



## IEA Hydrogen Implementing Agreement

**IEA Hydrogen Implementing Agreement (HIA) launches anniversary report *In Pursuit of the Future* and introduces strategic plan for the “Second Generation HIA.”**

**Contact:** Mary-Rose de Valladares of HIA Secretariat, +1 301 530 6591 or [mrsenter@comcast.net](mailto:mrsenter@comcast.net).

**9/07/04 Washington, D.C.** The International Energy Agency (IEA) Hydrogen Implementing Agreement (HIA) held a press conference at the National Press Club in Washington, D.C. to release its 25<sup>th</sup> anniversary report, *In Pursuit of the Future*, and introduce the 2004-2009 strategic plan for its second generation of R,D&D. Representatives of the HIA, IEA and the U.S. Department of Energy (DOE) came together to mark this milestone. “Since 1977, when the IEA’s newly created HIA began its investigation of hydrogen, the HIA has made significant progress in long-term, pre-competitive R&D,” said HIA Chairman Trygve Riis of the Norwegian Research Council. “Over the course of 18 annexes (tasks), this collaboration has laid the foundation for the ‘Second Generation HIA’.”

*In Pursuit of the Future* highlights important HIA contributions to the advancement of hydrogen science and technology, while also conveying the attractive fundamentals of the hydrogen energy proposition. The report (free download at <http://ieahia.org/publications/25thAR.html>) contains an overview of the HIA program and a summary of activities and accomplishments. It provides a serious introduction to the complex, interconnected issues associated with development of a hydrogen infrastructure and adoption of hydrogen as the “future fuel.” Topics include production, storage, conversion, integrated systems, markets and economics, as well as safety.

The report examines the findings of seven hydrogen production annexes, which encompass numerous production possibilities. It predicts that, ultimately, renewable sources will be the core of sustainable hydrogen as the dominant, clean and abundant post-fossil fuel. *In Pursuit of the Future* covers the highly promising and equally challenging solar hydrogen production methods -- thermochemical, photochemical (photoproduction, photoelectrolytic production), and photobiological production. Task 14 demonstrated photoelectrochemical water-splitting with 16% conversion efficiency. Task 15 proved the possibility of producing hydrogen from sun and water using biological systems. The report also discusses nearer term hydrogen production routes from electrolysis and hydrocarbons such as fossil fuels and biomass.

Hydrogen storage is a universally acknowledged challenge. Task 12 (MeH for Hydrogen Storage) is distinguished as the first initiative to plan and prioritize related research. Notably, Task 12 developed a material capable of 5 weight percent reversible hydrogen storage at 120°C. Tasks 12 and 17 (Solid and Liquid State Hydrogen Storage Materials) created the

Hydride Information Center (<http://www.hydpark.ca.sandia.gov>), the most comprehensive such data base in the world.

In the conversion arena, Task 7 (Storage, Conversion and Safety) focused on hydrogen “fuel” and liquefaction, examining internal combustion engines, hydrogen gas turbines and regenerative fuel cell systems. It also summarized specific hydrogen safety-related properties.

HIA’s first forays into markets and economics as part of Task 3 (Assessment of Potential Future Markets) in the late 1970’s, and as part of Task 8 (Technical and Economic Assessment of Hydrogen) in the late 1980’s segmented hydrogen into three markets: non-energy sector; indirect energy – captive sector; and direct energy- merchant sector. These tasks concluded that the period 1985-2025 would be crucial for emerging hydrogen technologies, with fossil fuel based energy prices assumed to escalate steadily, absent major economic or political instabilities. Given the potential uncertainties, *In Pursuit of the Future* concludes that the real challenge lies in development and commercialization of hydrogen production technology that will reduce consumer costs and compete head-to-head with fossil fuels.

Tasks 11 and 13 examined integrated hydrogen systems, producing design and optimization guidelines, original modeling work (27 component models) and 15 case studies, including detailed evaluation of 10 international projects, as well as the cost and economics of hydrogen production. Task 18 continues this effort. The report characterizes the challenge of developing integrated hydrogen systems as “the triple bottom line,” the optimal combination of existing and evolving technologies that satisfy three fundamental criteria: increased efficiency, minimum environmental impact and improved economics.

The ‘Second Generation HIA’ has a 2004-2009 strategic plan with three goals: advancement of science and technology, assessment of the market environment, and implementation of an outreach program. The plan stresses cooperation with other international hydrogen programs and closer liaison with other IEA implementing agreements. Current annexes include storage, carbon-containing materials and integrated systems analysis. A safety annex will launch soon. Closing hydrogen production annexes are evolving into broader photoelectrolytic and photobiological tasks. New tasks include annexes in economics; industrial use of hydrogen; and both low and high temperature hydrogen production, including nuclear, wind and electrolysis.

HIA now has 15 members: Canada, Denmark, France, Iceland, Italy, Japan, Lithuania, Netherlands, Norway, Spain, Sweden, Switzerland, United Kingdom, United States and the European Union. It is poised for growth in membership and industry participation. HIA’s 200 experts constitute a leading resource of technical expertise in hydrogen with a global reach and a neutral international profile

Dr. Giorgio Simbolotti, IEA Principal Administrator, remarked, “While the IEA fosters development of many technology options to fuel our energy future, it is proud to celebrate the 25<sup>th</sup> anniversary of its Hydrogen Implementing Agreement, a key success story in the IEA Energy Technology Co-operation Framework.” “Along with the IEA,” said Steve Chalk, DOE Hydrogen Program Manager, “DOE commends HIA’s accomplishments and looks forward to a hydrogen future with improved energy security, environmental stewardship and economic prosperity.” Concluded Simbolotti, “This report and the HIA’s significant R&D achievements send positive signals about the high potential of hydrogen technology and the effectiveness of international cooperation ‘in pursuit of the future.’”