Project no. EIE/05/217/SI2.420237

RES-FC MARKET

Regional markets of RES-fuel cell systems for households

Intelligent Energy – Europe (EIE)
ALTENER Action

Interim Technical Implementation Report (IR)

Period covered: from 01.01.2006 to 30.06.2007

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Duration: 30 months

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1. INTERIM REPORT SUMMARY

The aim of the project is to support the development of early niche market for renewable energy sources fuel cell micro-CHP (combined heat and power) systems for households and thus firstly contribute to commercialisation of fuel cell technologies, and secondly – to increase the share of renewable sources in the energy consumption.

The key part of the project is identification and description of the potential regional markets for at least 3,000 units of RES-FC systems – a catalogue of min. 10 regions, describing the technology to be used there, local conditions, barriers and ways to overcome them.

While the technology is already in place, the major barriers for the commercialisation are at present absence of regulations and the price. In particular driving the prices down is a critical element for the success of the development of market. The cost of RES-FC systems is expected to be cut down to the level of less than EUR 5.000 / kWe through the aggregation of regional market and getting benefits of the effect of scale. Additional price decreases are expected from sharing experience between the regions and implementing best practices, as well as further technical improvements.

1.1 Objectives of the interim period

The first major activity and task in the reporting period was to identify and describe the relevant technologies (first part of WP2). The other work packages will then built on that input.

The technology part of WP2 comprises:

- description of an entire RES-FC system, from prime energy source, through storage and distribution to a fuel cell CHP system at the end user.
- A report with scenarios for all identified systems (biogas to CHP, biogas and wind to CHP and only wind to CHP).
- determining the size of a fuel cell system (FCHS) for a single household, taking into account different requirement for regions, resulting from differences in climate and the residential market characteristics.

The important consideration was unification of components whenever possible, so that the same components could be used in possibly many places, enabling us to benefit from economies of scale (a vital part of WP4). Standard or common components should be used – whenever possible – not only in various regions, but also for different systems.

The second key activity and task in the reporting period was to identify and describe the status of 10 potential regional RES-FCHS markets (the second part of WP2).

The market part of WP2 comprises:

- Status description of regional markets in Denmark, Germany, Iceland, Portugal, Spain and the Netherlands for the transformation of renewable energy sources (RES) into hydrogen for household fuel cell (FC) applications.
- Status description with a focus on barriers for implementing the markets. The description of state of the art was to be based on a common format, including checklists, developed by the WP-leader together with the coordinator.

The third key activity and task in the reporting period was to initiate the work of WP3, WP4 and WP5 almost simultaneously. The 3 work packages comprise the overall objectives of constructing market development plans (WP3), developing an aggregated market of 3,000 RES-FCHS units (WP4) and improving the technical performance of RES-FCHS (WP5). The 3 work packages are all in process at the interim date.

1.2 Achieved results and lessons learnt until the interim date

With regards to WP2 the description of the technical status of RES-FCHS systems and the advancement of description of the regional markets are 100% done. At the same time WP3, WP4 and WP5 are in process at the interim date and following results have been achieved and following lessons learnt:

The technology

It was mutually decided that the fuel cell system would be a PEM fuel cell operating on pure hydrogen with a power level of 0.5 to 1 kW. The RES supply would be generating pure hydrogen in a pipeline system for a new residential area. The houses in these areas would be well insulated because of the low thermal output of the fuel cell system. In this way the system is more focused than all the systems that the individual partners had in mind. With that in mind following lessons were learnt regarding the technology:

- The conversion of biogas to hydrogen for PEM-FC showed that low temperature fuel cells (although they work with biogas) are not the first choice when biogas should be used in combination with a fuel cell. Too many process steps are needed to refine biogas to the level of natural gas and then transform the biomethane to hydrogen.

- The combined ethanol/methanol plant from biomass is still under development and cost projections for the fuel are encouraging.
- The excess wind to hydrogen case lacks understanding of the conditions for optimal operation in the case of direct electricity production versus operation in the electrolyser mode for hydrogen production.
- The part on the fuel cells and fuel cell CHP systems shows that cost reduction is a very important issue for commercialisation and this is one of the goals for the project.

Special attention has been paid to electrolysis. Integration of wind energy on a bigger scale without cheap electrolysis is not possible, thus finding alternative and cheaper way to produce hydrogen using electrolysers is among the key issues for success of the project. As a part of WP2 representatives of BIC and HIRC visited a Russian manufacturer of alkaline electrolysers.

The market

There have been some difficulties in identifying 3,000 units of RES-fuel cell systems for households in the regional markets. Until now 1300 potential units have been identified in the period up to 2010. The aggregated market of 3,000 houses in the next years therefore needs also the development of new markets after a successful demonstration of the technology. But there is hope: In North-Germany regions with excess wind energy exist. Biomass and biogas are not yet easily adaptable to hydrogen fuelled fuel cell CHP for households, but there is a plan to have 450 fuel cell CHP systems for households by 2010, 2.250 units by 2012, and 72.000 units p.a. by 2020, spread over Germany. The following observations were a.o. found to hamper the early identification of 3,000 units of RES-fuel cell systems for households:

Regulation

There is a general lack of public regulation of fuel cells, and there are safety concerns regarding use of the hydrogen. There are no specific regulation/subsidies/guaranties/tax reductions on the coupling of RES and FCHS. The framework conditions regarding legislation in Denmark are complex and it is not yet certain under which regulations and paragraphs a RES FCHS can operate.

Barrier

The cost of fuel cells is too high and hydrogen is much more expensive than natural gas. Biomass route is not established for methanol production and ethanol reforming is not an option.

Stakeholders

Some specific locations and/or projects are mentioned. But the planning of the projects is still in its initial phase. The main constraint for fuel cells market in Portugal is the lack of informa-

tion on the technology itself by the main stakeholders, in particular households and building owners and constructors, and the price of the FC system elements (FCs and electrolysers).

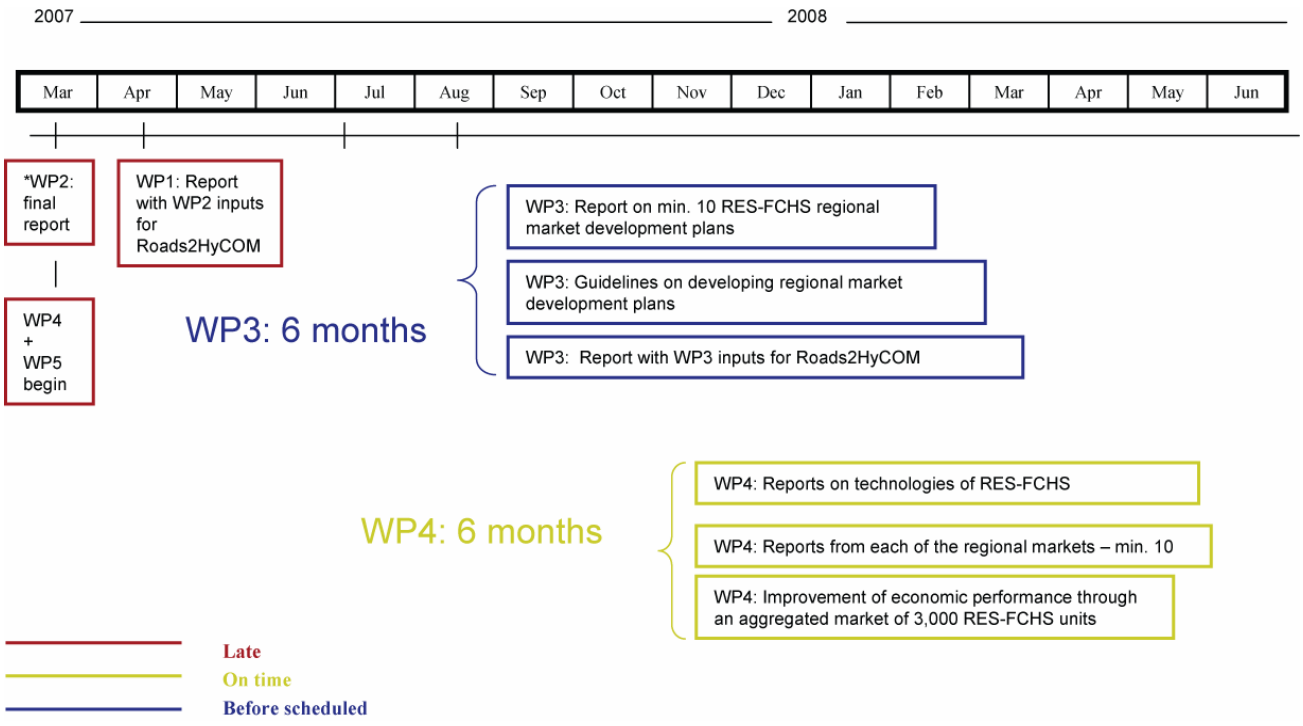
3 preliminary lessons learnt

- Cost reduction is necessary for commercialisation of RES-fuel cell systems for households
- There is a general lack of public regulation of fuel cells
- There have been some difficulties in identifying 3,000 units of RES-fuel cell systems for households in the regional markets.

1.3 Identified problems and corrective actions taken in the interim period

Due to the problems of identifying the 3,000 units of RES-FC systems, the outcome of WP2 has been delayed. The WP2 leader postponed the deadline until the end of March 2007 to conclude the market part. To reach the 3,000 units it was decided to include CHPs using reformed bio-gas, so that the focus was wider than just on a hydrogen grid. The Icelandic, Portuguese, German and Danish partners provided extra materials and WP2 has been concluded. This decision has met general consensus.

Since the whole project was delayed several months, WP3 and WP4 leaders made a rather harsh, but supposed realistic schedule to speed up the process and to submit the deliverables according to plan. The time table looks like this:



The time table shows that WP3 will be finished before time and that WP4 will be on time. WP5 is not included in the time table, but in May 2007 the WP5 leader hosted a workshop for the Danish participants in Copenhagen to kick off WP5 and formulate the focal points. The final report from this work package is expected in February/March 2008 – right on time.

In addition to the problems of delay there has been more individual technical obstacles experienced by the different partners. For instance it seems that there is an unforeseen lack of availability of FC systems for households from manufacturers in Portugal. In order to overcome these problems, the Portuguese partner has scheduled a meeting for mid-July with the only FC manufacturer in Portugal SRE. This company used to produce very small FC units in the past. Possible collaboration with this company will be sought.

The Spanish partner experienced difficulty in finding information about some of the components. People in Navarra don't know very much about hydrogen and fuel cells and there is no legislation in this area, and the government has other fields of interest concerning renewable energy.

The German partner from KIBZ has identified one important barrier in the area of bio-ethanol. For wind and bio-ethanol the “producers” aim at the mobile applications as first choice instead of stationary CHPs. There are cautious activities to upgrade biogas to SNG, which can be fed into the grid, but supporting regulations are still missing.

The WP4 leader from HIRC has chosen to include another aspect in WP4 than planned after having tried to find out under which legislation a FCHS currently can operate. The other approach has been included as a supplement. Calculations have been made in order to decide what level of feed in tariff is required in order to operate a FCHS close to commercial terms. This called for a new coordination of the Danish contribution. The questions the partners were to answer had to be reformulated to fit the specific technologies in focus and an attempt was made to prevent overlapping work areas. This has been coordinated and the project is back on track, but there has been a minor delay on that account.

1.4 Main activities until the end of the action

The partners are all busy with WP3 and WP4 consulting relevant stakeholders – both regionally and nationally – in order to identify carriers of technology, the framework conditions and how to overcome the barriers. The regional market development plans are also being concluded. At the same time WP4 focused on how to obtain synergies, especially on cost reductions, in cooperation between the 10 regional markets and aggregating the 10 regional markets. The first

part of WP4 has almost been concluded and contains a description of best solutions, cost reductions, improved guarantees etc. of the FCHS.

At the same time, dissemination activities of different kinds have been carried out. For instance the Portuguese partner in charge of WP6 has elaborated an information brochure for the potential end-user that will be available for download from the project website and the partner has also written an article to be published in a relevant regional news media. Presentations of the regional market have been presented at two regional seminars.

2. CONSORTIUM MANAGEMENT UNTIL THE INTERIM DATE

2.1 Project meetings

In the reporting period three project meetings were held:

a. The kick-off meeting in Herning, DK

The kick off meeting was held on 6-7 March 2006 in Herning, DK. Setting an earlier date was not possible due to other appointments of the partners. To avoid such situation in future, dates for all remaining coordination meetings were proposed in the minutes from KO meeting and accepted by partners. The agenda for the meeting, list of participants and presentations have been published on Coordinator's website www.hirc.dk. The minutes were taken and sent to partners, and afterwards put on project's website www.resfc-market.eu in the »Member area«.

b. Coordination meeting at ECN, NL

The meeting was held on 27-28 June 2006 at ECN. Representatives of all partners were present. Minutes from the meeting have been taken and are available on the project website along with agenda and presentation.

c. Coordination meeting at International Biogas and Bioenergy Centre of Competence, DE

The meeting was held on 19-20 February in Kirchberg/Jagst in Germany. The meeting was postponed 19 days at the request of Aalborg University. Representatives of almost every partner were present (except IRD and BIC). Minutes from the meeting have been taken and sent to partners and are available on the restricted area of project website along with agenda and presentations (www.resfc-market.eu).

2.2 Cooperation with other projects – Roads2HyCom

The scope of RES-FC Market covers much of the same as Roads2HyCom, a project funded under FP6 and cooperation between the two projects in order to exchange information and experience and avoid duplication of activities was recommended by IEEA in the negotiations phase. A formal contact with representatives of Roads2HyCom has not yet been established, but we have been informally contacted by Jane Patterson on behalf of Nick Owen from Roads2HyCom. She asked us help collect information in two launched online surveys. One is aimed at organisations active in hydrogen and fuel cell research and technology development, the other at existing or potential early-adopting »hydrogen communities«. After the finish of WP2 a short abstract of the findings were sent to the Roads2HyCom coordinator in order to inform about our activities and latest achievements. They wrote back that the abstract was very useful to their work.

2.3 Communication

The communication between partners in the reporting period has primarily been made via e-mail and telephone. The coordinator took steps towards speeding up WP2 and was in close contact with the WP leader for a while in order to solve the difficulties of finding the 3,000 units and in order to make a more cogent organization of the market report.

In May the coordinator arranged an extraordinary workshop for the Danish participants on behalf of the WP5 leader from Iceland. The workshop was held 22th of May in Copenhagen at the Icelandic Embassy and the outcome was a detailed elaboration of how to lead the RES-FCHS technology to minimum 10 % cost reduction. The workshop also stressed the need for cooperation at every level and the need for more frequent personal contact.

The WP leaders make the quality control of the written reports individually and make sure that adjustment and changes are made – when needed - to fulfill the objectives of Annex 1.

2.4 Miscellaneous

Hydrogen Innovation & Research Centre has become an independent association. HIH Development A/S has transferred all assets and liabilities to Foreningen (association) Hydrogen Innovation & Research Centre, CVR no. 30010396 with effect from 1.11.2006. IEEA has been informed and legal documents have been sent. One of the partners changed its legal name from Elsam Kraft A/S to DONG Energy A/S. IEEA has been informed and acknowledged the

change. The reason for the change was related to new market strategy and did not entail any further substantial organisational or functional changes.

Due to technical problems at a power plant combined with lack of available manpower DONG Energy A/S has had difficulties in fulfilling all the tasks of this project. The company has been cut some slack and we hope that the contributions of this partner will be back on track in time for the next coordination meeting in Spain 3-4 September.

3. PROGRESS OF WORK PLAN AND ACHIEVEMENTS UNTIL THE INTERIM DATE

3.1 Progress and achieved results pr work package against initial objectives

WP1: Management and coordination

In the reporting period the management activities planned included the standard coordination activities: organising of coordination meetings, making close follow ups of the partners and establishing cooperation with Roads2HyCom. The coordination meetings were organised and held successfully and almost according to plan, and minutes have also been prepared and sent to all partners and subsequently put on the website. The managing of the project, including the task of giving close evaluation to see if the milestones were reached as planned, has been in use all the way through the project. We reached the first obstacles in the task of identifying the 3,000 units of RES-FC systems. This meant a close contact with the leader of the WP2 and a constructive evaluation of the findings. It also changed the chosen scenario for the CHPs, and reformed biogas was included as mentioned in 1.3. The Icelandic, Portuguese, German and Danish partners provided extra materials and WP2 was concluded. The third task – that of establishing the cooperation with Roads2HyCom – has been successful and an abstract of the findings in WP2 has been sent from us to the managers of this project. The work of WP1 has been carried out by the work package leader in close cooperation and with great help from all the partners involved in the project.

WP2: Status on RES-FCHS technology and regional market development

The WP firstly had to focus on identifying the technology relevant for the purpose of the project: if we wanted to benefit from economies of scale, we had to focus on a limited number of solutions, which could be ordered in bigger quantities. This focus changed in the second part of WP2, because we wanted to be able to include more units in the study as mentioned above. The second task was to place the short listed technologies in the system context and analyse the feasibility of the whole RES-based system. That task proved to be more challenging than expected at the moment of project description, but as a result lists of technologies as well as 3

technological scenarios describing the possible systems based on renewable energy sources were prepared:

- Case 1: Biogas to CHP - Germany, Denmark
- Case 2: Biomass and Wind to CHP - Denmark, Germany, Iceland
- Case 3: Only wind to CHP - Denmark, Germany, Portugal, Spain, The Netherlands.

The regional part of WP2 was made with focus on the basis of the short listed technologies, using uniform questionnaires, which enabled the partners to compare the results. Preparing the questionnaires took rather long and the last version, incorporating factors relevant from the point of view of commercial companies was sent to all partners in the middle July 2006. As part of WP2 a trip to a Russian manufacturer of electrolysers was made, after selecting the manufacturer from the list of all potential producers in the East European markets. As the effect of the trip it was found that the manufacturer can produce the requested electrolysis equipment at a fraction of the price asked by Western suppliers, but introducing even minor changes to the design in order to get CE-certificate for the equipment would meet serious obstacles due to old and bureaucratic organisation.

The 10 regional markets were described by the partners with following results:

Regional markets	*Performance indicator*	*Need of RES integration*	*End-users*	*Infrastructure*	*Subsidy*	*Feed-in tariff*	*Supplier RES/FC*	*Conditions in place*
Country	Technology	**Technical**	**2010**	**H_2**	**€/kWh**	**€/kWh**		
Iceland	Biomass	**no**	**0**	**no**			**?/0**	**no**
Germany	Excess wind	**yes**	**450**	**340 km**		**0.08 - 0.09**	**X/X**	**yes**
Germany	Biogas	**no**				**0.08 - 0.21**	**X/X**	**no**
Germany	Biomass	**no**			**350 €/ha**		**X/X**	**no**
Holland	Excess wind	**no**	**300**	**100 km**	**0.065**	**0.03-0.04**	**X/X**	**no**
Portugal	Excess wind	**yes**	**10**	**no**		**0.09**	**0/0**	**no (heat)**
Spain	Excess wind	**yes**	**20-40**	**no**		**0.063**	**X/0**	**no(heat)**
Denmark	Excess wind	**yes**	**400**	**no**	**0.013**		**X/X**	**yes**
Denmark	Biogas	**no**				**0.08**	**X/X**	**no**
Denmark	Biomass	**no**			**350 €/ha**		**X/X**	**no**

The partners of the RES-FC Market project all carried out the tasks as described in Annex 1.

WP3: Market development plans

The objective of WP3 was to prepare market development plans (MDPs) for the 10 potential RES-FCHS markets. At an early stage of the project the WP leader presented a working plan, methodology and organisation for the WP3. At the second coordination meeting a »boundary« between WP2 and WP3 was also discussed to avoid confusion in task distribution, because some issues could be attributed to either of the WPs. It was agreed that:

- WP2: provides technical description of state-of-the art technology and regions, and gives only description of barriers
- WP3: provides means of overcoming the barriers described in WP3 and verifies if market conditions exists in a given region using system analysis.

The general idea behind the template for the MDP was first to demonstrate that there is a technical perspective. Secondly the idea was to demonstrate or ensure that the technology is economically feasible and attractive for end-users. The MDP should end up with a step by step summary of what must be done to establish the market including the specific requirements at each level – e.g. grid connection requirements, feed in tariffs or establishment of an obligation for TSOs to pick up excess electricity generation. Various templates for the elaboration of the market development plans have been submitted to the partners responsible for the 10 techno-logical/geographical area combinations. Special focus has been made on actor analysis, as actors - or stakeholders - are perceived to have a particular impact on the successful introduction of RES FC systems in individual dwellings. After delays in WP2, which forms the basis for WP3, a strict work schedule has been established in order to be able to finalize the work within the alloted timeframe (see 1.3). The deadline for the second report for WP3 was June 14th and the WP leader is currently facilitating the deliverables. No permanent conclusion has yet been made but a few tendencies can be mentioned: A lesson learned is that there must be focus on the barriers against FC systems. It is a very difficult area to do research in, because the stakeholders in the industry do not have specific strategies or plans on how to overcome barriers with regards to framework conditions or legislation. The stakeholders are waiting for results of demonstration projects in order to identify the barriers. There have also been some problems with partners not being able to identify the necessary potential sites for RES FC systems. It has been stressed that they must be identified - and if external conditions are not favourable for the technology mix in question, then appropriate changes to framework conditions must be suggested and assumed for the further analysis. The outcome and general conclusions will be presented at the next coordination meeting on 3-4 of September.

WP4: Developing an aggregated market of 3,000 RES-FCHS units

WP4 is half way through and various tasks regarding synergies by establishing cooperation between min. 10 regional markets of RES-FCHS, especially in cost reductions, and through these synergies to promote the implementation of the regional development plans have been submitted to each of the partners. The concrete objective is improvement of economic performance of RES-FCHS by 40-50% - reducing costs for RES-FCHS to a level < 5,000 EUR/kWe. Another concrete objective is improving regional framework conditions for RES-FCHS as a result of learning from other regions. To achieve the concrete objectives a transregional negotiation platform and a group for integration of synergies into the regional market development plans have been established. This WP has caused a high degree of confusion among the Danish partners and therefore intensive coordination efforts in WP4 were required. The first problem was caused by a rather general formulation in the WP4 list of deliverables. According to this outline DONG, Dantherm, HIRC and AAU were all supposed to write about fuel cells – which could have been relevant if it had not been decided in WP2 that the focus should be laid upon LT PEM fuel cells, which requires pure hydrogen fuel. Some of the Danish partners found it difficult to add further value to the work done by the other Danish partners, and a new approach was taken to bring WP4 one level further than originally expected. Therefore a new distribution of tasks was decided:

- Dantherm was to concentrate on the fuel cell system
- HIRC was to focus on purchase of wind electricity to the electrolyser and transfer of periodic surplus of electricity back into the grid.
- AAU was to focus on biogas and upgrading and reforming technologies.
- DONG was to focus on methanol and reforming technologies

The WP leader is currently gathering the materials from the partners and concluding on the findings. If all the materials are received in time, the WP4 leader will make general conclusions and an overall presentation of the findings at the next network meeting 3-4 of September.

WP5: Improving technical performance of RES-FCHS

WP5 is in its initial phase. The goal of WP5 is to obtain technical and thereby economic improvements of RES-FCHS through utilization of experiences with similar technologies where good results have been obtained. The methodology is to take the best of the WP2 regional solutions. The work package leader has made a tight schedule, which contains a plan of first written comments from partners needed before end of May 07, telemeeting end of May 07, discussion and analysis done at September and a draft of the final report February/March 08. So far the WP leader has hosted a workshop as mentioned in 1.3., where special attention was given to fuel cells and production of hydrogen as well as reforming. The main objects are:

- PEM fuel cells 0,5 – 1 kWe (stack and the components of the stack)
- Alkaline electrolysers

WP6: Dissemination

The project web-site (http://www.resfc-market.eu/) has been online since June 2006 and is being updated as more results are achieved. A restricted area has been created with password access for the members of the consortium. Internal project documents, reports, minutes of the meetings, etc., can be downloaded from this restricted area. A network cooperation group of the 10 regional partners of the project + expected 5-10 additional regions, which want to develop regional RES-FCHS markets is being established as the reports are being submitted and potential stakeholders mentioned. HIRC serves as secretariat of the network group with a newsletter, and template for the newsletter has been made. The first newsletter is scheduled to be published in September. The WP6 leader has made an elaborate dissemination plan for transregional, regional and sector dissemination activities. Some presentations have already been made. For more information please consult the website (http://www.resfc-market.eu/) where the disseminated presentation and articles are published.

WP7: Common dissemination activities

The objective of the WP is to give input to development of online information systems, to participation in contractors' meetings, conferences in association with the EIE and other relevant programmes, EU-wide exhibitions, etc. The objective is also to contribute to brochures and other media, websites, newsletters etc. We have been invited to contribute to Intelligent Energy News Review a couple of times but not yet accepted the offer. After the coordination meeting in September we expect to have news to tell and we will submit a small piece in next available issue. A set of updated publishable slides will be prepared as well as an update of the summery slides. The tasks will be completed immediately after the submission of this report along side with an update of the fact sheet.

3.2 Deviations from the project work plan

The kick-off meeting for the project was delayed by 2 months, which also delayed the work in WP2. The further delay of the work of WP2 could suggest further delays in the project. But as seen in the time table 1.3, initiatives have been made to speed up the process and submit the rest of the deliverables on time. With this tight schedule and intensified effort of the partners we hope to be able to deliver a satisfying study and the rest of the reports on time. For more technical knowledge about deviations in each work package please see 3.1.

3.3 Interim review of deliverables

See Annex 1. The remaining deliverables are due in months 24 – 32. To see which deliverables have been submitted please look at table 1 in appendices.

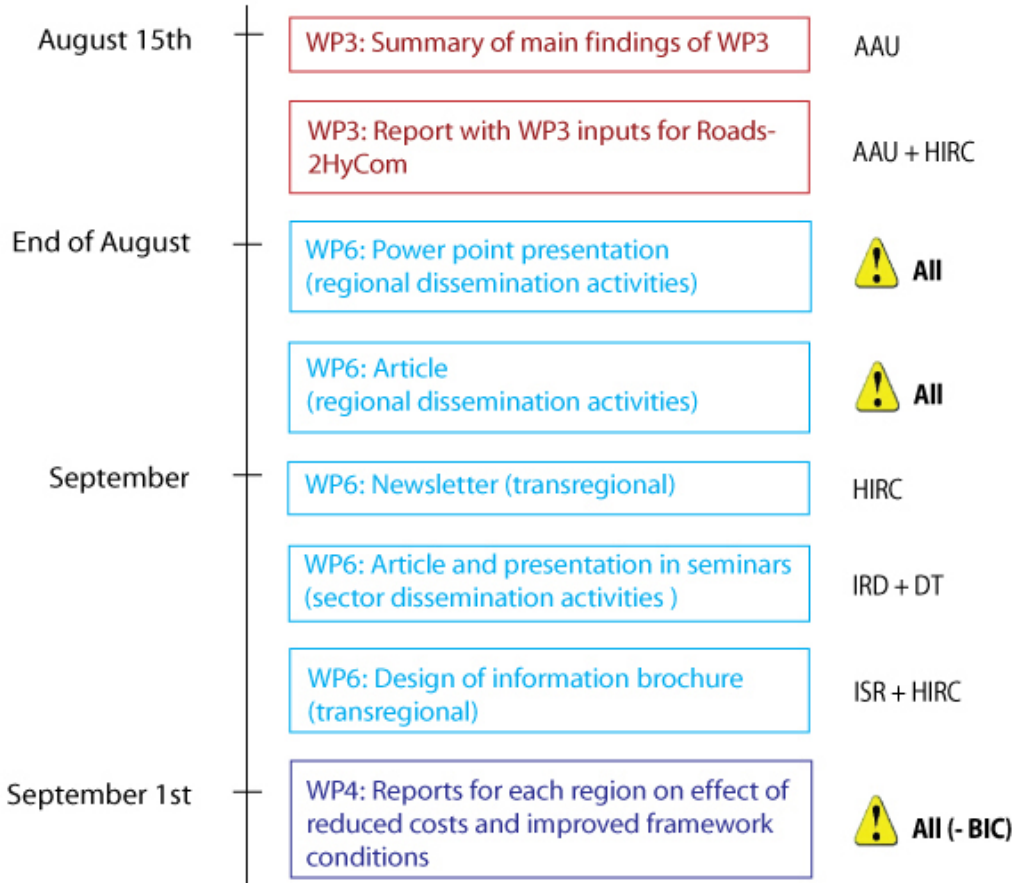
3.4 Interim review of performance indicators

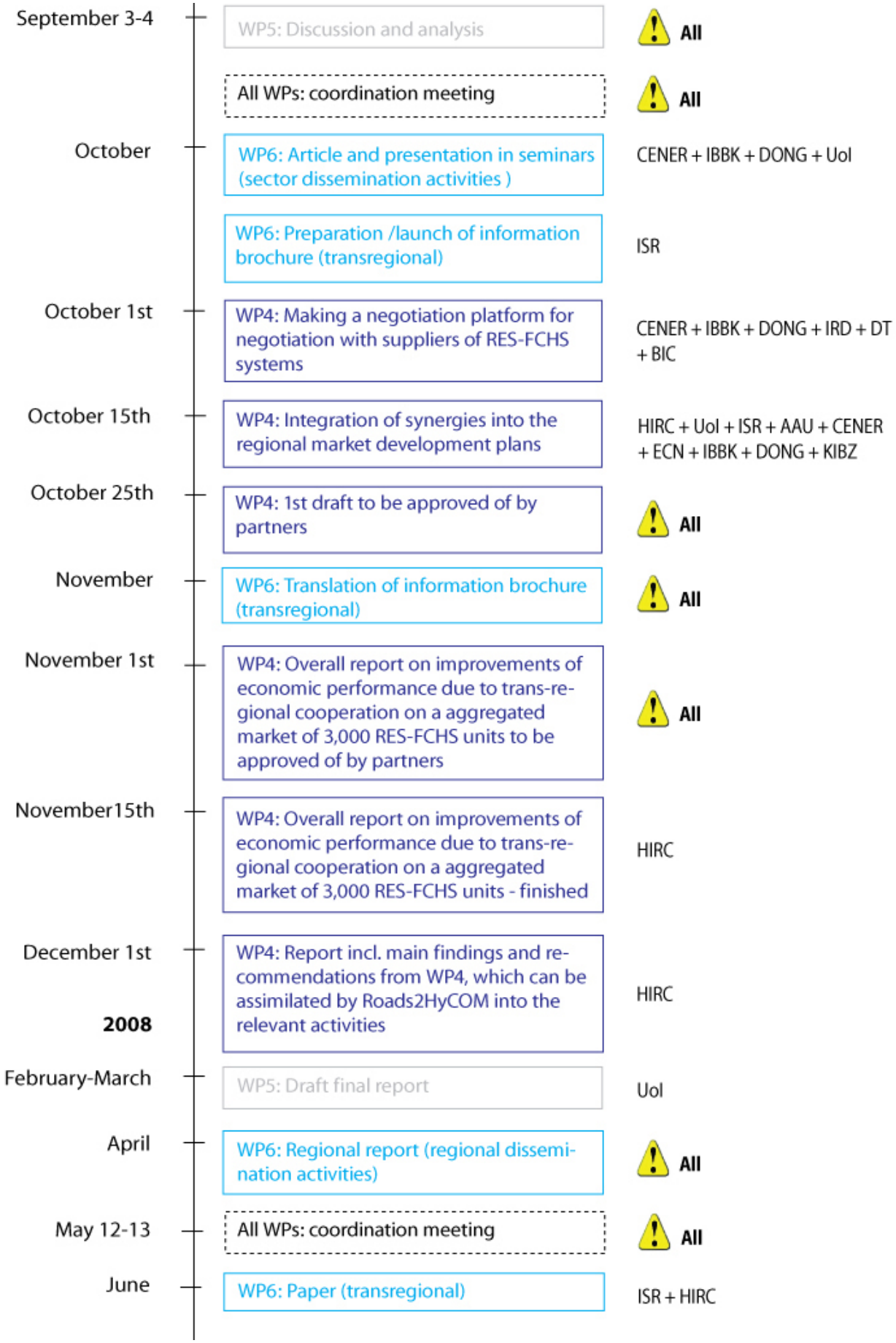
The performance indicators for activities planned for the reporting period are:

- WP2: description of technical reliability, cost, manufacturers, EU need for RES-integration, description of need of RES-integration, end-users, "infrastructure", feed-in tariff, suppliers. The technical conditions are in place. The regional market conditions are partly in place for the 10 regions (see the figure at page 11).
- WP3: describing how the specific barriers can be overcome. The part is in progress, but 3,000 units on a RES-FCHS market will be identified in the nearest future.

4. WORK PLAN FOR THE NEXT PERIOD

4.1 Planned activities in the next period




September 3-4
WP5: Discussion and analysis
All
All WPs: coordination meeting
All
October
WP6: Article and presentation in seminars (sector dissemination activities)
CENER + IBBK + DONG + UoI
WP6: Preparation /launch of information brochure (transregional)
ISR
October 1st
WP4: Making a negotiation platform for negotiation with suppliers of RES-FCHS systems
CENER + IBBK + DONG + IRD + DT + BIC
October 15th
WP4: Integration of synergies into the regional market development plans
HIRC + UoI + ISR + AAU + CENER + ECN + IBBK + DONG + KIBZ
October 25th
WP4: 1st draft to be approved of by partners
All
November
WP6: Translation of information brochure (transregional)
All
November 1st
WP4: Overall report on improvements of economic performance due to trans-regional cooperation on a aggregated market of 3,000 RES-FCHS units to be approved of by partners
All
November15th
WP4: Overall report on improvements of economic performance due to trans-regional cooperation on a aggregated market of 3,000 RES-FCHS units - finished
HIRC
December 1st
WP4: Report incl. main findings and recommendations from WP4, which can be assimilated by Roads2HyCOM into the relevant activities
HIRC
2008
February-March
WP5: Draft final report
UoI
April
WP6: Regional report (regional dissemination activities)
All
May 12-13
All WPs: coordination meeting
All
June
WP6: Paper (transregional)
ISR + HIRC

4.2 Planned meetings and dissemination activities

The planned coordination meetings are listed in the figure above. Additionally it is being tried to gather the Danish participants for an extraordinary writing-camp" in August. In order to motivate and avoid overlaps in the tasks of the Danish participants the coordinator is trying to schedule a meeting to achieve synergy, which is what the WP4 is all about.

Regarding the dissemination activities a 4-pages information brochure will be prepared in English by the end of September 2007 by ISR-UC. By the end of the project, between April 2008 and June 2008, one paper with the results of the project will be presented at one international conference. In addition one article will also be prepared to be published in one international media. The participants are now trying to select relevant conferences, especially those issuing a journal or proceedings. Two seminars have to be realised by the end of the project (April-June 2008): One will be held in Denmark (HIRC is the responsible), addressing Northern countries and another in Coimbra (ISR-UC is responsible), targeting the Southern countries. Additionally the regional market for each region will be presented at two regional seminars, and an article will be published in relevant regional news media. At the end of the project a 0-20 pages report (in each national language) about the regional dissemination activities will be produced, as well as a 2-4 pages executive summary in English.

5. OTHER ISSUES

I seems like there is a great need for communication between partners in order to target the development plans. This will be taken into consideration at the next coordination meeting. Perhaps the coordinators were too ambitious in speeding up the work process? After the summer break of 2007 we will know whether the deadlines can be met or not.

Appendices to the Interim Technical Implementation Report

Table 1: Updated list of submitted deliverables since starting date

Del. N°	WP N°	Deliverable name	Month of completion	Submission with report	Deliverable uploaded at website?
D.2.1	2	Catalogue of RES FCHS technologies	10	Month 8	yes
D.2.2	2	Report with status of 10 regional markets	16	Month 8	yes
D.2.3	2	Report with WP2 inputs for R2HC	18	Month 8	no
D.6.1.A	6	Presentation of project on the website	6	Month 6	yes

Table 2: Indicative state of advancement of hours spent

Work package	Actual/Planned Achievement	Total Partners	Partner 1 HIRC	Partner 2 UoI	Partner 3 ISR	Partner 4 AAU	Partner 5 CENER	Partner 6 ECN	Partner 7 IBBK	Partner 8 DONG	Partner 9 IRD	Partner 10 DT	Partner 11 KIBZ	Partner 12 BIC
WP 1: Coordination	Actual	65,0%	65%											
	Planned	65,0%	65%											
WP 2: Status	Actual	100,0%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	Planned	100,0%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
WP 3: Market dev. plans	Actual	79,6%	100%		80%	75%	95%	50%	39%	100%	57%	80%	100%	100%
	Planned	92,8%	100%		100%	75%	100%	60%	100%	100%	100%	100%	100%	100%
WP 4: 3.000 units	Actual	0,0%	40%		50%	50%	60%	0%	60%	30%	30%	50%	40%	100%
	Planned	0,0%	45%		45%	45%	45%	50%	60%	45%	45%	100%	40%	100%
WP 5: tech. impr.	Actual	19,6%	10%	40%	0%	0%	20%	10%	5%	30%	0%	0%	20%	100%
	Planned	0,0%	30%		0%	0%	30%	50%	5%	30%	30%	0%	20%	100%
WP 6: dissemin.	Actual	5,1%	0%	5%	0,70%	0%	0%	0%	0%	0%	50%	0%	10%	0%
	Planned	3,0%	0%			0%	0%	20%	0%	0%	0%	0%	10%	0%
WP 7: common diss.	Actual	10,0%	0%		0%	0%	0%	0%	100%	0%	0%	0%		0%
	Planned	16,7%	0%		100%	0%	0%	0%	100%	0%	0%	0%		0%
Total Project	Actual	44,9%		13%			20%	50%				40%	55%	
	Planned	43,5%						60%				50%	55%	

Table 3: Updated list of main persons in charge of the action

Partici-pant N°	Participant Short name	Family name, first name	Telephone N°	Fax N°	E-mail	Date of Change	Justification
1	HIRC	Møller, Jens-Chr.	+4570251114	+4570251115	jcm@hirc.dk		
2	IS	Sigfusson, Thor-steinn	+3545254690	+3545528911	this@rainvis.hi.is		
3	ISR-UC	de Almeida, Aníbal	+351239796218	+351239406672	adealmeida@isr.uc.pt		
4	AAU	Østergaard, Poul	+4596358424	+4598153788	poul@plan.aau.dk	1/01.2006	Paul Østergaard has more technical knowledge
5	CENER	Aguado Alonso, Monica	+34948252800	+34948270774	maguado@cener.com		
6	ECN	Kraaij,Gerard	+31224564569	+31224568489	kraaij@ecn.nl	1/1.2006	Changing of projects between units in the organisation
7	IBBK	Köttner, Michael	+497954926203	+497954926204	info@biogas-zentrum.de		
8	DONG	Henriksen, Niels	+4576222404	+4576221962	niehe@dongenergy.dk		
9	IRD	Grahl-Madsen, Laila	+456280 0008	+456280 0009	lgm@ird.dk		
10	DT	Themsen, Jesper	+4596143700	+45961438 00	jt@dantherm.com	1/1-2007	Paw Mortensen changed work to the telecom Power Backup team
11	KIBZ	Schaible, Bernhard	+49711/6862-566	+49711/6862-1566	bern-hard.schaible@kibz.de		
12	BIC	Kalkstein, Lucja	+48501236004	+48914636 265	kalkstein@post.pl		