VII.7 Management of International Energy Agency (IEA) Hydrogen Implementing Agreement (HIA) Secretariat

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Start Date: May 2004
Projected End Date: Project continuation and direction determined annually by DOE

Objectives

- Manage orderly and efficient conduct of the HIA Secretariat to support realization of the IEA HIA mission and the overarching goal of the Hydrogen, Fuel Cells and Infrastructure Technologies Program to advance the coming hydrogen economy.
- Support appropriate and effective expansion of the scope of the HIA R,D&D analysis and outreach program.
- Promote growth in HIA membership and industry participation.
- Cooperate with other international hydrogen R,D&D ventures, notably the International Partnership for a Hydrogen Economy (IPHE), in laying groundwork for the coming hydrogen economy.
- Enhance the HIA leadership position in international hydrogen R,D&D ventures.
- Foster the HIA's standing as a premier global resource for technical expertise in hydrogen R,D&D.

Technical Barriers

The IEA HIA's collaborative R,D&D work program has contributed, and continues to contribute to reduction of the full range of technical barriers in hydrogen production, storage, safety, systems analysis and integration identified in the Hydrogen, Fuel Cells and Infrastructure Technologies (HFCIT) Multi-Year Research, Development and Demonstration Plan (MYRDDP). Consequently, program management is essential for continued technical barrier reduction.

The President's Hydrogen Fuel Cell Initiative supports cooperative partnerships as a key facet of the Administration's Program Management approach. MYRDDP Section 6.1, DOE Program Management and Operations, cites the value to the U.S. in cooperative partnerships and coordinated international hydrogen activities. It specifically acknowledges DOE's leadership role in collaborative international activities via the IEA HIA.

Accomplishments

- Expansion of HIA Portfolio under 2004-2009 Strategic Plan
  - Task 21, Biohydrogen, received final approval and completed first year operations.
  - Task 17, Solid & Liquid State Hydrogen Storage Materials, officially closed and its successor annex, Task 22, Fundamental and Applied Hydrogen Storage Materials Development, received preliminary approval with expectation of cooperation with IPHE on mutual agreement of both groups.
  - A new task in Wind and Integrated Hydrogen, now in the project preparation phase, will hold its first Experts meeting in October, 2006 in Brussels, Belgium.
  - Task 16 officially closed with two successor tasks: one successor task, Hydrogen from Steam Reformation, has received final approval; the other successor task, Biomass, has received preliminary approval.
  - 750 expert publications.
- Membership
  - 19 members, including European Commission
  - One new member: Korea
  - Several other countries in membership pipeline
- Planned and conducted two Executive Committee Meetings, in Singapore and Lyon, France; plans are underway for FY 2007 meetings in the Netherlands and Italy.
- Prepared, published and distributed *2005 IEA Annual Report.* (See Figure 1)
- Realized key HIA objective by opening independent office outside of Washington in Bethesda, MD on the campus of the Federation of Associations for Experimental Biology, which has produced 150 Nobel Prize winners. (See Figure 2)
- Managed junior and senior professionals and administrative support.

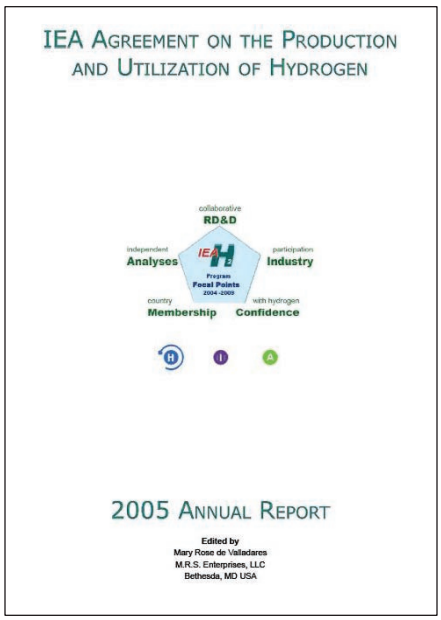

FIGURE 1. IEA HIA Annual Report - M.R.S. Enterprises

FIGURE 2. IEA HIA Office, FASEB Campus in Bethesda, MD

- Renovated IEA HIA public website www.ieahia.org, using new logo and corporate identity, to reflect strategic HIA mission and work portfolio, as well as the growing significance of hydrogen. Per direction of Executive Committee, creating additional members-only private site whose existence is expressly hidden from public. Both sites are data base driven.
- With IEA HIA Executive Committee, formulated proposal for collaboration with the International Partnership for a Hydrogen Economy (IPHE) which was presented to IPHE Steering Committee in January 2006 by HIA Chairman Nick Beck of Natural Resources Canada.
- Planned and managed IEA HIA exhibits at: International Hydrogen Energy Congress & Exhibition (IHEC), World Hydrogen Technologies Convention (WHTC); European Hydrogen Energy Conference (EHEC); World Hydrogen Energy Conference (WHEC 16) in Lyon, France. (See Figure 3)
- Secretariat speaking engagements (and related publications) and posters at key conferences and meetings include: International Hydrogen Energy Congress & Exhibition (IHEC), World Hydrogen Technologies Convention (WHTC), IPHE Storage Conference (poster), Austrian Hydrogen Conference.
- Developed and circulated press releases on Gaps and Priorities in Hydrogen and the Task 14 Photoelectrolytic Production of Hydrogen, Final Report as well as letter to the editor at l'Express.
- Held successful IEA HIA Networking Event in Lyon in conjunction with WHEC.
- Complied with various IEA reporting requirements.
- Portfolio Status –Task accomplishments and activities:
  - Closed Task 16 (Hydrogen From Carbon Containing Materials) May 2006 – Final Report on expected soon - (three subtasks: Subtask A- Large scale integrated H_2 production for power generation; Subtask B – H_2 from Biomass; Subtask C – Small stationary reformers for distributed H_2 production).
    - Completed Subtask A and will soon publish final subtask report.
    - Subtask B completed report on Comprehensive Status and R&D challenges for H_2 production from biomass.
    - Successor task on Small Reformer Technology approved.
    - Successor task on Biomass received preliminary approval.
  - Task 17 May 2006 – Solid and Liquid Hydrogen Storage Materials - 13 countries and 39 experts; successor annex, Task 22, underway; cooperation with IPHE anticipated
    - 36 Projects comprise the world's leading storage R&D effort: 20 metal hydride; 12 combined hydride/carbon; and 4 carbon.
    - Data base globally acknowledged – www.hydpark.ca.sandia.gov/ieaframe.html
    - One page project reports; 800 publications, presentations and patents.
  - Task 18 – Integrated Systems Evaluation (2 subtasks: Subtask A – Information Base Development; Subtask B – Demonstration Project Evaluation)

FIGURE 3. WHEC 2006 Exhibit – Mary-Rose, International Energy Agency Hydrogen Implementing Agreement, and Giorgio Simbolotti, International Energy Agency Secretariat

- 11 member countries, with one member pending.
- Demonstration projects: nine projects selected; two evaluations complete; two underway.
- Comprehensive mid-term report on Subtask A completed.
- "Hydrogen Resources Study" underway with broad participation.
- New Case Study approach produced two new case studies.
- Public website – www.port-h2.com/IEA-Annex-18
- Task 18 extension proposal received favorable consideration.

– Task 19 - Safety – launched in October 2004
  - Three subtasks: Subtask A – Risk Management; Subtask B – Testing and Experimental Program Subtask C – Information Dissemination.
  - Eight official participating countries.
  - Survey of global Risk Assessment methodologies developed and reviewed for Subtask A.1; Report compiled on Comparative Risk Assessment of Hydrogen Systems with Hydrocarbon Fuel Systems, benchmark comparisons of hydrogen systems with conventional public acceptable features; Table of Contents developed for Subtask A.3 – Probabilistic Risk and Consequence Analysis.

– Task 20 – Hydrogen from Waterphotolysis (launched in October 2004)
  - Objective: net solar-to-hydrogen conversion of 10%
  - Eight member countries, 26 researchers, 23 research groups
  - Significant progress reported on preparation and performance of new photo-electrode materials in general and of hematite (a-Fe_2O_3) photo-anodes in particular.

– Task 21 – Biohydrogen (Final approval fall 2005)
  - Four subtasks: Subtask A – Biohydrogen Systems; Subtask B - Basic Studies for BioHydrogen Production; Subtask C – Bio-Inspired Systems; Subtask D – Overall Analysis.
  - Three meetings; huge global interest, particularly in Asia.
  - Dr. Veziroglu will publish a special HIA biohydrogen issue for H_2 Journal.

– Tasks in definition phase (non-successor tasks)
  - Wind and Hydrogen Integration.
  - Hydrogen from high temperature processes – thermochemical and solar thermal.

– Internal cooperation with IEA Fuel Cell Implementing Agreement underway on multiple activities of common interest.

– Groundwork laid for internal cooperation with IEA Wind Implementing Agreement.

Introduction

Over the past 25 years, the International Energy Agency's (IEA) Hydrogen Implementing Agreement (HIA) has earned global standing both as a unique leader in collaborative international research and development ventures, and a premier international resource for technical expertise in hydrogen. The IEA HIA Secretariat manages this collaborative R,D&D program. Over time, the HIA management function has

grown commensurately in scope and responsibility with the R,D&D program. Both the success of the HIA in its research and development program and the burgeoning global interest in hydrogen energy have contributed to this growth. The HIA management function now supports the continued success of the HIA in all phases of activity from planning through execution. The United States, a long-standing HIA member, is committed to the HIA's success via direct participation and U.S. support for the HIA management function. It should be noted that U.S. support for the management function declined in FY 2006 year from its previous half-time level to approximately the one-quarter level. The IEA HIA Common Fund supported the balance of the half-time cost of the Secretariat. The U.S. plans a similar level of support for FY 2007 with the anticipation that the IEA HIA Common Fund will ultimately also assume that portion of the Secretariat cost.

Approach

Current Activities

The IEA HIA Secretariat operates under the direction of the Executive Committee and its Chairman. The approach to management of the IEA HIA Secretariat consists of three tasks: operations management, personnel management and management of the communications and outreach program.

Operations management consists of the following functions:

- Strategic Planning for R&D, analysis and outreach portfolio
- Accounting and finance
- Administration and legal, including IEA Executive Committee minutes
- Office maintenance
- Conferences, meetings and event planning
- HIA representation to relevant groups and organizations

Personnel management consists of supervising and coordinating employees and consultants, both professional and administrative.

Management of the communications and outreach program consists of:

- Internal HIA communications and IEA liaison
- External communications and cooperation
- Media engagement

Operations and personnel management are basic IEA Secretariat responsibilities mandated both by IEA requirements and HIA needs. In its 2004-2009 Strategic Plan, the Executive Committee embraced a growth strategy for the HIA that features membership recruiting and increased industry participation in addition to expansion of the collaborative R,D&D program and the establishment of an independent office. To support these efforts, the Executive Committee directed the Secretariat to develop and implement a proactive outreach strategy that targets internal and external audiences in key stakeholder groups. This strategy assumes that elevating the stature of the HIA through its cooperative R,D&D Program will advance the hydrogen economy. It also assumes that positioning the HIA for relevance and influence will benefit the HIA, its annexes and member countries, as well as the reputation and status of all international hydrogen R,D&D programs. The HIA is committed to liaison and collaboration with international R, D&D interests. Collaboration with the IPHE is viewed as particularly important and mutually beneficial for both entities.

Results

A bulletized list details results for each task in the HIA R&D and analysis portfolio, and highlights accomplishments in the three areas of Secretariat activities. The January 1, 2006 lease of the new HIA office, per the 2004-2009 Strategic Plan, is a major milestone. The outreach program, created to support realization of the HIA's outreach goals for the 2004-2009 period, flourished with a series of speaking and exhibition opportunities as well as written promotion pieces. As a collaborative international hydrogen R, D&D effort, the HIA continues to thrive, contributing to reduction of the full range of technical barriers in hydrogen production, storage, safety, systems analysis and integration identified in the HFCIT MYRDDP.

Conclusions and Future Directions

- Expand management services to full-time per HIA Strategic Plan
- Manage growth of collaborative R,D&D program and assessment of market environment under conditions favorable for international collaboration:
  - Launch approved Small Reformer Technology task, Task 16 successor
  - Realize final approval of Wind and Hydrogen Integration task, cooperating with the IEA Wind Implementing Agreement and launch task
  - Realize final approval on Biomass task, Task 16 successor
  - Complete project preparation phase for new high temperature production task
  - Support new Task 22 efforts to cooperate with IPHE on storage
  - Create discrete cooperative efforts with other IEA implementing agreements

- Expand outreach effort – inaugural newsletter fall 2006
- Step-up liaison and cooperation efforts with IPHE
- Continue to pursue membership recruitment and greater industry participation

Special Recognitions & Awards/Patents Issued

1. Individual tasks, their Operating Agents and experts received various recognition and awards. Various experts filed for and/or received patents.

FY 2006 Publications/Presentations

1. IEA HIA 2005 Annual Report.

2. IEA HIA Gaps & Priorities (See Figure 4).

3. Five Secretariat presentations prepared and delivered: IHEC in Istanbul, Turkey; IPHE Education Conference in Reykjavik, Iceland; Hydrogen Energy Conference in Graz, Austria; poster for IPHE Storage Conference in Italy; FY 2005 Program Review poster.

4. Six Secretariat presentations prepared for delivery by Chair and others: European Hydrogen Energy Conference (EHEC) in Zaragoza, Spain; IPHE Steering Committee January 2006; NHA Conference 2006; WHEC 2006; IEA REWP and CERT meetings.

5. All HIA Operating Agents made a presentation at each of the semi-annual IEA HIA Executive Committee meetings (24 presentations).

6. ~1,000 Task specific Operating Agent and Expert Presentations, including four at WHEC 16.