Deliverable D.4.0.4.1

Final report of all realized monitoring and evaluation studies

January 2012

Prepared by: Claudia Villalobos Montoya (claudia.villalobos@fg-upsy.com)
Research Group Environmental Psychology at Otto-von-Guericke-University Magdeburg, Germany

Dissemination level: Public

Table of contents

1. Introduction

This document will summarize the Project Monitoring activities realized by the University of Magdeburg within the framework of the project ECO-City.

The Otto-von-Guericke-University of Magdeburg was in charge of the work package 4.0 (Result Monitoring), focussed on socio-economic activities. The Project Monitoring was divided into two parts: Internal and External Project Monitoring.

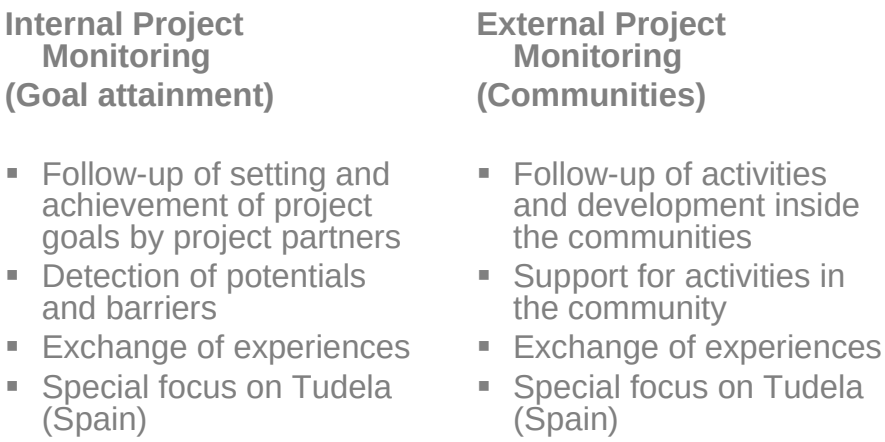


Fig. 1: Monitoring activities

The *Internal Project Monitoring*, focussed on project partners' work, has been initiated by the definition of internal goals regarding RTD activities by the project partners themselves. It was planned to realize the goal setting for the demonstration activities in the same way and to carry out every 12 months an internal assessment of goal attainment during the project's course (Formative Evaluation) till the end of the project (Summative Evaluation).

The *External Project Monitoring,* focussed on the project's impact on the community, includes the analysis of the socio-economic measures in the three communities involved in the project: Trondheim (Norway), Elsinore/Helsingborg (Denmark/Sweden) and Tudela (Spain). The community monitoring was based on the criteria of socio-economical (SE) monitoring, developed in the CONCERTO initiative. Further on, own criteria for project monitoring have been elaborated.

The methodology and the results of SE Project Monitoring will be described in detail further on.

2. Internal Monitoring

2.1 Methodological review

The University of Magdeburg (SOC-DE) was in charge of the assessment of the RTD and demonstration activities and to inform the consortium about actual state of demonstration activities.
Applying the formative evaluation methodology, results of demonstration activities should be assessed in 12-month intervals.

In a first step, the project objectives of each project partner were defined. With this objective, SOC-DE has elaborated a questionnaire form with the title “Quality Assurance and Evaluation of RTD Activities in the Project ECO-CITY” (Annex 1,2). This questionnaire form includes the following aspects:

1. Definition of goals
2. Definition of objectives in research activities and development of technology
3. Priorities
4. Steps of goal attainment
5. Milestones
6. Outcomes – Possible scenarios

A similar questionnaire form (Annex 3) should be applied for evaluation of demonstration activities, but this procedure has shown no to feasible as there were many intersections between RTD and demonstration goals. Therefore, we used a combined questionnaire for the follow-up of the progress of RTD activities with the title “Quality Assurance and Evaluation of Research Activities in the ECO-CITY Project; 2nd Revision, State of the Art 2008” (Annex 4). The response was poor, so we were forced to reconsider our strategy in order to realize the assessment. In order to improve the efficiency of our work and to adapt the methodology for getting valuable data, our team has made an auto-critical review, analysing the factors of failure and searching for solutions.

We have detected the following weak points in our strategy:

1. Ambitious goal setting:
   Our internal evaluation objectives were too ambitious and not sufficiently realistic regarding the frame conditions of the project.

2. Parallel work:

As a yearly technical audit is realized by the European Commission, there was an overlap of information with the internal evaluation regarding RTD and Demonstration activities.

3. Lack of personal contact to project partners:

As the project has many project partners widespread over Europe, it is impossible to know all partners personally and to register in time every change of stake holder. Therefore, an actualized contact list on the internal project website is very important.

4. Personal discontinuity:

Due to the project lasts five years, there are many changes in the persons in charge. In the questionnaire we ask also for personal objectives. And the questionnaire is designed to be followed during the whole project time from one person or a relatively stable working group. Only they can valuate the progress of the project objectives they have set and defined by themselves.

5. Requirements of the questionnaire:

We have recognised that the questionnaire was too long and too complex to be integrated smoothly in the project work. As it is a relatively new and uncommon method, probably it would have required more detailed information and presentation to the project partners.

6. Valuation of the Internal Project Evaluation:

The Internal Project Evaluation has not been a first priority for the project partners, as they have to contribute with similar information to the technical audit (RTD and Demonstration activities) and to the Concerto project evaluation (technical and socio-technical measures).

Regarding the methodology of internal project monitoring, we have detected the following potentials of improvement:

1. Questionnaire style: The form of the questionnaire must be shorter, easier to understand and to fill out and present less complexity. Few core questions and a multiple-choice style will be more appropriate.
2. Communication channel: We will use E-mail, but also make phone call in case that there is no response to our messages.
3. Content: We will avoid any overlap with technical audit, and focus on community work and socio-economic aspects of the project.
4. Relation between effort and benefit: We have to find the way to minimize additional work and maximize the benefit of evaluation for our partners.

During an internal project meeting in November 2009 in Copenhagen, we have proposed the following modifications in order to improve the efficiency of the project evaluation:

1. Exchange of experiences between communities:
   - The role of the University of Magdeburg is to be a facilitator and multiplier between communities and partners:
     - We collect information and inform regularly in deliverables on activities in the communities.
     - The activities in he communities should be documented and published on the ECO-CITY- website for internal and public use.
     - We will promote the collection and sharing of project material, photos etc. among partners and the public.
     - We will organize a final workshop during the final project meeting, where lessons learnt will be presented and discussed.
2. To improve efficiency of internal project monitoring:
   - Realize a regular follow-up of recent activities (every 3/6) months by phone call and utilizing a small multiple-choice form.
   - Give feed-back to partners about the activities of other communities.

During the same project meeting, the project partners have discussed the following questions:

- How to improve communication between partners without additional effort?
- How to minimize additional tasks and to maximize the impact of activities?
- How to exchange of experiences between communities and to share results and resources?
- What would be an efficient methodology to follow up the work on communities?
- How to use best existing channels, resources etc.?

As result of this discussion, the consortium has decided the following measures regarding the Socio-Economic Monitoring:

- We will search for smart measures in order to optimize the information flow and to minimize the additional effort
- We will apply the following measures in order to exchange experiences between project partners and to disseminate experiences of the project:
- Update the ECO-City website (update the contact list and make a pool of available material, photos, activities),
- Adapt criteria of internal monitoring to requirements of Concerto+ for social monitoring,

- Utilize a template highlight sheet for socio-economic activities, using the same format as for the technical monitoring, including the requirements of Concerto+. The highlight sheet should not exceed two pages. The front page contains basic information; the back page contains background information and lessons learnt. The highlight sheet will contain information about activities, target groups, impact, material, photos, a contact person, etc.
- In order to contribute to the Concerto+ Report on social monitoring in December 2010, we will prepare sheets about especially successful activities.
- Every three months, the University of Magdeburg will contact project partners by E-mail and phone, if there is no answer from partners. We will document recent activities, fill out with the information the highlight sheets and give input to Concerto+ about SE measures.
- We will provide Concerto+ regularly with social monitoring data from the ECO-City project.

2.2 Monitoring of Socio-Economical activities

The SE activities are complementing the technical RTD and demonstration activities in order to involve relevant stakeholders or inhabitants and to increase the acceptance of the implemented measures.
The research about socio-economic activities contributes to the analysis of local trends in energy costs, of prices and savings, of the social and environmental impact of the project, and of the quality and added value of provided energy services. For this purpose, the socio-economic impact assessment evaluates the effects of policies or projects on social and economic conditions in the community or region (retrospective), and prepares local and regional planners and decision makers for changes (positive and negative effects) as result of a specific policy or project (prospective).

The Concerto+ initiative has proposed eight core criteria for the assessment of SE activities:

1. The degree of satisfaction / acceptance of inhabitants, tenants, owners (e.g. by inquiries, involvement in planning processes)
2. The active / proactive households behaviour (by awareness rising activities, campaigns for Rational Use of Energy RUE)
3. The level of information and direct participation (info sessions, discussion rounds, site visits…)
4. The improvement of district environment and internal comfort level (e.g. air quality, pollution, CO2-emmissions, noise, accessibility…)

5. The economic-ecological cost effectiveness (relationship between effort and benefit, ecological impact)
6. The increased control of local energy production and supply (clean E-sources, smart supply systems, short transport ways…)
7. The stimulation of local economy (creation of employment, local investment)
8. The pay-back period (investor side: economic sustainability, financing models)

Beside the eight core indicators of the Concerto+ initiative, SOC-DE has developed its own socio-economic-indicators for the SE project monitoring. They are mostly compatible with the Concerto Plus indicators. The indicator set includes the three classic dimensions of sustainability (environmental, economic and social).

Social sustainability:

- Involvement of end-users and stakeholders in different phases along the project at different levels (information, consultancy, decision making)
- Keeping contact to political decision makers at local and regional level
- Previous studies of the population of end-users in the areas of intervention, in order to know their needs, socio-cultural and socio-economical status, their disposition towards the project and previous knowledge about the issues concerned.
- Preparation of an adapted intervention strategy and accompaniment of the communities
- Evaluation of the social impact of project measures

Environmental sustainability:

- Cooperation with local and regional ecologist groups
- Including environmental parameters in the planning of interventions
- Adopt actions that increase the level of general ecological consciousness of the community
- Evaluation of the environmental impact of the project measures

Economic sustainability:

- Previous studies of socio-economic level of the community and disposition of end-users to contribute to the project costs
- Search for adapted financing models an subsidies

- Interventions in order to increase the acceptance of the project and the willingness to assume an economical compromise
- Evaluation of economical impact of the project in the community

Both sets of criteria were applied in order to assess the SE activities.

From November 2009 on, the Municipalities of the communities involved in the project were asked to fill out the trimester questionnaire form “Socio-economic Project Fact Sheet” (Annex 6). In this fact sheet, the project partners were asked to provide and update information about the following topics:

1. SE core activities: What have been done?
2. Duration: From when to when?
3. Objectives: What was the motivation?
4. Stakeholders: Who was involved?
5. Target groups: Who are participants, recipients?
6. Responsible: Who organised it?
7. Expected benefits: What will be the outcome?
8. Performed activities / issues addressed: Concrete actions?
9. Response: Reaction of the target group?
10. Results: What has been moved?
11. Outcome /materials: What remains and can be shared (fotos…)?
12. Contact person
13. CONCERTO+ indicators: SE impact in the community?
14. Lessons for policies: Successful policies or strategies?

2.2.1 Results

In this chapter, we will present the most significant SE activities carried out during the last years and their impact on the community.

2.2.1.1 Elsinore (Denmark)

Activities:

- From 2007 to 2009, an information campaign to the public was organized in form of a yearly exhibition of 45 days of duration about the project in the main library of Elsinore, where pamphlets about ECO-City and Concerto were distributed.

- In 2009, the same exhibition with a duration of four months in House of Administration for Central Heating of Municipality of Elsinore.
- In 2009, seven meetings about urban planning, environmental issues and the project ECO-City for inhabitants and associations took place.
- From the beginning of the project in 2005 till 2009, yearly information meetings with the Elsinore City Council took place.
- Monitoring of energy consumption on ventilation and lighting in the school (Grydemose skolen) and the new office building (Prøvestenen)

Highlights:

1. Influencing the design and building process of the Cultural Yard in Elsinore

The Project partner COWI has persuaded developers and building owner to use new energy efficient LED light, improved glassing, sea water cooling and Photo Voltaics.

Duration of the accompanying SE measures/activities	During design and projecting of the Cultural Yard
Objectives	Improve the sustainability of the new Cultural Yard
Involved stakeholders	Municipality, COWI and developer
Target group(s)	Decision makers
Organisation(s) responsible for SE research and activities	COWI and Elsinore Municipality
Expected benefits	Saved energy and changed attitudes

From this socio-economic activity, the project partner has drawn the conclusion that it is important to have internal knowledge of the institutional operation of the Municipality to be able to influence and to require the optimal solutions from developer. External expert support, which in this case was provided by ECO-City, has been fundamental.

2. Networking between colleagues in Helsingborg/Elsinore

A network between the counterparts from Elsinore and Helsingborg was created. The municipalities has worked together on a strategic training event, where stakeholders involved in energy efficiency campaigns created a network and started up defining themes and a work procedure for energy savings campaigns towards end-user in the region. A workshop with janitors was realized in cooperation, were input to climate action plans were created. All activities led to an increased consciousness about energy and environmental impacts for the participants.

Duration of the accompanying SE measures/activities	2005-2011
Objectives	Sharing of knowledge
Involved stakeholders	Municipalities, utilities, building associations, etc. of Elsinore and Helsingborg
Target group(s)	The communities of Helsingborg and Elsinore
Organisation(s) responsible for SE research and activities	The Municipalities of Helsingborg and Elsinore
Expected benefits	Lower energy consumption

3. Improving the political and administrative outset for deploying ambitious energy- and climate policies.

During the years of the ECO-City project, the political commitment has increased considerably and in 2009, Elsinore has adopted a climate policy obliging the municipality to cut down CO2 emissions to less than 1 ton per inhabitant by 2030 and to become CO2 neutral in 2050. The municipality is currently working with strict requirements on energy performance for new buildings, installation of Photo Voltaics on municipal buildings and energy saving measures in all public buildings. Administrative resources and capacities were upgraded. A high level of consciousness among the inhabitants about energy savings was attained. Action plans for energy management, buildings, renewable energy, green transportation, shopping and behaviour were adopted. The awareness among politicians about environmental issues was increased.

Duration of the accompanying SE measures/activities	2005-2011
Objectives	To improve the outset for pursuing ambitious climate objectives in Elsinore
Involved stakeholders	The Municipality
Target group(s)	Inhabitants of Elsinore and employees of the Municipality
Organisation(s) responsible for SE research and activities	The Municipality
Expected benefits	Saved energy, reduced CO2 emissions and a healthier environment

Conclusions:

The support provided by the ECO-City project has made a big difference for Elsinore Municipality. First at all it has allowed the Municipality to install a new biomass boiler for a much more sustainable energy supply. It has been such a great success that the utility is planning a second biomass boiler. Moreover, the support has allowed the Municipality to focus more on energy efficiency of its administrative and institutional buildings.

Within the administration, the Municipality has used the project and inspiration from Helsingborg as an outset to develop and adopt an ambitious climate policy.

General Results Elsinore:

- One school is applying energy efficient measures.
- An integrated information campaign (articles in local press, pamphlets, posters, exhibition & working material…) on different levels was carried out.
- The activities have had an widespread impact on numerous participants (exhibition: 1500-2500 visitors/day, information meetings with about 750 participants, the topping out event of the Kulturvaerftet counted 2000 visitors, in several site visits have participated 300-400 visitors).
- Due to the information meetings for political decision makers, the City Council Elsinore has applied for more subsidies for new similar projects.
- The District Heating Department Elsinore has installed the first biomass boiler, the 2nd is planned.

- The Natural Gas Supply Company was convinced to introduce biomass in their original planned supply area.

2.2.1.2 Helsingborg (Sweden)

Highlights

1. Educational meeting with janitors in Elsinore and Helsingborg

The objective of the meeting was to inform local janitors about potentials of energy saving in public buildings. Thirty janitors of both communities have participated in the gathering. The meeting has increased the awareness of the janitors who are now more focused on energy savings.

Duration of the accompanying SE measures/activities	2008
Objectives	Energy savings
Involved stakeholders	Helsingborg Municipality, local janitors, Helsingborgshem
Target group(s)	Janitors
Organisation(s) responsible for SE research and activities	Helsingborgshem and Helsingborg Municipality
Expected benefits	Energy savings and increased awareness

2. Establishment of an Energy Workshop in Helsingborg

The energy workshop was established during the ECO-City project and since than it has been frequented very often. At the workshop, school children are instructed in energy efficiency and energy saving devices by two full time employees. The activities at the workshop are very pedagogical and the contents are presented in a very comprehensive manner, that is easy to understand. The activities include a cycle that generates energy when you spin the pedals and different demonstrations of energy saving products.

Duration of the accompanying SE measures/activities	Ongoing
Objectives	Higher awareness of energy consumption and energy efficiency among school children. Early education about energy issues.
Involved stakeholders	Helsingborg Municipality, Helsingborgshem, Öresundskraft
Target group(s)	Local school children and interested public
Organisation(s) responsible for SE research and activities	Helsingborgshem, Helsingborg Municipality
Expected benefits	Energy savings. Higher awareness of energy consumption and energy savings among children.

3. Preparation of an Energy Strategy Plan for Helsingborg

The Energy Strategy Plan has been presented in a 50 pages report, containing visions for the Municipality and concrete measures to obtain the vision. The plan includes objectives for district heating and cooling, wind power, solar power, biogas production, energy use, energy efficiency etc.

Duration of the accompanying SE measures/activities	Ongoing
Objectives	Helsingborg should become the most attractive city for both inhabitants and companies in Sweden.
Involved stakeholders	Helsingborg Municipality, Helsingborgshem, Öresundskraft
Target group(s)	Actual and future inhabitants of Helsingborg.
Organisation(s) responsible for SE research and activities	Helsingborgshem, Helsingborg Municipality
Expected benefits	Energy savings. Healthier city.

4. New metering system in Helsingborgshem's buildings

A new metering system has been developed and implemented in selected new-built buildings of Helsingborgshem. The system has increased the awareness of the tenants about the energy consumption and led to energy savings. The current energy consumption is clearly visualised on the monitoring screen. Besides energy consumption, the metering system also handles comfort metering, burglar alarm, fire alarm etc. improving the tenant's attention to the monitoring screen. The system has proved to raise the awareness from the consumers, resulting in energy savings.

Duration of the accompanying SE measures/activities	2005-2011
Objectives	Energy savings
Involved stakeholders	Helsingborgshem, tenants
Target group(s)	Tenants of Helsingborgshems buildings
Organisation(s) responsible for SE research and activities	Helsingborgshem
Expected benefits	Energy savings

5. A new energy standard for new-built and refurbished buildings in Helsingborgshem

When the ECO-City project has started in 2005, the standards of Helsingborgshem's new-built and refurbished buildings were very close to minimum requirements regarding energy consumption. Partly driven by the ECO-City project and during the project period, Helsingborgshem has been become aware of the great advantages of low energy buildings and eco-refurbishment. Today several passive house and low energy building neighbourhoods has been erected in the ECO-City area of Helsingborg which has improved the life quality of hundreds or even thousands of inhabitants in the social dwellings of Helsingborg.

Duration of the accompanying SE measures/activities	2005-2011
Objectives	Higher comfort and life quality of tenants. Reduced energy consumption.
Involved stakeholders	Helsingborgshem, tenants, Helsingborg Municipality
Target group(s)	The inhabitants in Helsingborgshem's buildings
Organisation(s) responsible for SE research and activities	
Expected benefits	Lower energy consumption and higher involvement of inhabitants in the common objective of energy saving.

2.2.1.3 Trondheim (Norway)

Activities:


Photo 1: City of Trondheim

- Since 2007, an Awareness rising campaign in schools was realized in form of an energy module for elementary schools. In the framework of this activity were organised competitions between schools, a website and leaflets inform about the activity and E-consumption monitoring was implemented. Since 2008, the energy module was adapted for and applied in kindergartens.
- An Environmental light-house certification procedure was established for local SME. The Municipality installed a new procurement for its suppliers that have to be all certified.
- About the project progress was informed in local media (press).
- Information activities for local politicians were carried out, e.g. meetings and site visits to Nardo School.
- Till 2009, the Municipality of Trondheim maintained a political committee on climate change.
- Information events for general public, professionals and the private sector were organised, e.g. a brochure, conferences and opening ceremonies.
- A new Municipal Energy- and Climate Action Plan has been adopted by the City Council on June 2010:

- Concrete measures to reduce energy consumption and emission of greenhouse gases
- All new Municipality buildings have to be “low-energy-buildings” (approx. 25% lower energy use than national standard)
- Number of municipal “passive houses” should increase
- 4-page presentation of the new municipal energy- and climate action plan in the local newspaper on 20th of April
- Internal seminar for 70 employees of the Municipality about energy use in buildings

- Energy Module for schools and kindergartens continuing
- 5th NewsIetter for involved schools in April 2010
- Need for teaching and activity material regarding energy use that can be used in kindergartens
- Economic support from Ministry of Environment for developing such material (to be ready in 2011)

Highlights:

1. Recruit and certify SMEs according to the Eco-Lighthouse program

Small-and-medium enterprises (SMEs) were recruited and certified according to the Eco-Lighthouse program (“Miljøfyrtårn” in Norwegian).

Photos: Carl-Erik Erikson

Miljøfyrtårn®

Figure: Logo of the Certificate

Duration of the accompanying SE measures/activities	Since 2003
Objectives	a) Recruit SMEs to start the process to become environmental certified according to the Eco-Lighthouse program. The process of becoming certified normally takes between 2 and 6 months for an SME b) The actual certification of the SMEs (The Municipality has the authority do carry out the actual certification)
Involved stakeholders	- Department of Environment, Municipality of Trondheim - The National Environmental Lighthouse office in Kristiansand - Private consultants that are trained to assist SMEs in the certification process - Cities of the Future-program
Target group(s)	- SMEs in Trondheim
Organisation(s) responsible for SE research and activities	Municipality of Trondheim (Department of Environment)
Expected benefits	- Improved environmental performance of the SMEs (for example reduced energy consumption, reduced/better waste systems) - Improved competitiveness for those SMEs that are certified

2. Installing individual metering of energy consumption in block dwellings and information measures in this regard

Photos: Ustmyra borettslag (Hans-Einar Lundli)

Duration of the accompanying SE measures	Since 2008
Core activities	"Ustmyra borettslag" in Trondheim consists of block dwellings and row houses from the construction year 1978 (188 units). The dwellings and row houses were rehabilitated in 2008, decreasing the annual energy consumption from 270kWh/m2 to 150-160kWh/m2. In addition intelligent metering for heat and hot water consumption has been installed in all 188 units. Previously the energy bill for each unit depended on its size in square meters and the total energy consumption for the whole "Ustmyra borettslag". After the intelligent metering system was installed, the energy bill for a unit is based on its actual energy consumption. In addition to the technical installations, information measures for the residents have been adopted and implemented.
Objectives	- Develop and implement a relatively new type of individual metering technology - The installation of individual metering is expected to set down the energy consumption by 10% (this comes in addition to the reduction in energy

	consumption due to the rehabilitation of the dwellings) - Inform the residents about possible measures to reduce their own energy consumption
Involved stakeholders	- "Ustmyra borettslag", which is a housing company that is part of TOBB (see below). - TOBB ("Trondheim og omegn boligbyggelag"). TOBB is a cooperative , owned by well 45.000 members who are tasked to build and manage housing for their members - Istad – the private company that owns the metering technology that has been installed at Ustmyra borettslag - Trondheim Energi – the energy company that delivers district heating to Ustmyra borettslag
Target group(s)	- The residents of "Ustmyra borettslag" - Other housing companies in Trondheim (and elsewhere)which have a similar potential to install individual metering
Responsible for SE activities	- Ustmyra borettslag and TOBB
Expected benefits	- Reduced energy consumption since energy bills are to be based on actual energy consumption instead of square meter

3. Awareness Campaign in Schools and Kindergartens ("Strømsparegrisen")

Figure: Symbols of campaigns in schools and kindergartens

SE core activities:	An energy module called "Strømsparegrisen" for schools, later on extended to kindergartens."Strømsparegrisen" = Electricity Saving Piggy Bank.
Duration	The module was developed and launched in the school year 2005/2006. Since 2008 an energy module for kindergartens also has been running.

Objectives	a) Raise the awareness among pupils regarding the importance of energy efficiency b) Reduction in energy consumption at the involved schools c) Pupils trained in energy issues will hopefully also influence energy consumption at home
Stakeholders	- Energy and environmental advisors at the Municipality of Trondheim - Teachers (both a stakeholder and a target group!) - The national energy agency in Norway (Enova). - The energy company “Trondheim Energi” (also partner in Eco-City) contributing with teaching material - To some degree also janitors at the involved schools. - A project called Trondheim SmartCity launced in autumn 2009. A collaboration project between Siemens, the Municipality of Trondheim and an environmental organization called Bellona.
Target groups	Pupils and teachers at the involved schools. Children and employees in kindergartens
Responsible	The program has been developed and implemented by two departments of the Municipality –*Trondheim eiendom* (the department responsible for all municipality buildings, including energy efficiency) and *Miljøenheten* (the department of Environment). Trondheim eiendom is the project leader and having the main responsibility for the program. However, Miljøenheten is also an important actor since the energy module is integrated in to a more broader environmental program towards schools called Grønn Barneby (“Green City for Children”).
Expected benefits	- Increased knowledge and awareness among pupils and teachers regarding the importance of energy efficiency.

Photos: Hans-Einar Lundli

Results:

- In 2008/09 have participated 21 of 53 public schools in the awareness raising campaign. This intense participation has led to an increased awareness and reduced consumption of energy.
- In 2008/09, 31 kindergartens have applied the energy module. There is a higher demand than the number of available places.
- Nowadays, 124 SME in Trondheim have finalised the certification procedure and are Environmental light-house certificated. There is a boom of certifications since 2007, when the Municipality established the new procurement.
- Nice local politicians from the Committee of climate change were informed about technical solutions and energy efficiency in buildings. They have pushed for stricter energy standards for public buildings. The Municipal Climate Action Plan will be revised in February 2010.
- Some pupils of Nardo School were trained as energy guides for visitors of the school. The site visits were combined with a school intern development project for Africa: Visitors can get a meal and the incomes of this will go to the development project.
- The outcome of the diverse activities is a brochure, articles, a website for Nardo School etc.
- Policy instruments supporting CONCERTO project are very effective
- Project's objectives mostly overachieved
- Good political commitment from early beginning
- Integrated climate and energy plans existing
- Good mix of stakeholders, strong working group committee
- Important soft measures supporting the successful realization of the project (see examples)

Conclusions:

When the Eco-City project started in 2005, the energy and climate issue was relatively low on the political agenda. Similarly, both private companies and public bodies did not focus

much on for example energy use in buildings. This picture has totally changed since 2005. The Eco-City-project and its stakeholders have contributed to this development. In the first part of the project period both private and public actors (like the Municipality of Trondheim) have been reluctant regarding what is possible to achieve regarding energy use in new buildings. The attitude has changed substantially in the period. The actual construction of low energy houses/offices has demonstrated that it is possible at a reasonable cost.

However, the low energy price in Norway (compared to other countries) is still a substantial barrier to the implementation of measures to further reduce energy consumption in Norway.

2.2.1.4 Tudela (Spain)

The situation of this community during the project was especially complex. As we focussed our monitoring activities on this community, we would like to present the challenges and solutions and the specific participation strategy more in detail:

The project situation

The project presented here has shown its complexity through several temporal, personal, political and administrative divergences at different moments and levels.

National level: The international economic crisis with its climax in 2008 led to an implosion of an enormous speculation bubble of the Spanish construction sector (Ruiz 2010, Eichhorn & Solte 2009). The criteria of economic sustainability of buildings changed drastically as the market for new constructions excepted social housing broke down. The focus of the construction sector shifted to refurbishment projects. Obviously, the original project goal, the new construction of a complete quarter with a luxury apartment complex and golf course out of town, became obsolete.

Regional level: Meanwhile the Department of Industry of the regional Government was a formal, but not committed member of the project consortium, the Department of Urbanism of the same Government stopped after three years of preparation the mentioned project version considered as unsustainable.

Local level: Due to administrative and political reasons, the Municipality changed the complete project and its location two times. The second version, mentioned above, was considered an elitist goal and a speculation with public ground; it raised many polemics at local level by the political opposition, but also among ecologists and citizens.

Project level: The only very committed person of the Municipality in charge of the project retired and during 11 months of vacancy, there was nobody being responsible of the project. Because of these changes and stagnation during long periods, other project partners partly lost their trust in the project and their motivation to cooperate; they disconnected or left the consortium.

This was the panorama of the project two years ago. After, the situation has changed very positively with the adoption of more sustainable project goals (construction of social housings, refurbishment of an old quarter inside the town) and the introduction of a new project partner, in charge of the refurbishment and responsible for the community involvement. Since than, the project is finally progressing towards the attainment of the original project goal: an energy sustainable city by the reduction of emissions and the promotion of renewable energy sources and the rational use of energy.

The project community

The area assigned for the refurbishment project is a quarter situated closed to the centre of the town.

This quarter was built in two decades from the 1950ties to the 1970ties in order to meet the high demand of low-cost housing, due to the strong immigration flow from rural areas to the town. The quarter counts with a total of 2000 apartments and 8600 inhabitants, representing almost the fourth part of the whole population of the town.

Photo: Buildings before refurbishment

The popular quarter counts with a high percentage of retired people, workers, many of them unemployed, and families with a migration background. The socio-economic and socio-cultural level of the inhabitants is medium-low. As local stakeholders told us, the formerly existent strong social cohesion and the participation in community activities were decreasing in the last decades.

There can be observed a fluctuation process from original inhabitants to other parts of the town, and a concentration of families with a lower income level as leasers of the flats.

The project includes the complete renovation of a central heating system, including the installation of a biomass boiler, for a total of 486 apartments distributed in 30 buildings.

A total of eight buildings with 122 apartments will participate in the refurbishment of the thermal isolation, including facades, roofs and windows. The dwellings, of seven, four or two floors, were built in the 50ties, 60ties and 70ties. The substance of all buildings of the quarter is generally poor due to the age of buildings and the low quality of employed materials. They present very low energy efficiency values, requiring an integrated refurbishment. As the average income level of the inhabitants of the quarter is low, there are subsidies and external funding needed. Therefore, the European project was a great opportunity for the quarter to start the refurbishment improving the energy efficiency of a total of 564 apartments, more than 25% of the quarter.

The participation strategy

After the selection of the quarter, the Municipality has subcontracted a Government-associated consultancy agency for the coordination of the refurbishment project. This company, expert of social refurbishment, is in charge of all practical aspects of the project, like civil works, subsidies, contracting of companies, but also responsible for the involvement of the end-users. For this purpose, a cooperative of social initiatives, expert in participation processes has been engaged. These two entities together built an interdisciplinary team, composed by two architects, one technical architect and one social worker. The team opened a project office for the public in the centre of the quarter and started with its participation plan that will be described in detail.

Figure: Logo of refurbishment project

The inhabitants, potential beneficiaries of the project, were approached progressively. There were carried out general dissemination activities, like a conference about refurbishment and presentations of the project to local associations of different collectives, like women and retired people.

At the beginning, the objective of the activities was to catch the attention of the neighbourhood, to get closed to them and create links; at the same time realizing an integrated diagnosis of the current situation. Therefore, a very creative method has been applied: the team members started placing posters with a symbol, but without any explanation in unusual locations around the quarter. Five days later, a second poster type with the same symbol and the question “Who has the elixir of youth?” was placed.

Figure: Posters of initial campaign

In parallel, neighbours were asked about their opinion regarding to the posters and their opinions were recorded with a video camcorder. A first video was produced and all neighbours were invited to the inauguration of the office where the video was presented to the public. More than 150 persons assisted, exceeding the capacity of space in the office.

PLAZA NUEVA, 12 de mayo de 2010

Lourdes Renove: ahorro, participación y rehabilitación

El pasado 8 de marzo se abrió una oficina de información para atender a los vecinos del barrio de Lourdes

Informar y canalizar las sugerencias de los vecinos de la zona. Esa es la labor de la Oficina Lourdes Renove que, ubicada en la calle Bonifacio Olleta nº2, se encuentra abierta al público, desde el pasado 8 de marzo, en horario de 10 a 14 horas, de lunes a viernes. Por la tarde sólo con cita previa.

Ana Beltaña, arquitecta técnica de Nasursa, empresa pública que presentó el citado proyecto de rehabilitación al Ayuntamiento tudelano, indicaba que han sido numerosas las personas que se han acercado a interesarse por las mejoras de ahorro energético que podrían realizarse en sus edificios y qué tipo de ayudas recibirían. "El problema es que vienen tres o cuatro de una comunidad y tenemos que ir trabajando con el resto de vecinos del inmueble", apuntaba Beltaña. Y es que, las acciones del Lourdes Renove están dirigidas a la renovación de todas las zonas comunes: fachada y cubiertas, cerramientos, instalaciones generales (abastecimiento de agua, red eléctrica y de saneamiento) "además de poner ascensor por el tema de la accesibilidad", añadía Beltaña. "Queremos actuar en viviendas colectivas donde es difícil movilizar a la gente y ponerles de acuerdo para llevar a cabo la rehabilitación". El objetivo es mejorar las condiciones de vida de sus ocupantes y mejorar la composición estética de las fachadas y la apariencia del barrio.

Por su parte, el Consistorio está realizando las tramitaciones necesarias para declarar el ámbito del Proyecto Lourdes Renove como zona de Interés Municipal, apoyada con la redacción y tramitación de una ordenanza de Ayudas a las Obras de Rehabilitación, similar a la existente en el casco antiguo, pero con la peculiaridad de que contendrá una serie de ayudas extraordinarias a situaciones de mayor dificultad.

Concursos

A finales del mes de mayo está previsto que se convoquen cuatro concursos de arquitectura, uno por cada una de las tipologías en las que se han dividido los inmuebles del barrio de Lourdes. Los ganadores serán ofrecidos a las comunidades de vecinos y los gastos de redacción de los primeros proyectos que se soliciten correrán a cargo del Ayuntamiento. "De esta forma se premiará a aquellas comunidades que alcancen un mayor consenso a la hora de acometer las obras. Además, cuando estén los proyectos seleccionados ya podremos aplicar los porcentajes de ayudas con costes reales porque con estimaciones no se puede movilizar a una comunidad de vecinos", indicaba Beltaña.

Juan Mª Hidalgo, Mar Castillo, Ana Beltaña y Laura Rayo son los cuatro trabajadores de la oficina Lourdes-Renove instalada en la calle Bonifacio Olleta.

In parallel, neighbours were asked to provide photos of the quarter in order to prepare a photo exposition about the past and the future of the quarter in the office. During the market day, the team participated with a desk and neighbours of all ages were invited to express their desires and ideas about what aspects to maintain and what to change in the quarter. The collection of these glimpses was presented to the Municipality.

In parallel, the technical analysis of the buildings started and representatives of each neighbourhood community were interviewed in order to know the social situation of the community, existent conflicts between neighbours, etc.

Figure: The office Lourdes Renove in the quarter

All inhabitants were invited to an excursion to another town, where a similar refurbishment project has been finalized recently. Participants of this trip have had the opportunity to see the possible results of the project and to exchange with the neighbours of this quarter.

Photos: Visit of other refurbishment area, consultations of neighbours

During the whole project, neighbours were informed about the progress and other related topics by an information bulletin and by a blog at internet.

Photos: Meetings with neighbours and associations

In a second step, neighbourhood communities were invited to apply for the project. Finally, 30 communities participated in the renovation of its central heating system and eight communities in the refurbishment of the thermal isolation structure. From this stage on, the activities were concentrated on the members of the participating neighbourhood communities. The total of 486 flat-owners, belonging to the district heating community were invited to participate in various information meetings of about 30 participants each, where the project, its technical and financial aspects were discussed. Each owner has to vote and with a majority of about 80% (necessary minimum 60%) of favourable votes, the realization of the project was decided. There was no possibility for them to influence in the design of the project. In order to assure the transparency of the implementation process, a follow-up committee with a representative of each community was funded that holds regular meetings with the technical staff of the project, so that each community is well-informed about the progress.

With each of the eight neighbourhood communities were held an individual information meeting. The neighbours were invited to the presentation of the proposals to the architecture competition and to discuss about the different options. Due to their concerns, a second call for proposals was launched and finally, acceptable options were chosen. The team did not only search for subsidies and sustainable financing models, but also gave individualized assistance to the neighbours to apply for the credits and subsidies and took over the administrative work.

During the implementation phase, the office team was the interlocutor between the neighbours and the technical staff; they received complaints, transmitted information and solved emerging problems and conflicts.

In a final stage of the project, a second video project was realized: neighbours were approached in the street with a video camera and asked about their opinions, how the quarter is changing. The presentation of this second video was embedded in a debate about the present and the future of the quarter, organized from the office, where all neighbours were invited to participate.

Further Activities:

- In 2006 and 2007 were carried out two field studies in La Azucarera as a reference sample for future ECO-city. People were asked about:
  - Knowledge about RUE & RES
  - Knowledge project Eco-City
  - Interest in participate in community activities
  - Habits in daily life regarding energy saving.

  The objectives were to show tendencies and to evaluate the impact of awareness rising campaigns.
- In 2009 and 2011 took place two inquiries in Lourdes among potential participants, participants and no participants of the refurbishment project, asking them about:
  - Interest in ecological topics
  - Habits in daily life regarding energy saving and responsible consumption
  - Interest in eco-buildings
  - Interest in participating in project

  The objectives of the inquiry were:
  - to elaborate a socio-economic profile
  - to wake up and evaluate interest in participating in refurbishment project
  - to get data for adapted information and argumentation strategies

- In 2007 were organised four workshop sessions for general public with the title "Sustainable Tudela" with the following contents:
  - The urban design concept of the new eco-city
  - CO2-emissions and the ecological foot-print
  - Renewable Energy Sources
  - Rational Use of Energy

  Objectives of the activity were:
  - Awareness raising about sustainability
  - Information about project ECO-City
  - Promote exchange between citizens and experts

For 2008, a second cycle of workshops "Sustainable Tudela" with the following topics were planned and prepared, but not realized yet:

- Rational use of drinking water
- Sustainable transport
- Recycling of domestic waste
- Responsible consumption

- In November 2007, CENIFER has organized two information sessions about environment and housing:
  - Sustainable urban planning
  - Sustainability, energy and housing: basic notions
- In November and December 2007, the Municipality of Tudela has organised two citizens' participation workshops about the Local Agenda 21 and two information workshops about Sustainable Urban Mobility Plan in Tudela (PMUS) in October 2007 and June 2008.
- In November 2006, the Municipality of Tudela has organised a Congress of Sustainable Cities SUCIC for professionals and public with 150 participants and 22 presentations.
- As side effect of the project ECO-City, the Municipality has promoted the following activities in the framework of the Local Agenda 21:
  - In November 2009, discussion rounds with citizens about the distribution of the Municipality participation budget were realized.
  - An Energy Plan for public schools and city hall was adopted in 2008. In the framework of this plan, awareness raising workshops for pupils were carried out.
- In 2008, a Plan for Sustainable Urban Transport (PMUS) were prepared by the Municipality:
  - In 2008, an inquiry between inhabitants about their transport habits was realized.
  - In 2009, a campaign promoting the public transport by busses in the town was carried out.

Highlights:

1. Dissemination and awareness rising among neighbours and stakeholders

The project office Lourdes Renove was inaugurated and has introduced the idea of the project in the quarter. The four fulltime employees were in contact with neighbours in order to understand their needs and doubts. In specific activities they raised awareness about the importance of energy efficiency.

Duration of the accompanying SE measures/activities	January 2010 – October 2011
Objectives	- The office in the quarter in order to work with the neighbours, responding to their questions and doubts - Present the Project to the public by site visits, information meetings and direct contact with neighbours - Study questions about energy efficiency and refurbishment
Involved stakeholders	- Public relations and general dissemination: Navarra de Suelo Residencial, S.A, NASURSA. - Participation plan: Kamira S. Coop. - - Dissemination of energy efficieny: CENÍFER.
Target group(s)	- Potential end-users - Technicians, professionals, administrators
Organisation(s) responsible for SE research and activities	Navarra de Suelo Residencial, S.A, NASURSA.
Expected benefits	- Rising of users' awareness about energy efficiency in their homes - Transform doubts of neighbours into improvements of the Project - Wake up professionals' interest in the project

2. Search for subsidies

As the participants of the refurbishment project are not able to afford the total cost of the project, possibilities for getting subsidies from the National Energy Institute IDEA and Innovation Department of the Government of Navarra were searched. In parallel, the office has contacted banks in order to obtain credits with favourable conditions to elaborate an adapted financing model.

Duration of the accompanying SE measures/activities	March to June 2010
Objectives	Search for external funds in order to support economically the refurbishment.
Involved stakeholders	Navarra de Suelo Residencia, S.A, NASURSA.
Target group(s)	Potential end-users
Organisation(s) responsible for SE research and activities	Navarra de Suelo Residencia, S.A, NASURSA.
Expected benefits	To obtain a maximum of tenant communities interested in participate in the refurbishment Project

3. Monitoring

In 12 apartments included in the Project Lourdes Renove were installed meters in order to know the temperature.

Duration of the accompanying SE measures/activities	March 2010
Objectives	To know the internal temperature of the apartments
Involved stakeholders	Technicians of Navarra de Suelo Residencia, S.A, NASURSA.
Target group(s)	Potential end-users
Responsible for SE research	Navarra de Suelo Residencia, S.A, NASURSA.
Expected benefits	To know the minimum and the maximum temperatures of the apartments as preparation of the civil works and the measures for energy efficiency.

4. Renovation of the heating system

In order to introduce RES the supply system of the Association San Juan Bautista, the current situation of the heating systems was investigated.

Duration of the accompanying SE measures/activities	February - June 2010
Objectives	- To know the current situation of the heating system - To know the needs of the users and include them in the new design - To detect needs of the installation - To search for technical advice regarding RES
Involved stakeholders	Technicians of Navarra de Suelo Residencia, S.A, NASURSA.
Target group(s)	Potential end-users. Association San Juan Bautista.
Organisation(s) responsible for SE research and activities	Navarra de Suelo Residencia, S.A, NASURSA.
Expected benefits	- Solve existing problems of heating system - Improve the energy efficiency of the system by introduction of RES

5. Energy Refurbishment of the dwellings

The original architecture plans were collected and scanned. Technical inspections to the dwellings took place, where architecture projects and real constructions were compared and the plans were corrected as built. Finally, the call for tender for architecture works (refurbishment of isolation, installations, accessibility) was prepared.

Duration of the accompanying SE measures/activities	January 2010-June 2010
Objectives	- To prepare the call for tenders.

Involved stakeholders	Technicians of Navarra de Suelo Residencia, S.A, NASURSA.
Target group(s)	Potential end-users
Organisation(s) responsible for SE research and activities	Navarra de Suelo Residencia, S.A, NASURSA.
Expected benefits	- To know the current state of the dwellings. - To prepare the call for tenders for participating enterprises

3. External Monitoring

The operational objectives for the External Project Monitoring (Community Monitoring) are the following:

- Analysis of baseline situation (Need analysis and inquiry of expectations of future users) at the beginning of the project
- Accompaniment of the communities during the project implementation (Social Design approach: consultancy and social interventions)
- Final study after finishing demonstration activities: Result evaluation (community impact assessment, analysis of acceptance of RES and RUE, assessment of community involvement)
- Comparison between communities
- Facilitation of exchange of experiences between communities
- Dissemination of examples of best practice and lessons learnt

We focussed our external monitoring activities on the community of Tudela (Spain), were four field studies were carried out (2006, 2007, 2009, 2011). The results of these four studies will be presented briefly in the following chapters.

3.1 Inquiry among inhabitants of the quarter of Azucera 2006

The field study in the quarter La Azucarera at Tudela (Navarra, Spain) which took place from March, 17 to March, 31 of 2006. The investigation was planned and realized by the work group Environmental Psychology of the Otto von Guericke University of Magdeburg, Germany, headed by Prof. Petra Schweizer-Ries. In this occasion, the University of Magdeburg cooperated for the first time with the Master on Environmental Intervention: People, Society and Management of the University of Barcelona, under direction of Prof.

Enric Pol. The master students were involved in the development of the questionnaire, in the data collection, data analysis and presentation of preliminary results to the Municipality of Tudela.

Goal of the field study was to analyse the baseline situation in Tudela before the implementation activities in the framework of the project ECO-City have been initiated. Therefore, the knowledge and consciousness regarding issues of RES and RUE of a determined group of inhabitants of Tudela have been studied. Their needs as representatives of future users have been analysed. In concrete, the study has dealt with the following topics:

- Knowledge of Renewable Energy Sources
- Use of Renewable Energy Sources
- Knowledge about and behaviour regarding Energy Saving
- Interest in an Energy Controlling System
- Knowledge about Energy Sustainable Communities
- Attitude towards the town and the quarter
- Knowledge of the project ECO-City
- Interest in Community Participation

As the future inhabitants of the ECO-city are still unknown, the inhabitants of the quarter La Azucarera have been interviewed in their representation. La Azucarera has been chosen as comparative sample because the quarter and it's population presents similar characteristics like the future ECO-city is supposed to possess: The quarter of La Azucarera, a clearly defined separate urban area, has been planned and built within the last 17 years. The population is composed mainly by young families with a medium or medium-high socio-economical level.

During the field study, the following activities have been realized:

- The quarter has been visited by the investigation team. The different types of houses have been classified and documented in a photographical dossier.
- The documentation about the Planning and Construction of the quarter La Azucarera, available in the Municipality Archive, has been seen.
- Several meetings with the political and administrative responsible for the project ECO-city in the Municipality took place.

- A press conference has been organized by the Municipality in order to inform the population of La Azucarera about the imminent investigation n in order to ask them for their collaboration.
- A semi standardized questionnaire for the inhabitants have been developed, tested and applied in the field.
- A conversation with representatives of a local enterprise of RES has been held.

I. The quarter under survey

The quarter La Azucarera is a compound which connects the town centre of Tudela with the river Ebro over a surface total of 215 ha. 177 ha are covered with constructions; the maximum amount of housing units is 650; some buildings are still under construction. The number of inhabitants is estimated in 2275, with an average of 3.5 habitants per housing unit. La Azucarera has a low population density, with a great number of single family houses and the maximum of 5 plants per building. There are high standing single family houses, medium sized single houses, row houses and multi family buildings. 25 ha of the surface are streets, 7 ha for sportive installations and 5 ha for green areas. La Azucarera counts with few pubic installations, among them one pharmacy and one coffee shop. There is no public transport available between the quarter and the town centre due to the short distance. The electricity is provided by the utility IBERDROLA. Few buildings are provided wt solar thermo-collectors for warm water.

II. The Sample

118 valid questionnaires have been included in the data analysis.
58% of the surveyed persons have been men, 42% women.
The average age of the participants is 43 years.
46.2% of the surveyed persons said to have finished or to study at a higher education level (bachelor).

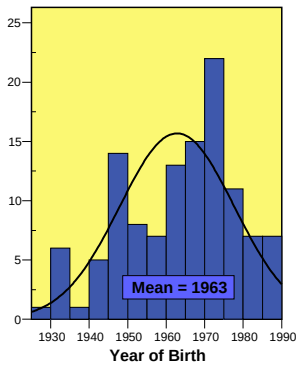


Figure 1: Age of surveyed persons

III. Housing situation

The participants live in the following type of house:

- N=57 (49.1%) multiple family building
- N=35 (26.7%) row house
- N=23 (19.8%) single family house
- N=4 (3.4%) high standard row house
- N=1 (0.9%) high standard single family house

Half of the surveyed persons (49.6%) lives without children in their household, 62.4% of the surveyed persons live with one other adult in household, most of them will be probably couples. We have no information, which percentage of them has no children or adult yet independent children.

IV. Knowledge RES

90.7 % have heard of RES, but 90.6% have affirmed not to use them as source of their electricity.

Solar energy has been the best known source of renewable energies; 99 persons mentioned it. Although wind turbines are easily visible around Tudela, only 86 persons mentioned wind energy. In addition, 8 people know bio mass and 8 people know hydro power.

Asked to estimate the balance between consumed electricity and electricity produced by RES in Navarra, only 15% answered correct (100%), and 85% sub estimated the quantity. More than two third parts estimated the balance even around or below 50%.

V. Use of RES

90.6% affirmed no to use RES (N=107). Asked for reasons why they are not using RES, they answered the following:

- “I have no choice.” (N=65; 61%)
- “I have not thought about it.” (N=17; 16%)
- “It is too expensive.” (N=15; 14%)

The minority of about 10% who affirmed to use RES, added the following reasons for using it:

- “It protects the environment.” (N=5)
- “It is cheaper.” (N=4)
- “Navarra provides it.” (N=2)

Many people have heard of RES, but they have no specific knowledge.

They think that they have no choice to use RES.

No use RES because they have no choice or because it is expensive.

There is little knowledge or confusion between concepts (gas, electricity, etc.).

VI. Energy Saving

For 85% of the surveyed persons it is important or very important to save energy. Asked for their most important reason for saving energy, about the half (50.9%) underlined the economical aspect (It saves money.), and almost the other half (45.7%) affirmed the importance of the ecological aspect (It protects the environment.). Only for 3.4%, the social aspect has been decisive (My neighbour is also doing it.).

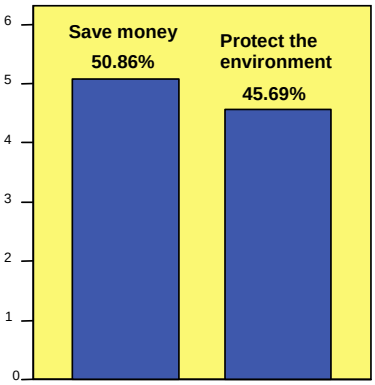


Figure: Main reason for saving energy

Nevertheless, their behaviour doesn't reflect this high grade of consciousness; there is a gap between consideration of importance and concrete habits:

- 52% don't shut down the TV completely.
- 68% don't use energy efficient devices in their households.
- 72.4% don't use the public transport.
- 73.3% don't use multiple use bags instead of plastic bags.

- The first reason for energy saving is saving money
- The energy saving device must be very easy to handle
- It is important for them to save energy, but lacks information about it and people don't do so much for save energy
- Consciousness about energy saving because of economical reasons
- They wish to have an device which helps to save energy and in consequence, saves money, but not because of ecological reasons
- The device must be simple, automatic, no expensive, inform about the monthly consumption
- People don't want to be involved too much, no extra effort for RUE
- They wish to get information by e-mail or by letter

VII. Energy Sustainable Communities

47% of the surveyed persons have heard about Energy Sustainable Communities (ESC). 89% wish Tudela to become an ESC.

VIII. Living in Tudela

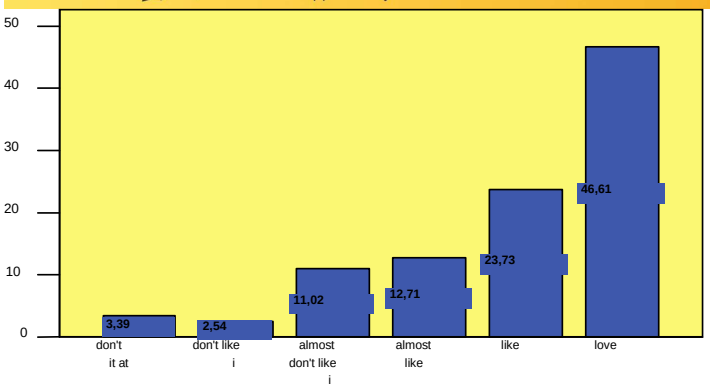
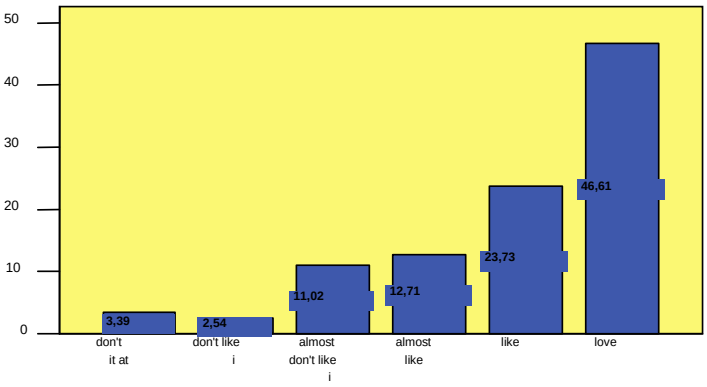


Figure: Do you like to live in Tudela (above) / La Azucarera (below)?



81,6% of the interviewees would like to live in an eco-building.

45,8% doesn't believe that Tudela promotes the use of RES.

46,6% doesn't believe that Tudela promotes the use of RUE.

50% doesn't believe that Tudela is aware about energy issues.

79,6% doesn't believe that Tudela has an ecological image.

Till the moment, interviewees are sceptical about the efforts of the Municipality of Tudela regarding the promotion of RES and RUE. There is a lack of information and little knowledge about ESC, but also a high interest in living in an ESC

IX. ECO-City

- 70,7% don't know the project ECO-CITY.
- 74,6% think that ECO-CITY increase Tudela's attractiveness (12,7% don't know).

The project is not very well known. People wish to live in an eco-building but only if it doesn't cost too much; they prefer to stay in their apartments and to make the improvements there, because they live short time in La Azucarera. People showed Interest in the project, they think it could make Tudela more attractive.

- Interest in living in a eco-building, but the problem is the price
- There was a polemic point if it is a kind of speculation

X. Community Participation

- 25% are involved actively in community activities.
- 73% did not perceive Municipality campaigns for RUE and RES.
- 61% want to participate in urban planning processes.

5) Participation

People showed little interest in participation. Two thired parts showed interest in participate in the urban planning processes.

XI. Concl

Although the great majority of surveyed persons have heard about renewable energy sources, very few of them are using them conscientiously. The green tariff for electricity is not an attractive alternative for them, because or they don't know about its existence, or because it is more expensive than the normal tariff and because in Navarra is produced a great percentage of electricity by wind turbines, so people know that probably they are using RES without paying a higher price than the normal tariff.

XII. Recommendations

- The Municipality should promote the adaptation of housings to ecological requirements and facilitate the financial support to the inhabitants (tax deductions, incentives)
- Education for the younger generations, a long term work for the future
- The manner to inform the population was not successful; the municipality should find other ways, e.g. information point, letters, posters in central public places
- The information must be easy and accessible; maybe in the street is the good way
- The eco-city will be well accepted, because people was interested and accepted the idea even without having the information about the project
- Tudela must make use of the project, of its prestige, to increase the participation of the population in the whole town, to educate the population about environmental issues, for tourism
- The Municiality should make use of the condition, that the population of La Azucarera has the information, the interest and the economical possibilities in order to promote eco-buildings
- If there was any campaign of the Municipality it was not successful. The people got no concrete information from the Municipality but the Municipality can make use of this "market"
- The activities of the Municipality should b developed in the framework of the Agenda 21
- The environmental education should be considered as a positive value

- The social participation can contribute to the environmental development nd to the social wellbeing
- If the citizens participle in the urban planning, they feel more committed
- There re two aspects of information an education: the long term education for the children in the school and the short term concrete information for the actual projects for adults

3.2 Inquiry among inhabitants of the quarter of Azucera 2007

The follow-up-study in the quarter La Azucarera at Tudela (Navarra, Spain) took place from March, 1st to March, 08 of 2007. The investigation was planned and realized by the work group Environmental Psychology of the Otto von Guericke University of Magdeburg, Germany, headed by Prof. Petra Schweizer-Ries. In this occasion, the University of Magdeburg cooperated for the second time with the Master on Environmental Intervention: People, Society and Management of the University of Barcelona, under direction of Prof. Enric Pol. The master students were involved in the development of the questionnaire, in the data collection, data analysis and presentation of preliminary results to the Municipality of Tudela.

During the preparation and realization of the study, the investigation team cooperated closely with the Municipality of Tudela, mainly with Mr. Luis Eduardo Gil, Director of Industrial Promotion.

Goal of the study was to analyse the actual situation in Tudela after one year of execution of the project ECO-City and to examine the changes regarding the knowledge and consciousness regarding issues of RES and RUE of inhabitants of Tudela during the last year.

The study has had the following objectives:

- Continuation of the social support of the Municipality of Tudela.
- Establishment of cooperation with the involved architects.
- Application of a second version of the questionnaire to a minimum of 100 inhabitants of La Azucarera.
- Study of changes and progress in the project ECO-City during the last year.
- Understanding of the urban planning concept and its implications.
- Exchange of ideas between Universities and project partners.
- Development of strategies for identification and invitation of potential future inhabitants of the eco-city.
- Promotion of citizen participation in a discussion forum about the urban planning concept.
- Elaboration of recommendations for the Municipality of Tudela.

As the future inhabitants of the future ECO-city are still unknown, the inhabitants of the quarter La Azucarera have been interviewed in their representation. La Azucarera has been chosen as comparative sample because the quarter and it's population presents similar characteristics like the future ECO-city is supposed to posses.

s: The quarter of La Azucarera, a clearly defined separate urban area, has been planned and built within the last 17 years. Mainly young families with a medium or medium-high socio-economical level compose the population.

The interviewees were asked about the following topics:

- Knowledge of Renewable Energy Sources
- Use of Renewable Energy Sources
- Knowledge about and behaviour regarding Energy Saving
- Knowledge about Energy Sustainable Communities
- Attitude towards the town and the quarter
- Knowledge of the project ECO-City
- Interest in Community Participation

As well as in the first study, we have chosen a mixed methodological design, including qualitative and quantitative elements:

- The investigation team has visited the quarter and have had conversations with locals.
- Several meetings with the political and administrative responsible for the project ECO-city in the Municipality took place.
- A semi-standardized questionnaire for the inhabitants have been developed, tested and applied in the field.
- The investigators have had individual and group reflections about the research process.

II. The Sample

125 valid questionnaires have been included in the data analysis. The sample is representative because of the distribution of age and the relationship between women and men.

III. Conclusions

Although the majority of interviewees knows renewable energies, especially wind power, very few use them consciously. Some consider they have no choice to use renewable energies,

because they rented their flat, they live in neighbour communities or because renewable energies are too expensive.

Saving energy represents a great value for te majority of the interviewees, who mention the protection of the environment as the main reason. Economical reasons that dominated the survey of the last year remained in a second place. People shows good disposition to save energy in their daily life and in comparison with the last year, there are some improvements. For example, they improved the rational use of the heating and cooling systems and they use more energy efficient devices and bulbs. There remains still some confusion and some differences between the level of consciousness and the concrete behaviour: Especially those habits that are not directly linked with the home economy are less developed, e.g. use multiuse bags for shopping.

The inhabitants of La Azucarera have still little knowledge about Energy Sustainable Communities, even 5% less than in the last year.

Nevertheless, they expressed a great interest in converting Tudela in an ESC.

There is a big interest in living in ecological housings, even the majority of the interviewees expressed their disposition to make some modifications in their own flat in order to convert it in an eco-building. The barrier they see is the high cost of these kind of buildings.

The interviewees were sceptical regarding the image of Tudela as an ecological town. They are critical about the actions towards environment protection of the Municipality of Tudela: The majority doesn't think that the town council promotes the use of renewable energies nor the rational use of energy. Although the Municipality has made big efforts in this direction, especially in the framework of the project ECO-city, many interviewees did not note it. It seems that there was some confusion about the authorship of the activities: some thought that the government of Navarra carried out the activities of the Municipality.
There is still a lack of efficient communication between the Municipality of Tudela and the inhabitants of La Azucarera.

After working during one year in the project ECO-City and with considerable presence n he local media, not always free of polemics, the project is much better known than the last year. Nevertheless, the interviewees were more sceptical about its influence of the attraction of the town Tudela.

For the inhabitants of La Azucarera, the town Tudela and specially their quarter are attractive places for living. There is no intense community life in the quarter, even if there was found a neighbour association last year. The interviewees showed little interest in participating in community activities.
The interviewees were interested, although less than the last year, in being involved in urban planning processes. Some of them expressed their disposition to participate actively in evens like round table discussions about urban development.

IV. Recommendations

The municipality should make use of the big interest in eco-buildings of the inhabitants and promote them. It should facilitate the access to information, consulting and subsidies to those persons who wish o adapt their own living unit to the requirements of an eco-building.

The municipality should promote the rational use of energy, for example through information campaigns or an incentive system for energy saving. In addition, the municipality should give an example of good practice to the inhabitants. We propose the installation of a longterm awareness rising program about environmental issues in order to inform and educate the inhabitants about energy saving and recycling of resources. The municipality should continue the organization of information sessions for different target groups.

Regarding the renewable energies, the municipality should inform the inhabitants about the possibilities to use them, e.g. by contracting green energy or the consume of bio diesel. It should inform about existing assistance programs or subsidies for the installation of renewable energy systems in the own living unit or for the modification into an eco-building. .

The municipality should continue with its committment to convert the twon ino an Energy Sustainable Community. It should give an example of good pratice, e.g. though rational use of public lighting in streets and buildings, promote the public transport, use renewable energies for the consume of public institutions, promote recycling of waste, make a rational use of all its resources, etc.

The municipality should continue its efforts to promote the citizens' participation, e.g. with information sessions and public hearings of experts. The ciizens' participation has a positive impact in the environmental development, in the wellness of the in habitants as web as in the citizens' acceptance of municipality decisions.

Regarding te communication between the municipality an the inhabitants of Tudela:
The municipality should develop and apply efficient methods of information transmission to the public, e.g. by information points, posters, flyers, individualized letters to citizens, etc. The information should be easy to understand and accessible to a maximum of persons. The municipality should develop methods to evaluate the efficiency of its actions.

The municipality should take measures in order to improve its ecological image. The inhabitants are still not aware or not web informed regarding the actions of the municipality, but they show interest in this topic.

The municipality should show its authorship of its actions in order to enable the citizens to link it to the action.

The municipality should develop incentive systems for energy saving of its citizens. The incentive should not be economical, but of acknowledgement. For example, the municipality could publish the yearly energy balance of the town or in the electricity bill of each costumer could appear the personal balance of energy savings.

Regarding the promotion of and the information about the project ECO-City, the municipality should apply all kind of communication like press, radio, TV, WWW, letters, flyers and posters.

We propose to create an information flyer for each household, in which the municipality explains the objectives and the progress of the project ECO-city. It is very important that the inhabitants don't link eco-city only to the golf camp, but to an effort f the town to obtain sustainability, financed y the European Commission.

3.3 Inquiry among inhabitants of the quarter of Lourdes (Tudela, Spain) in October 2009

In July 2008, the new area for the rehabilitation project as part of the EC-funded project ECO-City has been assigned: It is situated in the quarter *Nuestra Señora de Lourdes* in the centre of the town Tudela (Navarra, Spain).
This quarter was built in the 1950ties to 1970ties in order to meet the demand of social housing, due to the strong immigration from rural areas to the town. The quarter counts a

total of 1500 apartments and 3000 inhabitants, representing 10% of the population of Tudela. The area comprises three types of dwellings with a total of 662 apartments:

- 4 towers of 6-7 floors with 112 apartments,
- 5 blocks of 4 floors, built in the 60ties, with 374 apartments,
- 3 blocks of 2 floors, built in the 50ties, with 176 apartments.

Fig. 1: The towers

Fig. 2: 1960ties

Fig. 3: 1950ties

The inquiry among the inhabitants of the rehabilitation area was planned in October 2008 with the following objectives:

- To get a first contact with the inhabitants and to elaborate a preliminary socio-economic profile.
- To introduce the topic of energy efficiency embedded in the broader framework of environmental consciousness. This part represents in addition an intervention to invite people to think once more about their daily energy behaviour and habits of responsible consumption.
- To introduce the planned rehabilitation project and evaluate inhabitants' initial interest and disposition of participation.
- To know the opportunities and barriers that people anticipate with the project, in order to elaborate an efficient approach of the communities with convincing arguments.

The general delay of the project, due to administrative reasons, affected also the date of realization of the inquiry. Finally, it was carried one year later as foreseen, in November 2009.

Methodology

A questionnaire was designed with the following chapters:

1. Interest in environmental topics

2. Environmentally friendly behaviour
3. Ecological Tudela
4. Project of sustainable rehabilitation
5. Citizens' participation
6. Personal data

In order to enable the participants of the inquiry to fill out the questionnaire by themselves, a multiple-choice-format has been chosen. In addition, there was space left for comments and further information. In the Annex 10 is attached the questionnaire form.

It was planned to hand over the questionnaire directly to the inhabitants and to use this personal contact to explain the rehabilitation project and the purpose of the inquiry as well as to motivate people to participate in the inquiry.

Due to lack of capacities of the Muicipality, the questionnaires have been sent by post to the inhabitants.

The participants have had 14 days to fill out the questionnaire and to deposit it in the Municipal office of citizens' affairs. Among the participants, the raffle of an electric device is planned.

Results

I. The sample

1. The sample of the inquiry is not representative for the population of Lourdes.
2. The majority of participants are elder retired persons, who are the flat owners.
3. The represented education and socio-economic level is relatively low.
4. There is no information available about the inhabitants of the towers, majority of flat leasers, big part of the working population and people with immigration background.
5. In the majority of households live one or two persons, without children and youth.
6. The community participation level is relatively low.

II. Ecological interest

1. Participants show high interest in ecological issues.
2. There is a widespread interest in different topics. The expressed interest in concrete and regional topics is higher than in more abstract ones.
3. Participants show special interest in the River Ebro and in several sensitive points regarding ecology in Tudela. This information is very valuable for the Municipality in order to detect demands and areas of possible action.
4. The most frequented information channels are TV and radio.
5. Participants show relatively low practical ecological commitment.

III. Energy saving and responsible consumption

1. Energy saving is considered from the participants as very important issue.
2. Women focus more on the economical aspect, men more on the ecological consequences.
3. People show generally well adapted energy behaviour at home.
4. Mostly they have adopted attitudes with a direct economical impact.
5. People show mostly well adapted water using behaviour.
6. There are potentials of improvement regarding the investment in energy and water saving appliances.
7. Car-sharing is not an extended habit.
8. The majority of participants affirm to separate the domestic waste. There are potentials of improvement at work and for the separation of organic waste.
9. We observe some important efforts made to shift from consumption to recycling culture.
10. There are important potentials of improvement regarding responsible consumption.
11. The information about habits of resource use and consumption is very valuable data for the Municipality in order to design well-adapted information and awareness rising campaigns in the future, also regarding the objectives of the Local Agenda 21.

IV. Ecological Tudela

1. Participants are sceptical about efforts of Tudela to become an ecological town (e.g. by promoting RES and RUE).
2. The majority consider Tudela not to be an ecological town.
3. There is low knowledge and interest in ecological activities of the Municipality.
4. Nevertheless, the majority is very satisfied with their life conditions in Tudela and Lourdes. Men show to be more satisfied than women. Tudela seems to be slightly more attractive than Lourdes.

V. Rehabilitation project

1. The majority is interested in living in an energy efficient apartment and in converting the own flat in such an eco-apartment, participating in the proposed rehabilitation project.
2. One third is hesitating about its participation; people will need further and more detailed information about the project and its real costs. People need to share opinions with their neighbours before making any decision.
3. People showed to be very prudent taking over economical commitments. As higher is the compromise less disposed they are. Maybe, their economical situation doesn't permit to assume a higher percentage of costs.

4. Further efforts are needed to involve people in the project, more detailed information, cost statements and sustainable financing models.
5. The majority wants to be informed, half want to participate in related activities.

3.4 Inquiry among inhabitants of the quarter of Lourdes (Tudela, Spain) in July 2011

In January 2010, the new project has started and between January 2010 and June 2011, all the activities of the participation strategy were realized.

In July 2011, the second study took place, in order to evaluate the social impact of the project. Therefore, semi-structured interviews with the social assistant and the director of the consultancy agency were realized. A second version of a semi-standardized questionnaire with the same contents, but with different items, adapted to the actual situation, was elaborated. The social assistant of the office approached the neighbours directly and applied the questionnaire. 74 of the 122 neighbours participating in the refurbishment project are included in the sample, as well as 96 neighbours that do not participate in this project.

Results

From the complete sample of 170 interviewees, 74 (43.5%) participated in the project, 33.8% of them are still in the planning phase and 56.8% in the implementation phase.

Here we will concentrate on results of this part of the sample. The profile of them confirmed the general low socio-economic level: 33.8% have no studies, 24.3% finished the primary school. 35.1% are retired persons, 21.6% workers and 16.2% housewives.
Although 62.2% expressed their interest in environmental affairs (2009: 85%) – air pollution and nature protection were the most mentioned topics, as well as pollution and green areas in the town, only 4.1% have participated in environmentally related activities during the last year. About one third part ignores if the Municipality cares about the environment, if the Municipality promotes the use of renewable energies or the rational use of energy. About one third part considers that the Municipality does something and the same percentage affirmed that the Municipality doesn´t care sufficiently. We observe certain scepticism about the ecological commitment of the Municipality; only 8.1% consider that the town has an ecological image (2009: 16%). Despite this fact, about three quarter parts of the participants like to live in the town and in the quarter, although the opinions about the town are more homogeneous and about the quarter are more widespread: 43.2% like is very much and 4.1% doesn't like to live in the quarter. The level of participation in community activities is low: Only 6.8% of the participants are member of a neighbourhood association and 25.7% participate actively in community activities.

All participants affirmed the importance of energy saving, 55.4% due to economical reasons and 25.7% due to ecological reasons. Asked for their concrete energy saving behaviour, the participants affirmed in most of the examples to be less concerned than two years ago. E.g., 59.5% (versus 79% in 2009) affirmed to switch off heating and air condition at night. We have to investigate further about the reasons of this reduced energy consciousness.

Asked for the first reason to participate in the project, 28.4% mentioned the increased comfort level and 25.7% affirmed that this was the decision of the neighbourhood community. All neighbours were invited to be involved in the project and the study has shown that a high acceptance of the proposed actions: 79.7% has assisted to almost one meeting with their neighbours, 62.2% has visited the project office in the quarter almost one time, and 10.8% has visited the other refurbishment project in the other town. The project became a topic for conversations among neighbours: 59.5% spoke with their neighbours about it.

Looking at the four levels of participation (information – consultation – decision making – taking over responsibility), we obtained the following data:
87.8% were informed; only 4.1% affirmed that they got no information. The participants of the survey affirmed the opinion of the professionals that in the design of the project were only few possibilities foreseen for end-users to influence in it: Only 5.4% affirmed to be consulted (37.8% something, 41.9% no) and 2.7% affirmed to be involved in an decision making process (66.2% no) and to take over any responsibility, e.g. member of a work committee (83.8% no). As interviewed professionals pointed out, this lack of involvement in the technical process was due to the delay and the very tight time frame of the project. As well, a further involvement of end-users was not foreseen in the conception of the project.

The participants of the survey confirmed the acceptance and the positive evaluation of the work done by the staff of the office: 91.9% affirmed they received excellent or good attention, 81.1% were well or sufficiently informed, 64.8 received good or sufficient assistance for administrative matters and 64.9% got good or sufficient support for financial affairs.

Asked for their evaluation of the financial commitment, 56.8% of the participants affirmed that the amount is acceptable; 39.2% evaluate the financial model as acceptable and even 29.3% considered it favourable.

4. Conclusions

We detected yet the following factors as important for the success of the project and its probability to attain sustainability:

Political commitment at regional and local level: Divergent political interests should remain behind the common goal of sustainability and improvement of live conditions of the community. In order to assure the support of the opposition, it could be invited to participate in the planning process, e.g. in a work committee.

Initial stakeholder analysis: Hypothesis what are the role(s), interests and motivations of each stakeholder beyond the formal work programme. This analysis helps to detect potential conflicts of interests or other barriers to the attainment of project goal and permits to apply preventive measures.

The interdisciplinary team, composed by professionals of technical, social and economical disciplines, with expertise about the issue and commitment, is crucial. In an ideal case, the team members are involved from the beginning in the project and can contribute their professional points of view to the project design. Personal continuity of the team during the project is very helpful in order to establish a closed and continuous contact to the affected community. Ideal is the establishment of an office inside the quarter with permanent staff, who invite inhabitants to participate actively and attend their concerns, offering practical advice and support.

Adequate users' participation: Future end-users should be informed and consulted about aspects that affect them, and feel that their opinions are seriously taken into account. They are the experts of their situation and the experience of own influence increases the motivation to participate. As they will live in the buildings later on, they should be directly involved in the elaboration of the criteria and the design of the building.

Without flexible financing models, adapted to the income situation of end-users that they can afford their part of costs, the project would not succeed.

5. Lessons learnt

The analysis of the activities carried out reveals that accompanying socio-economic activities have had positive effects on the implementation of the demonstration activities. Following lessons learnt can be drawn:

Designing SE activities and measuring success

In order to meet the challenge of integrating social, economic and environmental aspects it is necessary to develop an integrative approach encompassing methods, activities, data streams, etc. able to grasp the interactions between complex systems.

Communities could meet challenges more easily when:

- Concepts have been comprehensive, tailored from the beginning to the specific characteristics of the project and clearly defined.
- Implementation of measures affecting the inhabitants has been communicated and when residents have been informed and involved in the activities from the very beginning and throughout all phases of the project.
- Information campaigns and surveys were commenced even before the demonstration activities start (especially for renovation projects).

Communities that develop such strategies and have dedicated plans for SE activities can better cope with difficulties related with:

- implementing comprehensive renovation activities that ensure significant energy savings, but at the same time also guarantee an increased social cohesion, sense of place and identification of the inhabitants in the concerned districts;
- finding the right balance between energy improvement measures and quality of life improvement measures e.g. by increasing local acceptance of measures while renovating under occupied conditions for example by involving tenants (information campaigns prior to projects, metering activities by tenants, training tenants as advisors and potential multipliers);
- finding means to contact and motivate various user groups;
- identifying acceptance issues problems at an early stage and reacting to these problems by either adapting the project activities or taking these aspects into account for further activities;
- designing support programmes and providing additional financing incentives

Socio economic criteria and the development of the necessary tools to support projects during their implementation phase should be mandatory for each project.

The social dimension

Stakeholder commitment

Getting stakeholders involved is the first step to making a commitment, and making a commitment makes people more likely to act. Understanding the target groups, inhabitants, home owners, etc. was one key to successful refurbishment activities. The central message is to involve the ones affected by the measures so as to ensure acceptability of the project and social response. It is crucial that participation of the project affected people is provided at each stage from planning through implementation and to keep them informed about the development.

Behavioural change can only take place if there is an effective 'engagement' of stakeholders and residents, which means more than barely better awareness and understanding. It is necessary also to cover the domains of concern, emotion and behaviour. To achieve this engagement, communication initiatives need to overcome a number of barriers at individual and social level. These include also barriers created by feeling disempowered, disbelief, distrust of information or long-established "bad" consumption patterns. SE accompanying activities should aim to provide an increase in both cognitive and emotional involvement. Empowering schemes addressing inhabitants acting as liaison with other tenants or establishing district agencies are very effective and should be enhanced.

Refurbishment of flats and works on the building site put considerable burdens on all tenants, especially with regard to dirt and noise during the implementation, but also regarding financial burdens. Special attention should be paid to tenant liaisons in a refurbishment project, running through the entire process from planning to end use. Local advisers counselling tenants and acting with mediating function should be established. They can be valuable to speed up the construction process, to take the pressure off site supervisors and to increase the social acceptance of the measure.

Refurbishment in low-income areas

Often, refurbishment activities are carried out in structurally weak areas. Due to the improved standard of the dwellings and buildings and of the infrastructures, the neighbourhood could become or is on the way to get a better image. As a consequence, some districts are starting attracting also young families with higher income, thus improving the social mix and possibly helping decreasing the level of unemployment.

In countries with a tradition of strong tenants' rights, and where residents associations have a certain bargaining power, there is a higher participation of residents in rehabilitation processes. Successful concerted gradual rehabilitation processes rely strongly on:

- Participation as key method
- Strong identification of the inhabitants with the rehabilitation process;
- Balance between correct management of public real estates and sustainability of the costs for low-income households by adapted financing models.

Creating awareness and providing information

The effects of providing awareness and information activities can be manifold. These can lead to outcomes ranging from better acceptance of construction works and general public interest about the results, to an improved perception of the district, a tangible increase of property value and concrete improvement in health and the quality of life in general. Due to information and increased acceptance, adjustments to the needs of the target groups and involvement of inhabitants and stakeholders, the implementation also of very complex measures could advance. A general lesson learnt is that the acceptance by the residents and their readiness to change their behavioural patterns are important factors if retrofitting is to meet its energy efficiency targets.

Surveys amongst the stakeholders allowed to reacting to problems and to dissatisfaction and preventing major difficulties. Accompanying socio-economic research helps to identify problems at an early stage and react on these problems either by adapting the project activities or by taking these aspects into account for further activities. Success in surveying tenants´ attitudes depends on the method chosen. Methods that included personal contact either through direct interviews or a personally delivery of a questionnaire achieved a higher return rate than methods where a questionnaire was send by email or by post.

Triggering householders´ energy behaviour

Householders' energy behaviour is influenced by factors such as available income, cultural and societal background (attitudes, beliefs, standards), housing conditions and country-specific regulations. Experience suggests that better information and responsibility appeals for behavioural change are essential, but have not been demonstrated as effective enough to change households' energy consumption. Indeed, the perceived energy cost problems of households do not always affect changes in behaviour and induce energy-saving efforts. Nonetheless, educational measures have been playing an important role and showed impact especially for households with low incomes that spend a high fraction of their budget on

energy. In contrast, evidence shows that providing households better feedback on their energy consuming behaviour can make them more aware of their every day behaviour and how this is related to energy consumption.

There have been activities and surveys in the communities targeting changing attitudes towards renewable energy sources, etc. However, there is no strong correlation between changing attitude and changing behaviour. Feedback and follow-ups are crucial. Feedback either through ITC (displays) or diaries or personal advisory services gives people signals about the impacts of their behavioural changes. Follow up contacts are important in motivating people to continue behaving properly.

Counselling on the spot and the establishment of reference points and a guiding service for the citizens in the district in form of development/territorial agencies can be a factor guaranteeing a smoother implementation. Residents tend to trust neighbours more than external advisors. Encouraging of residents to act as multipliers in the community has demonstrated to be a valuable vehicle to inform and convince tenants.

Summarising**,** the analysis of the three social criteria provides evidence that the majority of the communities' residents and stakeholders:

- identify themselves with their district and like to live or work there;
- appreciate the changes brought by the project;
- are satisfied with the better image of the district / block of flat;
- welcome the better comfort level;
- are positive about the perceived effects and planned measures because of expected overall economic benefits;

Coping with the environmental and economic dimension

Even if the chosen indicators belong to the technical domain, the analysis shows that coupling technical data with flanking social activities is essential for success.

There are communities where high avoided CO_2 emissions could be reached. This is almost entirely due to installation of RES and CHP plants and only to a lesser extent to energy efficiency gains on demand side (reduced energy demand in buildings for electricity, heating, cooling). Success on energy efficiency measures in new and refurbished buildings is related to consumption patterns and needs longer time to show effects.

It is too early and there is too little evidence to claim that innovations brought about by technical measures have stimulated local economy and impacted on social-ecological systems. The economic impact of the measures will take a much longer time to show than

the social impact. Measurable data will probably be available after finishing the project in 2011 and therefore it was not possible to draw lessons on cost effectiveness, new services, increased short-term and long-term employment; increase in property value, etc.

The project measures will be remarkable on energy bills resulting in a lower energy consumption. However, because of increased energy costs and tariffs, residents somehow can perceive the current heating system as more expensive than the previous one. This prejudice reiterates the need for targeted information and counselling. New heating forms will be accepted better if they are presented in a user-friendly way, well introduced and explained to the tenants, especially older ones.

Refurbishment activities of blocks of flats, especially retrofitting the building envelope and simultaneously converting individual heating systems to a centralised district heating system sometime poses difficulties in comparing energy bills before and after the conversion. In some cases, there can come up misunderstandings concerning the resulting higher charge. As a result, retrofitting measures could face opposition from residents. Conversely, social activities aimed at generating a sense of empathy and identification and timely information concerning changes in rent and additional costs to be covered by the tenant and targeted information material helped to increase understanding and hence acceptance.

From the rational choice viewpoint, it can be assumed that people weight up choices, such as whether to install a solar thermal or build according to low energy criteria and then act according to their economic advantage. Information campaigns in this case help little to affect decisions. Life cycle cost assessments are only carried out if the investor in the building is also the user.

Eco buildings, a part from reducing environmental impact, also create a better indoor air quality as well as higher levels of thermal, visual and acoustic comfort than conventional buildings. This aspect, associated to the saving potential due to reduced operating costs, contributes to promote acceptance. Very few data on cost per square meters could be gathered. However, without targeted incentives (fiscal, financial) higher investment costs of the buildings remain a barrier hindering new investment.

Summarising**,** the analysis of the environmental and economic criteria provides evidence that the majority of communities' stakeholders:

- appreciate improvements of district quality of life and reduction of environmental pollution through the project measures;