

Think smart to save fuel

With the global shipping industry now committed to reducing CO₂ emissions by 30% within 20 years, we all need to come up with some good ideas...



It's official: the shipping industry's going to clean up its act. As reported in the Telegraph last month, the International Maritime Organisation has finally agreed measures to cut greenhouse gas emissions from the world merchant fleet.

Not before time... We all know that, per tonne-kilometre travelled, shipping by sea is a greener alternative than air or land freight, but the fact remains that the sheer size of the world's merchant shipping fleet makes it a more significant polluter than other forms of commercial transport.



Above: The BBC Sky Sails, one of the vessels now using a towing kite to contribute to its propulsion. Picture: Sky Sails
Left: An artist's impression of the Magnus Voss system, which plans to put wind-powered generators on a ship's deck – with the aim of reducing fuel consumption by up to 50%. Picture: Magnus

Research published last month in the Sunday Times newspaper showed that, if the world's shipping fleet were a country, it would be the fifth-biggest polluter in the world, producing more carbon dioxide emissions than Japan or Germany.

It is clear that CO₂ reduction needs to be addressed at a global level, and there was a breakthrough at the IMO marine environment protection committee in July this year. Despite opposition from China and Saudi Arabia, members voted to address the problem on two fronts. Newly-

built ships will have to conform to the IMO Energy Efficiency Design Index, and all vessels will have to follow the Ship Energy Efficiency Management Plan.

The regulations will be introduced as amendments to the MARPOL convention and are

expected to come into force in January 2013. They will apply to all ships of 400gt and above, and the aim is to cut CO₂ emissions from shipping by up to 30% within the next 20 years.

So far so good, but assuming the industry will continue to be responsible for moving 90% of the world's goods, how exactly are we going to meet the target? As always, the advice on reducing emissions falls into two main categories: use less fuel and find alternative ways of generating power.

Saving fuel

It makes sense that if you burn less fuel, you will have fewer emissions. The key principle here is energy efficiency: make sure you're getting the most from the fuel you burn, as we do when we insulate our homes to keep the heat in. Using modern engines is a good start, and these are usually more energy efficient than old ones and get the same result from less fuel.

Smart voyage planning can make a surprisingly big difference. Allowing more time for the journey will enable a vessel to travel at a reduced speed ('slow steaming'), which uses less fuel per mile than travelling quickly. The IMO has estimated that a 10% reduction in speed would result in a 23.3% drop in emissions across the global fleet. We can also use good planning to avoid waste, as in the tanker sector's Virtual Arrival initiative, which aims to stop vessels hurrying at full speed to ports that aren't ready to receive them and then wait. Virtual Arrival improves communication between a vessel and its destination port so the vessel can slow down mid-voyage and arrive only when the port is ready.

Ship design can play a part too, as the more easily a vessel slips through the waves, the less hard the engine has to work. Low-friction hull paint is a recent innovation in this area, as adopted this year by the Japanese firm MOL on its newbuild car carriers.

Alternative power generation

Cutting back is one thing, but it would be better for the environment if we didn't have to burn CO₂-generating fossil fuels (oil, gas or coal) in the first place. There has been a huge amount of research into green or 'renewable' power generation in recent years, but no single method of generation has emerged as a replacement for fossil fuels. Instead, it is currently accepted that we need to look at a range of methods, each one contributing a certain amount of the power we need.

Some of these techniques work particularly well at a micro level, such as solar panels for heating household water. But we are also seeing them scaled up for national power generation, as with the vast offshore wind farms now under construction. States in the European Union have committed to generating 20% of their electricity by renewable methods by 2020.

In the shipping industry, green power generation needs to operate on a vessel-by-vessel basis, and there are some interesting ideas out there. Quite well-known now is the SkySails towing kite – developed in Germany – which is fixed into the air from the bow of a ship and uses the steady wind at the altitude of 100m-300m to contribute to the vessel's propulsion. The towing kite aims to reduce a ship's annual fuel consumption by 10%-35%, and is currently being trialled on a number of different vessel types worldwide.

Another emerging invention is the US-based Magnus Voss,

which puts wind-powered generators in funnel-like cylinders on a ship's deck and claims to reduce fuel consumption by up to 50%. And there has been great interest in a shipboard wave-power device developed by Alstair Shepherd of Southampton University. The device uses the motion of the ship to generate electricity but is not immersed in water, so it overcomes the problems of sea damage that have affected previous wave power generators.

Achieving the IMO target

There is not room here to explore all the possible techniques for cutting CO₂ emissions from shipping, but even in this brief overview, we have seen that there are many good ideas out there. The problem is that it's still early days for many of the fuel-saving techniques and alternative power devices. If we are really going to reduce emissions by 30% within the next 20 years, the pace of change needs to increase, and more large companies need to lead the way.

The Telegraph will be closely following the industry's efforts to reduce its emissions in the coming years, and we welcome reports from readers about this process. If your company is adopting some of the new fuel-saving ideas or alternative power generators, please send us a photo and let us know how the new initiatives are working on your vessel. With your help, we hope to be able to highlight good practice and encourage the rest of the industry to strive harder to meet the IMO target.



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The Virtual Arrival initiative might well reduce stress as well as fuel emissions... Picture: Inertank/OCIMF