

Hydrogen milestone could help lower fossil fuel refining costs

October 9 2009

(PhysOrg.com) -- Hydrogen researchers at the U.S. Department of Energy's Idaho National Laboratory have reached a milestone on the road to reducing carbon emissions and protecting the nation against the effects of peaking world oil production.

Stephen Herring, laboratory fellow and technical director of the INL High Temperature <u>Electrolysis</u> team, today announced that the latest <u>fuel</u> <u>cell</u> modification has set a new mark in endurance. The group's Integrated Laboratory Scale experiment has now operated continuously for 2,583 hours at higher efficiencies than previously attained.

"I'm very much encouraged that it will be able to operate for longer periods of time," said Herring. "It means that this research is closer to commercial viability."

The commercial viability that Herring spoke about is likely different than what many may think of when they hear about <u>hydrogen</u> and fuel cells. Instead of working to create vehicles that use pure hydrogen as fuel, Herring and his team are focused on another application. Currently, "gasoline and <u>diesel fuel</u> actually have a lot of hydrogen that has been added to them, and that's one thing many people don't recognize," said Herring. "Next to a refinery, there's often a plant that's making hydrogen used for upgrading."

If that hydrogen can be produced more efficiently, by decreasing the amount of electricity required by the electrolysis process that separates



hydrogen from oxygen in water, there's the potential for large savings.

Perhaps even more motivating is that multiple government, corporate and other organizations have published reports pointing to severe world economic consequences when world oil production peaks sometime in the near future. Those same reports identify that one of the key parts of a solution is being able to upgrade lower quality petroleum, from sources like oil sands in Canada, into transportation-grade fuels.

"The production of liquid fuels, such as gasoline or diesel, is the primary use of this hydrogen. Refining poor-quality crude oils, upgrading the tarlike Canadian oil sands and removing sulfur from petroleum already require large amounts of hydrogen," said Herring. By adding a special coating to the cells used in the latest test, the team achieved more than double the lifetime of previous cells and will immediately begin analysis of the experiment to try to improve the design further.

"It has been a lot of work by a number of people here, particularly Lisa Moore-McAteer, Keith Condie, Carl Stoots and Jim O'Brien," said Herring. "They've really worked hard in putting this all together over the last five or six years and then keeping it running, that's always a real challenge."

Provided by Idaho National Laboratory

Citation: Hydrogen milestone could help lower fossil fuel refining costs (2009, October 9) retrieved 28 April 2024 from https://phys.org/news/2009-10-hydrogen-milestone-fossil-fuel-refining.html

This document is subject to copyright. Apart from any fair dealing for the purpose of private



study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.