Project no.: EIE/05/124/SI2.419657

Project acronym: REMODECE

Full title of the action: Residential Monitoring to Decrease Energy Use and Carbon Emissions in Europe

Intelligent Energy – Europe (IEE)

Type of action: Type 1; SAVE

Key action: VKA4.3

REMODECE First Technical Progress Report

Period covered: from Jan 2006 to Jul 2006 Submission deadline: July 31, 2006

Start date of the project: 11 January 2006 Duration: 30 months
End date of the project: 30 June 2008

Project coordinator name/ organisation/ e-mail/ telephone number:

Project website: www.isr.uc.pt/~remodece

TABLE OF CONTENTS

1 Project objectives and major achievements during the reporting period

1.1 Project objectives

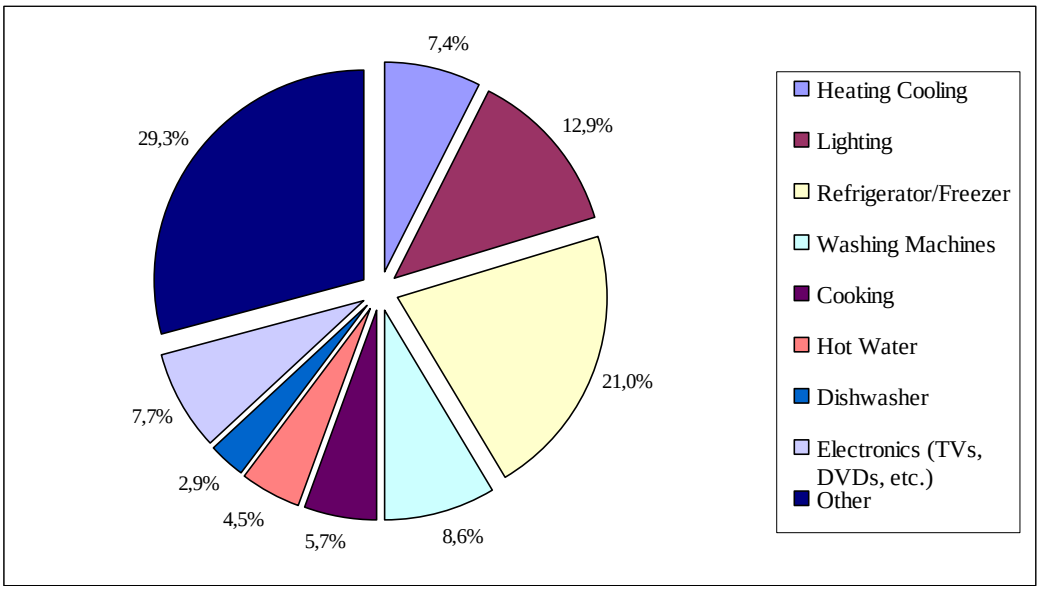
The overall objective of the REMODECE project is to contribute to an increased understanding of the electricity consumption in the EU-25+2 households for the different types of equipment, including the consumers' behaviour and comfort levels, and to identify demand trends. This project will evaluate the potential electricity savings that exist in the residential sector in Europe, and that can already be implemented by existing means, like the use of very efficient appliances or the elimination/mitigation of standby consumption. The availability of high quality data is an essential condition for the definition of policy recommendations to influence through a combination of measures the energy efficiency of the equipment to be sold in the EU-25+2 in the next decade, as well as to influence the user behaviour in the selection and operation of that equipment.

In this scope, the main objectives of this survey are:

- Contribute to an increased understanding of the energy consumption in the EU-25+2 households for the different types of equipment, including the consumers' behaviour and comfort levels;
- To identify demand trends;
- Evaluation of the potential electricity savings that can already be implemented by existing means, like the use of very efficient appliances or the elimination/mitigation of standby consumption;
- Analysis of market transformation for different types of equipment;
- Policy recommendations for each type of equipment.

The demand for electricity to power residential appliances and equipment does not appear to be slowing down. The increasing income of the population in general, and the increasing diversity of available appliances in the market, are causing people to use more and more appliances in the home. IEA estimated that, even with a continuation of all existing appliance policy measures, the appliance electricity consumption will grow by 13% from 2000 to 2010, and by 25% by 2020 [IEA, 2003]. The fastest growing electric end-use is projected to be standby power consumption, or the consumption of electricity by appliances that are turned "off" or, that are in a low power consumption mode, (Standby, hibernate, sleep modes, etc.). According to IEA, by 2020, 10% of total appliance electricity consumption in the OECD could be for standby functionality, which is currently unregulated in OECD countries. In contrast, electricity consumption for clothes washing declined by 9% over the 1990s. The present total EU consumption for home consumer electronics in stand-by is estimated to be about 36 TWh and is forecast to grow to 62 TWh by year 2010.

Although the electricity consumption of some end-uses is better known than others, Figure XX present the share of residential electricity consumption by major end-use in EU countries in 2004 [Bertoldi].



It is important to investigate about the "other loads", which represent a large share of the total electricity consumption in the residential sector. Therefore a further degree of disaggregation of that type of loads needs to be characterised, in order to understand those load profiles and to identify effective market transformation strategies. The availability of high quality data is an essential condition for the definition of policy recommendations to influence through a combination of measures the energy efficiency of the equipment to be sold in the EU-25+2 in the next decade, as well as to influence the user behaviour in the selection and operation of that equipment.

In the project a large monitoring campaign will be carried in 12 countries, accompanied by a consumer survey. So far the measurements carried out have been concentrated in electronic loads, whose diversity and relevance is increasing fast. From the measurements carried out it can be concluded that electronic loads are a key contributor to the power demand and that there is wide range of performance levels in the models available in the market. Available technology, associated with responsible consumer behaviour, can dramatically reduce wasteful consumption of electronic loads. It is expected that based on the project results, to be conclude in June 2008, a better understanding of the residential electricity consumption will be achieved and strategies to achieve a desirable market transformations will be identified.

1.2 Summary of activities and results for the reporting period

Investigation of already existing studies, surveys, metering campaigns, databases, statistics, manufacturer's information, market information, etc., on energy consumption in the residential sector, focusing end-use equipment, and operating modes, has been carried out by all the partners.

Development of the Database:

- Definition of database structure and software platform

Establishment of the Harmonised monitoring/surveying methodology:

- Clear definition of what will be considered as stand by consumption within this project.
- Definition of a harmonized methodology for electricity metering campaign and collection of information.
- Definition of the questionnaire to collect the information from the households in each country. Two different questionnaires have been developed:
  - one simple questionnaire focusing only on behaviour, to be used for the survey in 400 households;
  - one detailed questionnaire to be used for the 100 households participating in the measurement campaign.
- Establishment of a structured statistical approach for energy consumption data in each "region", which will be developed dealing with issues such as pattern of uses, type of electric appliances and electronic equipment, equipment characteristics (age, size...), validation techniques to be used. In each country the sample should be representative
  - Defining the survey: Definition of statistical sample for collection of information by ADEME with the cooperation of SAFE

Measurement and Surveying Campaigns:

Based on the information collected by all the partners and on his own background, Energy piano has collected and prepared a detailed Catalogue of equipment that is suitable for the monitoring campaigns within this project (see Annex III). This list includes the main characteristics of equipment, the manufacturer/distributor web-site and the costs when available. A “Comparison Table of equipment” with comparison of main features and prices has also been prepared. Besides the list of equipment, the list of measurements to be carried out for each end-use, taking into account the pre-requisites from the database, has also been identified.

All the partners except Eneffect, have already informed the consortium about their plans for the monitoring campaigns, in terms of equipment to be used and monitoring starting dates.

Monitoring campaigns have already started in France, Hungary, Italy and Portugal. In the remaining countries monitoring is scheduled to start between August and October, 2006.

Several measurements have been carried out on the electronic loads available in the market by ISR-UC, covering a wide range of different types of end-uses. A database was set-up (xls), with the measurements carried out, and in. These results have been presented at the EEDAL conference, in London, on 23 June, 2006.

Based on available information collected by the partners an historic database was set up, and is being sent with this report.

1.3 Identified problems and corrective action taken

To feed into the historic database that has already been developed, there is a lack of raw data from previous studies, surveys, statistics or monitoring campaigns. Besides Eureco Project, the available data is usually compiled in a report. The partners are engaged in looking for available raw data in their countries, and send it to Enertech, in order that they can import this data into the database. Enertech needs tables of data (excel, access…) in order to be able to fill in the database. For Germany there are already some recent raw data available, especially for ICT technologies, and for Czech Republic some typical daily load curves are also available for a significant number of households.

Several partners mentioned difficulty in finding households that are willing to participate in the survey and monitoring. In Belgium, because the participation is free of charge, people might not take the business serious. Therefore e-ster is considering charging 100€ per audit and deliver every household a personal audit report with recommendations.

Enertech and Energy piano stressed not to give advice to people about the possible measures to save electricity before the end of the measurements. Only after end of the monitoring campaign and data analysis this information could by given to household participants.

Another important constraint is the difficulty in installing the measurement devices, when in site. For example, to monitor air conditioning that has not a plug, and that is directly supplied from the mains, requires more sophisticated equipment than to monitor loads that can be unplugged from the socket, and install the meter in between. In Hungary, for example, it is not possible to install any device in the mains control panel, because this procedure requires opening the panel, what is forbidden under legislation.

2 Consortium management in the period

The project coordinator has been assuring general management of the project activities. The main communication channel used has been electronic email, and telephone calls when needed.

The project Task leaders which are responsible for the progress of the work in each task, have been working very effectively, and there is almost no delay in the foreseen schedule for each task.

Two meetings have already been organized, namely:

- the kick off meeting held in Brussels in January 23, 2006, in which all the project partners were represented, and in which the project officer and the financial officer from the EC have participated. Conrad Brunner of SAFE has also attended this meeting as he is one member of the Steering Committee. The main objective of this meeting was to present and clarify the methodologies for each WP, specially focusing the first 6 months period. Initially all partners made a short presentation about their activities, particularly focusing on activities related to this project. Afterwards there was a discussion about the methodology to be followed in the execution of the different tasks within the different work packages. The project Task Leaders were asked to make an overview presentation and a detailed presentation of the methodology of the work foreseen for the first semester of the project.

- the second project meeting was held in Sophia Antipolis, France, at ADEME premises, on June 26-27. This meeting last for two days, because there was several critical issues to be discussed, especially concerning WP2, WP3 and WP4. This was a very important and productive meeting which main result was the precise definition of the methodology to be used for surveys and monitoring campaigns. Only Eneffect has not been presented at this important meeting because of unforeseen circumstances. Although the coordinator asked Eneffect to be represented at this important meeting for the continuation of the project, this turned out impossible. Immediately after the meeting the coordinator contacted Eneffect and asked them to visit either Diana Vorsatz in Budapest or Thomaz Vorizek in Prague, to learn with them the methodology to be used in Eastern Europe for energy monitoring and making the surveys. After making this visit, Eneffect should prepare a small half a page report on what is going to be their approach for the monitoring.

Co-operation with other projetcs:

The project coordinator presented the Remodece project at the IEE VKA4 Coordinator Meeting & Poster Display, at EEDAL. Because of parallel commitments the project coordinator left this event earlier, but asked Théreze Kreitz to be our representative in this important meeting. Théreze indicated the most relevant ongoing projects for Remodece interaction, in particular TopTen.

During the EEDAL conference, the project coordinator had contact with Yvonne Boerakker of ECN, Netherlands, who has been involved in energy modelling since a few years ago, and has some recent experience on surveying in the residential sector. Yvonne has attended the second project meeting in and in interested in being a collaborator for this project. She will cooperate with the REMODECE team providing us some information from Netherlands and advice, and will have access to our results.

Fraunhofer Institute has established contacts with the ODYSEE/MURE responsible. The official website is http://www.mure2.com/. From the web site it is possible to enter the MURE measure database on energy efficiency measures (which could be helpful for WP6) and download the MURE simulation tool (http://www.mure2.com/simulation.shtml) which contains technical data on household energy consumption (possibly for WP2). There is also a direct link to the MURE measure database (http://www.isis-it.com/mure/). Both databases have a free access, you can download all measure descriptions and you can also create nice summary tables.

Fraunhofer also made a request for data on electrical household appliances from the ODYSSEE database (http://www.odyssee-indicators.org/). This data is not free, but Barbara Schlomann will try to obtain this data for our REMODECE database.

3 Progress of each work package in the period Jan 2006 to July 2006

3.1 Progress on work plan against initial objectives

3.1.1 WP1: Project Management

The task leader of WP1 is ISR-UC. According to the contract the deliverable of this WP 1, are six monthly progress reports, the interim report and the final report, as well as the minutes of the meetings. The kick off meeting was attended by all the partners and also by Conrad Brunner, one member of the steering Committee, who has been actively involved in WP3 and has been giving advice on the progress of the work. The project officer has attended the meeting during the morning, and the financial officer make a presentation in the afternoon focusing financial issues related to the project. The second project meeting was hosted by ADEME, France, and was attended by all the partners except Eneffect, who apologized for the impossibility of attending the meeting.

The meeting presentations and the minutes of the meetings are available in the project web-site, under the Private Area section.

3.1.2 WP2: Review of all existing monitoring campaigns and creation and updating of an historic database of the residential electricity measurements and consumption

The task leader of WP 2 is Enertech. The outcomes of this task are:

D2 - 20 A4 pages report on reviewing all existing monitoring campaigns.

D3- Data base with monitoring campaigns, with information for at least 500 households per country.

D7 **-** Software tool to enable users a cross comparison of the energy performance of similar households.

D2 is being sent to the EC with this progress report, as well as the first version of D3, consisting of one CD ROM containing the historic database of the residential electricity measurements and consumption (per country and appliances). The deadline for D7 is January 2008.

Review of all existing monitoring campaigns

All the existing European monitoring campaigns on specific uses of electricity have been reviewed and they are described in a report called «Review of all existing monitoring campaigns» (deliverable D2).

Database design

The database that will contain all the existing available data from monitoring campaigns (« historical data ») and the coming data from the REMODECE project has been designed. The database structure has been presented during the last meeting and partners have now agreed on it. The first data (from previous monitoring campaigns) have been entered (deliverable D3). The database will be updated all along the project.

Design of the query engine

The first iteration of the interface that will enable people to query the database from the internet website of the project has been presented to all partners during the last meeting. A new version that takes into account the different comments should now be developed.

Software tool

The definition of the software tool that will enable users to make a cross comparison of the energy performance of similar households has been initiated based on the analysis of a similar tool that has been developed by the Swiss agency for efficient energy use -SAFE-. The group plans, if SAFE agreed, to upgrade the existing tool with reliable and updated data on end-use electricity use that will be collected during the REMODECE project.

3.1.3 WP3 Establishment of an harmonized monitoring / surveying methodology and of statistical sample

D4 Definition of the methodology for measurement and surveying campaigns

Version 2 has been commented during the last meeting. Main points discussed were: seasonality, standby consumption, relevance of monitoring electric heating, air conditioning, validity of collected data. Based on these discussions, the final version is being finalised and will be sent to all partners on week 30. The only point left open regards the extrapolation procedure to account for seasonality, which will be first tested on existing data from previous measurement campaigns.

D5 Design of the questionnaire to be used in the survey

A new version of the questionnaire has been designed, taking into account remarks from partners at the last meeting. It was agreed to use two slightly different versions of the questionnaire: one for the survey focussing on consumer behaviour and one more exhaustive with technical data for the monitoring campaign. An Excel version will be used for harmonisation of data collection. An online version has still to be discussed.

D6 Statistical sample for the new common measurement campaign

The approach to the establishment of the sample has been discussed with all partners and agreed upon. All partners expressed different concerns about costs, access to consumer databases and experience with consumer surveys: the approach will therefore vary according to the means available in each country but with a common base. The final version will be sent on week 30.

3.1.4 WP4 Measurement and surveying campaigns

The co-ordinator Energy piano has produced a report “Equipment for end-use load recording in the residential sector” that gives an overview of equipment available for end-use recording in the domestic sector. 16 different equipments are described including the following information: additional information and contact

- Equipment name and manufacturer
- Website of manufactures for additional information and contact
- Main features/characteristics of the equipment prices
- List of organisations that have experience with use of the equipment
- Prices (these may always be negotiated with the manufacturer).

The equipment are compared and six equipments are prioritized as the most suitable for REMODECE. Besides the above the report also describes how to perform load recording and advice on how to handle the data including:

1. Handling all customers and load appliances by systematic ID.

2. Installation with training and documentation for routines.
3. Remote reading of data every night with daily control of data. In case of no remote reading facility data reading by visit of the customer every week or two-weeks are recommended.
4. Quality control of data.
5. Data repair/correction of failures.
6. Storage of accepted data in database.
7. Load Research analysis facilities (own analysis besides the analysis SINTEF Energy performs in WP5).

All the partners except (Eneffect from Bulgaria) have already informed the coordinator about their plans for the monitoring campaigns.

3.1.5 WP5 Common analysis of the survey/measurement campaigns and common conclusions

The main activity of WP 5 will start when results and data from measurement campaigns, and from surveys are available. The main schedule of the project REMODECE shows that start up of activity of WP 5 is in month 18 of the project, which is July 2007. Although the plan is to start activity later, the work on planning how the actual analysis of the measurements and surveys of the different partners is in commence.

In most countries energy use for space heating or space cooling are heavily influenced by energy consumption in appliances such as lighting, cooking, refrigeration, etc. This means that if you try to save energy by e.g. replacing incandescent lighting by CFL's, the space heating system will be forced to deliver more electricity, to replace some of the missing energy from lighting. Analysis of electricity use has to take these important matters into consideration, and the tool Useload has been developed for this purpose. In Useload, space heating and cooling is assumed to be the residual when energy used in appliances are subtracted from the main total consumption. This method leaves a good estimate of the important end-use of space heating which in most Nordic countries stands for 50% of the annual energy consumption in an average household.

The tool Useload is under constant development to better simulate the mutual influence between different appliances, and the tool is planned to be distributed for the partners to carry out the analysis for their own country.

In a pre-study Useload has been used to segment Norwegian electric energy demand of 2001 into end-uses for the residential sector. Partial results from the pre-study was presented at the project meeting in Nice, June 2006.

3.1.6 WP6 Strategies for market transformation and recommendations to policy makers

WP6 has been planed to begin on the 22nd month of the project (10/2007). Since it is a very early stage of the project a basic structure of the issues that have to be dealt was prepared.

Specifically, the objective of this WP is to analyze all the parameters, apart technological, related to energy consumption in the household sector, to examine different approaches, including voluntary agreements, technology procurement, labeling, mandatory minimum efficiency standards, and white certificates, in order to make concrete suggestions at institutional, supportive and fiscal level for a successful market transformation.

In order to achieve that all related information from this project (surveys, monitoring campaigns), existing experience and other relevant project results will be collected from project partners and utilized.

Finally, key stakeholders such as manufacturers/wholesalers, utility companies and public administration will be contacted and involved in order to analyze all relevant issues and to examine their willingness and motives to have a more active involvement towards energy efficiency (technology procurement, voluntary agreements, etc). Furthermore, their opinion on key issues, barriers, opportunities, etc, will be recorded and utilized.

3.1.7 WP7 Dissemination of results

The task leader of WP7 is ISR-UC. The outcomes of this task that have already been developed are:

- **Web-site design** (Deliverable 1), which is online since April 2006. Afterwards 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. The web site will be regularly updated, and will be linked with the database which was developed under WP2. The web site which can be assessed at: http://www.isr.uc.pt/~remodece.

- **Presentation of one paper** in the recent EEDAL Conference, which was held on 21-23 June 2006, in London. The power point presentation and the full paper are available for download under:

http://www.isr.uc.pt/~remodece/downloads/REMODECE-Presentation-%20EEDAL06.pdf
http://www.isr.uc.pt/~remodece/downloads/REMODECE-Paper-EEDAL06.pdf

3.1.8 WP8 Common dissemination activities

ISR-UC has collaborated with ADEME (Thereze Kreitz) for the preparation of the Intelligent Energy Europe Co-ordinators Meeting on Energy Efficient products, held in London on 20 June 2006, as side meeting to the EEDAL 06 Conference on Energy Efficiency in Domestic Appliances and Lighting. ISR-UC has also developed a summary slides presentation of the project for this meeting, which can be downloaded from the IEEA web-site at: http://ec.europa.eu/energy/intelligent/projects/save_en.htm. One project poster has also been prepared, which will be permanently displayed at the IEEA and Commission conferences. This poster is not only displaying objectives/work package descriptions, deliverables, time schedules, but presents some interesting results already achieved in this project. The poster can be downloaded from: www.isr.uc.pt/~remodece/downloads.

3.2 Deviations from the project work plan

There are no deviations from the project work plan.

3.3 Up-date of time schedule – showing the original version together with any changes to the timing

Original Schedule:

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
WP1: Management																														
WP2: Review of all existing monitoring campaigns, creation and updating of an historic database																														
WP3: Establishment of an harmonised monitoring/surveying methodology and Establishment of statistical sample																														
WP4: Measurement/Surveying campaigns																														
WP5: Common analysis of the survey/measurement campaigns and common conclusions																														
WP6: Strategies for market transformation and recommendations to policy makers.																														
WP7: Dissemination of results																														
WP8: Common Dissemination Activities																														

Updated scheduled: In the kick off meeting it was decided to anticipate the monitoring campaigns:

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
WP1: Management																														
WP2: Review of all existing monitoring campaigns, creation and updating of an historic database																														
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WP6: Strategies for market transformation and recommendations to policy makers.																														
WP7: Dissemination of results																														
WP8: Common Dissemination Activities																														

The dashed horizontal filled cells represent the anticipation of monitoring campaigns that it was agreed on the kick off meeting, in order to star earlier the field measurements in particular in Portugal and in France. Hungary has also started monitoring campaigns earlier, in order to overcome their lack of experience, they have been doing pilot measurements in several households.

3.4 List of deliverables showing any expected changes to the delivery dates.

See Annex I.

4 Progress regarding performance indicators

For most of the identified indicators which are listed in the proposal, it is still too early to have an assessment of their achievement. It can be however mentioned that for the number of questionnaires filled in each country, although very effective, face to face interviews are by far the most expensive solution. A recent experience in Germany with a mail survey in 20 000 representative households in Germany was very good with regard to questions on electricity consumption, especially for appliances and lighting. The quality of the answers was very satisfying, whereas they had quality problems with the answers on heating and hot water (both electrical and non-electrical). But for electricity a **mail survey** seems to be a suitable and cheaper solution, if the response rates are taken into account. In German survey, a response rate of 75 % was reached, which is very high because they have used an existing representative household panel of GfK Germany. What concerns a survey by e-mail, GfK however has

some doubts from a methodological point of view, because it is very difficult to ensure that the survey is representative. And the response rate is often rather low.

5 Other issues

By the time being, the list of partners that are going to buy/rent Enertech's dataloggers are the following:

- SEVEn : rental of 6 sets
- CEU: rental of 6-7 sets and purchase of 3 sets
- Politecnico di Milano: purchase of 30 serial wattmeter and 20 wattmeter with amp clamps
- E-ster: rental of 30 lampmeters, 2 serial wattmeter and 2 wattmeter with amp clamps

6 Annex I

Overview of the current status of deliverables, based on the List of Deliverables

Del. N°	Deliverable name	Related Work package Nº	Date due	Actual/Forecast submission deadline
D1	Web site	7	April 2006	April 2006
D2	Report on reviewing all existing monitoring campaigns	2	July 2006	July 2006
D3	Historic Database	2	July 2006	July 2006
D4	Harmonised monitoring/surveying methodology	3	July 2006	July 2006
D5	Design of the Questionnaire to be used in the survey	3	July 2006	July 2006
D6	Sample definition Report	3	July 2006	July 2006
D7	Software tool	2	Jan 2008	Jan 2008
D8	Report covering “light” monitoring in “old” EU countries and detailed monitoring report covering HU, CZ, BG and RO	4	Jan 08	Jan 2008
D9	Report with the results of the surveys based on questionnaires for all countries.	4	Jan 08	Jan 2008
D10	Yearly electricity consumption and average specific load curves for each type of appliance, and potential energy savings	5	Aug 2008	Aug 2008
D11	Set of specific policy recommendations for each type of equipment	6	Aug 08	Aug 2008
D12	Electric Appliance Energy Guide in each national language of each partner	7	Aug 08	Aug 2008
D13	CD-ROM with the brochure and the software tool	7	Aug 08	Aug 2008
D14	Country workshops	7	Between Jan 08 and June 08	Between Jan 08 and June 08

7 Annex II

Overview table on the state of advancement (in %) of the budget expenditure per partner and per work package:

Work package	Actual/Planned Achievement	Total Partners	ISR-UC	Enertech	FhG-ISI	Energy Piano	Sintef	EnEffect	Seven	CRES	ARCE	ADENE	ADEME	E-ster	CEU	eERG	EDF
WP 1: Management	Actual %		7,2	3%	0,8	2,3	2,72	?	0,4	1,3	0,55	1,4	1,8	0,78	0,2	?	?
	Planned %	100%	34,6	6,2	5,3	9,7	8,5	1,7	1,9	5,1	1,0	3,6	7,6	3,9	2,4	3,9	4,5
WP 2:Database	Actual %		1,5	19,3%	4,2	2.9	0,0	?	0,0	2,9	0,0	0,0	1,5		0,0	?	?
	Planned %	100%	3,5	64,6	6,6	7,3	2,5	0,0	0,0	5,3	0,0	0,0	5,3	0,0	0,0	4,8	0,0
WP 3: Methodology and sample	Actual		4,5	4,9%	3,0	3,4	6,1	?	0,7	3,4	1,2	3,9	15,7	3,6	0,9	?	?
	Planned	100%	6,2	5,4	6,5	12,8	7,5	0,8	0,9	8,6	1,2	4,4	22,4	4,8	3,5	4,7	9,9
WP4: Measurement /Surveying campaigns	Actual		1,5	3,7%	1,0	7,14	2,15	?	0,0	0,5	0,03	0,0	0,0	0,6		?	?
	Planned	100%	6,8	12,5	7,7	14,0	7,4	4,9	5,5	9,6	2,9	5,3	0,0	9,5	4,6	9,3	0,0
WP5: Common analysis	Actual		0	0%	0,1	0,0	10,8	?	0,0	0,0	0,0	0,0	0,0	0,0		?	?
	Planned	100%	7,0	14,6	3,2	5,7	30,2	4,2	4,7	6,1	2,0	0,0	5,9	5,8	2,4	3,8	4,5
WP6: Strategies	Actual		0	0%	0,5	0,0	1,0	?	0,0	0,0	0,0	0,0	0,0	0,0		?	?
	Planned	100%	9,9	0,0	8,2	9,0	9,9	1,3	2,9	25,7	1,9	0,0	4,1	8,4	1,9	5,0	11,7
WP7: Dissemination	Actual		8,5	0%	0,8	0,0	0,26	?	0,0	0,0	0,0	0,2	1,4	1,03		?	?
	Planned	100%	19,2	0,0	10,8	9,9	5,2	3,5	3,9	7,1	2,0	3,1	9,3	5,3	4,9	5,2	10,7
WP8: Common Dissemination	Actual	20%	20%	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
	Planned	100%	100%	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
Total Project		100%	11,9	12,3	6,8	10,4	11,1	3,2	3,8	9,9	2,0	2,8	5,2	6,7	3,2	6,1	4,5

NOTE: Actual %-Percentage of budget already spent in each WP from the planned %.

8 Annex III – Equipment for End-use load recording in the residential sector