planSOEC

R&D and commercialization roadmap for SOEC electrolysis

Application for ForskEL 2010 funding | September 2009
Project no. 10432

Applicant:

- Topsoe Fuel Cell A/S

Participants:

- H2 Logic A/S
- RISØ DTU - Fuel Cells and Solid State Chemistry Division

Application documents:

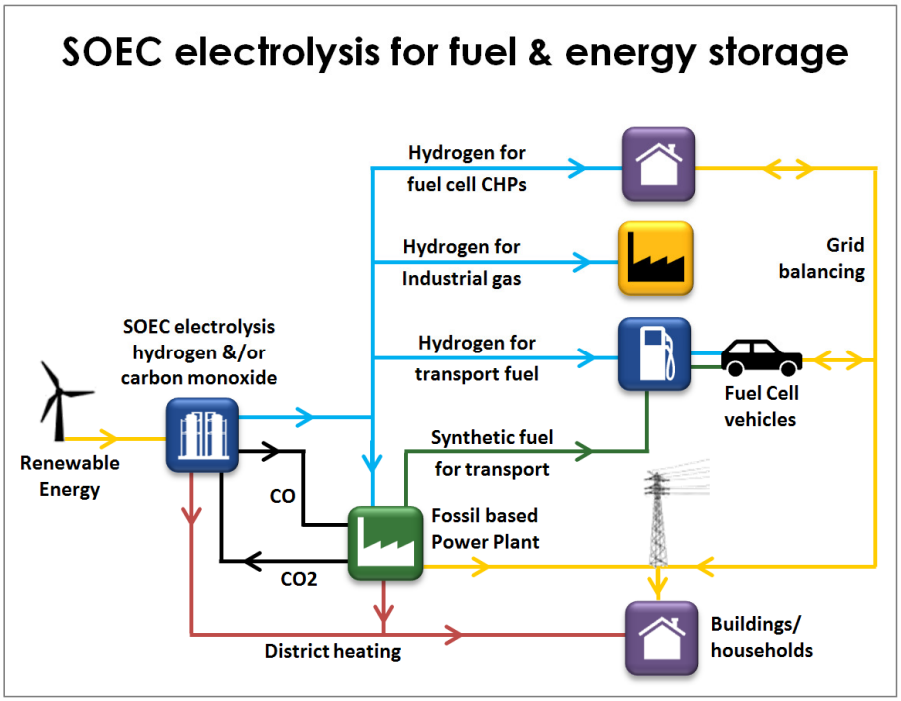
- Main Application Document *(this document)*
- Appendix A – Budget specification of wages and salaries *(separate document)*
- Appendix B – CVs of Key Staff & Organisation Description *(separate document)*
- Appendix C – Elaborate Project Description *(separate document)*

Table of content

01: Purpose

The purpose of the project is to develop a R&D and commercialisation roadmap for hydrogen and CO production plants based on the solid oxide electrolysis cell (SOEC) technology.

Production of hydrogen and carbon monoxide (CO/syngas) through use of renewable electricity for water/CO2 SOEC electrolysis may benefit the overall energy system as shown in the figure to the left.



Hydrogen can act as storage medium for renewable energy and can be utilised for industrial gas supply, fuel for transport and supply of hydrogen to combined heat and power units (CHP) in e.g. households.

Hydrogen and CO (syngas) can be used as feedstock for production of various CO2 neutral synthetic hydrocarbon fuels such as methane (synthetic natural gas – SNG), dimethylether (DME) or clean diesel.

The SOEC production plants, the CHP units as well as the fuel cell electric vehicles (hydrogen &/or synthetic fuelled) may also provide various balancing services to the power grid (up and down regulation of either electricity consumption or production).

Electrolysis using SOEC can enable a significant higher energy efficiency compared to existing alkaline and PEM electrolysis, thus holding the potential for significantly lower cost of hydrogen production.

SOEC technology is still on an early R&D stage, however years of extensive R&D within SOFC technology in Denmark provides a strong platform for an accelerated commercialisation. Also an R&D effort on SOEC is already taking place in Denmark. This applying project is to develop a detailed and executable R&D and commercialisation plan that is to act as a platform and planning instrument for Danish R&D within SOEC electrolysis.

The Roadmap formulation and development will continue and further detail the SOEC part of the *"Electrolysis hydrogen production R&D strategy"* that has been formulated by the *"Hydrogen Production Strategy-follow-group"* beneath the Danish Hydrogen and Fuel Cell Partnership.

The project participants complement each other and cover the entire value chain from basic research and system development through market use of the SOEC technology. The participants also constitute the leading organizations in Denmark which encompass the required competences to develop and commercialize the SOEC technology for the international markets.

02: Organisation

Project responsible Enterprise/institution, Authorised signatory and Project Manager

Company name	Topsoe Fuel Cell A/S	**Phone**	+45 4527 2000	**Fax**	+45 4527 2999
CVR no.:	28308523	**E-mail**		**Web**	www.topsoefuelcell.com
Street	Nymøllevej	**No.**	66	**Level**	
Address 2		**ZIP**	2800	**City**	Lyngby
Country	Denmark				
Key staff member 1	Helge Holm Larsen	**E-mail**	hhl@topsoe.com	**Phone**	+45 4527 2168
Key staff member 2	Andreas Benedict Ricther	**E-mail**	anbr@topsoe.com	**Phone**	+45 4527 8469
Project manager	Helge Holm Larsen	**E-mail**	hhl@topsoe.com	**Phone**	+45 4527 2168
Authorised signatory	Helge Holm Larsen	**E-mail**	hhl@topsoe.com	**Phone**	+45 4527 2168

Project Partners and Subcontractors

Two project partners will participate in the project. No subcontractors will be involved in carrying out the project.

Company name	H2 Logic A/S	**Phone**	+45 9627 5600	**Fax**	+45 9714 0899
CVR no.:	26933048	**E-mail**	info@h2logic.com	**Web**	www.h2logic.com
Street	Industriparken	**No.**	34	**Level**	
Address 2		**ZIP**	7400	**City**	Herning
Country	Denmark				
Key staff member 1	Mikael Sloth	**E-mail**	ms@h2logic.com	**Phone**	+45 2991 3179
Key staff member 2	Jesper Boisen	**E-mail**	jb@h2logic.com	**Phone**	+45 2145 2963

Company name	RISØ DTU - Fuel Cells and Solid State Chemistry Division	**Phone**	+45 4677 5800	**Fax**	+45 4677 5858
CVR no.:	42154113	**E-mail**		**Web**	www.risoe.dtu.dk
Street	Frederiksborgvej	**No.**	399	**Level**	
Address 2		**ZIP**	4000	**City**	Roskilde
Country	Denmark				
Key staff member 1	Mogens Mogensen	**E-mail**	momo@risoe.dtu.dk	**Phone**	+45 4677 5726
Key staff member 2	Søren Højgaard Jensen	**E-mail**	shjj@risoe.dtu.dk	**Phone**	+45 4677 5849

03: Project Description

Project objectives
The purpose of the project is to develop a R&D and commercialisation roadmap for hydrogen and CO production plants based on the solid oxide electrolysis cell (SOEC) technology. The potential markets for these plants are expected to be in the production of hydrogen industrial gas, hydrogen transport fuel, hydrogen for fuel cell CHP units, and CO2 neutral synthetic hydrocarbon fuels where hydrogen and CO are used as chemical feedstock.

The project activities are to:

1. Analyse state-of-the-art SOEC technology and identify research and development needs in order to make the technology viable in commercial applications
2. Identify technology requirements and commercial targets for hydrogen and CO production plants based on the SOEC technology. Conduct a market outlook and projection analysis for the various potential markets (hydrogen industrial gas, hydrogen for fuel cell CHP units, hydrogen and synthetic transport fuel) in order to determine possible market introduction years, international market potentials and value propositions
3. Combine the gathered data and results into an operational and executable R&D and commercialisation roadmap and define future projects that develop the SOEC technology towards the commercial market targets

Project content
The project will contain the following work packages:

- WP1 – Project Steering Committee
- WP2 – Study specification
- WP3 – SOEC state-of-the-art and R&D need analysis
- WP4 – Market requirement and outlook analysis
- WP5 – R&D & commercialisation roadmap formulation
- WP6 – Reporting, dissemination & continuation

The listed work packages are further elaborated in *"Appendix C - Elaborate project description"*.

Project method
The project is a review and analysis project that will provide a roadmap for research and development activities as well as commercialisations activities for the SOEC technology.

In a first step the scope of the required data for the roadmap is identified. In a second step the data is gathered and evaluated. This is done in parallel for the SOEC technology and for the potential markets.

The results will then be combined and summarized into a roadmap which details research and technical development activities as well as business development activities. The level of detail of the roadmap is sufficient to be used as operationally as an outline to guide future projects. The project will also strive to secure that new projects are initiated in order to ensure implement the roadmap.

04: Relevance

Relevance to the energy sector as a whole & the Forsk-EL call

CO2 neutral synthetic hydrocarbons as well as hydrogen gas can act as energy carriers for renewable electricity. Thus, these energy carriers contribute to achieving the goals of CO2 and particle emissions and also contribute to the long term independency of fossil fuel, especially in energy markets where there is a specific political and societal demand. Concerning electricity from renewable sources it can be intermittent and depending on environmental conditions, such as wind. Having an effective and carbon-neutral mean of energy storage may benefit the overall efficiency of renewable energy sources.

Specifically, the project targets four markets for the production of CO2 neutral fuel based on solid oxide electrolysis by use of renewable electricity:

1) Hydrogen industrial gas market – Currently, most of the hydrogen used for various industrial purposes is produced based on natural gas reforming. Employing the SOEC technology enables the use of renewable electricity thus reducing CO2 and particle emissions and the dependency on fossil fuels.
2) Hydrogen transport fuel market – Hydrogen is recognised as an enduring contribution to the use of renewable electricity in the transport sector. Also electric transport may contribute with valuable balancing services to the power grid in long term. The SOEC technology may yield a higher energy efficiency compared to existing alkaline and PEM electrolysis technology and thereby lower the production cost of hydrogen which in consequence may advance the commercial use of it as transportation fuel.
3) Hydrogen and CO as feedstock for synthetic fuel production – Hydrogen and CO can be used as feedstock for production of synthetic hydrocarbon fuels. By use of renewable electricity for the production of both hydrogen and CO the synthetic fuel can become CO2 neutral and contribute to fossil fuel independency. Furthermore, existing infrastructure is utilized better.
4) Hydrogen supply for fuel cell based combined heat and power units in e.g. households. This will enable storing of renewable energy for later conversion to heat and power on a decentralised basis.

Overall the project will thus contribute to all of Forsk-EL call focus areas: 1) Control and regulation of energy systems, 2) Tomorrow's environmentally-friendly electricity generation and 3) Environmental improvements and greater efficiency.

The development of the SOEC technology can thus in the long term contribute to the Danish and international political goals of reducing CO2 and particle emission and increasing the use of renewable energy for energy purposes. It can also advance the higher goals of zero emissions and fossil fuel independency.

In particular, the project is in alignment with the Danish ambition of creating and securing business for Danish companies with new energy technologies and supplying public funding for the area. The project participants cover the entire value chain from basic research and system development through market use of the SOEC technology. The group of partners also constitutes the leading organizations in Denmark which encompass the required competences to develop and commercialize the SOEC technology for the international markets.

Relevance to national & international energy plans & R&D strategies

The SOEC technology addresses the potential of both hydrogen and synthetic fuels that together hold the potential for enabling use storage and balancing of renewable energy and use hereof for transport with zero emission and fossil independency. The two technologies are not seen in completion with each, nor are they in competition with other sustainable transport technologies such as bio fuels or battery electric propulsion. Instead a variety of solutions is needed to firstly cover the increase in global energy consumption for transport, and secondly in long term to potentially partly or fully replace use of fossil based fuels.

The relevance of hydrogen and fuel cells is internationally acknowledged by: 1) *"European Strategic Energy Technology Plan"* (SET) where hydrogen is identified as a key technology for Europe for achieving the 20/20/20 reduction goals 2) The Commission's Communication, *"Energy for a Changing World – An Energy Policy for Europe"* and 3) The European Council's *"Conclusion on a European Energy Strategy for Transport"* 29 May 2007.

The relevance of R&D within hydrogen technologies is thus confirmed and supported by a number of national and international R/D/D strategies such as the Danish Energy Authority *"Brintteknologier - strategi for forskning, udvikling og demonstration i Danmark Juni 2005"*, Danish Hydrogen and Fuel Cell Partnership strategy for transport *"Brint og brændselsceller til transport i Danmark strategi 2008-2025"* and EU Fuel Cells Hydrogen Joint Undertaking *"Multi annual implementation plan"*. Also hydrogen and fuel cells are listed as one among several key research topics in the Danish Ministry of Science, Technology and Innovation: *"Research2015"*. March 2009.

This project is also to further detail the SOEC part in the The *"Electrolysis hydrogen production R&D strategy"* that has been been developed by the *"Hydrogen Production Strategy-follow-group"* beneath the Danish Hydrogen and Fuel Cell Partnership. All the project participants are part of the Hydrogen Production strategy-follow-group and thereby already familiar with the subject of electrolysis and SOEC. This project will continue and enlarge the efforts of the working group and ensure that a detailed plan for future activities concerning SOEC is laid out. This roadmap is required to coordinate future efforts and achieve a successful commercialization of the SOEC technology.

05: R&D Strategy

The project participants have been and are continuously involved in various national and international supported R&D projects that can support this project with valuable knowledge.

Risø DTU has since 2002 performed R&D projects on SOEC that are supported nationally and internationally. Risø DTU together with Topsoe Fuel Cells A/S has also for 20 years conducted R&D and demonstration within solid oxide fuel cell (SOFC) technology which creates a technology basis of knowledge and skills for the SOEC technology. Additionally, Topsoe Fuel Cell A/S has built a pre-commercial production facility for SOFC and is together with Risø DTU researching and developing efficient processes to produce SOFC on a commercial scale. Assuming that SOEC can be produced with similar processes strong synergies between the two products can be expected. Topsoe Fuel Cell A/S also has a strong relation to the existing market for catalysts for fossil fuel production that also may be a valuable market channel for SOEC technology for use in synthetic fuel production.

H2 Logic A/S has ended and ongoing R&D projects on use of hydrogen for transport fuel that have attracted national and international funding. Also H2 Logic supply commercial PEM and alkaline electrolysis production plants for industrial gas and transport fuel applications. H2 Logic thus contribute to the project with valuable knowledge on

the market requirements and R&D needs for complete hydrogen production systems and plants for the industrial gas and transport fuel markets. H2 Logic also has activities within development of fuel cell hybrid systems for various transport applications. The knowledge and competence from the fuel cell activities may also support activities on developing systems based on SOEC technology. In particular there are great synergies between the Balance of Plant (BoP) system needed for SOEC stacks (e.g. provided from Topsoe) and the extensive knowledge and competence H2 Logic has on BoP systems for fuel cell stacks.

Below are listed the major projects with national funding that the participants have or are being involved in.

SOEC related R&D projects

Project number & title	• (Forskel-10045) *"Durable solid oxide electrolysis cells and stacks"* • (ENMI-2058-03-0014) *"Efficient conversion of renewable energy using solid oxide cells"* • (EU-FP7-Relhy) *"Innovative Solid Oxide Electrolyser Stacks for Efficient & Reliable Hydrogen Production"* • (EU-FP6-Hi2H2) *"Highly efficient, high temperature, hydrogen production by water electrolysis"* • (FORSKEL-6287) *"Pre-investigation of electrolysis"*
Relevance for the applying project	The projects will provide valuable R&D data on SOEC electrolysis for the state-of-the-art analysis and R&D need analysis in the project

Hydrogen related market outlook studies

Project number & title	(Forskel-0110) *"CanDan1.5 - Analysis of power balancing with fuel cells and hydrogen production plants"*
Relevance for the applying project	The project will provide valuable input on the market potential and outlook projections for use of hydrogen electrolysis plants for transport that has been developed as part of the CanDan1.5 project

Hydrogen refuelling infrastructure related projects

Project number & title	• (EBST-09/01080) *"How2use – sustainable hydrogen for the satisfied and demanding gasoline/diesel end-user based on the "Quintuple Helix Innovation Model"* • (ENS-64009-0018) *"HyLIFT-DEMO - European demo of 3rd gen. hydrogen powered fuel cell forklifts"* • (ENS-64009-0172) *"LINK2009-phase2 - demonstration of 2nd gen. fuel cell hybrid vehicles & hydrogen refuelling station in Denmark"* • (ENS-63011-0069) *"LINK2009-phase 1 - Development and demonstration of 2nd gen. fuel cell hybrid vehicles and hydrogen refuelling stations for demonstration at COP15"* • (ENS-63011-0045) *"R&D 2nd generation fuel cell systems and large scale demonstration in backup power and materials handling applications in Canada and Denmark – phase 2"* • (ENS-33033-0286) *"R&D 2nd generation fuel cell systems and large scale demonstration in backup power and materials handling applications in Canada and Denmark – phase 1"* • (ENS-33032-0208) *"Canadian/Danish Joint Fuel Cell Initiative (CanDan) development of a generic 2-10kW fuel cell system for pilot testing in niche transport (NT) and Uninterrupted Power Supply (UPS) applications in Denmark"*
Relevance for the applying project	The project will provide valuable R&D and market data and experience on use of hydrogen electrolysis production & refuelling stations for the technical & market related studies in the project

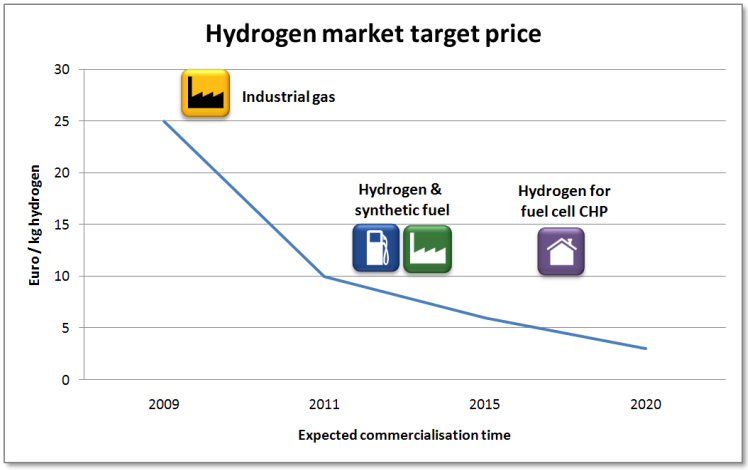
06: Business Strategy

The aim of the project is to develop a research and development as well as a commercialisation roadmap for the SOEC technology targeting four markets with international business potential. The participating companies Topsoe Fuel Cell A/S and H2 Logic A/S each cover a part of the value chain for the markets and thus hold a potential to benefit from the roadmap along with other Danish companies. As SOEC technology is in the early the main challenge is to move the technology onwards commercialisation, as this will require a substantial R&D efforts. Here the project participants together have a strong basis in the existing and extensive R&D effort conducted on SOFC technology.

Topsoe Fuel Cell A/S is conducting research and development within the SOFC technology and is in the process of establishing manufacturing facilities in order to roll out commercial products in the coming years. The SOEC technology is much related with the SOFC technology and there is a large potential of expanding the current business activities to this field. The parent company Haldor Topsøe A/S is a leading company in the supply of catalysts and plants for the existing fossil fuel markets that may provide channels to a deriving market for synthetic fuel production based on the SOEC technology. Within the value chain of the SOEC technology Topsoe Fuel Cell A/S may act as a developer and manufacturer of stacks supplying these to system integrating and plant manufacturing companies such as the other participant H2 Logic A/S.

H2 Logic A/S is a world leading developer of fuel cell hybrid power systems and supporting hydrogen infrastructure in terms of hydrogen production plants and refuelling stations for various energy applications. H2 Logic A/S has accumulated sale of more than 20 hydrogen infrastructure solutions and plants various energy and transport fuel applications since 2003. The accumulated R&D efforts in H2 Logic is €5,3 million, with ongoing activities amounting to €5,0 million. H2 Logic A/S acts as a system integrator and plant manufacturer, currently using alkaline and PEM electrolysis technology in complete infrastructure solutions. For H2 Logic A/S the SOEC technology can increase the energy efficiency of the hydrogen productions solutions offered by the company, thus reducing the cost of the produced hydrogen for the customers. H2 Logic A/S will act as system integrator of the SOEC technology supplied by e.g. Topsoe Fuel Cell A/S providing complete production plan solutions for the various markets.

The targeted four markets for the SOEC electrolysis technology have different commercial targets that allow for early market introduction to niche markets at high price level, and continuously introduction to new and larger markets as technology matures and price is reduced; as shown in the figure to the left.



All together the four markets hold enormous potentials. The market for industrial gas today is more than 50 million tons of hydrogen, corresponding to ~400 GW of electrolysis production capacity. Supplying hydrogen for the fuel cell vehicles targeted for deployment in USA and Europe onwards 2025 would require up to ~37 GW capacity[1].

[1] Calculations based on: ORNL March 2008: *"Analysis of the Transition to Hydrogen Fuel Cell Vehicles and the Potential Hydrogen Energy Infrastructure Requirements"* and www.hyways.de

07: Dissemination

A project report will be compiled from all results from the project including the R&D and commercialisation roadmap. The report and roadmap will be disseminated through the various national and international networks that the participants are part of, amongst others:

- The Danish Hydrogen & Fuel Cell Partnership (DKHFC) and especially the "Hydrogen production strategy-follow-group" www.hydrogennet.dk
- The Scandinavian Hydrogen Highway Partnership www.scandinavianhydrogen.org
- The Hydrogen Link Denmark network www.hydrogenlink.net
- The European Fuel Cells & Hydrogen Joint Undertaking, especially the working group *"IDA2 Hydrogen production"* www.ec.europa.eu/research/fch
- Publication on www.energyprojects.dk managed by RISØ DTU
- International Energy Agency "Advanced Fuel Cells - Annex XX Fuel Cell Systems for Transportation"
- International Energy Agency "Hydrogen Implementing Agreement - Annex Large Scale Hydrogen Infrastructure & Mass Storage"

Also presentation of results from the project on a continuously basis is expected at various national and international conferences and workshops, among others the biannual workshops arranged by the Hydrogen Link Denmark Association, Fuel Cell Seminar, F-CELL, FCH JU General Assembly, World Hydrogen Energy Conference and others. Please note presentation at the mentioned fairs will be depended on approved paper/abstract submission.

Confidential information and results from the participants and outside contributors will be kept confidential and not published in this project. This also accounts for information and results that may be patentable or involve detailed business strategies and data of the involved companies.

It is a clear goal for the project to secure that new projects and activities are initiated before end of the project, thus staring of the road map implementation. Therefore the project is also to plan new and future R&D projects.

08: Description of Research-based content

The project will not directly include research-based activities, however the formulation of the R&D and commercialisation roadmap will require extensive knowledge on State-Of-the-Art (SOA) within SOEC technology as well as industrial knowledge on technical and market issues and requirements. Thus the combining hereof will represent new knowledge and especially a strong planning tool and platform for conducting future R&D onwards commercialisation.

Therefore CVs for Key Staff and an organisation description is provided in *"Appendix B – CVs of Key Staff & Organisation Description"* in order to document that the participants together hold the necessary knowledge and competence within SOA of SOEC technology as well as industrial technical and market aspects.

09: Time Schedule

Resource allocation

Resource allocation, in terms of participant hours, across all WPs is shown in the figure below:

Participation & hour allocation across WPs

Organisation	WP1	WP2	WP3	WP4	WP5	WP6	Total
Topsoe Fuel Cell A/S	50	30	125	310	75	40	**630**
H2 Logic A/S	45	75	45	250	150	60	**625**
RISØ DTU	30	30	200		50	40	**350**
Total	**125**	**135**	**370**	**560**	**275**	**140**	**1.605**
WP-Leader WP participation							

Main resources will be allocated to WP3 and WP4 where SoA for SOEC electrolysis as well as market requirements for the technology is to be identified, thus the very basis for the roadmap. As can be seen all participants are part of most of the WPs in order to ensure the necessary interdisciplinary collaboration, coordination and sharing of results across the WPs. Reflecting their role in the value chain, RISØ DTU will focus on WP3, whereas H2 Logic and Topsoe Fuel Cell A/S will focus their efforts on WP4.

Time table & milestones

Below is shown a detailed time table for the project with milestones, in the form of a Gantt chart.
The work packages and milestones are further described in Appendix C "Elaborate Project Description".

Gantt chart – planSOEC

Time period: 01.02.2010 – 30.04.2011 **Year →**	2010											2011			
Work package & milestones *(dotted line)* ↓ **Month →**	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4
WP1 – Project Steering Committee M1.1 Kick-off-meeting (15.02.2010) M1.2-2nd meeting (15.05.2010) M1.3-3rd meeting (15.09.2010) M1.4-4th meeting (15.12.2010) M1.5 Ending meeting (15.03.2011)															
WP2 – Study specification M2.1 Specification finished (15.05.2010)															
WP3 – SOEC state-of-the-art and R&D need analysis M3.1 SoA analysis finished (31.10.2010)															
WP4 – Market requirement and outlook analysis M4.1 Market analysis finished (31.11.2010)															
WP5 – R&D & commercialisation roadmap formulation M5.1 Roadmap formulation finished (15.02.2011)															
WP6 – Reporting, dissemination & continuation M6.1 – Project reporting finished & continuation secured (15.03.2011) M6.2 – Main dissemination ended (30.04.2011) *(dissemination to be continued after project end)*															

10: Budget allocation and total budget

The figure below outlines the total budget and detailed allocation on each project participant.
Further budget details can be found in *"Appendix A – Budget specification of wages and salaries".*

Cost/info type	Topsoe Fuel Cell A/S	H2 Logic A/S	RISØ DTU	Total
Wages & salaries	683.000 DKK	462.000 DKK	285.000 DKK	1.430.000 DKK
Other costs	10.000 DKK	20.000 DKK	13.500 DKK	43.500 DKK
Total costs	**693.000 DKK**	**482.000 DKK**	**298.500 DKK**	**1.473.500 DKK**
Support PSO	346.000 DKK	287.000 DKK	202.600 DKK	835.600 DKK
Share PSO	50%	60%	68%	57%
Number of hours (VIP+TAP)	630	625	350	1.605
VIP hour rate	494 DKK	422 DKK	400 DKK	
TAP hour rate	334 DKK	--	--	
Overhead rate hours	125%	75%	105%	
Overhead other costs	0%	0%	35%	

For the participating companies a support rate between 50% to 60% is asked for as the project will develop an R&D and commercialisation roadmap that will be disseminated to the public for use by other Danish as well as international actors within the area. Thus the roadmap will benefit to a large degree other companies and organisations that are not participating in or contributing financially to this project. The 50-60% funding is under the EU stated max funding levels for LARGE and SME companies on respectively 65% and 80% for *Industrial Research with dissemination of results.*[2]

Topsoe Fuel Cell A/S explanation of overhead above 50%
Topsoe Fuel Cell uses an overhead rate of 125% on wages in all public applications. This reflects the actual cost situation as the company is in a pre-commercial phase. At the present most efforts are focused on R&D and the company does not have substantial commercial income.

H2 Logic A/S explanation of overhead above 50%
The overhead level on wages used by H2 Logic is 75% and thus differs from the max level on 50% as stated by Energinet.dk. As an R&D company with continuously ongoing R&D activities in the range of €5 million, H2 Logic operates with standard and fixed staff salaries for employees and overhead rate, that are used across all R&D projects with public support (national & EU). Salaries are fixed from start of project and are thus not increase during the period, despite of expected increase in salaries.

RISØ-DTU explanation of overhead above 50%
Risø, DTU has an overhead rate of 105 % on wages, containing rental, administration and IT support. This is used in the calculation of the total budget in the application and does not affect the PSO funding of 135% in direct costs.

[2] "FÆLLESSKABETS RAMMEBESTEMMELSER FOR STATSSTØTTE TIL FORSKNING OG UDVIKLING OG INNOVATION" (page 14)
http://www.ens.dk/da-DK/NyTeknologi/om-eudp/Lovgrundlag/Documents/Rammebestemmelser-jan-2007.pdf