

## PURPOSE

The proposal is to study hydrogen systems integrating with electricity and other energy and mobility networks. The Task should have considerable industrial input intended to move hydrogen systems to commercialization. The purpose of Task 29 is to progress the optimization and replication of “green” hydrogen within distributed and community energy systems. This will be accomplished by identifying situations where the use of hydrogen is appropriate and assessing the technical, environmental, economic, and social benefits of such systems. The Task will focus on H2 applications in energy communities and distributed systems, mostly involving stationary applications but also looking at potential benefits for transportation. An energy community is defined as a group of people living in a common location featuring shared geographical location and energy needs. Communities to be considered should include up to 1000 people and the total installed power capacity of the hydrogen energy technologies (both producing and consuming hydrogen) in the communities should not exceed 500 kW.

## STATUS OF THE TECHNOLOGY

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Since DISCO-H2 is focusing on H2 application in communities, in order to define the status of the technology a case by case analysis of the various applied technologies needs to be done in order to define the status of the technology. Some of them are in a start-up phase and need to prove the concept, while some others are in an early market phase and are currently aiming at demonstrating their technical reliability so to gain soon an improved economical viability. Due to the fact that the Task is looking into real life applications, the Technology Readiness Levels (TRLs) may range from TRL 7 to TRL 10 depending on the analyzed project.

## FRAMEWORK SUMMARY

Task 29 is organized in five subtasks (STs) as depicted in Figure 1.

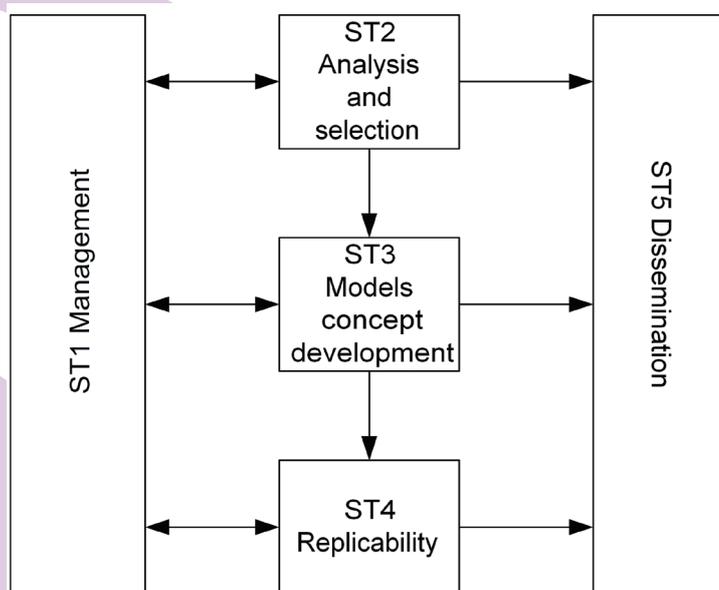


Figure 1: Flow chart of Subtasks

## TASK 29

### DISTRIBUTED AND COMMUNITY HYDROGEN

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### VITAL STATISTICS

#### Term

Dates 1/11/2010 - 31/12/2013

#### Members

List members  
Canada  
France  
Greece  
HyER  
Japan  
New Zealand  
UK  
UNIDO  
USA

#### Expert Participants

10 (including OA)

#### 2012 Meetings

2-3 June 2012  
Toronto, Canada  
Edinburgh, Scotland;  
15-16 October 2012  
Brussels, Belgium



ST1 and ST5 run for the whole duration of the Task dealing with management and dissemination issues. They are led respectively by UNIDO-ICHET (Operating Agent (OA) of DISCO-H2) and HyER/Proton OnSite. ST2 produces as an output the selection of six projects representing the core group based on which three DISCO-H2 models concept will be extrapolated. CRES and AIST are ST2 and ST3 coordinators. Finally, ST4 provides an economical analysis for the concept applicability in order to achieve market penetration. In addition, it assesses advantages and disadvantages of the three DISCO-H2 concepts.

## MEMBERS

Task Member and Expert Table

TASK 29	COUNTRY	EXPERT NAME (SUBTASK LEADER)	INSTITUTION NAME
1	Japan	Hiroshi Ito (ST3 lead)	AIST - National Institute of Advanced Industrial Science and Technology
2	France	Aline Rastetter	Alpheia
3	Greece	Emmanuel Stamatakis (ST2 lead)	CRES - Centre for Renewable Energy Sources
4	France	Jean-Christophe Hogue	Helion
5	Canada	Raymond Schmid	Hydrogenics
6	France	Marieke Reijalt (ST5 lead)	HyER
7	UNIDO	Federico Villatico Campbell (Operating Agent, ST1 lead)	ICHET - International Centre for Hydrogen Energy Technologies
8	New Zealand	Alister Gardiner (ST4 lead)	IRL - Industrial Research Limited
9	USA	Robert Friedland	Proton OnSite
10	UK	Daniel Aklil and Simon Bourne	Pure Energy and ITM

## MEMBERSHIP CHANGES

Since the beginning of the Task, NREL from USA and ITC from Spain withdrew from the consortium, as they both encountered financial troubles related to task funding. ITM from UK is in the process of becoming member.



## ACTIVITIES AND RESULTS IN 2012

### PROGRESS AND ACCOMPLISHMENTS

Per the timetable depicted in the Gantt chart (Fig. 2), ST3 – Model Concept Development was underway in 2012 along with ST5 – Dissemination.

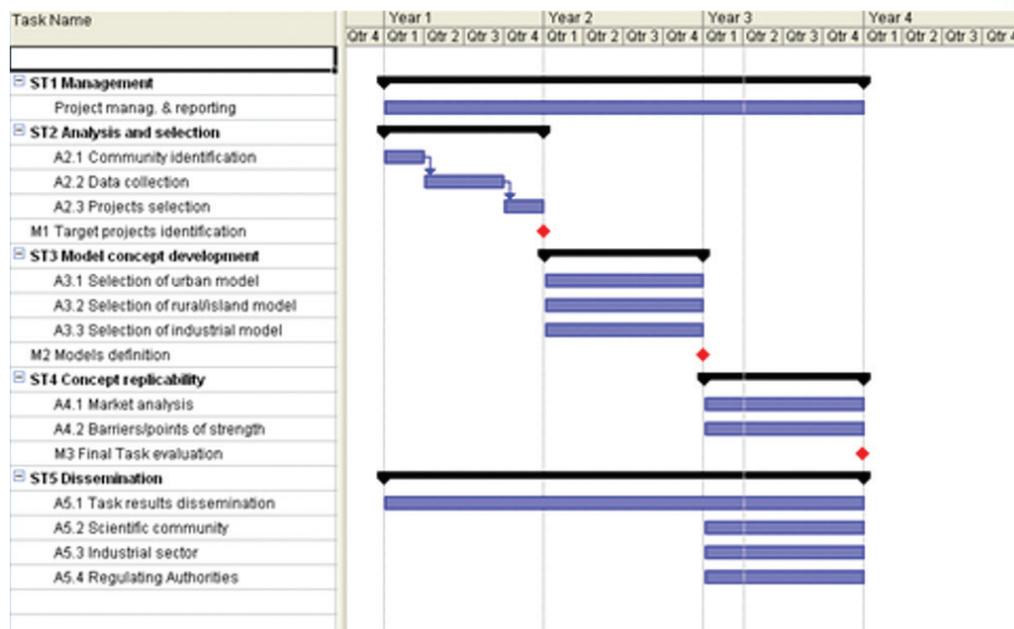


Figure 2: Gantt Chart

In 2011, ST 2 was completed. ST2 consists of:

A2.1 Community Identification

A2.2 Data Collection

A2.3 Project Selection

ST 2 resulted in final selection of six projects that comprise the core group of projects studied under ST3. The six projects are:

#### RURAL/ISLAND communities

- H2 Office (UK) : renewables and hydrogen power an office building
- MYRTE Project (EU) : grid-connected renewable energy storage application on an island
- LOLLAND Project (EU) : combined heat and power (CHP) application with strong community involvement in a rural area

#### URBAN communities

- OCTAGON (US): green building application inside a city
- CHP Japan (JAPAN): CHP application in urban area.

#### INDUSTRIAL communities

FedEx Forklist Project (US): Forklifts (industrial) application in a warehouse.

The methodology adopted to perform the projects analysis is based on the Strength, Weaknesses, Opportunities and Threats (SWOT) analysis. Led by AIST of Japan, ST3 is



engaged in an in-depth SWOT analysis of the six projects. Specifically, ST3 is organized into three main activities geared toward definition of models that represent a community typology:

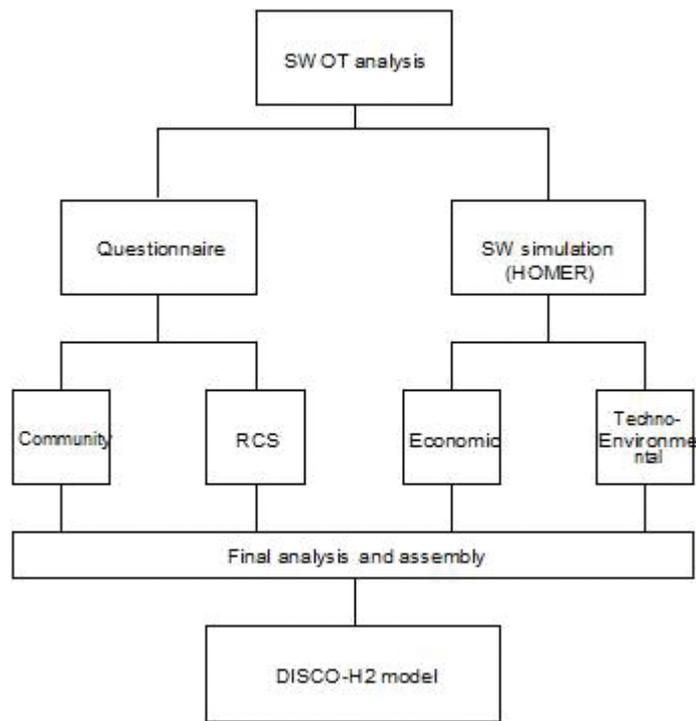
A3.1 Selection of an urban model

A3.2 Selection of a rural/island model

A3.3 Selection of industrial model.

The models' definition will consist of two main steps:

- A software (HOMER) simulation that characterizes models definition from the environmental/technical and economic points of view
- A questionnaire to be sent to project managers to define the community and regulatory field.



The selection of the six final projects as an output of ST2 marked the achievement of the first Task milestone (M1) in 2011. The target date for completion of the next milestone, the definition of the DISCO H2 models, is slated for February 2013 per the table below:

Table 1 Milestones list

MILESTONE N.	MILESTONE NAME	ST N.	MONTH
M1	Target projects identification	2	12
M2	(DISCO-H2) models definition	3	24
M3	Final Task evaluation	4	36

The diagram below articulates the DISCO H2 models logic scheme.

The final task report is expected to consist of general guidelines on hydrogen facts and applications potential accompanied by one technical publication for each of the community types.





## OUTREACH AND COMMUNICATION

### Summary of Strategy and Activities

The main dissemination activities undertaken in 2011 are:

- A presentation at the World Hydrogen Technology Conference (WHTC) outlining the DISCO-H2 activities on September 15th in Glasgow, Scotland;
- Publication about DISCO-H2 activities within Alpea hydrogen newsletter;
- Presentation of “Renewables and Hydrogen: an opportunity for Communities” during the II annual meeting of Task 29 at City Council of Edinburgh with the presence of the Scottish Energy Minister and the CEO of the City Council;
- Presentation at Low Carbon Earth Summit-2011 (LCES-2011) Dalian, China.

The principal 2012 Dissemination activities consisted of:

- Participation in the HyER Annual Meeting at the Palais des Academies, which opened further discussion about collaboration
- A DISCO H2 poster was presented by Mr. Robert Friedland from Proton Onsite at the Fuel Cell Seminar & Exposition in November in Connecticut.

In 2014, workshops are expected to be a key component of the DISCO H2 outreach strategy.

## FUTURE WORK

### ACTIVITIES AND /OR TARGETS FOR 2013

The target for early 2013 is the achievement of milestone n. 2, namely, the definition of the three DISCO-H2 models, one per each of the three communities' categories identified. The 2013 meetings are expected to be held in Edinburgh in June in conjunction with the HYPOTHESIS conference and in Corsica at the site of the MYRTE project installation.

### ACTIVITIES AND/OR TARGETS BEYOND 2012

Organization of a workshop in conjunction with one of the bi-annual task meetings may begin in 2013. To this end, contacts with relevant stakeholders are well underway. Challenges (subheading level 2) DISCO-H2 carries no major R&D challenges as it is mostly focused on an analytic and dissemination type of work based on existing projects. However, the team is challenged to produce a useful tool (in the form of a document) that can suggest to communities the correct hydrogen energy solution tailored on their energy case and encourage their investments in order to increase the penetration of renewable energy into the energy mix.

#### Task websites

[www.disco-h2.org](http://www.disco-h2.org)