Energy Savings from Intelligent Metering and Behavioural Change

Contract N°: EIE/04/107/SO7.38635

Progress report 2 (January-June 2006)

Date: July 2006

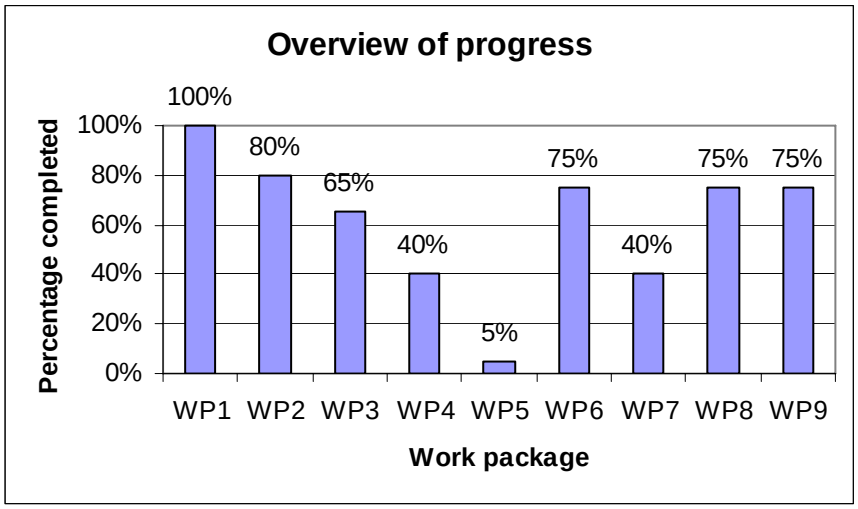
Partners:
Leicester City Council/Leicester Energy Agency (LEA) (UK), County of South Jutland (Denmark), Energieagentur Waldviertel (EAW4) (Austria), ENERGIE 2000 e.V. (Germany), Esbensen (Denmark), IT Power Ltd (UK), Sonnenplatz Großschönau GmbH (Austria).

Summary

This report is an update on progress with the European Commission funded Intelligent Metering project for the first six months of the second year of the project (January – June 2006).

In this reporting period, partners have reviewed the buildings which are being monitored in the project to provide a final list of metered buildings. A key activity which has been completed in this period has been arranging for the production of graphs and the display of graphs on the public website. Also, considerable work has been carried out on WP3 Training building occupants, with the full range of training material being made available on the internal project website and several training sessions being carried out in monitored buildings. Some analysis of training activities has taken place. The public website has continued to be developed and includes pages in the language of each partner. An outline for the best practice methodology and case studies has been developed in WP5. Dissemination activities have continued.

An overview of progress from the start of the project in January 2005, up to June 2006 is given in the chart below:



An introduction to the project, information on the status of implementation of the project by work package, and details of progress in achieving the deliverables are given below.

Introduction

The European Commission, through its Energy Intelligent Europe programme, is providing support for the project 'Energy Savings from Intelligent Metering and Behavioural Change' (Contract ref. EIE/04/107/SO7.38635, Intelligent Metering), involving partners in Austria, Denmark, Germany and the United Kingdom. The project runs from January 2005 to December 2006.

Aims and objectives

The project aims to demonstrate and promote the savings available from the use of intelligent metering and training occupants in public buildings and to show that these savings can be achieved at little, or no, additional cost.

The overall objective of the project is to maximise the energy savings available across Europe through the use of intelligent metering and behavioural changes of building occupants.

Work programme

The steps being followed in the project are summarised in the table below, which lists the work packages in the project:

Work packages (WP)	**Work overview**
WP1: Monitoring specification	Assessment of needs for a monitoring system. Outline specification for intelligent metering systems – half hourly metering in real time. Identification of buildings to be monitored.
WP2 Collection of data, analysis and monitoring	Data is recorded every half hour in real time and put through data analysis software, to produce results and identify savings and actions.
WP3 Training of building occupants	Training is provided to the building occupants on changing their usage patterns to save energy.
WP4 Analysis of results of training	Information on the savings is disseminated to the building occupants and an analysis carried out to identify the most effective changes/training.
WP5: Best practice methodology	Based on the experiences of the project and monitored savings, a best practice methodology will be prepared. It will enable other organisations across Europe to replicate the project and the savings.
WP6: Project website	Website design, establishment and maintenance. Used for up-dating monitoring information
WP7 Dissemination and training	Workshops, training of agencies, etc.
WP8 Common dissemination activities	Common project dissemination activities
WP9 Management	Project management

Timeplan

The original timeplan for the project is shown below.

Project phase / Duration of the project (in months)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Work package 1: Monitoring Specification																								
Work package 2: Data collection, monitoring and analysis																								
Work package 3: Training building occupants																								
Work package 4: Analysis of training																								
Work package 5: Best practice methodology																								
Work package 6: Website																								
Work package 7: Dissemination																								
Work package 8: Common dissemination activities																								
Work package 9: Management																								
Project meetings	**X**					**X**						**x**						x						**x**
Project deliverables*		1	2,3,4			PR*, 5, 6, 7, 8, 9, 19, 20			10, 11, 12	13		19	IR					PR*, 21, 22		14, 15,1 6, 19				FR *, 17

Expected results

Initially expected results have been:

- Intelligent metering of at least 80 public buildings – including office space, and schools
- 30% energy savings in buildings being monitored.
- Building occupants trained in each of the monitored buildings.
- Development of a best practice methodology for intelligent metering.
- Widespread understanding and knowledge of the intelligent metering approach.
- Development of a framework for on-going training.

Through the demonstration, training and dissemination elements of the project the expected results of the project in the longer term will include:

- Increased take-up of intelligent metering in every EU country
- Significant energy savings in public buildings through behavioural change
- Established training programmes for building occupants

Partners

The partners in the project are as follows:

- County of South Jutland (Denmark),
- Energieagentur Waldviertel (Austria),
- ENERGIE 2000 e.V.(Germany),
- Esbensen (Denmark)
- IT Power Ltd (UK),
- Leicester City Council (UK),
- Sonnenplatz Großschönau GmbH (Austria).

Details of the status of implementation by work package

An overview of progress with the project by Work Package is as follows:

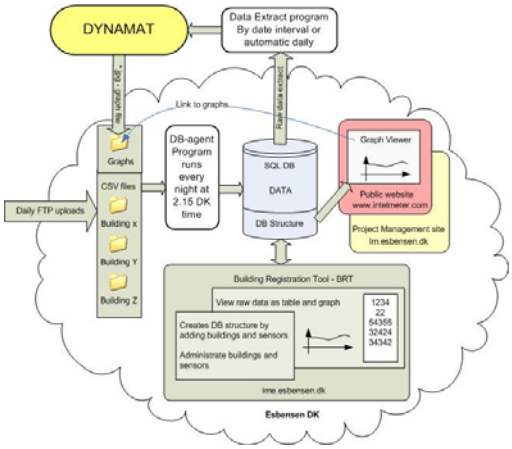
Work Package 1 Monitoring Specification – led by EAW4

This work package was completed mostly earlier in the project. In this reporting period, the partners have reviewed and updated the list of metered buildings, with EAW4 updating the 'Final list of buildings to be monitored' (Deliverable 3). To summarise:

Partner	Buildings listed in Deliverable 3
EAW4, Austria	8 buildings from the Government of Lower Austria, including main local government buildings and residential nursing homes for elderly people.
Sonnenplatz, Austria	All 5 public buildings in Großschönau (considered a typical sample of public buildings for rural municipalities): elementary school, gymnastic hall, kindergarten, town hall, community building with fire brigade, financial institute, museum and doctor
County of South Jutland, Denmark	11 buildings, including high schools, main local authority buildings, residential homes for the handicapped, and a special needs school.
ENERGIE2000, Germany	19 buildings, including primary and secondary schools, gymnastic halls, and public rooms.
Leicester, UK	26 of Leicester City Council's buildings are included in the project, including administrative offices, business-type premises, community centres, and sports and leisure facilities, and 13 schools.

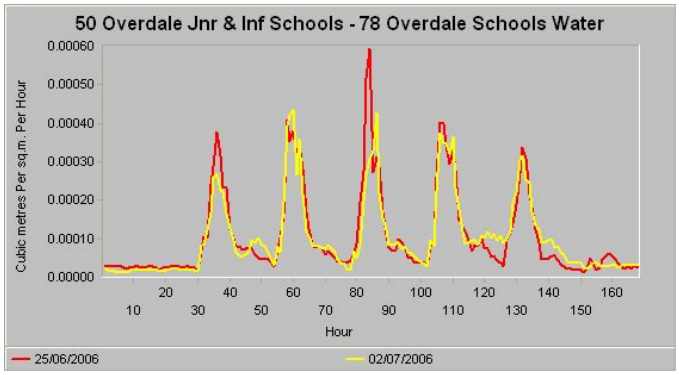
Work Package 2 Collection of data, monitoring and analysis – led by Esbensen

Arrangements have been completed to enable the successful transfer of data to the Dynamat software from the Esbensen project database, the generation of intelligent metering graphs using Dynamat, and their transfer to, and display on, the public website. In December 2005 Esbensen developed a data collection programme for Dynamat to collect data from the SQL database to create graphs. Leicester Energy Agency has liaised with Energy Metering Technology (EMT, developers of the Dynamat software) over arrangements for sending the data via Dynamat to the project website. EMT has used the data collection programme to collect the data from the database. The data has then been imported into Dynamat which has been run to generate intelligent metering graphs which are then sent automatically to the project website. Intelligent metering graphs with key figures for day on day, week on week and month on month graphs are now displayed on the website www.intelmeter.com (under 'Monitored data').



Data flow in the project

Also, Esbensen have updated the Building Registration Tool so that raw data is shown as both table, graph and CSV file, directly transferable to an excel spreadsheet, in order to accommodate further needs from the building users.



An example intelligent metering graph from the project website

Different partners have reviewed progress with sending data from their buildings to the database.

County of South Jutland, Denmark
Most buildings have been delivering both electricity, water and heating data since autumn 2005, and the remaining buildings completed their data transmission in January 2006. For most of the buildings, this gives a good foundation for comparing data with two similar seasons, which is helpful particularly for analysing the consumption of heating.

EAW4
EAW4 evaluated all settings of their energy accounting system to check if the outcomes were plausible. They controlled the counter coefficient, and carried out some updates.

Sonnenplatz
For the data acquisition within intelligent metering they interact closely with the mayor of Großschönau who ordered the necessary meters. All five buildings have installed meters and are reading out energy data. Two meters of the fifth building don't work exactly. The cause is not yet known. They are using the fibre optic network for the metering and were one of the first partners who delivered data to the database in 2005.

ENERGIE2000
There is a large amount of data for 6 of the buildings in Germany on the project database, with some data for 9 others. Currently, there are some buildings for which data is not being delivered to the database because of technical or administrative difficulties.

There are 20 heat- meters and 6 electricity meters installed in 20 buildings, which are mostly connected to ENERGIE2000's database at senger&partner. As Senger & Partner changed their database this spring, there have been some delays with the data transfer. From the new database the data is sent to the Esbensen database. In most of the objects there have been problems concerning the telephone lines. The district council as the owner of most of the buildings was not able to solve the problems up to now. In some cases there were no works done because the buildings will get new telephone connections this year and no works should be done on the old ones.

ENERGIE2000 use the data from another 7 electricity meters of the utility company (eam) in these buildings, too. The axp- data sheet does not correspond to the csv-sheet required by Dynamat, so the sheets are converted by s+p and then sent to Esbensen.

In some cases ENERGIE2000 noticed that the installed meters are not suitable for half hourly data transfer. These are meters without grid connection but with batteries. In these cases they got data only in the first minutes of each day and then the transfer was automatically stopped until the next day. In these cases the owners of the buildings had to change the meters, but this was not done in each concerned building.

Leicester Energy Agency
The majority of buildings have been delivering data to the database. It is intended that data will also be available on the database soon for the two buildings which are collecting half hourly data but the data is not yet being provided to the database.

Work Package 3 Training building occupants – led by LEA

Leicester Energy Agency have made the complete training package available on the internal website. Also, resources provided by partners are available. Good progress is being made by the partners with the training of occupants of the monitored buildings. Details of some of the training activities which have been underway are given below:

Leicester Energy Agency
At the end of April a training launch was held for representatives of the buildings in the project. Some individual meetings have been held with representatives of the different buildings (e.g. headteacher, premises officer or business manager). Further meetings are being arranged.

IT Power
IT Power is helping Leicester to implement the training actions.

EAW4
In total, EAW4 prepared 23 training sessions. They prepared trainings in all the local government buildings, with 2 nursing homes left to be trained. In every building they carried out 4 trainings. They have created a lot of material for the trainings, e.g. posters, handouts, main information, folders.

Sonnenplatz
The training material has been downloaded and partly adapted for the training of the building occupants of the buildings in Großschönau. New training material has been created for the

topics water, electricity and heating. They held the training sessions for all pupils of the elementary school in Großschönau and the first training session with the caretaker of all five buildings. They produced a lecture for other school classes (they have a lot of classes on project weeks in Großschönau) and are holding the first "Energiekaiser" for an external school. They produced information sheets for the teachers and the pupils of the elementary school and handed them out. They held the first training sessions for all teachers, for the staff of the kindergarten and for the cleaning staff of three of the five buildings.

ENERGIE2000
They held an initial meeting for some large buildings in January where they informed people concerned with the environmental aspects of the buildings.

In March they held five training sessions for the housekeepers of the buildings involved.
In June they invited the relevant person from the buildings involved to prepare individual training sessions. Recently they have been coordinating these training sessions.

County of South Jutland
Kick-off meetings with head teachers and buildings administrators for all the high schools were held in May 2006. They have carried out preliminary teaching material for the pupils regarding changing user behaviour. A Kick-off meeting has been held with science teachers from all the high schools to receive input for teaching material and coordinate the autumn teaching. The local database registrations are made available via IP addresses to the teachers so that students can have recent data available as soon as it is registered to get an idea of the building consumptions.

The County of Vejle has visit and started training at ASV Horsens, Røde Kors, Fredericia Skolen, and Vestergade/Skansebakken. All four places have worked with environmental issues for several years, and have followed the use of water, electricity and heating each month.

Esbensen
Esbensen have been involved in developing inspirational material for the building users in high-schools in Denmark. They have participated in meetings with different building users of the high schools involved from South Jutland.

Work Package 4 Analysis of results of training – led by EAW4

There has been some analysis of the results of the training.

EAW4 have created a data sheet for training actions containing key figures, consumption, heat degree correction, and a brief description of training (date, who is trained, who carries out the training,…) and an abstract of feedback. Using this sheet makes it possible to select best practice easily.

They have filled in the training action data sheet for all the trainings they have completed. They have started to analyse the energy savings for their buildings. Also, they have thought about a scheme for the evaluation of the data for all partners, e.g. concerning the provision for heat degree correction.

The Leicester Energy Agency has used the graphs displayed on the project website to make a quick comparison of consumption before and after training activities. Data sheets are to be completed.

Sonnenplatz used the training action data sheet to collect all necessary data for the analysis of their training sessions.

Work Package 5 Best practice methodology for replication – led by IT Power

IT Power built the basic structure for the best practice methodology report as well as the template for the case studies. This was presented at the project meeting in June. The basic concepts behind the best practices has been established and discussed with the project partners. Guidelines to collect information for the case studies have been distributed. It has been suggested that contents of the best practice methodology 'Roadmap for an intelligent monitoring' and the Case Studies are as follows:

Best practice methodology	**Case studies**
Introduction	General description
Need assessment	Need assessment
Monitoring objectives	Monitoring system
Monitoring systems	Monitoring management
Monitoring management	Data analysis
Data analysis	Training package
Training package	Conclusions
Success criteria	
Assessing savings	
User feedback	

Individual partners have considered the case studies to be produced for their buildings. For example, Sonnenplatz is collecting the necessary data for a Case study regarding the community Groβschönau as a whole. This Case study should be used to convince further rural communities to introduce intelligent metering systems.

Work Package 6 Development of web site- led by Esbensen

Different partners have been arranging translation and providing material for the public website so that it is now available in the languages of the different partners.

Esbensen have been providing assistance for partners when uploading to their website. They have been uploading important material and links to the Danish website, and formal documents to all sites (Denmark, UK, Germany, Austria).

Work Package 7 Dissemination and training –led by Sonnenplatz

As the leader of WP 7 Sonnenplatz scheduled the work for the second half of the project with the help of Leicester and provided a dissemination plan. The project leaflets have been translated in all languages. There were various dissemination activities from each partner: workshops, TV-spots, press releases, presentations at exhibitions and fairs. The second project bulletin has been created by Sonnenplatz with the help of all partners and uploaded on the homepage. Some of the dissemination carried out by each partner is listed below:

EAW4

- Roland was in Regensburg (Germany) to present the project, in the course of the EIE project meeting of ENERinTOWN.
- Some institutions would like to use their folder, e.g. Siemens, a school for agriculture, …
- Documents for "train the trainer" are in preparation.

ENERGIE2000

- In May they presented the project at the fair BAUSAN/ENBIO/DENEX 2006 in Kassel.

County of South Jutland

- Dissemination meeting about the IM project presented for all the counties in Denmark, May 2006

Esbensen

- Informing of the IM project at relevant workshops and meetings with other schools in Denmark.

LEA

- Presentations have been given at various events. Intelligent metering information was provided at a Beacon Council event.

ITPower

- IT Power is helping Leicester to implement an action plan for the dissemination campaign in the UK.

Sonnenplatz

- Poster presentation of Intelligent Metering during the environmental fair BIOEM with 26000 visitors and 300 companies presenting their products.
- Press releases of Intelligent Metering have been published in various regional newspapers and online-magazines after the 4th project meeting in Austria.

Work Package 8 Common dissemination activities – led by LEA

At the request of the European Commission the Leicester Energy Agency has prepared an updated project summary following consultation with the project partners, which has been provided to the European Commission. Also, information has been exchanged with another European Commission funded EIE project involving intelligent metering (ENERinTOWN).

Work Package 9 Management –led by LEA

The Leicester Energy Agency has been coordinating the project with each work package being led by individual partners.

Early in the year the Leicester Energy Agency completed the interim report with the help of the partners. Finance claims for the first year of the project were prepared by the partners, passed to the coordinator and sent to the EC. Also, proposed budget revisions were collected from different partners and submitted to the EC by the Leicester Energy Agency. Following the review by the EC of the interim report and finance claim additional financial information was requested. This has been provided by different project partners and submitted to the EC.

Esbensen arranged some telephone meetings for partners, including writing a summary, helping with communication between the partners.

The fourth project meeting was held in Waldviertel, Austria, from 18th to 20th June 2006. It was arranged by Energieagentur Waldviertel and Sonnenplatz Großschönau. At the meeting, the current position with the project was reviewed. There was an update and discussion on Work Package 3 Training of building occupants. Some examples of the analysis of the training were given (Work Package 4). Also there was an update and discussion on Work Package 5 Best practice methodology, and on WP7 Dissemination and training. The next activities in the project were considered and actions agreed.