

Eco n'Home WP 2

WP leader : e-ster bvba, Belgium

D2 : Definition and Methodology of the Project (final draft)

It was agreed during the Kick Off Meeting to use the following framework for the development of the Definition and the Methodology of the Eco 'n Home project:

	Details	Methodology
Electricity	- Big appliances - Stand-by losses - Lighting	- Questionnaire - Measurements of big appliances + stand-by losses (?)
Heating & domestic hot water installations	- Type - Age - Controls	- Questionnaire - Measurements ?
Building envelope	- Age - Type of house - ...	- Software package ? - Questionnaire
Transport	- Type - Number of kms. - real costs	- Questionnaire - ???

In this final version of a draft doc, the information currently available on Best Practices / Closely Related Projects is summarized. This helped us to select some of the best available tools for our Eco n Home project. In an Annex , each partner describes what he/she exactly intends to do in the 'action' phase (WP 3 ?) and with which tools.

BUILDING ENVELOPE + HEATING INSTALLATION :

Assessing the building envelope & the heating installation + formulating recommendations for improvement has a close link with Building Certification (although an energy audit and certification of a building are 2 really different things !). Previous experience in Europe, by partners or by other projects (non-exhaustive list) :

The Netherlands :

During the past 7 years, over 200.000 energy houses in The Netherlands have been assessed and undergone an energy audit (only bldg. Envelope + heating installation). This has been done mainly with a tool, developed by Novem, the Dutch energy agency. Such an energy audit did cost 250 EUR of which the government paid 200 EUR until recently. Since the subsidies have been abolished, the 'market' for household energy audits has collapsed to almost zero. One of the maybe most important lessons from a SAVE project touching this area (EPA-ED (2001-2004), www.epa-ed.nl.) : *It is important to be aware of maintenance activities foreseen by the client. Combining maintenance with energy saving is in general more cost-effective.*

France :

ADEME : Alsace finances energetic visits in households. Contract between State and Région. About 150 households per year. Cost: 350 € of which 70 € in charge of owners. No feedback is given after the audits.

Germany :

The Heidelberg Building Typology distinguishes 10 very common types of building, which are classified according to their type of use and construction date. For each building type, exemplary insulation measures are presented and assessed on the basis of their energy saving potential.

The Heidelberg Heating Certificate is a graded advice package, tailored to each building and takes into account retrofitting measures that possibly have already been carried out. The Building Typology data are all available in a computer database and are supplemented with specific building data (questionnaire filled in from the house-owner). This procedure avoids a costly and time-consuming on-site inspection. The Heidelberg Heating Certificate calculates the energy ratio of the building, evaluates its insulation quality, suggests energy saving measures and assesses them with regard to their energy and cost reduction effects.

During the past 8 years over 1,400 houses have been undergone this form of an energy audit. It is used also elsewhere in Germany in some cities, for example Mannheim and Tübingen.

KLIBA also gives advice on heating installations, but no special tools are used for that. There are different tools from heating manufacturers.

UK :

LEA : Leicester City Council, and other local authorities across the UK, offer free home energy surveys. Leicester City Council's Home Energy Team complete approximately 300 surveys each year. These assess heating performance and consumption, electricity consumption, heat loss from the building fabric, but do not assess transport use. Householders complete a questionnaire, the results from which are fed into the National Home Energy Rating (NHER) software. This software is able to calculate the reduction in carbon dioxide emissions and financial savings to the householder. Available tools : Meter readings, HOBO Pendant Data Loggers

The Energy Saving Trust has an online energy assessment tool which can be entered through the page: <http://www.est.org.uk/housingbuildings/calculators/energycalculator/>

There is also the Simplified Building Energy Model.(SBEM), a computer program that provides an analysis of a building's energy consumption. SBEM calculates monthly energy use and carbon dioxide emissions of a building given a description of the building geometry, construction, use and HVAC and lighting equipment. It was originally based on the Dutch methodology NEN 2916:1998 (Energy Performance of Non-Residential Buildings) and has since been modified to comply with the emerging CEN Standards. The tool can be downloaded at the top of this webpage: <http://www.ncm.bre.co.uk/>

This is the National Calculation Method (NCM) for the Energy Performance of Buildings Directive

Portugal :

In Portugal, it's too hot for heating in the southern part . So this part does not exist in (the middle and south of) Portugal.

RESIDENTIAL ELECTRICITY CONSUMPTION :

Previous experience in Europe :

Pilot campaign France

GEFOSAT set up an experimental project aiming to prevent fuel poverty and unpaid bills of energy. About 80 audits have been made at the house of beneficiaries, both on electricity and fuel consumptions. An example of report is available (in French).

Sparwatt (Frankfurt)

KLIBA gives advice on electricity, but there are no special tools used for that. In this project, KLIBA will use the Sparwatt tool.

Sparwatt has been founded as a private company in 1998 in Frankfurt to give advice on energy and water consumption to families. The central idea behind was the realisation that personalized energy information is much more effective than general info.

Starting from year 1998 the methodology and the market approach including computer tools have been developed. The method has been tested successfully in different cities. The method now can be applied everywhere, including the formation of new skilled "Spar Watt agents". The realised Spar Watt analyses state an average saving of 800-1000 kWh/year, 20 m³ of water, a reduction of the annual energy and water bill of 200-300 Euro and a reduction of the CO₂-emission of 1 ton/year per household. In some cases even a 50% saving of electricity has been realized without imposing less comfort !

Spar Watt offered its service checks along with minor installations for around 180 EUR (excl. material). It is useful to scale the price of the check with the yearly electricity consumption due to increasing analysis efforts.

Energy audits in Belgium by e-ster

Since its start in 2004, e-ster has been doing more than 250 energy audits in houses with an own questionnaire, measuring devices and own software.

The audit focuses on easily achievable measures to reduce the energy consumption (both fuel and power) with 30-40 %.

The total process per house (intake + audit + reporting) typically takes 3,5 hour (building envelope + heating installation + electricity). The basic service is offered for 179 EUR for normal households.

Portugal

AGENEAL :

Project 1

From January to July 1995 about 25 houses located in Lisbon, Porto, Coimbra and Setúbal underwent an energy audit. The partners involved were ADENE, National Energy Agency, EDP, Portuguese Electricity Company and Contawatt, Energy Consultants. This project was financially supported by SAVE. Each energy audit cost 1.172 EUR.

The audits involved a survey, energy bills evaluation and electricity consumption measurement of the main domestic appliances for 15 days. The tools developed for this project used EXCEL worksheets.

Project 2

During 1997 about 90 houses located in Coimbra underwent an energy audit. The partners involved were INECC, EDP and Contawatt. This project was financially supported by SAVE. Each energy audit cost 900 EUR.

The audits involved a survey, energy bills evaluation and electricity consumption measurement of the main domestic appliances for 15 days. The tools developed for this Project used EXCEL worksheets.

Project 3

ADENE, National Energy Agency was partner of a European project called EURECO. For the period of this project 100 houses in Portugal underwent an energy audit. Each house was monitored during a month, between January 2000 and July 2001. The project leader was Enertech and the other partners were ADEME (France), CRES (Greece), Politecnico de Milano (Italy), Servizi Territorio (Italy), Odense Elforsyning Net (Denmark).

This project was financially supported by the European Commission, EDP and ERSE, National Energy Services Regulatory Authority.

It was undertaken a survey and the measurement of electricity consumption of several domestic appliances. The potential savings were determined by means of the project's software tool.

TRANSPORT

- France : Tool Individual Carbon Report realised by the association “Résidents et amis de Neudorf” with a part about transport. There are some quick tools on the ADEME website. It’s possible to calculate the yearly cost of a car, the cost of a journey by car etc... (according to the type of the car, the longer of the journey, the type of the journey). URL : <http://www2.ademe.fr/servlet/KBaseShow?sort=-1&cid=96&m=3&catid=14291> There are some quick tools on the ADEME website. It’s possible to calculate the yearly cost of a car, the cost of a journey by car etc... (according to the type of the car, the longer of the journey, the type of the journey). See it on (in french): <http://www2.ademe.fr/servlet/KBaseShow?sort=-1&cid=96&m=3&catid=14291>
- UK : website “Direct Transport” (UK) : This website helps you plan a route from A to B - you can select whether to use a 'car route' or 'public transport', and in 'advanced options', the type of public transport and the time you wish to spend walking. It also allows you to calculate your fuel use if you are travelling by car. It gives you different options with approximate journey times for each..
<http://www.transportdirect.info/Web/Templates/Home.aspx?NRMODE=Published&NRORIGINALURL=%2fTransportDirect%2fen%2f&NRNODEGUID=%7b9B2CEBBB-B2D4-4022-A0D1-5B939541864D%7d&NRCACHEHINT=Guest>. Although this site gives accurate information regarding which bus to catch and the timetable, it is unable to give a cost comparison with the car probably because bus companies are not working in partnership with sites like these and are therefore not providing up-to-date fare information. The car option also assumes that you are able to park at your destination – this is not so, and does not include the cost of parking. There are therefore limitations with using sites like these.
- Portugal (AGENEAL) : Excel worksheet developed to calculate greenhouse emissions of the transport sector in the city of Almada.

OVERVIEW OF EXISTING TOOLS

Name of the tool	Developed by	Language	Input	Output	Estimated time needed per house ¹
Building envelope & heating installation					
EPA	Novem	Dutch	<ul style="list-style-type: none"> - yearly fuel consumption - measured surfaces - detailed description of the building envelope (per part) with library of 200 construction materials - details of heating & DHW installation (production, distribution, controls) 	<ul style="list-style-type: none"> - Assessment of existing situation - Calculating heating losses per window/wall/... - Recommendations for improvement 	3 to 4 hours
Wärmepass	Ifeu, Germany	German	<ul style="list-style-type: none"> estimated surfaces - U-values based on Building Typology data - degree-days 	<ul style="list-style-type: none"> - Assessment of existing situation - suggestion of energy saving measures - assessment of these measures with regard to their energy and cost reduction effects 	2 hours
Dialogie	ADEME	French	<ul style="list-style-type: none"> - Level "Quick": age of building, house or flat, number of family members, type of heating, hot water, cooking - Level "Intermediate": idem + improvements made on roof, ... - Level "Details": *detailed definition of envelope : surfaces and materials. Materials can be chosen in a library. *description of the heating and the hot sanitary water system. 	<p>Energy consumption and cost: total and for each type of using (heating, hot sanitary water, lighting etc...)</p> <p>Possibility to define scenarios and to evaluate potential savings</p>	0,25 to 3 hours
Mediathaer	COSTIC / ANAH	French	<ul style="list-style-type: none"> - quick description of insulation (surfaces + 3 possibility for walls, roof, window, floor) - aeration / ventilation / humidity - quick description of heating and hot water systems 	<p>Energy consumption and cost for heating and hot water.</p> <p>Some actions of improvement and their impact are included in the software</p>	1 to 2 hours
Coind'table	ADEME	French	<ul style="list-style-type: none"> - yearly fuel consumption - envelop: surfaces with U value - heating, cooling, hot water system and 	<p>Energy consumption and cost: total and for each type of using (heating, hot sanitary water, lighting etc...)</p>	2 to 4 hours

¹ Collecting needed information, processing data, reporting

			“other electricity” : simple description		
EPA-Belgium	Belgian Building Research Institute	Dutch & French	<ul style="list-style-type: none"> - yearly fuel consumption - measured surfaces - detailed description of the building envelope (per part) with library of 200 construction materials - details of heating & DHW installation (production, distribution, controls) 	<ul style="list-style-type: none"> - Assessment of existing situation - Calculating heating losses per window/wall/... - Recommendations for improvement 	6 to 8 hours
e-ster tool	e-ster	Dutch	<ul style="list-style-type: none"> - yearly fuel consumption - roughly estimated surfaces and type of the building envelope (per part) - many details of heating & DHW installation (long checklist) 	<ul style="list-style-type: none"> - Assessment of existing situation - Recommendations for improvement 	1 hour
Simplified Building Energy Model	BRE (UK) ?	English	<ul style="list-style-type: none"> - description of the building geometry - construction - use and HVAC 	<ul style="list-style-type: none"> - Monthly energy use - CO2 emissions 	?
NHER	UK	English	-requires information on size of house and rooms, construction of walls, type of heating and many other factors.	Reduction in carbon dioxide emissions Financial savings to householder	1.5 hours
Residential electricity consumption					
Sparwatt	Sparwatt	German	<ul style="list-style-type: none"> - instant measurements of leaking losses (“stand-by losses”) of 10 to 20 appliances ; visual inspection of all large appliances - Inventory of most used light points - Questionnaire with ca. 100 questions 	<ul style="list-style-type: none"> - Assessment of existing situation - Recommendations 	2 hours
EAB	Novem	Dutch		<ul style="list-style-type: none"> - On-line tool for self-auditing - Recommendations 	0,5 hour by participant
e-ster internal software	e-ster	Dutch	<ul style="list-style-type: none"> - Short-term measurements of 6 to 10 appliances (1 to 3 weeks) + instant measurements of leaking losses (“stand-by losses”) of 10 to 20 appliances - Inventory of 7 most used light points - Questionnaire with ca. 100 questions 	<ul style="list-style-type: none"> - End-use split (based on measurements) - Assessment of existing situation - Recommendations 	1,5 hour
Dialogie	ADEME	French	2 levels: <ul style="list-style-type: none"> - Quick - Detailed 	See above	0 to 0,5 hours

Transport					
Transport-Direct	Atos Origin (UK)	English	- Point of departure, point of arrival - Travel date	- Detailed travel advice (bus/train/tube numbers, maps, ... - Travel details (costs, travel time for car and for public transport, ...)	5 minutes
Excel spreadsheet	AGENEAL	Portugese	- Characteristics of the car - Number of kilometers	- CO ₂ emissions	5 minutes ?

OVERVIEW OF PARTNERS WHICH REPORTED THE USE OF MEASURING DEVICES FOR GIVING ENERGY ADVICE :

Measuring device	Used by	Number of m.d. available	Description of logger	Cost per measuring device	Number of measuring devices used per dwelling
HOBO Pendant Data Loggers	LEA - UK	??	Measures indoor temperature	Records temperature	2 loggers per house (upstairs and downstairs), half-hourly monitoring
IButton loggers	LEA	??	Monitors light levels	Recorded light levels per room	2 weeks data needed at 10 minute sample rates
CE Electric Meters	e-ster	80	Measures Watt and kWh of appliances with a plug	130-200 EUR	2 meters during 3 weeks
Escort Loggers	e-ster	8	Logs indoor temperature or departure/return temperature of a central heating circuit	150-400 EUR	2 + 2

Annex :

**Decription of the Partners's Planned Energy Service Activities
and Tools**

Partner no. 7: AGENEAL, Portugal

Methodology:

Building envelope, heating/cooling and domestic hot water installations: AGENEAL will focus on easily achievable and very cost-effective measures to improve comfort and energy efficiency. A simple regression model will be used to determine the fuel consumption for water heating and cooking.

Electric appliances and lighting : AGENEAL will use the Sparwatt tool which focus on easily achievable and very cost-effective measures to improve comfort and energy efficiency. The consumption of the main appliances will be measured during 1 week in each house involved and spot measurements will be carried out in order to determine leaking losses (“standby losses”).

Transport : For transport, AGENEAL will use the same methodology as the other partners (questionnaire, calculation of costs, energy consumption and emissions of transport, for a sub sample detailed tailored advice on switching to convenient lower carbon transport solutions).

Short description of the planned services

AGENEAL plans to carry out 100 energy audits. Each house will be visited and a checklist will be filled by each participant, the audit itself will take approximately 2 hours. After the audit, a second visit will occur to each house and a report, with an inventory of the energy consumptions and potential energy savings identified, will be delivered and the energy savings action plan will be signed. If necessary other quick visits will be made and a permanent service of advisory by phone will be available. The last visit will occur one year after the first. At this time an evaluation of the energy saving actions will be made, difficulties will be discussed and other actions for improvements will be proposed. Each participant will receive a short evaluation report.

In a sub sample of households, depending on the co-financers, it is planned that the energy auditor will directly install some cheap but very effective measures (energy-efficient bulbs,...) during the audit.

Selection of households:

The selection of participants will be made through the enclosure of a registration form in the Municipality of Almada Bulletin, which is delivered to each Almada’s household on a monthly basis. Other contacts will be made through AGENEAL’s associates, which will disseminate Eco n’ Home energy audits to their staff.

The Eco n’ Home registration form will also be available at AGENEAL’s website.

Partner no. 4 : e-ster bvba, Belgium

Methodology :

Building envelope, heating and domestic hot water installations : For these topics, e-ster will use its own-developed methodology which focuses on easily achievable and very cost-effective measures to improve comfort and energy efficiency. In a subsample, e-ster will measure temperatures with loggers in order to give advise on the control of the heating installation.

Electric appliances and lighting : For these topics, e-ster will use its own-developed methodology and software tools which focuses on easily achievable and very cost-effective measures to improve comfort and energy efficiency. In all houses involved, e-ster will measure the consumption of the main appliances during 1 to 2 weeks + carry out spot measurements in order to determine leaking losses (“standby losses”).

Transport : For transport, e-ster will use the same methodology as the other partners (questionnaire, calculation of costs and emissions of transport, for a subsample detailed tailored advice on switching to convenient lower carbon transport solutions).

Short description of the planned services

e-ster plans to carry out between 100 and 250 energy audits. Before the audit, a short checklist will be sent to the participant. The audit itself will take approximately 1,5 hour. After the audit, a report of typically 15 pages will be sent to the participant. In most cases, no other visits are planned, but in all cases it is planned to monitor the energy and transport consumption on a monthly basis.

In a subsample of households, depending on the co-financers, it is planned that the energy auditor will directly install some cheap but very effective measures (stand-by cutters, energy-efficient bulbs, ...) during the audit.

Selection of households :

At this moment, the co-financing is still uncertain (which means that a la limite, e-ster's regular clients will co-finance the project). E-ster did contact however ca. 5 public and 5 private potential partners. Already one Social Service agreed to co-finance. The selection of participants will entirely depend on them. The contacted potential partners represent a good mix of social welfare organisations, and private companies which would ‘buy’ energy audits to their staff’s houses.

Partner no. 4 : KliBA GmbH, Germany

Methodology :

Building envelope, heating and domestic hot water installations :

For these topics, KliBA will use its own-developed methodology, the Heidelberg Heating Certificate - a graded advice package. The package includes both the Building Typology and the Heating Certificate itself. The Heidelberg Building Typology distinguishes 10 very common types of building, which are classified according to their type of use and construction date. The heating certificate is tailored to each building and takes into account retrofitting measures that possibly have already been carried out. The Building Typology data are all available in a computer database and are supplemented with specific building data (questionnaire filled in from the houseowner). The Heidelberg Heating Certificate calculates the energy ratio of the building, evaluates its insulation quality, suggests energy saving measures and assesses them with regard to their energy and cost reduction effects.

Electric appliances and lighting : For these topics, KliBA will use SPARWATT- a developed methodology and software tools from Frankfurt, Germany which focuses on easily achievable and very cost-effective measures to improve comfort and energy efficiency. The method has been tested successfully in different cities combined with local energy saving actions and campaigns. In all houses involved, KliBA will measure the consumption of the main appliances during 1 to 2 weeks + carry out spot measurements in order to determine leaking losses (“standby losses”).

Transport : For transport, KliBA will use the same methodology as the other partners (questionnaire, calculation of costs and emissions of transport, for an advice on switching to convenient lower carbon transport solutions).

Short description of the planned services

The project in Heidelberg will be carried out in cooperation with the City of Heidelberg and the Public Utilities of Heidelberg. Both partners will also give a financial contribution to the project. In a total of 100 households, energy checks will be made in the form of on-the-spot inspections.

These 100 households are determined as follows: the Public Utilities will enclose a voucher for an energy consultation to the electricity bill of about 9,000 electricity customers. The value of the voucher (“Energy consultation in the value of 200 €”), the limited number of consultations and the customer’s own contribution of 20€ are specified on the voucher. Then 100 households will be selected from the feedback information and contacted by telephone for an appointment. In this first contact, relevant data such as the type of heating, energy source, ownership structure etc. are queried. The appointment will be confirmed in writing and the households will be sent 1 to 2 electricity meters in order to carry out measurements on refrigerators, washing machines etc. before the inspection takes place.

This action is accompanied by PR (press statement at the beginning of the project, releases dealing with the house inspections and the results). The City of Heidelberg will supply energy saving lamps, connection plug boards etc. which can be directly installed.

Partner: Leicester, UK

Methodology

Building envelope, heating and domestic hot water installations: Leicester will measure indoor temperatures in all houses using HOBO loggers. Two loggers will be installed per house – one upstairs and one downstairs. They are capable of storing two years worth of data, and will therefore produce enough data in order to compare differences in indoor temperature prior to and after installation of energy efficiency measures. Estimated heat loss from different building fabrics will be calculated by the National Home Energy Rating (NHER) software. The necessary data to be fed into the software will be obtained from the householder's questionnaire. Weekly gas meter readings will be obtained from the householder.

Electric appliances and lighting: Leicester will estimate the consumption of the main appliances and lighting from answers to appropriate questions in the questionnaire. No direct measurement of electrical consumption and stand-by losses will be carried out, due to the length of time this will add to the energy survey, and problems of access to the back of appliances. Weekly electricity meter readings will be obtained from the householder.

Transport: Leicester will use the same methodology as the other partners (questionnaire, calculation of costs and emissions of transport). It should be noted, however, that Leicester has reservations about the ability of Eco n'Home to demonstrate **actual** carbon savings from analysing transport use.

Short description of the planned services

Leicester plans to carry out 100 energy audits. The surveys will take approximately 1.5 hours and are free of charge.

Year 1: selection of approximately 100 households. Basic information (contact details, type of house) is obtained by telephone prior to survey. During the energy survey, the questionnaires will be completed and monitoring tools will be installed. The householder is referred to the grant scheme, run by Leicester City Council, which is able to provide a 75% grant for energy efficiency measures. Measures installed are loft and cavity wall insulation, draught proofing, heat recovery fans, gas-condensing boilers, heating controls and low energy light bulbs. Advice will also be given on lifestyle changes.

Year 2: Follow-up of measurement plus technical evaluation (by De Montfort University) and repeat of questionnaire. Results will be fed into the NHER (National Home Energy Rating) software programme, which is able to calculate the reduction in carbon dioxide emissions and financial savings to the householder. These predicted results would be compared with actual levels of consumption measured by the monitoring tools.

Year 3: Dissemination of results. In a sub-sample of households, (approximately 10 motivated householders) it is planned to install "whole house" monitoring equipment, supplied by De Montfort University in Leicester. This will provide more detailed information about energy consumption.

Selection of households

All householders will have permanent residency within the UK and live within a grant-assisted area of Leicester city (the SRB 6 area). Home owners and private renters are both eligible. Leaflets on the SRB6 scheme are distributed within the eligible area – it is the individual householder’s responsibility to contact Leicester City Council to register. This ensures that the householder is committed to the scheme.

Partner : MVE, France

Methodology :

Building envelope, heating and domestic hot water installations : MVE as other French local energy agencies will use the software “dialogie” as data-processing tool for this topic. In the mean time, using temperature loggers inside the dwelling will enable to see what is wrong on the temperature control. Thus we can give advice on system regulation (only 1°C over 19°C is equivalent to a 7% growing of the heating consumption)

Electric appliances and lighting : MVE as the other European partners will use the “Sparwatt” tool as data-processing tool for this topic. We will list all the electric appliances in every household in order to measure the consumption of the main appliances (fridge, washing machine, etc...) during the most representative period. For that MVE will use a straight-forward energy measuring device. Spot measurements will be carried out to determine standby losses.

Transport : MVE will use the same methodology as the other partners i.e. questionnaire, calculation of costs and emissions of transport, advice on switching to convenient lower carbon transport solutions.

Short description of the planned services

MVE will experiment the service on the initial sample of 30 households. Before the audit, a **first contact** will be made with the surveyed households in order to collect basic information. Then a **first visit** would take 2-3 hours after which energy consumptions will be analysed with the help of specific tools defined beforehand (“Dialogie” for building envelope, heating, and domestic hot water installation & “Sparwatt” for electricity).

This **analysis** will enable us to make a **report** of around 10 pages on their energy consumptions and thus draw up a list of recommendations regarding advisable investments on energy systems and appliances to be more efficient, building envelope to reach standards, and regarding behaviour both at home and for transport.

Other visits might be planned in order to check if recommendations are taken by householders and to monitor energy consumption as it goes along by comparing new energy bills with previous energy bills.

Selection of households :

MVE has obtained co-financing from three cities located around his working area (Montreuil, Vincennes, Bagnolet), therefore the sample will be split as followed : 10 households for Montreuil, 10 households for Vincennes, 10 households for Bagnolet. Household selection will be made through our advising service database. Those people who made contact were already willing to get information on energy savings and on how to undertake appropriate solutions for improving energy efficiency like retrofitting their dwelling with new systems or appliances, improving insulation, reducing their energy bill, etc.

Partner no. 3: Marches Energy Agency (MEA), UK

Methodology :

Building envelope, heating and domestic hot water installations :

MEA will make use of the National Home Energy Rating software, developed and used by Leicester Energy Agency (LEA) and other organisations across the whole of the UK. The software provides a full energy analysis based on measurements of volume, structure, and installations, and calculates the cost of replacing or upgrading installations, the CO₂ reduction, and gives an energy rating (NHER) for the property. Temperature loggers will be used to monitor internal temperature in a sub-group of households. These measurements will be gathered over a period of one year.

Electric appliances and lighting :

MEA will use the SparWatt tool which will be translated from German into English for this purpose. This tool will provide information on electricity use, energy efficiency and CO₂ savings. Diagnostic tools will be used to record the electricity consumption of larger appliances, where this is possible, over a period of one to two weeks. The same tools will be used to measure standby losses from electrical appliances. Households will also be asked to complete a form recording the operation of appliances in different modes (on/off/standby) for an average week, which will enable advice to be provided on reducing standby losses.

Transport :

MEA will use a combination of simple tools to provide advice on energy saving in transport. Households will be asked to record their time, mode, distance and reason for travel during an average week by completing a template form. Details will also be collected on each private car e.g. fuel type, engine size. This information will be entered into an electronic database which will calculate the carbon emissions from transport. Advice on reducing energy use and carbon emissions will be provided based on the information collected in the form and database output.

Short description of the planned services

MEA will carry out an estimated 500 energy audits. The exact number is dependent on willingness to participate and the availability of information. Prior to the audit, each interested household will be sent a short questionnaire asking socio-economic information. A convenient time will then be found for an advisor to visit the household to carry out the energy audit, which will take approximately one and a half hours. Diagnostic tools will be fitted during this visit. A report will be provided to the householder and a plan of energy saving actions agreed. Information on energy use in heating and power will be requested from households on a monthly basis.

MEA plans to carry out additional visits during the year of experimentation to a sub-group of households. One group will receive one visit, and another two visits. These visits are additional to the follow-up visit timed for one year after the energy audit.

Selection of households :

The audits will take place primarily in three rural communities in Shropshire in combination with another project, supplemented by households from other projects and communities with which the Agency works. The co-financer requires a representative sample of households and it is in the best interest of the project to ensure this is true. However no criteria have been set additional to those agreed as standard by the partners (e.g. period of residence, first home..)

Partner : Torino Energy Agency, Italy

Methodology:

The energy-audits will be undertaken on 100 dwellings within the metropolitan area of Torino.

It will be undertaken following the completion of a check list by the residents of the participating dwellings, together with an on-site survey to collect relevant information regarding:

- the energy consumption of the last three years (heating and domestic hot water installations)
- the macroscopic characteristics of the building and more specifically of the dwelling in question (date of construction, building characteristics, surface area, volume, etc).
- the way the building is used by the residents.

There will also be an evaluation of the applicability of integrating solar systems through the analysis of the type of building structure and the orientation of the roof.

For a limited subdivision of the “dwelling stock” a more detailed analysis will be undertaken which will record temperature measurements of the different environments using a data logger.

The energy performance of the window fixtures in relation to the whole surface area will also be evaluated, analysing the type of fixture and the characteristics of the glazing.

Electric appliances and lighting:

The analysis of the lighting system will evaluate the energy characteristics of the light bulbs installed in each dwelling.

For a limited subdivision of the “dwelling stock” a specific measurements campaign will be undertaken, this will last 1-2 weeks and will analyse the principle domestic electrical appliances in order to evaluate the energy consumption, and in the case of electronic appliances to quantify the energy lost through the use of the “stand-by” function.

This data will then be extended to other dwellings that present similar characteristics in terms of age, type of building and type of use following the elaboration of specific spreadsheets.

Transport:

In the transport sector, by common agreement with the other partners, questionnaires will be sent to the participating households seeking information about the household’s behaviour regarding transport and will include characteristics of their vehicle/s.

The information collected will then be elaborated in a file that will summarise the average annual consumption and the CO₂ emissions into the atmosphere.

An evaluation will be made regarding the economic-environmental benefits that can be achieved using alternative methods of transport.

Short description of the planned services

The Agenzia Energia e Ambiente di Torino plans to undertake a hundred energy audits of this kind. Before the on-site survey, a check list will be sent to the participating households, the analysis of which will determine the methods and timescale of the surveys.

The survey at the dwelling will last between 1 to 2 hours. Each survey will be accompanied by a personalised report which will be sent to the household following data elaboration.

In the dwellings where the measurements are to be taken, a further visit is foreseen to collect the data recording equipment as well as the data in question.

After the audit synthetic data cards will be produced and all the information/training material regarding the best practices to implement to reduce energy consumption will be supplied.

This will provide the residents practical advice on how to act to obtain maximum benefits on the critical points that emerged from the audit through efficient energy management of the dwelling and its appliances.

Finally, spot checks will be undertaken to evaluate the benefits that result from a modified energy management of the various appliances, highlighting the energy saving achieved.

Selection of households:

Where possible, the project will seek to involve different districts of the city and will cover a vast proportion of the city territory so that there will be a broad selection of case studies, evaluating and analysing apartments and residents from different socio-economic backgrounds.

For co-funding AEA has contacts with 3 public partners: Municipal Council, Exegesi and ATC and 2 potential private partners.

It will be the co-funding partner that will indicate the lines of action to be taken regarding the choice of participants.

An interesting experience could be that to include in the sample group to be analysed the apartments belonging to the MOI (Media Olympic Village) from the recent Winter Olympic Games: following the Games, many of the structures that were used to house the press have been converted into apartments for students, young couples and low-income families.

Partner no 5 : GEFOSAT, France

Methodology :

Building envelope, heating and domestic hot water installations : For these topics, Gefosat will use a tool as Dialogie (tool also used by EIE, developed by Izuba Energies for ADEME).

Electric appliances and lighting : For these topics, Gefosat will also use a tool as Dialogie.

Transport : For transport, Gefosat will use the same methodology as the other partners.

Short description of the planned services

Gefosat plans to carry out 90 energy audits. Each visit will last from 1 to 2 hours.

Some measuring checkers will be installed to help households to measure their electricity consumptions, and to make them realize how important they can be.

After each audit, a short report will be sent to the household (maybe 4 or 5 pages). Gefosat advisor will try to make this report visual (it will probably contain a graph of energy consumptions, and maybe some costs boards). The report will contain some characteristic data of the household (energy consumptions, energy loss in building...), and also general information (possible savings...).

A purpose of action plan will be included in the report. The participant will have to sign this action plan, as a sort of a moral contract. Gefosat advisor will call the participant to explain the report and to validate the action plan with him.

The experimentation will last one year. During this time, if necessary, Gefosat advisor will visit participants again, and the Gefosat EIE (Espace Info Energie) will assist them.

At the end of the experimentation, a new visit will be done to analyse the results and some new recommendations could be done (a final report will be written).

During the experimentation, a competition could be organized to reward the household which will save the most energy.

Selection of households :

Gefosat is working with two official partners (ADEME, Region Languedoc-Roussillon) and three local partners : Ville de Mèze, CCPL (Communauté de Communes du Pays de Lunel), SIVOM "Entre Vène et Mosson". The households will be selected on these three areas : 20 households for Mèze, 50 households for CCPL, 20 households for SIVOM Entre Vène et Mosson.

The selection has started : a form is available on internet (Gefosat's site and partners' sites), and in partners' offices. Some articles have been published and a press point will be organized. The interested households have to fill a short form (characteristics of building, heating installation, etc...) and to send it to Gefosat. Then they will be, or not, chosen (the selection will be done with local partners' agreement).

Gefosat is also going to work with social housing organisations. 20 households will be selected by this way (included in the 90 households).

Partner : LATERE/SIEL

Sélection des foyers :

Le SIEL réalise des opérations de MDE visant à éviter ou retarder les renforcements de réseau électrique. Il dispose à ce titre d'information concernant certains consommateurs sur les départs qu'il cherche à optimiser. 100 foyers ont été sélectionnés, parmi lesquels 30 volontaires seront recherchés pour participer à l'opération. Un mailing sera envoyé à ces 100 foyers en juillet 2006, avec coupon réponse et lettre T. Une relance téléphonique sera effectuée pour atteindre le chiffre de 30 volontaires (juillet et septembre 2006).

Méthodologie :

L'objectif est d'optimiser le temps passé par foyer, en réalisant l'opération avec 3 visites, et en éditant les rapports et recommandations directement en fin de visites

Première visite :

Lors de la première prise de rendez-vous, il sera demandé de préparer pour la visite les documents liés à la consommation (factures gaz, électricité, fuel, bois...). La première visite permettra de réaliser un diagnostic sur le volet thermique, en s'inspirant des diagnostics de performance énergétique, basé sur l'outil 3CL. Un rapport type DPE, avec étiquette énergie et recommandations sera imprimé et commenté.

Des mesures instantanées de consommations électriques seront effectuées (veilles, appareil au fonctionnement continu). Des compteurs d'énergie seront installés sur les appareils au fonctionnement intermittent (appareils de froid, lave-linge, lave-vaisselle...). Il sera préféré, dans la mesure du possible, une utilisation d'un nombre important de compteurs (5 à 10 par foyer environ), mais pendant une période assez courte (1 semaine par exemple), sans intervention de l'habitant. Des compteurs pourront être installés sur les appareils de forte puissance mais à l'utilisation très intermittente (fers à repasser, sèche-cheveux...), pour bien insister sur la prépondérance des appareils à fonctionnement continu.

Deuxième visite :

Lors de la deuxième visite, 1 semaine ou quinze jours après la première, les relevés des mesures sur les compteurs d'énergie seront effectués (et les compteurs récupérés). Un rapport avec recommandations sera imprimé et commenté sur les consommations électriques (intégrant les mesures instantanées de la première visite et les mesures continues entre les deux visites). Les deux diagnostics (thermique et électrique) permettront d'élaborer en concertation avec le foyer, un document d'engagement sur des objectifs de réduction de consommation. Des fiches de suivi (relevés mensuels ou trimestriels des compteurs électricité et éventuellement gaz) seront fournies, avec enveloppes préaffranchies.

Suivi :

Un numéro de téléphone fourni aux foyers leur permettra de contacter le technicien pour toute question sur la mise en œuvre des actions décidées dans le document d'engagement. Les foyers enverront les relevés de compteurs (mensuels ou trimestriels), permettant d'analyser d'éventuelles dérives en cours d'années par rapport aux objectifs fixés. Des courbes de consommation pourront leur être envoyées en retour comme « tableau de bord ».

Visite finale :

Une visite finale (au moins 1 an après la première visite) permettra de faire le bilan de l'opération, des résultats obtenus et des difficultés rencontrées.

Partner: ALE Grenoble (38), France

Methodology:

Building envelope, heating and domestic hot water installations: For these topics, ALE 38 will probably use the software 3CL. We intend to measure temperatures with loggers in order to give advice on the control of the heating installation.

Electric appliances and lighting: For these topics, ALE 38 will use its own-developed methodology and software tools which focuses on easily achievable and very cost-effective measures to improve comfort and energy efficiency.

Transport: For transport, ALE 38 will use the same methodology as others partners (questionnaire, calculation of costs and emissions of transport, for a subsample detailed tailored advice on switching to convenient lower carbon transport solutions).

Short description of the planned services

ALE 38 plans to carry out 150 energy audits. It will be demand to candidates to recover a lot of information before our visit. The audit itself will take approximately 2 or 2.5 hours in households, and the same time to write reports. One month after the first visit we will contact people to verify the beginning of actions. A second contact will be taken 4-5 months later, to know the advance of the project. To finish, we will return in each household to evaluate the energy saving. This last intervention will take roughly 1 hour. The time afforded to each participant is approximately 1,5 day.

During this test year, every household will have a graphic of its electrical consumption of 2005 and each month they will report their consumption of 2006 on this graphic to compare the two years.

Selection of households :

Our selection has been determinate by the transport topic. In a first time, we have chosen 3 towns of the build up area of Grenoble that were equipped of a railway station and buses or tramway, to make people thinking of those sorts of transport. At the moment we have 60 candidates. If we can't reach our goal of 150 candidates, we will selection household in others towns (in the build up area). We already have a standby list with 20 candidates.

Specific remarks:

ALE 38 also chooses to pay attention at water's consumption, for this topic, we will use software created by another "energy information space" (ADIL 26). It will consist in locating the different water appliances and to propose a solution adapt to each of them.

Partner: ALE Grand Lyon

1 – Méthodologie

- Bâti, systèmes de chauffage et installations d'eau chaude sanitaire :

L'ALE du Grand Lyon compte utiliser le logiciel 3CL ou Dialogie. Nous ne souhaitons pas mesurer la température intérieure des logements, trop fluctuante et dépendant plus du ressenti des personnes que de la température en elle-même.

- Electricité :

Nous souhaitons utiliser le logiciel Sparwatt qui va être traduit d'ici peu en anglais. Nous allons mesurer la consommation d'électricité des logements : des appareils principaux, des veilles... Nous pensons mesurer les consommations des appareils principaux lors de l'utilisation de chaque appareil et de demander leur temps d'utilisation, par semaine ou par mois, plutôt que de laisser le compteur plusieurs semaines et de récupérer les mesures au bout de ce laps de temps.

- Transport :

Actuellement nous n'avons pas de logiciel sur les transports. Nous allons prendre contact avec l'ADEME (l'ALE 38 ou une autre agence prendra contact avec eux) pour essayer d'obtenir celui sur les DPE/DPU qui devrait être sur le site Internet prochainement, et doit être utilisé avec leur accord. Mais par contre il est difficilement transposable.

2 – Service prévu

Nous planifions d'intervenir sur 100 logements situés sur le Grand Lyon, principalement des maisons individuelles mais aussi des appartements.

Nous sommes actuellement en phase de recensement des logements (aujourd'hui une bonne 20aine).

La démarche à suivre n'a pas été définie clairement mais nous envisageons d'envoyer un questionnaire très simple aux familles avant la première visite et de leur demander de bien préparer leur facture et autres documents nécessaires à l'analyse de leur consommation.

Lors de la visite nous remplirons alors un questionnaire plus détaillé, leur laisserons des compteurs d'électricité qu'ils devront nous renvoyer (?) au bout d'une ou deux semaines.

Nous envisageons de développer un carnet de suivi aidant la famille à faire un bilan régulier de ses consommations, ce qui l'impliquerait d'avantage dans le projet, et la possibilité de lien avec les résultats du diagnostic (courbes de consommation de l'année en cours par rapport à l'année précédente si possible ou courbe de référence)

3 Les suites à donner

Une réflexion sur les compteurs d'électricité est à envisager (relevé, fréquence d'utilisation de tel ou tel appareils, types d'appareils importants ou non, ainsi qu'un groupement d'achat éventuel.

Partner: ALE Mulhouse

Descriptif d'un diagnostic énergétique

15 mn

1. Prise de contact téléphonique + fiche de renseignements (surface chauffée, occupation, nombre d'occupants, système de chauffage)

2. Visite sur site

Mesures :

- 2.1 Orientation
- 2.2 Mesure de combustion si chaudière
- 2.3 Mesure de la température d'ECS
- 2.4 Mesure de températures ambiantes et des parois
- 2.5 Mesure de débit sur point de puisages (eau)
- 2.6 Mesure de puissance et des consommations de certains appareils électriques

Visualisation :

- 2.7 Performance de l'isolation
- 2.8 Performance des vitrages
- 2.9 Système de ventilation
- 2.10 Equipements en eau
- 2.11 Systèmes de chauffage
- 2.12 Régulation
- 2.13 Eclairage et équipements électriques
- 2.14 Système durable (tri, composteur, hangar à vélo)
- 2.15 Potentiel pour les systèmes renouvelables
- 2.16 Adéquation quant aux abonnements énergétiques souscrits

Données :

- 2.17 Factures chauffage
- 2.18 Factures électricité
- 2.19 Factures eau

4 h

3. Rédaction du rapport

1 h

4. Compléments d'information et assistance téléphonique

Donc une grosse journée de travail par diagnostic.