

HYDROGEN IMPLEMENTING AGREEMENT

www.ieahia.org

With a 35 + year operating history and significant accomplishments to its credit, the International Energy Agency (IEA) Hydrogen Implementing Agreement (HIA) is a unique leader in the conduct of coordinated hydrogen research, development and demonstration activities on a global basis. Through the creation and conduct of nearly forty tasks or annexes, the IEA HIA has facilitated and managed a comprehensive range of Research, Development & Demonstration (R, D&D) and analysis programs among its member countries. In September 2004, the IEA HIA released its anniversary report entitled *In Pursuit of the Future: 25 Years of IEA Research toward the Realisation of Hydrogen Energy Systems*. The IEA HIA continues to pride itself on collaboratively addressing many innovative, longer-term, pre-competitive R, D&D key issues related to hydrogen (H₂) production, storage, conversion, safety, integrated systems, economics and markets. It is further committed to analysis and outreach in support of its R, D&D activities. See the *IEA HIA End of Term Report 2009-2015* for more information about progress over the past five years, and the *IEA HIA Strategic Plan 2015-2020* for a preview of the coming five year period. The IEA HIA welcomes liaison with interested groups in public and private sectors.

The HIA Strategic Framework

- VISION** A hydrogen future based on a clean sustainable energy supply of global proportions that plays a key role in all sectors of the economy
- MISSION** Accelerate hydrogen implementation and widespread utilization to optimize environmental protection, improve energy security and promote economic development internationally, while establishing the HIA as a premier global resource for expertise in hydrogen
- STRATEGY** Facilitate, coordinate and maintain innovative research, development and demonstration activities through international cooperation and information exchange

IEA HIA 5-Year Plan (2009-2015 & 2015-2020): Themes & Portfolios

- Collaborative R,D&D
That advances hydrogen science and technology
- Hydrogen Production
 - Hydrogen Storage
 - Integrated Hydrogen Systems
 - Hydrogen Integration in Existing Infrastructure

- Analysis that positions Hydrogen
- Technical
 - Market
 - Support for Political Decision-Making

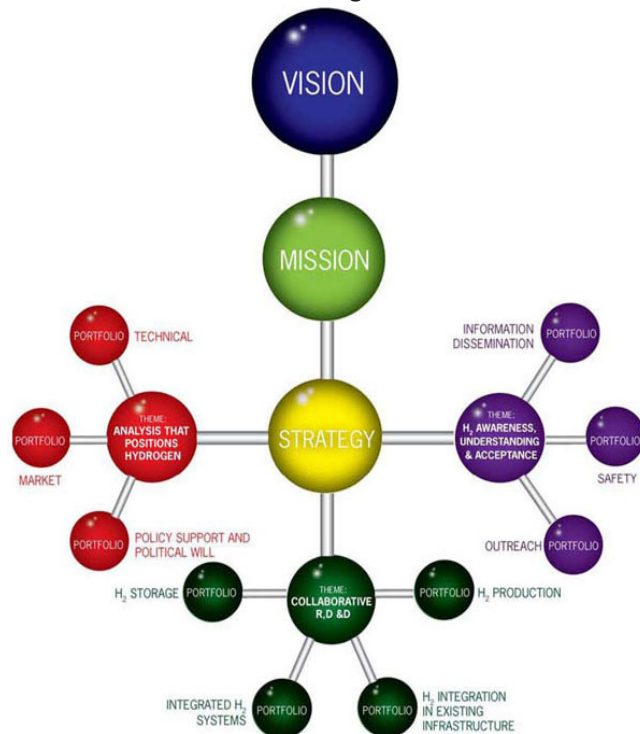
- Hydrogen Awareness, Understanding and Acceptance
- Information Dissemination
 - Safety
 - Outreach

Members

The 25 current IEA HIA members are:

Contracting Parties: Australia, Belgium, Denmark, Finland, France, Germany, Greece, Japan, Israel, Italy, Korea, Lithuania, the Netherlands, New Zealand, Norway, Spain, Sweden, Switzerland, United Kingdom, United States, the Commission of the European Union and the United Nations Industrial Development Organization (UNIDO)

Sponsor Members: HYSAFE, Nationale Organisation Wasserstoff und Brennstoffzellentechnologie (NOW), Shell Global Solutions International BV



CURRENT AND CLOSING IEA HIA TASKS

Task 22 Fundamental & Applied H Storage Development (2006-2012)

NEW! FINAL REPORT AVAILABLE at <http://ieahia.org/new.htm>

- Final Report (introduction, summary and project list) • Appendix A – Reports from 59 experts with scientific achievements • Appendix B – Publication list (260 pages)

Task 23 Small Scale Reformers for On-Site H₂ Supply (2006-2012)

FINAL REPORT AVAILABLE at <http://ieahia.org/new.htm>

Task 24 Wind Energy and Hydrogen Integration (2006-2010-2011)

FINAL REPORT AVAILABLE at <http://ieahia.org/new.htm>

Task 25 High Temperature Production (HTP) of Hydrogen (2007-2011)

FINAL REPORT AVAILABLE at <http://ieahia.org/new.htm>

Task 26 Advanced Materials for WaterPhotolysis of Hydrogen (2008-2012)

FINAL REPORT AVAILABLE at <http://ieahia.org/new.htm>

Task 28 Large Scale Hydrogen Infrastructure and Mass Storage (2010-2014)

- **FINAL REPORT PENDING** • Subtask A – Scenarios • Subtask B – Assessment HRS Concepts
- Subtask C – Analysis of H₂ Delivery Pathways & IEA data Evaluation – Comparison of H₂ Refueling Station concepts • Subtask D – large-scale deployment of variable RE sources

Task 29 Distributed and Community Hydrogen (DISCO H₂) (2010-2014)

- Scope - H₂ applications in energy communicates integrating H₂ with electricity and other energy and mobility networks and distributed systems • Community size – 1000 and installed H₂ capacity NTE 500 kW • Community Types: Urban, Rural and Island, Distributed Industrial applications • Subtask 1 – Project Management • Subtask 2 – Analysis and Selection HRS • Subtask 3 – Model Concept Development • Subtask 4 – Concept Replicability • Dissemination

Task 30 Global Hydrogen Systems Analysis (2010-2014)

- **FINAL REPORT PENDING** • Subtask A – Detailed Analysis: Global Hydrogen Resources
- Subtask A Final Report coming soon • Subtask B – Updated and harmonized H₂ data set • Subtask C – Collaboration with IEA Analysis • Subtask D – Hydrogen for the Smart Grid

Task 31 Safety (2010-2013)

FINAL REPORT AVAILABLE at <http://ieahia.org/new.htm>

Task 32 Hydrogen-based Energy Storage (2013-2015) Successor to Task 22

- Project based: further research on new and improved compounds and demonstration of solid storage systems for both stationary and mobile applications • Develop reversible or regenerative H₂ storage materials fulfilling relevant technical targets; develop the fundamental and engineering understanding of H₂ storage; develop materials and systems that have the capacity to fulfill these targets • Develop materials and systems for H₂ based energy storage for use in stationary, mobile and portable applications, and electrochemical storage

Task 33 Local Hydrogen Supply for Energy Applications (2013-2016) Successor to Task 23

- Provide a platform for evaluation and harmonization of the various technologies for local H₂ supply for reduced costs and increased costs and increased employment • Harmonize technological and economic assessment of available on-site supply technologies • Monitor upcoming technologies and their barriers • Generate a meeting arena for reformer and electrolyzer suppliers as well as end-users

Task 34 Biological Hydrogen for Energy and Environment (2014-2017) Successor to Task 21

- Subtask 1 – Basic Research on BioHydrogen production (dark fermentation and bioelectrolysis; light-drive BioHydrogen production; Enzymatic and Bio-inspired Molecular Systems) • Subtask 2 – Applied Research on Biohydrogen Production (Integration of BioHydrogen Fermentation systems; system feasibility; eco/energy systems)

Task 35 Renewable Hydrogen Production (2014-2017)

- Subtask 1 – Renewable Electrolysis (with IEA AFC); Subtask 2 – Photoelectrochemical Water Splitting; Subtask 3 – Solar-Thermochemical Water Splitting (with IEA SolarPACES)

Task 36 Life Cycle Sustainability Assessment (2014-2017)

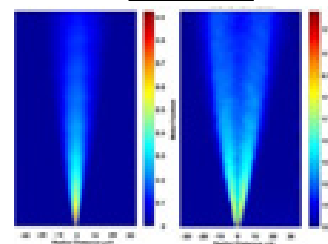
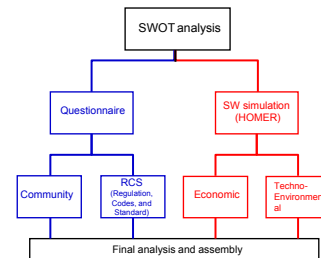
- Subtask A – Addressing Environmental Challenges in LCA of H₂ Energy Systems;
- Subtask B – Economic Analysis of H₂ Energy Systems; Subtask C – Social Indicators for Assessment of H₂ energy systems and integrative LCSA approaches; Subtask D – Collaboration with IEA HQ analysts

Task 37 Safety (2015-2018) Successor to Task 31

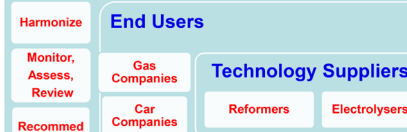
- Subtask A – Tool Kit Integration • Subtask B – Accident Scenarios Development • Subtask C – Physical Effects • Subtask D – Human Reliability Analysis • Subtask E – Materials Compatibility

Tasks in Definition

- Power to Hydrogen/Gas/Fuel Task
- Marine Task



Local Hydrogen Supply



Visit the HIA website at www.ieahia.org for further information and recent publications.
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