



Notice of Funding Opportunity

Title: Hydrogen Fuel Cell Demonstrations in Rail and Marine Applications at Ports (H2RAM)
Website: <https://www.energy.ca.gov/solicitations/2020-07/gfo-20-604-hydrogen-fuel-cell-demonstrations-rail-and-marine-applications>
Funding: \$12,600,000
Dates: Pre-Application Workshop: July 30, 2020 at 10:30 a.m. PDT
Questions Deadline: August 7, 2020 at 5:00 p.m. PDT
Application Submission Deadline: October 8, 2020 at 5:00 p.m. PDT

Summary: This solicitation intends to fund projects to demonstrate and evaluate the feasibility of hydrogen fuel cells for powering switcher locomotives and harbor craft, deploy shared hydrogen fueling infrastructure across multiple freight applications, and increase the potential for future widespread adoption of hydrogen fuel cells in related rail and marine applications such as ocean-going vessels, line haul freight locomotives, and passenger trains.

The California Energy Commission's (CEC) Natural Gas R&D Program announces the availability of up to \$6.6 million in grant funds for the technology integration and demonstration of hydrogen fuel cell-powered locomotives and harbor craft. Additionally, the CEC's Clean Transportation Program (formerly known as the Alternative and Renewable Fuel and Vehicle Technology Program) announces the availability of up to \$6 million in grant funds for shared hydrogen fueling infrastructure to support hydrogen fuel cell-powered locomotives or harbor craft, as well as on-road vehicles and cargo handling equipment.

Project Topic Areas: Projects must fall within the following project groups:

Group 1: Fuel Cell Demonstrations in Switcher Locomotives and Commercial Harbor Craft

Projects funded under Group 1 must develop and demonstrate a hydrogen fuel cell-powered switcher locomotive or commercial harbor craft at a California port for a minimum of six months. Projects may repower or convert an existing locomotive or harbor craft by replacing the internal combustion engine(s) with hydrogen fuel cell systems or design and demonstrate a new build. Projects must focus on making engineering and technology integration advancements to overcome the barriers of using hydrogen fuel cells in a rail or maritime environment while demonstrating the potential value proposition, including emission reductions, cost reductions, and connections between increased hydrogen demand with other energy sector benefits. Project data, key findings, and lessons learned should be used to analyze technology scalability to support other applications, such as ocean-going vessels, line haul freight locomotives, and passenger trains. The technology readiness level (TRL) of the hydrogen fuel cell-powered switcher locomotive or harbor craft should be moved from current level to 6 or 7 by the end of the project.

Group 2: Shared Hydrogen Fueling Infrastructure

Projects under Group 2 shall deploy long-term hydrogen fueling infrastructure to support on-road vehicles at a California port, and also support a hydrogen fuel cell-powered locomotive or harbor craft to reduce emissions from multiple mobile sources. Supporting off-road cargo handling equipment may be included as an additional option.

Group 3: Design and Feasibility of Fuel Cell-Powered Commercial Harbor Craft

Projects funded under Group 3 will focus on developing fuel cell-powered commercial harbor craft designs and assess their feasibility for future demonstration and deployment in California. Projects should evaluate opportunities to take advantage of fuel cell modularity to reduce electricity transport losses and improve resiliency. Projects should aim to complete actionable fuel cell-powered harbor craft design(s) that would be ready for construction and deployment with additional funding.

**Cost Sharing:**

Match funding is required in the amount of at least 20% of the requested CEC funds for Group 1 and Group 2. Applicants that provide more than this amount will receive additional points during the scoring phase. Match funding is not required for Group 3. However, applications that include match funding will receive additional points during the scoring phase.

Project Group	Available Funding	Minimum award amount	Maximum award amount	Minimum match funding (% of CEC Funds Requested)
Group 1: Fuel Cell Demonstrations in Switcher Locomotives and Commercial Harbor Craft	\$6,000,000	\$2,000,000	\$4,000,000	20%
Group 2: Shared Hydrogen Fueling Infrastructure	\$6,000,000	\$2,000,000	\$4,000,000	20%
Group 3: Design and Feasibility of Fuel Cell-Powered Commercial Harbor Craft	\$600,000	\$200,000	\$600,000	0%

Topic Area Requirements:**Hydrogen Safety Plan and Design Review (For Group 1 and Group 2 Only)**

Each applicant for Group 1 and Group 2 shall commit to developing (a) Hydrogen Safety Plan(s) for the proposed demonstration project that addresses the design of the demonstration locomotive or harbor craft, and supporting hydrogen fueling infrastructure.

Eligible Applicants:

This solicitation is open to all public and private entities. Demonstration projects under Group 1 in this solicitation must be located in the service territory of a California natural gas Investor Owned Utility (NG IOU), which includes Pacific Gas and Electric Company (PG&E), San Diego Gas & Electric Company (SDG&E), and Southern California Gas Company (SoCalGas). Projects under Groups 1 and 3 must benefit NG IOU ratepayers. Pursuant to California Public Resources Code, the California Energy Commission's Natural Gas Program must give priority to "California-Based Entities" (CBEs) when making awards. Group 1 and Group 3 proposals must meet the following requirements in order to receive CBE preference points: The proposal must include a CBE as either the recipient or a subcontractor; and The budget must show that the CBE(s) will receive more than 60.00% of the funds awarded. Group 1 and Group 2 demonstration projects located and benefiting disadvantaged and/or low-income communities will be considered under the scoring criteria for this GFO.