GreenBuilding

Pilot Phase 2005-2006
This publication represents the final publishable report of the project GreenBuilding (EIE / 04 / 057 / S07.38638) in the context of the European Commission’s Energy Intelligent Europe Programme.

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The buildings sector is responsible for more than 40% of the European final energy consumption. Roughly one third of this consumption can be attributed to non-residential buildings. Especially in existing buildings, the potential for economically viable energy efficiency and renewable energy measures is significant.

In order to meet the political objectives in terms of enhancing competitiveness, security of energy supply and climate change mitigation, the large potential of economic energy saving potentials in the buildings sector must be realised. The European Union and the member states will have to intensify their efforts by putting in place a mix of instruments to remove existing barriers for large scale energy efficiency improvements in the European buildings sector.

Legislative initiatives are important for defining the regulatory framework for the market players. Examples are the introduction of building certificates through the Energy Performance of Buildings (EPBD) Directive of 2002 or the introduction of minimum performance requirements for buildings which is envisaged by the European Commission for 2009 (similar regulations already exist in some of the member states). Grant policies, e.g. programmes offering financial support for very energy efficient refurbishments (as being run by some of the member states) support the market penetration of new technologies and prepare the market for stricter minimum requirements in the future. As a third column, market oriented measures to help overcoming non-technical barriers are indispensable for creating awareness, providing know-how, as well as for encouraging and assisting the market players to exploit existing energy and cost-saving potentials by applying existing state-of-the-art technology.

GreenBuilding is the European Union’s voluntary programme to promote the enhancement of energy efficiency and the use of renewable energies in non-residential buildings. GreenBuilding offers information, promotion and publicity for building owners and professionals, who are ready to implement cost-efficient energy efficiency measures. Building owners who successfully reduce the primary energy demand of their non-residential buildings by at least 25% are being awarded the GreenBuilding Partner status. Professionals supporting a building owner with products or services can receive the status of a GreenBuilding Endorser.

Initiated and administered by the European Commission’s Joint Research Centre (EC-JRC), the GreenBuilding Programme officially started in 2005. The programme’s pilot phase 2005-2006 was performed in the context of the Intelligent Energy Europe (SAVE) Programme. Co-ordinated by the German Energy Agency (dena), thirteen organisations from ten European countries set up the GreenBuilding infrastructure on the European level and on the level of the participating countries:

National Contact Points in ten countries are addressing building owners and professionals to join the GreenBuilding Programme. Promotion and assistance is being offered in workshops, on the internet, and by carrying out public relations activities. Programme participants are being supported with information and know-how in the shape of guidelines and technical modules, best practice inventories, and also brochures presenting successful projects of the GreenBuilding Partners. Most of the information is available on the central website www.eu-greenbuilding.org in English as well as on the GreenBuilding Executive Summary
internet sites of the National Contact Points in national language.

After the GreenBuilding infrastructure was set up in the ten participating countries between January and October 2005, the programme was well-positioned to promote the new programme among the relevant target groups of the buildings sector. By January 2007, a total of 52 institutions with 64 buildings had been awarded the GreenBuilding Partner status. 29 GreenBuilding Endorsers had given support to the building owners.

In evaluating the projects of the 52 GreenBuilding Partners, the following results have been collected by the consortium:

- 52 Partners from 12 European countries, strongest participation in Germany (18);
- 29 Endorsers from 8 European countries, strongest participation in Germany (7);
- Building types in the programme: 54% offices, 24% education buildings, 8% sports facilities, 6% hotels, 8% other non-residential buildings;
- 65% of the GreenBuilding Partners are private companies, 35% are public institutions, mostly municipalities;
- The technical fields most frequently addressed in the projects were heating systems (71%), control systems (54%), ventilation and air conditioning (52%) and lighting systems (52%);
- The total primary energy savings in the 64 buildings amount to 90 000 MWh per year;
- The total CO₂ emission savings in the 64 buildings are about 22 000 MWh per year;
- The energy savings in new buildings were 40% in average (compared to the standard in force for new buildings), in retrofit projects the average savings were 33%; in several projects, savings of more than 50% were realised.

The average simple payback time of the projects where financial data was available was below 4 years, the average internal rate of return (IRR) amounted to 27%.

On the basis of the achieved cost-effective energy savings as a reference for future potentials of energy savings in service buildings, the consortium elaborated a projections of possible energy consumption development paths for the services sector until 2030. Focussing on the important subsection of retrofits, the projection uses the savings figure of 33% which was the achieved average of the retrofit projects of the awarded GreenBuilding partners.

Since services is the sector in Europe with the strongest growth projections for the upcoming years (almost 1.2% p.a.), the final energy demand is expected to rise from 160 Mtoe (2000) to 225 Mtoe (2030) in a business as usual scenario. Supposed, that 50% of the retrofits will be performed according to a standard in the range of the GreenBuilding projects (-33% energy consumption), almost 500 Mtoe of final energy savings could be achieved until 2030 under the assumption, that the renovation cycle will rise to 2,6% by 2020.

Other new policies (e.g. for enhancing the energy efficiency of office equipments) have not yet been incorporated in these projections.
The necessary developments of the two main variables (renovation rate, energy performance improvements in retrofits) depend on the combination of several policies and measures. As part of a possible policy mix, a voluntary programme such as GreenBuilding is an important instrument to promote energy efficiency in non-residential buildings by providing know-how and presenting best practices from all over Europe.

As a result of the evaluation of the GreenBuilding pilot phase, the consortium strongly favours a continuation of the GreenBuilding Programme until at least 2009 and a geographical extension in order to further spread the locomotion effect of the programme based on the established infrastructure.

The focus of the programme activities should be put on supporting the participants with a portfolio of promotion and marketing measures, since this aspect proved to be the most important one for building owners and professionals to engage in GreenBuilding (even more important than the cost savings achieved through the measures). One such measure could be an annual GreenBuilding Award.

Concerning the target value of 25% energy efficiency improvements, the average savings achieved (33-40%) are already beyond this threshold. With respect to the large regional differences in the development of energy efficiency markets in Europe, an increase to 30% or 35% percent – although seen as possible in some countries – would be premature for the less developed markets. The 25% target should therefore remain unchanged for the next 2-3 years.

Looking at GreenBuilding from a strategic standpoint, its relevance and potential lies not primarily in the total amount of energy and CO₂ savings achieved by its immediate participants (although considerable), but in its function to deliver success stories of energy efficient service buildings from all over Europe, thereby motivating a larger number of building owners to consider similar actions. In order to keep up and intensify the positive impact of GreenBuilding, the consortium proposed in October 2006 a follow-up project in the context of Intelligent Energy Europe (SAVE) Programme, which is presently under examination through the Intelligent Energy Executive Agency.
Examples of GreenBuilding Partners

HUSÖ Fastighets AB, Hudiksvall

Main measures applied:
Change from oil to district heating, using 99% renewable fuels, ventilation with 80% heat recovery, computerised control for heating and ventilation, improved insulation

Primary energy savings: 132 MWh / y (-30% heating, -68% electricity)
Energy consumption in the tertiary sector

In 2004, the European Union’s (EU 25) final energy consumption accounted for 1 140 Mtoe\(^1\). In a business-as-usual scenario with European GDP growth at similar rates as in the past and not taking into account the latest initiatives for enhancing the energy efficiency in Europe, the EU-25 final energy demand is projected to rise to 1 400 Mtoe in 2030.

The final energy consumption in the tertiary sector is projected to rise from 159 Mtoe (2000) to 225.3 Mtoe (2030). With an average increase of nearly 1.2% in the period, it is the sector with the highest energy consumption growth rates. This increase is directly connected with the growing share in gross value of this sector in the EU-25, rising from 68.4% in 2000 to projected 72.1% in 2030\(^2\). This increase is caused to a large part by the additional space requirements, bringing about a growing demand for energy.

Current policies for energy efficiency

Europe faces today massive energy challenges resulting from increased import dependency, decreasing supplies of fossil fuels worldwide and a clearly discernable climate change with the resulting need to cut down CO\(_2\) emissions significantly.

In the last two decades, the energy productivity increased by an average of 1.8% p.a. This development was strongly supported by a large number of initiatives by the European Union and its member states to improve the energy efficiency in the different consumption sectors.

In spite of high energy prices, significant potentials to save energy are still waiting to be realised in the different sectors of energy consumption. The saving potentials until 2020 based on 2005 figures are calculated at 27% in households, 30% in commercial buildings, 26% in the transport sector, and 25% in industry\(^3\).

In October 2006, the European Commission published the "Energy Efficiency Action Plan: Realising the Potential", presenting a large number of actual and new measures to cut down 20% of the current EU energy consumption by 2020. Five priority measures of this plan (as identified by the EU Council in November 2006\(^4\)) are expected to be adopted through the European Council as part of the “Energy Policy for Europe” in the context of the Spring Summit 2007 in Brussels. One of the priorities refers to the continued implementation and further development of a framework for energy efficiency in buildings.

Energy consumption in the buildings sector

More than 40% of the final energy consumption in Europe can be assigned to the buildings sector, of which again one third can be attributed to non-residential buildings.

The buildings sector offers the largest single potential for energy efficiency improvements. 20% of the present energy consumption in Europe could be saved by 2010 by applying more ambitious standards to new buildings and buildings which are being modernised. This would lead to savings of 30-45 Mio t CO\(_2\) emissions per year, representing a significant contribution to meeting the EU targets in the context of the Kyoto protocol\(^5\). To achieve this goal, the renovation rate in the European buildings stock is to be increased significantly.
Although the renovation rate in non-residential buildings is slightly higher than in residential buildings, leading to a quicker market penetration of new technical developments and revised building codes, non-residential buildings offer significant energy saving potentials. Measures with large energy saving potential are the renewing of technical installations, enhanced control systems for heating and ventilation, improved air conditioning as well as additional insulation for the building envelope.

**Energy efficiency policies in the buildings sector**

The goal of enhanced energy efficiency in buildings has been set out by the European Commission in several legal instruments. Among the main Community legislation for the building sector are the Boiler Directive (92/42/EEC), the Construction Products Directive (89/106/EEC), and the buildings provisions in the SAVE Directive (93/76/EEC).

The EU Directive on the Energy Performance of Buildings (EPBD) of 2002 is the latest piece of legislation to improve the energy performance in residential and non-residential buildings, both new-built and existing. The EPBD obliges specific forms of information and advice on energy to be provided to building purchasers, tenants and users. The intention is that this information and advice will help consumers to make informed decisions leading to practical actions to improve energy performance. As part of the EPBD, a Building Energy Rating (BER) certificate will be required at the point of sale or rental of a building, or on completion of a new building. The BER certificate will be accompanied by a report setting out recommendations for cost-effective improvements to the energy performance of the building. However there will be no legal obligation to carry out the recommended improvements.

The implementation of the EPBD on the level of the member states, which was originally foreseen for the year 2006, has fallen behind schedule; however, the national implementation with the introduction of the BER certificates is expected to be complete until the end of 2007 in all member states. The requirement for a BER certificate will be extended in two further steps to all new non-residential buildings and to existing buildings offered for sale or rent in 2008 and 2009.

The improved market transparency which will be achieved through the introduction of the building certificates will contribute to the necessary increase of the renovation rate in the European buildings stock.

In the context of the "Energy Efficiency Action Plan", the Commission announced as a priority action to propose a substantial expansion of the scope of the EPBD in 2009. Furthermore, the Commission intends to propose in 2009 minimum performance requirements for new and renovated buildings (kWh/m²) and for components, such as windows.
GreenBuilding is the European Commission’s voluntary programme to enhance the energy efficiency and the use of renewable energies in non-residential buildings. The GreenBuilding Programme (GBP) was initiated and is being administered by the European Commission’s Joint Research Centre (JRC).

Programme objectives

The GBP is designed to provide information, motivation, best practices, marketing assistance and publicity to owners of non-residential buildings, who are willing to reduce the primary energy consumption of their premises by more than 25%.

Overcoming of barriers

Launched by the European Commission in 2005, the GBP addresses existing non-technical barriers to the improvement of energy efficiency in service buildings, such as lack of awareness, lack of know-how and technical capabilities as well as lack of finance and energy service offerings. By providing information on energy saving technologies or horizontal issues such as energy management or financing of energy related modernisation projects, GreenBuilding assists building owners and their staff to identify the best measures for their premises.

Market development

GreenBuilding puts the focus on the identification and realisation of economic measures with payback times of less than six years. The potential for economic energy savings in non-residential buildings in Europe is around 30%, offering a huge potential for growing energy efficiency markets. While in some member states markets for energy efficiency are already well developed and networks of experienced energy service companies (ESCO) and financing institutions are established, in other regions these markets are at a very early stage.

By addressing the existing non-technical barriers and spreading information about best practice projects, GreenBuilding serves as a catalyst and incentive for the implementation of cost-effective energy efficiency measures. Information about the participating building owners (GreenBuilding Partners) as well as supporting service companies or manufacturers (GreenBuilding Endorsers) is spread to provide a “brokering service” to bring together building owners and service or technology providers.

It is the explicit aim of the GBP to make building owners aware of the huge economic potential and to inform and motivate them to reap it, thus creating a growing demand for respective services and products.

Voluntary approach

GreenBuilding complements the framework of energy efficiency legislation in the building sector on the European and the member state level. As a voluntary programme, GreenBuilding offers the opportunity to address the issue of energy efficiency from a different angle. By showing that energy related modernisation measures are good business already now – regardless of the final implementation of the EPBD – an important signal is being sent to the market. GreenBuilding focuses on the mutually positive effects for the market partners and society and strongly exploits the potential of good practice and publicity. It adds a different psychological moment, the carrot instead of the stick, and thereby improves the chances of a smooth market transformation to better building standards.
Examples of GreenBuilding Partners

**KfW Bankengruppe, Frankfurt**

Main measures applied:
Optimised façade, improved ventilation system, summer heat protection, natural lighting, night time cooling, efficient lighting

Primary energy savings: 2 990 MWh / a (-47%)
Participation Criteria

Assisted by GreenBuilding National Contact Points (NCP) in currently ten European member states, building owners as well as service providers or technology manufacturers can participate in the GreenBuilding Programme.

GreenBuilding Partners

Owners of non-residential buildings who successfully reduce the primary energy demand of their premises by 25% or more qualify to receive the status GreenBuilding Partner from the European Commission. Eligible are modernisation projects as well as new buildings. In the case of new buildings, the energy demand must be 25% below the requirements of the building code in force for new buildings. Furthermore, projects reaching back until the year 2000 (year of construction or modernisation) are eligible as well.

There are multiple promotional benefits for a GreenBuilding Partner, such as presentations of the project on the programme website and in brochures, a GreenBuilding certificate to be displayed in the respective building, the right to use the GreenBuilding logo in the PR communication and finally supporting public relations activities through the National Contact Points.

GreenBuilding Endorsers

Organisations or companies, who successfully support an owner of a non-residential building in becoming GreenBuilding Partner and who commit themselves to the promotion of the GreenBuilding Programme among their customers qualify for the GreenBuilding Endorser status. An endorser will also be promoted on the GreenBuilding website and in GreenBuilding publications and also has the right to use the GreenBuilding logo.

Typical GreenBuilding Endorsers are architects, energy planners, engineers, ESCOs, or manufacturers of energy saving equipments.

Both the GreenBuilding Partner and Endorser status is being awarded by the European Commission’s Joint Research Centre (JRC) upon recommendation of the GreenBuilding National Contact Points.
Examples of GreenBuilding Partners

La Vola, Manlleu

Main measures applied:
Optimised building envelope, heat and cold distribution by radiant floor, heat recovery systems and air preheating in greenhouse façade, high efficiency lighting, centralised energy management system, renewable energies

Primary energy savings: 113 MWh / y (Gas –40%, electricity –27%)
In order to enable the initial setting up of the necessary infrastructures in ten EU member states, the European Commission approved in 2004 the proposal for the project “GreenBuilding” in the context of the “Intelligent Energy Europe” programme (SAVE). The project covered the 2-year pilot phase of the GreenBuilding Programme 2005-2006.

Thirteen organisations from ten European countries made up the GreenBuilding consortium, among them national or regional energy agencies, university institutes and also a federation of property owners.

The consortium partners

- German Energy Agency (DE, co-ordinator)
- ADEME (FR)
- ARMINES (FR)
- ADENE (PT)
- CRES (GR)
- URV-CREVER (ES)
- Politecnico di Milano, eERG (IT)
- Austrian Energy Agency (AT)
- Jozef Stefan Institute (SI)
- Motiva (FI)
- Fraunhofer-ISI (DE)
- Fastighetsägarna (SE)
- Berliner Energieagentur (DE)

The German activities within the GreenBuilding project have been co-financed by the German Federal Ministry of Economics and Technology, the Italian activities were supported by la 220 azzurra S.r.l.

In the first part of the GreenBuilding pilot phase, the rules and procedures of participation in the GBP were defined, the GreenBuilding guidelines and technical modules were elaborated, the National Contact Points (NCP) were established, the central website and the ten decentralised websites in national language were created and the programme kick-off was prepared.

In 2006, the GBP was officially launched with workshops by the NCPs in the participating member states. The relevant target groups of the buildings sector were invited to the events. In the following months, the GreenBuilding consortium contacted a large number of building owners and other stakeholders in the buildings sector to investigate possibilities for participation in GreenBuilding.
Examples of GreenBuilding Partners

Camara Municipal de Lisboa

5 swimming halls in Lisbon

Main measures applied:
Solar thermal systems, efficient lighting, 4 way heat pumps, passive solar measures (double glazing, external shading)

Electricity savings: 2 115 MWh / y (-55% )
The Renewable Energies Unit of the European Commission’s Joint Research Centre (JRC) administers officially the GreenBuilding Programme. The JRC accepts or rejects applications for GreenBuilding Partner or Endorser status upon recommendation of the National Contact Points, is the overall contact point for all member states and also hosts an English language GreenBuilding website with information about the Programme and the up-to-date list of participants.

In ten EU member states National Contact Points have been established during the GreenBuilding pilot phase 2005-2006. A set of instruments – both on the international and on country level – has been elaborated, including websites, publications, guidelines and modules.

**National Contact Points**

In order to enable an optimum transfer of information between GreenBuilding and the potential participants from the buildings sector, the setting-up of a decentralised structure with National Contact Points (NCP) providing assistance in national language has been a main undertaking in the first GreenBuilding phase in 2005.

In each participating country, an NCP has been established. Today there are GreenBuilding NCPs in the following countries: Austria, Finland, France, Germany, Greece, Italy, Portugal, Slovenia, Spain, and Sweden.

Each NCP provides at least one responsible GreenBuilding contact person assisting building owners and service companies in their participation in the GreenBuilding Programme. This encompasses support with the rules and procedures, technical assistance by either providing access to written information (e.g. the GreenBuilding technical modules) or reference to the network of GreenBuilding Endorsers, qualified feedback on submitted written documents (Energy Audit, Action Plan, Report) and offering promotional support to the accepted partners.

**Guidelines and technical modules**

A set of concise supporting documents has been elaborated by the GreenBuilding consortium partners together with the JRC. The English versions of these documents can be downloaded from the centralised GreenBuilding website [www.eu-greenbuilding.org](http://www.eu-greenbuilding.org), translated versions of most of the documents are available on the national GreenBuilding websites.

The GreenBuilding Guidelines provide details on the participation procedures to potential GreenBuilding Partners or Endorsers. Horizontal Modules are available on the topics of Financing, Energy Audits, Energy Management and Benchmarking. In seven Technical Modules, technology related advice is being offered to building owners for the identification of cost-efficient energy savings in non-residential buildings. The topics covered by the Technical Modules are:

- Air Conditioning
- Heating
- Office Equipment
- Solar Hot Water and Heating
- Combined Heat and Power
- Lighting
- Building Envelope
The programme related internet sites were successfully used as multiple information platforms for potential and accepted partners and endorsers, buildings sector stakeholders, scientists and journalists. The English language GreenBuilding website www.eu-greenbuilding.org offers comprehensive information about the GreenBuilding Programme, including:

- Introduction to GreenBuilding
- Assistance on how to become GreenBuilding Partner or Endorser
- downloadable GreenBuilding Guidelines and Modules
- Up-to-date list of GreenBuilding Partners
- Up-to-date list of GreenBuilding Endorsers
- Best Practice Inventory
- Event announcements, news and GreenBuilding newsletter
- Complete co-ordinates of all GreenBuilding National Contact Points

By selecting the respective country flag on the front-page of the website, the GreenBuilding websites in national language of the respective country can be accessed. Although the national websites are different in layout and design, the same pieces of information are available as on the central website, adapted to specific requirements of the respective country. Depending on the type of organisation responsible for the respective NCP, GreenBuilding may be presented in connection with national activities on energy efficiency in service buildings. Examples are the Austrian programme “Ecofacility” or the German campaigns “Zukunft Haus” and “Initiative EnergieEffizienz”.

The number of visitors on the GreenBuilding websites in the first year (most websites went online late in 2005) grew steadily with the profile of the GreenBuilding programme and also connected to special events, for which the agenda and the announcement was placed on the web. The average traffic was between 3 000 and 5 000 page views per month on the national internet sites, around 5 300 on the centralised website, with peak months having almost double the normal traffic.

During the GreenBuilding pilot phase 2005-2006, around 180 000 visits with some 600 000 page views have accessed the different GreenBuilding internet platforms. Given the fact, that GreenBuilding is a new programme, these figures constitute an excellent start, underlining the relevance achieved among the public as well as the great significance of the internet for the information exchange and dissemination activities in the context GreenBuilding.
**Best practice inventory**

All GreenBuilding Partners are invited to present their projects in the GreenBuilding Best Practice Inventory. The inventory is realised as a database embedded into the central website. Some NCPs also implemented national inventories on the country-related GreenBuilding websites.

In the context of the best practice cases, information is being provided about the co-ordinates of the building owner (GreenBuilding Partner), the building with which they participate, information about financial investments and energy and cost savings, the energy concept, the technical measures applied, as well as technical details on energy related issues such as insulation, energy demand, and saved CO₂ emissions. Graphs or photographs complement the presentation. Furthermore, a printable summary can be generated for each best practice.

Since some building owners regard parts of the information requested as confidential, the decision about which information is being provided and which is not is up to the respective Partners.

By January 2007, a total of 44 Best Practice examples from eight European countries was represented in the Best Practice Inventory on the centralised GreenBuilding website.
Examples of GreenBuilding Partners

I.T.I.S. C. Zuccante, Provincia di Venezia

Main measures applied:
Improved thermal insulation of walls, roof and ground floor, substitution of old windows (frame and glazing)

Primary energy savings: 162 MWh / y for space heating (-51%)
Dissemination

As an energy efficiency promotion programme, GreenBuilding puts the focus on a wide range of promotion and dissemination measures. The objectives of the promotional activities are:

- Creating awareness about energy and cost efficiency issues in non-residential buildings;
- Promoting energy efficiency through best practices;
- Introducing the GreenBuilding Programme to the target groups (branding);
- Encouraging institutions to participate, communicating how to do this;
- Providing technical information on energy efficiency in non-residential buildings;
- Producing publicity for the programme and its participants.

A highly important aspect of the dissemination activities is the communication in national language. All media employed – be it printed material, presentations, media work or the internet – are also provided in national language by the NCPs to the target groups in the respective countries. In parallel, the umbrella communication is realised in English language.

Publications

The international GreenBuilding brochure “GreenBuilding: enhanced energy efficiency for non-residential buildings” was published in November 2006 at the occasion of the international GreenBuilding workshop in the context of the conference EPIC 2006 AIVC in Lyon, France.

The objectives of this 12-page publication are as follows:

- Introducing the GreenBuilding Programme;
- Explaining criteria and procedures to potential programme participants;
- Presenting examples of successful GreenBuilding projects from various European countries;
- Providing coordinates of the GreenBuilding National Contact Points.

Similar brochures have been elaborated on the national level, namely in Austria, France, Germany, Italy, Portugal, Slovenia, Spain and Sweden.

The brochures, which have been printed in large quantities, have been distributed among the relevant stakeholders of the buildings sector, such as municipalities, industry, service companies, real estate companies, ESCOs, engineers, planners, and architects. Furthermore, media representatives are addressed to pick up on the issue of energy efficiency in non-residential buildings by using the examples in the brochures.

In addition to the brochures, several GreenBuilding NCP – such as Sweden, Portugal, Austria and Germany – produced leaflets in national language in larger quantities to promote the campaign kick-off, campaign events or to give a quick introduction into GreenBuilding.

Presentations

The consortium partners presented the GreenBuilding Programme in the context of more than 100 national and international events, among them at the Euroace 2005 (Rome), REHVA World Congress 2005 (Lausanne), BATIMAT 2005 (Paris), European Conference on Energy Management 2005 (Milan), IECEB 2006 (Frankfurt), EXPO Real 2006 (Munich), and EPIC 2006 AIVC 2006 (Lyon).
Workshops and other events

A very important way to promote the new programme GreenBuilding was the organisation of workshops on the national level. In several countries, the programme start was linked to an official kick-off workshop.

The idea of the workshops was to invite relevant stakeholders of the buildings sector, especially potential GreenBuilding Partners and Endorsers, to a one-day event, where the GreenBuilding programme was being introduced to the public. Often supported by presentations from the third parties (ministries, banks, architects or engineers), the NCPs explained the goals, criteria and the added value of GreenBuilding and how interested parties could join the programme.

In several countries, presentations about successful refurbishment projects or information about national support schemes for energy efficiency in non-residential buildings were added. In the Slovenia, the first part of the workshop consisted of Al Gore’s documentary “An inconvenient truth”, thus presenting GreenBuilding in immediate connection to the goal of climate change mitigation.

The workshop invitations were spread in mailings in print and eMail, the announcements were supported by press releases and information on the national websites. Internet evaluations showed that these services were widely used by the target groups. With a total of 17 workshops in eight countries in 2006 and participation of up to 150 persons per event, the workshops have been very successful. In the follow-up of the workshops, the NCPs were frequently addressed by newly interested institutions, often followed by registrations to become GreenBuilding Partner.

In November 2006, a final international GreenBuilding workshop with some 50 participants was organised in the context of the conference EPIC 2006 AIVC in Lyon, France.
During the GreenBuilding pilot phase 2005-2006, the consortium partners addressed a large number of building owners and professionals to involve them in the GreenBuilding Programme. In the following are represented the results and evaluation of these efforts.

**GreenBuilding Partners**

By February 2007, a total of 52 organisations in Europe were officially accepted GreenBuilding partners with a total of 64 buildings in the programme.

**Development of participation**

The first year of the GreenBuilding pilot phase was dedicated mostly to the setting up of the necessary infrastructures in the participating countries. Early in 2006, the first GreenBuilding Partner – the City of Vienna – was officially accepted by the European Commission’s DG JRC for the renovation of the indoor swimming hall in the district of Floridsdorf in Vienna.

In the following months, the publicity activities – especially with dedicated workshops organised by the National Contact Points – was strongly intensified, which lead to a significant acceleration in bringing new partners into the programme in the second half of 2006.

The consortium partners had to introduce the completely new GreenBuilding Programme to the market within a short time frame and make it well-known among the target groups of the buildings sector. This was challenging, since some potential partners were only willing to invest time and resources into the necessary procedures after they were convinced of the programme’s significance. This significance, however, could only grow with the number and quality of organisations taking part in the initiative. It was the difficult task of the consortium to break this circle, which was achieved in summer 2006. Since then, in many – not in all – countries, GreenBuilding reached a level of publicity, which ensures a constant programme growth even after the end of the pilot phase.

**Graph 1: Development of accepted GreenBuilding Partners**
Geographical spread

In the first two years, 52 institutions officially received the GreenBuilding Partner status, which corresponds with the goal set for the programme’s pilot phase. Looking at the geographical spread of the programme participants, it is obvious, that GreenBuilding achieved a strong feedback in some countries while in other countries the participation is still small. In France and Finland no participants could be identified until the end of 2006.

In the course of the evaluation of the GreenBuilding pilot phase, the following factors have been identified as being influential for the success of the programme in a certain country:

- Level of market development: Is there already a well-established market for energy efficiency concepts and measures in the buildings sector with a significant number of market actors (e.g. ESCOs)?
- Level of awareness and know-how: Is energy efficiency already seen as a relevant issue by building owners? Do they know about the cost saving potentials? Do they know, what can be done on the technical side? Do they know whom to consult?
- Political frameworks: Do national building codes or funding schemes encourage owners of non-residential buildings to invest in the modernisation of their buildings?
- EPBD implementation: What is the attitude towards the implementation of the EPBD and the introduction of BER certificates on the national level? Is GreenBuilding seen as a chance to receive a possible add-on in the context of making a building more energy efficient, or do current uncertainties about the final EPBD implementation make building owners hesitant to consider participation?
- Intensity of promotion work on the level of the National Contact Points: Even in countries with an unfavourable situation concerning market development and frameworks, very active National Contact Point proved to be able to encourage institutions to join the GreenBuilding Programme.
GreenBuilding Endorsers

In the GreenBuilding pilot phase, 29 manufacturers or service providers from 8 European countries have been accepted officially as GreenBuilding Endorsers. Among them are large manufacturers of building technologies, energy service companies, but also engineering consultancies, energy planners and architects.

In programmes similar to GreenBuilding (e.g. GreenLight), companies were allowed to apply for Endorser status by submitting documents stating their commitment and their activities to promote the programme among their customers. This made it possible to receive the Endorser status without ever becoming involved with the concrete implementation of a project. In GreenBuilding an additional requirement was established for becoming Endorser:

While building owners are allowed to become GreenBuilding Partner on their own, a company is allowed to become GreenBuilding Endorser only after having assisted at least one building owner in becoming a GreenBuilding Partner. This rule ensured that each Endorser will have been involved directly with at least one GreenBuilding project. At the same time, becoming GreenBuilding Endorser is a more complex task; the total number of Endorsers is therefore significantly lower than that of the GreenBuilding Partners.

Graph 3: Geographical spread of accepted GreenBuilding Endorsers
In order to evaluate the impact of the GreenBuilding programme, information has been collected from the participants in various ways. As part of the mandatory energy audit and the following action plan, GreenBuilding Partners must provide data on the status of their building and the energy efficiency measures planned. In a second step, all accepted GreenBuilding Partners are invited to present their projects as Best Practice examples on the GreenBuilding internet site, including standard data about the building, technical details, as well as figures on energy consumption and CO₂ emissions. Finally, the partners are requested to assess and report about the success of the energy saving measures within one year after their implementation.

The National Contact Points consolidated these data and elaborated statistics and evaluations over the programme participants.

**Building types and owners**

During the GreenBuilding pilot phase, a strong prevalence was visible among the GreenBuilding Partners to participate in the programme with office and administration buildings. Reasons for the large share of 55% among the participating buildings are the significance of this building type in the European building stock, as well as the good comparability of office buildings and the availability of experience and standards for this type of building.

The second largest group are education buildings with 25%, including schools, universities and day-care centres. Less homogeneous building types such as production facilities have so far not been submitted to GreenBuilding.

Two out of three GreenBuilding Partners are private companies, whereas one third of the participants are public institutions (mainly municipalities and organisations under public law). While private organisations mainly participate with new or refurbished office buildings, the spread of building types is much larger among the public partners, among them administration buildings, schools, day-care centres, swimming halls, universities, prisons, police stations, court buildings and even a church.

**Graph 4: Building Types in the GreenBuilding Programme**

- **Offices**: 54%
- **Education buildings**: 24%
- **Sports facilities**: 8%
- **Hotels and restaurants**: 6%
- **Other non-residential buildings**: 8%
Technical fields addressed

GreenBuilding asks its partners to make an energy audit of the entire building to identify the technical fields with the largest potential of economically viable energy savings. Although the participants are strongly encouraged to address all the areas identified, it is also possible to concentrate the efforts on specific technical issues.

While most partners typically implemented measures in 3-4 technical areas, some partners addressed no less than 6 or even 7 technical fields in a comprehensive approach.

Improvements of the buildings’ heating systems were among the measures most frequently employed (almost 3 out of 4 partners), followed by enhanced control systems, improved air conditioning and ventilation and energy efficient lighting systems.

Due to the climatic situation, some technical fields, such as air conditioning or summer heat protection, have been addressed more often in southern countries than in the European average.
Energy and CO₂ savings achieved

The figures of the energy and CO₂ savings among the 52 participating partners with a total of 64 buildings (status February 2007), which have been provided by the building owners, have been assessed and accumulated by the National Contact Points. According to this calculation, a total amount of almost 90 000 MWh primary energy will be saved each year in the buildings of the 52 institutions, corresponding to CO₂ savings of about 22 000 tons per year. Those savings will extend over the lifetime of the implemented measures, e.g. in 20 years will cumulate to 1,8 TWh primary energy and 435 thousand tons of CO₂.

The average primary energy savings (weighted with the building size and considering all the buildings) resulted in a value of about 34%, much higher than the minimum threshold of 25% for receiving GreenBuilding Partner status.

The weighted average savings were higher in new buildings (compared to building codes or to reference new buildings) than in retrofits. In many cases savings higher than 50% have been achieved.

From the point of view of the building owners who are making the investment for the energy efficiency retrofit or for additional energy efficiency features in case of new buildings, the actions proved to be cost effective. Considering the 17 buildings for which data on investment costs were available (that is buildings from Greece, Italy, Slovenia, Portugal), assuming a lifetime of the measures of 20 years and a real discount rate of 5%, one gets the following surface weighted average values:

- Simple payback time: 3,7 years;
- Internal Rate of Return (IRR): 27%;
- Cost of conserved primary energy (at 5% real discount rate): 1,13 €cent/kWh.

<table>
<thead>
<tr>
<th></th>
<th>Primary energy consumption before GB, surface weighted [kWh/m² y]</th>
<th>Primary energy consumption after GB, surface weighted [kWh/m² y]</th>
<th>Percentage savings, surface weighted</th>
</tr>
</thead>
<tbody>
<tr>
<td>All buildings</td>
<td>360</td>
<td>245</td>
<td>34%</td>
</tr>
<tr>
<td>Retrofitted buildings</td>
<td>359</td>
<td>249</td>
<td>33%</td>
</tr>
<tr>
<td>New buildings</td>
<td>368</td>
<td>220</td>
<td>40%</td>
</tr>
</tbody>
</table>

Table 1: Relative energy savings achieved
Why GreenBuilding is attractive for its participants

As part of the evaluation of the GreenBuilding pilot phase, the National Contact Points asked institutions which expressed their interest in becoming GreenBuilding Partners about their attitude towards GreenBuilding and their motivations (not) to join the programme. The feedback, which was positive to a large extent, brought the following results:

- GreenBuilding is seen positive because it is a label awarded by the European Commission;
- It enhances the visibility of the institution on the European level;
- Great interest in the poster/plaque which can be displayed in the building;
- GreenBuilding is an opportunity to promote the own efforts for energy efficiency, in case of some Partners or Endorsers also the own products or services; participation is exploitable in marketing and public relations activities;
- Synergies are often seen or expected with other energy efficiency related activities, e.g. with the building certificates;
- The participation in GreenBuilding is motivating for the own staff;
- GreenBuilding is an opportunity to receive the positive image of a frontrunner.

The following feedback was given by organisations which ultimately did not apply to join the programme:

- The programme was not yet sufficiently well-known;
- Some organisations were afraid of the (assumed) difficulty or extent of the participant’s obligations (data collection, elaboration of action plan, reporting);
- Some were hesitant because of remaining insecurities about national EPBD implementation;
- Some thought that they would be eligible for extra financial support through GreenBuilding.
Examples of GreenBuilding Partners

Menerga d.o.o., Maribor

Main measures applied:
Building envelope with improved insulation, ventilation with 90% heat recovery, thermal activation of concrete construction, efficient lighting, intelligent central control system

Primary energy savings: 225 MWh / a (-62%)
Policy approach

In order to reach the enormous energy savings necessary to achieve the ambitious European targets concerning energy consumption and CO₂ emissions, an integrated policy approach is needed. In a mix of market oriented measures, grant policies and regulatory policies, implemented on the European as well as on the national, regional and even local level, the large potentials of energy efficiency improvements must be reaped in a common effort within the next 15 years. The buildings sector with its huge energy saving potential will play a decisive role for meeting the defined targets.

In the important case of building retrofits, there are two main determining factors which have to be strongly improved in the upcoming years to arrive at significantly lower energy consumption figures. These are the energy performance (measured in kWh per m²) and the renovation cycle (measured in percentage of buildings which are being renovated per year out of the complete building stock).

Improving the energy performance of non-residential buildings

In several EU member states, the definition of energy performance standards of buildings is realised through national legislation (e.g. the Energieinsparverordnung (EnEV) in Germany).

Lately, the European Commission also addressed this issue as a priority for new legislation on the European level. In the “Energy Efficiency Action Plan: Realising the Potential” of October 2006, the Commission proposes as a priority action the introduction of minimum performance standards for buildings in an amendment of the EPBD (see box below).

Minimum performance requirements (which are presently in place in only some European countries), are very important to bring forward a good level of energy efficiency in the buildings sector. An additional monitoring system can ensure compliance with the requirements on the national level.

Due to various reasons, often only a certain part of the cost-efficient measures is being implemented in the course of a renovation activity.

Additionally, grant and soft loan programmes connected to certain energy performance standards can have a very significant impact on the market penetration of energy efficiency technologies. Furthermore, such schemes

Evaluation and outlook

Energy Efficiency Action Plan, Priority Action 2:

Building performance requirements and very low energy buildings

The Commission will propose expanding the scope of the Energy Performance of Buildings Directive substantially in 2009, after its complete implementation. It will also propose EU minimum performance requirements for new and renovated buildings (kWh/m²). For new buildings, the Commission will also by the end of 2008 develop a strategy for very low energy or passive houses in dialogue with Member States and key stakeholders towards more wide-spread deployment of these houses by 2015. The Commission will set a good example by leading the way, as far as its own buildings are concerned.
are a good way to prepare the market for performance standards before they are introduced as a binding standard at a later point of time.

Finally, market oriented measures of information and promotion have the potential to provide an additional approach to enhancing the energy performance of buildings. By providing relevant information to the market partners and by presenting the opportunity to benefit from additional sources of know-how, publicity and the significant cost savings through more efficient buildings, building owners and professionals are encouraged to come from an attitude of “what must I do?” to an attitude of “what else can I do?”. For the sector of non-residential buildings, GreenBuilding is a successful voluntary measure to encourage building owners to improve the energy performance of their buildings.

**Improving the renovation rate**

Looking at the life-span of typical building elements, the renovation of the building stock in regular intervals is a must. Experience shows, however, that necessary renovation measures are sometimes being postponed, thus contributing to a deteriorating building stock and a slowing down of energy efficiency improvements. In order to maintain a good quality of the building stock, an average annual renovation rate of 2.5% to 3% is necessary. Today, the renovation rate in many European countries is still considerably lower.

A bundle of measures is necessary to accelerate the renovation rate in Europe. These measures include regulatory policies, e.g. the introduction of building certificates as required by the EPBD. The BER certificates will improve the market transparency concerning the energy performance of the building stock, thus contributing to an earlier modernisation of inefficient buildings.

Additional incentives for faster renovation cycles could come from national grant programmes for modernisation measures for high energy standards. Other grant programmes support the elaboration of energy audits through qualified energy experts.

An important reason for delayed building renovations lies in the lack of information on the side of the building owners and also a lack of know-how among planners and architects. This problem can be addressed by market based measures, such as information campaigns, qualification programmes for planners, or promotional programmes such as GreenBuilding.

GreenBuilding, the voluntary promotion programme for energy efficient service buildings, is complementary and supportive to regulatory instruments such as the EPBD. For non-residential buildings, GreenBuilding offers information, promotion and publicity for building owners and professionals, who are ready to implement today the energy standard of tomorrow. Furthermore, GreenBuilding addresses the complete spectrum of technical fields in which economically viable energy efficiency improvements can be achieved, thus encouraging building owners to implement the whole range of economic measures, not just some of them. GreenBuilding Partners are be well-prepared for receiving a highly-rated BER certificate for the buildings, with which they participated in GreenBuilding. Since the GreenBuilding partners are highly visible success stories, this will bring about additional public support to the introduction of BER certificates on the national level.
Projections for the services sector

The assessment of the buildings of the accepted GreenBuilding Partners brought the following results concerning energy related and economic performance:

- 34% of the primary energy consumption was saved on average, with an average of 33% in retrofit projects and an average of 40% in new buildings (compared to national standard for new buildings);
- The payback time of the applied measures was less than 4 years on average;
- The average Internal Rate of Return (IRR) exceeded 25%.

These field evaluations confirm the possibility of highly profitable energy saving investments in non-residential buildings. They may serve as examples and reference on which more ambitious policies could be adopted for supporting actions aiming at comparable results on a larger scale.

In the following, the possible impact of policies inspired by the GreenBuilding project results is being discussed. The focus lies on actions for improving the energy quality of retrofits and for supporting higher yearly renovation rates of the building stock.

In order to establish a baseline (or business as usual) scenario, a study by Mantzos and Capros published by the European Commission in 2006 was used as reference.

This study makes a set of assumptions on demography and weather, macro-economic issues, international fuel prices, and policy issues, of which the main elements are:

- The baseline scenario for EU-25 represents current trends and policies as implemented in the Member States up to the end of 2004. In particular, the baseline modelling assumes a continuation of policies on economic reform (Lisbon) and the completion of the internal energy market.
- The baseline scenario includes current policies on energy efficiency and renewables, without assuming that targets are met.

Graph 6: Sectoral economic development in Europe until 2030 (Mantzos / Capros)
The baseline does not take into account possible additional action in the Member States for living up to their Kyoto commitments, nor possible climate change policies for the years after 2012.

A CO₂ price of 5 €/t CO₂ has been assumed up to 2030 for those sectors covered by the EU Emission Trading Scheme.

The projections are based on a high oil price environment with oil prices of 55$/bbl on average in 2005 and 58$/bbl in 2030 (prices are in 2005 money; in nominal terms this could be 95 $/bbl in 2030 if one can assume that the inflation target of the ECB of 2% pa would be achieved).

Based on the above assumptions, the study comes to the conclusion, that the energy demand for services is projected to be 42% higher in 2030 than it was in 2000.

The energy demand in the tertiary sector is likely to continue growing over the projection period (+1,17% p.a. in 2000-2030).¹³

The baseline scenario of Mantzos and Capros shows the importance of the service sector both in

- generating a substantial and growing share of EU-25 GDP;
- contributing to the growth of final energy consumption in the period 2000-2030, with the highest annual growth rate among the economy sectors (roughly double than industry growth rate or transport growth rate).

Therefore a baseline or business as usual scenario with a +1,17% per annum growth in final energy consumption in the service sector in the period 2000-2030 is being assumed. Furthermore it is assumed, that carbon intensity¹⁴ will decrease from 2,23 tCO₂/toe (2003) to an average value of 2,0 tCO₂/toe (2030) of final energy (average over EU-25).

In the following, three scenarios are being presented, in which the evolution of final energy consumption¹⁵ in the service sector has been derived using the following assumptions and variables:

- Renovation rate of the buildings in the service sector:
  - Slow increase (scenario 1) with 1,0% in 2005, 1,5% in 2010, and 2,0% from 2020 on
  - Strong increase (scenarios 2+3) with 1,0% in 2005, 2,3% in 2010, and 2,6% from 2020 on

- Energy performance improvements: 33% final energy consumption saved (cf. results GreenBuilding)¹⁶

- The percentage of buildings that are retrofitted to the GreenBuilding-like standard (-33%) is assumed at 50% (in scenario 3: 100%).

The results of three of the combinations are shown in the following graphs and tables:

- Total EU-25 energy consumption continues to increase up to 2030; in 2030 energy consumption will be 15% higher than it was 2000
- Final energy demand increases strongest in the services sector due to the growing share of services in modern economies;
Scenario 1

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average savings per refurbished building</td>
<td>33%</td>
</tr>
<tr>
<td>Share of modernisations according to this standard</td>
<td>50%</td>
</tr>
<tr>
<td>Growth of final energy demand in service sector</td>
<td>1.17% / y</td>
</tr>
<tr>
<td>CO₂ Intensity (vs final energy)</td>
<td>0.17 kgCO₂/kWh</td>
</tr>
<tr>
<td>Annual CO₂ savings in 2030</td>
<td>33 MtCO₂ / y</td>
</tr>
<tr>
<td>Total CO₂ savings 2005 -&gt; 2030</td>
<td>370 MtCO₂</td>
</tr>
<tr>
<td>Total energy savings 2005 -&gt; 2030</td>
<td>185 Mtoe</td>
</tr>
<tr>
<td>Annual energy savings in 2030 (in service sector)</td>
<td>-7%</td>
</tr>
</tbody>
</table>

Table 2: Scenario with achievable savings in the European services sector compared to baseline scenario

Graph 7: European services sector, development of potential energy savings
Scenario 2

Table 3: Scenario with achievable savings in the European services sector compared to baseline scenario

<table>
<thead>
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<td>1.17%/y</td>
</tr>
<tr>
<td>CO₂ Intensity (vs final energy)</td>
<td>0.17 kgCO₂/kWh</td>
</tr>
<tr>
<td>Annual CO₂ savings in 2030</td>
<td>43 MtCO₂/y</td>
</tr>
<tr>
<td>Total CO₂ savings 2005 -&gt; 2030</td>
<td>495 MtCO₂</td>
</tr>
<tr>
<td>Total energy savings 2005 -&gt; 2030</td>
<td>248 Mtoe</td>
</tr>
<tr>
<td>Annual energy savings in 2030 (in service sector)</td>
<td>-10%</td>
</tr>
</tbody>
</table>

Graph 8: European services sector, development of potential energy savings

Renovation rate increase to 2.6%/y in 2020,
Retrofits performance: 50% of buildings with 33% average reduction of energy demand
Scenario 3

Renovation rate increase to 2.6%/y in 2020,
Retrofits performance: 100% of buildings with 33% average reduction of energy demand

Table 4: Scenario with achievable savings in the European services sector compared to baseline scenario

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average savings per refurbished building</td>
<td>33%</td>
</tr>
<tr>
<td>Share of modernisations according to this standard</td>
<td>100%</td>
</tr>
<tr>
<td>Growth of final energy demand in service sector</td>
<td>1.17% / y</td>
</tr>
<tr>
<td>CO₂ Intensity (vs final energy)</td>
<td>0.17 kgCO₂/kWh</td>
</tr>
<tr>
<td>Annual CO₂ savings in 2030</td>
<td>82 MtCO₂/y</td>
</tr>
<tr>
<td>Total CO₂ savings 2005 -&gt; 2030</td>
<td>959 MtCO₂</td>
</tr>
<tr>
<td>Total energy savings 2005 -&gt; 2030</td>
<td>480 Mtoe</td>
</tr>
<tr>
<td>Annual energy savings in 2030 (in service sector)</td>
<td>-18%</td>
</tr>
</tbody>
</table>

Graph 9: European services sector, development of potential energy savings
This simulation exercise leads to the conclusion that under the baseline scenario of a growth of final energy consumption in the service sector by 1.17% per annum, the objective of limiting the increase of the final energy consumption in the service sector and possibly stabilizing it requires conditions and policies able to support both a high renovation rate per annum, a good quality of energy related renovations, in additional to policies to mandate and/or support higher efficiency in new buildings.

Even if this appears to be a challenging endeavour, it might be eased by the consideration that the experience of the projects participating in Green Building supports the conclusion that retrofits saving over 30% of energy are technically and economically feasible. Retrofit investments might likely increase their profitability until 2030 because of learning effects and scale economies while the market for energy efficiency services develops, furthermore because of the expected increase in costs of fuel.

In summary, actions like a large scale retrofit plan would produce considerable economic saving due to reduction of running energy costs, and additional economic benefits connected with the possible creation of markets for CO2 and energy saving certificates, furthermore also local employment benefits.

This last benefit is especially underlined in the Green Paper on Energy Efficiency (see box below):

An effective energy policy means that instead of paying for imported hydrocarbons new, quality jobs are created in the EU.

A rough calculation based on the value of the energy saved from an energy efficiency increase of 1% per year for a 10-year period, shows that this could lead to over 2,000,000 man-years of employment if these investments are undertaken, for example, under proper conditions in the buildings retrofitting sector.

These estimates are corroborated by other studies. The large savings potential and the fact that the buildings sector is responsible for 40% of EU final energy consumption, make energy efficiency investments in this sector particularly interesting. The increased possibility to finance some of these investments from the Structural Funds and the possibility for Member States to apply reduced VAT and other taxes and charges can add to this interest.
The GreenBuilding pilot phase successfully managed to kick-start the GreenBuilding Programme in Europe with a good number of initial participants. Several large and well-reputed Partners and Endorsers bestow profile and significance upon the young programme. Building projects with excellent energy saving results underline the success of GreenBuilding in encouraging relevant actions.

However, a pilot phase is always a learning process, in which measures have to be assessed and improved and possibly some of the instruments applied have to be readjusted. Although promotion and dissemination already plays an important role in GreenBuilding, the consortium suggests to put an even stronger focus on promotion and marketing in the future. During the pilot phase, a lot of effort was invested in the setting-up of the programme infrastructure on the national and European level. With the elaboration of the technical modules, the aspect of providing technical assistance to the programme participants was followed intensively, especially since most of the documents were also translated and adapted to the national context.

In the work with the potential partners, the demand for the written advice of the technical modules was less often used than anticipated. Some of the partners were in command of the respective know-how themselves, many others used the support of external experts (ESCOs, energy planners) which very often became GreenBuilding Endorsers later on. So in spite of the advantage of being able to provide a certain level of technical information to the participants, this was not a very important aspect for the decision of an institution whether it would participate or not.

Instead – as it was stressed very often by the participants – the added value in terms of promotion, marketing and publicity was regarded very positively. Since this aspect proved to be of high relevance for encouraging participation in GreenBuilding, the consortium proposes to develop in the next programme phase an attractive portfolio of communication tools, from which the National Contact Points can provide offers to the programme partners. This portfolio should include the existing as well as some new elements:

- Welcome letter
- GreenBuilding leaflet with concise partner guideline
- GreenBuilding brochures with best practices (new brochure every year)
- GreenBuilding newsletter
- Nicely designed poster / plaque for the buildings of the Partners
- Promotion of success stories on the internet (Best Practices)
- Template for press releases
- Template for marketing plan (Endorser)
- PowerPoint presentations
- GreenBuilding events (workshops, road shows)
- Presentations at conferences and events
- Annual GreenBuilding Award

Further measures to ease the procedures and increase the programme impact could be:

- Online registration tool, online reporting tool
- Tool for the calculation of primary energy and \( \text{CO}_2 \) reductions
- Features (on the web, in the newsletter) on special buildings, special technologies
- Exploiting the synergies with existing national programmes

Outlook
Additional strategies to boost the participation in GreenBuilding are:

– Mass mailings with enclosures in magazines
– Engaging accepted Partners and Endorsers actively to exploit GreenBuilding in their own marketing activities (as already successfully done by several Partners and Endorsers in the pilot phase)
– Proactive contacting and invitation of well-known institutions to join GreenBuilding in order to further enhance the programme’s public profile
– Proactively involving property federations on the national level
– Communicating GreenBuilding as a chance to achieve excellent building certificates, furthermore displaying the certificates (when available) in the project presentations together with the GB certificate, thereby providing active support to the EPBD implementation

The consortium clearly sees the chance to extend the mutual benefit between the programme and its participants by the measures described, possibly even opening up opportunities for creating private co-financing for GreenBuilding.

Concerning the criteria for participation in GreenBuilding, the goal of energy efficiency improvements of 25% was seen as ambitious but realistic at the same time. Since the average savings achieved were as high as 34%, in some projects even above 50%, a more ambitious threshold than 25% should be envisaged in medium term.

One important aspect in the continuation of the GreenBuilding Programme is the further geographical extension with National Contact Points in Europe. Presently, National Contact Points exist in 10 European Member States. Furthermore, the European Commission’s Joint Research Centre serves as the contact point for all other countries. In the event of a large boost of GreenBuilding in Europe, the capabilities of JCR to process requests and applications from 15 countries without support of National Contact Points will be limited. In order to make possible the geographical enlargement with additional countries involved and intensified promotion and marketing activities, a follow-up project in the context of the EIE (SAVE) programme is strongly recommended.\textsuperscript{19}

In the case, that further co-financing through the EIE programme will not be available, most of the present consortium partners expressed their readiness to remain communicated as contact persons for GreenBuilding nationally, however financially not in the position to cover all the responsibilities of a GreenBuilding National Contact Point. The reduced profile could include only basic maintenance of the national websites and the distribution of brochures on suitable occasions. An active promotion of the GreenBuilding Programme or intensive networking without co-funding was seen as hardly possible by most partners.

Only in some countries like Austria and Germany, where the national GreenBuilding activities are linked to related national programmes (Austria: Eco-Facility, Germany: Zukunft Haus, Initiative EnergieEffizienz), regular GreenBuilding activities could be continued to a certain extent in combination with these national programmes, for which co-funding exists. However, this is only possible in a limited number of countries.

Given the fact, that the hardest part – namely to perform a successful programme kick-off – has been achieved,
the European Commission should use the great opportunity to broaden and intensify the GreenBuilding impact and to make possible a boost in the programme participation in the upcoming years through continued support in the context of an EIE (SAVE) project.

Examples of GreenBuilding Partners

Protestant Church of Stadl Paura

Main measures applied:
Renewable energies, improved building envelope, energy efficient lighting, energy monitoring

Primary energy savings: 26,4 MWh / y (-35%)
Appendix

1 ec.europa.eu/eurostat.

2 Dr. L. Mantzos and Prof. P. Capros: European Energy and Transport (2005), DG TREN.


4 15295/06 (Presse 326).


6 The traffic on the German Green-Building internet site www.green-building.de reached an all-time high in January 2006 (the month of the workshops) with more than 9 000 page visits (up from 2 700 in December 2005).


9 In Germany, the official minimum requirements are met only to the extent of 59%; Source: Forschungszentrum Jülich: Evaluierung der CO2-Minderungsmaßnahmen im Gebäudebereich. Studie im Auftrag des Bundesamtes für Bauwesen und Raumordnung (BBR), Jülich, 2005.

10 e.g. Germany: 0.8 – 1.3%.

11 e.g. the German KfW programme “CO2-Gebäudesanierung”.


13 This is in line with the evolution observed in the period 1990-2003 (Eurostat).

14 Carbon intensity: The amount of CO2 by weight emitted per unit of energy consumed or produced (t of CO2/toe or MWh).

15 Energy finally consumed in the transport, industrial, commercial, agricultural, public and household sector. It excludes deliveries to the energy transformation sector and to energy industries themselves. (Definition by Eurostat).

16 The primary energy savings obtained in the 52 buildings are the result of combinations of savings of electricity and savings of fuel. Considering only the savings of fuel there is a span of variation, with some examples having savings over 50-60% (similarly for only electricity). In conclusion, also the savings of final energy vary over a certain interval with more frequent values in the range 30 to 50%. Since the scenario analysis is founded on energy consumption data and a baseline scenario which is both expressed in terms of final energy, the projections about savings achievable with retrofits are also expressed in terms of final energy. The data provided by the GreenBuilding Partners confirm potential savings in the range of 33% or 50% of final energy, so that the figures may also support the chosen calculation model with reference to final energy consumption.

17 The report Mantzos 2006 only assumes a smooth growth of oil prices.


19 A proposal for a follow-up project with the title GreenBuilding+ was submitted to the IEEA by dena in the context of the last EIE call in October 2006.
Except for EU JRC, the organisations above represent the consortium partners of the EIE project GreenBuilding.
Supported by

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