Shared opportunities for natural gas and hydrogen fuel cell vehicle markets

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Fueling stations that offer both hydrogen and natural gas could benefit distributors of both fuel types, says a new Sandia National Laboratories report, "Transitioning the Transportation Sector: Exploring the Intersection of Hydrogen Fuel Cell and Natural Gas Vehicles."

The report, from a workshop last fall supported by the Department of Energy's Vehicle Technologies and Fuel Cell Technologies offices, considered common opportunities and challenges in expanding the use of hydrogen and natural gas as transportation fuels. Organized by Sandia, the American Gas Association and Toyota Motor Corp., the workshop included participants from the auto industry, freight delivery fleets, gas suppliers, gas storage developers, utilities, academia, industry associations, national laboratories and federal and state governments.

"Although natural gas and hydrogen have an obvious intersection—natural gas is the feedstock for 95 percent of hydrogen produced in the United States—this workshop was the first to actively probe synergies, competition and new ways of developing both fuels in tandem," said Dawn Manley, deputy director of chemical sciences at Sandia.

Fueling stations could serve both fuel types

Participants identified fueling stations as one area where companies can better capitalize on synergies between the two fuels. Station operators

could cater to both types of users, as natural gas and hydrogen fuels generally compete for different market segments (natural gas for fleets and hydrogen for consumers).

Similarly, the report finds that if companies shift away from separate approaches and toward using common equipment, similar pressures and the same manufacturing processes, they could enable economies of scale for storage equipment and handling. Common equipment could further improve the business case for co-locating infrastructure, driving down costs and expanding the market for both fuels.

Other observations include:

- Expanding markets are creating opportunities for new players and partnerships in transportation fuels.
- Multiple generations of vehicle and fueling infrastructure will coexist and are likely to suit different niches.
- While the growth of alternative fuels will be unpredictable, early station development can provide valuable lessons for long-term expansion.
- Thorough system requirements and cost assessments are needed to quantify the benefits of co-developing natural gas and hydrogen.
- Different policies may be more effective for different fuels. For example, aggressive deployment programs for natural gas vehicles have stimulated the development of complementary, unsubsidized fueling infrastructure. In contrast, zero-emission vehicle mandates and public investment in early hydrogen infrastructure have motivated automakers to produce hydrogen fuel cell vehicles.

Read the workshop report and findings on the DOE Office of Energy Efficiency and Renewable Energy's Vehicle Technologies and Fuel Cell

Technologies offices' websites.

More information: The report is available online: crf.sandia.gov/wp/wp-content/u … 2NG-Report-FINAL.pdf

Provided by Sandia National Laboratories