

**IEA Hydrogen Implementation Agreement
Semi-Annual Progress Report
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**Task 22: Fundamental and applied hydrogen storage materials
development**

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Summary

Hydrogen storage is considered by many as the most challenging aspect for achieving a hydrogen-based economy. Task 22 addresses hydrogen storage in solid materials. The task started December 1st 2006, and an extension for 3 years were approved at the Executive Committee meeting in Seville in November 2009, thus until end of November 2012. At present there are 50 active Experts from 17 countries and in total 47 projects. There has not been a Task 22 meeting since the previous IEA HIA ExCo meeting in Essen, Germany in May 2010. The previous Task 22 meeting was in Death Valley in USA 11-15 April 2010 and the following one will be in Perth, Australia 16-20 January 2011. The meeting after Perth will be in Copenhagen, Denmark in September 2011.

Task description

Task 22 addresses hydrogen storage in solid materials. The research efforts will require new materials and solutions, and not simple, incremental improvements in current technologies. The specific goals and objectives for research on hydrogen storage materials in Task 22 are:

- A. Develop a reversible or regenerative hydrogen storage medium fulfilling international targets for hydrogen storage.
- B. Develop the fundamental and engineering understanding of hydrogen storage by various hydrogen storage media that have the capability of meeting Target A.
- C. Develop hydrogen storage materials and systems for use in mobile and stationary applications and also other potential energy related applications, for example in batteries.

Task 22 is open to a broad spectrum of project types:

- Experimental
- Engineering
- Theoretical
- Modelling
- Safety aspects of hydrogen storage materials.

The following classes of materials are included:

- Reversible metal hydrides
- Regenerative hydrogen storage materials (chemical hydrides)
- Nanoporous materials

Task 22 is built on projects with international collaboration strongly encouraged. A project plan is prepared for each project.

Activities during the previous six months

There has not been any Task 22 meeting during the last six months. The seventh meeting was held in Furnace Creek Inn and Ranch, Death Valley, USA 11-15 May 2010. 56 participants were present at meeting, and most of the projects were presented and discussed. Details about the achievements at the seventh Task 22 meeting is given in the SAR from the last ExCo-meeting in Essen. Since the previous meeting it is clarified that Switzerland will participate with Prof. Andreas Züttel from EMPA as the Expert, but it is still unclear for UK and the European Commission. The next Task 22 meeting will be in Perth, Australia 16-20 January 2011. It will be organized by Prof. Craig Buckley at Curtin University. The Table below summarizes the Task 22 meetings so far.

Table 1. Task 22 meetings.

Location	Dates	No. of participants
Monterey, California, USA	28.1-1.2. 2007	51
Egmond aan Zee, Netherlands	3-7.9. 2007	58
Hotel Sacocomie, Québec, Canada	2-5.3 2008	49
Villa Mondragone, Italy	7-10.10 2008	52
Jeju Island, Korea	19-23.4 2009	50
Paris, France	11-15.10 2009	59
Death Valley, USA	11-15.4 2010	56

Abbreviated Work Plan and Milestones for next 6 months

The following meetings will be 16-20 January 2011 in Perth, Australia organized by Prof. Craig Buckley, and 4-8 September 2011 in Copenhagen, Denmark organized by Dr. Torben R. Jensen. There are still remaining some signed National Participation Letters. The OA will try to collect as many as possible at the meeting in Istanbul.

Effectiveness of Task Participation

The participation in Task 22 is very good. Most of the Experts were present at the meeting in Death Valley, USA and thus also most of the project being presented. This shows that participation in the IEA HIA Task 22 meetings is given a high priority by the Experts. Dr. Ping Chen from China was the only IPHE-experts present in the last meeting. This will hopefully help in the process to recruit China. Russia did not participate and also the Expert from Brazil did not attend. An Expert from Israel planned to attend, but problems getting visa for the USA made it impossible. He is planning to attend the meeting in Australia.

Publications

The list of publications and presentations will be updated by the end of 2010 in order to include the complete list for 2010. The list will be available on the Task 22 web-page.

Matters Required Executive Committee Attention

- Approval of the semi-annual progress report.