Ships Could Soon Be Fueled by Floating Sacks of Algae

Yesterday, we started our look at the low-carbon future of shipping. We've covered autonomous ships – of course. But there are also more surprising technologies: the renaissance of sail; and even the unexpected approach of designing for lower speeds.

Today, we'll continue our look at this vital industry – that is so often overlooked. We'll be picking a range of new technologies, which are soon to make waves. Again, it's all about fuel economy.

New fuels

We're used to ships powered exclusively by diesel. As you may be aware, diesel is our "Big Short". The fact that diesel is both highly polluting and non-renewable means that it's going to take an economic battering, soon. But it's not just road transport that's affected by the air pollution backlash. Ships' bunker fuel has also recently been subject to severe cuts in permissible pollution levels.

Accordingly, it's worth looking at some new fuels. These are somewhat diverse – and could include biofuels made from a variety of crops. Many of the new generation biofuels are made from non-food crops – grown on marginal land, unsuited to agriculture. We might even power ships using algae grow at sea, in floating bags!

Another alternative method for producing renewable liquid fuels is the power-to-fuels process. This is far more realistic for use at scale. This approach involves using surplus renewable electricity to generate hydrogen, then using that to create other chemical fuels (eg, methane – "natural" gas). Novel fuel types can also be produced, such as the bulky-but-clean dimethyl ether (DME). In this way, we can enjoy the benefits of a liquid-fuelled global shipping industry, long after the demise of fossil fuels. We can expect solar to play a big part in this renewables revolution. However, there's actually a chance that a long-overlooked form of renewable power could play a significant part in our energy future.

Companies to watch: ITM power, Oberon Fuels.

Bubble lubrication

Air lubrication involves blowing bubbles through the hull of a ship, allowing it to slide more easily through the water. This works particularly well with flat-bottomed boats. One interesting side-effect is that ships often leave a bright wake, lit up by the reflection of sunlight in the tiny bubbles. This conveniently enables sunlight to be reflected off the water's surface, cooling the sea. A brighter ocean directly helps prevent global warming, by reflecting sunlight. Additionally, it also helps remove carbon dioxide from the atmosphere – as colder waters better absorb CO2.

Companies to watch: Mitsubishi, Foreship, Shipwright.

Tunnels

Norway's wrinkly coastline poses many challenges. Accordingly, the country is at the forefront of civil engineering technology. Previously, we've covered its novel underwater road tunnels. Now the country is planning a different sort of tunnel – the world's first for ships. The Stad Ship Tunnel will bypass a particularly dangerous stretch of water, therefore reducing insurance and accident costs. Shortcutting a peninsula will also save considerable fuel, and time. On its own, this would merely be a curiosity. However, it could mark the start of ship tunnel construction worldwide. This is a radical alternative to canals – the traditional method of crossing land.

Companies to watch: Snøhetta, Norconsult.

Battery powered

Electric propulsion in ships is nothing new – but most use electricity generated on board, with thermal power plants. Cheaper batteries are now starting to change this – and some modern ships now don't use chemical fuel at all.

The short trip length, and extended loading times, of short-haul ferries make them particularly suited to electric operations. Again,

Norway is marching a – with the recent commissioning of the “Ampere” ferry. That’s an unsurprising lead – as it’s already leading in uptake of electric vehicles.

Surprisingly, one of the key problems with deploying this technology actually has nothing to do with the ships. Often, the power supply on land isn’t big enough to tolerate the charging loads. This has sometimes been fixed, by installing a second, shore-based set of batteries. That’s interesting – as it’s yet another use case for the ever-expanding world of high-energy static batteries.

Companies to watch: Multi Maritime, Siemens (Marine).

Solar power

In sunnier climes, boats can make their own energy. The Aditya is India’s first solar ferry. It’s used for under six hours per day – giving it plenty of time to recharge its batteries.

It’s unlikely that we’ll see solar vessels used for bulk shipping – at least for a while. Unlike ferries, cargo ships require continuous power, night and day. However, for slow-moving, low-value cargo, a solar-propulsion ship might one day make sense. It’s already a sensible complement to sail power, as we’ve seen.

Companies to watch: Navgathi Marine Design %26 Constructions, Alternative Energies, EVE System.

I hope you’ve found our review of the ships of the new millennium to be interesting. Please do let us know what you think: andrew@southbankresearch.com.

Best,

Andrew Lockley
Exponential Investor