

# Cleaner fuel for cruise ships, other big vessels from ingredients in detergents, medicines

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Scientists today described development of a new fuel mixture to ease the major air pollution and cost problems facing cruise ships, oil tankers and container ships. These vessels tend to burn the cheapest and most highly polluting form of diesel fuel. Their report was part of the 244<sup>th</sup> National Meeting & Exposition of the American Chemical Society, the world's largest scientific society, being held here this week.

George N. Harakas, Ph.D., explained that large ships have slow-speed engines designed to burn inexpensive, thick "bunker fuels" that literally are the bottom-of-the-barrel from the petroleum refining process. Bunker fuels are high in substances (such as sulfur) that produce [air pollution](#), which creates a serious health and environmental problem when ships cruise along the shore or drop anchor in ports of heavily populated urban areas.

Harakas and colleagues from the Maine Maritime Academy and SeaChange Group LLC developed a [fuel](#) by adding two ingredients to low-sulfur diesel to produce "Bunker Green" fuel, a member of the Eco-Hybrid family of fuels. One ingredient was glycerol, a thick, colorless liquid widely used in foods, medicines and other products. Glycerol is a byproduct of biodiesel production, making it a cost-effective, carbon-neutral and domestically sustainable fuel. Blending glycerol and [diesel fuel](#) is literally like trying to mix oil and water. The use of a surfactant, a class of chemicals similar to ingredients that boost the cleaning power of

laundry detergents, was used to solve that problem.

The fuel they produced has improved emission properties and the potential to lower fuel costs for the shipping industry. Laboratory tests at the Marine Engine Testing and Emissions Laboratory (METEL) at the Maine Maritime Academy demonstrated that "Bunker Green" fuel produced 15 percent lower emissions of soot-like particulates and 26 percent less nitrogen oxide pollutants. The International Maritime Organization (IMO) has recently passed regulations that call for tighter emission limitations for marine vessels operating near shore. This research into fuels with a lower environmental impact has been supported by the Maine Technology Institute, the National Science Foundation and private industry. Harakas concluded that "Bunker Green" fuel could help the shipping industry reduce air pollution to meet these IMO regulations, especially for older ships.

Provided by American Chemical Society

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