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

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Start Date: May 2004
Projected End Date: Continuing

Objectives

- Manage orderly and efficient conduct of the International Energy Agency (IEA) Hydrogen Implementing Agreement (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 Research, Development and Demonstration (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 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 how valuable cooperative partnerships and coordinated international hydrogen activities are to the U.S. It specifically acknowledges DOE's leadership role in collaborative international activities via the IEA HIA.

Approach

Introduction

Over the past 25 years, the IEA's HIA has earned global standing both as a unique leader in collaborative international R&D ventures, and as 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 R&D 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 U.S., a long-standing HIA member, is committed to the HIA's success via direct participation and U.S. support for the HIA management function.

Current Activities

The IEA HIA Secretariat operates under the direction of the IEA 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 by IEA requirements and HIA needs. In its 2004-2009 strategic plan, the IEA 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. 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.

Expansion of the Secretariat to full-time operation and creation of a permanent HIA office are key to managing expected current and future growth in the work plan and membership roster. The HIA expects to establish its office in the FY05 last quarter timeframe.

As a collaborative international hydrogen R,D&D effort, the HIA continues to flourish.

Future Directions

- Expand management services to fulltime and complete establishment of HIA office, per the HIA strategic plan

- Manage growth of collaborative R, D&D program and assessment of market environment under conditions favorable for international collaboration:
  - Final approval Task 21
  - Final definition and approval of tasks on high and low temperature production of hydrogen
  - Define new tasks for 2004-2009 HIA portfolio
  - Create discrete cooperative efforts with other IEA implementing agreements
- Expand outreach effort, initiate a newsletter to be available on publicly accessible website area
- Step-up liaison and cooperation efforts with IPHE
- Continue to recruit new members and seek greater industry participation

Accomplishments

- Expansion of HIA Portfolio under 2004-2009 Strategic Plan (Figure 1)
  - Three new tasks (18, 19 and 20) received final approval
  - Fourth task received preliminary approval; final approval imminent
  - Two tasks in project definition phase
  - Other tasks under consideration
  - 200 expert publications
- Membership (Figure 2)
  - Three (3) new members: Finland, Australia and New Zealand
  - Two countries expected to join soon
  - Other countries in membership pipeline
- Planned and conducted two Executive Committee Meetings, in London, UK and Utsira, Norway; Plans are underway for FY05 meetings in Singapore and Lyon, France
- Redesigned HIA corporate identity, beginning with IEA HIA logo (Figure 3)
- Prepared, published and distributed *2004 IEA Annual Report*
- Renovated IEA HIA website, using new logo and corporate identity, to reflect strategic HIA mission and work portfolio, as well as the growing significance of hydrogen. Website has three areas: Executive Committee only; Members and HIA participants only; and the general public
- Managed junior and senior professionals and administrative support
- Produced definitive presentations and papers on gaps and priorities in hydrogen R&D at the request of the IEA Secretariat in satisfaction of Executive Director Claude Mandil's mandate to the IEA

Figure 1. Five Focal Points of 5-year HIA Program During Term 2004 – 2009

Figure 2. Graphic of the 17 Participating HIA Member Countries and Executive Committee Members

HYDROGEN IMPLEMENTING AGREEMENT

Figure 3. New HIA Logo

Hydrogen Coordinating Group; presented findings and conclusions to Renewable Energy Working Party (REWP) and Committee on Energy Research and Technology (CERT)

- Cooperated with other key international efforts, notably the International Partnership for the Hydrogen Economy (IPHE) and the Hydrogen Coordinating Group (HCG)
- Co-sponsored (via financial contribution) the IPHE Storage Conference and participated via poster
- Secretariat speaking engagements (and related publications) and posters at key conferences and meetings include: the Fuel Cell Seminar, IEA HCG, IEA REWP, IEA CERT, International Conference on Philippines Renewable Hydrogen Economy, International Hydrogen Energy Congress & Exhibition, World Hydrogen Technologies Convention, IPHE Storage Conference (poster)
- 12 media articles resulting from media engagement through press releases and direct contact
- Portfolio Status: Task accomplishments and activities
  - Task 14 - Photoelectrolytic Production of Hydrogen closed; successor task 20 approved
    - Final Report, *Photoelectrolytic Production of Hydrogen: Annex 14* published on website: www.ieahia.org
    - Development of world's first water-splitting catalyst and pioneer manufacture of demonstrator photoelectrochemical cell (PEC) water-splitting cells
    - Strong engineering progress with preparation and characterization of WO3 and Fe_20_3
    - Promising conceptual development of novel planar, multi-junction PEC water-splittingcells (WO_3/TiO_2)
  - Task 15 - Photobiological Production of Hydrogen closing soon; expanded successor task in preparation as Task 21
    - Two breakthroughs:
      - Identification of accessory genes needed for assembly of the Fe-hydrogenase
      - Advancement of hydrogen and methane fermentation systems
    - Comprehensive process-development scale photobioreactor systems tested
    - Comprehensive database established on hydrogen producing organisms
    - Hydrogen production from green algae demonstrated
    - Sponsorship/collaboration on world's leading BioHydrogen Symposia and R&D Programs
  - Task 16 – Hydrogen From Carbon Containing Materials (3 subtasks: Subtask A- Large scale integrated H_2 production for power generation; Subtasks B – H_2 from Biomass; Subtask C – Small stationary reformers for distributed H_2 production)

Figure 4. Graphic of 25th Anniversary Report In Pursuit of the Future: 25 Years of IEA Research towards the Realisation of Hydrogen Energy Systems

- Completed Subtask A and will soon publish final subtask report
- Subtask B completed report on Comprehensive Status and R&D challenges for H2 production from biomass
- Review of small-scale stationary reformers for H2 from fossil fuels with Clean Urban Transport for Europe (CUTE) update
- Osaka Gas won Japanese Engineering Advancement Association (ENAA) engineering excellence award

– Task 17 – Solid and Liquid Hydrogen Storage Materials - closed to new members; will end in May 2006; successor task in discussion; cooperation with IPHE anticipated
  - 35 projects comprise the world's leading storage R&D effort: 19 metal hydride; 12 combined hydride/carbon; and 4 carbon
  - Database globally acknowledged – www.hydpark.ca.sandia.gov/ieaframe.html
  - R&D on catalyzed sodium aluminum hydrides led to identification of hydride capable of 4%wt reversible H_2 storage at 120ºC
– Task 18 – Integrated Systems Evaluation (2 subtasks: Subtask A – Information Base Development; Subtask B – Demonstration Project Evaluation)
  - 12 member countries, with one member pending
  - Demonstration projects: 10 projects selected; 2 evaluations complete; 2 underway
  - "Hydrogen Resources Study" underway with broad participation
  - New Case Study approach
  - Public website: www.port-h2.com/IEA-Annex-18
– Task 19 - Safety – launched October 2004
  - 3 subtasks: Subtask 1 – Survey of Quantitative Methods; Subtask 2 – Establishment of Testing Equipment to Evaluate the Effects of Equipment, Product and/or System Failures Under a Range of Real-life Scenarios, Environments or Mitigation Measures; Subtask 3 – Development of Targeted Information Packages for Stakeholder Groups
– Task 20 – Hydrogen from Waterphotolysis (launched October 2004)
  - Objective: net solar-to-hydrogen conversion of 10%
  - 12 member countries with substantial group and expert participation
– Task 21 – Biohydrogen (preliminary approval granted)
  - Several components including: H_2 dark fermentations, photobiological H_2 production, in vitro and bio-inspired systems and techno-economic analysis process integration
– Tasks in definition phase:
  - Hydrogen from high temperature processes
  - Hydrogen from low temperature processes
– Internal cooperation with Fuel Cell Implementing Agreement underway on multiple activities of common interest