

DOCKETED

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California
Energy Commission
Research & Development

Fuel Cell Demonstrations in Rail and Marine Applications at CA Ports

Background on a Future Solicitation

Energy Research and Development Division

Peter Chen

October 25, 2019





Natural Gas Research & Development Program

- Annual budget plans of \$24M/yr funded by a natural gas IOU ratepayer surcharge established by the CPUC.
- Goals for transportation research:
 - ❑ Advance transportation technologies that reduce air pollution and greenhouse gas emissions beyond applicable standards.
 - ❑ Benefit natural gas IOU ratepayers.
- Past research focused on natural gas vehicle technology such as advanced combustion, low NOx engines, and hybridization.



California Energy Commission
STAFF REPORT

Natural Gas Research and Development Program

Proposed Program Plan and Funding Request for Fiscal Year 2019-20

California Energy Commission
Gavin Newsom, Governor

March 2019 | CEC-500-2019-035



FY2019-20 Natural Gas R&D Program Budget

- FY2019-20 budget plan includes a **\$6.6M** initiative to demonstrate fuel cell technologies in rail and marine applications at ports.
- Expand portfolio to target difficult-to-decarbonize sectors and zero emission technologies.
- Collect data to evaluate performance in real world operation, validate potential benefits, and inform future regulations and deployment.



BNSF 1205 Source: RR Picture Archives

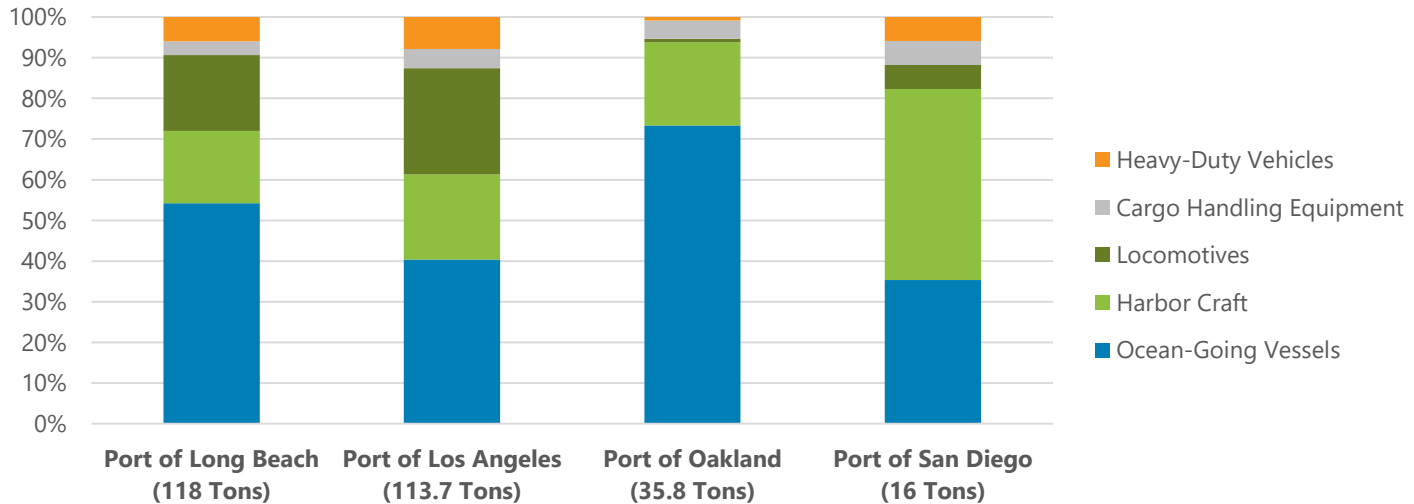


Water Go Round Source: Golden Gate Zero Emission Marine

Air Quality Impacts of Locomotives and Commercial Harbor Craft

➤ Locomotives and commercial harbor craft are major emitters of diesel particulate matter and increase near-source cancer risk around ports.

Diesel Particulate Matter Emissions at California Ports



Source: Port Emissions Inventories



October 17, 2019 Scoping Workshop

- Collected input from stakeholders and the public to determine how to best facilitate successful demonstrations with measurable benefits.
- Ideally, projects funded under the upcoming GFO will spur technology advancement and future market adoption of fuel cell technologies in rail and marine.
- Slides, attendees list, and WebEx recording can be found here: <https://www.energy.ca.gov/event/workshop/2019-10/staff-workshop-identify-research-needs-and-opportunities-demonstrating-fuel>



Potential Connections to the MHD Zero Emission Vehicles and Infrastructure Solicitation

- \$6.6M is a limited amount of funding for demonstrating fuel cell technologies in rail and commercial harbor craft.
- Funding for hydrogen refueling infrastructure can be leveraged from the MHD Zero Emission Vehicles and Infrastructure Solicitation.
- Like the vehicle/vessel, hydrogen refueling infrastructure must be designed to meet all safety and operational requirements.
- Preferred but not required:
 - Use fueling infrastructure to support multiple applications at the demonstration site such as cargo handling equipment, drayage trucks, or light-duty cars.
 - Include plan for post-project revenue service or continued data collection for the demonstration vehicle/vessel.
 - Procure 100% renewable hydrogen.



Comment Period for Scoping Workshop Extended to October 31, 2019

- Submit electronically through the CEC's "Research Idea Exchange" docket:
<https://efiling.energy.ca.gov/Ecomment/Ecomment.aspx?docketnumber=19-ERDD-01>
- Submit by email to the Docket Unit at: docket@energy.ca.gov
- Submit paper copy to the Docket Unit: California Energy Commission; Docket Unit, MS-4; Re: Docket No. 19-ERDD-01; 1516 Ninth Street; Sacramento, CA 95814-5512

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