

The journey towards carbon zero emissions – The situation up to now and prospects for the future

Ted Petropoulos

Nafs

March 2023

There are numerous crucial questions to be asked regarding the transition to zero emissions. The most important one is where we stand now regarding shipping's progress towards said goal. Let us firstly ask what exactly is this goal? IMO has set specific dates for the gradual reduction of emissions. By 2030 the objective is to reduce CO₂ by 40% for shipping compared to 2008. The next milestone is in 2050 when CO₂ emission reduction target is 70% compared to 2008 and 50% for all Greenhouse Gases. In the meantime EEDI phase 3 will come in effect which aims up to 30% reduction in carbon intensity for newbuildings. These dates are not far away at all. In fact, 2030 and even 2050 are really only a young bulker's lifetime away. Decisions now will impact on the above dates and the future of shipping as an industry and in relation to shipping's role towards climate change.

The current fleet stands at about 3bn DWT and is expected to exceed 5bn DWT tons by 2050 (Man Energy Solutions). Thus, it would be useful to see where we stand now so that we can assess our rate of progress towards said goal.

1. The position now – current operational fleet

According to Clarkson's WFR there are 255 vessels built up to date with alternative fuels of which 11 are Greek. It should be noted that there is currently a scarcity of data on the use of alternative fuels but we are beginning to get a clearer idea via available data.

The journey towards carbon zero emissions – The situation up to now and prospects for the future

Ted Petropoulos

Nafs

March 2023

Table 1

Number of Alternative Fueled vessels by Fuel and by Type of Vessel

Main Engine Fuel Type	No. Vessels
LPG	111
Biofuel	71
Methanol	29
Ethane	23
Hydrogen	11
Nuclear	10
Petrofin Research © - Source Clarkson's WFR	
* NB: Though these alternative fuels may require specific engines, they have variants compatible with existing technology.	

Vessel Type	No. Vessels
Tankers	15
Dry Bulk	8
Containers	14
LPG	185
Petrofin Research © - Source: Clarkson's WFR	

Petrofin Research ©
www.petrofin.gr
March 2023

According to UNCTAD, between 2012 and 2022 there was a reduction in carbon intensity. In particular, for container ships it fell by 21% and for dry bulk by 18%. Tankers' decline, however, was only 1%.

It should be noted that this reduction came to be by reducing speed rather than using alternative fuels. Latest EU Maritime Transport data report states that most ships calling in the EU have reduced their speed up to 20 % compared to 2008. Globally the reduction is of the order of 17% since the 2000s (Clarkson's SIW). For example, in the Cape sector there was a reduction of approx. 0.5 knots in average speed in 2022. Thus, cutting speed has been the main source of emission reduction.

The journey towards carbon zero emissions – The situation up to now and prospects for the future

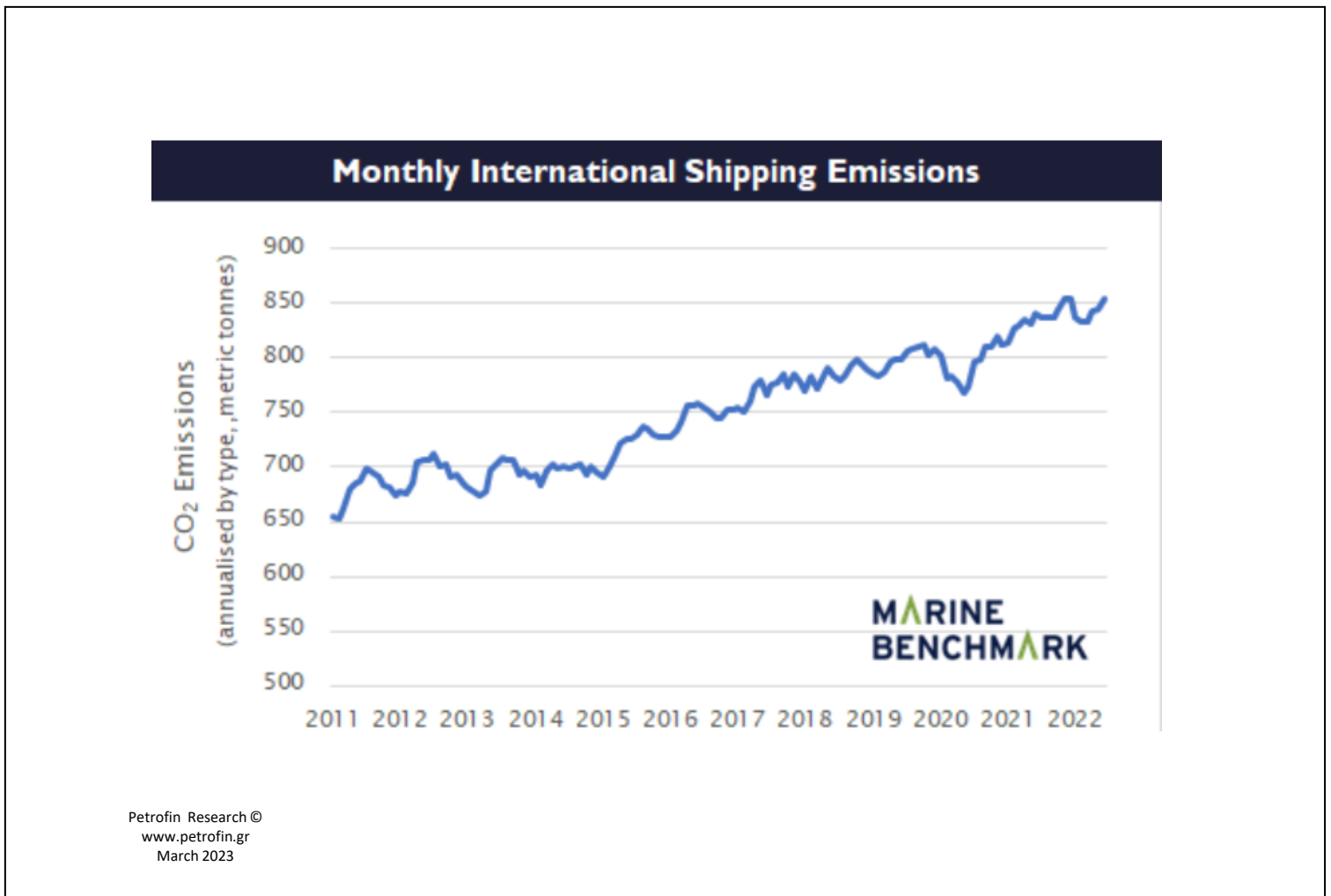
Ted Petropoulos

Nafs

March 2023

In the Marine Benchmark's Graph below, global emissions across all sectors rose by approx. 30% between 2011 and 2022 (Graph 1). However, taking into account that for the same period the global fleet has grown by 55% from 1.4bn DWT in 2011 to 2.2bn DWT in 2022 (Clarkson's WFR). This implies that there was an actual reduction in the emissions per DWT ton. This was almost exclusively the result of speed reduction.

Graph 1



2. The situation with the orderbook – 2023 and beyond

The Total Global orderbook for 2023 and beyond currently stands at 4733 vessels (of all fuels – Clarksons – WFR). Looking into top owner nations we have:

Breakdown of orderbook by top owner nationality:

The journey towards carbon zero emissions – The situation up to now and prospects for the future

Ted Petropoulos

Nafs

March 2023

Total Greek orderbook: 247

Total China's orderbook: 888

Total Japan's orderbook: 591

Regarding alternative fueled vessels in the orderbook, globally there are currently 224 orders for 2023 and beyond. Zooming in into these, we observe that the Greek alternative fuel vessel orders are 15, China's are 28 vessels and Japan's 20 vessels.

This underlies the doubts and insecurity in deciding which fuel to choose and whether to proceed with such new technology and the investment risks it might involve.

3. Conclusion

It is self-evident that there is insufficient progress. The main reasons relate to the absence of alternative reduced and zero emissions technology currently and in the near future. To achieve such new technology available requires massive R&D. Who is motivated to provide such vast sums without any orders in place? Moreover, what is the likely cost of such new technology and who would pay for it? Given the large capital requirement involved, owners themselves are unlikely to have the resources and appetite in investing such capital into new unproven technology without long term employment that would secure a satisfactory ROI. Are charterers willing to provide such long term commitments? Are they prepared to share in the investment cost? I would think that charterers are unlikely to wish to be involved and would simply wait for owners to decide to invest into new technologies in view of the regulations.

We also need to consider the possible role of state support. Just like with EVs where there are grants provided to reduce the cost of a new EV, the same could be done to enable owners to reduce the investment risk. Are states likely to provide such grants?

There is talk of emissions fines being used to support R&D, but would the industry and consumers accept such high penalties affecting prices and how would the mechanism work?

The banks have supported lower emissions related loans, but this alone is not a significant contribution if we are talking of a big increase in newbuilding costs.

It would appear that despite the rhetoric, states are looking into emissions reduction in order to be seen to be doing something and as a tax measure. The recent Ukrainian war and its aftermath of high energy prices has actually resulted in more shipments of fossil fuels and a de-emphasis from emissions reductions. Hopefully, this will be redressed soon.

Investment in fossil fuels, especially oil, is going up. The most recent example is Saudi Arabia (Aramco) that has stated they will expand into oil and gas production and exploration further after having reported a profit of more than \$161bn through the sale of fossil fuel. This, admittedly, renders the 2050 landmark very difficult to achieve, as can be seen by IPCC's prediction for substantial falling short of the target (Graph 2).

The journey towards carbon zero emissions – The situation up to now and prospects for the future

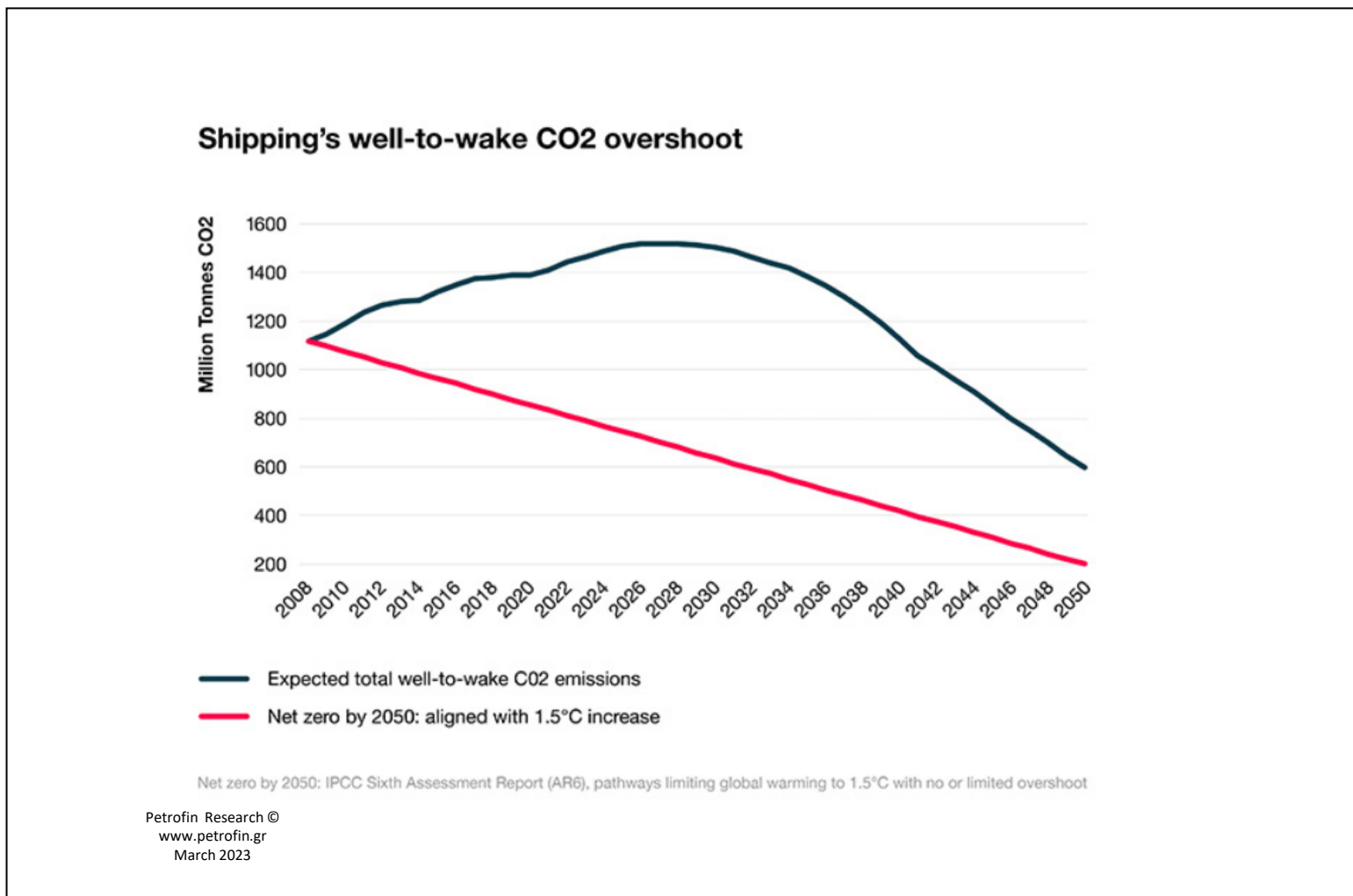
Ted Petropoulos

Nafs

March 2023

There are also disagreements as to the applicability and adoption of EEDI and CII and other yardsticks, which delay the outlook towards the 2030 and 2050 goals.

Graph 2



Moreover, there are also many who see the dual fuel ordered vessels as only a minor step in the right direction and hardly a game changer.

Shipping is currently not looking as if it would hit the desired target. Owners prefer to wait and see which fuels will likely rise as viable alternatives or invest in current technology. New technology is still

The journey towards carbon zero emissions – The situation up to now and prospects for the future

Ted Petropoulos

Nafs

March 2023

being tested. There is, however, an important increase in discussing and exchanging views and taking a more serious approach to the impending environmental impact. State emphasis shall shift from just issuing regulations and standards to the practical aspects of achieving them.