

The SHE project: Sustainable Housing in Europe. Social housing coops' best practices for sustainable communities

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ABSTRACT: The pressure to set out strategies for sustainable building to reduce CO2 emissions and energy consumption is increasing. The social housing cooperatives, managers of a large segment of the housing stock and expression of inhabitants' needs, are important actors for sustainability. This area has been largely ignored in current development activities, that often do not follow an integrated and people centred approach.

This paper presents the first results of an ongoing EU co-funded project, where social housing cooperatives have partnered with scientific and technical organisations to demonstrate the feasibility of sustainable housing on a daily practice.

The 8 case studies in Denmark, France, Italy and Portugal illustrate the potential and the obstacles of applying sustainable solutions.

The main project outcomes:

- Recommendations for social housing organisations, for clarifying the responsibilities of all participants involved and the procedures for the management and design process;
- A dwelling manual for each SHE pilot project for reinforcing environmental awareness of inhabitants in the use and maintenance of the dwellings;
- The global life cycle cost methodology, for highlighting social and economical advantages of sustainable housing.

1 INTRODUCTION

The SHE “Sustainable Housing in Europe” R&D European project, is a five-year European demonstration project funded within the 5th FP - Energy, Environment and Sustainable Development, Key Action 4 – Cities of the Future and Cultural Heritage (March 2003 – February 2008). It aims, as major objective, to send a clear message to all urban stakeholders and citizens that today moving towards an everyday practice of sustainability in newer housing estates, involving all stakeholders and especially the final users in the building process, is possible and necessary. The SHE commitment is to demonstrate that the application of basic sustainable principles in the daily practice is not a utopia of the next millennium, but a commitment that should be attended by everybody and that is worthwhile to everybody.

. At the end of the project, thanks to the continuous involvement and interaction of different stakeholders (housing cooperatives, technicians, universities, providers, professionals, public bodies, etc.), sustainable dwellings for about 600 families will be designed, built and monitored in Italy, Denmark, France and Portugal. The new methodology and the guidelines developed by the SHE consortium will demonstrate the replicability of sustainable housing in different climate and situations, such as those of the European Union.

Since 2003, eight social housing organisations together with a team of well-experienced experts, coordinated by the Federabitazione Europe (Italian housing co-operatives federation), are working to develop an integrated approach on new urban areas, promoting the inclusion of sustain-

able urban management in political agenda and policies at national, regional and local levels in 4 countries. The partners forming the SHE consortium are social housing organizations and a group of experts, under the coordination of Federabitazione Europe - Confcooperative, a national housing co-operatives federation.

The SHE project is innovative not because of new products or technologies, but because of its methodology and aim. The involvement of cooperatives, end-users, designers, public bodies, producers, etc. from the beginning of the project, is the most important means for moving towards a common practice of sustainable housing. The idea is not to set very high level standards for the dwellings that would only be applied by a minority, but to define minimum standards, with good levels of energy and water savings and with affordable costs that can be adopted by everybody.

There is already an important number of technologies, systems and materials for sustainable building projects but the real problem is to introduce them into the common practice, taking into account the social and environmental conditions of the building site and activating a cultural process for involving and convincing all the stakeholders of the necessity of a sustainable built environment.

2 THE SHE APPROACH

The SHE project wants to ensure to each main subject a scientific advisory. A team of experts supplies the necessary scientific support to implement sustainability in each pilot project. The topics of interest, the so called Horizontal Activities, are of great importance for the publication of the new methodology and guidelines.

2.1 *Participation Process*

The participation process is an essential part of sustainable construction projects' management. It consists in the whole range of actions aiming at making the different stakeholders take part and/or influence the decision making process.

The participation process includes different types of actions with different interaction and influence levels: from the information to the cooperation level. The level and intensity of participatory actions and their concrete influence on the decisions represent a significant indicator of the projects' social sustainability level.

The process of participation implies the set up of a dialogue between the different stakeholders since the brief writing stage. The dialogue fosters the implementation of higher quality projects responding to both end-users' needs and expectations as well as to community's interests. It also contributes to the end-users' change of behaviour. The dialogue with the future end-users helps achieving dwellings' optimal use and long term performance as well as an appropriate management of buildings.

2.2 *Social and economic aspects*

Sustainability is a shared responsibility. Co-operation and partnership with different level organizations are crucial. The objective is to structure and organise a common platform to carry out inquiries for evaluating the values and attitude of the tenants towards the environmental issues. For each pilot project a specific model, the SET SHE model, regarding the shared global cost for each project and for different types of actors will be developed.

This innovative Life Cycle Cost, based on the OLCC, approach is a crucial tool for evaluating the importance of sustainable housing benefits and to convince the national and local governments to provide incentives for sustainable housing based on its social and economical advantages. It includes externalities and induced impacts making the project "shared" between different actors. *Externalities* include environmental and social impacts, which do not have a market value. *Induced impacts* regard the indirect impact of a project.

The objective is to work out and apply a new specific methodology using both economic and social impacts as assessment tools.

2.3 *Site Analysis, building and landscape design*

The principal aim of a site analysis is to highlight a design method to guide the eco-sustainable design process of the different SHE projects. It represents the first essential step which provides basic information to define project sustainable targets. From the site analysis it is possible to get a clear overview of the existing situation in which the project stands, both in terms of potentialities offered by the site and problems to solve (even looking to the neighbourhood scale).

The macro activities that should be performed by each design are the site analyses, the definition of specific design targets and the selection and control of the different solutions.

2.4 *LCA procedures, safe materials and technologies*

The principal aim is to provide guidelines and recommendations concerning the choice of sustainable building materials, components and maintenance or finishing products.

The following Guidelines are provided to enable design teams to orient their choices and clearly focus the problem, considering that in a sustainable approach materials have to be evaluated comprehensively, taking into account the implications related to their overall life: from the production to the dismissing.

2.5 *Water, ground and underground management cycle*

The aim is to achieve large conservations on the water consumption by using well-known techniques, materials and components – perhaps used in another and less familiar way. Of course, without minimizing the comfort of the housings noticeably.

The purpose is to limit the interference in the natural water cycle as much as possible. In practice, this takes place partly by limiting the quantity of water, which is pumped for consumption, partly by retransferring the optimum quantity of rainwater to the water cycle through local percolation and industrial water

2.6 *Waste management cycle*

The “Waste Management” recommendations deal with “prevent – separate – recycle” of waste in connection with the construction and operation of housing.

Construction waste is the subject with most focus, (however, household waste is not less interesting) as with our increasing purchasing power, experience a still increasing quantity of goods flowing through the modern households. Construction waste emerges the year in which the housings are built, whereas the household waste arises for the next 100 years during the operation of the housings.

2.7 *Energy management cycle*

The main objective is to reduce CO₂ emissions. For each demonstration project the eco-management for energy is encouraged. The guidelines are meant to develop and finalise ventilation and heating system designs, to explore the feasibility of mixed mode or natural ventilation approach, to consider thermal storage options, to select exterior wall systems and insulation appropriate for the local climate, to reduce the needs for cooling using passive cooling systems and to use active and passive solar systems.

Important preliminary targets for energy performances have been set and, as for the simulations already done, they have even been over-passed by many of the SHE pilot projects.

2.8 *Day-lighting and acoustic issues*

The objective of this topic is the satisfaction of visual and acoustic comfort requirements inside the buildings. It is important to promote day lighting instead of artificial lighting, sun shading devices, correct fenestration and the use of innovative solutions and special materials for day lighting applications.

Specific information have been provided for the noise control, both at neighbourhood and building scale, through careful planning of the building.

2.9 Energy and environmental simulation and monitoring

The main objective of simulation and monitoring is to measure and quantify the actual performance of the buildings, comparing it with the theoretical expectations based in the strategies adopted in each project.

The information gathered through the monitoring activities will be used to examine the efficiency of the choices adopted in the planning phase, and to increase the know-how and awareness of the cooperatives regarding the use of innovative tools to be applied in future projects.

Table 1: Targets set up for saving natural resources and results of the simulations (compared with local regulations or with past experiences)

Saving of natural resources (average of the 8 SHE pilot projects)		
	Target	Simulation
Energy saving for heating	30 %	40 %
Energy saving for cooling	100 %	100%
Energy saving for lighting	20 %	20%
Water savings in the building, including rain water recover	40 %	40%
Reduction of the use of primary raw materials	25 %	30%
Reduction of construction related waste	45 %	60%
Recycling of urban waste during the use of the buildings	35 %	35%
Reduction of the best practice life cost of the construction process	65 %	55%

To conclude, it is important to note the difficulty of synthesizing and simplifying some complex HA topics into practical documents. Scientific partners and social housing organisations have therefore discussed how to transfer the original HA recommendations into more feasible recommendations. As the challenge is to move from extraordinary to the ordinary, we have tried to avoid unrealistic targets and documents, that are too long or academic and therefore not practical tools for housing organisations.

3 THE IMPORTANCE OF COMMUNICATION

Great attention has been given to the dissemination activities which have been carried out according to the SHE principle that dissemination is not only spreading information, but involving and convincing. The SHE consortium has been engaged in activities to create a broader consensus on sustainable housing and to stimulate the participation of the decision-makers and the main actors of urban management. More levels of communication were used in order to create a new vision towards sustainable urban development and to prepare the ground for acceptance of sustainable concepts. At all the events, there is an increasing interest in sustainability topics and high expectations from representatives of various national stakeholders.

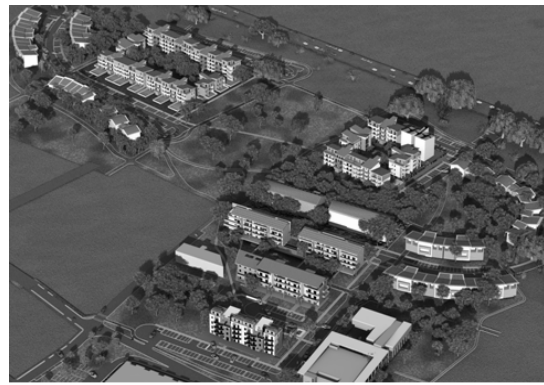
The social housing organisations are strategic actors for urban sustainable development and therefore their commitment contribute to the change of urban planning management. Many municipal land planners have understood that citizens ask to live in a sustainable way. The importance given to the bottom-up demand is innate in the cooperatives of many countries.

The specific aims of the SHE dissemination activity are:

- To provide interactive and targeted information on the project, putting in evidence the relevant features, the problems encountered and the measures for overcoming them;
- To ensure a widespread dissemination of knowledge. Adoption and exploitation of the successful approaches and techniques used in the SHE project also through the usual networks of the social housing organisation;
- To enable key decision-makers to adopt these approaches and techniques;
- To disseminate relevant results to the new members countries;
- To spread the results to the different stakeholders involved, to the members of candidate countries through distribution of newsletter, booklet, press releases, book, mobile exhibitions;
- To publish and update a project dedicated web site: www.she.coop

4 THE SHE PILOT PROJECTS

According to the SHE approach, the demonstration projects are now under construction or already built. Each of the 8 pilot projects provides concrete examples sustainability integration by means of long-term management of land, water, waste, energy and natural resources in social housing, and of integrating close participation of citizens in all the decision-making phases of urban management.



The Preganziol project – Treviso (IT)
 Social Housing organization: COIPES
 70 eco-dwellings
 Construction: November 2005 / March 2007

The Villa Fastiggi project – Pesaro (IT)
 Social Housing organization: COPES
 130 eco-dwellings
 Construction: November 2005 / May 2007



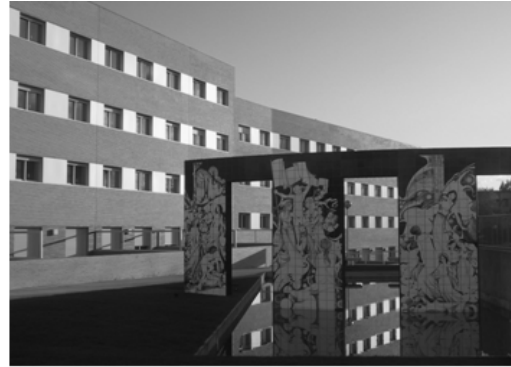
The Mazzano project – Brescia (IT)
 Social Housing organization: CONSEDI
 40 eco-dwellings
 Construction: May 2006 / December 2007

The Ozzano project – Bologna (IT)
 Social Housing organization: COPALC
 12 eco-dwellings
 Construction: May 2005 / December 2006



The Teramo project – Teramo (IT)
 Social Housing organization: CCICASA
 60 eco-dwellings
 Construction: April 2006 / September 2007

The Lystrup project – Aarhus (DK)
 Social Housing organization: RINGGAARDEN
 130 eco-dwellings
 Construction: January 2007 / November 2007



The Burgoin-Jallieu project – Grenoble (FR)
Social Housing organization: OPAC38
61 eco-dwellings
Construction: March 2003 / March 2004

The Matosinhos project – Porto (PT)
Social Housing organization: NORBICETA
101 eco-dwellings
Construction: December 2004 / February 2007

5 REPLICATION POTENTIAL AND FIRST IMPACTS

The replication potential of SHE is very high and the first results and impacts on the building sector and social housing practices are already visible.

The SHE project has contributed to boost key stakeholders to understand that it is time for action, and the social housing movement has demonstrated that cooperatives are almost a perfect means for understanding what sustainable living is and how it is possible to change behaviors and attitudes. Social housing providers are considered as key actors for the generation of dynamic partnerships, linking the creativity and intensity of a wide range of actors.

The SHE partners have recently promoted in each country professional training, dissemination and training actions for informing the managers of the housing coops and the end-users about the use of renewable energies, bioclimatic approaches, ecological materials, etc.

In Italy, Federabitazione has recently created an innovative network of social housing coops for providing practical energy and environmental recommendations and quality procedures for the building process (design, construction, use and maintenance).

In France, OPAC38's board decided to develop its own Agenda 21 for promoting the inclusion of sustainable concept in the daily practice of OPAC38.

Similar results have been reached in Portugal and Denmark and it is important to note that the SHE buildings have managed to create a growing interest of the professional actors: many architects and students are visiting the construction site, asking for details about the technical and non-technical issues of the project, discussing thesis on the new trend of sustainable architecture and the SHE approach. Delegations from many countries have come to Italy to visit the building sites: delegations from Singapore, Poland, Australia, etc.

The SHE project is a great inspiration for other housing associations, private, municipal and international organizations, i.e. the participation at the United Nations HABITAT meeting of Nanning (China) as one of the best European projects on urban sustainable development.

In the municipalities where the pilot projects are situated there is a “domino effect”: more and more the local actors are asking the SHE partners to be engaged in new housing projects or to give advice to reinforce professional skills, impose high demands for the energy and environmental quality in housing projects.

On February 2007 the SHE project was awarded with the prize of the Sustainable Energy Europe Campaign 2005-2008 (Fig. 2) – A European Campaign to raise awareness and change the landscape of energy (www.sustenergy.org), which is an important recognition and also confirms the key role of social housing providers in raising the awareness of decision-makers at local, regional, national and European level, spreading best-practice, ensuring a strong level of public awareness, stimulating the growth of private investments in sustainable technologies.

SHE won the section “public-private partnership” with the following motivation of the Jury:

“SHE represents a shining example of a public-private partnership where social housing cooperatives on a local, regional and European level have partnered with building companies, scientific institutions and technical organizations to demonstrate the feasibility of sustainable housing and communities. SHE focuses on raising awareness among end-users and wants to improve the lives of citizens by offering healthy and sustainable environments.

The partnership is demonstrating an integrated approach to the development and construction of sustainable housing by making the extraordinary ordinary. By the end of the project, 600 families in Denmark, France, Italy and Portugal will be living in sustainable dwellings.

SHE will develop best-practices guidelines so that sustainable dwellings can be replicated by others.”



Figure 2: SHE awarded by the Sustainable Energy Campaign Prize of the European Commission

6 CONCLUSION

The SHE team has made a considerable pressure on the key stakeholders and the activities carried out have not been limited in time or place. The actions have generated further progress and achievements both for the projects themselves and for the local and national policy.

The social housing cooperatives have demonstrated to be almost a perfect means for raising the awareness towards sustainable living and for changing the lifestyles. They are also key actors for the generation of dynamic partnerships, linking the creativity and intensity of a wide range of actors, injecting energy into the national dialogue on sustainable development.

At the beginning of the SHE project, in 2003, the decision to make an effort to lower the major barriers was a big challenge. In all the countries involved, the efforts of the national governments were almost inexistent or fragmented, the process of mainstreaming sustainable practices was very slow and the key EU documents, as the *Thematic Strategy on the Urban Environment* or *Energy Performance of Buildings Directive*, were not published yet.

In light of this, it is easy to understand that the SHE philosophy was considered a very long-term vision, or even an illusion of some utopist cooperators.

However, in the last years, due to the increased focus on climate change, natural resources and energy prices, we have experienced a strong increase of interest. New technical knowledge, products, projects and local regulations are coming out and actors of the building sector are realizing that they can actually have an impact.

The different SHE teams have acted as critical friends with the local governments and as ambassadors for sustainable housing development and we can affirm that the SHE project contribution was to go from a “non-culture” to a culture of sustainability.