EUROPEAN REGIONAL DEVELOPMENT FUND

The North Sea Region Programme 2007–2013

Investing in the future by working together for a sustainable and competitive region

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EUROPEAN REGIONAL DEVELOPMENT FUND

NORTH SEA TRANSPORT

ANSWERS

The end of the road?

The need for new transport concepts

21st century travel and transportation

Economic growth, less environmental impact

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ACCESSIBILITY MEANS CONNECTING to the rest of Europe and the world. It is the key to getting goods to market and making places attractive for living and working. The North Sea Region is Europe's gateway to the world and the transport industry is a major contributor to growth and employment. But in many cases the system is reaching capacity limits and is under additional pressure because of the environmental costs of mobility with 96% of transport still oil based. Never content with sitting still on a challenge, the North Sea Region is leading many efforts to solve these challenges.

The North Sea Region programme has been supporting the improvement of accessibility and development of a modern and fast transport system for many years. Partners from regions in the seven countries around the North Sea have joined forces and can now offer important lessons on improving efficiency, providing infrastructure and the technological solutions to keep things moving in Europe.

The North Sea Region is home to some of the largest ports in Europe. These international gateways link the region to global markets while smaller regional hubs all over the region provide the network for wider distribution. Traffic around these hubs is increasing and despite a huge decrease in goods transport in 2009 as a result of the financial crisis, the transport sector is on a long term growth path. This growth is leading to significant capacity problems in some areas of the North Sea Region with the challenge of organising transport in an efficient manner.

Another major challenge for the region comes with climate change. Weather conditions are becoming more extreme and the sea level is already slowly rising. The transport sector is one of the main contributors of greenhouse gases and its emissions have been increasing significantly in past decades. Transport has proven one of the toughest areas to bring down emissions but promising (and most importantly realistic) ideas are starting to appear.

Another challenge is our own personal transport habits. Linking urban areas with the surrounding area and rural areas often leads to car dominated transport patterns. Congestion, rising fuel prices and financial constraints on offering quality public transport alternatives are increasingly becoming challenges for transport users as well a spatial and town planners. A lot of hopes have been pinned on electric vehicles but it may well be that there is no technological cure-all and deploying more collective and non-motorised transport options may be a large part of the answer.

The EU underlines the clear territorial dimension transport has. It affects economic, social and environmental development. Documents like the Bristol Accord or the Leipzig Charter have taken this into account by linking European territorial policy development directly to regional development for sustainable communities and towns.

This magazine provides an overview of some of the different transport related projects in the North Sea Region as well as their motivations and the solutions. These projects have already attracted international attention and, for example, North Sea Region projects are actively contributing to the Rio+20 UN Conference on Sustainable Development with a message about carbon responsible transport solutions*. There are solutions here for important challenges; read on and learn more.

* www.care-north.eu/sites/default/files/Message_to_RIO+20.pdf

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Transport related projects and clusters funded by the programme

Cluster: **Maritime Transport Cluster - MTC**
Supporting the development of innovation capacity in businesses: **NMU**
Promoting regional accessibility strategies: **CARE-North, Cruise Gateway, E-Mobility NSR, Green Airports, iTransfer** and **ITRACT**
Promoting the development of multi-modal and transnational transport corridors: **Food Port GreCOR, LO-PINOD** and **StratMoS**
Promoting the development of efficient and effective logistics solutions: **ACCSEAS, CNSS, Dryport, E-Harbours** and **NS Frits**
Supporting sustainable development of coastal land and sea areas through integrated coastal zone management: **BLAST** and **TIDE**
Developing preventive and responsive measures to address marine pollution: **Ballast Water Opportunity**
Promoting sustainable growth solutions for expanding areas: **Waterways for Growth**
More information about each of the projects on our website: **www.northsearegion.eu/ivb/projects/**

CO2, particulates, congestion: cars are getting really bad press at the moment. Yet we totally rely on them for convenient, quick, door-to-door travel. What can we do to reduce the environmental and economic damage of pollution and congestion while maintaining mobility?

On an eco-drive

Wherever you go in the North Sea region you find people have a love-hate relationship with the motorcar. In half a century the car has gone from being a desirable status symbol to a necessary evil. Our quality of life, our jobs, our business, our leisure, they all depend on the convenience and speed of road travel.

Yet we all know how bad cars are for the environment, even for our health, as we opt to travel by four wheels rather than two legs. Truly a political hot potato!

There is one thing that is sure to make us think twice before we turn on the ignition, however: the rising price of oil. Most people know that driving has an environmental cost; now they are beginning to feel the financial costs too.

Where the electric car was once derided—small, slow and impractical for most car journeys—people are beginning to take them seriously. Battery technology has greatly improved and even some of the large car manufacturers are beginning to add electric vehicles to their range.

Numerous cities in the North Sea region are now promoting and supporting the use of electric vehicles in an effort to improve air quality and hit carbon emission targets. It is becoming increasingly common to find electric charging points in large cities.

But the take-up of electric cars will remain relatively low until 'e-mobility' gets more joined up. Will you be able to recharge your car if you want to drive to a nearby village, or another city several hours away? What if you visit another country? 'Range anxiety' remains one of the main reasons that people refuse to drive electric cars today.

'We need some joined up thinking across the North Sea region,' says Walter Leal, who is spearheading a project taking on some of these challenges. 'Could we develop electric vehicle hubs in cities in different countries so citizens could move between them and use the infrastructure wherever they are?' he asks. 'How about planning electric-friendly routes with the necessary charging infrastructure between key regional destinations, including across borders?

'We need to work together to make sure our promotion of electric mobility is coherent across the region. There are still so many issues to solve—policy issues, infrastructure development and technology barriers like speeding up charge times. It makes sense to work on all this together and pool our expertise and experience.'

Electric cars may help to reduce pollution, but European cities must find more innovative approaches to cutting congestion.

E for everything?

Car lobbyists claim that it will be decades before electric vehicles even come close to the performance of the combustion engine, which gets more efficient and cleaner every year. They say that all the anti-car legislation and taxation is a witch-hunt, curbing freedom of travel and damaging the European economy.

Michael Glotz-Richter from the city of Bremen in Germany partially agrees. 'Think about it,' he says. 'Today in your small car you have a radio, air conditioning, you can drive 1000 kilometres on a tank of petrol and it takes three to five minutes to refuel. And you can transport up to five people. Can we really get electric cars to match that kind of performance?' Possibly. Some long-awaited breakthroughs in electric car technology are coming onto the market that could considerably increase the range of these vehicles. One system even claims to perform a 10-minute battery recharge.

But it will never be the whole answer for Mr Glotz-Richter. 'It is our reliance on road transportation that is unsustainable,' he argues. 'Industry has done a fairly good job at reducing its energy consumption. But the transport sector is still going in the wrong direction. Europe has to do something—something big—not just to curb car CO2 emissions but to get people out of their cars and off the roads. Congestion is as big a problem as pollution and it is really damaging to society and our economy.'

- **Congestion affects 10% of the EU's major road network and costs €50 billion per year.**
- **Road transport accounts for more than one-quarter of the EU's total energy consumption.**
- **In 2010 more than 30 000 people were killed in road accidents in Europe.**

And that is the big question: *how do you get traffic off the roads?*

You don't buy a cow when you need a glass of milk

'We need changes in mobility culture and better spatial planning to reduce the distances we have to travel and increase alternative modes of transport, especially cycling and walking,' says Mr Glotz-Richter. The European Commission's Transport 2050 White Paper sets an ambitious target to remove the combustion engine from cities by 2050. But so far no-one has come up with a societal model on how this could possibly be achieved.

Mr Glotz-Richter suggests that in future we ideally would not have just one car for all types of journey as we have today. Instead people will need different cars for different trips: a two-seater battery car for a weekly shop, a fuel cell vehicle for longer road trips, and perhaps even an old-style combustion vehicle using bio-diesel in some cases. But we will not be able to afford three cars each, so that means more sharing.

Bremen already encourages its residents to adopt this new mobility model through its city-wide car club. The club owns a pool of different cars and members can hire them at low rates whenever they need the convenience of four wheels.

And it works. So far Bremen calculates that its club has taken some 1500 private cars off the road—equivalent to 7.5 kilometres of parked vehicles. On average each car in the car club replaces nine privately owned vehicles. The Bremen car club is seen as a global pioneer and was selected as a showcase at the EXPO2010 in Shanghai as well as being invited to the Rio+20 talks on sustainable development.

There is no single solution to curb the congestion and pollution caused by the high density of road traffic in the North Sea region. Studies have shown that biofuels are not a global fix to our reliance on fossil fuels, but they may work at a local level. Friesland in the Netherlands is an area that produces large volumes of agricultural waste which can be treated to produce biofuel for vehicles. Studies are currently underway to assess the costs and financial viability for this alternative closed loop recycling/refuelling scheme.

'We still need answers about how to get round our amazing appetite for car ownership, but we are convinced that technology is not really the answer. We think we need more policies that promote mobility management and a mobility culture,' states Mr Glotz-Richter. 'Decision-makers must be aware that changing behaviour is vital. ■

GREEN SKIES THINKING

We are the jetset generation and Europe's economic growth over the past decade owes a lot to the massive increase in air travel.

Today around 800 million passengers fly through EU airspace each year, and over two-fifths of this traffic is intra-EU travel. For most countries around the North Sea air travel is an economic lifeline, linking cut-off communities to their national capitals and giving peripheral Member States strong connections to European heartlands and the wider export market.

If you live in the remoter parts of Norway, Sweden or the Scottish Isles, for example, air travel is the only viable option for quick, long-distance transport. And when a low-cost airline decides to open a new route it can transform the local economy within more than 100 kilometres of the airport. Who would have thought a decade ago that places like Gothenburg or Haugesund could become major European tourist destinations and business hubs?

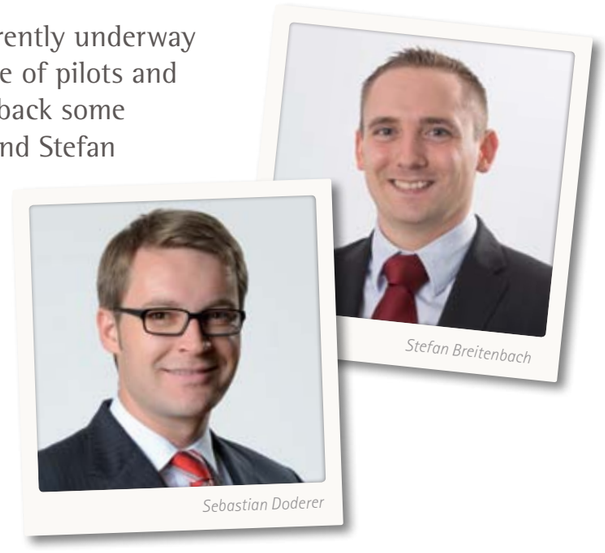
There are 400 airports in the EU, but almost a third of these handle fewer than 150 000 passengers per year. Indeed, the North Sea region is dotted with small and medium sized airports (SMAs); their accessibility and growth is key to regional development. But in an era when air transport is condemned for its environmental effects, how can these airports grow responsibly? Aviation must cut its emissions by 10% by 2020; can these airports expand yet adhere to stringent environmental controls?

Small airports from around the North Sea region are working together to come up with a host of green solutions for airport operations and management. These include greater use of renewable energy, new de-icing methods to cut down on chemicals and more efficient arrival and departure procedures to reduce noise and emissions. These airports will also have tighter links to public transport networks to encourage people to travel to and from the airport by bus, train or tram.

With the advent of more fuel efficient aircraft engines in 2012 and a more eco-conscious aviation industry it looks like the far flung corners of the North Sea can continue to enjoy their connectivity. ■

Can small, regional airports grow and be green?

More than 15 transport projects are currently underway around the North Sea—the latest in a line of pilots and tests of new ideas and routes that goes back some 15 years. We talk to Sebastian Doderer and Stefan Breitenbach of the Maritime Transport Cluster (MTC) to discover why they are so excited about today's initiatives. How can we keep up the momentum?



How have we moved on since the early days of North Sea projects? Did those earlier projects make a difference?

Sebastian: 15 years ago climate change was just starting to gain wide-spread acceptance as a theory. Back then we were still trying to promote rail and shipping, but it had more to do with planning how to avoid congestion and cut pollution. Now changes to transport have become more and more urgent. Things are happening at a scale and speed that you could not have imagined at the start so we are not just planning anymore – we are making real changes.

What are the big challenges facing the North Sea maritime sector today?

Stefan: For the transport sector, I would say to keep the North Sea's position as a leading maritime region, while at the same time meeting the challenges of higher efficiency, environmental protection and increased competition to make the region attractive to business and investment.

Are new technologies the answer to these challenges?

Sebastian: On the one side, we have a lot of world class research institutions and technologies. On the other side, there is our extremely strong maritime economy. Bringing these together should allow us to create even better solutions than we have today. Technologies certainly have a part to play, but I believe first and foremost we need to enhance cooperation in the region.

How exactly do you get ports, shipping companies and end-users talking and working together?

Stefan: By inviting them for lunch (laughs). Actually, this is a really difficult task; you need good, convincing arguments about cooperation, and that means a well prepared concept, and also a certain amount of patience. Luckily, here at Port of Hamburg Marketing, we have experience as a cluster organisation. In MTC, we created a big network of project partners, researchers, business and political stakeholders and are quite satisfied with the outcomes.

So is MTC just about getting people talking to each other?

Sebastian: Well, talking is a good start! I see this as a starting point, but of course there is a lot more that follows. When you talk, you discover the different needs and challenges of the different participants. Matching them is not always easy! However, it is a good feeling when you manage to agree on certain overall topics.

And what difference does it make?

Stefan: In the North Sea region there are a lot of very interesting transport related projects that have produced a wide range of results. We have written a report *Maritime Transport and Future Policies: Perspectives from the North Sea Region* which bundles these results together and highlights the 10 most important topics. Each topic is connected to several recommendations. You can see that it would take something like the MTC to have this overarching view—the big picture—and coordinate the research and sum up with consensus recommendations. Being the voice of the maritime transport industry, MTC can shout out these 'universal' recommendations with more credibility and to a broader audience.

Hopes for the future?

Sebastian: We hope to raise awareness of the importance of our maritime transport sector as a global leader and support its further sustainable development. Apart from that, I would like to see the EU supporting further initiatives for cooperation such as the MTC. You always need somebody to trigger joint projects and our experiences of this in the Interreg North Sea Region Programme have been promising.

Making the transport sector cleaner and more efficient isn't going to happen through technological innovation alone.

Getting ship-shape for the future

We have to make sensible decisions about our transport options because we can ill-afford to start from scratch, nor can we just keep on 'as is'. Only a combination of technology and smart thinking can really help transportation clean up its act. Fortunately there are plenty of interesting concepts on the table just waiting to be taken up.

So how about this for a smart idea: we all love the convenience and simplicity of motorways, so why not promote similar high density shipping routes? They could run between well-equipped key ports which would act like regional hubs. Cargo could be distributed more locally, ideally by short sea shipping, rail or inland waterways.

This is the idea of 'Motorways of the Seas' (MoS). It sounds great in theory, but takes little account of current market forces. 'You need commitment from private enterprise,' asserts Pim Bonne, an engineer in the Department of Mobility and Public Works of the Flemish government in Belgium. 'Ports and shipping operators are quite reluctant to upgrade their infrastructure, increase capacity or commit to plans with a time horizon of more than five years.'

But if business cannot think in the longer term and politicians are unable to deliver a binding framework for future development, how can we hope to make real progress?

Concrete progress has in fact been disappointing, but for the North Sea region the principles of MoS remain highly attractive, not least because current truck-based solutions are so glaringly inefficient. If you land fresh fish in Norway, to take just one real example, it makes a lot more sense to ship it to markets in northern Scotland (a distance of less than 1 000 kilometres) and avoid an overland journey at least five times the distance.

FEATURES OF A HUB PORT

- Very fast paperwork issued at terminal gate.
- Safe/secure Ro-Ro terminals, outside cities where possible.
- Round-the-clock hours.
- Respect for time and punctuality.
- Quality of service (high frequency, driver facilities).
- Sailings and arrivals coordinated with other transport services.

A regional rethink

Cooperation projects are kick-starting this kind of much needed rethink. The StratMoS project has spent the last three years looking at ways to implement MoS concepts in the North Sea region and overcome some of the reluctance. The project brings together port authorities, transport and logistics companies to identify how policy could support the shift from road to sea and to demonstrate how MoS can work in reality. 'It is not so much anymore about A to B routes—the original MoS concept proposed by the European Commission a decade ago. We are looking at a whole package of initiatives to promote maritime transport, especially short sea shipping,' Mr Bonne remarks. 'These initiatives include measures to make maritime transport a more sustainable mode of transport.'

Indeed, the MoS concept will be superseded by the new TEN-T policy which was recently issued for 2014–2021; this new approach prefers a hub and spoke model of integrated supply chains rather than just a 'motorway route' between two ports.

StratMoS has looked at the whole logistics network which gets goods from their starting point to their destination. The project has targeted bottlenecks and barriers all along the chain.

The port of Hamburg, for example, is investigating how to develop feeder services where deep sea cargo vessels transfer to short sea shipping lines to take freight to smaller ports prior to their 'last mile' road trips. Dutch ports are developing barge feeder services. These demonstration projects will help to support the case for a shift of goods traffic to sea. They focus on the operational aspects of traffic between ports, looking at ship movements and operations to establish the most efficient handling and transportation procedures, and keep freight moving at high speeds.

StratMoS is also supporting some more technical developments, such as radio frequency identification (RFID) tags for tracking and tracing containers along their sea journey. The idea is to speed up customs checking, allowing customs officials to check a container once and seal it. The RFID tag can be used to verify that the cargo has not been tampered with and has taken a direct route to port. The technology is now being tested following an agreement between a maritime operator and several customs authorities.

Home and dry

The dryport is another smart idea that relies on cooperation rather than new technology. Many ports in northern Europe have a capacity constraint; they simply do not have any more land to build on. The dryport overcomes this problem by establishing an inland location which provides overflow port functions like warehousing, customs and the transfer of goods to other transport modes.

Dryports therefore increase port capacity and, because they are new developments, they can be designed and built with sustainable transport embedded in all levels of their operation. But as dryport expert Jason Monios explains, there is a bit of a chicken and egg problem: 'Shippers are reluctant to reorder their transport chains unless they have a secure and cost-effective option already in place. But operators will not provide this option unless they have shippers ready to use it.'

The aptly-named Dryport project is helping to resolve this issue through feasibility studies and spreading the know-how of existing dryport stakeholders. 'The idea is to reduce the risk that either the shipper or the operator has to take in the first instance,' Dr Monios explains.

'If modal shift is to be achieved, it is important for large shippers to move their warehouses, etc., to rail-connected sites and remodel their supply chain if needed. We are starting to see this with large shippers such as supermarkets. Dryports only make sense if you can consolidate traffic on high-capacity links. If that is not the case already, it needs to be addressed first, or as part of the development process.'

DR JASON MONIOS

'Dryports are an excellent way to get freight traffic off the roads,' explains Dirk Harmsen, manager of the project. 'They remove many of the access and capacity constraints that have made road transport the most viable option in the past at many traditional ports.'

But although dryports are springing up in many locations, there is no coordination of these developments or any sharing of best practice. 'We've brought together partners involved in every step of dryport development—from those currently developing and running dryports to those just looking at the options,' says Mr Harmsen. 'We can learn from each other, share insights into planning, operations, IT and security and how to manage the environmental impacts.'

An environment for learning

Smart transport solutions also rely on education—raising awareness of road alternatives and how to use them, encouraging people to think differently, share and test new ideas. Alf Baird of the Transport Research Institute at Edinburgh Napier University, Scotland, is participating in an unusual project which is looking to educate and equip maritime organisations with the knowledge and skills to 'think smart' and operate their services in more competitive and environmentally friendly ways.

'The Northern Maritime University (NMU) project brings together nine institutes from around the North Sea to deliver combined courses and workshops for their students,' Professor Baird explains. 'Each of the universities has a traditional focus and a number of additional specialities in their shipping and maritime logistics curricula. NMU is opening up this expertise to other students in the North Sea region so everyone can get the complete package on offer.'

Through NMU these institutions now swap teaching staff so every student can benefit from the expertise and specialist knowledge of other partner organisations. The NMU modules combine traditional lectures with e-learning to deliver a much broader range of content for students.

Many of the students work in the maritime industry and are taking post-graduate qualifications to learn the latest approaches in shipping and port logistics, management and operations. They will hear about the very latest policy and legislative issues. 'We have people from government agencies, shipping firms, port authorities and more. These are really applied modules, so what we teach is going right back into the heart of the industry and policy making,' says Professor Baird. 'The students do a lot of project work, many of them based on their own companies and sectors. What they discover will be taken back and acted upon by their own management teams.

'But NMU is not just about learning. We are taking results from other projects and feeding them back to those people who can make best use of the findings from other projects. This is dissemination—and it is making the industry much smarter at what it does.' ■

Do smaller regional ports have anything to offer?

'They are real gems,' asserts ed metcalfe of the UK's Institute for Sustainability. 'As rising petrol prices make road transport ever more expensive, ports and their water-based networks will become more attractive and in demand. This is not just within the freight industry and maritime new business sector but in growing industries such as renewable energy and biomass. This trend will help many ports with a declining profile become an important local asset and employer; they could return to a position as a central economic hub of their community.'

'Regional ports often face the challenge of capacity for marketing and lobbying for government support and investment,' Dr Metcalfe continues, 'however, through collaboration with their peers along the North Sea coast, they are able to make a compelling case. Through projects like LO-PINOD we are helping them to get in on the act now and prepare for the growing demand.'

LO-PINOD works with ports from around the North Sea to improve their accessibility and initiate investment in multimodal connections to ports.

The sea terminal at Ridham, across from the Isle of Sheppey in the Thames Estuary, UK, has a small port which is enjoying a new lease of life thanks to a new rail link built in to the dock. This has connected the port with Kent and the wider UK market and provides shipping firms with an alternative port to the larger, nearby docks along the south coast. It has also connected the port with local businesses including a new biomass plant. The rail link allows material to be brought in by sea then moved to the plant by rail.

LO-PINOD is also helping the City of Edinburgh to launch a daily freight ferry service along the Firth of Forth between east Fife and Grangemouth which could divert as many as 40 trucks off the Forth Road Bridge.

'I feel strongly that we need demonstrations like this,' says Dr Metcalfe. 'Unless people see, feel and hear how it can be done, it won't happen. Some operators just can't see the opportunities and potential they have.' ■

Food for thought

When you have a product with a short shelf-life, transportation time is obviously of the essence which makes road transport seem like the only viable option for most produce. But a new wave of the essence, which makes road transport projects is challenging this accepted thinking, winning ground on the back of consumer concerns about the carbon footprint of their daily shopping. We asked Liesbet Pauwels from the Food Port project to tell us about the latest developments.

What are you doing to encourage alternative transportation?

We set up the Food Port project to stimulate a modal shift from road to more sustainable transport modes like rail, short sea shipping and inland waterways. We are working to raise awareness in the logistics sector about the alternatives and demonstrate that they are commercially viable; it's a really commercially driven project. We are in the process of completing the first stage, which involves a considerable effort in collecting data about product flows—over 200 companies have supplied data to the project. Now we are looking at which collaborations would be the best. For example, we found that Norway transports large quantities of fish to other regions of the North Sea, whereas West Flanders ships potatoes and frozen vegetables to Norway, so we can balance those flows. There's no reason why these products should travel by road. In many cases it's just a question of opening people's eyes to the alternatives.

Are you developing any new technologies to make road or rail shipment more attractive?

One reason that food logistics prefers road is that road transport is less reliant on services provided by others. For example, there's always a risk that a signal fails and holds up the train or the dock workers go on strike. Disruption and infrequent sailings make transportation by rail and sea more difficult and risky. One Food Port demonstration is to trial new technologies for temperature and atmospheric controls which will prolong the shelf life of fresh fish so it can be shipped by sea.

Will Food Port get lorries off the road?

We have to change how the people who run logistics think and realise there are other options than trucks, although the rising cost of fuel is already making companies look twice at their haulage costs. But I think ultimately a lot will come down to consumers. Consumers are more aware of their food products and their country of origin and how they are transported. This will have an effect on the logistics chain. ■

Bringing land and sea together

EU transport policy for the next few decades will rely in part on more and bigger ships. But with this choice come risks—the risk of an accident, for example; a major oil spill in the North Sea would have disastrous consequences. So before maritime traffic increases it would be wise to address these safety issues.

One of the first steps is to make sure that sea charts are right. Anyone who has experienced the North Sea in a storm will have nothing but respect for the mariners who spend their lives criss-crossing these waters. But large tides, powerful currents and rocky shores are not the only dangers that ships must overcome each day. Some of the greatest perils lie below the surface and even the best charts sometimes fail to highlight these hazards.

The floor of the North Sea is constantly changing. Sandbanks can move by tens of metres per year. Channels open and close and areas for safe anchorage may subtly shift. A nautical chart of the North Sea has a remarkably short life span.

The dynamic changes to the sea bed near the shore are especially dangerous for shipping, but the shallows tend to be the 'shadowlands' when it comes to mapping: they are ignored by land-based cartographers while hydrographic officers are responsible for charting deep navigational waters.

But finally the land lubbers and sea dogs of the mapping community are coming together. By combining their charting know-how and datasets they hope to create a prototype land-sea inter-operable database for the North Sea. This shared information will not just help improve coastal sea charts, but also enable authorities to make more informed policy decisions regarding the coastal zone.

Today maritime information such as details about the approaches into ports and harbours is presented in different ways by different ports and in different countries. But simple coordination between these players could make everything more straightforward and clearer, so regions are now working together to harmonise navigational data to improve safety for international shipping. New standards would also open up opportunities for electronic navigational systems such as three-dimensional navigational aids which display landmarks and submerged features to help captains guide their ships safely into port. ■

Where do we go from here?

Greener shipping is on the horizon for transportation in the North Sea region.

When it comes to 21st century travel and transportation, most of us agree that we should set our sights on highly efficient, low carbon services. But the proposed routes – the big policy initiatives – to this target are certainly raising a few eyebrows across the North Sea region. Can the transportation sector really support economic growth but dramatically reduce its environmental impacts? The scale of the EU's maritime trade is often overlooked. The vast majority of the EU's international trade is seaborne; some countries like the United Kingdom are especially reliant on maritime trade.

The European Commission's Transport White Paper, published in 2011, sets out proposals for a competitive transport system that will 'increase mobility, remove major barriers in key areas, and fuel growth and employment.' *Transport 2050:Roadmap to a Single European Transport Area* outlines ambitions to reduce Europe's dependence on imported oil and cut carbon emissions in transport by 60% by 2050. Nobody could possibly argue against the virtues of increased mobility and reduced emissions. But the lacklustre performance of the transport sector in hitting emissions and other environmental targets has generated a certain understandable scepticism about the likelihood of Europe ever meeting these laudable targets.

At the launch of the white paper Commissioner Siim Kallas commented: 'The widely held belief that you need to cut mobility to fight climate change is simply not true. Competitive transport systems are vital for Europe's ability to compete in the world, for economic growth, job creation and for people's everyday quality of life. Curbing mobility is not an option; neither is business as usual. We can break the transport system's dependence on oil without sacrificing its efficiency and compromising mobility. It can be win-win.'

The statement deliberately threw out the challenge to transport providers, but it is not one to take lightly, especially in the high-population, freight-intensive North Sea region - please check it is North Sea region throughout the publication. Here you find Europe's largest ports – Rotterdam, Antwerp, Hamburg, Bremerhaven and Felixstowe – and bumper-to-bumper container lorries on the roads are part of everyday life.

Making the Commission's targets a reality will have an unavoidable impact on everyone: businesses, freight and passenger transport operators, ports, importers and exporters, and even private individuals.

Unsurprisingly, the reaction from the transport sector in the North Sea region has been mixed; many operators are already striving to be as green as they can, within the constraints of current technology and the extreme operating and cost pressures of the present economic climate. These companies are certainly open to being 'greener', but they also want to know who will pay?

Driving the European economy

The transport industry is an important part of the entire EU economy, directly employing around 10 million people and accounting for 5% of its GDP. For Europe's regions, this sector is nothing less than a lifeline and still an essential service for most trading businesses. When you stimulate the economy, you must stimulate or at least maintain transport connections.

But the days when transportation was synonymous with road haulage look numbered. 'The EU economy is one of the most open in the world. The future prosperity of our continent will depend on the ability of all of its regions to remain part of a fully integrated world economy,' remarks Jukka Savo, who is responsible for maritime transport policy, ports and inland waterways at the European Commission's Directorate-General for Mobility and Transport (DG Move). He points out that fuel costs and congestion levels are expected to rise significantly by 2030. 'To meet the challenge, transport has to use less energy and use cleaner energy. And it has to exploit efficiently a multimodal, integrated and 'intelligent' network.'

The performance of multimodal logistics chains must be optimised, for example by making greater use of more energy-efficient modes Mr Savo adds. Many European companies are world leaders in infrastructure, logistics, manufacturing of transport equipment and traffic management systems; the sector promises some real green solutions for Europe.

But how can this integration be realistically achieved?
Mr Savo outlines his four 'I's:

INTERNAL MARKET A genuine Single European Transport Area could be created by eliminating all remaining barriers between modes and national systems.

INNOVATION EU research needs to deliver the technologies needed to change transport.

INFRASTRUCTURE EU policy on transport infrastructure needs a common vision and sufficient resources. The real costs of transport should be reflected in its price in an undistorted way.

INTERNATIONAL Opening up third country markets in transport services, products and investments should continue to have high priority.

The Commission is focusing on 'full modal integration'. It is a vision that will only work by planning on a supra-national scale, because it requires all transport flows to feed into the most effective networks, especially rail and water; each region must understand and support its role in these networks. Regional policy will continue to serve as an important balance in this system by making sure that the regions which feed into the core networks, especially the remoter parts of Europe, are not side-lined economically.

Intelligent integration

The EC *Transport 2050* roadmap demands a 'profound shift' in transport patterns for passengers and freight. As Dimitrios Theologitis, head of the ports and inland navigation unit in DG Move's European Mobility Network Directorate, told delegates at the recent GreenPort Congress in Hamburg, the emissions reduction target is 'extremely ambitious'. 'The challenges are even more difficult because maritime traffic will rise in the years to come,' he continued. 'In 2008, when we came up with a new document on maritime transport policy for the next 10 years, it was apparent that by 2018 maritime traffic would rise by about 50% which means a tremendous strain on ports. Of course, spread over several years the annual rise is not spectacular we are talking about three to four to five percent a year but the strain is already very big.'

KEY EU TARGETS

- Shift 30% of road freight journeys over 300 km to other modes by 2030 and shift more than 50% by 2050.
- Create a fully functional, EU-wide multimodal TEN-T 'core network'.
- All seaports should be linked to rail freight and, where possible, inland waterway systems by 2050.

Other authorities have come up with similar predictions for the growth of cargo and freight. Although the economic problems of the last years have temporarily interrupted some of this growth in transport volumes they have in no sense reversed the overall upward trend.

Ports play their part

DG Move's Dimitrios Theologitis believes that the role of ports is central to what the European Commission is doing. 'How do we achieve this spectacular reduction in CO2 emissions?' he asks. 'First of all, a green port should be part of a green transport chain. One cannot isolate some islands and say they have to be green, whereas everybody else is polluting.'

Mr Theologitis emphasises that the proposed European 'core network' of transport corridors will also be a green network. 'In these guidelines, ports for the first time find an important place. The main change in the guidelines is the inclusion of ports as entry nodes into the whole European transport network. They talk about connecting major European nodes with maritime networks. A number of ports will be connected in the core network and from this the rest of Europe will be connected.'

This model presents a great opportunity for ports to develop locally but also to function as part of a much larger 'hub and spoke' system.

Green ports must also tackle the problem of poor air quality and the need for cleaner fuels in ships. 'Already some cities have had problems meeting their air quality targets because they are heavily affected by the emissions of the ports themselves,' Mr Theologitis suggests, arguing that the environmental voice was not loud enough in this respect. 'We really miss a strong voice,' he remarks, although the heated debate about 'dirty' tar sands oil may be the beginning of a stronger environmental movement in this domain.

But even though demand for transportation increases each year, Dennis Olesen, chief operating officer of APM Terminals Europe, is confident that there is a general and genuine desire to create environmentally friendly, efficient transport solutions. 'We have only limited resources on this planet. Sometimes it costs a little bit more, but it is the right thing to do,' he says. 'The capability to offer low-carbon corridors [for freight] into Europe is important. Logistics providers and shipping lines will provide CO^2 calculations for their customers. Some of the big shippers are already doing audits into how low-carbon their supply chain is; they will find some port terminals more green than others. We measure our performance in CO^2 kg/teu (standard 20ft containers). I think everybody will start to move that way eventually it is a question of which industries go first.'

Mr Olesen believes a lot of waste in the system could be eliminated: 'If we all work together terminals, shipping lines and shippers and remove that waste in the system, it will not only be good business for everybody, but also improve environmental performance,' he remarks.

Green investment

Many institutional investors want to be sure they are putting their money into companies that operate in a sustainable way, Mr Olesen emphasises. 'So from a financial perspective it also makes sense to be green. If you need to finance your business and don't have a sustainable business model, you may have difficulty getting finance.' APM

For the first time ports are to play a central role in European transportation policy at the hub of green transport networks.

Rail infrastructure needs investment to encourage rail-sea multimodality.

Terminals has a strategy to reduce its CO^2 emissions drastically by 2015; in 2011 alone it achieved a 15% reduction in its CO^2 levels. Within its global portfolio, its terminals at Rotterdam and Zeebrugge are both served exclusively by green electricity.

The bigger the better?

In 2011, Maersk Line, a giant on the Asia-Europe shipping routes, ordered 20 so-called Triple-E class container ships. Carrying up to 18,000 teu (standard containers), these vessels will be among the world's largest container ships and are due to enter service in 2013. Their vast size will put enormous pressure on the few ports that are able to handle them and also on the hinterland infrastructure.

'If a vessel exchanges 6,000 boxes in one port call, of course this will put pressure on the onward transport services,' explains Dennis Olesen of APM Terminals. 'Barge, rail or truck services will have sudden surges. So infrastructure will be the challenge. Rail infrastructure has to be improved in Europe that is about figuring out how we can optimise the rail system we have, and how we can extend it as well. Cooperation along the whole supply chain, including smaller ports, is vital.'

The industry is a willing player in the changes taking place but representatives stress that there are limits to the changes Europe can make unilaterally without sacrificing too much competitiveness. The Sulphur Emission Control Areas (SECAs) coming into force in 2015 are often cited as a pertinent example. Ships in these zones will face a new 0.1% sulphur content limit in fuel; the North Sea and the Baltic are the first designated SECAs in Europe.

'For our sector, the magnitude of the challenge on the horizon due to this change to sulphur emissions seems to be underestimated,' notes Brian Rees, spokesman at P&O Ferries. 'All of us are trying to adapt to the continued burden of high energy prices, but come 2015 we in the North Sea face a step change in energy costs for our ships. Estimates vary but at the lower end we could see our fuel costs rising 50% or, at the higher end, by 80%. That doesn't pose an evolutionary change to our operating costs, but a revolutionary one, because fuel is already one of our largest costs.'

'Watch as freight rates rise substantially,' Mr Rees continues, 'and the costs move on through the logistics chain, and try to consider the implications. It may become more economical to move loads that would have gone by sea on the roads instead. And longer sea routes that might make the most sense logistically may suffer as loads switch to shorter routes – adding road miles – because the higher fuel costs are not as acutely felt on shorter sea routes.'

Profit margins are very small in the road haulage industry so traffic flows do shift for even minor financial advantage, observes Mr Rees. 'Equally, margins are slim in the ferry industry and the switch to 0.1% sulphur may be more than some services can bear. We all understand the desire to reduce sulphur emissions, but it needs some careful consideration of the overall effect. We don't want to take sulphur out at one side of the equation and add it on the other.'

Mr Rees' views are echoed by Danish-based container specialist Jesper Kristensen, chief executive of the short sea and feeder operator Unifeeder. 'When the new limits come in, there will be two options,' he explains. 'Either burn the same fuel oil we use today and add an exhaust scrubber, or buy different oil, either diesel without sulphur, or perhaps liquefied natural gas (LNG) which some people speculate will become a suitable fuel in the future.

'The challenge is that everybody wants to do something good for the environment but, on the other hand, by protecting the environment short sea shipping could become so uncompetitive that you get a modal backshift of cargo away from the sea.'

'We have been fighting for years to get cargo off the roads and on to sea,' Mr Kristensen highlights, 'and in the past couple of years we have seen good success. Many of us believe it would be catastrophic if something that is supposed to be good for the environment ended up putting traffic back on the roads. From the environmental perspective this would be even worse.'

The environment in the balance

The pros and cons, the direct positive and indirect negative effects of environmental policies lead to heated debate and impassioned views. The controversy and intense discussions certainly illustrate the complexity of the problem and that Europe's transport policy must balance the interests often conflicting of many interested parties.

But Unifeeder, along with so many other transport operators, believes very much in inter-modality. The majority of its door-to-door land-based transport makes use of rail and the company avoids long-distance road transport. However, there are many bottlenecks in Europe's rail infrastructure, observes Mr Kristensen, including some corridors with virtually no freight capacity at all.

On the right track

Unifeeder's expansion of its network along the UK east coast in 2010 serves to highlight how transport challenges in the congested North Sea can be solved. 'The cargo we carry into the UK used to go to a southern port Felixstowe or Southampton and travel across the whole country by lorry to get to its destination,' explains Mr Kristensen. 'But direct short sea shipping can avoid this haulage. It can move cargo away from congested, heavily populated areas and call in at smaller local ports around the country.'

Small changes and model shift like this are rarely noticed, but they are contributing to the North Sea gentle transportation revolution to create sustainable and long-term solutions. Whether it's shipping companies cutting their emissions, keeping cities mobile without cars, or integrating shipping and rail networks and services, the solutions we need to make the European Commission's *Transport 2050* vision seem less futuristic are starting to take shape. ■

Update May 2012. A new deal brokered under the Danish EU presidency will see all ships in EU waters having to comply with IMO sulphur caps by 2020.

A large tanker lumbers into port. Just a small wisp of smoke rises from its funnel, the harbour water is clear and reflects a dockside that looks clean and organised. Shipping no longer needs to be a 'dirty' industry, but what is it doing to tackle its less visible environmental effects?

Unwelcome visitors. The Chinses mitten crab is spreading rapidly.

A sea change for shipping

Although new ships use cleaner engines that no longer belch clouds of black fumes into the air, they still produce significant quantities of carbon dioxide and some other unpleasant by-products. Reducing these emissions will be one of the biggest challenges facing the industry over the coming years.

In the North Sea region, where so many people live close to some of the busiest shipping routes in the world, ship exhaust fumes have to be controlled to protect human health. The North Sea and the Baltic Sea are both already designated as Sulphur Emission Control Areas (SECAs) by the International Maritime Organisation (IMO) following the detection of dangerous levels of sulphur dioxide (SO^2) over Denmark and northern Germany in recent years. Ships are now required to use low-sulphur fuels within the region to lower SO^2 emissions. Anecdotal evidence suggests that most operators are complying with these regulations; recent modelling by a research group suggests that levels of SO^2 should drop by an impressive 91% between 2007 and 2020.

However, by 2015 the IMO requires that the heavy fuels used by ships within the North Sea should contain no more than 0.1% sulphur, which will present a whole new set of challenges for operators. Installing scrubbers to remove sulphur from exhausts could be one answer, although Patrik Pettersson of Stena Oil, quoted in the industry publication Bunker World, said that it seemed unlikely that scrubbers would be the answer.

While Mr Pettersson believes that ship owners could begin to use marine gas oil as a low-sulphur alternative, Ed Metcalfe from the UK's Institute of Sustainability suggests that liquid natural gas (LNG) could also be a suitable alternative because it is not just low in sulphur, but has low carbon emissions too. He points to new designs being developed by Damen Shipyards in the Netherlands for ferries to use LNG.

This work is part of a project called iTransfer. Led by the Institute, the project's partners are working to deliver innovative and sustainable solutions to develop green ferry technology and create more efficient ferry operations. By switching to LNG, vessels will already have taken positive steps to becoming zero emitters.

Zero emissions on the horizon?

However, perhaps the biggest benefit of LNG is as a stepping stone to zero-emission ships. LNG engines use very similar technologies to hydrogen fuel cells which could one day power boats and produce nothing but water as a by-product. Dr Metcalfe is involved in early-stage research to test fuel cells powering small passenger vessels.

But Dr Metcalfe is well aware that complex environmental issues cannot be solved by a single technological approach. Switching ship owners to LNG, for example, would be extremely expensive; ships would have to retrofit LNG converters and ports would have to invest in an entirely new LNG fuelling infrastructure and safe bunkering facilities. Ships operators must also be sure LNG is available at supply nodes along a ship's route. Today it is unclear whether LNG is really a commercially viable alternative to more traditional heavy fuels—there are still many regulatory and technological issues to address.

But there are some much simpler ways for shipping operators to cut their overall emissions. The Bremerhaven ferry operator Weserfähre, for example, has made some startling discoveries. Studies have revealed that most of its ships' fuel consumption occurs during manoeuvring and docking. Using computer simulations, the company has looked at how captains could pilot their boats in different ways, taking account of wind, weather and tides to reduce fuel consumption. Armed with its findings Weserfähre is currently holding workshops for its captains, hoping to cut overall fuel consumption (and thereby cutting emissions and costs) by 10%—simply by changing behaviour.

Alien invasion

But even ships using more eco-friendly fuels and operating more efficiently can still pose a major environmental threat in the North Sea. Along with their cargo, ships can also bring unwanted stowaways into port. *Erocheir sinensis* and *Crassostreagigas* may sound like innocuous Latin names to most people, but the Chinese mitten crab and the Pacific cupped oyster just should not be found in our northern ports. These organisms—and many others—hitch rides in the ballast water of ships; they are pumped out and invade their new environment, where they may infect local aquaculture or threaten the delicate balance of the local marine ecosystem.

The dangers of alien aquatic species has been addressed by the IMO through the 2004 *Convention on the Management of Ships' Ballast Water and Sediments,* currently ratified by 28 countries (five from Europe). The convention will come into effect 12 months after it has been ratified by at least 30 countries.

But for the North Sea region it makes no sense for one country to insist on thorough ballast water disinfection if its neighbours tolerate invasive species; ships will simply dump their ballast water next door where regulations are lax. The North Sea cannot be properly protected unless Member States harmonise their ballast water policies and tackle the problem of invasive species in a consistent and coordinated approach.

Joint action across the region is essential to ensure that the implementation of the convention—in national legislation and compliance monitoring—takes a region-wide perspective. For example, collaborative research is currently looking at the possible harmful effects that the by-products of ballast water disinfection may have on human health and marine environments. The North Sea region again leads in this field with monitoring authorities from several countries developing common procedures for testing ballast water and enforcing the convention in the Ballast Water Opportunity project.

The green choice

Despite these problems, shipping must continue to be at the heart of the North Sea region's sustainable transport options. 'Whether it's passenger transport or freight haulage, there's the perception that water is slow and alternatives would be better,' says Dr Metcalfe. 'But the shipping industry in the region is working hard to improve its environmental impact and share best practice across the region. Companies have tight margins, little resources for R&D and they struggle to see how they can improve. By working together they are demonstrating how ships and ferries are a green transport choice.' ■

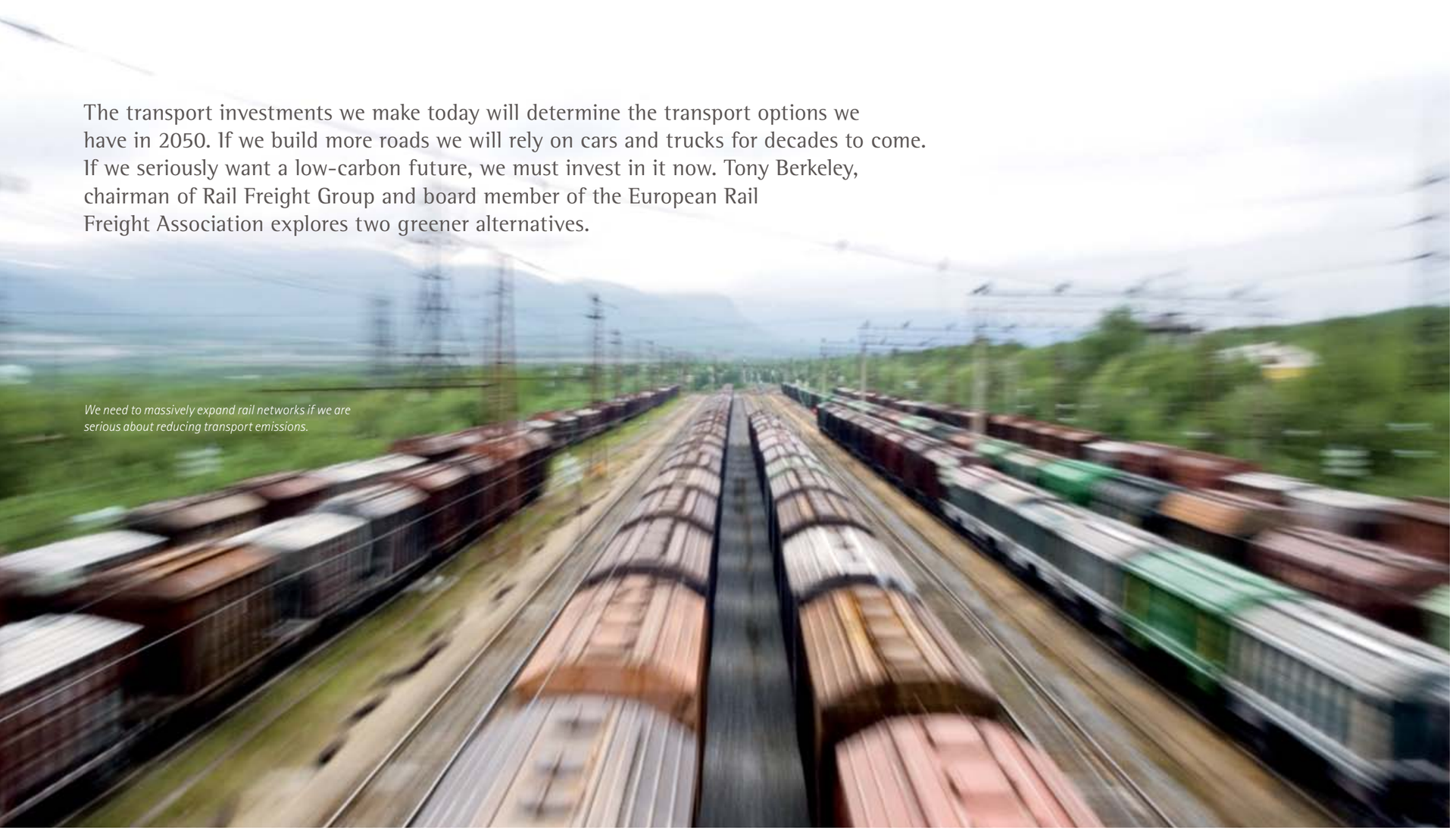
Small changes make a big difference

The port of gravesend boasts one of the biggest tides in the world with sometimes as much as 7 m between high and low water. It is therefore extremely tricky to offer a regular timetabled ferry service unless landing stages can cope with these extreme changes.

However, a high quality, regular ferry service across the Thames estuary at Gravesend could help to take some of the traffic away from the highly congested road crossing further upstream at Dartmouth. To expand its service and commission newer ferries the port needed to install a new pontoon landing stage.

An iTransfer project workshop of experts from the North Sea region was convened to discuss the design and site for a new pontoon. The experience of other ports and designers helped Gravesham Borough Council to rethink its initial plans and re-site the pontoon so that it would be more accessible for disabled users and cheaper to build. 'The new design improves the "people management" side of operations,' remarks Ed Metcalfe, director of the Institute of Sustainability in the UK. 'It will help people to get on and off the ferry faster and also allow double berthing so two ferries can moor at the same time. The redesign was nothing spectacular, no exciting new technology or materials, but the collective experience and transnational collaboration improved the designs and their deliverability. It could only have happened by bringing these partners together.' ■

The transport investments we make today will determine the transport options we have in 2050. If we build more roads we will rely on cars and trucks for decades to come. If we seriously want a low-carbon future, we must invest in it now. Tony Berkeley, chairman of Rail Freight Group and board member of the European Rail Freight Association explores two greener alternatives.



We need to massively expand rail networks if we are serious about reducing transport emissions.

A greener freight industry?

The European Commission's *Transport 2050* White Paper should give our politicians a wake-up call. It is high time to implement the changes necessary if Europe is to meet its target of reducing greenhouse gas emissions by over 50% by 2050. As the White Paper observes, 'The challenge of establishing a more resource efficient economy is particularly demanding for the transport sector, which continues to rely almost entirely on oil, has emitted 34% more greenhouse gases in 2008 than in 1990 and remains a major source of noise and local air pollution.'

Let's also add that freight transport is expected to increase, with respect to 2005, by around 40% in 2030 and by a little over 80% by 2050; passenger traffic is forecast to grow too (up 34% by 2030 and 51% by 2050). There is clearly a problem, but few people seem to have accepted that it even needs addressing.

The scientific evidence is quite clear: we need a massive reduction in greenhouse gas emissions. But the extent to which this can be done without affecting our economic

Transport and emissions

JUST HOW MUCH DIFFERENCE do the right transport decisions make? This is not the place for detailed scientific analysis but a quick comparison of widely accepted figures paints a pretty clear picture. Moving one tonne of goods 100 kilometres by plane creates CO^2 equivalent emissions of 55.2 kg. Switch to a truck and we are already down to 5 kg. Trains offer a further saving at 1.7 kg while the clear leader is shipping at just 1.3 kg.

And stuff sure does travel a lot nowadays. For example, studies estimate that making an iPhone requires materials and components from 50 locations on 4 continents. Your walk home from the shop represents the final steps in a total journey of 314,603 km for just one phone (use sourcemap.org to develop your own product carbon footprint information).

Given the scale of these movements, making the right logistics choices can clearly have a profound effect on global emissions levels. Unfortunately though, the trend is going the wrong way. The latest EU figures show that in 2008, 76.4% of freight was moved by road an increase of 2.7% since 2000. Unsurprisingly, the same trend can be seen in emissions from the transport sector, which increased by 35.6% between 1990 and 2007.

Much of the required improvement can and must come from a smarter use of existing infrastructure and technology. As just one example, 25% of the trucks driving on our roads are empty. 90% of the EU's international trade is carried by ship and the North Sea hosts all seven of Europe's largest ports and 19 of the EU's 27 deepwater ports. The seven largest ports handle approximately one billion tonnes of goods every year and this means that most goods enter and leave the EU far from the places where they are used or produced. The newest ships are capable of carrying 18,000 twenty-foot containers (TEUs) and this may further limit the number of ports open to major international traffic.

This means that 'hinterland connections' how goods travel to and from ports are essential. One recent survey suggested that 45% of companies would not even consider getting their transport off the roads , citing cost, unreliable transport times and quality of service as their top three reasons. These attitudes reflect a rather out-dated but common idea of what the alternatives to roads can offer nowadays.

There will always be a place for road transport but that place should be the first and last kilometres travelled with much more fuel efficient alternatives for the bulk of the journey. Everything argues for this shift and as Transport Commissioner Siim Kallas pointed out in a recent speech, 'The choices made today will determine the shape of transport in 2050.' Yet 60% of EU transport infrastructure investments still go to roads.

It's not that there aren't good alternatives. The Motorways of the Seas concept could streamline maritime routes and make them faster than road while modern advances in logistics systems and management can integrate different transport modes to offer a fast and reliable door-to-door service. As a transport hotspot, the North Sea is a great place to show that these new approaches work and that the alternatives to road do not have to be second best.' ■

activity and human behaviour—and the means by which this might be achieved—are still being debated. There is a sense of denial among many politicians and governments; they simply do not believe that the transport sector has the ability to achieve such reductions.

Of course, all parts of the transport industry are making some progress in cutting emissions; for example, in some cases, high-carbon fuels have been replaced by alternatives with little or no emissions. Substituting electric for petrol and diesel power is a favourite, but we must not forget that the electric power must itself come from sustainable sources if the switch to electric is to make a real environmental difference.

The freight factor

But freight transport does not have this easy electric option —nobody has invented a truck that can move heavy loads on electric power. A battery to move a 40-tonne truck 250 km would weigh about 40 tonnes itself!

Freight transporters are left with a limited choice: either use rail or perhaps water to move goods long distance, or simply do not move so much so far. These are the only options.

If the cost of freight movement doubled or quadrupled to reflect environmental costs, there might be some employment benefits in areas of higher wage rates in Europe. But transportation is an extremely competitive, global market so such restrictions are unlikely to be achievable in a free market economy.

We can only accommodate growth and lower carbon emissions if we accept rail transport as a major part of the solution for longer distance land transport.

In the UK we have calculated that virtually all freight moving over 250 km would have to be taken by rail to achieve the 50% reduction target. This is technically possible, but would require five or six times the number of freight trains compared with today. Loads would be transferred to battery-powered road vehicles for the 'last mile' delivery.

But freight trains will be vying with passenger trains for track clearance. Even though electric car technology is developing faster, passenger travel by rail is expected to rise in the future too.

Laying down the lines

The logical conclusion is that we should be building a lot of additional rail capacity, not roads, and stimulating the rail market, not favouring road haulage. The European Commission is still trying to liberalise rail legislation, through its Recast of the First Railways Package but is fighting against a formidable array of opposition from some Member States and their rail operators.

There is frustration at the slow progress in rail reform and the consequent inability to provide more rail infrastructure. Greater competition would allow growth and unlock more of rail's potential.

It is easy to understand why people are hesitant to invest. Why should they when the sector does not appear to use its existing infrastructure effectively and where, in some Member States, rail freight volumes are actually falling fast?

But our European and national politicians have a strong responsibility to look at the distant horizon, not just try to protect the jobs of their local or national rail operations by opposing any liberalisation and measures to open markets. Rail workers will be the ultimate losers in the end; short-sighted opposition to reforms will mean less rail traffic and fewer rail jobs.

Taking the UK as an example again, we have found that the number of railway jobs has remained constant since privatisation 15 years ago, despite liberalisation. Rail passenger numbers have grown by 50% in this time and freight traffic by 60%.

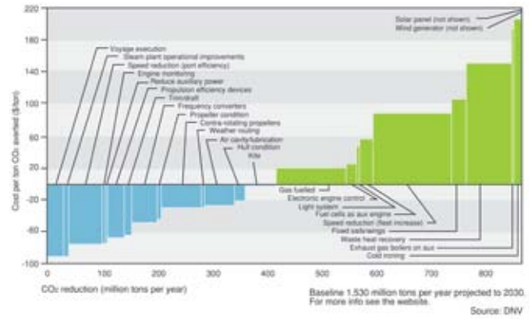
Our politicians must realise that without liberalisation, without investment in rail rather than road, there will be no hope of even coming close to the targets for cutting carbon. ■

The lo-tech green revolution

Ideas about modernising transport often involve grand visions of futuristic technologies—and vast expenditure. But a quick survey of pioneering ideas around the North Sea shows that we can make a big difference armed with existing equipment and a desire to change.

Less fuel, clean fuel

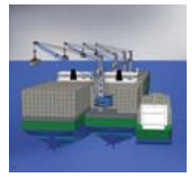
Even though shipping is by far the cleanest of our transport options, scientists and engineers are still working towards 'zero emissions' shipping. But one project has found that you can quickly cut emissions without any fancy new combustion engine or super fuel. Indeed, shipping operators could reduce their emissions by 14% simply with better voyage planning and small speed reductions. These behavioural changes can save fuel and generate considerable cost saving as well. A survey by the project shows that existing technologies and methods could halve emissions from ships; indeed by adopting a wide package of measures operators could cut emissions by about 45% with no overall impact on profitability. See what is possible at **www.cleantech.cnss.no**.



Moveable harbours

Shipping in the north sea use a system of 'hubs', where large deep-sea vessels can load and unload, and 'spokes'—smaller ships carrying cargo to the many small ports across the region. But even in this busy maritime region there are few deep-water ports where this 'transhipment' (moving cargo from big ships to small boats or vice versa) is possible; port stops often involve a considerable detour.

To compound the problem, the arrival of newer, bigger ships requires ports to invest in expensive new quays, yet there is little land available for ports to expand. So what can they do?



Enter the Floating Container Storage and Transhipment Terminal (FCSTT)—a cheap and flexible solution that takes the cranes to the ships rather than the other way around. It is good for port costs, for fuel efficiency and for the environment. From its conception in Scotland, the FCSTT has already attracted attention from as far away as Asia and Africa. Read more at **www.stratmos.com/home/dp5---offshore-hubs-and-mos-linkages**.

Knowledge for the new transport system

The days when you could run away from home at 14 to become a cabin boy and sail the seven seas are long gone. Jobs in today's shipping industry and associated landside services are complex, highly skilled and hi-tech—and a major source of employment. One recent survey found that in the north-west German state of Niedersachsen alone over 41 000 people depend on the shipping industry for employment.

Transport managers need up-to-date knowledge of a rapidly developing market and to have a firm grasp of all the associated regulations. The newly established Northern Maritime University, a virtual network of universities from across the North Sea, keeps up-to-date with all of these developments. It offers students—mostly people in the industry seeking to upgrade their qualifications—online access to the latest academic thinking and professional development in their field. Enrol now at **www.nm-uni.eu**.