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# Air Liquide to supply hydrogen fueling infrastructure for Fuel Cell Bus Demonstration in Birmingham, Ala.

press release

## Contacts:

**U.S. Corporate Communications** 

Michael Rosen +1 713 624 8023

George Smalley +1 713 624 8021

## Air Liquide in the U.S.

Air Liquide companies in the U.S. employ about **5,000** employees in over **200 locations**, and offer industrial gases, equipment and related services to customers in the large industries, industrial merchant, electronics and healthcare markets.

Air Liquide's Industrial Merchant business is present throughout the U.S. providing gases in bulk tankers or in cylinders to diverse sectors in automotive, manufacturing, food, pharmaceuticals, materials, energy, technology, research and to distributors.

Industrial gases optimize production processes, enhance safety and improve product quality.

# Hydrogen Energy

Hydrogen can be produced from a various range of energy sources, natural gas, in particular, but also renewable energy sources. Hydrogen thus has great potential to provide clean energy and ensure reliability of supplies.

Air Liquide is present across the entire hydrogen energy chain (production, distribution, high-pressure storage, fuel cells and hydrogen filling stations). Air Liquide Industrial U.S. LP ("Air Liquide") announced today an agreement with the Center for Transportation and the Environment (CTE) to supply the hydrogen fueling infrastructure for a hydrogen fuel cell bus demonstration in Birmingham, Ala.

CTE, a non-profit organization that specializes in bringing clean transportation technologies to the market, will manage the hydrogen fuel cell bus demonstration over a **two-year period**, scheduled to begin in summer 2012. During this period, a **hydrogen-powered bus will operate in regular service alongside the fleet of public buses** currently operated by the Birmingham-Jefferson County Transit Agency ("BJCTA").

Air Liquide will provide gaseous hydrogen and the compression and dispensing bus refueling system. The system will dispense on average about 20 kg of hydrogen per day, totaling about 12,500 kg of hydrogen during the 24-month demonstration period. The hydrogen fueling station will feature automated 350 bar hydrogen dispensing at one kg per minute, allowing operators to regularly fuel the hydrogen-powered bus quickly.

Mark Lostak, president of Air Liquide Industrial U.S. LP, commented: "Air Liquide is excited to participate in the Birmingham Fuel Cell Bus Demonstration. This initiative illustrates the logical progression toward the use of hydrogen fuel cells in public transportation vehicles. Hydrogen fuel cell technology is a solution that is both economic and sustainable for mass transit systems due to the size of public bus fleets, fuel volume requirements, and the inherent ability to use a centralized fueling system. As we move towards fueling larger bus fleets, we look forward to this technology further demonstrating itself as a cost competitive and environmentally beneficial solution for public transit."

Air Liquide has provided **more than 200,000 hydrogen fills worldwide** and supplied a number of filling installations in North America, including those for buses, materials handling, and light vehicles. In Whistler, Canada, Air Liquide signed a tenyear contract for 20 hydrogen-powered buses that started in February, 2010 in conjunction with the Vancouver Winter Olympics and Paralympics Games. This hydrogen bus fleet is the largest in the world.

"Air Liquide has a proven track record of developing hydrogen fueling stations around the world," said Erik Bigelow, the technology development project manager at CTE who is managing the project. "We are excited to work with them to bring the first hydrogen infrastructure to Birmingham, Ala."

### Blue Hydrogen

With Blue Hydrogen, Air Liquide is moving towards a gradual decarbonization of its hydrogen production dedicated to energy applications.

In practical terms, Air Liquide takes a commitment to produce at least 50% of the hydrogen necessary to these applications through carbon-free processes by 2020, by combining:

- renewable energy sources, water electrolysis and biogas reforming,
- carbon capture and storage technologies during the hydrogen production process based on natural gas.

"The BJCTA is proud to be a part of this fuel cell demonstration," said Lee Jackson, Director of Maintenance at BJCTA. "This project will give Birmingham and the surrounding communities a firsthand look at the new clean technologies that are being developed and introduced to mass transit. The project will also allow the BJCTA to step forward as a leader in the Southeast as a test facility for the new technology."

The Birmingham Fuel Cell Bus Demonstration is a part of the National Fuel Cell Bus Program ("NFCBP"), an initiative funded by the Federal Transit Administration ("FTA"). EVAmerica, an organization specializing in the design, development, and manufacturing of electric and hybrid-electric medium to heavy-duty vehicles, will design and integrate the hydrogen-powered bus, and the hydrogen fuel cell is being provided by Ballard Power Systems.

Air Liquide is the world leader in gases for industry, health and the environment, and is present in 80 countries with 46,200 employees. Oxygen, nitrogen, hydrogen and rare gases have been at the core of Air Liquide's activities since its creation in 1902. Using these molecules, Air Liquide continuously reinvents its business, anticipating the needs of current and future markets. The Group innovates to enable progress, to achieve dynamic growth and a consistent performance.

Innovative technologies that curb polluting emissions, lower industry's energy use, recover and reuse natural resources or develop the energies of tomorrow, such as hydrogen, biofuels or photovoltaic energy... Oxygen for hospitals, homecare, fighting nosocomial infections...Air Liquide combines many products and technologies to develop valuable applications and services not only for its customers but also for society.

A partner for the long term, Air Liquide relies on employee commitment, customer trust and shareholder support to pursue its vision of sustainable, competitive growth. The diversity of Air Liquide's teams, businesses, markets and geographic presence provides a solid and sustainable base for its development and strengthens its ability to push back its own limits, conquer new territories and build its future.

Air Liquide explores the best that air can offer to preserve life, staying true to its Corporate Social Responsibility and sustainable development approach. In 2011, the Group's revenues amounted to €14.5 billion, of which more than 80% were generated outside France. Air Liquide is listed on the Paris Euronext stock exchange (compartment A) and is a member of the CAC 40 and Dow Jones Euro Stoxx 50 indexes.

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