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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.
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.
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**

- **Port of Long Beach (118 Tons)**
- **Port of Los Angeles (113.7 Tons)**
- **Port of Oakland (35.8 Tons)**
- **Port of San Diego (16 Tons)**

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

Peter Chen
E-mail: peter.chen@energy.ca.gov