

What's the Future for Aviation and Shipping?

IHS Markit is keeping a close eye on to the future of aviation and shipping, both high-growth, oil-thirsty sectors that are increasingly attracting the gaze of policymakers.

In this Q&A, subject matter experts Ronan Graham and Hédi Grati discuss key findings from our **Reinventing the Aircraft and the Ship Multi-Client Study**.



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Q. How is demand for aviation and shipping going to develop in the next three decades?



One of the main challenges with decarbonizing the aviation sector is that this is fundamentally a growth sector at a global level. We often hear of the growth in the flight shaming movement in Europe, and we hear that the Chinese high-speed rail network is expanding rapidly...and there is a perception that those things will lead to reduced demand for air travel in the future. But there are core, fundamental factors which will push aviation demand sharply upwards in the future. Population growth in the developing world, a continued expansion of the Middle class. These factors create strong demand for aviation and far outweigh the constraining factors that I mentioned before. We're looking at demand for air travel growing by perhaps a factor of 2-3 times on today's levels by 2050. And that's the challenge. How do you decarbonize a sector that is integral to the global economy, and is rapidly growing?



Shipping has got a comparable issue. We do expect seaborne trade of containerised goods, energy and non-energy commodities all to continue growing steadily, but not as fast as aviation. Even in a greener scenario from an energy mix perspective, the call on shipping remains strong. Rather than a factor of 2 or 3 like what you were saying, we expect to see shipping activity roughly double by 2050 compared to today's levels.

Q. What are policymakers doing to encourage the aviation and shipping sectors to decarbonize?



As shipping activity doubles over the next 30 years, the International Maritime Organization's signatories agreed to reduce GHG emissions by at least 50% compared to the year 2008. So, if you think about this per tonne shipped and per mile moved around, that is a challenging target. The target is clear, but the means to get there are not. The IMO is still to firm up the initial strategy it proposed in 2018, this is due by 2023, and it will be interesting to see whether shipping will be subject to further efficiency targets, carbon taxes, mandatory speed reductions, or even low-carbon fuel mandates.



The targets are similar, if not even more challenging for aviation. At the international level – IATA – the big aviation industry body has a target to reduce emissions from international aviation by 50% on 2005 levels by 2050 – and ICAO the International Civil Aviation Organization – which is a specialized organization of the UN – has the job of coordinating the decarbonization of aviation through various means.

Q. What are the options for decarbonizing aviation and shipping?



These are hugely ambitious targets and the reality is that nobody really has a plan on how to achieve them. We know that the laws of physics will not allow us to power a large commercial aircraft with an electric battery. What aviation needs is a drop in liquid fuel that is less carbon intensive than petroleum jet fuel. Many people point to biofuels as the answer. But will there be enough biofuels to go around, and do biofuels really provide the carbon intensity reductions that we need to seriously decarbonize aviation? It's highly questionable.



Luckily, we just stay afloat in the sea, no need to take off, so we have got a few more options, hybridization can be considered, and the likes of hydrogen and its carriers such as ammonia and methanol are being actively looked at. Additionally, LNG is already making inroads, although that remains a fossil fuel at heart. And then, similar to aviation's outlook, we also look at biofuels and power-to-liquid style synthetics, including LNG substitutes like liquefied biogas or PtL methane.

The other way to reduce emissions from shipping is obviously through being more efficient, whether it is through engine improvements, hull modifications, better capacity utilization, voyage planning or ship-shore interfaces, all these aspects have got a role to play in reducing fuel consumption. The IMO already has an increasingly challenging standard for newbuild vessels, and it is likely the existing fleet will have to make incremental improvements too.



In the aviation sector, there is significant potential for improvements in efficiency too. We'll see operational efficiency gains, we'll see engines improving, we'll see the increased use of composites, and lighter materials. But those efficiency gains only take us so far.

The aviation sector needs another way to decarbonize. And that is why it is so focused on offsetting. Because it cannot decarbonize to a serious level 'in sector.' So, ICAO has implemented the CORSIA program – which foresees that all carbon emissions above 2020 levels in international aviation will be offset through an investment in a carbon reduction project in another sector of the global economy. But, as you know, offsetting is a highly controversial practice...



While offsetting is an interesting concept, we don't see it work in shipping. From all signals we pick up, the decarbonization and its associated market-based mechanism should focus on actual in-sector shipping emissions, rather than to "buy its way out of the problem", so our expectation is that offsetting won't be in the mix, or at most marginally.

However, our product price analysis shows that zero-carbon fuels remain expensive compared to their fossil alternatives throughout the forecast, and even more so in a world where falling demand for fossil fuels depresses its price. So, to level the playing field and give those new fuels a fair chance of being scaled up to the commercial volumes needed, I agree that ultimately there will be need for a carbon-based price equalization. This has been discussed at the IMO 10 years ago, but will undoubtedly come back on the table.



For sure, decarbonizing these two sectors is not a straightforward task. In aviation, we have big pressure to decarbonize but no obvious solutions. What's certain is that if serious decarbonization of the aviation sector is to be pursued – whether that be through alternative fuels or offsetting – it will come at a cost. Is that a cost that consumers will ultimately want to pay for a decarbonized aviation sector? It remains to be seen.



For shipping the pressure is mounting to tackle GHG emissions, and with offsetting off the table, the cost will initially be covered by the fuel buyers, and ultimately by end- consumers. Unlike in aviation, the impact on a litre of gasoline, a flat-screen TV, a pair of trainers, or a car is going to be less pronounced than on long-haul or even short-haul airfares. So, from that perspective, the wider consumer impact might be less visible than for aviation. Additionally, and this should not be underestimated, we are not just talking about reinventing the actual vessel, but also the entire supply infrastructure and building production capacity for fuels that are still to be developed at the scale the world needs.

Reinventing the Aircraft and the Ship was a collaborative project undertaken by the IHS Markit energy, aerospace and defense, and maritime and trade teams, in conjunction with our project partners.

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Reinventing the Aircraft and the Ship

The future of aviation and shipping

IHS Markit has launched a major new multi-client study investigating the role that the energy industry will play in supplying the fuel for planes and ships of the future. For two different scenarios, we forecasted demand in these markets, potential for efficiency gains, plane & ship sales and the future energy demand mix.

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