

## INL makes debut at the 2007 Hydrogen Expo

Photo: Steve Herring

A receptive crowd greeted INL the National Hydrogen Association (NHA) Conference and Hydrogen Expo U.S. in San Antonio, Texas this March. The lab made its first appearance at the event to showcase new technologies for generating hydrogen from nuclear energy. Nuclear energy is gaining acceptance in the U.S. as a carbon-free way to produce hydrogen.

INL- pioneered methods for producing hydrogen include high-temperature electrolysis using solid-oxide cells, syntrolysis, which is the co-electrolysis of steam and CO2 to produce synthesis gas, and thermochemical water splitting.

With more than 1,500 people in attendance, the NHA conference and expo is the largest meeting in the U.S. dedicated to hydrogen. The 2007 event hosted 91 exhibitors from nine nations. In past meetings, nuclear energy has been largely bypassed in favor of traditionally "green" technologies, like solar or wind, said Steve Herring, who oversees INL's high-temperature electrolysis research.

**Steve Herring outlines the INL-developed high-temperature electrolysis process during the 2007 Hydrogen Expo US in San Antonio, Texas.**

Herring said he has attended the conference in the past as a hydrogen researcher, but the 2007 expo was the first time INL or nuclear energy has had a formal presence at the event.

That change is due to the growing acceptance of nuclear as a carbon-free energy source, said Tomlin Coggeshall, organizer of the expo's Hydrogen-from-Nuclear pavilion.

"As global warming rapidly becomes a primary concern, sources of carbon-free energy become more and more attractive. At this time when nuclear power offers a significant, carbon-free source of energy which can partner well with hydrogen as the clean carrier of this energy, it seemed logical to invite exhibitors from the nuclear power community to show how that works," said Coggeshall.

"I feel that there was both an acceptance and a welcoming of nuclear power as a relatively inexpensive, significant source of carbon-free hydrogen to help drive the hydrogen energy economy," he said. "Any development that offers a low-cost supply of carbon-free hydrogen will only accelerate the implementation of hydrogen energy. Issues of nuclear waste are being partially addressed by new reactor designs that produce less waste."

Herring said the contrast between this meeting and the first NHA meeting he attended in 2000 was striking.

"The earlier meeting had no papers or displays about using nuclear energy for the production of hydrogen. This year, the dual concerns of our dependency on imported oil and the threat of global climate change fostered a much friendlier reception for the discussion of nuclear energy," he said. "There were some concerns voiced in the exhibition hall about reactor safety and the management of high level nuclear waste. But the audience was much more sophisticated in realizing that hydrogen, like electricity, is an energy carrier rather than an energy source."

Herring said that many conference attendees from academic and industrial backgrounds recognized that generating hydrogen from fossil fuels using steam reformation of natural gas is a short-term solution, due to constrained natural gas supplies and the large amount of greenhouse gasses this method releases into the environment.

Herring also spoke at the expo about the DOE Nuclear Hydrogen Initiative.

"Both during the talk and in our conversations at the booth, the work at INL was well-received," he said. "After the talk, I was asked several questions about the various experiments at the lab and had several invitations to collaborate."

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Photo: High-temperature electrolysis

**The Integrated Lab Scale high-temperature electrolysis experiment will begin testing four 60-cell stacks when assembly is completed later this year.**