

VI.9 Management of International Energy Agency Hydrogen Implementing Agreement Secretariat

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Objectives

- Manage orderly and efficient conduct of the Hydrogen Implementing Agreement (HIA) Secretariat to support realization of the International Energy Agency (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 deployment (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, 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. Consequently, program management is essential for continued technical barrier reduction.

Further, the President's Hydrogen Fuel Cell Initiative supports cooperative partnerships as a key facet of the Administrations' program management approach. In the international arena, cooperative partnerships face the special challenges of communicating and coordinating effectively across multiple languages, cultures and national programs.

Approach

- Manage operations (including accounting and finance, IEA Executive Committee minutes, strategic planning communications, outreach and representation).
- Supervise and coordinate contractor and HIA personnel, as appropriate.
- Develop and implement a proactive strategy for HIA outreach.

Accomplishments (See Table 1)

Table 1. HIA Task Participation by Member Country (excludes new members Denmark and France)

HIA Member Country	Task-13	Task-14	Task-15	Task-16	Task-17	Task-18
Canada	X		X		X	X
European Commission	X					X
Iceland ¹						X
Italy					X	X
Japan	X	X	X	X	X	X
Lithuania ¹	X				X	
Netherlands	X		X	X		
Norway	X		X	X	X	X
Spain	X			X	X	X
Sweden	X	X	X	X	X	X
Switzerland	X	X		X	X	
United Kingdom	X		X	X	X	X
United States	X	X	X	X	X	X
¹ Non-IEA-member country participant						

- Formal IEA approval received for new five year term 2004-2009; *HIA End of Term Report* and *Strategic Plan for 2004-2009* presented and accepted
- Status of Work Program
 - Task 14 - Photoelectrolytic Production of Hydrogen closing soon; expanded successor task in preparation as Task 20
 - Net solar to hydrogen conversion efficiency of 16% using photoelectrochemical cell (PEC)
 - Promising advances in PEC material science
 - Favorable economics for hydrogen production from wastewater
 - Task 15 - Photobiological Production of Hydrogen closing soon; expanded successor task in preparation as Task 21
 - Task 16 – Hydrogen from Carbon Containing Materials; on track with extensive industry participation
 - Task 17 – Storage; with over 30 projects still expanding in activities, members and participants; data base globally acknowledged – <http://www.hydpark.ca.sandia.gov/ieaframe.html>
 - Task 18 – Integrated Systems Evaluation launched in January, 2004
 - Task 19 - Safety now in definition phase
 - Internal cooperation with Fuel Cell Implementing Agreement underway on multiple activities of common interest
 - New Tasks in concept phase: high temperature production processes, low-temperature production processes, economics and analysis; cooperation with other IEA implementing agreements in proposal phase
- R,D&D achievements since 1977 are captured in the 25th Anniversary Report *In Pursuit of the Future*
- Press conference held at National Press Club in Washington to launch *In Pursuit of the Future*
- Redesigned, published and distributed *2003 IEA Annual Report*

- Cooperated with other key international efforts, notably the International Partnership for the Hydrogen Economy and the Hydrogen Coordinating Group
- Speaking engagements (and related publications) at key conferences and meetings including World Hydrogen Energy Conference, National Hydrogen Association, the Germany Hydrogen Association, World Renewable Energy Congress

Future Directions

- Continue basic operation of the HIA Secretariat
- Manage growth of collaborative R, D&D program and assessment of market environment:
 - Launch Safety Task 19
 - Proceed with development of successor Tasks 20 and 21
 - Define new tasks for 2004-2009 HIA portfolio
 - Create discrete cooperative efforts with other IEA implementing agreements
- Develop and implement outreach program
- Pursue membership recruitment and greater industry participation

Introduction

Over the past 25 years, the IEA HIA has earned global standing as a unique leader in collaborative international research and development ventures as well 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 research and development program and the burgeoning global interest in hydrogen energy have contributed to this growth. The HIA management function is now prepared to support 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.

Approach

The approach to management of the IEA HIA Secretariat consists of two tasks. The first is management of operating functions (including accounting and finance, basic IEA duties and strategic planning, communications, outreach and representation); the second is supervision and coordination of contractor and supporting HIA personnel.

Basic IEA duties (minutes, legal records, accounting and finance function) and the strategic planning function are mandated both by IEA requirements and HIA needs. For its 2004-2009 Strategic Plan, the executive committee has embraced a growth strategy for the HIA that features membership recruiting and increased industry participation in addition to an expanding 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 collaborative 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.

Results

Over the past year there has been technical progress in all HIA tasks relative to their objectives and executive committee evaluation. Tasks 14 and 15, Photoelectrolytic Production of Hydrogen and Biological Production of Hydrogen are now concluding with sufficient progress and interest to warrant development of successor tasks with expanded participation. Task 18, Integrated Systems

Table 2. List of the 15 participating HIA member countries and their contracting parties

HIA Member Country	Contracting Party
Canada	Natural Resources Canada Stuart Energy Systems (formerly the Electrolyzer Corporation)
Denmark	Danish Gas Technology Center
European Commission	Joint Research Center
France	Commissariat à l'Energie Atomique (CEA)
Iceland ¹	National Energy Authority
Italy	Ente per le Nuove Tecnologie, L'Energia e L'Ambiente (ENEA)
Japan	New Energy and Industrial Technology Development Organization (NEDO)
Lithuania ¹	Lithuanian Energy Institute
Netherlands	Netherlands Agency for Energy and the Environment (NOVEM)
Norway	Research Council of Norway
Spain	Ministry of Industry and Energy
Sweden	Swedish Energy Agency
Switzerland	Swiss Federal Office of Energy
United Kingdom	Department of Trade and Industry
United States	Department of Energy
¹ Non-IEA-member country participant	

Evaluation, has been successfully launched while the new safety task is well into the definition phase. There has also been solid progress in each of the varied subtasks of Task 16, Hydrogen from Carbon Containing Materials. The Task 17 Storage effort continues to receive international acclaim for its database as well as progress in its ~30 projects. Development of new tasks for the 2004-2009 HIA portfolio is underway, beginning with annexes for high temperature processes, low temperature processes and economics. Other portfolio items await development.

There has been growth in membership. Italy has rejoined, and France and Denmark have become new members. At least one other country is expected to join this year, and several others have expressed serious interest in joining (see Table 2). Greater industry involvement is expected for new tasks (see Table 3).

The IEA approved a new term (2004-2009) for the HIA (See Figure 1). Preparation of the 25th HIA Anniversary Report, *In Pursuit of the Future*, was an "IEA first," as was the press conference announcing its publication and future HIA plans for the "Second Generation of Hydrogen R,D&D".

Table 3. List of industry participation in HIA Tasks

Company	Task-13 Design and Optimisation of Integrated Systems	Task-14 Photo-electrolytic Production of Hydrogen	Task-15 Photo-biological Production of Hydrogen	Task-16 Hydrogen from Carbon-Containing Materials	Task-17 Solid and Liquid State Hydrogen Storage Materials	Task-18 Integrated Systems Evaluation 1
ABB						CH
Air Liquide						F
Air Products						USA
Associated Octel						UK
B9 Energy						UK
Biomass Technology Group				NL		
BOC						UK
BP-Amoco				USA		USA
Dynamotive				CAN		
ENI				ITA		

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EniTechnology			USA			
Energetics						USA
Ergenics					USA	
ET Energie Technologie					GER	
Gas Natural				ESP		
Gastec				NL		
Gas Technology Institute				USA		
Gaz de France				FRA		
General Hydrogen						CAN
Haldor Topsøe				NOR		
Harvest Energy Technologies						USA
HERA Hydrogen Storage Systems					CAN	
Hydrogen Solar Production Company		UK				
IGS Mahler				GER		
Ineos Chlor						UK
Intelligent Energy				UK		
London Hydrogen Partnership						UK
Longitude 122 West	USA					USA
Norsk Hydro				NOR	NOR	
NRG Technologies						USA
Nuvera						ITA
Osaka Gas				JAP		
PanCanadian				CAN		
Plug Power						USA
QuestAir Technolo- gies						USA
Repsol				ESP		
Services Mij						CAN
Shell				NL		
Shell Hydrogen						UK
Sigen						USA

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Sustainable Technologies International		AUS				
Statoil				NOR		
Stuart Energy Systems	CAN					CAN
SunaTech					USA	
Suncor				CAN		
Sycon	USA					
Sydskraft	SWE					SWE
TeesValley H ₂ Partnership						UK
Texaco				USA		
Transport of London						UK
United Technologies					USA	
Wind-Hydrogen						UK
Würth Elektronik						GER

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

Conclusions

Progress in all IEA HIA tasks, membership growth and IEA approval of the proposed 2004-2009 HIA Strategic Plan have contributed to validation of the IEA HIA effort. As a collaborative international hydrogen R,D&D effort, the HIA is flourishing. Over its lifetime, HIA accomplishments have been

sufficient to sustain interest and support for HIA pursuit of the second generation of hydrogen R,D&D beginning in 2004.

FY 2004 Publications/Presentations

(Secretariat only – does not include annexes)

- 25th Anniversary Report – *In Pursuit of the Future*
 - See 2003 Annual Report for selected list of publications for each task
- 2003 Annual Report, End of Term Report, Opportunities Assessment Report
- German Hydrogen Conference – presentation and paper
- National Hydrogen Association Annual Conference presentation
- Windsor Workshop – panel discussion
- World Hydrogen Energy Conference
 - Oral presentation and paper

- Presentation to Task 16C
 - Presentation to Task 15
7. World Renewable Energy Conference – presentation
 8. For a complete list of publications and presentations, see IEAHIA website for Operating Agent contact information and links to individual tasks
 - HIA website scheduled for renovation; www.ieahia.org

Special Recognitions & Awards/Patents Issued

1. IEA approval of new term, 2004-2009, for HIA collaborative R,D&D program
2. Press Conference to launch *In Pursuit of the Future* at the National Press Club in Washington, D.C.