

NYK issues first green bond from the shipping sector – green enough for now but not for long

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First green bond from the shipping sector

Japan’s Nippon Yusen Kaisha (NYK) closed the first green bond in the shipping sector on 24 May 2018. The JPY10bn (USD92m), 5-year bond benefits from a [second party opinion](#) from Vigeo Eiris.

Decarbonising shipping is crucial. Shipping currently accounts for c2.5% of global emissions, but left unchecked [shipping emissions are expected to grow by 50-250% by 2050](#).

Shipping decarbonisation targets

In April, the International Maritime Organisation (IMO) set international [targets for emission reductions in the shipping sector](#): at least 40% cut in greenhouse gas (GHG) emission intensity by 2030 and 70% by 2050; and, at least 50% absolute emission reductions by 2050, compared to 2008 levels.

Aligning shipping with the Paris Agreement of limiting global warming to below 2 degrees Celsius and making efforts towards 1.5°C requires even more ambition than the IMO’s current targets. Shipping was not directly covered by the Paris Agreement, but alignment to the Paris Agreement [means full decarbonisation of the shipping sector by 2050](#).

The IMO mentions they will make efforts towards decarbonising shipping, but it is currently an aspirational aim rather than a concrete target. Future revisions of the IMO-targets could see a higher level of ambition.

NYK green bond: good disclosure and transparency

Proceeds from NYK’s green bond finance and refinance LNG-fuelled ships, LNG-bunkering ships, ballast water management systems and SOx scrubber systems. From a climate perspective, we focus on the LNG-fuelled ships and bunkering ships.

The [second party opinion](#), prepared by Vigeo Eiris, highlights that NYK is also improving the fuel-efficiency of the ships by making changes at the design stage. Disclosure of the level of GHG-emission reductions expected from the improved design would have been good to see.

A second component of fuel efficiency is how the ships are operated. Software and data is expected to further improve the emissions performance of the ships beyond what is achieved by the improved design, according to NYK. However, the level of expected emissions reductions is again not quantified.

Operational optimisation is not financed with the proceeds from the green bond, but will be applied to the ships financed by the green bond, since it is applied to all the ships in NYK’s fleet.

The post-issuance annual reporting can play an important role in ensuring the disclosed expected emission reductions are being achieved in practice, as well as quantifying the emission reductions from operational optimisation that is not disclosed at this stage.

Under its green bond, NYK has committed to reporting on the full environmental impact using operational data.

Switching to LNG is insufficient to keep global warming under 2°C

In its opinion, Vigeo Eiris states:

NYK’s LNG-related projects being expected to reduce GHG emissions by less than 30% (respectively 21% and 15%), the targeted objectives for climate change mitigation and energy transition are not considered significant in terms of the IMO strategy to achieve an absolute reduction in the volume of emissions of at least 50% in 2050.

Climate Bonds takes the position that green bond investments should be in line with the very steep downward emissions trajectory that science tells us we need to keep global warming well below 2°C in line with the Paris Agreement.

We simply do not have the time for incremental improvements.

Deep cuts in emissions are required across sectors.

Since the ships financed by NYK’s bond will be in operation well into the 2030s, we should look at how their emissions performance compares to where the decarbonisation trajectory needs to be by this time.

NYK green bond: Emissions reductions

<i>Emission reductions relative to current Heavy Fuel Oil ships</i>	LNG-fuelled ships	LNG-bunkering ships
CO2 reduction	30%	30%
Total GHG reduction (GHG emissions accounting for methane leakage)	21%	15%
NOx	30% refinanced assets 86% new/financed assets	76%
SOx	99%	99%
Particulate matter (PM)	100%	100%

The switch to LNG-ships reduces total GHG emissions by 15-21% and CO₂ alone by 30% compared to NYK's heavy fuel oil ships.

Therefore, simply switching to LNG does not meet the 40% GHG-emission reduction target IMO has set for 2030, or NYK's own company-wide target of reducing shipping and maritime CO₂ emissions by 40% by 2030. On its own, LNG also falls short of the steep emission reductions required to meet the Paris Agreement.

The fuel efficiency improvements NYK are implementing at the design stage will move the ships' performance closer to the emission reduction targets. But the lack of quantified disclosure on emission reductions expected from fuel efficiency design improvements means we don't know how much closer.

We will look to post-issuance reporting to tell us.

On-going reporting should also help quantify and monitor the contribution of the operational fuel efficiency, since this can fluctuate year by year.

Renewable shipping essential – but not yet viable

In the words of [the second opinion](#):

LNG is the best available option for full scale application to reduce emissions in the global shipping industry, especially for long-distance navigation purpose.

The main renewable fuel alternatives identified for decarbonizing shipping – ammonia and hydrogen – are not yet commercially available.

Ammonia and hydrogen are in the R&D stage. The uptake of ammonia and hydrogen could start in 2020, but mainly after 2025, [according to the OECD](#). NYK are doing R&D on hydrogen ships (no bond proceeds will be applied towards R&D).

Biofuels are more developed, with bio-fuelled ships already in operation. Biofuels can offer more substantial emission cuts than LNG, according to Dr. Tristan Smith, Reader in Energy and Shipping at University College London. But the challenge here is that biofuels for shipping are available only in limited quantities, which means ships currently often use a mix of heavy fuel oil and biofuels.

Biofuels also come with the added caveat of fulfilling sustainability criteria of their own. *Climate Bond Standard [criteria for bioenergy](#) are currently out for public consultation.*

Ultimately a shift to renewables is essential to meet the shipping sector's emission targets and align it with the emission trajectory of keeping global warming well below 2°C. Fuel efficiency improvements at the design stage and during operations are an important complement to the shift to renewables.

Maximising fuel efficiency is particularly valuable in the short term: while the application of renewable fuels is still in development, we need to use all the available tools to maximise emission reductions.

Shipping in low-carbon limbo

The long lifetime of NYK's LNG-ships means they will operate well into the 2030s, i.e. past the point when renewable energy alternatives are expected to be viable at scale.

Here's the problem: Investing in new LNG-vessels today locks shipping into fossil fuel usage, delaying the transition to renewables.

So, the only way to avoid lock in is to hold off investing in new ships until hydrogen and ammonia become viable. However, delaying investment in new ships doesn't make commercial sense for shipping companies.

From an asset-perspective, shipping companies remain limited to investing either in traditional heavy fuel oil ships, and committing to running them on biofuels as much as possible, or LNG-ships, and optimise for fuel efficiency at the design stage.

Shipping companies can also maximise fuel efficiency in operations, in particular by reducing speed, but knowing the extent of the operational fuel efficiency relies on post-issuance reporting.

The lack of viable low-carbon alternatives at the asset-level sets shipping apart from other sectors like transport and fossil fuel production. Climate Bonds Initiative excluded Repsol's 2017 green bond from its green bond database. [Repsol's 2017 green bond financed improved efficiency in gas production](#).

Though the bond did facilitate marginal emission reductions, locking in the use of fossil fuel, when renewable energy alternatives were already viable, does not align with the need for rapid emissions reductions.

It's worth mentioning that LNG-ships are also not necessarily fully locked into fossil fuels.

The second opinion highlights that LNG-ships can be converted to run on alternative fuels.

LNG ships could [transition to bio-LNG fuel](#), though the practicality remains uncertain due to limited feedstock of bio-LNG. Fuel cells is another potential future ship modification NYK mentions.

Best practice would be to incorporate flexibility at the initial design of the ships to more easily retrofit the ships to run on renewable fuel in the future.

Methane leakage must be addressed in LNG assets

When LNG is transported and stored on ships and bunkering vessels, unburned methane leaks into the atmosphere. If this methane leakage is not controlled, it can leave LNG with a worse GHG-emissions profile than traditional heavy fuel oil ships.

Methane is also a greenhouse gas. Although it doesn't last as long as CO₂, it is around 28 times more powerful in its warming potential.

[Methane leakage varies significantly for different LNG ships](#). NYK aims to minimize methane slip by ["exploring a possibility to use state-of-the-art technologies for managing methane emissions and preventing methane slips."](#)

At first we were concerned that this is not a sufficiently strong commitment to controlling methane emissions. But we were assured by methane emissions being quantified and accounted for in the disclosed GHG emissions reductions for the LNG-assets, which suggests certainty in which technologies will be used to control methane leakage.

Upstream emissions are excluded from the analysis of NYK's green bond; the Climate Bonds database currently only considers what's within the remit of the bond.

NYK's green bond is included in the Climate Bonds database

At the end of the day, the assets financed by NYK's bond are currently the lowest-emission asset option for long-haul shipping, provided methane slip is kept to an absolute minimum. Annual reporting will be crucial to provide assurance that the expected levels of emission cuts are achieved in practice.

Fuel efficiency optimisation is important, particularly when designing the vessels, but also during operation.

While renewable fuels are not yet commercially viable for long-haul shipping, best practice would be to incorporate flexibility at the initial design stage of the ships to easily retrofit the ships to run on renewable fuel in the future.

The [Climate Bonds Taxonomy](#) and [Climate Bonds Standard](#) are based on climate science and limiting global warming well below 2°C, but it also takes commercial viability into account. This is why sector-specific Industry Working Groups feed into the Technical Working Groups, which determine the criteria. Both groups' members are external experts.

The Taxonomy and Standard are flexible. As renewable alternatives start becoming viable – expected in the next 3-5 years or so – new green bonds in the shipping sector will have to offer more drastic emission reductions than we see in this green bond from NYK to qualify for inclusion in our green bond database.

Climate Bonds Initiative launching shipping criteria development process

Climate Bonds is currently establishing a Technical Working Group (TWG) and Industry Working Group (IWG) to develop specific eligibility requirements for shipping-related green bonds. The Working Groups will consider options at the operational level as well as the asset level, and establish a clear baseline to measure emission reductions against. NYK will be a member of the IWG.

If you would like to join the TWG or IWG, get in touch with [Katie House](#), Senior Research Analyst.