



THE INTERNATIONAL PROPELLER CLUB *of the United States*

An international business network dedicated
to the promotion of the maritime industry,
commerce and global trade.

ZERO EMISSION VESSELS (ZEV)



There is a global drive to decrease carbon dioxide (CO₂) as well as Green House Gases (GHG). According to studies by the International Maritime Organization (IMO) international shipping accounts for 2.2% of the global CO₂ emissions and could grow between 50% and 250% by 2050 primarily due to the growth of international shipping. IMO has established a goal to reduce CO₂ emissions by 40% below 2008 levels by 2030 and by 85% by 2050.

Domestic vessel emissions may be required to have Zero emissions by 2050. Given the lifespan of a vessel – that could mean that many vessels built after 2030 will have to have zero emissions if they are to operate beyond 2050 – particularly if they operate in an Emission Control Area (ECA).

There are several technologies available for Zero Emission Vessels (ZEV) including battery, ammonia, hydrogen, and fuel cells. The technology that is appropriate for any vessel may be dependent upon the size of the vessel, length of the voyage, amount of time in port, and the area of operation of the vessel.

Europe

Vessel emissions account for approximately 13% of greenhouse gas emissions from the transportation sector in the European Union in 2015. The European Community has been planning on the eventual use of Zero Emission Vessels for several years. In 2013, the EC established a 3-step strategy for vessel emissions:

- Monitoring, reporting and verification of CO₂ emissions from large ships.
- Greenhouse gas reduction targets
- Further measures, such as market-based measures.

In November 2018, the Transport and Environment issued a study titled “Roadmap to decarbonizing European Shipping”. This study found that EU shipping is responsible on average 200 Metric Tons of GHG per year. The study identified how pathways that may be feasible to decarbonize shipping “would likely affect the future EU renewable energy supply needs.” It found that initiatives such as improvements in ship design efficiency will not meet the fuel efficiency improvements needed to decrease emissions to the levels needed. Therefore, “The decarbonization of shipping will require changes in on-board energy storage and use and the necessary accompanying bunkering infrastructure.” The main findings and recommendations of the study were:

- Prioritize battery-electric and hydrogen technologies.
- The investment required for additional renewable electricity production, transmission grids, shoreside charging station, hydrogen production plants, and new vessel propulsion and energy storage systems must be evaluated.
- The least additional demand on the European renewable energy supply would likely come from decarbonizing EU short-sea shipping because these are usually smaller vessels engaged on shorter voyages. The study found that “The technology is readily available to start this process and range can be extended as technology matures.”

In July 2019 the British government announced a “Clean Maritime Plan” which required vessels ordered beginning in 2025 must have zero-emission capabilities. They also launched a \$1.25 million competition to find new ways to cut maritime emissions.

In December 2019, the International Chamber of Shipping (ICS) announced plans for a \$5 billion fund to design zero emission ships. They said that \$2.00 should be levied on each ton of ships fuel to support research into clean engines. ICS has said that this initiative is supported by owners of 90% of the international merchant fleet.

In March 2020, the EU Transport Ministers signed a declaration that targets “a carbon-neutral and zero pollution waterborne transport sector” in the EU by 2050. There is not a consensus in Europe regarding whether the EC should simply follow the IMO standards or whether they should adopt their own measures to ensure that the IMO goals are met.

United States:

The Federal Government does not have a plan or program to evaluate zero emission technologies for vessels or assist the maritime industry in transitioning to these technologies. Individual vessel owners are having zero emission vessels designed and built. These are mostly small passenger vessels such as ferries and tour boats. The largest project to date is the plan for the Washington State Ferries in Seattle to transition to a zero-emission ferry fleet by using funds from the Volkswagen settlement fund.

To facilitate and expedite the development of zero emission vessels in the United States the Federal Government should:

- Develop a Zero Emission Vessel Strategy that includes an evaluation of the available technologies that may be appropriate to be used on various vessel types and classes such as ferries, harbor tugs, dinner cruises, and towing vessels.
- Provide grants to U.S. shipyards and vessel owners for series construction of 10 zero emission vessels to help decrease the life-cycle cost of ZEV and shoreside energy refueling equipment.
- Allow the use of Capital Construction Funds ([46 U.S.C. 53501](#) et seq.) for ZEVs to help vessel owners finance the construction of these vessels.