

APPENDIX C

**AIR QUALITY IMPROVEMENT PROGRAM (AQIP) AND LOW
CARBON TRANSPORTATION GREENHOUSE GAS
REDUCTION FUND (GGRF) INVESTMENTS**

**ZERO-EMISSION TRUCK AND BUS PILOT
COMMERCIAL DEPLOYMENT PROJECTS**

HYDROGEN REFUELING STATION REQUIREMENTS

This page intentionally left blank.

I. MINIMUM TECHNICAL REQUIREMENTS

To be eligible under this Solicitation, applications that include a hydrogen refueling station to be funded as part of the project must, at a minimum, meet each of the following minimum technical requirements. ARB will only process applications that include hydrogen refueling infrastructure projects where the project is proposed to be sited where similar infrastructure already exists (e.g., installing a hydrogen refueling station at an existing fueling station or a commercial or industrial facility). Applications including the use of an existing hydrogen station for refueling project vehicles must provide assurances that the station can meet all refueling needs of the project vehicles in terms of refueling pressure, vehicle storage vessel capacities, hydrogen quality, safe refueling, and other requirements described herein.

A. Station Access

Access to hydrogen refueling stations funded as part of the project must be limited to vehicles and devices approved by the station owner/operator for use. Applications must describe how station access will be controlled and, if non-project vehicles are granted access for refueling, what steps will be taken to ensure safe refueling.

B. Hydrogen Quality

Hydrogen dispensed at the station shall meet the requirements adopted by the Department of Food and Agriculture Division of Measurement Standards, and found in Title 4, Division 9, Chapter 6, Article 8 of the California Code of Regulations, Automotive Products Specifications. The regulation adopts by reference the Society of Automotive Engineers (SAE) International J2719: 2011, "Hydrogen Fuel Quality for Fuel Cell Vehicles" (www.sae.org). A hydrogen refueling station must undergo and pass the hydrogen purity test under all of the following circumstances: before being considered operational; every 6 months thereafter; and when the hydrogen lines are potentially exposed to contamination due to maintenance or other activity. The applicant must employ and provide a narrative of the best practices that ensure continued adherence to hydrogen purity standards.

C. Fueling Protocols

The station/dispenser(s) shall meet SAE International J2601/2, "Fueling Protocol for Gaseous Hydrogen Powered Heavy Duty Vehicles" (www.sae.org). The applicant must describe how the fueling protocol and equipment at the station match project vehicle requirements and equipment.

D. Fire and Safety Awareness, Prioritization, and Adherence

To the extent practicable and with consideration of local ordinances, applicants should meet the requirements of Chapter 23 of the California Fire Code: Motor Fuel Dispensing Facilities and Repair Garages; and use the National Fire Protection Association

(NFPA) 2: Hydrogen Technologies Code: 2011 or most recent edition, <http://www.nfpa.org>, as a guideline for hydrogen refueling station design.

E. Dispenser Pressure

Each hydrogen refueling station identified for the project shall dispense fuel at 350 bar and follow the appropriate SAE International fueling protocol (e.g., SAE J2601/2).

F. Hydrogen Dispensing

For applications including a hydrogen station that intends to sell hydrogen by the kilogram, the applicant must demonstrate the ability to dispense hydrogen per “Specifications, Tolerances, and Other Technical Requirements for Weighing and Measuring Devices” as adopted by the 97th National Conference on Weights and Measures 2012, U.S. Department of Commerce, National Institute of Standards and Technology (NIST), Handbook 44: 2013.

Hydrogen dispenser performance specifications must satisfy NIST Handbook 44: 2013, unless superseded by California Department of Agriculture (CDFA), Division of Measurement Standards Rulemaking: California Code of Regulations (CCR) 3.39 “Hydrogen Gas-Measuring Devices -- Tentative Code” (as proposed for replacement through public review processes).

G. Hydrogen Technologies Code

The station/dispenser(s) shall be capable of meeting or exceeding the National Fire Protection Association (NFPA) 2: Hydrogen Technologies Code: 2011 or most recent edition, www.nfpa.org.

H. Station Design Requirements

Hydrogen refueling stations must have a plan in place for continued refueling of project vehicles in the event that the existing station goes off-line. The applicant must provide a detailed plan, equipment list, and performance specifications to show they are able to obtain and contract for temporary fueling from an experienced supplier.

I. Renewable Hydrogen

Applications must demonstrate compliance with the minimum Renewable Hydrogen Requirements (Section II of this Appendix). This compliance may be met considering all stations included in the application for which the applicant is applying for funding under this Solicitation.

II. RENEWABLE HYDROGEN REQUIREMENTS

Applications that include a request funding for proposed hydrogen refueling stations must provide a plan for dispensing at least 33 percent renewable hydrogen. This plan must describe how the station(s) in the application expects to dispense at least 33 percent renewable hydrogen on a per kilogram basis.

A. Eligible Renewable Feedstocks

Eligible renewable feedstocks include:

- Biomethane or biogas such as: biomass, digester gas, landfill gas, sewer gas, or municipal solid waste gas.
- Other feedstocks may be eligible if the Application demonstrates that the proposed feedstock is sustainably produced, reduces greenhouse gas emissions compared to the petroleum baseline, and achieves the Sustainability Goals of the Alternative and Renewable Fuel and Vehicle Technology Program Regulations (20 CCR 3101.5).

B. Eligible Renewable Electricity Sources

Eligible renewable electricity sources include facilities that use the following:

- Fuel cells using renewable fuels
- Geothermal
- Small hydroelectric (30 megawatts or less)
- Ocean wave
- Ocean thermal
- Tidal current
- Photovoltaic (PV)
- Solar Thermal
- Wind
- Biomass digester gas
- Municipal solid waste conversion (non-combustion thermal process)
- Landfill gas
- Renewable Energy Certificates (RECs)

C. Required Information

Applications must include information about the source of the feedstock(s) and/or process electricity (i.e., electrical power used to run a system); how the feedstocks will be processed into fuel; and how the fuel will be transported, stored, and ultimately dispensed at the proposed station(s). If the primary process energy for hydrogen production is electricity (e.g., for electrolysis), applicants must describe a direct source of eligible renewable electricity or source of renewable energy certificates (RECs) that

are registered and verifiable through Western Renewable Energy Generation Information System (WREGIS) or an equivalent tracking and verification system. Further information about WREGIS can be found at: www.wecc.biz/WREGIS.

For each station, applicants must submit the following information: Year, name of hydrogen production and delivery pathway, amount of hydrogen dispensed annually per station (in kilograms), biogas/renewable feedstock (in standard cubic feet), and renewable electricity (in kilowatt hours), assumptions and calculations on an energy equivalent basis that demonstrate that the required percent of the energy used to produce, deliver, dispense and use hydrogen was from renewable feedstock.

D. Renewable Electricity Requirements

Applicants planning to use renewable electricity for system power must describe how they intend to use new renewable electricity capacity with the electricity either going directly to the hydrogen production system or connected to the grid (within the Western Electricity Coordinating Council --- WECC). Applicants planning to use renewable electricity for system power must describe how the electricity will be dedicated and used for the hydrogen production. Alternatively, applicants purchasing and utilizing eligible renewable electricity credits must describe how the credits will be dedicated and used for the hydrogen production.

E. Biogas Requirements

Applicants planning to use biogas for system power must describe how they will either produce or purchase biogas (certified as renewable) that will be delivered directly to their hydrogen production facility or injected into a pipeline system. If the purchased biogas will be injected into a natural gas pipeline distribution system, applicants must show that a physical pathway exists by providing documentation that proves that the purchased biogas could be transported from the injection point to the hydrogen plant (that supplies the hydrogen for the applicant's stations).

F. Verification

The ARB will verify whether the renewable hydrogen requirement is met.

G. SB 1505 Disclaimer

The 33 percent Renewable Hydrogen Content requirement is a condition to participate in this Solicitation. This is separate and distinct from ARB's sole authority to regulate the renewable hydrogen content requirements for hydrogen refueling stations under Health and Safety Code, Section 43869 (commonly referred to as Senate Bill 1505 or SB 1505). Fulfilling the 33 percent Renewable Hydrogen Content requirement in this Solicitation does not guaranty or warranty in any way that hydrogen refueling stations funded under this Solicitation will meet any standards or regulations that ARB may adopt in the future for hydrogen refueling stations pursuant to the authority in SB 1505.

The applicant will be solely responsible for complying with such standards and regulations as applicable, including funding its compliance with them.

H. Greenhouse Gas Requirements

Applicants must use “well to wheel” calculation methodology for the greenhouse gas emission calculations that include the feedstock of the hydrogen, the production of the hydrogen, and the use of the hydrogen.” See Appendix D for the emission reduction and cost-effectiveness methodology.