



September 20, 2022

Ariel Fideldy, Manager  
Austin Hicks, Air Pollution Specialist  
California Air Resources Board  
1001 I Street  
Sacramento, California 95814  
Via Electronic submittal

**Re: Comments on the California Air Resources Board Proposed 2022 State Strategy for the State Implementation Plan**

Dear Ms. Fideldy and Mr. Hicks,

We would like to thank the California Air Resources Board for soliciting public comments on the Proposed 2022 State Strategy for the State Implementation Plan (August 2022).

On behalf of the undersigned organizations, we urge CARB to set a more aggressive target on reducing climate and air pollution from marine vessels, and to identify specific actions that can rapidly phase out short-lived climate pollutants, which not only will help leverage and accelerate climate mitigation, but which also will have significant health benefits for local populations.

As was extremely clear from the recently released Intergovernmental Panel on Climate Change's (IPCC) [AR6 report](#), rapidly reducing short-lived climate pollutants is the only pathway to keep to 1.5°C of global warming by mid-century.

California is already experiencing extreme climate conditions such as massive wildfires, sustained drought and heatwaves and continues to experience some of the worst air quality in the nation. Many of California's port communities continue to suffer poor air quality standards, and some remain in extreme nonattainment of NOx reduction goals under the federal Clean Air Act.

One of the main culprits contributing to the poor air quality are ships. By CARB's own [emissions analysis](#) report found that fossil fuel pollution from 2021 cargo ship congestion at San Pedro ports has caused:

- An increase in NOx emissions equivalent to **5.8 million passenger cars in South Coast, and**
- An increase in particulate matter (PM) emissions equivalent to **\*100,000 big rig trucks (or "Class 8 diesel trucks") \*per day\***

California continues to be a beacon for many jurisdictions on climate and air quality standards. With a view to help California increase emissions reduction efforts while improving the protection of public health, especially in port communities, we urge CARB to make the following revisions to the **Proposed 2022 State Strategy for the State Implementation Plan.**

#### **A. Ban Fossil Fuel Powered Ships by 2040**

Under CARB's Proposed SIP Commitment: Cleaner Fuel and Vessel Requirements for Ocean-Going Vessels, we were very disappointed to see CARB change the tier 3 requirements from 2031 to 2037. Transitioning to tier 3 should only be a short term measure while we set the industry on a clean pathway to go fully zero emission by 2040.

**Therefore, we urge CARB to revise the target tier 3 implementation date to 2026, not 2037, along with adopting other short term emission reduction measures. CARB should establish a 100% zero emission shipping mandate for all vessel categories by 2040.**

CARB's very own analysis shows that without any additional measures, by 2037, the Statewide NOx Emissions from OGVs is 27%, surpassing all other categories. We urge CARB to set a more aggressive focus on reducing climate *and* air pollution from OGVs by banning fossil fuel powered ships by 2040 through a regulatory market forcing mechanism. We cannot afford to lock in fossil fuel ships for the next few decades.

This is critical to ensure the protection of port communities air quality and public health and accelerate shipping's zero-emission transition. Fossil-fueled OGVs are massive climate polluters that cause significant air pollution globally and acutely in port communities. So long as OGVs run on fossil-fueled internal combustion engines, port communities will suffer from NOx and PM pollution. Strong market signals are needed now to force OGVs off of fossil fuel propulsion, and CA could be the first in the nation to set this landmark policy.

#### **Compliance Is Possible and the Commercial Zero-Emission Vessel Market Is Maturing**

There's major efforts to decarbonize the shipping industry underway. Already, major cargo owners like Amazon and IKEA have [committed](#) to 100% zero-carbon shipping by 2040 and container companies including Maersk, Hapag Lloyd, and HHM [responded](#) that they're ready.

Moreover, under the federal Clean Air Act, EPA has clear legal authority to regulate greenhouse gas emissions from marine vessels. The [Clean Shipping Act of 2022](#), if enacted, would direct EPA to exercise this authority and promulgate regulations by January 1, 2026, to reduce GHG emissions from marine vessels of 400 gross tonnage and above that call on ports in the United

States, and to eliminate in-port ship emissions by 2030. The bill would set progressively tighter GHG intensity standards for fuels used by ships consistent with a 1.5°C decarbonization pathway. These standards would require lifecycle carbon dioxide-equivalent reductions of 20% from January 1, 2027, 45% from January 1, 2030, 80% from January 1, 2035, and 100% from January 1, 2040 (based on a 2024 baseline).

Globally, the Zero-Emission Shipping Mission, an alliance between countries including the United States, the private sector, and researchers, has committed to deploy zero-emission fuels, ships, and fueling infrastructure for at least 5% of the global shipping fleet by 2030<sup>1</sup>. CARB cannot be laggards in this effort to clean up the air harming those most in port-adjacent communities.

CARB can use its authority to get to a 100% zero emission vessel fleet by 2040 by:

### **1. Expand and Strengthen the Ocean-Going Vessel Fuel Standard**

Since the adoption of Fuel Sulfur and Other Operational Requirements for Ocean-Going Vessels in 2008, this regulation has helped reduce particulate matter, oxides of nitrogen, and sulfur oxide emissions from ocean-going vessels and helped spur the adoption of a global standard through the International Maritime Organization.

However, the majority of emissions from OGVs occur while vessels are in transit and additional reductions of these pollutants are needed in order to achieve federal air quality standards and reduce health impacts from ultrafine diesel particles in portside communities. It is time for CARB to update the Fuels Standards to adding PM2.5, NOx and GHG emissions to their sulfur rule.

We strongly encourage the development of a carbon fuel standard for OGVs which aggressively seeks to lower carbon emissions from off-road maritime sources and accelerate the maritime industry's transition to ZE fuels. In the development of a cleaner fuel standard, we urge CARB to evaluate all fuels on a "lifecycle" basis, such as (i.e. from production (could be extraction, growing crops, generating electricity, using industrial feedstocks) to processing (e.g. electrolysis, refining) to the emissions from its use on board. This must also include any leakage, slips and venting along the way (e.g. methane). All Greenhouse Gases (GHGs) and co-pollutants like Black Carbon must be accounted for, not just CO2.

We are strongly opposed to the use of liquefied natural gas (LNG) as a shipping fuel. Many of today's LNG ships are worse even than the traditional ships they replace. According to recent data from the International Council on Clean Transportation, when accounting for both upstream and downstream emissions factors and methane leaks, an LNG-powered ship is likely to release GHGs with up to [80% more warming potential](#) than diesel-powered ships, when analyzed over a 20-year GWP framework.

### **2. Expand and Strengthen At-Berth Regulation**

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<sup>1</sup> Mission Innovation Zero-Emission Shipping Mission. Industry Roadmap for Zero-Emission Shipping. April 2022. [Zero-Emission-Shipping-Mission-Roadmap.pdf \(mission-innovation.net\)](#)

We are supportive of CARB prioritizing adding bulk carrier vessels and general cargo vessels into the existing At-Berth emissions regulations but **urge CARB to add all unregulated vessels into the rule as well**. According to CARB, the current rule is expected to save **237 lives from premature deaths, and over \$2.315 billion in avoided health impacts**. Adding additional vessels will help reduce pollution at the ports and save more lives.

While bulk carrier vessels account for only 9% and 7% of DPM and NOx from Ocean Going Vessels’ (OGVs) [emissions in California](#), respectively, these vessels comprise the majority of ship calls to smaller ports, which are often located adjacent to communities that already bear the brunt of air pollution.

The Ports of Stockton and Richmond, for example, see much of their annual throughput in dry and liquid bulk, which is transported by bulk carrier ships. At the Port of Stockton, over 50% of [shipping throughput in 2020](#) comprised of dry and liquid bulk cargo. Portside communities in Stockton and Richmond, furthermore, reside in CalEnviroScreen 92<sup>nd</sup> and 98<sup>th</sup> percentiles for air pollution burden in the state, respectively. It is critical for CARB to recognize that, by excluding bulk carrier vessels from At-Berth requirements, the state is failing to address the major DPM, NOx, and PM pollution concerns of some of California’s most pollution-burdened communities.

There is record funding available for ports to transition port infrastructure to zero emission: in California, there’s \$1.2 billion for Port and Freight Infrastructure Program under CalSTA, and \$3 billion for EPA to reduce air pollution at ports under the Inflation Reduction Act. Funding is available to modernize berths for container ships and for shore power requirements and use it to clean up pollution from the ports.

There are a number of zero emission bulk and general cargo vessels on the water or currently being developed.

2017	Newbuild	TBN	Bulk carriers
2020	Retrofit	Paolo Topic	Bulk carriers
2017	Newbuild	Invoxis IX	Bulk carriers
2022	Newbuild	Misje Verde	Bulk carriers
2022	Newbuild	Misje Viola	Bulk carriers
2022	Newbuild	Misje Vita	Bulk carriers
2022	Newbuild	unknown	Bulk carriers
2022	Newbuild	Aasfjell	Bulk carriers
2022	Newbuild	Aasfoss	Bulk carriers
2020	Newbuild	Invoxis 10	Bulk carriers
2022	Newbuild	TBA	Bulk carriers
2016	Retrofit	Star Laguna	General cargo ships
2019	Retrofit	Hagland Captain	General cargo ships

*source: DNV Data on Battery operated ships, accessed 1.26.22*

### **3. Adding in Vessels at Anchor requirements**

We are supportive of CARB adding in vessels at anchor into the existing At- Berth rule. While ocean going vessels may not make the transatlantic trip fully zero emission (yet), hybrid ocean going vessels can switch to battery technology or green hydrogen on a dual fuel engine when they are at anchor.

A 2013 study by the Sandia National Lab shows that power barge for ships at anchor is technically feasible<sup>2</sup>. In addition, there are companies that are developing battery-swapping technology that could be applicable for ships at anchor. The International Council on Clean Transportation will be coming out with a study on zero At-Berth/At-Anchor technology options in the fall. For all these reasons, we urge CARB to expand the existing At-Berth emissions to include At- Anchor emissions.

#### **CARB's Proposed SIP Commitment: More Stringent NOx and PM Standards for Ocean-Going Vessels**

CARB staff proposes to commit to petition and/or advocate to U.S. EPA and/or IMO to adopt more stringent Tier 4 marine standard and establish efficiency requirements for existing vessels. Right now, the Moving Forward Network, a coalition of environmental and environmental justice groups, is advocating for U.S. EPA to adopt a Tier 5 zero -emission standard that will require 100% of new marine engines to be zero-emission by 2035<sup>3</sup>. We would urge CARB to advocate for these same standards.

#### **B. Commercial Harbor Craft**

Harbor boats are **one of the top three cancer risks** for Californians living near the ports of Los Angeles, Long Beach, San Diego and Oakland. We thank CARB for its leadership in adopting the nation's first standard on zero emission ferries this year and were pleased to see \$60 million through the budget allocated for harbor craft implementation.

We would like clarity on what CARB staff will pursue to achieve the NOx and ROG emissions reductions shown in Table 37 for the relevant nonattainment areas in the relevant years. One way to achieve NOx and ROG emission reductions is to require commercial harbor craft in those areas be 100% zero emissions by 2035, in line with [California Executive Order N-79-20](#).

In the face of climate emergency, CARB should not allow an entire new generation of harbor craft vessels to be designed for diesel powered. New zero emission technologies are being developed every day:

- [e1 Marine | News | World's First Methanol-Fuelled Towboat To Launch In 2023](#)
- [New battery hybrid tugboat design developed for U.S. market - Marine Log](#)

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<sup>2</sup> Vessel Cold-Ironing Using a Barge Mounted PEM Fuel Cell. Sandia National Lab.

<sup>3</sup> Moving Forward Network Letter to US EPA [MG EPA Letter: ZE Freight 10/26 \(movingforwardnetwork.com\)](#)

- [TECO 2030 Is Leading A Project Group That Will Build A Hydrogen-Powered High-Speed Vessel For The Port Of Narvik \(fuelcellsworks.com\)](https://fuelcellsworks.com)

### **C) Update Spark-Ignition Marine Engine Standard Regulation next year**

We urge CARB to revisit the Sparks Ignition Marine Engine rule next year instead of 2029, and require that all recreational boats go electric by 2025 instead of the phase in date of 2031-2035 for zero-emission.

Without any action, CARB projects that by 2031, **smog forming emissions from an average recreational boat in California is equivalent to 20 passenger cars.** At the same time, electrification of marine vessels is now seen as a proven technology contributing to a decarbonized sustainable maritime sector. Electric marine propulsion technologies are already commercially available, and viable solutions will be widespread by 2023. Examples include [Pure Watercraft](#), [Flux Marine](#), [Navier Boat](#), and others cited in [this article](#). What we need now to drive uptake are strong market accelerating policies, including incentives and funding mechanisms.

### **D) Indirect Source Rule**

We strongly support CARB exploring an indirect source rule (ISR). An ISR will allow the South Coast Air District and the San Joaquin Valley Air District to target pollution more holistically by addressing a keystone of goods movement in the state's most impacted regions and accelerate emissions reduction by tackling some of the largest sources of toxic air pollution in Southern and Central California, such as ships.

Thank you for your consideration of these comments.

Sincerely,

Teresa Bui  
State Climate Policy Director  
**Pacific Environment**

Marc Carrel  
President and CEO  
**Breathe Southern California**

Eli Lipmen  
Executive Director  
**Move LA**

Amelia Murphy  
Board Director  
**Center for Human Rights & Environment**

Maya Golden-Krasner  
Deputy Director & Senior Attorney  
**Climate Law Institute at the Center for Biological Diversity**

Matt Holmes  
Environmental Justice Director  
**Little Manilla Rising**

Samuel Sukaton  
State Advocacy Coordinator  
**California Environmental Voters**

Regina Hsu  
Senior Associate Attorney  
**Earthjustice**

Dr. Catherine Garoupa White  
Executive Director  
**Central Valley Air Quality Coalition**