PMC-EF2a
(20.0.02)

U.S. DEPARTMENT OF ENERGY
EERE PROJECT MANAGEMENT CENTER
NEPA DETERMINATION

RECIPIENT: GENCO Infrastructure Solutions, Inc. **STATE:** PA

PROJECT TITLE : Fuel Cell-Powered Lift Truck Fleet Deployment (Topic 7B)- Sysco

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-EE0000483	DE-EE0000483	GFO-0000483-006	EE483

Based on my review of the information concerning the proposed action, as NEPA Compliance Officer (authorized under DOE Order 451.1A), I have made the following determination:

CX, EA, EIS APPENDIX AND NUMBER:
Description:

B5.1 Actions to conserve energy, demonstrate potential energy conservation, and promote energy-efficiency that do not increase the indoor concentrations of potentially harmful substances. These actions may involve financial and technical assistance to individuals (such as builders, owners, consultants, designers), organizations (such as utilities), and state and local governments. Covered actions include, but are not limited to: programmed lowering of thermostat settings, placement of timers on hot water heaters, installation of solar hot water systems, installation of efficient lighting, improvements in generator efficiency and appliance efficiency ratings, development of energy-efficient manufacturing or industrial practices, and small-scale conservation and renewable energy research and development and pilot projects. The actions could involve building renovations or new structures in commercial, residential, agricultural, or industrial sectors. These actions do not include rulemakings, standard-settings, or proposed DOE legislation.

Rational for determination:

DOE is proposing to provide federal funding to GENCO Infrastructure Solutions to support the construction of hydrogen fueling storage and dispensing system for fuel cell-powered lift-trucks at the Sysco Foods distribution center site located at 600 Packer Avenue, Philadelphia, PA 19148. The proposed project would take advantage of a separately funded, liquid hydrogen fueling station that would be installed in parallel with the fuel cell fleet.

GENCO is the prime recipient under this award, the facility manager, and the 3rd party logistic provider for the site and this grant. This NEPA review is the fifth and final NEPA determination under the ARRA GENCO award (EE0000483). The project has an additional three subawardees/subcontractors under this award: Sysco Food owns the distribution center and forklifts; Plug Power would be supplying and installing the fuel cell units for the forklifts; and Air Products would be supplying and installing the hydrogen compressor, storage, and dispensing equipment.

Federal funding would be used for the purchase of 95 Plug Power GenDrive systems (70 Class-3 systems and 25 Class-2 systems), installation of the units into lift trucks and the daily operation of the lift trucks and infrastructure. Data collection and evaluations would be ongoing throughout the project.

The existing fork lift trucks would be retrofitted to accept the fuel cell units. No modifications to the trucks would be required as the new fuel cell units are designed to have the same size, weight, and center of gravity as existing battery packs. The fuel cell systems would range from 5-kW to 20-kW and would replace the existing lead/acid base batteries and their charging station infrastructure.

The Project activity is divided among the following 5 tasks:

Task 1 – Program Management and Reporting
Task 2 – Fueling Station Installation
Task 3 – Power Unit Construction
Task 4 – Start-Up and Training
Task 5 – Lift Truck Operation and Evaluation

Location and Traffic:

The Sysco Food distribution center is an existing 750,000 ft2 distribution center located in Philadelphia, Pennsylvania. This site is in the warehouse district in South Philadelphia near the sports stadium complex. The new hydrogen forklifts would be used in this area of the Industrial Park.

The only additional traffic created by this project would be the hydrogen delivery truck that arrives twice a month. These tanker trucks carry approximately 3,200 kg, but delivered amount would depend on storage tank level. The Sysco Food distribution center has numerous truck deliveries and deployments of products on a daily basis; therefore the addition of a truck delivery of hydrogen twice a month would not greatly increase the current level of traffic for the area.

Construction/Installation:

The proposed project is located on an existing industrial site. The hydrogen supply (liquid storage), compression, and high pressure storage would be outside the warehouse building in a secure area. The hydrogen compression and storage equipment would be installed on concrete foundations and pads to the north-east of the Sysco Food distribution center. This equipment would be fabricated at a vendor shop and shipped to the Sysco Food site for installation. The interconnecting piping and electrical tie-ins would be completed on site. An underground trench would be required for the hydrogen feed from the storage equipment to the Sysco Food distribution center. This would be dug by a trench excavator and would take place on ground that has been previously disturbed and paved. Fencing and additional lighting will also be installed around the compression and storage equipment. Hydrogen piping would run across the building roof to the dispensers.

Hydrogen Fueling Equipment and infrastructure construction would be conducted by Air Products technicians and local contractors working with and commissioned by Air Products's engineers. Installation would comply with latest editions of NFPA 52, 55 and IFC that specifies measures to protect environment and public safety.
GenDrive installations onto the lift trucks would be conducted by Plug Power Technicians. Installation would comply with latest editions of NFPA 52, 55 and IFC that specifies measures to protect environment and public safety.

Equipment:

The Hydrogen Fueling Station would consist of four modules: liquid Storage, compressor system, gaseous buffer storage, and automated dispensers. Hydrogen would be delivered to the site as a liquid (in ~ 12,000 gallon trailers). The hydrogen would be stored on site as a liquid and then vaporized and compressed for utilization as required. The trailer would temporarily park on the delivery pad and offload product via pressure transfer to the onsite tank. The flow of hydrogen from the liquid tank to the compressors is controlled by an automatic isolation valve. When required, hydrogen is fed to a compressor (CP-10) to increase the pressure to 350 bar. After leaving the compressor, gas is directed to one bank of high pressure storage tubes. Approximately, 2,400 kg of liquid and 60 kg gas would be stored on site within a cryogenic tank and high pressure storage tubes. It is estimated that approximately 100kg of hydrogen would be used each day to run the 95 lift trucks.

The compressor system would typically be in a "standby" mode with the buffer storage filled to nominally 7,000 psig. When a lift truck arrives at the indoor dispenser to fuel, a portion of the mass of hydrogen in the storage tubes is transferred by pressure to the vehicle tank until the local PLC determines a full fill (final pressure is compensated for temperature). After multiple fueling, the outdoor storage tube pressure becomes reduced and the compressor automatically restarts to keep it full.

Operations/Training:

All on-site operators and maintenance personnel would be trained during a two-day session. Air Products would provide training for hydrogen fueling system safety and vehicle dispensing practice and procedures. Plug Power would also provide GenDrive fuel cell system training and safety-related training. Additional sessions would be organized on an as needed basis. Fueling station operating manuals, service manuals and training materials would be available to all personnel.

Permits:

Station design, equipment, and infrastructure will comply with latest editions of NFPA 52, NFPA 55 and IFC. Permitting for the fueling station is currently being secured and will include building permit and a revise use permit. GENCO and Sysco Food will obtain the required electrical, mechanical, and construction permits from local and state authorities for the site, with assistance from Air Products, as required.

Waste stream:

The GenDrive units would be installed in brand new electric lift trucks. If old batteries are removed, these would be used as spares in other battery-powered lift trucks on site or at other sites. If not used as spares, they would be disposed of accordingly by the fleet owner.

Noise:

The project and installation site for the hydrogen fueling station unit is located at least 100 ft from the property line. Per

Air Products, the hydrogen compressors make a minimal amount of noise and the compressor is not audible at distances further than 100 ft. Noise levels are less than 75 dB at 3 meters when the compressor is operating. The additional noise created by the hydrogen dispenser and compression units would not exceed existing noise levels created by normal distribution center activities.

Safety:

Air Products has supplied to DOE a Safety Plan and Safety Review Plan that addresses their compressed hydrogen vehicle fueling protocols and mitigation being applied to all aspects of their fueling procedures, especially in regards to the indoor dispensing units and their safety protocols.

Additional safety measures in place include:

General - Multi-layer redundant features –
*Feed initiated only after system check,
*Refueling rate limited to 2 kg/min,
*24/7 monitoring & automatic shut-off,
*Pressure and Temperature limits for fuel tank,
*Gas detector, inside and outside,
*Fire eye for dispensing area,
*Emergency shut off,
*Local and remote (20 to 100 ft.),
*Class 1 div 2 within 15 ft,
*NFPA 52 2009, section 9.4.

Dispenser Safety Features –
*Non-interchangeable nozzles,
*Special design nozzles per SAE J2600,
*Extensive testing, third party approvals,
*Double block and bleed, unlike industrial connections,
*Cannot be opened unless connected,
*Multiple shutdown features,
*Storage isolated at outdoors before entering building,
*Two valves outside, additional valve inside,
*No mechanical fittings inside building except in cabinet,
*Self-sealing break away joints,
*For vehicle pull-away/accident,
*Vehicle and station electrically bonded through nozzle,
*Vehicle grounded through parking surface,
*Verified at startup.

No venting is anticipated under normal operating conditions.

The hydrogen fueling equipment control systems would include PLC alarming for both precautionary alarms and shut-down alarms. These signals are monitored by Air Products 24-hr control center via information transferred over dedicated phone lines at the site installation.

Emergency first-responder response protocols would be established with the site during preparations for site commissioning. If necessary, the alarm signals that Air Products receives at its 24-hr control center can also be sent to an emergency responder station (e.g. Fire Company).

GENCO, Air Products, Plug Power and Sysco Food committed actions include, but would not be limited to: worker safety (include trainings and equipment provided), equipment maintenance (storage and forklift), acquisition of permits, and monitoring of fuel systems when in use.

Based on the information discussed above and the supporting documentation submitted to DOE, this project's impacts to the human and natural environment can be deemed less than significant and this project qualifies for a CXB5.1 "actions to conserve energy".

NEPA PROVISION

DOE has made a final NEPA determination for this award

Insert the following language in the award:

Note to Specialist :

Cristina Tyler 6.23.2011

SIGNATURE OF THIS MEMORANDUM CONSTITUTES A RECORD OF THIS DECISION.

NEPA Compliance Officer Signature: _____ Date: 6/23/2011

NEPA Compliance Officer

FIELD OFFICE MANAGER DETERMINATION

☐ Field Office Manager review required

NCO REQUESTS THE FIELD OFFICE MANAGER REVIEW FOR THE FOLLOWING REASON:

☐ Proposed action fits within a categorical exclusion but involves a high profile or controversial issue that warrants Field Office Manager's attention.

☐ Proposed action falls within an EA or EIS category and therefore requires Field Office Manager's review and determination.

BASED ON MY REVIEW I CONCUR WITH THE DETERMINATION OF THE NCO :

Field Office Manager's Signature: _____ Date: _____

Field Office Manager