy group, and Proteus Environmental Technologies, a leader in the innovation of green technology, have announced a national strategic partnership to bring their combined “green technology” practices into the port, maritime and goods movement community.

A mong the Proteus technology portfolio are PhySoSystems, which is pioneering a market-changing new approach to creating bio fuels and electricity from algae. M icrobial Energy Systems is developing advanced technologies in organic waste treatment and the simultaneous production of electricity. It is also developing two initiatives in sustainable aquaculture to improve aquaculture yields and increase the efficiency of off-shore aquaculture through automation.

Technoplex, Inc. uses a hands-on approach to technology cluster development and use of new technologies within them. Technoplex, Inc. has been particularly involved in the Los A ngles ports, helping to lead the approval of $5 billion of pending capital projects which require green technologies. Technoplex, Inc is working with the Harbour A ssociation of Industry and Commerce and the California M arine and Intermodal T ransportation System A dvisory C ouncil, in order to establish the Los A ngles ports as the national centre of green port technology, and to replicate the model nationally, working with other U S ports, universities, and the U.S. Department of Transportation.

www.technoplexgroup.com

Four new members join PEMA

The Port Equipment M anufacturers A ssociation (PEMA) has four new members: crane cabin specialist Brieda Cabins; port vehicle manufacturer Linde Heavy Trucks; drives systems supplier Control T echniques; and port equipment and services group Portek. “With this new wave of members, our industry knowledge and experience grows once more, equipping us with tools to further improve the cooperation in the ports sector on crucial issues such as safety, environmental protection, technological innovation and regulatory reform,” says PEMA President, Otoniel Popesco.

www.pe.org

The system presents no danger of overdose or under dose, as only naturally occurring processes are used. T he process does not result in any changes in the physical parameters of the water, such as its pH, value, temperature, salinity, taste, odour, or colour.

T he project is currently undergoing an intensive type approval testing phase; the final products are expected to reach the market in the second half of 2010.
Gottwald reinforces its position in Germany

C. Steinweg (Süd-West Terminal) GmbH & Co. KG has ordered a Generation 5, G H M K 7608 Mobile Harbour Crane, a variant of Model 7, from Gottwald Port Technology GmbH for its multi-purpose terminal at the Port of Hamburg. The G H M K 7608 has a maximum lifting capacity of 150 tonnes and a maximum radius of 51 m. C. Steinweg has been operating an identical Gottwald Mobile Harbour Crane at this terminal since 2006.

The new crane is to carry out commercial operations on Kamerunkai (Cameroon Quay) where Steinweg handles project cargoes, heavy lifts, containers, iron and steel. Both Mobile Harbour Cranes will be able to work in tandem lift operations, allowing them to handle very heavy loads weighing up to 300 tonnes.

Gottwald continues to grow in India

Liebherr has acquired a strategically important order in the Indian market. In delivering six mobile harbour cranes of type LHM 400 to A BG InfraLogistics Ltd., Liebherr has further bolstered its market position on the Indian subcontinent in this product range. The large machines shipped to the Port of Haldia have a maximum lifting capacity of 140 tonnes and are fitted with a 20 m and a 35 m four rope grab. All cranes will be delivered in a pre-assembled condition in order to achieve almost immediate operation on site by mid-October.

To increase their handling capacities, many port operators are turning to Liebherr technology. For example, on 20 August 09, Krishnapatnam Port achieved an All-India record; the cape size vessel M V Cape Santa Alegria was turned around with an average load rate of 50,400 MTD per day. A total cargo of 101,250 MT was loaded within 48 hours by using two Liebherr Mobile Harbour Cranes, type LHM 500. Peak performance of the cranes reached 1500 MTD per hour and the average handling rate was 1050 MTD per hour over the entire vessel.

New challenges in applying environmental directives

Roger Morris of Bright Angel Coastal Consultants talks of some of the new challenges for the application of environmental directives which must be overcome in order to enable a high level environmental performance.

"Since its introduction in 1992, the EC Habitats Directive has challenged everyone from port managers to environmental regulators. The need to prove that there would not be a harmful effect on wildlife led to the introductions of the precautionary principle. This principle has been responsible for terms such as 'appropriate assessment' which has been the cause of much uncertainty for ports.

In northern Europe many environmental issues are reasonably well understood and in many cases solutions have been found. Other terms that have become better understood include 'sediment management' and 'sediment budgets'. There is a much greater knowledge of the geomorphological implications of port development, especially channel deepening and its knock-on effects on wildlife assets. 'Managed realignment', however, is another term that has become established in the lexicon of port management and has been used on many occasions to compensate for habitat loss.

Returning sediment to the marine system by over-spilling or various forms of direct placement has been used to mitigate impacts on sediment budgets. These techniques are now starting to encounter new challenges, however. Not all estuaries have a high sediment load and where sediment loads are lower there can be concerns about the impact of re-introducing sediment at the wrong time of year. The main issues concern impacts on migratory salmonids (Atlantic Salmon and Sea Trout) and on Biological Oxygen Demand. These issues are only just starting to emerge but are likely to become increasingly prominent as the objectives of the Water Framework and Habitats Directives are explored and challenged.

Achieving higher levels of environmental performance is an ongoing process and there will be new challenges to resolve. Doubtless solutions will be found in many instances, but impasse cannot be ruled out in some special circumstances.

* Bright Angel Coastal Consultants specialise in port development and coastal management issues that affect the natural environment. Roger Morris, who established the consultancy, has previous experience working for Natural England and its predecessor English Nature. He can be contacted on: brightangel.coastal@gmail.com

Six electric RTG’s to Vietnam

Saigon Newport Company (SNP), Vietnam has awarded Cargotec a contract for a further six all-electric Kalmar E-One rubber-tyred gantry (RTG) cranes, destined for the 1st phase of its Tan Cang-Cai Mep International Container deepwater port near Ho Chi Minh City. SNP’s 6+1 wide and 1-over-5 high RTG’s will come equipped with a container position verification system, Kalmar Smartpath, and will be delivered during first quarter of 2010. These are identical in design to the twenty top-performing E-One RTG’s ordered by SNP in 2007.

Commenting on the latest order, Henry Tan, Sales Director, South East Asia, Cargotec said: “SNP selected Kalmar E-One for its Cat Lai terminal due to productivity, ease of maintenance, more sustainable design and a high standard of services. The equipment and our service have fulfilled their expectations and our strong relationship with SNP has become even stronger.”

“Over the years we have supplied SNP with twenty RTG’s, reachstackers and terminal tractors. At the same time we have a strengthened our presence in Vietnam by providing of a broader range of equipment, technology and services. Vietnam’s container industry is developing as the trade is growing and we are building on the closer co-operation with our customers to play an important role in this development.”
The 2nd Safe Cargo Handling Seminar
Clarion Sign Hotel, Stockholm, Sweden
Tuesday 23 February 2010

First Announcement

ICHCA International and EWP Communications Ltd (organisers of the GreenPort series of conferences) are pleased to announce that the 2nd Safe Cargo Handling Seminar will take place in Stockholm on Tuesday 23 February 2010. The 1-day seminar will be held on the day prior to GreenPort 2010 - permitting those who have interests in port safety and environmental matters to attend both events.

The aim of ICHCA International’s Safe Cargo Handling seminars is to highlight topical issues at international level, enabling delegates to clearly understand the latest requirements - and how these changes will affect their companies.

The 2nd Safe Cargo Handling seminar will focus on the following key topics:

International Developments
- Dangerous goods
- Containers (CSC & Safe Lashing)
- Bulk Loading and Unloading
- Flexitanks
- Latest ICHCA publications

Cargo Handling Plant and Equipment

Carriage of Timber Deck Cargoes
- The latest position regarding the revision of the IMO Code will be given, with practical examples. Various industry views will be explained

Safe Use and Care of Lifting Gear
- New edition of a Code of Practice on the safe use of lifting gear
- Gear Stores
- Care and use of slings

High Winds at Terminals
- The latest joint publication from TT Club and ICHCA International will be reviewed and the contents explained

Further information:

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Peter Barham Environment Ltd established

After eight years as Sustainable Development Manager with Associated British Ports, Peter Barham has moved on to set up his own company providing advice to the ports industry on environmental and sustainability issues.

During his time with ABP, Peter developed a comprehensive environmental management framework for all 21 ports in the ABP group and ensured that protection of the environment was central to the company’s corporate governance at all levels from the Board down. Peter also led on resolving the environmental issues associated with a number of key port developments, including two in the Humber Estuary, the whole of which is designated under the EU Habitats Directive.

His new company offers a wide range of expertise in port environmental management and sustainable development covering all aspects of port work:

• day to day port operations
• resource management and efficiency
• port waste management
• port planning and development
• dealing with new legislation

The company also offers a full service on the development and implementation of environmental management systems which meet the need of the customer and are cost-effective.

For further information, Peter can be contacted at Peter Barham Environment Ltd on peterbarham@googlemail.com

Battery powered locomotive unveiled

Norfolk Southern has unveiled the latest in alternative energy locomotive technology at its Juniata Locomotive Shop in Altoona, PA. The NS 999 is a prototype 1500-horsepower switching locomotive that relies solely on rechargeable batteries for power.

NS 999 is an entirely electric locomotive that uses a lead-acid energy storage system, comprised of 1080 12-volt batteries, to operate in railroad switching applications without the use of a diesel engine and with zero exhaust emissions. The plug-in locomotive can also regenerate dynamic braking energy through a system provided by Brookville Equipment Company. The recovered dynamic braking energy continually replenishes the energy storage system, and uses this recovered energy for tractive effort in rail operations. The batteries are carefully monitored and controlled through an elaborate battery management system to assure safety and maximum battery life, and when fully charged NS 999 is able to operate three shifts before recharging is required.

ESPO sets out priorities

The European Sea Ports Organisation, ESPO, recently issued its contribution to the European Commission’s Review on the Future of Transport. This consultation aims to set the basis for the preparation of a new Transport Policy White Paper which will be published in 2010 and which will set out policy priorities until 2020.

ESPO proposes the following priorities to be taken into consideration and translated into policy actions in the next White Paper:

• Strengthening the role of nodal access points, such as seaports and inland ports, and improvement and further development of hinterland connections between ports and land transport networks.
• More attention and resources for freight transport, with the possibility to create dedicated infrastructure networks.
• A better integration of transport and environmental policy objectives at the level of the EU.

• A better connection between the Common Transport policy and the Trans-European Transport Policy.
• A alignment of transport infrastructure needs and urban development requirements through enhanced planning procedures.
• Full implementation of the policy framework set out in the European Commission’s 2007 Ports Policy Communication.
• A rapid and harmonised implementation of the European Maritime Transport Space without Barriers, to turn short sea transport into a viable and competitive alternative to inland transport.
• Full rail market liberalisation.
• A level playing field, both between ports and between transport modes, as well as enforcement of applicable EU Treaty rules, international agreements and relevant secondary EU legislation (e.g. in the field of environment, customs, etc.).

ESPO award nominations

The ports of Algeciras, Genoa, Ghent, Gijón, Rotterdam, Stockholm and Turku have been shortlisted for the ESPO Award for the societal integration of ports. The seven were chosen from 30 applications by the international jury, chaired by John Richardson, former Head of the European Commission’s Maritime Task Force.

“The quality of the applications received was outstanding,” said John Richardson, “this is very encouraging and shows that more and more port authorities care about the social integration of their ports. We will now be putting a number of precise questions to these ports so that we can pass a final judgment.”

The winner of the ESPO Award will be announced on 4 November during an evening ceremony at the Brussels’ Town Hall. The award itself is designed by the Belgian artist François Schuiten.

www.espo.be

New chairman for AIVP

The Members of AIVP elected Jean-Pierre Lecomte, to the Chairmanship of AIVP, at their most recent General Assembly in the Icelandic port city of Reykjavik.

Former President of the Port Authority of Le Havre (1998-2008), Mr. Lecomte succeeds M. Jákri A. Ákuna, Lord Mayor of Bilbao (Spain) who headed the development of AIVP over the last four years. Among the future actions of AIVP over the last four years.

Jean-Pierre Lecomte, former president of the Port Authority of Le Havre, is the new Chairman of the AIVP

www.aivp.org
Two key industry events come together

The Francis Marion Hotel
CHARLESTON
4-6 MAY 2010

EW P Communications Ltd, organisers of the annual GreenPort Conference in Europe, are pleased to announce that a 1 day GreenPort Americas Conference will be held in conjunction with the 2 day AAPA Biennial Ports Harbour Environmental Conference.
Long Beach and Los Angeles: no let-up in environmental initiatives

Emissions control, air and water control, green business development and societal integration are all high on the San Pedro Bay Ports agenda

EMISSIONS CONTROL

Clean trucks program marks first anniversary

At its one-year anniversary, the Port of Long Beach Clean Trucks Program is on track to achieve its goal of an 80 percent reduction in diesel truck pollution, two years ahead of schedule. The program, initiated in 2008, focuses on a progressive ban to phase out the oldest, most polluting trucks in favor of trucks that meet the tough 2007 federal emission standards.

In just one year the trucks program has been extraordinarily successful thanks to truck owners who have moved quickly to comply with looming deadlines, the program will prompt a near-complete conversion to cleaner trucks by the next “ban” deadline, January 1st 2010.

Clean trucks are at the heart of the Port of Long Beach’s pollution reduction strategy

Incentives expanded for vessel speed reduction

The Los Angeles Harbour Commission has approved an expansion of the Port’s Vessel Speed Reduction Incentive Program, allowing all ocean-going vessel operators to qualify for further financial incentives while saving fuel and reducing pollution.

A Voluntary Vessel Speed Reduction Program has been in effect since 2001, in which vessels voluntarily reduce speed to a 12-knot speed limit within 20 nautical miles of Point Fermin. In June 2008, the Port of Los Angeles added a financial incentive, rewarding vessel operators whose fleets achieved 90 percent or better year-round compliance of the speed reduction program with a 15 percent discount on first-day dockage fees. Ninety percent of vessel operators are participating in the current program.

In addition, recent action by the Harbour Commission gives vessel operators the option of slowing down within 40 nautical miles of Point Fermin instead of 20 nautical miles. Vessel operators achieving 90 percent compliance at the 40-mile range would receive a 30 percent discount on first-day dockage fees.

Deadline extended for zero emission rail yard cargo mover submission

The Port of Long Beach has extended the date for the submittal of “concepts and solutions” for a pollution-free, cargo-moving system, to replace the diesel trucks that travel between port marine terminals and a local rail yard to October 23.

Shore-powered oil tanker berth wins award

Southern California regional air pollution authorities presented the Port of Long Beach and BP America with an award for becoming the first seaport in the country to construct an oil shipping terminal that offers clean “shore power” to improve air quality.

The Port of Long Beach outfitted BP’s oil tanker terminal on Pier T with the ability to allow tankers to safely “plug in” to the landside electrical grid for all power needs while docked and unloading crude oil. BP America retrofitted two of its Alaska oil tankers to plug in.

When it comes to the shore-powered oil tanker berth, it’s calculated that with visits from the first two Alaska Tanker Co. ships equipped to plug in, 30 tons of air pollution will be eliminated per year. Plugging an oil tanker in during off-loading operations is the pollution-reduction equivalent of taking 187,000 cars off the roadways for a day.

The shore power berth on Pier T was built at a cost of $23.7 million, with $17.5 million from the Port and $6.2 million from BP America. It supplies up to 8 megawatts of power at 6,600 volts safely to docked vessels, allowing the ships to shut down their diesel engines that they formerly had to run to provide power to run onboard pumps, lights, communication and ventilation systems.

GRANTS

Air quality grants awarded by the EPA

The U.S. Environmental Protection Agency and Governor Arnold Schwarzenegger have announced $26.5 million in funding for diesel emission reduction projects in the Southern California air basin, under the American Recovery and Reinvestment Act of 2009. “Upgrading hundreds of vehicles and machinery to clean diesel technology will help create and save jobs and reduce health and environmental costs of dirty diesel emissions” said EPA Administrator Lisa P. Jackson.

Of this funding nearly $2 million has been awarded to the Port of Los Angeles. The funding will be used to replace, repower or retrofit a total of 27 pieces of equipment currently in operation at the Port. The types of equipment to be modified include trucks, forklifts, cranes and other cargo handling equipment. The emission reductions achieved from this project will improve air quality and health in the surrounding areas. “As we mark the one-year anniversary of the successful Clean Truck Program, we’re grateful that the EPA is assisting us in our efforts to reduce port air pollution on other clean diesel fronts,” said Dr. Knatz, Port Executive Director.
TOC Americas
Embraces Recovery

Key business panels at TOC Americas will provide delegates with the latest market intelligence, covering:

- macro economic and trade indicators
- deployment strategies for liner shipping including the effect of the Panama Canal expansion
- the state of the market in port infrastructure finance
- the impact of recent events on marine terminal operators’ appetite for investment and development in Latin America and the Caribbean

New speakers confirmed:

- Julian Thomas
  CEO South America East Coast, Hamburg Süd
- Marcos Hansen
  Centro de Navegacion & Commercial Director, Maersk Argentina
- Enrique Arteaga
  Regional Director ECSA, CSAV
- Rodolfo Sabonge
  Vice President Research, Panama Canal Authority
- Marcelo Patricio
  Director of Processes, Grupo Libra, Brazil
- Roberto Negro
  CEO, ITL, Exolgan, Argentina
- Álvaro Brunet L.
  CEO, Ultramar - Inversiones Neltume Ltda., Chile
- Alberto Bórquez C.
  General Manager, San Antonio Terminal Internacional S.A., Chile

Book your conference place today at www.tocevents-americas.com/book
WATER
San Pedro Bay WRAPs up sediment quality
The Los Angeles and Long Beach Boards of Harbor Commissioners have jointly adopted an ambitious strategy to improve and maintain water and sediment quality in their ports with an adaptive, science-based approach.

The newly adopted W ater Resources Action Plan (W R A P), includes actions to zero in on litter, legacy sediment contamination, loose materials and other potential contaminants in the harbour area.

The W R A P, designed with input from multiple stakeholders, outlines strategies designed to work in conjunction with regulations expected to be issued soon by the Los Angeles Regional Water Quality Control Board.

BUSINESS GROWTH
Additional cruise ship facilities for Los Angeles
By certifying the Final Environmental Impact Report (EIR) and project entitlements, the Harbor Commission’s action moves forward the largest community-serving waterfront redevelopment initiative in the Port’s history.

The 400-acre waterfront infrastructure and revitalization initiative will extend from the Port’s inner harbor cruise facilities to Cabrillo Beach in the outer harbor, creating a world-class waterfront. The project, expected to take a decade or more to complete, will include the expansion of cruise ship operations with a new outer harbor terminal that will provide more berth space and accommodate the largest ships that will call at the Port in the coming decades.

The Port anticipates funding approximately $900 million, largely for public infrastructure, and anticipates an additional $300 million will be raised through private investment through the board’s entitlement of up to 300,000 square feet of commercial-retail redevelopment and an additional 75,000 square feet of conference centre space. The project will create an estimated 5,000 permanent jobs serving cruise operations, beautification initiatives, including the development of a new community park in San Pedro (Plaza Park), implementing a Beautification Plan along area corridors and landscaping along Front Street, which runs parallel to the terminal perimeter.

MOL renews long-term lease for LA container terminal
MOL’s terminal operator TraPac, Inc has renewed its long-term lease contract for a container terminal at the Port of Los Angeles.

Under the new contract, the terminal’s total space will be extended to 1.3 times the current area. The number of berths will also increase. New on-dock rail facilities will be constructed on the terminal site, as well as multilevel additions to the existing terminal access roads, which will reduce traffic congestion in and around the terminal. The gate facility and terminal office will also be relocated to further enhance the terminal’s operating efficiency.

Furthermore, the new contract also includes a provision for shore power to supply vessels berthed at the port, which will significantly reduce emissions of environmental hazardous substances such as NOx, SOx, and PM from the vessels’ exhausts, as they will not be required to operate engines for power purposes. The TraPac will proactively introduce new technologies to reduce the environmental burden, ensuring more environment-friendly terminal operation.

SOCIETY
Offsetting the port’s impact on the local community
A new Port of Long Beach grant program with $15 million in funding is set to be introduced in November. The grant programs are designed to offset the cumulative air quality, reduce greenhouse gases and noise impacts that future port projects will have on the surrounding community. The $15 million will be divided equally among three separate funds to assist schools and related sites, health clinics and senior centres, and greenhouse gas projects.

The Board of Harbor Commissioners approved the first funding, $15 million, as part of the Midle Harbor Redevelopment Project, a 10-year plan to remake two aging shipping terminals into a modern facility.

“While we build environmental improvements to Port terminals and equipment, the grants will go a step further to reduce those impacts that still exist,” said Dr. Robert Kanter, the Port’s Managing Director of Environmental Affairs and Planning. “Part of the funding will go directly to the areas of Long Beach most affected by the Port, and part will be used to reduce the gases linked to climate change.”

Record crowds at 5th annual Green Port Fest ‘09

Green Port Fest ‘09 visitors enjoyed dozens of interactive exhibits, boat and train tours.

More than 10,000 people filled the colourfully decorated roadway outside the Port of Long Beach administration building for the fifth annual Green Port Fest ‘09. The waterfront street fair gives attendees a chance to learn more about the Port’s environmental programs such as the use of shore power and its Clean Trucks Program.
Nordic ports have established a strong reputation for their environmental initiatives and their commitment to investing in sustainable operations and technology.

Participants on the 2nd GreenPort Environmental Study Tour in February 2010 will have a chance to view first-hand the work being undertaken by some of these ports.

Participation in the tour is open to Port Authorities, Terminal Operators, Logistics Companies and Suppliers of Equipment and Services. The itinerary is as follows:

- Monday 15 February - Convene Copenhagen
- Tuesday 16 February - APM Terminals - Aarhus
- Wednesday 17 February - Maersk HQ & Copenhagen Malmo Port
- Thursday 18 February - Port of Oslo
- Friday 19 February - Port of Gothenburg
- Saturday 20 February - Stockholm City
- Sunday 21 February - Stockholm City
- Monday 22 February - Port of Turku
- Tuesday 23 February - Port of Helsinki (& Vuosaari)
- Wednesday 24 February - GreenPort 2010 Conference
- Thursday 25 February - GreenPort 2010 Conference
- Friday 26 February - Ports of Stockholm

As a preview to the Study Tour, GreenPort Journal reports below on the environmental initiatives at some of the ports which will be visited on the Tour.

### PORT OF COPENHAGEN AND MALMO

The Copenhagen and Malmö Port (CMP), a member of the EcoPorts Foundation, gives priority to safety, health and the environment, in order to obtain a durable and sustainable environment. Both Copenhagen and Malmö are certified according to ISO 14001 covering “Environmental Management System Certificate.”

CMP has adopted the following environmental goals:
- Reduction of fuel gases and particles from machinery handling cargo
- Reduction of diesel consumption per handled cargo tonnes
- Continuous reduction of discharge of oil products from machinery and other equipment to water and soil
- Reduction of effect on the environment from bulk products when loading and unloading

**It pays to think green**

Last year, CMP saved 120,000 litres of diesel, representing a cash saving of more than DKK 5 million (SEK 1 million). The 12 percent less diesel used meant air pollution from its operations fell by an average of 19 percent compared to 2007.

The lower diesel consumption is partly the result of sending some of our dock workers on ‘eco-drive’ courses”, says Lennart Hall, CMP’s quality and environment co-ordinator. “In other words, they drive in as environmentally friendly a manner as possible – e.g. by avoiding unnecessary acceleration. We also improved the way we plan calls by ships, to ensure that driving distances are as short as possible when we load and unload cargo.”

Particle filters installed on CMP’s machinery were also a major contributor to air pollution reduction. More than 50 large machines are to have particle filters mounted by 2010. Some of the oldest
NORDIC PORTS: STUDY TOUR PREVIEW

The Port of Oslo must comply with set standards and regulations to ensure environmental protection and sustainability. The new facility at Norra Hamnen, scheduled to come on stream in the first quarter of 2011, will move the majority of freight traffic out of the inner city, improving air quality and reducing noise-related annoyance and the health impacts of people living around port industrial areas. The project was funded by the European Commission LIFE-Environment Programme.

The new facility, scheduled to come on stream in the first quarter of 2011, at Norra Hamnen, will move the majority of freight traffic out of the inner city, improving air quality. The intention is to create the ideal conditions for the transfer of goods between the different forms of transport: ships, trucks and trains. The joint project involves the City of Malmö, which owns the land in Norra Hamnen, and CMP, which operates the port. The area earmarked is the result of landfill, including earth from the recent City Tunnel project in Malmö.

The Port of Oslo must comply with set standards and regulations to ensure environmental protection and sustainability. The new facility at Norra Hamnen, scheduled to come on stream in the first quarter of 2011, will move the majority of freight traffic out of the inner city, improving air quality and reducing noise-related annoyance and the health impacts of people living around port industrial areas. The project was funded by the European Commission LIFE-Environment Programme.

The noise mapping of the Freeport area in Copenhagen demonstrates that there are no noise problems from the port activities, as the noise does not exceed noise limit values at residential areas. Most noise in the surroundings of the Freeport arises from the public road and rail transport along Kalkbrænderihavnsgade.

The Port of Oslo has incorporated an environmental management system since 1997. This implements environmental and sustainable principles in port operations. Certification, according to ISO14001 since 2001, entails dedicated work to identify and improve potential environmental impacts of port-associated activities. The Port of Oslo focuses on:

- Reducing air pollution from berthed ships and shore-based activities
- Maximising efforts to limit noise
- Reducing discharge to water from ships and port activities, and removing polluted sediments from the basin

“We take responsibility for the environment within the Oslo Port District,” says Anne Sigrid Hamran, Port director. “Neighbours and other groups affected by our activity shall experience the Port of Oslo as open, pro-active and solution oriented.”

The Port already adheres to air pollution control set by the IMO MARPOL annex VI and the EU Directive of 1999 but it plans to introduce more stringent EU and Norwegian controls, reducing sulphur emissions from berthed ships to less than 0.1% in 2010.

Shore-side electricity for ships in port can reduce negative environmental effects such as noise and air pollution, since the ships’ auxiliary engines can be switched off during the harbour stay. The Port of Oslo does not yet offer this service, but a working group on the issue has been appointed. The new regulations regarding NOx and SOx emissions, urban development along the seafront and increased focus on shore-power from several stakeholders, might influence a decision to install shore-power in our port.

The new combi-terminal will move more freight to the railway, and the target is for a minimum of 20 percent of the freight to and from Norra Hamnen to be transported by rail within the next few years.

Sailing times to Germany will be cut, as well the driving distances for CMP while it is processing freight. This will save on diesel and reduce pollution.
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Routing your transports between the east and west via the Port of Turku will speed up the delivery of your products. The Eastern Landbridge via Turku offers a quick and safe route between Scandinavia and Russia.

Our frequent ship connections allow for scheduling the entire transport chain precisely as per your company’s needs. Cargo handling is efficient, and the products are taken from the port to our modern distribution hubs very quickly.

Good further connections from our port allow for combining different modes of transport into a smooth overall solution. Cargo between the east and west is carried quickly and reliably both on rail and along the recently completed E18 motorway.
limits for noise from harbours/industrial areas. The cruise ships visiting Oslo arrive at the heart of the city. To keep the noise in the harbour on a reasonable level, the following recommendations are issued by the port:

- Intense noise in the harbour, e.g. caused by repair or service operations must be avoided. If such an operation is necessary, the dock master must be given advance notice.
- W hile berthed, passenger announcements must be limited to the interior of the vessel.
- A ship’s whistle may only be used for giving safety signals

Discharge of ballast water in the Oslo Port District must be reported to the Vessel Traffic Service station. Norway has recently ratified the IMO Convention on Ballast Water, under which all ships are required to clean ballast water to a certain standard after 2016.

Discharge of sewage into Norwegian near-coastal waters within a distance of 300 metres from land is banned, according to the Norwegian Pollution Control Regulation. A n absolute ban on discharge of sewage and grey water in the Oslofjord has been discussed among local authorities.

The port of Oslo has ten self-service waste reception facilities where incentives to keep fees low involve sorting waste before disposal. Hazardous waste is delivered to special waste facilities.

**Carbon footprint**

Oslo has been one of the first European ports to calculate its carbon footprint, in doing so more detailed information about the sources of emissions will be revealed. The port can then, more easily, provide measures for reductions and create a reduction target for the years to come.

**Contaminated sea bed**

For decades the fjord has been exposed to industrial activities, dockyard operations and municipal wastewater. In addition the inner part of the basin has been the subject of illegal dumping of rubbish and scrap. The contamination of the sediments has resulted in restrictions on the consumption of fish and fishery products from the inner parts of the Oslofjord. The Oslofjord has been the subject of several studies during the last 15 years and different options of remediation have been evaluated. Through a joint effort of the Oslo Harbour Authorities, the Municipal of Oslo, the Norwegian Road Administration and private city developers, a plan for the harbour of Oslo has been implemented, financed by the Pollution Control Authorities.

The contaminated layer contains cadmium (Cd), mercury (Hg) and PCB. Most of the mud consists of contaminated organic material. The sediments are being dredged using a specially designed closed grab in order to minimise resuspension. The material is then transported by a barge to the site of the confined aquatic disposal facility to be treated. To supervise the operations at the site an extensive control and monitoring program will be implemented involving:

- On-line monitoring of turbidity and current velocity
- M onthly sampling and analysis of water samples
- Periodic analysis of sediment traps
- Passive sampler devices at different water depth

**Improved preparations for environmental problems**

As part of its satisfactory level of environmental protection the port of Oslo has purchased a special waste container in order to prevent leakage of dangerous waste in the general unloading of container ships.

**The Port of Turku**

The Port of Turku is Finland’s oldest port. Ships operate through the unique archipelago, which obliges the Port to take the environment and its requirements for operations into account. The Port of Turku works actively together with its partners in order to decrease the environmental load and possible hazards caused by its operations and services.

The environmental permits granted to the Port of Turku concern both the follow-up of environmental impacts and the methods of port operations. In addition, the port operations involve, and are affected by, a diverse set of environmental laws and regulations. The Port of Turku has, since year 2000 published an annual environmental report of its operations.

**Environmental management system**

The operations of the Port of Turku are covered with certified quality, environmental and safety management systems.
PORT OF OSLO

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Together they form the Port’s operating system. The systems are based on international standards: ISO 9001 (quality), ISO 14001 (environment) and OHSAS 18001 (safety). Certified operations ensure a sufficient level of services to the Port’s customers in terms of quality, environment and safety. The operating system also provides a basis for the continuous development of the Port’s processes and customer service.

Key activities for preventive environmental work take place within the environmental programme related to the Port’s environmental system. The annually updated programme sets goals and actions for the most important environmental aspects for improving the Port’s environmental work and preventing contamination of the environment.

The environmental work of the Port of Turku has focused (years 2002-2009) on reducing emissions of sulphur and nitrogen oxides into air, noise abatement, development of waste management, improvement of energy economics, and reducing the environmental impacts of dredging and embanking. For years 2010-2014 the main goals will be water quality at the Archipelago Sea area, energy efficiency/climate change and noise from harbour operations.

Emissions into air
Since 2006 the Port of Turku has been involved in a co-operative group for air protection in the Turku region. Formed by municipalities and the largest operators, the group steers the air quality monitoring in the area. The environmental permits required from ports have also been taken into account in monitoring. The air quality monitoring is performed by the port together with the Environmental Protection Office of the city of Turku.

Furthermore, the Port follows up the emissions of its vehicles and machines at an annual level on the basis of mileage and hours of use. Emissions into air resulting from all port operations, including vessel traffic, are estimated annually.

Noise
The Port of Turku carries out noise measurements in accordance with the environmental permits of both the Inner Harbour and the Pansio harbour. Noise measurements are mainly carried out in the Ruisalo area, which is a Natura 2000 area.

Environmental port charges
Since January 2006 the Port of Turku has been applying a vessel charge tariff that takes into account environmental factors; the sulphur content of the fuel used and the nitrogen emissions by the vessels, for example. The goal of the environmental port charges is to guide the shipping companies to use fuel with a lower sulphur content and introduce technology to reduce nitrogen oxide emissions. Discount is granted, if an acceptable certificate or report of the sulphur content of fuel or the vessels nitrogen emissions is presented to the Port.

Environmental discounts also concern waste management. If a vessel sorts its waste in the way approved by the Port and can present an acceptable certificate of waste sorting, a discount is granted on the waste management charge for solid waste.

Aditional discounts may be granted to vessels on the waste management charge for oily waste, if the vessel can show that it uses equipment, methods or fuel which minimise the volume of oily waste left on land.

Baltic Sea Challenge
The Port of Turku is also involved in the Baltic Sea Challenge, that started in 2007 when the mayors of cities; Turku and Helsinki, made a commitment to improve the state of the local waters as well as of the entire Baltic Sea. The measures of the two cities concern point source loading, improving the cities’ drainage networks, loading from scattered settlement areas, agriculture in the two cities, the handling of waste water from shipping and boating, and dredging carried out by the harbours. In addition to the concrete measures for water protection, the cities are also committed to investing in international environmental collaboration, water protection research and providing general information and raising consciousness of the state of the Baltic Sea and how to improve it.

A second project named STABLE aims to introduce new types of environmentally sound and economically feasible processes for the treatment of contaminated materials. These can be easily adapted for other estuary and coastal regions with similar problems. The new sediment treatment process implemented removes TBT (organic tin compounds) contaminated sediments from the river Auranjoki by dredging with an environmental grab. The sediment was stabilisation using a new stabilisation system of using special binder materials.

ESPO Award
The Port of Turku has been selected to the short-list on the ESPO Award (the result of this Award had not been announced at the time of going to press).

PORT OF HELSINKI

At the Port of Helsinki, environmental matters are incorporated in the Integrated Management System of the Port of Helsinki based on ISO 14001 requirements. An annual environmental program takes into account the objectives of the sustainable development action plans of both the Port of Helsinki and the City of Helsinki.

As of November 2008, cargo operations of the Port of Helsinki moved to a new site, in the eastern-Helsinki district of Vuosaaari.
Sustainable growth

Businesses in the Baltic Sea region grow with us. The great green port of Scandinavia is expanding. We are now increasing our cargo handling capacities by the standards of tomorrow.

We offer the advantages of being served in a state of the art superstructure by an operator who is able to meet present and upcoming demands, both in terms of business as well as environmental aspects.
This meant that the old cargo harbour sites were freed for housing and office space and heavy road traffic decreased in city centre. The Vuosaari Harbour design meets the needs of today’s users, featuring new operational methods that ensure a fast flow of cargo.

The Vuosaari Harbour has been designed and built under tight environmental scrutiny, subject to years of environmental assessments. As a result, the harbour, which borders nature conservation areas, will be operating with a minimum environmental impact. The lighting of the site is the result of an architectural competition, won by APRT Architects for both merits in design and an effective, environmentally conscious solution to minimize the diffusion of light.

Environmental monitoring during Vuosaari Harbour construction

In addition to the assessment processes that are required by law, the impacts of the Vuosaari Harbour and traffic channels have been evaluated with an exceptionally large number of studies. The impacts of different options on nature, people, the community structure and the economy, have been thoroughly assessed. Impact assessment has been highly important in planning and executing the project. Steps have been taken to eliminate or reduce negative impacts on the environment at every stage of the project.

Before construction began, impacts on sea water, surface and groundwater, bird life, plant life, soil and air were assessed. All of these have been monitored during every stage of the project, from planning to operation, along with the monitoring of impacts during construction. Further monitoring will determine whether environmental impact assessments are sufficiently accurate and comprehensive.

Noise management studies

Noise studies examine noise emissions from port operations in various situations and compare noise values with the values specified in the environmental permits of the harbours. South Harbour, West Harbour and Vuosaari Harbour have valid environmental permits with provisions for noise studies to be performed every three years.

The most recent study, carried out in the Vuosaari Harbour, uses ship noise emissions and traffic information as sources. Experience of noise, however, is individual and even noise that stays below guideline values may be experienced as disturbing.

Monitoring water quality

Monitoring waterways in Helsinki sea area focuses on the chemical quality of water and sediment. Water quality is evaluated by studying turbidity, aquatic plants and the presence of fish. Monitoring fish includes determining populations and measuring contaminants.

Monitoring includes skerries along the fairway as well as the harbour and its vicinity, together with reference areas.

Waste management

Ships can pump their waste waters into the sewer system at all berths in South Harbour, West Harbour and Vuosaari Harbour. There are no fees incurred to do so meaning discharging wastewater in the Helsinki sewer system does not place any financial burden on anyone.

In March 2009 the Port of Helsinki awarded the Celebrity Constellation cruise ship the Green A ttitude recognition. Celebrity Constellation has been discharging its wastewater into the Helsinki sewer system since 2005 - right from when it was first made possible. During the first year, wastewater left by Celebrity Constellation constituted 70% of all cruise ship wastewater received at Helsinki. Since then, the amount of wastewater the ship discharges at Helsinki has doubled. Celebrity Constellation also worked with the Port of Helsinki to develop wastewater reception methods. The Port of Helsinki hopes that the Green A ttitude recognition will also encourage other shipping companies and ships to leave their wastewater in the Helsinki sewer system.

Monitoring air quality

The Port of Helsinki is monitoring the air near harbours. In 2009 there has been a measuring station near South Harbour and in 2008 near West Harbour.

The harbour activities and ships emissions don’t have big influence to air quality in Helsinki city area. Only SO 2 concentrations are higher.

Fuel cell project

Port of Helsinki is participating in the Fuel Cell Project organised by TEKES. Fuel cell technologies will provide a zero-emission, noise free and efficient energy source in the future. They utilise hydrogen or various gases for fuel. TEKES, the Finnish Funding Agency for Technology and Innovation, has a sizable development project running until 2013, where fuel cell technology is applied to harbour machinery. The Vuosaari Harbour has been selected as a pilot location, where fuel cell technology is applied in an actual production environment.

The Ports of Stockholm have been named one of the world’s leading environmental ports. For several years Ports of Stockholm has been actively pursuing long-term efforts to reduce the negative effects of the port and shipping on the environment. “Environmental issues are a central focus and constantly an integral aspect of our work,” says Gunn Rudberg, Head of Environmental Affairs and General Counsel of Ports of Stockholm. “We are continuously raising the bar when it comes to environmental efforts and have to date achieved a number of tangible improvements, not least when it comes to reducing carbon dioxide emissions from our own operations,“.

CO2 emissions down 45 percent

A port can include many aspects in its own environmental efforts. Ports of Stockholm
Minimising the environmental effects in the operation of the harbour.
Maximising the effectiveness of the logistic chain.
During the last decade, Ports of Stockholm has offered discounts of around two million Euros annually for vessels using fuels with low sulphur content, that have introduced measures to reduce engine nitrogen emissions and that separate their waste at source.

has for example worked on using energy more effectively by replacing old oil and gas boilers with district and geothermal heating. The Port's premises have been equipped with low-energy lighting and efforts to recycle waste are becoming more and more effective.

"We have been extremely goal oriented in the matter of reducing carbon dioxide emissions from our own operations," says Gun. "We began by reviewing everything at the port, such as vehicle fuel, heating of our premises and how the electricity we supply to the vessels via electrical connections is generated. The results demonstrate that we have in total reduced our carbon dioxide emissions by a whole 45 percent since 2005."

Incentives for cleaner shipping

During the last decade, Ports of Stockholm has offered discounts of around two million Euros annually for vessels using fuels with low sulphur content, that have introduced measures to reduce engine nitrogen emissions and that separate their waste at source. These incentives have led to a 60 percent reduction in sulphur emissions and a 40 percent reduction in nitrogen emissions from regular ferry traffic through Ports of Stockholm, despite the volume of traffic having increased during this same period.

Gun continues: "We are working to help shipping achieve reduced emissions while in port and during the journey to other countries. Ports however cannot legally force shipping companies to introduce measures, so we instead use green incentives such as differential port tariffs."

Ports of Stockholm is also actively working towards a cleaner environment within other areas of its operations. The environmental requirements for procurement contracts have, for example, been tightened during recent years. During each contract negotiation, Ports of Stockholm has imposed relevant environmental criteria. In addition, direct demands are imposed on suppliers and entrepreneurs, for example, with regard to exhaust purification and emission levels. Those submitting tenders must be able to demonstrate that they are systematically working to constantly improve the environment and quality.

The Environmental Buoy

In the year 2000, Ports of Stockholm introduced an environmental award for valuable efforts towards sustainable development within shipping. The award has been much appreciated by the shipping companies.

Gun explains: "The Environmental Buoy is awarded to a person or organisation that has contributed to a significant improvement within shipping or has increased the awareness of shipping's environmental efforts. Naturally there is a great interest on the part of our customers in receiving such proof that they are implementing ambitious and goal oriented environmental efforts."

Eco-friendly city district

The City of Stockholm is planning and building, together with Ports of Stockholm, an entirely new city district directly adjacent to the city's existing ports. The new city district will accommodate 10,000 new homes and 30,000 new workplaces. The expanding city will also combine proximity to water and to nature. Using innovative green technologies and creative solutions, the Stockholm Royal Seaport will be a showcase for sustainable city construction.

The global climate initiative programme, the Clinton Development Program, is a new symbol for sustainable urban development. The Stockholm Royal Seaport is one of 16 projects worldwide that the programme supports as a good example of successful green urban development including, among other things, reduced carbon dioxide emissions.

"The Stockholm Royal Seaport initiative will," according to Gun Rudeberg, "consolidate Stockholm's position as the leading capital city when it comes to climate efforts. The construction will contribute to the development of new green technologies that will benefit all residential construction in both Europe and the rest of the world. Through our ambitious environmental port efforts we want to demonstrate that there are no inverse correlations between economic growth and a clean environment. Economic growth is rather a prerequisite for our being able to achieve Stockholm's emissions goal of being completely independent of fossil fuels by the year 2050."
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Barometer indicates positive signs for Baltic port economy

The 12th Baltic Ports Conference held in Aarhus, Denmark in September concludes that despite the impact of the economic downturn, positive signs are beginning to show although the recovery ahead will be slow.

Prospects for the Baltic Sea Ports in 2010 with respect to the recession were discussed and the latest Baltic Port Barometer report conducted by the Centre of Maritime Studies (CMS) and the BPO was presented. The report concludes that there are positive signs for the Baltic Sea area, but the recovery of the economy will be slow. The majority of the Baltic ports expect to see some - or even strong - growth in cargo volumes in 2010 with the greatest increase expected in the container sector. There are also new activities which are becoming more attractive to ports; one such activity is the logistics chain of windmills. “It is a new, niche segment for the port business but has very high potential for development” explained Army Pedersen from Siemens Wind Power.

Helge Pedersen, Chief Economist from Nordea Bank agreed that the situation for ports will get better. This assumption comes from the fact that the manufacturing sector is improving: PMI factor is increasing in the US, Europe and Japan. There are also the first signs that the world trade has started to recover.

Philip Damas from Drewry Shipping Consultants emphasises that ports are no longer just a modal transfer point but Staffan Herlin from Finnlines explains that although combined intermodal transports are gaining a stronger foothold, temporary deviations from the vision of becoming a Baltic hub are apparent. It is explained that shipping companies, shippers, forwarders and ports currently have conflicting short term goals. Philip Damas suggests that the second stage of recession and recovery will allow for a more structural approach to cost actions.

Areas of uncertainty remain and the future for the Baltic hub is still somewhat uncertain. To leave the recession behind the network must be constantly maintained and expanded whilst commercial feeders need to show flexibility in cooperation. Jesper Kristensen CEO of Unifeeder explained that “Baltic ports must realise that the vision for a hub in the Baltic has in fact been postponed”.

New BPO strategy approved

A new BPO strategy was approved which focuses on the initiatives promoting the “Baltic maritime highway” as the way to move cargo and passengers from/to the world through the Baltic ports.

The main objective for BPO is to improve the competitiveness of maritime transport in the Baltic region by increasing the efficiency of ports, marketing the Baltic region as the strategic logistics centre, improving the infrastructure within the ports and the connection to other modes of transport.

BPO will support entrepreneurs, ideas, visions and initiatives that contribute to the overall transport developments in the Baltic Sea Region; promoting environmental management in the ports, and taking an active role in the international dialog where the environment is concerned. BPO will support and initiate research and science that will better understanding of future challenges and of the transport sector in the region.
Gothenburg goes even greener

The Port of Gothenburg, a pioneer of shoreside power, is continually striving to reinforce its green strategy with important initiatives, including the introduction of gas recycling systems and the launch of its Railport concept.

The Port of Gothenburg is Scandinavia’s leading port in terms of tonnage and TEU throughput. It is also at the forefront of World Ports Climate Initiative which is working to reduce carbon dioxide emissions and improve air quality across the world’s port facilities.

The port has offered cold ironing facilities since 2000. In co-operation with Stora Enso, one of the world’s largest paper companies, cold ironing was made available to maintain the company’s strict environmental requirements at all stages of its production – a good example of how the cargo supplier can influence the port infrastructure to benefit the environment.

The benefit of using shore side power supply is that no auxiliary engines, running on diesel or heavy oil, need to be used, keeping emissions and noise in the port area to a minimum, thus creating an improved working environment both for crew members and dockworkers. The positive effect on the environment is also felt by the immediate residents.

Running all the functions on a cargo vessel with electrical power requires a high output. Not only lighting, but also functions such as heating, hot water, fans and engines need to be supplied. During an average stopover in harbour, a ro-ro vessel connected to the electricity supply uses between 5,000 and 20,000 kWh, which corresponds roughly to the energy consumption of four average-sized houses over a three-month period. Vessels have previously used shore side electricity supplies with low voltage, but in order to run all of the units aboard, several heavy cables are required. In practice this involves a complex and time-consuming process, as well as equipment which takes up a great deal of space both in the port and aboard the vessel. Offering vessels a high voltage electricity supply through one high voltage cable with approximately 25 times the output of a standard 400V cable of the same dimensions, makes this operational stage both quick and simple.

Dramatic reduction of emissions

The total environmental benefit depends on factors such as the vessel’s time in port, which fuel is used and the power of the engines. On average, a ro-ro vessel visiting the Port of Gothenburg emits 25 tonnes of carbon dioxide, 520 kg of nitrogen oxides and 22 kg of particles if it is not provided with shore side electricity. Currently there are two quays at the ro-ro terminal that can offer shore side electricity, and six vessels operating for Stora Enso (three Transatlantic and three Wagenborg) regularly use these connections. Stena Line also has one quay with high voltage supply which it uses regularly.

If the entire ro-ro terminal were provided with this shore side power and, assuming that all vessels used it, substantial reductions of emissions would result. It is estimated that these emissions would decrease by approximately 31,000 tonnes of carbon dioxide, 510 tonnes of Nitrogen Oxides and 12 tonnes of particles annually. This means that the annual carbon dioxide emissions from shipping in Gothenburg would be cut by 10%.

Realistic environmental benefit

It is important to take into account how the electricity required for shore-side power is produced, and compare it with the emissions from the bunker oil or harbour diesel which would otherwise be used. Studies have shown that, irrespective of how the electricity is generated, the use of shore side electricity has a lower total environmental impact than using auxiliary engines. In order to ensure that electrically connected vessels are as environmentally sound as possible, the Port of Gothenburg utilises two local wind turbines. Through a close collaboration with Gothenburg Energi Nät AB, the Port of Gothenburg helps influence the development of the local electricity network right from the planning stage, and in this way continues to work towards the positive development of energy supplies to cargo vessels in the port.

Benefits of shoreside power

A part from achieving a much better working environment in the port, the environmental benefits are the great driving force. Studies show that society is the big winner. At a rough estimate, the social costs involved are reduced by 15–75 times the cost of the system.

From 2010 the EU’s sulphur directive will come into force, which means that vessels have to use diesel with a 0.1% sulphur content when they are in port. This will involve markedly higher fuel costs for the ship owners, so shore side electricity will also be a more attractive option from a financial viewpoint. It is entirely possible to adapt existing vessels to use a shore side electricity connection.

Currently there is no international standard therefore few vessels are adapted to use the technology. The ISO and IEC (international standardisation organisations) are expected to bring out new standards for shore side power supply in 2009. Shore side high voltage electricity is a new technology which is still under development.

One challenge is that different parts of the world use different frequencies. In the USA and Japan they have 60 Hz, whilst the rest of the world uses 50 Hz. Once the ISO and IEC standards have been finalised, everything will be in place for everyone to be able to use a compatible technology, which will expedite development.
In 2006 the Swedish government promised tax exemptions on electricity supplied to vessels using shore side connections. Bunker oil is exempt from tax, and as shore side electricity involves a lower environmental impact, tax exemptions would be welcome. Unfortunately no decision has yet been taken on this. It is hoped that the question is raised again, as it would entail lower costs for customers using shore side electricity. The Port of Gothenburg aims to be able to offer all vessels shore-to-ship electricity supply, but the initial focus is on the ro-ro terminal, as these vessels are best suited for electrical connection.

Gas recycling

The loading of petroleum products, particularly petrol, gives rise to environmentally hazardous emissions of volatile organic compounds (VOCs) which are also hazardous to health. Whilst there is already a gas recycling system for loading into road tankers and rail tankers, vessels have, in the past been loaded without recycling.

In Gothenburg around 1.4 million tonnes of petrol are delivered by vessel each year. With the good level of extraction achieved with gas recycling facilities, emissions linked to the loading of vessels could be reduced from around 300 tonnes to just 25 tonnes per year.

The Port of Gothenburg has worked on projects together with Preem, Shell, the Swedish Environmental Protection Agency, the County Administrative Board, the Explosives Inspectorate, the rescue services and members of the Swedish Shipowners’ Association, to find a solution for gas recycling for vessels.

The Port of Gothenburg has three gas recycling facilities of the absorption type. Each user has access to its ‘own’ facility and four quays are served by the systems. The facilities are highly efficient, with an extraction level in excess of 90 per cent. In consultation with the authorities it has been decided that the emission limit for the systems be set at 10g/N m³, a low level but perfectly attainable with the technology that has been chosen. Without extraction the gas could contain up to 1,000g/N m³.

The three gas recycling systems, with a capacity of 1,500, 2,000 and 2,400 cubic metres per hour respectively, cost around SEK 65 million. This figure also includes the cost of new and adapted connections to the vessels. The total cost is around SEK 30 per kilo of reduced emissions. The facilities are owned by the Port of Gothenburg although two of them are leased to Preem and Shell. This model has also presented Preem and Shell with far-reaching potential to design systems based on their specific wishes.

Rail Port

Rail Port Scandinavia is an integrated rail shuttle system linking the Port of Gothenburg with a large number of important consumption and production centres via Rail Port terminals (full service terminals with frequent rail connections to the Port of Gothenburg) all round Scandinavia. The port takes care of transhipping, goods handling and transshipment in Drammen for onward movement by rail.

The rail shuttle system is based on cooperation between the Port of Gothenburg, the Rail Port terminals, several rail operators, goods owners and the National Rail Administration.

This cooperation means that the logistics of sea and land can be efficiently linked in an environmentally sound way.

The railway is an increasingly important link in the transport chain. Since 2002 alone, rail transport to and from the Port of Gothenburg have increased from 6 to 24 daily shuttles. A bout half of the containers transported now go to and from the port by rail.

In instigating the Port of Gothenburg as a hub for the Baltic region, Norway and the Oslo area make up a very important catchment area. A new shuttle to Norway as a result of co-operation between the Port of Gothenburg, Green Cargo and H. Strøm/Rail Terminal Drammen will enable the system to be developed further, with transshipment in Drammen for onward movement by rail to other destinations, including Trondheim.

Specific customers, such as Maersk Line have opted to transport a larger portion of goods by rail. This year Maersk will carry around 75 per cent of the total goods volume by rail. Just a few years ago the split between rail and road was quite different as recently as 2005 the split was approximately 50/50.

“In our case the choice of transport is governed by customer delivery requirements. Although rail is not as flexible as road, it does have less impact on the environment and it is more cost effective. And that’s extremely positive,” says Patrick Berggren from Maersk Line.

In 2008 alone, transporting freight by rail led to a reduction in carbon dioxide emissions of 48,000 tonnes compared with transport by road. This is equivalent to driving 10,000 times around the world by car.

**Table 1: Environmental impact factor: Difference between train and lorry**

| Fuel, diesel | 19,800,000 litres | Carbon dioxide | 48,000 tons | Nitric oxide (NOx) | 420 tons | Hydrocarbons (HC) | 17 tons | Particles/dust (PM) | 9.4 tons |

GreenPort 2010
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APM TERMINALS

17 February
Host: Maersk
Host: Copenhagen
Host: Malmo Port

18 February
Host: Port of Oslo

18 February - Train to Gothenburg

19 February
Host: Port of Gothenburg

For further information, please contact:
Julian King at EWPC or visit www.greenports.net

Ports of Stockholm
20 February - Train to Stockholm
21 February - FREE DAY - Stockholm
21 February - Ferry to Turku

22 February
Host: Port of Turku

23 February
Host: Port of Helsinki (including Vuosaari)

23 February
SAS Flight to Stockholm
Attend GreenPort Welcome Reception,
Stockholm City Hall

24-25 February
Attend GreenPort 2010 Conference

26 February
Port Tour and Lunch
Host: Ports of Stockholm

See: green-port.net
Ports’ key role in the sustainable logistics chain

Sustainability in operations is no longer just an attractive option. It is fast becoming a commercial imperative to reduce costs and drive competitive advantage. Kate Royston investigates how it is remaining firmly on the agenda through the economic downturn.

This article focuses on key areas being addressed by Terminal Operators and Shipping Lines to enhance the sustainability of their operations, their inter-dependence with Port Authorities and the importance of co-operation and communication.

At a recent Royal Haskoning Ports conference in London, a number of major Terminal Operators agreed that sustainability has become an integral aspect of today’s business and its risk management.

Whilst the current economic situation has had an impact on investment in sustainability, it has not reduced attention in this area. It may in fact have accelerated attention to measures which, in particular, can deliver cost reduction with limited investment.

A number of areas are of common interest to Terminal Operators including:
- Safety and good housekeeping: ensuring the safety of employees and operations
- Energy efficiency and carbon reduction
- Air quality management
- Resource efficiency and waste management
- Sustainable supply chain management

Above all, the message is that measurement is the cornerstone: “if you don’t measure you can’t manage.”

Safety is seen as the starting point and foundation for sustainability. Sharing best practice is an important aspect of improving safety between different operations within the logistics chain.

In recent years there has been increasing attention to Air Quality Management in the US, led by California. There is now growing concern globally for particulate management, expected to be a key element of forthcoming European Commission (EC) legislation. This will require increasing work and investment in the future.

Effective management of Waste and Resources can reduce costs and provide opportunities.

For example, Eurogate Terminals has extended its combined heat and power generation at Bremerhaven with an additional woodchip heating plant fuelled from port dunnage, thus generating renewable energy from waste resource. A similar plant has now been installed in Hamburg.

Supply chain pressures are increasing. Customers such as global retailers IKEA and Wal-Mart are exerting pressure through their supply chains to understand the sustainability of their supply chain partners and products. In the last few months Terminal Operators have begun to receive requests from Shippers for carbon footprinting data to meet Shippers customer’s requests.

Energy efficiency and carbon management

Energy efficiency and carbon management appears to be at the top of the agenda and is reviewed here in some detail. It provides an opportunity for taking cost out of the business and must be addressed to meet customer pressure and the demands of developing legislation (e.g. the Carbon Reduction Commitment (CRC) legislation in the UK).

Energy monitoring and management and carbon footprinting are valuable tools to help understand an operation and its opportunities and priorities. Accurate and detailed data is increasingly critical as the scope of energy monitoring efforts expand.

DP World terminals have been measuring and reporting their fuel and electricity usage since 2000. They have an ambitious target to reduce CO2 emissions by 27% from January 2009 (staggered over five years) normalised against TEU. A web based Carbon Calculator tool has been developed to facilitate data capture.

Hutchinson Port Holdings UK (HPH-UK) has benchmarked all their terminals for energy use and encourages competition between them.

The profile of terminals’ energy use will vary according to geography and available energy sources. In Europe, for example, the typical split of diesel fuel to electricity usage is 70:30 depending on the types of equipment used. Diesel fuels the mobile equipment and electricity is purchased to power cranes, reefers, electrically powered mobile vehicles, lighting and buildings.

Improvement strategies, signalled from energy monitoring data, should ideally focus firstly on reducing energy consumption. Target setting helps focus attention. For example as part of its Eco-efficiency programme APM Terminals has set a goal of reducing its CO2 emissions by 15% per TEU handled within 3 years.

Reducing energy consumption

Reducing consumption will require changes in usage behaviour, operational practices as well as the technical aspects of the equipment itself.

In the current climate HPH-UK’s Andrew Marston stresses that the small things can add up to make a difference and deserve attention e.g. boiler controls and insulation. They have sought the support of the Carbon Trust (a government agency) in auditing and developing investment business cases. DP World’s Global Environmental Manager Charles Haine notes that important gains can be achieved at low or no cost. He added that DP World actively encourage engineers to brainstorm potential energy saving solutions.

Supporting behaviour change is essential. HPH-UK is investing time working with its Tug and RTG operators to secure their understanding of the importance of energy efficiency practices and how they can be achieved. An example is ensuring that equipment is set from engine idling to plug in mains supply when not in use.

Hand in hand with this is the need for optimisation of operating systems across the whole business including streamlining processes and procedures, reducing waiting or idle time and improving overall equipment utilisation.

Both DP World and HPH-UK have introduced Vehicle Booking Systems which have improved efficiency. The main aim is to spread haulage arrivals evenly across the 24 hour day generating benefits through reduced congestion and operational efficiency, whilst increasing air quality.

Accessibility on and off the port will
**Modal shift**

In the face of rising congestion and air quality issues the Port of Rotterdam Authority foresaw accessibility issues for its Maasvlakte II (MVII) development. To encourage co-modality MVII Terminal Operators concession agreements stipulate the need for a modal shift allowing a maximum of 35% container movement by road by 2035. The Port Authority is supporting this goal with a number of initiatives including the development of a container transfer facility in the hinterland serviced by inland vessels.

**Greening the equipment**

Equipment can be improved through retrofitting or investing in new eco-plant, especially where old stock is due to be replaced. Powering equipment represents a major cost element. One of the key priorities of the Terminal Operator is to understand energy consumption patterns of each plant through data tracking.

An important consideration is the whole life cost of the purchase, operation, maintenance and disposal of the asset. DP World engineers are now asked to consider not only cost and maintenance but also carbon reduction potential when assessing new equipment.

With asset lives in excess of 15 years, investment decisions today will influence future sustainability. Consideration of implications and business risks such as legislation and carbon pricing is leading to the role of Engineer and Finance Manager becoming as important as Operations and Health, Safety and Environment (HSE) in this area of plant decision making and carbon management.

**Retrofitting**

In the current climate, emphasis is falling on retrofitting to facilitate more energy efficient ‘sweating’ of installed assets. DP World for example has a long term programme underway to address the efficiency of its mobile equipment and plant at terminals.

The Engineering department at DP World’s Jebel Ali operation in the UAE achieved significant fuel consumption and cost benefits by retrofitting engines on RTGs. Twenty seven original diesel engines have been replaced by smaller Volvo engines with the installation of inverters in order to balance power and performance requirements.

The payback period has been one year and achieved a 50% energy saving. Eurogate is one of the Terminal Operators working with its engineers and equipment providers to capture energy from electrical container cranes within the port.

When a load is lowered or when the driver’s cabin comes to a halt, energy is released. Since the mid 1980’s work has been underway to find a way to capture and re-use this energy.

Eurogate is now employing a technology that returns 20-25% of the total energy released back to the power mains system and thus available to other consumers. This reduces cost and achieves reductions in CO₂ emissions of about 4,000 tonnes every year.

Lighting is another area where efficiencies can be gained by both Terminal Operators and Port Authorities. At DP World Southampton, in the UK, the Engineering / Crane team initiated a Prismalense Lighting Project.

This involved replacing more conventional high pressure sodium units with 150W lights on Liebherr cranes and metal halide units with Prismalense lights on high masts in operational areas.

This pilot study, with a payback of 21 months, has generated a 50% energy reduction and savings of 310 tonnes of CO₂ equivalent. Significantly workers feel improved lighting conditions are enhancing safety.

**New plant**

Looking to the future and the likely need to achieve CO₂ reductions of 80% by 2050, step changes are required in plant efficiency. Driving out cost and carbon requires innovation and partnership with equipment providers, Shippers and Port Authorities. Charles Haine notes that a significant portion of his time is now spent working on CO₂ initiatives, liaising with equipment providers of eco-technology and supporting pilot projects in different terminals.

APM Terminals have co-developed a more fuel efficient ‘Eco-RTG’ in collaboration with Siemens AG, with more than 100 RTGs in use throughout the Global Terminal Network in Europe and Asia.

New Terminals and extensions provide...
opportunities for installing new eco plant with substantial energy advantages. DP World’s London Gateway and Rotterdam Gateway Terminals will provide examples of this.

Eurogate is working on a research project to investigate the feasibility of installing an eco-friendly cable car transport system to transport containers more efficiently through the terminal. This would enable the replacement of truck journeys and their high fuel consumption.

The Port of Los Angeles believes it has a key role to play in supporting its users and tenants in achieving lean and green operations. One mechanism is the Technology Advancement Programme (T A P) jointly managed by the Port of Los Angeles and Long Beach. Its aim is to accelerate the verification or commercial availability of new, clean technologies to move towards an emissions free port. (http://www.cleanairactionplan.org/tech/default.asp)

Alternative Energy Sources

Port located operations are often ideally placed to benefit from alternative wind, wave, tidal and solar powered energy generation. These should be exploited wherever feasible taking into account their overall sustainability and ecological impacts.

A P M Terminals officially opened its new EUR 12.5 million power distribution network on October 16th 2009 at the Rotterdam container terminal which uses electricity generated through wind power. By switching from grey to green electricity the terminal reduces its CO2 emissions by 45% per year. The electricity is sourced from two nearby wind farms in The Netherlands.

Port Authorities can play an important role through investing in alternative energy infrastructure in collaboration with their tenants. The Port of Bristol is expecting to double its wind turbine capacity, in part to support its Deep Sea Container Terminal development. The Port of Rotterdam Authority plans to expand the wind energy generation in the port from 150 MW in 2009 to 300 MW in 2020.

In some cases a Port Authority provides tenants with utilities infrastructure such as electricity and water. Its sustainability has an important impact on tenants’ performance and may require a joint approach to investment and innovation. Where not already present, there will be a need to accommodate sub-metering measurement of utilities and facilitation of return flows from energy gains where relevant. The introduction of carbon footprinting and in the UK, the CRC legislation, will require discussion and agreement on boundaries, impacts, and beneficiaries of investment to name just a few!

Co-operation is crucial and will be discussed further below.

The Shipping Line View on Sustainable Operations

The shipping line perspective is represented by Maersk Line, part of the A. P. Moller-Maersk Group. The world’s largest container shipping line, it sees sustainability as being core to its operations. It seeks to achieve this through embedding environmental improvements into its operations as an ongoing process. This is facilitated through developing relevant environmental strategies and targets and employing innovation and investment in new technologies often together with supply chain partners.

A priority for Maersk Lines is reducing the environmental impacts of its own vessels, particularly fuel use. Some of the initiatives include:

- A Waste Heat Recovery system which saves 8-10% of fuel at optimum conditions. This has been fitted on 32 ships.
- Introduction of Slow Steaming. Reducing speed by 5-10% increases the number of days at sea but both fuel consumption and CO2 emissions are reduced by 15%.
- The Quest project. This addresses energy consumption for cooling in containers through the installation of software in containers. At the end of 2008, with 69% of Maersk Line and Safmarines reefer fleet fitted with the software achieved CO2 equivalent savings of 260,000 tons.

Improving the efficiency of reefer containers is also important for Terminal Operators. Significant energy consumption is directed towards reefer cooling.

- The Voyage Efficiency System. Optimised voyage planning identifies the most fuel efficient route.

Whilst these examples help to improve the efficiency of the fleet, optimal performance will depend on multiple factors. This includes the efficiency of Port and Terminal Operators in handling the swift passage of the vessel in and out of port; efficient unloading and loading processes to mini-
misme idle emissions; supporting sustainable energy use whilst in port; and in provision of waste management facilities. Shippers, for their part, must ensure frequent and effective communication between its ships and the port.

The Port of Gothenburg has led the way in developing high voltage Onshore Power Supply (OPS) in conjunction with Stora Enso. Since 2000 its use has expanded and over 20% of all ship calls to the port are now connected to OPS. This work is the core of the WPCI OPS initiative to develop best practice guidelines for the industry. OPS is not always the answer and its overall sustainability depends on the source of electrical power.

Co-operation is the way forward

The operations of Shipping Lines, Terminal Operators and Port Authorities are interdependent. Communicating and resolving these inter-dependencies is a critical part of both day to day business and improving the sustainability of operations between them and other players in the logistics chain.

“Greening the logistics chain” is fast moving from ‘buzzword’ into commercial necessity. Whilst much will be progressed as part of day to day working relationships, the complexity of some of the issues requires formal and informal forums to facilitate better industry wide understanding. These include:

• World Economic Forum’s Logistics and Transport Group which has recently released a report entitled ‘Supply Chain Decarbonisation’. DP World was an active participant in this effort helping to craft general approaches and innovation opportunities for de-carbonisation of the logistics chain

• The WPCI Carbon Footprinting project which brings together Port Authorities. A number of international Terminal Operators are holding their first informal meeting in October on this subject. A voiding double counting and collecting comparable data’ rather than ‘A avoidance of double counting and comparable data’.

Collaboration and co-operation is necessary to support optimal performance across the whole chain, integrating the potential of systems and equipment innovations with vendors.

Shipping lines are increasingly maintaining separation of waste on board and welcome appropriate waste reception facilities. At the Port of Felixstowe HPH-UK has been able to demonstrate that maximum energy can be gained from separation at source. Their innovative skip trailer system (pictured) has resulted in overall recycling rates across the port of 45%.

Conclusions

The inter-relation of the operations of Shipping Lines, Terminal Operators and Port Authorities operations is self-evident. Whilst some improvements to the sustainability of operations can be achieved by individual players in the chain many do require communication, co-operation and collaboration. For Port Authorities this will include working towards more sustainable accessibility on and off the port, both seaside and landside; sustainable utilities provision and metering facilities; lease and concession agreements which provide support and direction and necessary integrated systems.

Above all, increasingly transparent communications and a shared vision and goals are becoming critical as we move towards the sustainable port of the future.

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The Port of London Authority (PLA) is working to improve access to the port through providing deeper, straighter channels where feasible. This reduces shipping lines’ time and fuel use. An example of this is the Princes Channel dredge in the Thames Estuary. Shortening the Thames Estuary route from Fisherman’s Gat/Knock John to Princes’ Channel is calculated to save 2,200 tonnes of CO2 per annum.

The Port of London Authority has launched an initiative called the “End to End Study” which is examining how communication and the means of arranging all aspects of port entry, berth allocation and terminal operations can be made more efficient. Its aim is to reduce costs and ship delays which will also reduce emissions.

There is growing agreement of the need for greater transparency, also demanded by stakeholders, with increased focus on reporting and the need for industry wide standards. These are critical to help create a common base to support co-operation and achieve the required results.

APM Terminals believe that “common industry-wide standardised methods of measuring energy consumption and emissions of CO2 and particulate pollution would be a good start”.

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PORTS AND THE ENVIRONMENT

Environmental protection at Bremen Ports

The ports of Bremen and Bremerhaven have a clearly defined environmental strategy and an extensive environmental work programme, both of which are explained in detail in a recently published book entitled ‘greenports Bremen/Bremerhaven’.

The comprehensive report describes how environmental protection plays an increasingly important role in the port’s offices and workshops. With the support of many sectors: maritime logistics, terminal operators and shipping lines, the ports are not only changing over company fleets to low consumption vehicles, generating their own solar energy, efficiently disposing of waste, ensuring that workflows are as ecological as possible and adhering to International Maritime Organisation regulations, but also working within additional constraints set by the ports’ location.

Ecological standards

Whilst the city of Bremen is surrounded by a pronounced green belt, the area at the Weser estuary has brackish water habitats, as well as, sensitive salt meadows, mudflats and sandbanks that form part of the Wadden Sea National Park of Lower Saxony. Classification of these areas as flora-fauna habitats (FFH) by the European Union means that nature conservation and environment protection have to satisfy even more stringent criteria than before.

The National Park has set ecological standards for many years, so that many rare species of animals and plants already have protection. More recently large areas of the Weser have been declared an EU protective zone for anadromous fish. Moreover, further stretches of the river between Bremen and Bremerhaven have been declared special protection areas for birds and FFH sites.

If new water and port projects destroy or even affect protected habitats, equivalent natural areas have to be created. The Impact Mitigation Regulation in force in Germany is a recognised and successful procedure which has successfully been practised by port construction engineers and environmental planning specialists. Their brochure explains the unique and ingenious ways in which the ports of Bremen have offset the impact of port activities and development on nature.

Compensation and substitute areas

Modern day practice now dictates that if the environment loses out when port facilities are built, the natural habitat has to be restored elsewhere. Following the success of the substitute area created, Tegeler Plate, to compensate for the damage caused by the development of Container Terminal III, where engineers proved that the impact on the environment can be successfully balanced, a similar compensation project was implemented for the more recent construction of Container Terminal IV.

In 1997, Tegeler Plate, an area beside the Weser was chosen as the central substitute site for the huge Container Terminal III project in Bremerhaven. The environmental engineers created an extensive tidal area in the marsh, where the sea flows in and out of the tidal channels of this man-made ecological area. The 280-hectare site used to be intensively farmed, but the effects of the tides now allow natural and near-natural habitats to
develop. The landscape is defined by reed beds, tidal channels and ponds. At higher levels, there are barren areas that are now used for extensive farming.

The compensation measures for the construction of the latest port expansion project, Container Terminal 4, posed a particularly difficult challenge for the planning engineers. Habitats and sanctuaries of international standing are being developed on Grosse Luneplate and along the Wursten coast and are protected by long-term agreements. The central substitute site for the new terminal is located on Luneplate. The environment planners used heavy-duty machinery to construct a 220-hectare tidal polder near the village of Dedesdorf in Lower Saxony. From 2010 onwards, water from the Weser will flow into the intricate system of tidal channels, creating new mudflats and reed beds which will provide a refuge for rare species. At low tide, most of the polder will dry out again. Bremenports have had a flood barrier built in the Weser dyke to ensure the necessary protection against high tides. A new tidal pumping station will control water intake and drainage, while a roughly three-and-a-half metre high earth wall will serve as a boundary between the polder and the hinterland. The adjoining 290 hectares of grassland and ditches will provide a new refuge where rare species of birds can rest and breed.

There are valuable bird habitats in, and around Bremen and Bremerhaven, such as the tidal landscape of the Wadden Sea, or the vast grassland and ditch zones of the North German marsh. Innumerable migrant birds rest on these sites before setting off to breed or overwinter in other regions. The high-water resting sites are particularly important, as they provide a refuge at high tide for birds which search for food in the mudflat and shallow water zones of the southern North Sea. When planning the compensation measures for the impact caused by the major CT III and CT 4 terminal projects, the engineers had the chance to design new refuges for many species on Luneplate and along the Wursten coast. The reed beds, ditches and ponds that make up the wilderness of Tegeler Plate are dominated by extensive sedge growth and barren land, ditches, tidal pools and channels that are bordered by mudflats. More than 100 pairs of warblers - especially Eurasian reed warblers and sedge warblers - have found a new home here. Rare songbirds such as bluethroat and bearded tit have also been observed. The number of birds breeding in the reed beds has increased tenfold since this site was redesigned and there are now around 200 pairs.

A compensation for the impact on nature caused the construction of the new Kaiserschleuse lock. Bremenports has developed a substitute pool beside the Drepte, a tributary of the Weser. The 32-hectare site lies within the boundaries of Hagen local authority. Earth walls will be opened up and relocated along the banks of the Drepte to create a flood plain with wetland zones and a new shallow pool with highly diverse bank structures. The advantages of this pool are not only ecological. The Drepte site simultaneously enables compensation for several port construction projects, which substantially lowers the costs and takes the pressure off the port investment budget. Moreover, the fact that the substitute pool is already available means that the individual projects can be approved faster, saving time and therefore money.

**Cattle country**

The vegetation on extensively used grassland areas often consists of grasses and herbaceous plants that are unsuitable for high-yield cattle. Accordingly, the environment planning engineers at Bremenports opted for a tough breed that does not require high-quality grazing and that can remain outside all year round. The cattle prevent woody plants from spreading on the site, because they eat these plants when the meadows do not provide enough green fodder in winter. In the Drepte flood plains, Bremenports has introduced Fjell cattle, an endangered domestic breed from Sweden. In this case, the animals come from Nordhorn zoo. Water buffalo have been kept on the sites inside the dyke on Luneplate since August 2005. These four-legged “landscape gardeners” have played a crucial role in converting former arable land into prime ecological grassland. Fourteen animals currently make up the herd and there are plans to introduce water buffaloes to neighbouring sites in future.

A new grazing project is in progress in the north of Tegeler Plate. A sand deposit site that was created when the Weser was deepened has been left to develop naturally. Here, the use of galloway cattle has proved successful, as the areas are gradually changing their structure and developing vegetation-free zones which are specifically welcomed. The galloways are helping to create valuable habitats for rare species of animals and plants.

**Fish ladders and navigation**

Many species of fish need slow-flowing, shallow water with rich vegetation in which to spawn and rear their young. When the Weser was upgraded to provide a high-capacity shipping route, embankments and sheet piling were installed in Bremen - a benefit for shipping, but not for fish.

In the 1990s, Bremen had the harbour basin of Überseehafen filled in. To compensate, the Werdereisee lake was linked up to the Lower Middle Weser. This improved the spawning opportunities for fish in the Weser. The weir at the Kleeine Weser and the connection to Werdereisee was modified to enable the fish to move upriver without any barriers.

Water from the Weser now flows into the Überseehafen at Bremerhaven through a free-flow channel. However, construction of the canal meant eliminating a shallow water zone at the bank, so that compensation was again necessary. Since then, Bremenports has operated the lock at the flood barrier in the Geeste, to enable fish to overcome this obstacle. Instead of ships, fish enter the lock chamber, lured by the current, and leave the lock again on the other side to continue their passage upriver.

**Integrated management and maintenance plan for Luneplate**

Port ecologists and nature conservationists now follow the legally prescribed objective of preserving the protected habitats and species on the Grosse Luneplate and the areas forming the Lower Weser European bird protection zone. Preservation is and will continue to be achieved by means of a so-called “ban on degradation” and by prescribing impact assessments for all plans and projects. A management and maintenance plan is also being developed for Luneplate in consultation with farmers, hunters, anglers and other users. In its capacity as Port Management Company, Bremenports is responsible for the upkeep and development of these extensive substitute sites. Tasks which fall within the responsibility of the environment authority are also integrated in the management and maintenance plan.

Bremenports is currently preparing a website about ‘greenports Bremen/Bremerhaven’ which will deal specifically with marine environment protection at the ports and business enterprises.
APM Terminals and the eco-efficiency philosophy

Good business practices and proactive, sound environmental policies are not mutually exclusive principles, as APM Terminals, one of the world’s leading container terminal operating companies seeks to demonstrate.

With a global terminal network of 48 container facilities, 10 port projects in 34 countries on five continents, APM Terminals’ port operations are an integral part of the global logistics chain, and a key factor in the economic development of emerging countries in Asia, Africa and Latin America. This position bestows great significance on the company’s actions, and also confers great responsibility.

It is a responsibility that APM Terminals and its 19,000 employees worldwide take very seriously. The company has announced that its environmental performance target is to cut CO2 emissions from terminal operations worldwide by 15 percent from the 2007 base figure within three years. In 2007, APM Terminals’ total global CO2 emissions were 543,000 metric tons world-wide, or 17.5 kg CO2 per TEU handled. APM Terminals plans to reduce this number through innovative operational initiatives, best practice sharing, benchmarking, strategic investments and energy-conscious planning at every terminal. The figure of 14.96 kg per TEU has been established as the goal.

APM Terminals CEO Kim Fejfer states, “Our strategy is to minimize our global environmental footprint through our daily operations, across all terminals and in any new business opportunities we pursue. This means we will update our terminal procedures and environmental performance standards to exceed local and national environmental regulatory compliance levels”.

“Diesel magnets”

Today’s global economy is increasingly dependent upon world trade, as the recent global recession and credit crisis has (often painfully) illustrated. The boom in trade of the past decades is due, in no small part, to the increased efficiencies of moving merchandise, and an increasing share of refrigerated products and basic commodities in 20ft and 40ft shipping containers. Including container loadings, discharges and transhipments, overall container handling world-wide is estimated at 500 million TEU at present. A terminal’s responsibility for emissions entails more than the emissions produced by the facility’s own equipment. Container terminals function by their very nature as so-called “diesel-magnets”. They attract such diesel fuel consuming machinery such as large ocean-going vessels, and landside trains and heavy truck traffic. Vehicular traffic congestion in many port areas substantially adds to overall pollutant emissions.

The relative impact of container terminals on the total port pollution thus is a function of a variety of factors, including the number of vessels calling at the port, local vehicular traffic conditions, relative size of the container terminal, modal split (rail/barge/road) and the age and type of equipment employed. It is estimated that the contribution of terminal operations to port air pollution is less than 4 percent of the total supply chain.

Eco-efficiency policy

In recognition of this, APM Terminals has introduced a policy of Eco-efficiency and made a commitment to maximize environmental performance at every facility. “Eco-Efficiency” is defined as providing more goods and services to the customer while decreasing resources and energy consumption, reducing waste and pollution. This strategy requires surpassing basic local, environmental, regulatory compliance in order to create a competitive advantage.

The combustion of fossil fuels by terminals’ diesel-powered cargo handling equipment is the single largest source of air pollution caused by terminal operations. The movement of steel and aluminium containers loaded with as much as 30 tons of cargo each is an energy-intensive function. With newer, larger vessels capable of

APM Terminals officially opened its new €12.5 million power distribution network at

the Rotterdam container terminal with electricity generated solely by wind power.
Reduced waste and pollution allows wildlife to thrive

carrying as many as 14,000 TEUs, terminal operations have also become very time-intensive. To obtain maximum benefit from the economies of scale provided by such large vessels, port calls must be as brief and yet as productive as possible. Such concentrations of equipment and emissions can cause severe strain on air quality in local environments and so as terminals and ports expand to meet growing demand for larger volumes of container throughput, proactive solutions must be designed into new terminal construction and operating procedures.

At present, more than one third of the electric power consumed by APM Terminals’ facilities is Carbon Dioxide (CO2) neutral. This means the electricity is generated from power grids sourced from nuclear power plants or from such renewable energy sources as wind, solar or hydroelectric power.

Green-powered

In a major first for the company, and the industry, APM Terminals Rotterdam, which handled approximately 2 million TEUs in 2008, has become “green-powered” with the introduction of electricity-generating wind turbines into the power grid.

On October 16th, APM Terminals officially opened its new 12.5 million Euro power distribution network at the Rotterdam container terminal with electricity generated solely by wind power. APM Terminals Rotterdam is one of the busiest terminals in the company’s Global Terminal Network, accommodating weekly port calls from 11 large “mother” vessels, 20 smaller feeder vessels and 160 barges. The terminal also requires more than 5,500 truck trips to drop off and pick up containers each week, as well as moving 3000 containers a week by rail to inland European locations. By using non-fossil fuel produced power the terminal reduces its CO2 emissions by 45% per year.

The electricity feeding the Rotterdam terminal is produced by two windmill farms constructed near the terminal at Hagenwind in Aalten and De Landtong in Rotterdam. The wind-generated electricity is sufficient to power 14 gantry shore cranes which serve the largest container ships in the world, the refrigerated containers delivered and received into the yard from vessels and trucks, as well as the terminal, light poles, workshops and other power consumption needs. It is anticipated that the Rotterdam green power supply can serve as a model for other terminal locations.

Alternative fuels

One of the other methods APM Terminals is pursuing to reduce terminal equipment emissions is the use of alternative fuels, including low sulphur and ultra-low sulphur diesel fuel and compressed or liquid natural gas for terminal vehicles. In order to limit the consumption of energy, necessary to maintain high performance in operations, steps are being taken to eliminate idle running time for yard equipment, reducing unnecessary fuel consumption.

This can be accomplished by standardized and clearly communicated shutdown procedures both on terminal equipment and third-party equipment (e.g. trucks entering the terminal) but also through electronically-controlled engines that monitor their own idle times and automatically shut themselves off.

It is the company’s policy to also develop and employ efficient innovative yard equipment. A successful example of this innovation are Eco-Rubber Tyred Gantry Cranes (RTGs) which save up to 40 percent on fuel and emissions through more efficient engine operation, and improved conservation of kinetic energy. Some APM Terminals facilities have moved to electric Rubber Tyred Mobile Gantry Cranes - which run semi-automatically, and can be programmed for greater efficiency at full automation.

APM Terminals also utilizes software process optimization tools to enhance equipment deployment procedures, resulting in further operating efficiencies, and reduced pollution and emissions with expected fuel savings of 5-8 percent. The optimization tools anticipate yard traffic and container flows and minimize RTG moves in the yard through sophisticated planning algorithms. Global Pooling processes also eliminate unproductive driving, idling, crane delays and traffic congestion.

Benchmarking

A major initiative undertaken by APM Terminals has been to monitor air quality performance at individual terminals for benchmarking and comparative purposes both internally and within the industry. Local air quality surveys and environmental risk assessment and impact studies are conducted comparing data with other locations for the creation of standards for further performance improvement. Through dedicated energy awareness campaigns, terminals instruct personnel on CO2 and other greenhouse gas emissions, and the steps which can be taken to reduce these on a day-to-day basis through exercising caution, prudent business decisions and general good sense. It is emphasized that even small measures, when combined with operations across the Global Terminal Network, can add up to big changes.

In a similar way, this philosophy was also applied to the company’s global safety program - which successfully led to getting all employees engaged and delivered significant results. The best practices gained are now being applied to the environmental campaign, making it a global initiative with local targets, a leadership challenge and part of APM Terminals’ drive to meet and exceed Corporate Social Responsibility goals. These initiatives all come together to allow APM Terminals to pursue environmental innovation and improvement to benefit the shipping lines which constitute its customer base, and to benefit the people and local communities in which the terminal does business.
GreenPort Logistics 2010

Clarion Sign Hotel, Stockholm, Sweden
Tuesday 23 February 2010

Developing Carbon Neutrality within the Sustainable Logistics Chain

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Sustainable resource management

Kate Royston is leading a practical research project to understand how port estate areas could benefit from closer co-operation between their businesses.

Port estates and their related industrial areas are important economic components in their region. Hubs of industry, business and logistics activities, they also provide challenges for sustainable resource management - such as management of waste materials, emissions and energy utilisation.

There is a growing trend towards co-operation between organisations to reduce unwanted impacts and provide benefits such as cost savings and new business opportunities. This is particularly evident across port estates in the Netherlands where it is becoming more widely practised, and seen as an important tool for sustainable port development.

The Port of Rotterdam has many examples which have developed since the 1990's, including pipeline systems and networks for steam, CO₂, hydrogen and compressed air. The principles of industrial ecology (beneficial relationships) have been important in the planning of Maasvlakte II.

GreenPort Journal (March/April 2009) reported on the ‘Industrial Symbiosis in Moerdijk’ where a programme is underway to extend the existing ‘sustainable linking’ initiatives based on the principle ‘Your waste, my raw material’.

UK Research Project

These practices are not common across port areas in the UK. Kate Royston is leading a practical research project to understand how port estate areas could benefit from closer co-operation between their businesses. The project is supported by a number of organisations including NISP, the Knowledge Transfer Network – Environmental Sustainability, the University of Surrey and Robbee Smole.

NISP, the National Industrial Symbiosis Programme (www.nisp.org.uk), is a government funded business support programme in the UK and is a leading contributor.

An initial research study with ports in the South West of England suggested opportunities did exist for economic gain through more sustainable resource management. Levels of co-operation and collaboration between ports and their tenants appeared generally low. It was concluded that tools such as industrial symbiosis and energy management could be beneficial and that it would be valuable to develop best practice approaches which could be applied elsewhere.

Bristol Port Estate and Vicinity

The Bristol Port Company (BPC) agreed to support a demonstration project to introduce sustainable resource management across their port estate and its vicinity. Bristol Port is the largest port in the South West of England, covering an area of 2600 acres. It extends over the Royal Portbury Docks, Avonmouth Docks and the Chittening Estate and is integral to the industrial development areas of Avonmouth and Severnside.

The project’s aims are to:

• Develop a community of interest between businesses in the area
• Provide economic benefits to the port and its tenants and neighbours
• Reduce environmental impacts such as diverting waste from landfill and CO₂ reduction
• Identify opportunities for wider co-operation in the longer term e.g. potential development of a ‘heat-net’
• Provide a basis for replicating the approach elsewhere

Following a positive response from a pilot group of businesses, wider engagement has been taking place. A key step was a NISP ‘Quick Wins’ Workshop held for businesses on the Bristol Port Estate and Vicinity at the end of September. Patrick Kearon provided a welcome from Bristol Port Company. He was encouraged that the project, and working with NISP, had already delivered benefits to BPC.

Companies from a range of sectors including: manufacturing, distribution, construction, waste management and the port attended and helped make the event a success. Attendees were encouraged to identify resources that their business requires that others may have, or were surplus to requirements that others may want. Some key resources discussed included wood waste, plastics, cardboard, food waste, aggregates, office space, transport capacity, heat and land.

The project is now continuing with support available to businesses to identify and progress opportunities. A mapping of the area’s resource flows is also underway to help identify further options, and a follow up event is planned.

An additional output will be the development of Best Practice Guidelines based on experiences from this project and other best practice examples from across the world; and it is hoped further such initiatives elsewhere.

Growing Interest

There is growing interest from Port Authorities to work more closely with their local businesses and tenants. Legislation such as the UK’s Carbon Reduction Commitment will also require closer co-operation in the area of carbon management and energy reduction.

The Belfast Harbour Board, with the support of Invest NI and NISP, are assessing the feasibility of a similar project to that at Bristol. A ‘Quick Wins’ workshop will be held there in early November 2009.

If you would like to know more about this project, or have examples of beneficial relationships you would like to share, please contact Kate Royston at kate.royston@robbiesmole.com.

Aerial view of Bristol Port Estate

Source: Bristol Port Company

November 2009 GreenPort 47
A week in the life of an Environment Manager

A new GreenPort column designed to draw attention to the varied responsibilities of environment managers shaping port and terminal policy. This month, the spotlight falls on Charles Haine, Global Environmental Manager, DP World. Charles has been with DP World, the Dubai-based international marine terminal operator, since May 2008. His challenges include advising on global environmental strategy, tackling the carbon agenda and being a focal point for liaison with engineers, operations etc. He works out of the Europe Region corporate office in London.

Sunday

In the Middle East, Sunday is Monday so the Blackberry starts buzzing during the early rerun of Match of the Day. The Global Safety & Environment team - based in Dubai with staff also in London and Sydney - is available 24/7 to respond to accidents and incidents. An Incident Report describes a fire in a container housing a hazardous substance onboard a ship berthed in south-east Asia. I respond with pertinent questions to further clarify who, and how we, responded and where the (contaminated) firewater ended up. Later, my Director phones for input into a business development proposal for a potential new project. Environmental due diligence and an intrusive soil survey/analysis to determine contamination are required, in line with our Acquisition Standard. I quickly scan Outlook calendar for the week's impending meetings so I know which days to don a tie.

Monday

The commute into London Waterloo whizzes by in a blur as I make a head start on the email inbox and read newspaper reports of the weekend's Premiership action. I'm at my desk by 8.30, highlight high priority items for the week and send requests for data on energy consumption/KPIs to our seven Regional S&E Advisors. The day is filled-up with the inevitable requests for PowerPoint slides, telecons with Dubai and contributions to monthly Operations' and safety reports. A senior Director asks me to explain the concepts of the voluntary carbon trading market. We conclude by agreeing that signing a cheque to offset carbon is not very exciting. We must continue to develop better measurement techniques and proactive initiatives. This evening I find myself at Oxford Street to attend the excellent Green Mondays event. Cross-sector corporate managers and captains of industry meet to network and discuss climate change initiatives in a plenary followed by round-table discussion.

Tuesday

I travel between 20-30% of the time and flights are organised for Hamburg (ICHCA environment meeting) and Dakar, Senegal (audit and Environment & Social Management Plan to Equator Principles for an expansion). Later, it's the relative calm of an informative webinar hosted by the "2degreesnetwork.com" team on the Carbon Reduction Commitment. This new legislation will affect our UK terminals in terms of mandatory reporting of energy consumption/CO2 emissions, the purchase and trading of carbon allowances and reduction strategies. The carbon agenda is rapidly overtaking traditional environmental management issues in ports although compliance to waste and water thresholds and instilling best practice is still crucial. On the return commute, I scan, Containerisation International, Tradewinds and Sustainable Business magazine, snatched from the ever-growing tower of publications congesting my in-tray.
Wednesday

Dawn sees an early train journey to DP World Southampton where I’m presenting to the European region’s Operations’ Managers. The SVP is also in from Dubai. I modify slides on Environmental Strategy and make sure new ideas for 2010 are integrated to stimulate discussion. This forum is a perfect opportunity to raise awareness with influential colleagues, who we need to be ambassadors for energy saving. They don’t need convincing about climate change but speaking in terms of “energy effectiveness” and “cost-savings” will help me. The emphasis of the debate moves from new eco-technologies to low-cost solutions. One European terminal is justifiably proud to showcase a zero-total cost Eliminate-Reduce programme that has reduced electricity consumption by over 15% this year. Through a detailed analysis of consumption, engineers and finance teams have been able to better identify priority areas for focusing effort. The crunch has hammered travel budgets but all attendees agree there is nothing like face-to-face meetings to enhance networks and share new knowledge.

Thursday

I have a telecon with our IT supplier to arrange changes to the corporate CO2 Calculator Tool. S&E Advisors at each of our 49 operational terminals must input data to the GSE portal on a monthly basis. Delegations from our French terminals and Turkey are in town to discuss budgets with Senior Managers so I take the opportunity to get reacquainted with key characters. They respond favourably to discussions on training and ISO14001 by requesting more information. I am surprised how frequently and seriously S&E issues are discussed within DP World. Thursday evening is the beginning of the weekend in Dubai so I fire off some attachments on CSR issues for the Comms team to approve on Sunday.

Friday

I take the opportunity to finalise and circulate a draft of the Global Standards on waste management. These will complement the Safety Standards and are not as easy as it sounds to prepare. It must clearly present the company’s international-quality expectations while making sure they are as relevant to Canada as to Algeria. Later, I deal with emails requesting information on topics varying from ballast water exchange in Mozambique to the potential for solar energy in new buildings in India and China.

Saturday

The cricket season has finished so I afford myself strategically timed glances at the mobile for missed calls and emails. My wife looks over at me menacingly and suggests I quickly start chewing the Blackberry equivalent of nicotine gum.

Editor’s note - This is the first in a series of regular spotlights on “A week in the life of an Environmental Manager”

If you would to be included in a future edition of GreenPort Journal contact...

Patrick.hicks@ewpcommunications.com
Can ports be ‘green’ in a recession?

At the Royal Haskoning Green Ports Conference in mid-October, port authorities, terminal operators and environmental managers met to discuss whether ports can maintain their environmental strategies in the current recession. Millie Clive-Smith reports.

In the current climate of reduced trade and investment, it is becoming increasingly difficult for ports and terminal owners to achieve the necessary environmental improvements being enforced by legislation.

A part of Royal Haskoning’s commitment to helping ports develop environmental strategies as legislation in this area increases, and the importance of good environmental management comes to the fore, the Royal Haskoning Green Ports Conference addressed how European ports can maintain their environmental strategies. Delegates heard about economic and environmental influences, received operational examples to take away and found out how simple environmental changes, that do not cost the earth, can be made now and have a positive impact on the bottom line.

What is a sustainable port?

The keynote speaker, Patrick Verhoeven, Secretary General of European Sea Ports Organisation (ESPO) introduced the ESPO European view and discussed what makes a port sustainable; whether it is its relationship with the local community, its harmony with the natural environment, or both.

To attain sustainability the managerial attitude, governance and policy are vital. He stressed that the diverse nature of ports must be accounted for in legislation; what creates sustainability in one port may not in other.

The rise of the ‘green port’

The ‘Green Ports’ survey, conducted by ICM research, on behalf of Royal Haskoning of 100 port decision makers in Britain revealed that many ports recognise the growing importance of environmental management with 89% of respondents stating that they already have an environmental policy in place, speaker Sian John, Director, Environment, Royal Haskoning explained.

This shift of priorities within British ports is already underway, thanks to the expected increase in regulatory scrutiny, but also to a growing eco-consciousness and a recognition of the long-term environmental, social and economic benefits achieved by effective environmental management.

Despite significant steps having been made in the right direction the research reveals, however, that UK ports are in need of more support in order to meet the increased environmental requirements being placed on them.

John also announced the sustainable port ‘QuickScan’ tool that will give an instant review of sustainability. With an accurate idea of how sustainable the port is it is easier to develop an effective plan for improvement.

Trade contractions - lessons from the past

In a factual presentation, speaker Andrew Penfold, Managing Director of Ocean Shipping Consultants, explained the current global economic situation and its direct impact on the ports and shipping sectors. He estimates the overall contraction of the world economy in 2009 to be 1.1% although advanced economies, such as the UK and Europe showing a greater contraction of 5.4% and 4.2% respectively, whereas, developing countries actually exhibit expansion: China of 8.5% and India of 5.4%.

According to Penfold, container port demand has shown a 12% general decline in 2009, but with large variations at regional levels. Container volumes in China are relatively strong due to a reorientation towards regional trade. In contrast, the US import dependence means demand has contracted by as much as 15%. Europe has also shown decline in demand, with the steepest being in Germany due to declining Baltic transshipment.

Penfold referred to historical economic records which demonstrated that after past downturns, recovery has been very sharp. The latest IMP projections show that more developed economies in the north are being led out of recession by the southern economies; however, the relationship between economic growth and trade growth have been modified and the main uncertainty that remains is the strength of the upturn.

Action against climate change

When considering the trend of the global mean temperature it can be seen that we are currently in the position of a steepening increase of mean temperature according to Dr Matthew Hunt, Royal Haskoning’s Senior Environmental Scientist, who proposed how ports must adapt to the effects of this undeniable climate change.

Changes to our climate by 2050 include an increase of mean temperature of 2.5 °C, a rise in sea-level of 0.23m and increased winter precipitation and storm surges. It is too late to alter these changes but we can prevent further changes of the more distant future.

It is difficult to know the extent of planning which is necessary. His message here is: plan for the worst but don’t waste money.

Such precautions which may be necessary include:
- Port flood defences against rising sea levels.
- Improved, sustainable drainage systems and surface water management due to increased precipitation.
- Precautions against cracking asphalt due to increased thermal pressure and the buckling of rail tracks in the increased heat.
- A ditional cooling water for machinery operating in hotter conditions although water supply may be restricted
- Protection of cranes and gantries to withstand greater wind speeds.
- Treatment of biological hazards such as toxic levels of algae due to increased temperatures.

There will also be insurance implications due to loss and damage of cargo and equipment caused by more violent storms.

There are still some uncertainties surrounding climate change and with them comes the risk of a lack of action. It must
be realised that adaptation is better implemented when it is planned, focussed and prioritised.

Why adapt?
A study by Hutchinson Ports UK showed a strong positive correlation between environmental governance and financial success. Andrew Harston, Port Development Director, Hutchinson Ports UK, explained that investments such as buying new RTG’s or retrofitting drive controls to existing machines will require financial input but will be valuable investments, it is also explained that initiatives need not be large and costly but measures such as installing better boiler controls, insulation and energy meters are also beneficial.

Harston explained that while legislation creates a level playing field and is the only real catalyst for change, implementation varies across Europe, with different attitudes existing in different states. There is a need for international standards and legislation.

Charles Haine, Global Environmental Manager with DP World introduced a new carbon calculator for which terminals submit energy data online every month in order to better target their emissions sources. In agreement with Harston, he voiced the need for fewer assumptions to be made when accounting for energy use; improved metering, as used by DP World, should reveal exactly how much electricity is used in each area of the port and by which equipment.

Head of Corporate Responsibility at APM Terminals,Henrik Kristensen, said that ports need to make their case when legislation is being developed. He also stated that environmental opportunities must also be business opportunities, and equipment vendors should do more to offer low cost solutions. He added that yet another benefit of enhanced environmental performance is the safety and health of workers in ports - he stressed that APM want every one of their workforce to return home safe after every shift.

Particulate matter: under the radar
Of all air emissions particulate matter has the greatest effect on health and yet, none of the action plans of the 240 Air Quality Management Areas across the UK give substantial focus to particulate matter. Uncertainties with particulates lie with knowing the exact health effects, unclear standards for health protection, and unclear methods of measurement.

John Drabble, Advice Group Director, Royal Haskoning explained why more focus on particulates is necessary.

The size of the particle determines where in the respiratory tract damage will be caused. These particles are small enough to penetrate deep into the lungs. PM 10 particles (of diameter less than 10 micrometers) settle in the bronchi and lungs whereas PM 2.5 particles (of diameter less than 2.5 micrometers) can penetrate into the gas-exchange regions of the lungs where they may pass through the lungs and into other organs.

Improved methods of measurement with better quantification of the health effects are needed when it comes to Particulate Matter. The focus of air emissions should not only be on energy and fuel management and CO₂ emission reductions.

Control of emissions from marine diesel engines
Tom van den Nootgade, Royal Haskoning explained how the conditions for combustion in diesel engines can affect the production of Nitrogen Oxides (NOₓ), Sulphur Oxides (SOₓ) and Particulate Matter (PM).

A number of technologies, both those currently available and those under development, were given as options for reducing diesel emissions; modifications to the fuel injection equipment to reduce NOₓ emissions, low sulphur fuels to reduce SOₓ and filters to reduce PM emission.

The technologies available today are adequate to provide short term solutions in meeting regulatory requirements. More long term solutions are needed, however, and should involve the introduction of hybrid engines, dual fuel engines and gas turbines.

Environmental management
Environmental Manager for the Port of Rotterdam, Resianne Dekker, spoke of how optimising the use of port space, improving the sustainability of transport and improving air quality enables a prioritised response to climate change during recession. For example the use of the existing port area has been intensified by the introduction of a multifunctional sea wall; functioning both as a flood defence and a transport point. In improving the sustainability of transport, the accessibility of the area has been improved to reduce congestion and hence unnecessary emissions. Clean fuels are also encouraged and the access of older trucks with in certain areas is restricted depending on their engines.

Dekker also contended that sustainable entrepreneurship is prerequisite to achieving balanced growth. With growth comes the possibility of further CO₂ reductions; reduction methods become more cost effective with economies of scale gained from the collaboration of many businesses.

Implementing an environmental management scheme
To achieve sustainable entrepreneurship Peter Barham, an Environmental Consultant, explained how an Environmental Management Scheme (EMS) is essential.

An EMS raises awareness of environmental and societal issues and actions. Schemes ensure the protection of the environment is part of a company's culture for all employees. A scheme would introduce guidance and standards, and establish a structural approach to the best environmental practice through working with government conservation bodies.

The benefits of an EMS are numerous to include better corporate governance, enhanced reputation and use of resources, greater cost-effectiveness and increased chance of investment from the city. Delegates were alerted to the fact that acquiring certification such as ISO 14000, ISO 14001 or BS 555 is important in adding recognisable credit to an EMS.

Barham concludes that when it comes to an EMS there is no choice, guidance will be required and standards need to be set, met and monitored; and an EMS is the tool to do this.

The day's events finished with the concluding comments of Richard Marks, Conference Chairman and Director of Royal Haskoning. Marks commented on the upcoming United Nations Climate Change Conference in Copenhagen this December, saying that significant changes could result, and that a prediction suggesting there could be a decision to reduce carbon amounts by 40% by 2020 could be made. He also highlighted the GreenPort 2010 Conference in Stockholm next February, the theme for which is that ports are facing serious challenges today to achieve acceptable sustainability levels.

In the final activity of the day; delegates were given a set of cards; red, amber and green and asked for their opinion, by voting red (no), amber (maybe) or green (yes). The concluding verdict as to whether ports can be green at this time of reduced trade was predominantly voted with green cards; a resounding YES.

www.royalhaskoning.co.uk

November 2009 GreenPort 51
Managing port vessel traffic using earth observation technology

ABPmer and BMT ARGOSS are working on a European Space Agency-funded project to provide earth observation-based monitoring services to support Vessel Traffic Management systems.

Port operators and shipping companies are subject to increasing levels of environmental legislation, which inherently increases their monitoring responsibilities. It is recognised that a key element in maintaining good environmental conditions within ports and coastal waters is to minimise the risk of accidents in areas under port authority control. Accordingly, in 2002, the European Community issued Directive 102/59/EC - establishing a Community vessel traffic monitoring and information system, which replaced the 1993 legislation for vessel traffic monitoring. The most critical areas recognized by the maritime community are the coastal waters, and in particular the port approaches, where the situation is often critical, and conditions can be highly variable in space and time and therefore unpredictable.

As a subsidiary of Associated British Ports, ABPmer is frequently required to support its parent company by providing data, geo-information and expert advice in response to environmental or operational monitoring requirements.

At present, little use is made of satellite based earth observation (EO) for these activities and current service capabilities are at a very preliminary development stage. In 2004, ABPmer were involved in a pilot study to determine the extent to which earth observation data could fulfil the geoinformation requirements of port and harbour authorities. The study concluded that few port operating authorities were aware of the capabilities of EO data and that there were significant blockages preventing the wider uptake of these data streams. Of the different EO data platforms reviewed during the study, Ocean Colour, High Resolution Optical Imaging and Synthetic Aperture Radar (SAR) were found to be the most suited to port applications. The study also identified a number of potential applications for satellite data including:

- Oil spill monitoring
- Measurement of environmental parameters such as suspended sediment concentrations and chlorophyll to reduce the impacts of dredging operations; and
- Provision of wave and current data to assist in piloting operations.

ABPmer and BMT ARGOSS are currently being funded by the European Space Agency to develop and deliver earth observation based monitoring services to support Vessel Traffic Management at a number of ports within the UK and Europe. ABPmer are responsible for managing the integration of EO based data supplied by BMT ARGOSS with in situ data from End Users and for developing a suitable platform for service delivery.

The key elements of the POCAHONTAZ (Port and Coastal High Resolution Traffic Safety Zones) service are:

- To support vessels as they travel between ports;
- To support Vessel Traffic Services in managing port safety;
• To characterise (and thereby reduce) the risk of accidents to shipping both within the port environment and between ports.

Based on an initial review of information requirements within port management services, it is anticipated that the proposed service will integrate the following data streams:

- Metocean forecasting;
- Integration of near real time EO data with in situ measurements to improve local and regional forecasts of metocean conditions;
- A utomation Identification Service infrastructure;
- Marine spatial planning tools;
- Port usage/berthing statistics.

During the coming 12 months, a series of service trials will be carried out in order to test the suitability of the products and services being developed. Humber Estuary Services will act as a key customer for the services during the development phase. Humber Estuary Services (HES) is part of Associated British Ports (ABP) the UK’s biggest ports group, which owns and operates 21 ports, including the four Humber Ports of Grimsby, Immingham, Hull and Goole. Vessel Traffic Services (VTS) Humber, which is located at Spurn Point, operates a 24-hour service for all river users. Its major function is to monitor and regulate navigation of those parts of the Humber Estuary and Rivers Ouse and Trent within the jurisdiction of the Harbour Master, Humber.

In addition to the Humber Estuary Services, the Port Authorities for Groningen, Antwerp and Shannon have expressed a particular interest in extending their monitoring and forecasting capabilities outside the port environs. The main reason why these extended port safety zones do not currently exist is that the cost of managing shipping risk over a larger area is simply too expensive. A key element of the service trials will therefore be to determine how the data products and delivery infrastructure may be adapted in response to each user’s specific requirements whilst remaining commercially viable.

Although still at a very preliminary stage in development, it is likely that the Service Trials will address the following issues, which have been raised by the key user organisations:

- Delivery of high resolution wave and current data to assist in the management of vessels awaiting entry into the various ports and integration of this data stream into the existing VTS infrastructure;
- Provision of wave, current and water level forecasts to ships travelling between ports; and
- A shipping risk assessment assuming a theoretical worst case scenario (input to disaster mitigation plan), including for example, extreme weather, congestion in port approaches, or a pollution incident such as oil spillage.

Following the delivery of the Service Trials and their subsequent evaluation by the User Organisations, services or products that do not meet a minimum performance standard will be rejected. The remaining services will then be revised and upgraded for preparation in the final activity in the ESA funded study which will be to develop a commercial service roll-out strategy. This will include a firm schedule for delivering the service upgrades and will mainly focus on mechanisms for expansion and operational delivery.
Greening ports through Carbon Management

Jonathan Shopley, Managing Director, The CarbonNeutral Company assesses how the ports and maritime sectors can react to reduce their carbon emissions.

The maritime and aviation sectors are increasingly coming under pressure to respond to environmental demands to lower their carbon emissions. The pressure on the maritime sector to have a strong environmental position is coming from governments in the form of regulation, from manufacturers in the desire to improve sales, and increasingly from consumers with enhanced awareness about the environmental impact of distribution.

Science is telling us that an absolute reduction of 80% in GHG emissions is required by mid-century to prevent material damage to the world’s economy. This is at a time when global emissions are growing at their fastest rate ever. Each port and business within the maritime sector faces a similar challenge: how to grow profitably and reduce emissions.

If they take a strategic approach to carbon management it is possible for the maritime and aviation sectors to combine growth with a reduction in carbon emissions. These sectors must respond to the need to balance the demand for delivering internationally produced and manufactured goods, with the requirement to shift to a low carbon economy. As consumer demand increases for goods so does the quantity of greenhouse gas emissions (GHGs) through transportation. Leading retailers such as Walmart are putting pressure on manufacturers to disclose and improve the environmental footprint of their products, including distribution, by creating transparent measurements which will help them reward sustainable suppliers and products.

Within the maritime sector, ports, as fixed facilities, are able to lead the way in measuring and reducing carbon emissions. Forward thinking organisations such as the World Ports Climate Initiative (WPCI), under the leadership of the International Association of Ports and Harbors (IAPH), are playing an essential part in encouraging ports to be proactive and reduce their environmental impact. In order to achieve this goal it is essential to create programmes which enable ports to measure their carbon footprints, understand ways to reduce CO₂ emissions and promote the use of renewable energy. These innovative projects are being led by the Port of Los Angeles which has measured its footprint and implemented programmes leading to significant greenhouse gas reduction. The Ports of Oslo and Rotterdam have also taken the first steps to implement carbon management strategies by calculating their carbon footprints.

In addition to the work that the WPCI is currently undertaking in greening ports, The CarbonNeutral Company, which specializes in carbon management, has worked with The Port of Belfast since January 2008, to achieve CarbonNeutral® company status. CarbonNeutral company status was granted after The Port of Belfast had completed a four stage programme which involved:

- Measuring all the carbon emissions produced at the Port; setting reduction targets; and reducing emissions through a comprehensive plan of reductions. This included a carbon offset programme where offsets were established as immediate, cost effective reductions to enable the port to meet the target of zero emissions and communicating and encouraging others to also put in place proactive plans to reduce their emissions.

A baseline study calculated that The Port of Belfast generated over 3,200 tonnes of carbon a year, the equivalent of 2,700 return flights between Belfast and New York. Electricity used to power items such as cranes and quay lighting were identified as the primary source of emissions. In order
to reduce the carbon emissions to net zero, the Port’s carbon offsetting plan enabled it to counter balance every tonne of CO₂ emitted with a tonne of CO₂ saved by a validated emission reduction project that has met international standards. This was achieved through offsetting projects such as Callahuanca Hydro Power Project in Western Peru which delivers clean electricity to Peru’s National Grid, displacing energy that would otherwise have been supplied by fossil fuel fired power stations.

In order to be able to offer carbon credits, offset projects have to show that they would not have happened without carbon financing.

Carbon offsets are an immediate and cost-effective way for a port to present itself as a credible low carbon business. Implementing an offset inclusive carbon management programme is a simple and immediate way to demonstrate leadership. A strong position on carbon management delivers real commercial advantages including additional planning permission benefits, enhanced relationships with the local community and a powerful competitive differentiator.

In order for ports to develop a strategic approach to carbon management, the first step is to assess the size of the issue by measuring their footprint. Measuring a carbon footprint entails measuring the amount of CO₂ produced directly and indirectly over a period of time. For a footprint measurement to be credible it must do three things. Firstly, the boundary of the carbon assessment must be set in a clear and consistent way. Secondly, the port must ensure the assessment is completed according to a recognised standard. And finally, the measurement must use third party endorsed emissions factors. The most widely-accepted measurement Protocols are the WRI/WBCSD Greenhouse Gas Protocol (www.ghgprotocol.org).

Once the current status of the carbon footprint is established, a port can begin thinking about a reduction target. All the reduction proposals, both internal and offsets, can then be evaluated in terms of the amount of carbon reduced versus the cost of implementation. The target is met by selecting the most cost effective reduction measures available. In simple terms, the ports will pay to outsource emissions reductions when it is more cost-efficient or technologically feasible than doing so in-house, in the same way as if they were making the decision to outsource a business process like accounts payable or payroll.

Every business makes strategic decisions to make or buy, to in-source or outsource, and delivering emissions reductions is no different.

There is no doubt that climate change presents a significant risk to the planet and opportunity to gain immediate commercial benefits from a strong carbon position, in addition to being prepared in advance for increased legislation and a rising cost of carbon in the future.

www.carbonneutral.com

About The CarbonNeutral Company:
Established more than a decade ago, The CarbonNeutral Company is a leading carbon offset and carbon management business, helping companies and organisations, throughout the world, to measure and reduce their carbon footprint. The company sources and retails carbon credits in any volume, across all major standards and from projects worldwide.

The CarbonNeutral Company is committed to project quality and developing the best solution for each client. The company guarantees every tonne of carbon supplied, commissions a major international accounting firm to review and report on its carbon business, and is a member of the International Carbon Reduction and Offset Alliance (ICROA).
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AAPA Annual Awards Program

The seventh annual facilities engineering awards - a salute to exemplary port programs and best practices - took place during the 98th AAPA Convention in Galveston at the end of October

Awards of Excellence

The Port of Hueneme/Oxnard Harbor District for its Confined Aquatic Disposal Facility. The port of Hueneme was challenged with a need to dredge and dispose of a 10 year build-up of contaminated sediment unsuitable for open ocean or beach disposal. The solution developed by the harbour district, the U.S. Navy and the U.S. Army Corps of Engineers, was an on-site Confined Aquatic Disposal Facility requiring minimal transportation costs, no tipping fees and no need for sediment rehandling.

The Canaveral Port Authority also received an Award of Excellence for their South Jetty Deposition Basin Entrance Channel Sediment Trap. Three hurricanes in 2004 affected Port Canaveral, causing significant shoaling of the harbour entrance channel, limiting vessel access to the port for a period of time and causing significant economic impact. To avoid future problems the port constructed its Sediment Trap which intercepts sand shoaling prior to its negative impact on the navigation channel. This innovation functioned as designed during Tropical Storm Fay in August 2009, and the port quickly resumed operation.

Environmental Improvement Awards - Comprehensive Environmental Management

The Massachusetts Port Authority (MPA) with an honourable mention to the Port of Vancouver USA.

In order to consistently integrate sustainable technologies and practices into all of its capital projects, the MPA developed and implemented Sustainable Design Standards and Guidelines (SDSG). The SDSG is a certification program that consists of a set of standards and guidelines required to be used by all port authority planners, architects and engineers, aimed at non-building projects.

Designed to minimise the impact of the Port of Vancouver USA’s 50 tenants, the Tenant Environmental Management Program manages tenants’ environmental needs before the port enters into a lease and follows through to the end of the lease term. The port pre-screens tenants and their environmental needs, periodically audits environmental protection practices, rewards tenants for environmental performance and shares best practices among tenants.

Mitigation Award

In constructing its Choctaw Point terminals complex, the Alabama State Port Authority went beyond mitigation requirements by the U.S. Army Corps of Engineers and created a public park with access to Mobile Bay. The Corps required that the port compensate for the loss of wetlands, shallow-water bottoms and deep-water bottoms by converting uplands to tidal fringe marsh. In addition, the public park has hiking and biking trails, kayak launch sites and picnic facilities.

Stakeholder awareness, education and improvement

The award for stakeholder awareness, education and improvement was given to the South Carolina State Ports Authority. To communicate the South Carolina state ports authority’s commitment to environmental stewardship to a broad audience, the port developed its Pledge for Growth campaign. The campaign initiatives relate to reducing diesel emissions, providing aerial surveys for endangered right whales, restoring tidal marsh and preserving environmentally sensitive lands.

Galveston re-builds for the future

The Port of Galveston hosted the 98th AAPA Convention during the last week of October just over a year after Hurricane Ike hit the Texas port city of Galveston, sinking the city’s historic downtown under ten feet of water. A major cargo hub and one of the Gulf Coast’s primary cruise ports, the Port suffered substantial and widespread damage with heavy water damage to port equipment, buildings, and piers.

Located 50 miles south of Houston, Galveston is located on a 30-mile barrier island that averages only 2 miles wide. Ships can reach the open sea in about 30 minutes, compared to several hours need to reach the Port of Houston.

At the end of the 19th century, Galveston was the largest city in Texas and the third-busiest port in the country. But then, on September 8, 1900, a massive storm came ashore, carrying with it 140-mph winds and a 20-foot surge that washed completely over the island. More than 6,000 islanders, a sixth of the island’s population, were drowned. Work was then started to raise the city’s ground level by up to 17 feet and a massive seawall along 10 miles of shoreline, with several jetties of large granite blocks projecting out into the water. Though the seawall failed to completely stem Hurricane Ike, it definitely prevented an even worse disaster last year.

The Port’s cargo handling ability was operational in just over a week. “We had scheduled cargo operations that had to happen. On the eighth day after the storm the first ship came in to unload roll on, roll off cargo. We were going to make sure that this was going to happen and once our cargo customers saw we were very sincere, they stayed,” said Steve Cernak, Port Director of the Port of Galveston.

The Carnival Cruise Lines terminal was refurbished and back on line in less than two months. The Port of Galveston’s environmental policy includes recycling building materials from outdated cotton warehouses for use in other projects, the implementation of a solar powered demonstration project in 2010 and the replacement of diesel engines on some port equipment.

The Port of Galveston is being rebuilt to current severe weather specifications. “I’m a CEO but I’m also an engineer, so I understand these things. We’ll utilize elevation increases where appropriate and will do all that’s necessary to mitigate future damage. We have a chance here to do things properly,” Cernak says.
PORTS AND THE COMMUNITY

Making EFFORTS to be good neighbours

The EFFORTS research project is intended to permit ports to strengthen their role as environmental protagonists and to improve trust of nearby residents.

A sea-view is a much sought-after attribute, capable of increasing property value meaning it is not really surprising that landowners are converting unused warehouses into new flats - to sell at high prices. However, when the idyllic sea views of blue water dotted with sailing boats, a fresh sea breeze and the sound of seagulls turn out to be views of gantry cranes, the smell of tanker berth and the noise of van carriers, residents can feel aggrieved.

With more residents living in the vicinity of ports, the deep-set issues regarding this co-existence are becoming ever more important. Such issues cannot be ignored, and it falls to the port to ensure good relationships are maintained. Attempts to do so may involve improving social relationships by hosting children’s parties within the port, or by communicating the key economic role a port plays and the need for close cooperation required to minimise annoyance.

The port industry is well advised to become an environmental protagonist instead of fighting the image of an industry trying to hide environmental problems. Certainly this must be communicated to the public to build mutual trust and confidence between society groups, especially nearby residents, and the port industry.

EFFORTS project

"Effectiveness" and "Efficiency" are the key words for EFFORTS, a project co-funded by DG Research within the 6th Framework Programme on Research, Technical Development and Demonstration. The three thematic areas are:

- 'Navigation in Ports' led by the Port of Dublin
- 'Port Environment' led by the Port of Le Havre
- 'Port Organisation' led by the Port of Gijón.

As a cross-project activity ‘Training, Education and Human Resources Development’ elucidates the significance of the further development of skills, knowledge and attitudes in understanding advanced port operations.

Ports are complicated systems, hosting living near the water, in converted port buildings, can be an attractive option. Good examples of this are at PuertoMadero in Buenos Aires...
many facilities. In order to make activities transparent to people at all levels for processes, a process-orientated system approach was developed based on the process standards of ISO CEN 19439 and 19440 which allows treating processes as objects, allocating attributes and defining systems relations, thus also allowing the integration of environmental process aspects into the overall system.

It is understood that the port environment is a crucial production and image factor of a port. Energy management, ships’ ballast water, diluted aluminium from cathodic protection of port steel constructions, port air quality tackling VOCs and noise annoyance are the key words to describe EFFORTS work related to the port environment.

The overall topic for the environmental tasks in EFFORTS is "prevention is better than cure" which means pro-actively investigating all possible environmental threats before others find out and forcing re-active measures, which are always more expensive than prevention. The EFFORTS project activities are based on existing knowledge and aim at improving the state of the art. The financial restrictions and project schedule force us to focus on a few issues selected by the participating ports:

**Energy Management**

Advanced terminal operations, especially those of container operations including large numbers of reefer containers, consume high quantities of energy, which is not only a cost factor but also a question of CO₂ and emissions. Under the EFFORTS umbrella, a team works to model the port energy consumption and to map the consumption level and costs per type of operation and site. In order to locate energy production as close as possible to consumption, renewable energy sources compatible to ports will be investigated and by means of sophisticated simulation, correlated to the port energy consumption related to time and operation. Unexpected consumption peaks is one of the main problems in energy management and this will become even more difficult once cool ironing comes into practice.

**Ballast Water**

The background of this research task is the International Convention for the Control and Management of Ships’ Ballast Water and Sediments (International Maritime Organisation) focusing on:

- Identifying harmful aquatic microorganisms in ballast water
- Solutions to eliminate these or, at least, reduce negative consequences on the port environment.

**Aluminium from steel constructions**

In ports, sacrificial aluminium anodes are frequently used to prevent excessive corrosion of steel constructions. The objective of the investigation is to assess the aluminium contamination using yearly average noise levels weighted by frequency and time of day. These well established methods apply fairly well to continuous broadband noise such as that of road traffic. Port noise, however, includes components of a low frequency and an impulsive nature; it must therefore be evaluated in a new way.

The team in Dublin started with the usual procedure, measuring several sources. Sound sample recordings were taken for each noise source creating elaborate sound maps. Sound samples were captured from machinery operations as well as from cargo handling events.

The team then took a new approach and considered the effect of the weather on sound propagation from the source to the receiver. Weather-effected sounds can reach considerably higher levels than the estimated yearly averages and the annoyance perceived by the residents can be completely different in different weather conditions. The team also investigated how sound and noise is perceived by individuals and found that psycho-acoustic descriptors can better indicate potential annoyance than the commonly used sound pressure levels. Psychoacoustic descriptors describe sound properties in relation to human observations. The total effect on annoyance is a combination of factors; sound loudness, sharpness, fluctuation strength and roughness; these are calculated from sound signals. Additional factors are prominence of tonality and prominence of impulsiveness.

These factors are then used in the EFFORTS project to create higher order indicators; unbiased annoyance or sensory pleasantness. The development of these indicators required listening tests which involved processing sound samples to make them suitable for headphone testing. Samples were corrected due to distance or screening by buildings and organized for the tests on 100 persons from different professions, age groups and gender.

**Mitigating noise annoyance at the Port of Dublin**

Existing noise assessment procedures consider the noise annoyance evaluation using yearly average noise levels weighted by frequency and time of day. These well established methods apply fairly well to continuous broadband noise such as that of road traffic. Port noise, however, includes components of a low frequency and an impulsive nature; it must therefore be evaluated in a new way.

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PORTS AND THE COMMUNITY

concentration in the port water and in the sediment and to determine its toxicity against marine organisms. Preliminary results are mostly good news, showing that:

• No significant influence of aluminium sacrificial anodes dissolution in water was detected
• A low aluminium contamination in sediments was observed due to port activities, however, this contamination significantly increased close to aluminium anodes in non-dredged areas.

Ecotoxicological tests with mussels (Mytilus edulis) to determine the toxicity against marine organisms and the potential environmental impact of the use of sacrificial aluminium anodes are still going on.

Port Air Quality
This task tackles the problem of volatile organic compounds (VOCs) and sulphur compounds which are emitted as gases through loading or discharging operations of petroleum products and are considered as carcinogenic. The aim is to reduce the global impact of port operations on air pollution.

Noise Annoyance
Alert signals of vancarriers and the bumping of containers on top of one another or on the ground, together with the wide variety of port noises is irritating for nearby residents. It will, however, not be very efficient to combat all kinds of noises in the same way and with the same priority. Further knowledge needs to be gained about the annoyance factor of port-specific noises. The difficulty is that this factor is subjective rather than objective. Rather than just measuring, one must conduct empiric studies to identify annoyances due to noises, their sound power level, frequency and regularity or irregularity. Because the amount of annoyance sensed is subject to individuals, their condition and mood, the results can only match a majority of a certain collective rather than all individuals at all times under all conditions.

Conclusion
Research in port water and air quality and in annoyance due to port noises will, without doubt contribute to making ports better neighbours to nearby residents. There is a risk that the port energy issue may become ambivalent because wind parks for producing clean energy are not always welcome and are often considered visual pollution. However, wind parks are not the only source of clean energy. It is expected that intelligent management of energy will have a larger effect on the carbon-dioxide footprint of a port than that from new sources of energy. The question, however, is not which method to select but to exploit all possibilities to achieve the maximum effect.

A port environmental office needs to act more stringently than any other party. The port must be the first to recognize environmental impacts and immediately initiate measures to investigate and to improve. Those waiting until they are blamed by others are in a defensive position which requires more effort to overcome than taking an early initiative and not impairing the public image.

Environmental issues must be placed at the top of a port CEO’s list of tasks and be timely and comprehensively communicated to residents living in the vicinity of the port. The benefits of clever terminal contracts can rapidly become irrelevant once residents succeed in e.g. restricting night operations and a port can seriously become constrained by communities when planning an extension. Talking to each other does not solve the problems but it prepares the ground for coming closer to shaking hands.

GreenPort Internet Portal – Information about Ports and Environment Just One Click Away

EWP Communications Ltd, organisers of the GreenPort conferences and publisher of the GreenPort Journal, manage the GreenPort Internet Portal www.green-port.net.

Visitors can access the latest news about sustainable port development, equipment and technology innovation, alternative fuels, air quality initiatives and other programmes to reduce the environmental impact in the ports and shipping sector.

In addition to the latest GreenPort news, the portal integrates information about the GreenPort 2009 Conference in Naples, news about the GreenPort 2010 Conference, and other relevant Ports and the Environmental data.
EFFORTS demonstration in Le Havre

The EFFORTS Demonstration Event on Clean Energy Management, on Water Quality and on Air Quality in Le Havre drew a large and interested audience.

On September 22nd and 23rd, an international audience gathered in the Port of Le Havre to learn about the work done on clean energy management, water quality and air quality in ports within EFFORTS. A first warm welcome from the GPMH Manager Jean-Yves Le Ven and a project briefing from Yann Tréméac of TL&A, delegates visited the Port of Le Havre and its surroundings.

Clean Energy Management

The afternoon of the 22nd was devoted to Clean Energy Management. Jean-François Emery and Pascal Gallichon of GPMH quite explicitly explained, why clean energy management should be a matter of concern to all ports.

This led over to the detailed presentation of Jonathan Roberts of AREVA, who prepared the study together with Olivier Harnois and Sylvain Mouillac of CORYS TESS. A first introducing the methodology and specifying the tools needed for the investigation, he showed by means of a simulation, how these tools can be used in practice. Jonathan concluded the presentation by specifying future research work.

Water Quality in Ports

The following day was devoted to water and air quality in ports. Here, too, EFFORTS has done some landmark research.

Dr. Daniel Masson of IFREMER started off the morning with an introduction to the existing and upcoming regulations on ballast water management, in particular the new Ballast Water Convention. A first introducing the methodology and specifying the tools needed for the investigation, he showed by means of a simulation, how these tools can be used in practice. Jonathan concluded the presentation by specifying future research work.

Air Quality in Ports

The afternoon of the 22nd was devoted to Air Quality in ports. Jean-Paul Raffini of GPMH started of with a brief introduction of work the Port of Le Havre is doing to reduce air pollution in the port through the implementation of an Air Protection Plan.

He talked about ships’ emissions, which account for 9% of emissions in the port, and of emissions attributed to port handling, which account for 80% of the port’s emissions.

Jérôme Taranto of Biowind introduced an innovative system for the treatment of pollutants generated by port operations. The new system is based on photo catalysis and employs an advance oxidation process that allows a near complete removal of cancer-causing volatile organic compounds. A first laboratory tests, a prototype “air cleaner” was developed and tested in the field on diesel engine exhaust fumes and on fuel vapours during fuel loading. The tests showed that photo catalysis treatment of fumes and vapours is more effective and less costly than treatment with activated carbon.

www.efforts-project.org
Emission assessment using auto-ID

Transponder technology is being used to assess emissions by seagoing vessels in the Rotterdam area. Rinkje Molenaar¹, Kees van der Tak² and Jan Hulskotte³ explain how the technology works.

Rotterdam and its industrial port area, also called ‘Rijnmond’, is home to 1.2 million inhabitants, living very near to harbours, large waterways and industries (see figure 1). On the coast, several environmental protection areas exist (so called Natura 2000 areas).

The Netherlands has to invest much effort to meet the European standards for air quality and the Natura 2000 obligations for nitrogen deposition. The contribution of shipping emissions to the air pollution and the deposition in this region is substantial⁴. However, in comparison with other local sources such as road traffic and industry, the data about shipping emissions has not been comprehensive.

This article describes a successful method to calculate the emissions from seagoing vessels more accurately and with a high spatial resolution. This is required for detailed air quality assessment by modelling. The AIS (Automatic Identification System)-transponder signals, transmitted by each ship with a size of 300 gross tonnage or more, to report its position, speed and identity, are the key of this approach.

MARIN (Marine Research Institute Netherlands) and TNO (Netherlands Organisation for Applied Scientific Research) have tested a new method to estimate shipping emissions in the Rijnmond region.

Analysis of transponder data

Ships transmit the transponder signals with a high frequency (more than once per minute). For this study the signals were analysed with an interval of two minutes. Based on the received information the accompanying emission was calculated.

First, the MMSI (Maritime Mobile Service Identity)-number and the speed were linked to the grid cell where the ship was located at the moment it sent the signal. Using the MMSI-number the ship could be traced in the LMIU-database that contains information about the ship type and relevant characteristics of the engine needed to make proper calculations. In the next step the emission in these two minutes was calculated for the specific ship (for details see next paragraph) and added to the grid cell.

Almost 85 percent of the sources of AIS signals could be identified in this way. The missing ones were mainly inland vessels, pilot boats, etc. which were outside the scope of this study. Depending on its speed a ship can pass more than one grid cell in two minutes. This leads to an overestimation in one cell and an underestimation in another. Because of the large amount of observations (45.5 million AIS-signals in the year studied) this will level out.

Calculation of the emissions

Sailing ships

For all ships with a speed above 1 knot, the method was used to calculate the emissions of hydrocarbons, sulphur dioxide (SO₂), nitrogen oxides (NOₓ), carbon monoxide (CO), carbon dioxide (CO₂) and particulate matter (PM₁₀). The basis for the emission calculation is the so-called emission factor of the engine, expressed in g/kWh. This emission factor depends on the type and age of the engine in combination with the fuel type.

Previous studies by TNO⁵ determined...
the emission factor for the various combinations, assuming sailing at cruising speed. Speed, however, has a large influence on the energy-use, according to the formula:

\[ \text{Energy-use}_{\text{actual}} (\text{kWh}) = \text{Energy-use}_{\text{cruising speed}} (\text{kWh}) \times \left( \frac{\text{speed}_{\text{actual}}}{\text{speed}_{\text{cruising speed}}} \right)^3 \]

This formula suggests that energy consumption is a function of the third power of speed.

In this study the actual speed is known from the AIS-signal, so the energy-use can be calculated much more accurately. The engine characteristics are known from the LMIU-database and the used fuel type was deduced from the combination power and engine speed. With these elements the emission over the last two minutes was calculated for each AIS-signal and allocated to the right grid cell. The main uncertainty in this study is related to the use of the auxiliary engines, for which reliable information is lacking in the LMIU-database.

**Ships at berth**

Ships sailing less than 1 knot are supposed to be at berth. They send many transponder signals originating from the same location. Thanks to this new method the length of time at berth of the ships could be determined accurately. Surprisingly it appeared that this period was longer for almost all types of ships than previously assumed. The emissions for ships at berth were calculated based on ‘gross tonnage x time at berth’ and related to the ship type, as in the previous studies of TNO. Due to a lack of a good registration of the auxiliary engines and uncertainty about the fuel type used, the calculations of the ships at berth still show uncertainties. Supplementary research on this subject can be useful.

**Results**

Table 1 shows the calculated emissions for the Rijnmond region of the various pollutants for the year 2007. The total emissions for the year 2007 based on the AIS-data appeared to be similar to the assessment for the year 2006 using the existing method, the so-called EMS (Emission registration and Monitoring of Ship ping)-protocol, implying that the total emissions calculated until now were a fair estimate. However we observed a shift from sailing emissions to emissions at berth and a different spatial distribution.

The main advantage of the new method is the accurate and very detailed allocation of the emissions as is shown in Figure 2 for the NO\textsubscript{X} emission.

The spatially detailed emissions are the basis for modelling the air pollutant concentrations attributable to seagoing ships. Comparing the concentrations based on the old and the new spatial emission pattern reveals that the previous spatial distribution is no longer accurate. In the course of time port activities in Rotterdam have moved further west and the importance of the harbours near the city centre is diminishing. This phenomenon was apparently not sufficiently accounted for in the existing emission inventory. The relocation of the emissions has important consequences for the assessment of the air pollution concentrations in the city centre: they were previously overestimated. Towards the coast (and the Natura 2000 areas) the emissions were previously underestimated.

Table 1 shows the calculated emissions (ton/year) for sea going vessels in the Rijnmond region based on AIS-transponder data (2007).

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<th>Component</th>
<th>Sailing</th>
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<td>Hydrocarbons</td>
<td>142</td>
<td>209</td>
<td>351</td>
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<tr>
<td>Sulfur dioxide (SO\textsubscript{2})</td>
<td>1,101</td>
<td>2,339</td>
<td>3,440</td>
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<tr>
<td>Nitrogen oxides (NO\textsubscript{X})</td>
<td>3,296</td>
<td>4,351</td>
<td>7,647</td>
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<tr>
<td>Carbon monoxide (CO)</td>
<td>953</td>
<td>925</td>
<td>1,878</td>
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<tr>
<td>Carbon dioxide (CO\textsubscript{2})</td>
<td>141,378</td>
<td>490,837</td>
<td>632,215</td>
</tr>
<tr>
<td>Particulate Matter (PM\textsubscript{10})</td>
<td>173</td>
<td>266</td>
<td>438</td>
</tr>
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</table>

Here you can see the results of model calculations of nitrogen dioxide attributable to seagoing ships for the year 2010 (by DCMR and Royal Haskoning). Figure 3 shows the difference between the contribution of seagoing vessels calculated by the new AIS-method and with the existing method for the year 2010.

The concentration difference in the urban area is up to 10 percent of the national (and EU) limit value for nitrogen dioxide (40 \mu g/m\textsuperscript{3}). This is substantial in view of the difficulties faced in achieving the limit values. All over Europe cities are performing modelling exercises to assess their air quality and to analyse their options to abate pollution. High quality input data is essential in these studies. Updating the shipping emission inventory by mapping and re-assessing the emissions improves the air quality assessment in Rotterdam.

**Conclusion**

The use of AIS-transponder data in a pilot study improved the understanding of the impact of sea going vessels on the air quality in Rijnmond substantially. The method will be extended to the other Dutch port areas as well as the Dutch part of the North Sea and become the new standard approach.

A similar approach for inland waterway shipping would be very useful as well. These emissions are also characterised by considerable uncertainty about the location and the amount of emissions. However at this moment only a small part of the inland waterway vessels are equipped with a transponder. Legislation obliging the use of a transponder for these category of ships is also expected within a few years.

The pilot study was paid for by the Ministry of Transport Public Works and Water Management, the Netherlands Environmental Assessment Agency and DCMR Environmental Protection Agency Rijnmond.

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**Figure 2:** NO\textsubscript{X} emissions of sea going vessels in Rijnmond (100x100 m)

**Figure 3:** Difference in NO\textsubscript{X}-contribution by sea going vessels calculated by the AIS-method and by the standard method for the year 2010 (1x1km)
Small scale hydropower: an alternative power option for ports?

Renewable energy technology, such as hydropower, can provide non-polluting alternatives to reduce emissions caused by fossil or nuclear fuels. Due to their location, ports could use tidal and wave power for meeting some energy requirements. Royal Haskoning has vast experience in the design and development of ports and also plays a key role as an advisory body to port authorities all over the world. The company has recently gained experience with tidal and wave power options. As water levels in ports are dominated by tides and waves, Royal Haskoning sees opportunities to gain energy from these renewable energy sources and thus helps to comply with the stringent objectives set by the Kyoto-pact and Environmental Protection Agency which ports are committed to meet.

A lot of different aspects are involved in a hydropower project, such as mechanical engineering, electrical engineering, hydraulic engineering, logistics, legislation, economy and environment. The expertise and experience of professionals in a variety of disciplines allows them to fully consider all these aspects and thus regards multidisciplinary projects as their core business in order to develop sustainable and practical solutions. Considering this, Royal Haskoning sees three possible opportunities to exploit hydropower in ports.

Tidal current and wave applications

One approach focuses on tidal current conversion applications that could be introduced in ports. This can be manifested either as tidal range systems hereby aiming on higher power output ranges, or as tidal flow systems, also referred to as hydrokinetic applications which are fitted for smaller power output ranges. As another approach, wave energy conversion techniques could also be taken into consideration.

The latter two, hydrokinetic and wave energy conversion devices, offer ways to tap the energy of moving water without impoundment (dams) or diversion required by many conventional hydroelectric facilities. Hydrokinetic energy conversion devices are designed to be deployed in a stream or current capturing kinetic energy from the flow of water. Conceptually, the operating principle is similar to the way wind energy conversion devices work. The rotor, driven by the water flow passing through, powers a generator without impounding or diverting the flow of the water resource. An example of Swanturbines moored on a river bed is illustrated in photo 1.

To give a first idea of the potential electrical power that can be extracted from a tidal flow the following equation can be used:

$$P = \frac{1}{4} \cdot \pi \cdot d^2 \cdot v^3$$

In this equation, \(P\) is the power output [kW], \(d\) is the diameter of the rotor [m] and \(v\) is the free flow velocity of the water [m/s].

The system can be easily integrated, for example by constructing a basic foundation to anchor the machine at the bottom of a river or channel, with a minor impact on fish migration. Moreover, the energy is produced on a predictable basis which is a key advantage compared to other renewable energy sources e.g. wind energy.

However, in all cases, shipping is taken as a priority. Thus conflicting situations could arise, as most commonly, the most promising locations in a river or channel in
a port area are claimed as the navigational route. Studies are currently running where docks or channels are linked by small channels in a way that the energy of the water flow displacement could be captured by turbines.

Wave energy represents a form of renewable energy created by wind currents passing over open water. Wave energy conversion devices create a system of reacting forces in which two or more bodies move relative to each other, while at least one body interacts with the waves. The body moved by the waves is called the displacer, while the body that reacts to the displacer is called the reactor. There are many ways in which such systems can be configured. The common measure of wave power, $P$, is:

$$P = \frac{g^2 \cdot T \cdot H^2}{32 \cdot \pi}$$

This equation is expressed in kilowatt per meter ($kW/m$) of crest length, i.e., distance along an individual crest. $g$ represents the acceleration due to gravity ($m/s^2$), $T$ the period of wave(s) [s] and $H$ the wave height [m]. It should be noted that this is the energy offered by a wave. Turbine losses as well as generator losses still have to be taken into account.

Wave energy devices have the key advantage that they can easily be implemented without a major impact on shipping or the environment. On the other hand, the energy which can be harnessed will be lower compared to hydrokinetic or tidal range systems.

Looking at port areas, implementations on piers or wave breakers could be desired as systems which lower the energy content of waves and hereby generate electricity. In ports, waves could also be created by vessels navigating by. As such waves sometimes have to be dimmed, this softening process could be exploited as an energy creating application. However, these waves are steeper and have a shorter period $T$, which make them difficult to harness with conventional wave energy conversion devices. Studies within Royal Haskoning are currently running to find solutions in the near future.

Finally, tidal range energy shows a remarkable potential. However, the output of this form of energy generation is predominated by large water surfaces and therefore it is not always applicable in existing ports. However, gaining tidal energy from the tidal range has been done with tidal mills since the 8th century AD. Currently only one large scale tidal power plant exists in the world, in La Rance, France. Here a barrage was placed in an estuary with high tidal range, thus creating a basin on the upstream side. The potential of this tidal range energy can be calculated as follows for one tidal cycle:

$$E = \frac{1}{2} \cdot \gamma \cdot A \cdot R^2$$

In this equation $E$ is the energy [$J$], $\gamma$ the volumetric weight [$kN/m^3$], $A$ the surface area of the basin [$m^2$] and $R$ the tidal difference [$m$].

Although this method is often mentioned when damming off large estuaries, it can also be implemented in a port on a small scale. There the first challenge is to find a basin in an often busy port area. With docks behind locks and lakes in the vicinity of a port area can be used as such basins. The next challenge is to find a location for the turbine where the jet flow from the turbine has a minimal effect on shipping. An illustration of tidal range power plant can be seen in figure 3.

The market potential for tidal range, hydrokinetic and wave energy is vast, ranging from small-scale distributed generation applications to large-scale power plants hereby also looking at near-shore applications. A s every port is different, an inventory has to be made of the properties and restrictions of the port important for tidal and/or wave power. In discussion with port authorities locations can be found where water power is interesting and could be exploited. The main obstacles to development result from these being relatively new technologies, unfamiliar to licensing and resource agencies, and unfortunately as yet largely unproven from the point of view of investors.

![Figure 3: Illustration of a tidal range power plant.](http://www.tocardo.com)
African Ports & Maritime Conference
10 - 11 December 2009, ICC Durban, South Africa

“Linking Ports To Rails To Enhance Regional Integration”

For more information please visit: www.pmaesa.org/apmc09
AirClim: “Europe needs Emissions Control Areas”

Europe should follow the example of the US and Canada by establishing ECAs, says Christer Ågren of the Air Pollution & Climate (AirClim) Secretariat

Over the last 20 years, fuel and emission standards for land-based transport have been dramatically strengthened over most of the world. But international shipping has, for a long time, resisted similar legislation, with regard to both emissions of air pollutants and greenhouse gases.

Eventually, in October 2008, after some 20 years of talks but very little action, strict new limits for reducing sulphur emissions from ships were finally agreed by the International Maritime Organisation (IMO). But these important new standards are still many years away from practical implementation; the 0.5 percent global sulphur limit will apply as from 2020 (or possibly 2025), and the 0.1 percent sulphur limit for ships in designated Emission Control Areas (ECAs) will apply as from 2015.

Inadequate new measures to reduce emissions

The measures agreed so far in IMO for reducing emissions of nitrogen oxides (NOx) are totally inadequate; the Tier 2 standards that will apply to new ship engines as from 2011 will only reduce NOx emissions by about 16 to 22 percent, compared to the current Tier 1 standards.

The slow turnover of the shipping fleet combined with the high growth in shipping activities means that the Tier 2 standards are not likely to result in any real reductions in total ship emissions even within the next 15 to 20 years. Every effort must therefore be made to markedly strengthen the weak global NOx emission standards, both for existing and new ships.

Last year’s IMO agreement also included a Tier 3 NOx emission standard, which will be introduced in 2016 and requires an 80 percent NOx reduction from the present Tier 1 level. But the Tier 3 standards apply solely in specific designated NOx Emission Control Areas, and are limited to new ships only.

Europe should follow US and Canada

In late March, the United States and Canada jointly submitted a proposal to the IMO to designate most of their coastal waters, an area extending 370 kilometres from the coastline, as an Emissions Control Area (ECA) for the control of sulphur oxides, nitrogen oxides, and particulate matter emissions.

All ships operating in the ECA will face stricter emission standards designed to reduce the threat they pose to human health and the environment. The ECA standards will cut sulphur in fuel by 98 percent, particulate matter (PM) emissions by 85 percent, and NOx emissions by 80 percent compared to the current global requirements.

Clearly, the EU and its member states should follow the example of the United States and Canada and designate all sea areas around Europe (the Baltic Sea, the North Sea, the North-East Atlantic, the Mediterranean and the Black Sea) as “full” Emission Control Areas, i.e. covering all the major air pollutants (sulphur, PM and NOx). Currently only the Baltic Sea and the North Sea have ECA status, and this is limited to sulphur control.

Financial benefits

To ensure an organized gradual phase-in of low-sulphur fuel, to encourage the use of the best techniques, and to speed up the introduction of cleaner fuels and ships, IMO regulations need to be complemented by economic instruments, such as emission charges.

These should be set so as to make it financially worthwhile, at least for ships that regularly frequent the areas where they apply, to use cleaner fuels or to invest in techniques needed to ensure a distinct reduction in emissions.

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Companies such as CMA CGM have shown a real commitment to the environment. The CMA CGM Andromeda (11,400 TEU) was the world’s first containership to be equipped with the Fast Oil Recover System. (Photo: © Copyright T. Dosogne)
Controlling ship-generated waste

Eliminating maritime litter emissions is a high priority for the shipping business. The North Sea Foundation* explains the way forward.

As the current world shipping fleet grows with the world’s economy, the emissions of the shipping industry will also increase. More - and bigger - ships produce more emissions, influencing marine life and society. Different research programmes have shown an increasing impact of the shipping industry on marine litter problems like cargo residues, oily residues and other waste such as rubbish.

Shipping is one of the cleanest ways of transporting cargo around the world. Nevertheless, due to the increasing negative contribution of shipping to marine litter in coastal areas, the public, political and pressure groups will aim their arrows more and more on shipping. Public opinion is changing. It is important for the shipping industry to handle these issues proactively. Improvements in environmental performance are possible at relatively low costs to great effect. Clean shipping is also a big business opportunity.

Impact of ship emissions

Between 1970 and 2004 world seaborne trade increased from 10.65 to 27.6 trillion tonne-kilometres. During the same period the absolute mass of cargo transported rose 170 percent from 2.5 billion tonnes to 6.7 billion tonnes (EC, 2007). The current worldwide fleet is set to increase to 66,263 ships larger than 400 GT in 2020 (IMO, 2008).

The shipping industry is a major source of marine litter. Different measures to reduce marine litter generated by ships are in place, e.g. MARPOL Annex V, and the European Union Directive 2000/59 on Port Reception Facilities. Worldwide marine litter is recognized as a serious threat to the marine ecosystem. Nevertheless different indicators show little or no progress in solving the problems associated with marine litter (O SPA R, 2007).

Ship waste emissions

Oil: loss of cargo and oily residues

During the 1990s the European seas suffered from several disasters with tankers: Braer (Shetland, 1992, 85,000 tonnes of oil); Sea Empress (Bristol Bay, 1996, 72,000 t.); the Erika (Brittany, 1999, 20,000 t.); V olgolet

248 (1999, Sea of M armara, 5000 t.) and Prestige (Galicia, 2001, 63,000 t.).

These accidents only form the tip of the shipping pollution iceberg. Most of the harmful emissions originate from the daily release of various substances. Intentional and unintentional discharges of oil, chemical cargo residues, rubbish, cleaning agents, anti-fouling paint, exhaust and other air emissions, and non-indigenous species from ballast water, have an ongoing adverse impact on life in the world’s seas and oceans.

Aaccording to REM PEC each year, “70 to 80,000 tons of hydrocarbons are rejected into the Mediterranean because of maritime transport activities. Contrary to a generally accepted idea, these rejections are not the result of oil tanker operations only, but all ships and vessels contribute to it because of their daily operations, of their mode of propulsion and of the fuel employed, which produce residues.”

Marine Litter

Litter can smother the seabed and is a source of toxic substances. Entanglement and ingestion cause direct harm to wildlife. Marine litter can adversely affect people, property and livelihoods, and poses a significant safety risk for people at sea. It is also a long-lived problem as marine litter consists of the most part of items that degrade only very slowly, in some cases taking hundreds of years.

Plastic materials, which are durable and slow to degrade, have become the most abundant material of marine litter. In addition, many plastic items are highly buoyant, allowing them to be carried with currents a long way. More than one million birds and 100 000 marine mammals and sea turtles die each year throughout the world after either becoming entangled in or eating plastic materials dumped in the sea (UNEP, 2006).

Marine litter is one of the most pervasive pollution problems affecting the marine environment. It affects the economies and inhabitants of coastal communities worldwide, but more importantly it endangers sensitive marine ecosystems and wildlife both in the open sea areas and coastal areas. Marine litter can travel long distances with sea currents to end up in accumulation sites (UNEP, 2005).

International policies


European Union The European Union Directive 2000/59 on Port Reception Facilities, effective from 2003, also aims to reduce the amount of...
waste discharged into the sea. Port reception facilities are available in all European ports. Approximately 34% of all ships visiting the port of Rotterdam deliver MARPOL 73/78, Annex V waste to the ports reception facilities; about 6% of ships deliver Annex I waste.

The Clean Shipping approach

Shipping is a crucial, but highly invisible activity in delivering all sorts of products to consumers. Most people are unaware that almost every product has been transported by sea at some stage. Ships will remain a key transport mode for moving objects and people. However, the significant negative side effects of shipping which must be considered brings in the need for a revolution in ship design, operation on board, management in ports and ship dismantling.

Under the Clean Shipping approach, the North Sea Foundation wants to start a dialogue with all the stakeholders involved in the shipping business: ship owners, crew, agents, ports, cargo owners, research institutes and governments. Together with the front-runners in the shipping world the aim is to accelerate the sustainable development in the shipping business. Waste emissions from ships Port Reception Facilities (PRF); Efficient and easily accessible PRF’s play an essential role in waste management of shipping. The only right place for a ship to dispose waste is the Port Reception Facility; therefore an efficient PRF is essential for a clean port. Ports should have a clear policy on garbage and sludge disposal. Port communication about environmental services to entering ships is of major importance. The only logical place for a ship to dispose waste is inside the port. Ships should not leave ports with big amounts of waste on board.

Human awareness

Crucial to clean shipping is the commitment of officers and crew on board; they must act with respect for the environment. Waste should be avoided and never thrown overboard. Investing in the human factor is an essential element in achieving sustainable shipping. A first step is to train officers and crew members about the marine environment. Educating other stakeholders in the maritime transport industry is an additional step.

Corporate Social Responsibility (CSR)

Cargo owners can play an important role in stimulating innovations in the shipping industry, by requiring the best practices and the best available techniques from their providers of logistics services. A major advantage of a good environmental attitude towards ocean transport is that it tightens customer relationships and can result in long-term contracts. The push for standards on vessels will reduce the cost of developing new techniques. Innovations will become cheaper by creating higher demand. Banks will choose to invest in Clean Ships because of their CSR policy.

Crucial role of ports

Ports play a crucial role in catalysing measures in the shipping industry to improve waste management. Improving operational processes onboard ship is very important in reducing waste and it is important to realise that ports are the only correct place for the whole shipping industry to dispose of waste in an environmentally sound way.

Ports should seek ways to attract more clean ships. One way is to offer discount on harbour dues; this can be a very powerful incentive for ships to improve their environmental performance, more so than IMO and EU legislation standards. The Green Award is a good example; ships that perform better on their environmental performance get a discount on harbour dues.

A nother important player in the logistics chain is the cargo owners. Big cargo owners nowadays choose their ship and ports mainly on price and availability. Environmental performance of the shipping line is not yet that important. However, things are changing rapidly. In Sweden a new project started which evaluates ships on their environmental performance. Several big Swedish companies are taking serious steps to implement this system in their logistic management systems. In Holland, the North Sea Foundation is developing a similar system for ships and ports. The main criteria of the port and ship benchmark will be air quality and litter management.

Conclusions

Shipping is blessed with a green image, however, due to the increasing negative contribution of shipping to air quality and marine litter in coastal areas, public and political opinion is changing. It is important that the whole shipping industry responds in a pro-active manner.

Ports play a crucial role in catalysing measures in the shipping industry to improve the sustainability score of the whole shipping industry. By implementing incentives in the port management for ships with a good environmental performance, ports can influence the international operating shipping business. High environmental service in ports is also an incentive for ships to increase their environmental performance.

A level playing field is important for all Ports, therefore cooperation is important. However, this should not be used as an excuse to do nothing. Ports are no longer just landlords they are directly responsible for the condition of our oceans.
Reducing shipping’s CO₂ emissions

Although the level of emissions of CO₂ by the shipping industry is largely determined by world trade, multilateral collaborative action is needed to ensure significant reductions. Simon Bennett, Secretary of the International Chamber of Shipping*, explains how this might be achieved.

Although the level of emissions of CO₂ by the shipping industry is largely determined by world trade, multilateral collaborative action is needed to ensure significant reductions. Simon Bennett, Secretary of the International Chamber of Shipping*, explains how this might be achieved:

The international shipping industry is firmly committed to playing its part in reducing emissions of carbon dioxide and Green House Gases. International shipping is already, by far, the most carbon efficient mode of commercial transport.

However, it is fully recognised that CO₂ emissions from the industry as a whole (some 3% of global emissions) are comparable to those of a major national economy. The shipping industry therefore accepts that the CO₂ emission reduction which ships must aim to achieve should be at least as ambitious as the CO₂ emission reduction agreed under any new United Nations Climate Change Convention.

However, shipping is the servant of world trade. The total emissions of shipping, as a sector, will therefore be determined, to a significant extent, by the expected long term growth of the world economy (and population) between now and 2050.

IMO must lead CO₂ reduction measures

As already acknowledged by the Kyoto Protocol, emissions from international shipping cannot be attributed to any particular national economy. Multilateral collaborative action will be the most appropriate means to address emissions from the maritime transport sector.

Multilateral collaborative action will be best achieved by governments at the specialist United Nations agency - the IMO - that has a successful track record for the development of global regulations governing the shipping industry’s environmental performance. For example, the International Convention on the Prevention of Pollution by Ships (MARPOL) has been ratified and enforced globally through a combination of flag state and port state control by IMO Member States.

The delivery of significant emission reductions by the maritime sector will require that any mandatory measures adopted are applied on a uniform and global basis to avoid ‘carbon leakage’. Most shipping companies have the freedom to decide to register their ships with the ‘flag state’ of their choice including those which, under the current Kyoto Protocol, are not Annex I nations. Measures to deliver meaningful emission reductions are thus much more likely to be achieved by instruments developed by governments at IMO.

IMO package for reducing shipping’s CO₂

The IMO Marine Environment Protection Committee has already developed a package of measures for reducing shipping’s CO₂ emissions, with an agreed timetable for adoption. Inter alia, these include:

• A system of energy efficiency design indexing for new ships (similar in concept to the ratings applied to cars and electrical appliances)
• A template for a Ship Energy Efficiency Management Plan (SEEMP) for use by all ships. The SEEMP allows companies and ships to monitor and improve performance with regard to various factors that may contribute to CO₂ emissions. These include, inter alia: improved voyage planning; speed management; weather routing; optimising engine power, use of rudders and propellers; hull maintenance and use of different fuel types.
• The ingredients for possible economic measures that could be applied globally to shipping in order to encourage emission reduction.

Governments at IMO have also agreed key principles for the development of regulations on CO₂ from ships so that they will:

1. Effectively reduce CO₂ emissions
2. Be binding and include all flag states
3. Be cost effective
4. Not distort competition
5. Be based on sustainable development without restricting trade and growth
6. Be goal-based and not prescribe particular methods
7. Stimulate technical research and development in the entire maritime sector
8. Take into account new technology
9. Be practical, transparent, free of fraud and easy to administer

The international shipping industry fully subscribes to these principles.

Regulation should be applied uniformly

The Kyoto Protocol concept of ‘common but differentiated responsibility’ (CBDR) cannot be practically applied to shipping without the danger of significant ‘carbon leakage’. The ‘flag state’ with which a ship is registered, or indeed the ‘nationality’ of the entity operating the ship, can change frequently, especially when ships are bought and sold.

The direct application of the CBDR concept would also cause gross distortion of shipping markets, reducing the efficiency of maritime transport and thus the smooth flow of world trade. However, the IMO principle of ‘no more favourable treatment’ ensures that standards adopted for shipping are applied equally throughout the world, delivering maximum environmental improvement. The international shipping industry therefore believes that the achievement of meaningful reductions
in CO₂ emissions will be best achieved if nations agree that the development of detailed measures, for the international merchant fleet, should be directed by governments at IMO - but respecting the outcomes agreed for the sector under any new UN Climate Change Convention. Failure to deliver a global and uniform CO₂ reduction regime for international shipping will greatly reduce the ability of the shipping sector as a whole to reduce its emissions.

International shipping does not lend itself to inclusion as part of national emission targets. A ship may be registered in one country while the beneficial owner of the ship may be located in another. The cargo carried by the ship will be of economic benefit to a variety of different importing and exporting nations.

Most ships do not follow fixed routes and they will collect and deliver varying amounts of cargo in a large number of different nations throughout the course of a voyage. Moreover, the nationality of the entities exporting and importing the cargo carried will vary considerably from voyage to voyage.

**IMO’s track record on environmental regulation**

The impressive track record of IMO is demonstrated by the success of the MARPOL Convention in contributing to the substantial reduction of oil pollution since it entered into force.

The level of ratification and enforcement of IMO Conventions is very high in comparison to international regulations governing many land based industries. The MARPOL Convention has been ratified and implemented by virtually every maritime country and is applied, through a combination of flag state and port state control, to virtually the entire world merchant fleet. Most significantly, the ability of governments at IMO to respond to political pressure and to deliver global environmental regulations involving complex issues has also been demonstrated by the recent agreement, finalised in October 2008, to reduce pollutant atmospheric emissions (such as sulphur) from ships dramatically. A atmospheric pollution from ships, like CO₂, is a complicated subject, but on which an impressive global consensus has already been achieved at IMO.

**How is shipping reducing its emissions?**

The consensus of opinion within the global industry is that it may be possible for shipping to reduce CO₂ emitted per tonne of cargo transported one kilometre (tonne/km) by perhaps 15%-20% between 2007 and 2020, through a combination of technological and operational developments, as well as the introduction of new and bigger ships, designed to the new IMO Energy Efficiency Design Index. This is a significant challenge given that there have already been substantial improvements in the efficiency of ships’ engines.

In the longer term, depending on technological developments which at the moment cannot be fully anticipated, the industry believes it should be possible to deliver even more dramatic emission reductions (although for the foreseeable future shipping will remain dependent on fossil fuels).

Although the shipping industry is already very energy efficient, additional improvements to hull, engine and propeller design are expected to produce further reductions in fuel consumption. There may also be possibilities for the better utilisation of waste heat.

The increasing size of many ships is also expected to improve fuel efficiency. In addition, operational measures (e.g. better speed management throughout the course of a voyage) are also expected to reduce fuel consumption and are addressed in detail by the new Ship Energy Efficiency Management Plan that has been developed at IMO, with assistance from the industry.

Shipping companies have a very strong incentive to reduce their fuel consumption and thus reduce their CO₂ emissions: bunker costs represent an increasingly significant proportion of ships’ operational expenses, having increased by about 300% in the last 5 years.

There is every expectation that marine bunker prices will remain high. Furthermore, the cost of ships’ fuel is expected to increase by a further 50% as result of the increased use of (low sulphur) distillate fuel that will follow the implementation of the new IMO rules (MARPOL Annex VI) that will apply globally in Emission Control Areas by 2015.

**Alternative fuel sources**

The various parts of the shipping industry - shipowners, shipbuilders and classification societies - are actively examining a number of ways to reduce CO₂ emissions, both for new and existing ships, which are primarily linked to reducing fuel consumption. In the longer term, however, the shipping industry is also exploring a number of alternative fuel sources to help reduce CO₂ emissions.

Renewable energy sources, such as wind and solar power, may have their place in helping to meet some ancillary requirements, such as lighting on board ships. However, they are not practical for providing sufficient power to operate ships’ main engines. The current assumption, therefore, remains that ships will continue to burn fossil fuels for the foreseeable future, and that the most significant means of reducing CO₂ emissions will be achieved by further improvements in efficiency across the entire transport chain.

The challenge of reducing carbon emissions remains a critical issue for shipping, a global industry requiring global regulation applicable to all internationally trading ships, regardless of flag. Reducing these emissions is the responsibility of all parties in the supply chain, and the shipping industry certainly stands ready to play its part.
The future of transport: from policy to practice - a shippers’ perspective

The challenge for the EU is to balance the critical role of transport in the European economy with the need to get to grips with climate change, says Nicolette van der Jagt, Secretary General of the European Shippers’ Council.

Nine years ago, the European Commission published a White Paper on a European Transport Policy. The proposed strategy has largely failed and the Commission is now looking for new directions which it will present in 2010. So far, many agree with the broad principles contained in the communication although today most attention seems to go to the impact of the current economic and financial crisis and the global climate change. The figures are clear: transport represents 7% of Europe’s GDP and 24% of its Green House Gas Emissions. The challenge for the EU is that whereas transport is critical to European economy it needs to get to grips with climate change.

In 2001 when the White Paper was published climate change was barely thought of. Now the EU is faced with its commitments on reductions on CO2 emissions. Climate change objectives, the Commission believes, should also be placed at the centre of future TEN-T policy, the policy to develop the strategic pan-EU transport infrastructure. This clearly illustrates the political significance of this subject within Europe, subsuming, it would seem, other objectives such as competition and those of the Lisbon Agenda.

Transport policy for the next decade will clearly be influenced by the environment and, more specifically, climate change agenda. Sustainable transport will therefore require the reduction of Green House Gas (GHG) emissions from transport. As the communication suggests, “GHG emissions can be seen as the product of three components: the amount of the activity that generates the emissions; the energy intensity of that activity; and the GHG intensity of the energy that is being used.”

The Communication recognises that transport cannot be seen in isolation from wider economic growth and developments, along with other sectors and producers of GHGs: “The strong increase in global trade and the deepening integration of the enlarged EU prevented the decoupling of freight transport from GDP in the last decade. The growth of freight transport is also linked to economic practices – concentration of production in fewer sites to reap economies of scale, de-localisation, just-in-time deliveries, wide-spread recycling of glass, paper, metals – that allowed reduction of costs and, possibly, of emissions in other sectors at the expense of higher emissions from transport.”

What might appear more efficient to one business, may be less efficient to another.

This is an important acknowledgement to make; it is why ESC refutes suggestions that policies should force industry to use rail or maritime alternatives to road freight transport, for example. The Communication admits “There has [also] been limited progress in shifting transport to more efficient modes”. To assume that one mode of transport is more efficient (environmentally) than another is dangerous. There are many instances where shifting to rail or maritime (short-sea, coastal or inland waterways) for example, may not suit the cargo or the supply chain and incur greater costs, and greater GHG emissions. The nature of the supply chain and cargo, along with the many other factors referred to previously, need to be taken into consideration: what might appear more efficient to one business, may be less efficient to another.

Nevertheless, ESC welcomes targets set which aim to accelerate the uptake of renewable energy sources and the development of cleaner fuels. In particular, ESC would support this in relation to the policy of identifying ‘green corridors’ where the infrastructure that may be required to support the use of such fuels can become embedded. This might facilitate wider and more rapid uptake of these alternatives.
ESC is very concerned about newly introduced requirements on the use of low sulphur fuel for the maritime sector in some parts of the EU

Introduction of new or cleaner fuels should not, however, be forced ahead of industry’s capacity to supply it and for users to invest in technology or assets which may be required to use it. ESC is, for example, very concerned about newly introduced requirements on the use of low sulphur fuel for the maritime sector in some parts of the EU: it is understood that refining capacity will not be adequate to meet the demand from shipping by the implementation dates and will put strains on the supplies for road and rail freight sectors also. Industry expects increased costs and a shortage of available maritime services which might force them to find alternative transport options. The policy intentions were good, but the implementation appears hasty, ill-thought through and inconsistent with the principles of the European Single Market in that it is not universally applicable across the EU: the policy unfairly discriminates against member states bordering the North Sea, Baltic Sea and English Channel whilst favouring other coastal states; this could create a distortion of trade and unfair competition.

Legal, technical and operational barriers need to be removed

ESC believes that the path to increased sustainable freight transport rests largely with the ability of industry to optimise its transport and logistics requirements in line with the wider supply chain needs. In doing so, legal, technical and operational barriers need to be removed and incentives for speedier development, investment and implementation of more sustainable technology and measures may sometimes be required. This is what EC transport policy would do best to focus on.

Policies should be devised that provide incentives and assistance to industry to implement the most effective, efficient and sustainable supply chain and logistics options given their individual characters and needs.

Above all, policies in future need to be based on facts. Too much policy and decision making is based on speculation and anecdotal evidence.

Transport Policies for the next decade should aim to improve performance, and thereby derive environmental and economic benefits. Measuring performance is critical to such policy developments and prioritising where to focus policies and investment. Identifying freight volume demand is equally important: the nature of the freight, characteristics of the trade, origins and destination of the freight, value of the freight itself and to the economy.

The European Commission should look to facilitate the collection and dissemination of such data, encouraging private enterprise to capture and analyse data, but ensuring data collection does not put any undue or additional compliance burden on industry to supply it.

A realistic assessment of what freight should be paying, and when they need to pay it, will be required. This same applies to the use of new technologies. Engine technology improvements have already greatly reduced emissions per vehicle, but there has been only limited innovation with regard to the use of alternative fuels.

For the past ten years, policy makers have sought to force a shift from road to other modes in order to reduce congestion of the road network. Many protagonists opposed to road freight suggest rail as the primary alternative: but whilst progress in the rail freight sector has been made in respect of liberalization, competition and range of services, much still needs to be done: more competition, more services especially that provide for the majority of shippers with less-than-trainload volumes (not fewer, as has been the recent trend), competitive prices, and improved service levels.

Transport practice, infrastructure developments and modal choices must reflect industrial trends, social pressures and, more recently, geopolitical and environmental considerations. Globalization of trade is unlikely to reverse, but some production will, I think, shift closer to the largest markets rather than run the risks associated with extended and often complex supply lines.

Technological innovations which enable greater visibility of logistics within the supply chain will aid those companies wanting to retain or take back some control of the chain. In doing so, it is possible that efficiencies in the chain, risks and costs can be more readily identified and removed.

A’s visibility increases through improved and more readily accessible technological innovations - not least through the spread of the internet and standard messaging formats and systems; more companies may recognize that greater economies and service performance can be achieved by choosing to shift manufacturing back to Europe.

The providers of freight services will and should adapt their operations and business practices in order to continually meet the needs of customers and the efficiencies they need. Working together, providers and customers can find economically and environmentally sustainable solutions.

The freight transport customers themselves must also be wise and open to new business practices, and be prepared to change certain attitudes in order to find new efficiencies. For example, greater operational collaboration needs to be explored with different parties in their supply chains or those in other markets with comparable supply chains or logistics characteristics, in order to find opportunities to share transport and associated logistics assets like warehousing.

ESC hopes that the debates currently being held on the Future of Transport will bare fruit and deliver better EU transport policies for the next ten years.

Inland water transport - increasing modal share, Courtesy of via donau

ESC hopes that the debates currently being held on the Future of Transport will bare fruit and deliver better EU transport policies for the next ten years.
Lower sulphur levels in north Europe “are not sustainable”

The Swedish Forest Industries Federation argues that the stringent regional sulphur rules of the SECA (the Sulphur Emissions Control Area, comprising the English Channel, North Sea and the Baltic Sea) was a decision “made in the dark with no impact assessment conducted prior to the decision”. The SFIF's Karolina Boholm gives their view.

The new IMO sulphur regulation will dramatically affect costs for sea transport, leading to large cost increases and changed directions of logistics flows in Europe. It will also lead to a modal back-shift to the road, making short sea shipping unfeasible in many cases as well as drastically reducing competitiveness. Most importantly, the new regulations are not in line with the EU internal market and therefore not in line with the Rome treaty and the Lisbon agenda.

In a report by the Swedish Maritime Administration, published in May, it was concluded that for the pulp and paper industry, the regulations will lead to a cost increase of marine fuel by 50-80 percent, and a sea transport cost increase of 30-45 percent.

The report also shows a cost increase for the pulp and paper industry in the range of €2 - €9 per tonne product. This will lead to an enormous cost increase and amount to 7 percent (see Table 2) of value added for the forest industry. The Confederation of Swedish Enterprise has shown that for Swedish companies from all sectors, the annual cost is as large as €2.3 billion (Table 1) when using marine fuel of 0.1 percent instead of 0.5 percent.

At the same time the cost benefit to society has been calculated by the Swedish Maritime Administration to be €0.7 billion. The measure is therefore +230 percent more expensive than the value of it. Sustainable Development is built on three aspects: environmental, social and economic. In this case, the economic aspect is clearly not fulfilled making the SECA regulation unsustainable.

Background

The EU has, for a long time, put pressure on the UN maritime organisation, IMO, to take action concerning lowering emissions of sulphur and nitrogen oxide. The Ceilings Directive sets the emission levels of sulphur and nitrogen oxide for the member states and it is argued that shipping has to be included in order not to exceed the limits ("ceiling"). Since shipping is an activity where national borders have little importance and where around 80 percent of the world fleet is flagged with non-industrialised countries, it was argued that IMO was a better body to deal with this very international issue. EU has, in a way, threatened the IMO that if they do not act the EU will implement EU regulations.

Also a special Sulphur Emission Control Area (SECA) has previously been established including the Baltic Sea, North Sea and English Channel, where special emission restrictions apply. Present regulations in the SECA stipulate a maximum sulphur content of 1.5 percent in bunker fuel, whereas the international regulation stipulates a maximum of 4.5 percent.

As shown in the map above, Russia has not signed the Marpol convention that regulates the sulphur emissions; this could have significant impact on trade flows, if Russian ships do not comply.
The sulphur regulations

The Emission Control Area (ECA), comprising the Baltic Sea, North Sea and the English Channel, is an area covering only about 0.3 percent of world water surface. In April 2008 at the 57th meeting of IMO’s Marine Environmental Protection Committee (MEPC), new regulations of sulphur and nitrogen oxide emissions were adopted, which were later confirmed at the 58th meeting in October 2008. The member states, EC and other stakeholders, had previously agreed to the lowering of the ECA regulation from 1.5 percent sulphur content to 0.5 percent even though this is a hard and stringent regulation for the shipping industry. However, at the meeting due to an unknown reason, the level was suddenly lowered to 0.1 percent; to be implemented as soon as 2015. This was done without any prior study of feasibility.

The new sulphur rules, with levels both globally and within the SECA, are shown in Figure 2.

Dramatic cost increase and no impact assessment

The cost of bunker fuel increases dramatically when going from 0.5 percent to 0.1 percent, resulting in a fuel cost increase of 60-100 percent. Hence, the decision of 0.1 percent came truly as a shock for all stakeholders. It is most disturbing that no impact assessment was made of the level 0.1 percent before making the decision. Also, note that on the international level stricter rules will apply if an impact assessment shows it possible.

Even the environmental effect of lowering the sulphur emission in the ECA is arguable, since eutrophication in the Baltic to a large extent is dependent on the nitrogen emission in this area, not the sulphur emissions. The argument of particulates is also questionable.

The report by the Swedish Maritime Industry clearly shows that sulphur levels of 0.1 percent lead to a modal backshift, forcing freight on to roads, since lorries will become more cost-effective. Even from the north of Sweden it would be more cost effective to go by lorry to Germany or even to the south of Europe in some cases.

This obviously leads to a changed logistics flow in Europe, to other ports in order to reduce time in the SECA, for example to Le Havre or Marseille in France, the west coast of U.K and Narvik harbour in the north of Norway.

Besides changed logistics flows and the trade-off effect, is the increased greenhouse gas emissions. The Swedish Maritime Administration has showed one scenario, in which road transport will increase by 6 percent within Sweden, corresponding to more than 300 000 tonnes of CO2.

The European refining industry has also expressed concerns that tighter sulphur restrictions will double Europe’s diesel shortfall, leading to increased imports, a price spike and a knock-on effect on road transport in general, which could be more significant than a modal backshift in terms of CO2 emissions.

The way forward

Obviously, the regulations seriously impact the competitiveness of the industry and should not be implemented before all consequences are properly analysed. An impact analysis at EU level is still lacking.

The distortion of competition due to the new IMO sulphur regulation is unacceptable. A level playing field must be kept within in the European internal market. The objective is therefore that fair competition within the EU internal market must be secured. Thus, the demand of the industry is that harmonized rules regarding ship emission apply for all of Europe and be implemented into all of Europe at the same time.
Urban transport: the water-based option

The use of water for public transport by water is an ecological alternative to the road - and it is continuing to prove its efficiency. AIVP – the International Network of Port Cities - discusses the benefits

Hamburg - 7.30 am: passengers are lining up on the Landungsbrücken to await Ferry 75 which will take them to Steinwerder on the other side of the Elbe in the port territory. The German company HADAG has been running public water transport services for people living in the Hanseatic maritime city since 1888. Today it employs over 21 ferries with six regular lines and over 21 stops. The service is provided to the inhabitants 365 days a year and only very rarely suffers disruption due to bad weather.

With 6.7 million passengers per year - and good prospects for growth, with the HafenCity being developed on a 150 hectare former port wasteland at the city-port interface - public transport by water no longer needs to prove itself in Hamburg. It is used both by the local population and also by the savvy tourist who knows that, by using a simple public transport ticket, he will be able to appreciate the magical atmosphere of a trip on a boat in the busy port of Hamburg.

Real alternative

For cities and their suburbs, public transport by water can offer a real alternative to road and to more conventional means of transport. A estuary territory, a natural bay, a waterway system, but also a particular maritime coastal area can receive interregional ferry systems or link islands with the mainland but also water-buses, water-taxis, or simple shuttles for transfers from one bank to the other.

Port cities such as Venice, Istanbul or Sydney have for a very long time being promoting the use of water to carry people and freight. In these examples, geography has obviously favoured this mode of urban transport. Motivated by various factors - as much the congestion of road networks as the search for more sustainable development - other maritime or riverside cities have for a number of years been convinced of the overall added value that such services can provide.

Hence, Toulon, which is located on the Mediterranean coast of France, set up its first intra-urban lines by sea in 1981. The “Mistral Network”, the network of Buses and Boats of the Communauté d’Agglomération of Toulon Provence Méditerranée, is today the most developed bus-boat service in France. With its 5 km radius bay, Toulon offers three ferry lines linking the city centre to neighbouring localities. Studies have shown that the trip by boat is the fastest, while avoiding traffic or road congestion. Today over 1.4 million passengers utilise the sea connections for their movements, with over 5500 trips a day in the summer season. Weather constraints and possible high maintenance costs could make potential investors doubt the financial viability. In the case of Toulon, the assiduity of utilisation of these sea services shows a real interest on the part of the users. They find in them not only a faster way to get from one place to another but certainly also a contribution to their quality of living.

Different perspective of the port-city

Water transport enables the port city to be approached differently. One’s view uncovers sights that are usually hidden by too cumbersome port infrastructures or a too ambitious urban waterfront. From boat, ferry, or shuttle service such sights become accessible. One of the great successes of port cities such as Hamburg or Rotterdam is certainly their proximity with their ports where ferries, tourist boats and huge container vessels are closely mixed.

The success of this mode of transport relies much on the solutions meeting the expec-
to appear in 2010, to provide a true alternative to daily travel which has to confront more and more difficult land traffic conditions. The solar boat however remains a means of transport better suited for tourist movements because of its limited speed and reduced load capacity.

Another example, this time aimed at improving speed and transport time, is being experimented in the South of Italy.

In 2001, the Naples Region set up a rapid connection system of public transport by water called the “Sea Metro” with high-speed boats. The objective is to develop a fast network with several close distance stops able to respond firstly to the demands of tourists wishing to visit the islands and the Amalfi coast; and secondly to avoid the increasingly catastrophic traffic conditions in the outer Naples area.

The Neapolitan objectives were the following:

- to considerably reduce personal vehicle utilisation
- to reduce atmospheric pollution
- to improve attractiveness and thus tourist accessibility to certain historically renowned sites.

In eight years, the “Sea Metro” has increased from one to 11 services and from six to 23 stops. The arrival of this means of transport has also enabled a renovation process to be implemented and to improve former secondary landing stages so as to equip them with ticket sale outlets and passenger shelters.

Integrated planning

Finally, mention must be rapidly made of the examples of London, Liverpool and Stockholm, maritime cities par excellence.

The success of their waterfronts lies also in the integration of efficient and reactive waterway transport systems (the Thames in London and the Mersey River in Liverpool). More and more, developers and urban planners are associating water transport in their overall thinking, so as to present development schemes for the waterfronts and coherent and sustainable urban transport plans. Waterbuses and urban ferry services definitely have the wind in their sails!

Sources: AIVP database and the article “Development of Transbay Transport (bays, channels, rivers): state of art, success key factors, passenger shuttles (current conception and evolution)” /Olivier Crouzier, 2009 CODATU Conference.

AIVP – The worldwide network of port cities

www.aivp.org

Developers and urban planners are increasingly associating water transport in their overall thinking - the River Ferries on Liverpool’s Mersey being a good example

Toulon has thus order the construction of five new electric engine mixed propulsion ferries. A key aim is the reduction of CO₂ at all levels - and several cities such as Monaco, La Rochelle (with their “sea-buses”) have opted for electro-solar propulsion. Designed and built by the La Rochelle company “Alternatives Energies”, these 15 metre long catamarans are powered by 130kWh batteries and 16m² of photovoltaic panels.

The Monaco electric boat, originally launched in 2008 for cruise passengers so as to reduce congestion on the new mole, has been a real success with the Monégasques who, increasingly, are using it to get to their places of work. A new hybrid boat between Monaco and Menton is scheduled to appear in 2010, to provide a true alternative to daily travel which has to confront more and more difficult land traffic conditions. The solar boat however remains a means of transport better suited for tourist movements because of its limited speed and reduced load capacity.

A water taxi in Sydney, Australia

Stockholm’s water transport services are integrated into the city’s waterfront

A water taxi in Sydney, Australia
A new type of harbour vessel has been developed by Port Feeder Barge GmbH in Hamburg, aimed at reducing the environmental footprint both of the internal logistic procedures within container ports as well as of the intermodal transport chains routed via such ports. It will achieve this by:
1. shifting container haulage within the port from road to waterway,
2. easing transhipment procedures within major container ports,
3. increasing the share of inland navigation in hinterland transport.

The internationally patented Port Feeder Barge is a self-propelled container pontoon, equipped with its own heavy-duty container crane mounted on a high column on one side of the vessel. The barge is of double-ended configuration, intended to make it extremely flexible. It is equipped with two electrically driven rudder propellers at each end in order to achieve excellent manoeuvrability and the same speed in both directions.

While half of the containers are secured by cell guides, the other half is not, enabling the carriage of containers in excess of 40ft length as well as any over-dimensional boxes. The vessel will meet the highest environmental standards. A diesel-electric engine plant with exhaust scrubbers for lowest emission values has been chosen to supply the power either for propulsion or crane operation. The vessel can be operated by a crew of three.

The Port Feeder Barge will offer a daily round trip in the port of Hamburg connecting all container facilities with each other. Due to its own gear, the vessel can load and discharge independently from quayside gantries.

Trucking
Some 250,000 boxes are currently trucked within the port of Hamburg (mostly between the terminals) - producing high emissions and often causing road congestion resulting in further emissions.

Somewhat surprisingly, road hauliers are supporters of this concept: they often lose money by trucking boxes just within the port due to the congestion on the roads and at the terminal gates.

Despite the argument that barging is too slow and runs the risk of containers missing their feeder connection, it is suggested that 80 percent of trucking within the port is not time critical, and the Port Feeder Barge will be even faster for jobs consisting out of 20-30 boxes.

Feeder
Feeder operators are already a big customer of the truckers. Feeder vessels have to follow their customers - that is: they have to call at all the terminals where the deep sea vessels are berthing. On average, each feeder vessel has to berth at four different terminals per Hamburg call! This is very costly, time consuming and from a safety aspect very critical.

If the Port Feeder Barge collects and distributes containers for the feeder vessels, the feeders could concentrate on the major terminals only, thus reducing the number of vessel shiftings, reducing their time in port and related costs, improving safety and increasing terminal and berth efficiency.

From the terminal's point of view, all vessels with less than approx. 100 boxes to handle are critical with respect to profitability anyhow. However, in Hamburg two-thirds of all terminal calls by feeder vessels are below that figure!

Inland navigation
Inland navigation suffers even more than the feeders as these vessels have usually the lowest priority at the terminals. Some vessels need two days in Hamburg just to handle just a few boxes, hopping from one terminal to another. However, for environmental reasons, inland navigation has to take a bigger portion of hinterland transport. The Port Feeder Barge can act as a ‘floating terminal’ for inland waterway vessels. Once a day, the Port Feeder Barge will call at a dedicated berth to meet with the inland waterway vessels. The containers will be exchanged ship-to-ship, independently from any terminal equipment. Not even a quay is required but transhipment can take place somewhere at the dolphins.

The Port Feeder Barge will distribute
and collect the containers for inland navigation within the port in the course of its daily roundvoyage. If the terminals could delegate the inland waterway vessels to the Port Feeder Barge, the inter-modal connectivity for inland navigation would be improved substantially, thus helping to increase its share in hinterland transport. Ports can dispense with the construction of dedicated terminals for inland navigation.

Further applications

The Port Feeder Barge can also be used in ports in developing countries, to enhance their container handling ability which is often limited by shallow draft and/or insufficient quay facilities such as missing container cranes. Instead of heavy investment in the port’s infrastructure, the Port Feeder Barge can be used as a floating terminal, using its own gear for serving the deep sea container vessel at anchorage somewhere off the coast and shuttling the containers to small sites on the coast which do not even need a crane. A reachstaker and a minimum draft of 4 m would be sufficient to start container operation ashore. This would enable bypassing notoriously congested ports in developing countries.

some ports have conventional floating cranes for heavy lift operation available, they are not suitable to quickly discharge container vessels of panmax beam and more. A Port Feeder Barge could help to fill that gap in emergency response capability.

www.portfeederbarge.de

Port Feeder Barge: Main Data

<table>
<thead>
<tr>
<th>Type:</th>
<th>self propelled, self sustained, double-ended barge</th>
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<tbody>
<tr>
<td>Length o.a.:</td>
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<tr>
<td>Beam o.a.:</td>
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<td>Height to main deck:</td>
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<tr>
<td>Max. draught (as seagoing vessel):</td>
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<tr>
<td>Deadweight (as harbour vessel):</td>
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<td>Gross tonnage:</td>
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<td>Power generation:</td>
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<tr>
<td>Propulsion:</td>
<td>2 x 2 electrical rudder propeller of 4 x 280 kW</td>
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<tr>
<td>Speed:</td>
<td>7 knots at 3.1 m draught</td>
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<td>Capacity:</td>
<td>168 T EU (thereof 50% in cellguides), 14 reefer plugs</td>
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<td>Liebherr CBW 49(39)/27(29) Litronic (49 t at 27 m outreach)</td>
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<td>Spreader:</td>
<td>automatic, telescopic, 6 flippers, turning device, overheight frame</td>
</tr>
<tr>
<td>Accommodation:</td>
<td>6 persons (in single cabins)</td>
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</table>
West and Central African ports address the need for environmental management

Harry Barnes-Dabban, Corporate Estates & Environment Manager for Ghana Ports & Harbours Authority, highlights the need for WACAF to prioritise their environmental challenges or risk becoming a dumping ground.

Given the growing concern over threats to global environmental quality and increasing pressures on world resources, ports are under pressure to deal with environmental issues - both those generated from maritime shipping and those generated in port areas.

Ports have to balance their commercial orientation and goals with ecological concerns by implementing multilateral environmental agreements, particularly International Maritime Organisation’s (IMO) international conventions for the protection and prevention of marine pollution from ships.

Most of the IMO conventions were originally designed to regulate shipping activity. It has been realised, however, that ports are the only place to effectively regulate shipping related environmental impacts. The attention is therefore on ports to implement these conventions in addition to national and local environmental regulations.

Environmental policies: low priority

PMAWC West and Central African (WACAF) ports are obliged to implement and enforce IMO conventions in addition to the region’s two agreements; the Abidjan Convention and the Abuja MOU. Such policies have previously received low priority in the region. Though there is environmental awareness with an interest and concern, implementing the conventions remains a challenge. The formulation of policy to implement these conventions has traditionally been a state responsibility. Most nation-states, though members of the conference of parties (COP) for these conventions, have not harmonised them with their national laws.

The Abidjan Convention and its related protocol on pollution co-operation, is a comprehensive umbrella agreement for the protection and development of the region’s marine and coastal environment. It is also the only United Nations Environment Programme’s Seas Convention in the region. Its implementation has been slow, and although it was adopted in 1981 it has yet to be given any meaning. (Abidjan Convention & COP 5 [Nairobi Convention] meeting, Nov. 2007, Johannesburg).

Little capacity to regulate shipping related impacts

Ports in the WACAF region are confronted with all the common environmental issues, some of which are trans-boundary but do not have adequate measures to deal with them efficiently. These range from ships waste, oil spills, air quality and ballast water, to habitat loss and degradation.

In dealing with these issues, WACAF ports rely on domestic and international environmental legislations, both of which are ineffectively enforced. Although some of the ports have clear environmental policy guidelines, they lack knowledge, technology, human and financial resources to develop environmental structures.
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and measures that are sustainable and consistent with international standards and practices. Most of the region’s port states have ratified relevant international marine environmental conventions, but lack capacity for carrying out the necessary legislative review to enable them to develop compliant domestic regulations to guide environmental performance. There is therefore a feeling of inertia with little capability to regulate shipping related impacts, particularly in:

- providing adequate port reception facilities for ship generated wastes as required by MARPOL 73/78
- providing facilities and guidelines for ballast water management as required by the Ballast Water Management Convention (BWMC 2004)
- Readiness and response in cases of major oil pollution as required by the International Convention on Oil Pollution Preparedness, Response and Cooperation (OPRC 1990), and the Abidjan Convention.

While reception facilities are available, they are inadequate, with the exception two or three ports. It can therefore be safely assumed that illegal discharge of ship generated wastes is taking place somewhere in the region’s seas.

Under the International Convention for the Control and Management of Ships’ Ballast water and Sediment (BWMC 2004), ports are required to provide adequate reception facilities to receive ships ballast water and sediments in consistence with international law. This is to prevent, reduce or eliminate the transfer of harmful invasive aquatic organisms or pathogens through ballast water, one of the greatest threats to marine ecosystems. The emergence of new markets under globalisation has opened up the ports and shipping routes of the WACAF region. Several ports in the region export bulk commodities and oil and in return receiving large amounts of ballast water. This places the region at risk as they are potentially receiving harmful invasive organisms into their ecosystem but there is the lack of resources and capacity to implement the new BWMC 2004 to address this threat. The threat from ballast water begins and ends in ports and therefore ports must ensure compliance by ships. Unfortunately, it can be hardly asserted that ports in the WACAF region are ensuring compliance despite our vulnerability.

Regarding oil pollution, IMO’s OPRC 1990 and the Abidjan Convention aim at facilitating cooperation and mutual assistance in preparing for and responding to oil pollution incidents. WACAF region has lots of oil and cannot ignore its dire need of cooperation to prepare and respond to spills and pollution incidents. Explorations and exports from countries like Nigeria, Equatorial Guinea, Angola, Senegal, Sao Tome and Principe, and the recent discovery by Ghana makes the region vulnerable to oil spill incidents from offshore installations and tanker traffic which may be remote from ports. Studies in WACAF ports show that there are many recent incidents. Ports in the WACAF region together with other oil facility operators have been working on implementing these conventions but efforts have been slow and staggered due to ineffective co-ordinating structures.

**Learning Through Exchange. Ghanaian Ports build partnership with Netherlands on Waste Shipment**

Most WACAF countries seem to have an impressive set of environmental regulations for port environmental protection, but their implementation indicates limitations. There is limited knowledge of the environment and most ports lack a clearly defined environmental management structure. Where they do exist, they are not placed among top management levels. For most ports environment is largely seen as part of the Harbour Master’s responsibility. The Harbour Master’s duty normally has to do with taking charge of pilotage, and overseeing floating crafts and operations on the waterside; duties very different to environmental protection and management. In other instances, the environment is seen as port area waste management to be handled by the Harbour Master. The Harbour Master’s duty normally has to do with taking charge of pilotage, and overseeing floating crafts and operations on the waterside; duties very different to environmental protection and management. In other instances, the environment is seen as port area waste management to be handled by the Harbour Master.

**Lack of finances to support environmental management**

Most WACAF countries seem to have an impressive set of environmental regulations for port environmental protection, but their implementation indicates limitations. There is limited knowledge of the environment and most ports lack a clearly defined environmental management structure. Where they do exist, they are not placed among top management levels. For most ports environment is largely seen as part of the Harbour Master’s responsibility. The Harbour Master’s duty normally has to do with taking charge of pilotage, and overseeing floating crafts and operations on the waterside; duties very different to environmental protection and management. In other instances, the environment is seen as port area waste management to be handled by the Harbour Master.
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Implementation of international conventions is weak. Environmental laws, directives and policies are poorly adapted to the situation on the ground. There is lack of integration and coordination. Where environmental standards exist, implementation and enforcement is poor. Capacity for environmental management is limited with few officers in charge lacking a background in environmental management. Environmental monitoring and protection is not a priority for most ports in the region. There is also generally limited financial means to support environmental management in the region’s ports.

Need for environmental cooperation

European ports under the European Seaports Association (ESPO) has set up an eco-information network called Ecoports, which, in association with an environmental organisation, Greenports, promotes collaborative environmental projects through exchange of information and best practice as well as sharing of solutions to common problems. This aimed at making the ports proactive and self-regulatory towards higher environmental standards. There is a framework within the Association of American Ports (AAPA) to similarly address environmental concerns. The same is emerging among Asia’s ports but nothing has yet happened for African ports.

WACAF ports are still preoccupied with modifying and renovating their infrastructure in a bid to enhance competition and attract more traffic. They operate inherently as fragmented individual entities under a concentration of power in their nation-states and remain inefficient in environmental performance. There is little option of linkages of environmental issues with neighbouring ports. To be able to meet expected global environmental demands, WACAF ports will have to find forms of environmental cooperation and steering to facilitate improved environmental performance like their European, American and Asian counterparts.

The global maritime community acknowledges that trans-boundary environmental issues can be prevented and managed through coordinated action from international through to regional and to local. In a key example, an environmental information exchange among ports could have prevented the dumping of toxic cargo from the Koko and Probo Koala incidences in Nigeria and Abidjan. An environmental cooperation among WACAF ports would, among other benefits share and reduce the cost of environmental solutions, harmonise and standardise environmental practices, attract environmentally responsible operators and investors, facilitate effective implementation of international regulations, promote the exchange of information, experience and best practice, and eliminate dumping and illegal shipments.

Conclusion

The Ports Management Association of West and Central Africa (PMAWCA) acknowledges that its member ports cannot spare any more time and effort to just stand and stare, and risk becoming dumping grounds whilst the world moves on. It believes environmental challenges facing member ports must be seen as opportunities to develop a clear vision and build synergies to improve environmental performance in order to meet international standards.

PMAWCA to partner an environmental NGO

PMAWCA has initiated discussions to partner an Environmental NGO with interest in African ports, Ports Environmental Network-Africa (PENAf) in association with Ecoports and Greenport (Europe) to assist member ports in building capacity and efficiency to improve environmental performance. The partnership would be aimed at catalysing the sharing of environmental knowledge not only between WACAF ports but within a broader international network of ports. To this end a port environmental platform for WACAF port environmental managers is to be launched to create a forum for sharing environmental experiences and cooperating on concrete collaborative environmental projects. The platform would look at port environmental issues and how to actively address them from practical and feasible perspectives. It would seek to increase knowledge about African port environmental issues and promote the integration of environment into the agenda of African ports, as in other regions globally, towards achieving an overall sustainable environment. The kick-off meeting for this environmental platform which is geared towards the institution of a yearly Greenport Africa Conference is an opportunity for African ports to support themselves and work together, involving everyone in consultation, dialogue and cooperation to generate new knowledge and initiatives to make our ports sustainable.

hbarnes-dabban@ghanaports.net

Oil Spill in a West African Port

Commissioning a Pollution Control Craft
Experience ecological awareness

With its headquarters located in an environmentally protected area, ecological issues have always been high on the agenda for Liebherr-Werk Nenzing GmbH. The implementation of economy software, biodegradable oils and special noise insulation throughout its mobile harbour crane range are just a few examples of Liebherr’s ecological awareness.