Hybrid tugboat cuts emissions, study shows

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A new study by University of California, Riverside scientists of what is believed to be the world's only hybrid electric tugboat found that the vessel is effective in reducing emissions at the Ports of Los Angeles and Long Beach.

Researchers at the UC Riverside College of Engineering Center for Environmental Research and Technology (CE-CERT) demonstrated the hybrid electric tugboat reduces emissions of soot by about 73 percent, oxides of nitrogen (which help cause smog) by 51 percent, and carbon dioxide, which contributes to global warming, by 27 percent.

The findings are significant due to the heavy impact port pollution – caused largely by diesel-powered ship engines and, to a lesser extent, smaller harbor craft such as tugboats – has on regional air quality, according to the California Air Resources Board, which sponsored the study.

The Ports of Los Angeles and Long Beach are the largest contributors to air pollution in the South Coast Basin, which includes most of Southern California. Diesel pollution in particular can have devastating health impacts, including cancer and a host of respiratory and cardiovascular ailments.

CE-CERT has been investigating port emissions since 2003, first from locomotives and later drayage vehicles and equipment. More recently the center has also studied emissions from harbor craft, ferries and ocean going vessels.

Authors of the study were graduate student researchers Varalakshmi Jayaram, the principle author, and M. Yusuf Khan, research engineers J. Wayne Miller, William A. Welch and Kent Johnson, and David R Cocker, associate professor of chemical and environmental engineering.

The clean tug used in the study, the Carolyn Dorothy, runs on four diesel engines and 126 batteries. Built by Seattle-based Foss Maritime, it began working the ports of Los Angeles and Long Beach in January 2009 and is believed to be the first and only hybrid tug in the world.

More information: The study can be viewed online at: www.arb.ca.gov/ports/marineves … hybridreport1010.pdf

Provided by University of California - Riverside