



## **The Need for a Marine Shipping Retrofit Program — And How California Air Districts Can Help Make it Happen**

### **The Problem**

Emissions from marine shipping significantly impact air quality in California, and threaten the ability of areas in the state to attain standards. Coastal regions are affected by emissions along the coast, and in concentrated urban areas near ocean ports. Inland areas are affected by transport of emissions from upwind areas on the coast, and by emissions along inland rivers, and at inland ports.

Marine shipping air emissions have been largely unregulated, and the vessels are growing in number and size—even as the heavy fuel oil they use is degrading in quality. Left uncontrolled, marine shipping emissions will continue to grow, essentially negating reductions from onshore emissions sources in areas such as Santa Barbara County.

### **Isn't this a federal issue?**

Long-term, standards for marine vessels must be implemented through national leadership and international cooperation. However, even if stringent standards were implemented for new ship engines immediately (an unlikely best-case scenario), California would not reap the benefits for many years. Emissions must be reduced from the existing fleet. Initially, a demonstration program could provide the information and experience needed to lay the groundwork for a comprehensive, incentive-based program along the lines of the successful Moyer program, which could attract additional federal funding.

### **What is envisioned for the program? And who is involved?**

The California Air Resources Board Maritime Working Group, made up of participants from California air districts, the U.S. Environmental Protection Agency (USEPA), the U.S. Department of Transportation's Maritime Administration (MARAD), environmental groups, ship owner-operators, engine manufacturers, and control technology vendors, is working to develop the program.

Initially, the plan is to retrofit two to five ocean-going vessels over two to three years, adding more projects if additional federal funding follows the demonstration of the retrofits' viability. Management and participation in the initial projects would vary depending on the areas participating. Technologies and strategies under consideration to reduce both nitrogen oxides and particulate matter emissions include emulsified fuels, water injection, humidification, selective catalytic reduction and others. Extensive emissions testing will be conducted before and after installation of controls to develop valuable (and not currently available) operational information and to verify emission reduction goals.

*(see reverse)*

## **How much will the program cost, who will pay for it, and what are the objectives?**

The Maritime Working Group has set an initial target of one million dollars for the initial demonstration program. California air districts are being asked to contribute whatever resources they can to the program; one air district has already committed close to \$300,000. We anticipate that additional funding will follow from participating ports, the U.S. EPA, and “in-kind” staff resources from MARAD.

The five principal objectives of the program are as follows.

1. Improve our understanding of ship activities and emissions.
2. Evaluate potential control technologies.
3. Develop partnerships and funding mechanisms.
4. Implement retrofit technologies.
5. Document results.

## **What is the potential cost effectiveness?**

Due to the huge volume of emissions produced by these vessels, retrofit projects should easily be able to meet the \$13,600 cost/ton limit identified in the Carl Moyer Program, and it’s likely they could go well below that level. Control technologies are available that can cost-effectively reduce these emissions by 10-30 percent or more.

## **Who is likely to participate?**

Under the umbrella of the Maritime Working Group, a number of owner/operators, agencies, and ports have shown interest in the demonstration project. These include: Matson, BP, Maersk, MARAD, the U.S. Environmental Protection Agency, California Air Resources Board, the Ports of Long Beach and Los Angeles, the U.S. Navy, several air pollution control districts, technology providers, and emission testers.

## **How do potential Emission Reduction Credits (ERCs) factor into this program?**

All District funding provided for the demonstration projects will go to clean air – no ERCs will be generated. However, ERC programs could be considered in the future providing that U.S. EPA requirements are met.

## **What is the next step if a California air district is interested in joining the program?**

This first step is to take an active role in the Maritime Working Group. To join, please go to [www.arb.ca.gov/mspros/offroad/marinevess/maqtw.htm](http://www.arb.ca.gov/mspros/offroad/marinevess/maqtw.htm) and contact the Air Resources Board to sign up! District boards are also encouraged to allocate available funding for the program in order for us to understand the total amount of resources available. As project specifics are worked out, district boards will then be asked to approve specific grant agreements or enter into a Memorandum of Understanding.