

PMC-EF2a

(20102)

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



RECIPIENT: GENCO Infrastructure Solutions, Inc.

STATE: NC

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

Funding Opportunity Announcement Number DE-PS36-08GO98009	Procurement Instrument Number DE-EE0000483	NEPA Control Number GFO-10-089	CID Number EE483
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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:**

GENCO Infrastructure Solutions, Inc. has DOE ARRA funding available to support the construction of a hydrogen fueling storage and dispensing system for fuel cell-powered lift-trucks at Coca Cola Bottling Plant in Charlotte, North Carolina.

GENCO is the prime recipient under this award, the facility manager, and the 3rd party logistic provider for the site and this grant. The project has an additional three subawardees/subcontractors under this award: 1)Coca Cola Consolidated owns the warehouse and forklifts; 2) Plug power will be supplying and installing the fuel cell units for the forklifts; and 3)Linde who will be supplying and installing the hydrogen compressor, storage, and dispensing equipment

Funding will be used for the purchase of 40 Plug Power GenDrive Class-1 systems, installation of the units on new lift trucks, installation of the hydrogen fueling infrastructure, and the daily operation of the lift trucks and infrastructure. Data collection and evaluations will also be ongoing throughout the project.

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 Coca Cola distribution center is an existing 800,000 ft<sup>2</sup> facility in Charlotte, North Carolina. The center is located in an industrial park and is surrounded by additional manufacturing and warehouse facilities. The site consists of a soft drink manufacturing and warehouse facility; a sales and operations office building and; a fleet maintenance facility. The proposed location of the hydrogen storage tank will be located on the south end of the site.

The surrounding area consists of additional manufacturing facilities, a residential development at the north end of the industrial park, and a city water reservoir located approximately ¼ mile west of the site.

The only additional traffic created by this project will be the hydrogen delivery truck that arrives every 20 days. The Coca Cola distribution center has numerous truck deliveries and deployments of products on a daily basis; therefore the addition of a truck delivery of hydrogen every 20 days will not greatly increase the current level of traffic for the area.



**Construction/Installation:**

Two refueling dispensers will be installed and located inside the building for operators to re-fill the forklifts. The hydrogen supply (liquid storage), compression, and high pressure storage will be located outside the warehouse building in a secured area. Liquid hydrogen will be delivered to the site by truck and transferred to the tanks via cryogenic hose.

The hydrogen compression and storage equipment will be installed on concrete foundations and pads (approx 20' x 60') on the south side of the site. This equipment will be fabricated at a vendor shop and shipped to the Coke site for installation. The interconnecting piping and electrical tie-ins will be completed on site. An underground trench will be required for the hydrogen feed from the storage equipment to the distribution center wall. This will be dug by a trench excavator and will take place on a site that has been previously disturbed and paved. Fencing and additional lighting will also be installed around the compression and storage equipment.

Hydrogen Fueling Equipment and infrastructure construction will be conducted by Linde technicians and local contractors working with and commissioned by Linde's engineers. Installation will comply with latest editions of NFPA 52, 55 and IFC that specifies measures to protect environment and public safety.

**Equipment:**

The Hydrogen Fueling Station consists of four modules: Liquid Storage, Compressor system, Gaseous buffer storage, and Automated Dispensers.

Inside the distribution center, a dispenser, hose breakaway device, de-watering pump, and fueling control panel are located in a convenient location for the operator. Outside the 15' fueling zone, a control panel is located which displays the overall station status to the operator.

The compressor system will typically be in a "standby" mode with the buffer storage filled to nominally 5,946 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.

Hydrogen will be delivered to the site as a liquid (in ~ 15,000 gallon trailers). The hydrogen will be stored on site as a liquid and then vaporized and compressed for utilization as required.

GenDrive installations onto the lift trucks will be conducted by Plug Power Technicians.

Installation will comply with latest editions of NFPA 52, 55 and IFC that specifies measures to protect environment and public safety.

**Operations/Training:**

A liquid trailer affixed with an insulated DOT storage tank will deliver hydrogen to the fueling station at 8 bar pressure. The trailer will 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 compressor is controlled by an automatic isolation valve. When required, hydrogen is then fed to a compressor (CP-10) to increase the pressure to 410 bar.

After leaving the compressor, gas is directed to one bank of high pressure storage tubes. Approximately, 1,200 kg liquid and 60 kg gas will be stored on site within a cryogenic tank and high pressure storage tubes. It is estimated that approximately 50kg of hydrogen will be used each day to run the 40 lift trucks.

All on-site operators and maintenance personnel will be trained during a two-day session. It will include power unit training, including operation, planned maintenance, service, hydrogen safety and emergency response in a "train the trainer" arrangement. Additional sessions will be organized on an as needed basis. Fueling station operating manuals, service manuals and training materials will be available to all personnel.

Linde will conduct the training for hydrogen fueling system safety and vehicle dispensing practices/procedures. Plug Power will conduct the GenDrive fuel cell system training and any additional safety-related training.

**Permits:**

Station design, equipment, and infrastructure will comply with latest editions of NFPA 52, NFPA 55 and IFC.

No state or federal licensing is necessary other than PE license. Local permitting and inspections will be provided by licensed state PEs for this project.

Genco and Coca Cola Consolidated will obtain the required electrical and construction permits from local and state authorities for the site, with assistance from Linde, as required.



**Waste stream:**

There will not be any removal of old batteries for this project. The GenDrive units will be installed in brand new electric lift trucks which are replacing the older, LPG lift trucks. The old LPG lift trucks being replaced will be redeployed in other locations within the Coca Cola Consolidated Company.

**Noise:**

The project and installation site for the hydrogen fueling unit is in a large and existing industrial park that is surrounded by additional manufacturing and industrial park buildings. The storage and compression units will be located outside the warehouses on the south side of the facility and over 100' from the property line.

Per Linde and Plug Power, the hydrogen compressors make a minimal amount of noise and the compressor is not audible at distances further than 100'. 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 will not exceed existing noise made by the adjacent industrial park facilities, traffic created by distribution trucks through the area, and additional warehouse distributing equipment found around the site.

**Safety:**

The Linde Group (Linde) has supplied to DOE a document titled: Indoor Fueling Protocol – a Risk Mitigation Strategy.

This document addresses the compressed hydrogen vehicle fueling protocols and mitigation being applied to all aspects of their, especially in regards to the indoor dispensing units and their safety protocols.

Additional safety measures in place include:

General - Multi-layer redundant features –

- \*Setback distances to exposures for LH2 tank and compressor system,
- \*Fenced area for hydrogen and compressor systems,
- \*Installation conforms to NEC Class 1, Division II, Group B Electrical practices,
- \*Leak detection by LEL meter or section control (pressure monitoring),
- \*Multiple emergency stop buttons inside and outside facility,
- \*Outdoor Valve Manifold Box limits hydrogen inside the Distribution Center,
- \*Multiple Isolation valves between compressed storage tanks and dispenser,
- \*System bonded and ground at multiple points to same electric potential,
- \*Fueling hose integrity measured when not fueling and at 207 barg,
- \*Fueling rate limited to less than 30 grams/sec,
- \*24/7 monitoring for alarms and automatic shut down to safe state (de-energized),
- \*Fueling state of charge limited by pressure or temperature.

Dispenser Safety Features –

- \*Valve Manifold Box outside building limits hydrogen inside to less than 10 grams,
- \*Fueling nozzles constructed per SAE J2600,
- \*Breakaway coupling protects dispenser from vehicle driveway and is self sealing,
- \*Setback distances from dispenser restrict combustibles and flammable storage,
- \*Installation conforms to NEC Class 1, Division II, Group B Electrical practices,
- \*Vehicle grounded to same electrical potential as rest of system before fueling (data cable or nozzle),
- \*Dispenser protected from vehicle damage by floor barriers,
- \*Vehicle operator required to start fueling from outside the dispensing area (15'),
- \*Extensive testing, third party approvals for nozzle, hoses, breakaway,
- \*Multiple shutdown features (high/low pressure, leak, hose check, etc),
- \*Minimal mechanical fittings and short tube distance inside building to reduce potential leak points.

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

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

The DOE Hydrogen Program will mandate that a draft Hydrogen Safety Plan be submitted by Genco 90 days after the award is signed. Subsequently, the revised Safety Plan will be due 30 days after DOE has provided comments on the draft plan.

Genco, Linde, Plug Power and Coca Cola Consolidation's committed actions include, but will 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 will qualify for a CXB5.1 "actions to conserve energy".

**NEPA PROVISION**

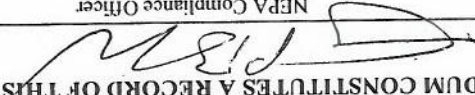
DOE has made a final NEPA determination for this award

Insert the following language in the award:

Note to Specialist:

None Given.

SIGNATURE OF THIS MEMORANDUM CONSTITUTES A RECORD OF THIS DECISION.

NEPA Compliance Officer Signature:  \_\_\_\_\_  
NEPA Compliance Officer

Date: 1/14/10

**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: \_\_\_\_\_  
Field Office Manager

Date: \_\_\_\_\_