



# EU local energy action

● GOOD PRACTICES 2008

In December 2008, the European Parliament and Council agreed a series of far-reaching proposals to help fight climate change and promote renewable energy. The 'climate and energy' package is the latest evolution in EU energy policy, aiming to transform Europe into a low-carbon economy and ensure future energy security. It aims to deliver the EU's ambitious commitments on climate change for 2020, which include reducing its overall CO<sub>2</sub> emissions to at least 20% below 1990 levels, increasing the share of renewables in energy use to 20% and boosting energy efficiency by 20%.

Policy-makers at EU and regional levels have recognised that action at the local level is essential to meeting these targets. After several years of work, 2008 saw the creation of the 'Covenant of Mayors' – a strong commitment by cities and towns across Europe to go beyond EU targets and take action. Fully endorsed and supported by the EU, the Covenant is a catalyst for effective action, with an approach based on participation of stakeholders and citizens. Enhanced co-operation between local and regional energy actors is also underlined in the agreement, with key elements being the exchange of experiences and mutual learning.

This publication aims to help disseminate good practice in local energy actions. It was produced by Kanergi, AB and European Service Network (ESN) for the European Commission Directorate-General for Energy and Transport's ManagEnergy initiative (part of the Intelligent Energy-Europe Programme).

Further information about ManagEnergy can be found at <http://www.managenergy.net>

Information on the Directorate-General for Energy and Transport can be found at [http://ec.europa.eu/dgs/energy\\_transport/index\\_en.html](http://ec.europa.eu/dgs/energy_transport/index_en.html)

A great deal of additional information on the European Union is available on the internet. It can be accessed through the Europa server (<http://ec.europa.eu/>).

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# Introduction

## Local initiatives lead the way

### A European challenge

Energy consumption in the European Union is rising, and so is our dependence on fossil fuels – principally oil and gas – imported from outside the Union's borders. At the same time, the EU has signed up to the Kyoto Protocol, committing us to reduce greenhouse gas emissions in 2012 by 8%, in comparison to 1990 levels. In November 2000, the European Commission adopted a Green Paper setting out the strategy to reduce the EU's dependence on imported energy. This was developed further by the Green Paper on Energy Efficiency of June 2005, which listed a number of options to save 20% of energy consumption by 2020 in a cost-effective way through changes in consumer behaviour and energy-efficient technologies. In 2007, EU heads of state and government adopted a binding 'Energy Policy for Europe'. This proposed an ambitious range of new targets and objectives for 2020, including: reducing greenhouse gas emissions from developed countries by 30%; improving energy efficiency by 20%; raising the share of renewable energy to 20%; and increasing the level of biofuels in transport fuel to 10%.

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Whilst action at EU and national levels is a vital part of realising these objectives, without action at the local level there is no chance that they can be achieved. The drive to improve energy efficiency requires end-users to examine their energy consumption and consider means of reducing it – but without reducing their standards of living. Initiatives such as installing insulation or more efficient heating/cooling equipment, or simply ensuring that lights and equipment are switched off when not in use all bring savings in energy consumption, and reduce the cost of bills. Increasing the use of renewable energy sources is often appropriately tackled at local level. Individual installation of photovoltaic panels to capture solar energy, or district heating plants fired by biofuels, or local wind farms to provide electricity to an area, are different examples in which local communities can commit themselves to using renewable energy.

Local – or individual – initiatives are critical to achieving the EU's targets in the energy sector. The more such initiatives are taken, the closer we come to

meeting our commitments. But if local citizens do not take up the challenge, we cannot reach our objectives. Certainly there is an initial investment that needs to be borne, but in the longer term these initiatives will pay for themselves in cost savings, in addition to reducing environmental damage.

### Energy agencies as local facilitators

Information and encouragement are at the heart of successful local initiatives to encourage take-up of energy efficiency and renewable energy use. Individuals, organisations and companies which stand to benefit from such measures often do not have the resources to investigate the possibilities and, therefore, do not consider taking them up. To help provide local citizens and organisations with the information and encouragement needed, the European Commission has supported the creation of local energy agencies across the EU. These are set up by public authorities (regional or local authorities made up of elected representatives) and partner organisations, although the agency itself must be established as a separate legal entity. The role of energy agencies is to promote and disseminate good practice in the areas of energy efficiency and renewable energies.

Achieving the European Union's ambitious goals for improving energy efficiency and increasing the share of energy from renewable sources cannot be left to governments and utilities alone. If these goals are to be reached, individuals – householders, companies, organisations – need to make choices, and take responsibility for their own energy use. Local energy agencies are about informing and encouraging local citizens to take these decisions, so that local actions bring direct benefits to local people. Ideas for local initiatives are often simple, and have already proved their worth elsewhere, but successful implementation requires commitment and resources.

### The European network of energy agencies

Today, there are some 400 energy agencies within the EU and new agencies receive support on a regular basis, through the Intelligent Energy – Europe programme. EU funding is used to get energy agencies

up and running, and lasts for a maximum of three years, beyond which the agency is expected to be viable. In principle, EU funds may cover up to 50% of an agency's budget in the first three years. The remainder of the budget comes from the local authority and other public or private partners. In many cases, an energy agency will generate funds from its activities which can then be reinvested in its work. Each energy agency works with local people in its area. Given that these local citizens are directly responsible for more than half of all final energy consumption in the EU, the focus of energy agencies is on disseminating good practice in demand-side management to consumers. Good practice may come from all over Europe and beyond, although in many cases the details need to be adapted to different local contexts. The need to access as wide a range of examples of good practice as possible on behalf of local citizens means that local and regional energy agencies across Europe need to communicate and co-operate with each other.

### **The ManagEnergy initiative**

To support the many energy agencies operating across Europe – as well as other organisations working in the energy field at local and regional levels – the Commission is funding the ManagEnergy initiative. ManagEnergy's primary aim is to facilitate the sharing of information. It does this through its website and helpdesk, and through events and publications, by providing a forum for the exchange of ideas and experiences. In particular, ManagEnergy supports the collection and dissemination of good practice throughout the network. It also helps organisations find partners to implement projects, and provides information on EU policies in the energy sector and on funding opportunities.

### **Exchanging good practice**

The basis of the ManagEnergy network is exchanging ideas and experience between local actors. Schemes which have worked well in one situation may fit in well in another, or may work with some adaptation, or may not be suitable for a given context. The essential basis for exchange of good practice is circulating the available information to as wide an audience as possible. People's different reactions to ideas mean it is essential that as many local actors as possible have access to good practice examples: whilst one person may not be able to envisage a scheme in their own

situation, their colleague may be able to visualise it clearly. Equally important is the ability to contact a counterpart who has the experience of implementing a scheme, and can discuss informally the benefits and difficulties in implementation, as well as the key criteria for success.

ManagEnergy provides a range of information channels for the exchange of dissemination of good practice, of which this brochure is just one. This brochure is the 4th in a series entitled 'EU Local Energy Action – Good Practices'. The previous reports can be downloaded in PDF format from the ManagEnergy website, which also includes a searchable listing of more than 1,000 case studies and other documents. The more people who see these examples the more chance they have of being replicated in other parts of Europe. Whilst the details would undoubtedly change when implemented in a different context, the principles will remain the same – not just the design of the scheme, but its results as well.

### **Selection of case studies**

This brochure contains just 12 examples of good practice from energy agencies across Europe. Each has been validated by the European Commission against a set of objective criteria, and they have been chosen for their significant contribution to the promotion of energy efficiency and/or renewable energy use, and for their strong possibilities of replication. The selection in the following pages demonstrates the wide variety of spheres in which energy agencies operate, from small rural districts to large cities, and in Member States of varying sizes and historical energy policies and infrastructures. Furthermore, different agencies have chosen to work with different target groups. Some have worked with individual householders, some with companies, some with whole villages or districts, some have gone straight to young people in schools to promote energy efficiency, and some have worked directly with public authorities to change policies and oversee their implementation.

The examples of good practice in the following pages represent a wide variety of approaches, and all of them could be replicated elsewhere. But there are many other approaches which could be taken, and this brochure is meant to stimulate thought rather than provide all the answers.



# Changing **energy usage** protects **churches** and the **environment**

## Energy efficiency in churches

Ethics & Energy, Sweden

In 2004, the organisation Etik & Energi (Ethics & Energy) was created to help congregations of all faiths to conserve energy and become more energy efficient. The Lutheran Church of Sweden alone owns more than 20,000 buildings, the majority of which are heated using traditional fossil fuels. There is therefore a potential for energy savings.

### The aim of the scheme

Working with a network of religious bodies, Ethics & Energy promotes the use of renewable energy, energy efficiency and energy conservation in religious buildings in order to cut costs and protect the environment. By increasing the use of renewable energy sources and decreasing energy consumption levels, churches can minimise the impact of soaring fuel prices, help prevent climate change, and play a part in the better preservation of these historic buildings and the cultural treasures that they house.

parishes save money and also learn about their buildings' energy systems and consumption. An Ethics & Energy's energy conservation expert then recommends improvements that can be made in each building. The suggestions may include anything from installing an entirely new heating system to something as simple as replacing incandescent light bulbs with compact fluorescents. The employees and volunteers who use the buildings are then asked to review the recommendations and add any suggestions of their own.

### The partners

Ethics & Energy is a not-for-profit organisation that advises congregations, church organisations, and people of faith in local communities. It collaborates with experts on energy conservation, the preservation and heating of historic buildings, renewable energies, the environment, and other relevant topics. Around 50 parishes and five dioceses have become members and, in the future, personal memberships will also be available.

Education plays an important role in the scheme and all employees and volunteers receive a day's training on energy issues to learn more about sustainable development, responsibility for the local and global environment, energy conservation and cost-cutting.

Each parish then creates a plan of action for the coming year, deciding which investments are to be implemented and setting personal goals for conserving energy. Each year these action plans are reviewed and new goals set for the next year, functioning as an efficient energy management system.

### How it works

Parishes join the association and pay a membership fee based on the number of buildings they own. Members follow a three-year programme, which begins with an energy audit, carried out by the parish with support from Ethics & Energy. By conducting the survey themselves,



Ethics & Energy produces a monthly newsletter, and provides information about government subsidies and other benefits.

### Could it be repeated?

This project, contributing as it does to tackling the energy problem, is particularly relevant for other countries as well. Reducing energy consumption concerns everyone, and the church, with its important role in society in all European countries, can play an important role in changing the ways in which we use energy.

Important lessons to remember when setting up such a scheme include the need for education: teaching people about energy and the environment is vital. In addition, it is not always necessary to make expensive changes; big savings can be achieved just by using existing technologies more efficiently. It is particularly important to focus on how to decrease the amounts of energy used before making changes to the supply.



### The results

Changes made vary from parish to parish according to their energy needs and use. An example that shows the type of results being achieved is the Karlstad diocese, in central Sweden, which consists of 156 parishes with around 600 buildings, 75% of which are heated by oil or electricity. The Ethics & Energy programme estimated that efficiency could be boosted on average by 30%, meaning a similar saving in energy costs. The total payback time for all of the recommended changes is about six years.



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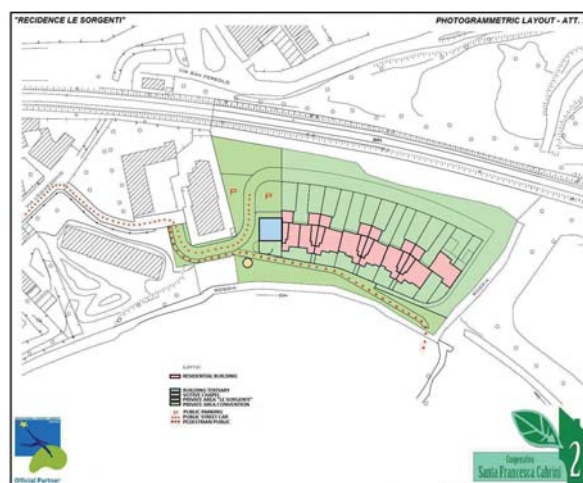
## An **eco-home** for an energy-efficient future

**“Residence Le Sorgenti” – a house to benefit the city**  
Cooperativa Santa Francesca Cabrini Due, Lodi, Italy

Le Sorgenti is an eco-sustainable housing development in Lodi, in the Italian region of Lombardy. The project is to be exclusively powered by renewable energy sources with high energy efficiency. The development will be built taking into account the environment and local community where it is located.

### The aim of the scheme

The underlying concept of the project is to create a self-sufficient housing block running on renewable sources of energy, built to serve and fit into the environment where it is located. It aims to help the environment through the reduction of CO<sub>2</sub> emissions, the autonomous production of energy, and increased sustainability. Locally sourced resources are to be used when possible in order to reduce transport mileages and to boost the local economy. The community will also be involved through education and information initiatives.



### The partners

Residence Le Sorgenti is the brainchild of the Cooperativa Santa Francesca Cabrini Due, a co-operative building company created in 1987 to ease the purchase of new houses for young couples, elderly people and families in the Fanfani district of Lodi. Since then it has built two housing developments in the area on a non-profit basis.

This project is co-financed by the Banca Popolare Etica (30% of the total cost), with the remaining 70% of the expected €6,100,000 cost to be met by the Cooperativa's partners. These partners include the Sustainable Energy Europe Campaign 2005-2010, the Italian Ministry for Environment, and Legambiente.

### How it works

The residential complex will consist of 14 family homes and a business centre, and will be built to high-energy efficiency criteria. In its

planning, efforts have concentrated on lagging and thermal insulation to save energy and boost efficiency. Natural materials are to be employed as widely as possible, including roofs and attics made of wood. The houses are designed to blend in with local architectural styles and will have large private and common outside areas, in a modern reinterpretation of farmyard living. The development will produce all of its own energy, including water heated through ground-source heat pumps and solar thermal panels, as well as recovering and reusing rainwater.

### Could it be repeated?

One of the most important elements of the design of Le Sorgenti is the use that it makes of the resources and products of its location. In order to replicate the project it would therefore be necessary to identify suitable renewable sources in the relevant area to guarantee the energy autonomy of the development.





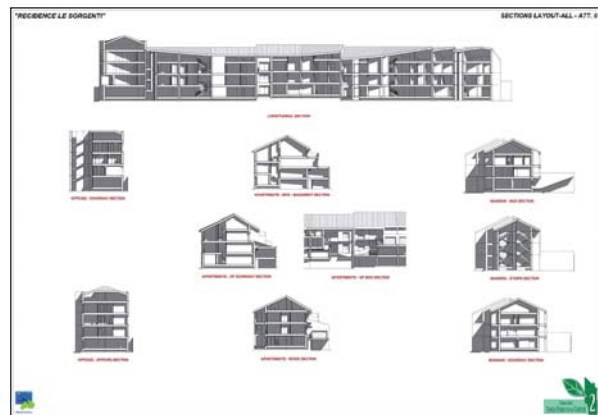
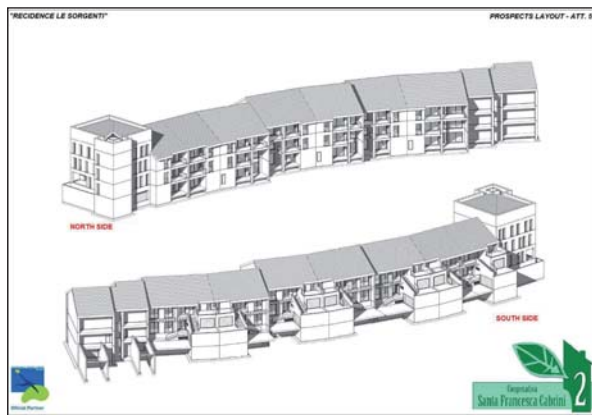
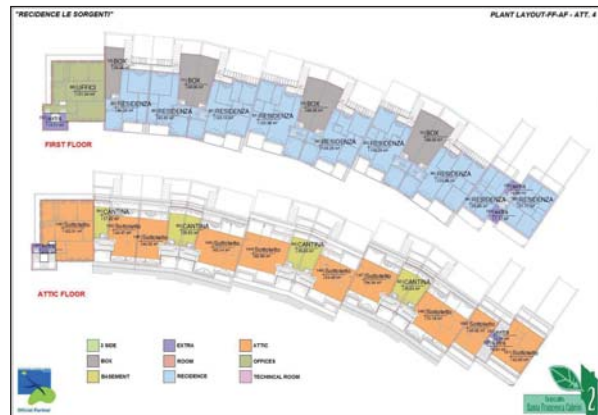
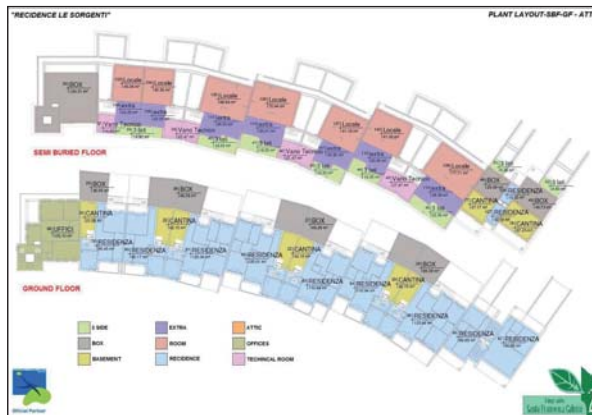
Each area will have its own unique solution to the problem of energy provision, making use of local resources, helping the region's economy and changing the way that people think about housing.

## The results

In terms of energy savings, the project is expected to cut 114 tonnes of CO<sub>2</sub> emissions and 230,396 kWh of energy each year, amounting to an approximate annual financial saving of €20,000. The cost of living in

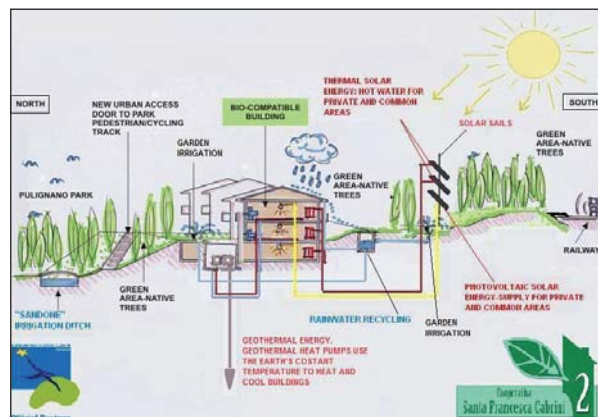
the development will therefore be 10% cheaper than average market prices.

The scheme has caught the attention of the public both locally and further afield in Italy. Presentations on the development have been held in Lodi itself, as well as in Florence and Venice. Throughout the construction, process information days will continue to be held to educate local residents about the aims of the project.



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## New energy for old blocks

### Refurbishment of the energy installations in a housing complex

Managimm – Modulo architects, Belgium

Renovating old heating and energy systems in large buildings can bring big environmental and financial benefits. However, in blocks with many owners, the finances, administration and logistics can get complex. Working with architects, local authorities and energy specialists, the heating and hot-water systems in a large apartment complex in Brussels were overhauled using renewable and energy-efficient technologies – demonstrating that such large-scale projects are possible.

#### The aim of the scheme

La Sauvenière is a private housing complex in Brussels with over 350 apartments and 600 inhabitants spread across 13 blocks. Its heating and energy systems, installed in the 1980s, were outdated and inefficient. The renovation involved the fitting of a centralised combined heat and power (CHP) system fuelled by vegetable oil – replacing four old gas-fuelled boilers – and the installation of a solar power collection unit with 250m<sup>2</sup> of roof-based panels. The new systems offer the potential for big savings – both in terms of environmental impact and running costs.

The project, which started in 2005, aimed to provide a model for owners, authorities and energy experts working together on renewable energy and efficiency projects in multi-owned properties. It was important to show that work could be carried out with minimal disruption to the occupants and ensuring continued energy services.

#### The partners

The project was initiated by a syndicate of the owners from the housing complex. Total investment amounted to €490,000, raised through private investment and subsidies from local regional and central government (which totalled €130,000).

Two Brussels-based firms organised the project – building management consultancy

Managimm and architects, Modulo. All stages of the project involved consultation with the owners, local authorities and outside experts. Different technologies were assessed and decisions were reached through voting by the owners' representatives.

#### How it worked

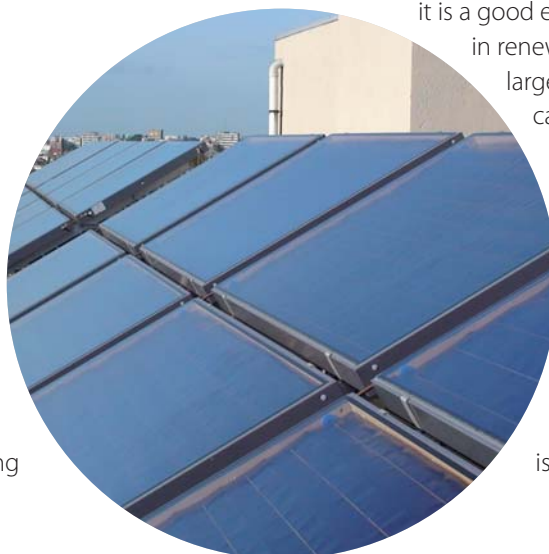
There were several stages:

- Energy consultants carried out a technical survey;
- Different contractor proposals were evaluated. The board of owners approved the final choice;
- Building and environmental permits were granted from the local authorities;
- Installation was carried out in phases, ensuring uninterrupted energy services for the buildings;
- Finalisation of the project included monitoring and evaluation of the overall installation.

#### Could it be repeated?

The architects in charge of the project believe that it is a good example of how investment in renewable energy in existing large-scale housing complexes can be both economically and environmentally sustainable.

They highlight the individual characteristics of each complex that need careful consideration in such a project – ownership, management, and energy production technologies. Other issues include:



- The amount of money to be invested;
- Overcoming uncertainty from the building managers about new technologies and if the maintenance would be increase.

They stress the vital role that local authorities play in financial and administrative support.

### The results

The amount of gas used for heat production is much lower than before. Annual savings through reduced gas consumption and efficiency from the new bio-fuelled boiler total €98,865. There are also substantial environmental benefits, cutting CO<sub>2</sub> emissions by 220 tonnes per year – a 73% reduction.

The solar system cuts CO<sub>2</sub> emissions by 40 tonnes per year, while lifetime savings will amount to around 1,000 tonnes. The cost, when subsidies are taken into account, comes to just under €250 per apartment.

The results have been so good that Managimm is now planning to install another 700 kW heat generator fuelled by vegetable oil to provide additional heat in winter.

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# Renewable energy for Europe's homes

## RESINBUIL, Agencia Provincial de la Energía de Burgos, Spain

Residential housing currently accounts for 40% of the energy consumption in the EU. The RESINBUIL project aims to improve the performance of the sector by promoting small-scale renewable energies. It looks to overcome barriers that exist to greater take-up of such technologies and create wider public awareness. Efforts are targeted at regions with low levels of renewable energy take-up and cover a wide variety of climatic, social and economic conditions.

### The aim of the scheme

The overall objective was to increase the use and installation of small-scale renewable energy (RE) technologies in homes, especially solar and biomass. Promotion, training and market-based actions were all undertaken, as well as analysis of the current use of technologies in each area and the legal, technical and training barriers that existed at the local level.

The areas involved in the project, in operation from January 2006 to March 2008, were: Burgos (Spain), Trapani (Italy), Pomurje (Slovenia) and Harghita (Romania).

### The partners

There are eight partners from the four regions: Spain – Burgos Energy Agency (AGENBUR), University of Burgos (UBU), ABASOL (local installer) and the Business Incubator Centre of Burgos (BIC Burgos); Italy – Trapani Energy Agency (APEA-Trapani); Slovenia – Sinergija Development Agency and RE-ING (local installer); Romania – Harghita Energy Agency.

The budget for the 26-month project was €607,603, half of which was co-financed by the European Commission through the Intelligent Energy Europe Programme.

### How it worked

The consortium followed a management plan that was developed by the Burgos Energy Agency (the project coordinator)

together with the other energy agencies. Assessment was done by the University of Burgos on a regular basis and reports submitted to the IEE (Intelligent Energy Europe programme) every six months.

The main lines of action in each region were:

- Analysis of the current legal, technical and market barriers to renewable energies and the creation of local strategies for the marketing, promotion and training of small-scale RES appliances;
- Market initiatives included the preparation of local regulations on energy efficiency in buildings, going beyond European and national standards and facilitating commercial agreements between SMEs and local banks with the energy agencies as mediators;
- Awareness-raising activities included a four month-long campaign, permanent renewable energy exhibitions in Pomurje, Trapani and Burgos and workshops in the four participating regions aimed at specialised audiences;
- The development of two academic courses for renewable energy technicians, including a nine-month Master's level course at the University of Burgos and a distance-learning course for students from Slovenia, Italy and Romania;
- Dissemination included a website in the six participating languages (EN, SP, IT, SL, RO, HU), a newsletter and articles and conferences.





### Could it be repeated?

Transferability was a primary concern in the development of the project and the coordinators are confident that their model can be applied in other EU areas. Being based in four different regions enabled the development of a 'versatile and inclusive' model for using small RE applications in the residential building sector.

Activities were designed to ensure an increase in the use of small RE applications and achieve high-quality permanent training for the sector.

The project incorporated direct beneficiaries, allowing the model to be instructive, inclusive and sufficiently supported by technical data.

The project organisers stressed the role that communication plays in the success of an international project such as this one. Partners were in close contact and gained much from mutual sharing of experiences. The project's principal activities will be disseminated in several different languages.

### The results

The project has already noted a significant boost in the instalment of small-scale RES applications in the residential sector in each region.

In the medium/long term the following results are expected, with some already being achieved:

- Creation of the conditions for the easier application of the EU Buildings Directive in the participating regions;
- Increasing the share of domestic RE technologies by 100% within three years of the project's end, and a 15-20% increase in sales of the small RE applications;
- The project directly stimulates the general increase in the rate of the energy production from RE sources, especially through solar panels (thermal and PV);

- Up to 40 jobs are expected to be created in the four participating regions within five years. More than ten firms have contracted interns to work on the design of installations of RES in buildings;
- Increased interest in RE technologies from architects and engineers. The construction sector, meanwhile, remains less keen on renewable energies.



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## Sourcing **heat for housing** associations

### Installation of ground-source heat pumps in social housing homes, Penwith Housing Association, Cornwall, UK

One of the greatest challenges concerning CO<sub>2</sub> reduction in the housing sector is to reduce the emissions from the vast number of existing homes that cannot use high-efficiency gas boilers because they are off-grid. This project was the first project in the UK to fit ground-source heat pumps (GSHPs) to a group of existing social housing homes.

#### The aim of the scheme

The project, which operated from 2002 to 2004, involved retrofitting 14 bungalows with heat pumps connected to vertical ground loops, providing affordable space heating and hot water, with low levels of carbon emissions.

It aimed to:

- Demonstrate that ground-source heat pumps could provide a renewable energy solution for space and water heating in fuel-poor homes;
- Identify and solve the technical problems associated with fitting ground-source heat pumps in existing homes;
- Give residents the choice of the technology to be used in their homes and assess the acceptability of a renewable energy system to end-users.

#### The partners

Penwith Housing Association initiated and managed the project and building-related design. EarthEnergy, a geothermal energy company, acted as a consultant for GSHP system design and managed the installation.

Powergen, part of E.ON energy group, supplied 'HeatPlant' kits and technical support.

Cornwall Sustainable Energy Partnership managed public relations and publicity.

Total funding was €233,000, with €102,000 from the Clear Skies Programme, €37,000 from Penwith District Council and €94,000 from Penwith Housing Association.

#### How it worked

The process began in 2002. At that time, GSHP technology had been shown to work in new-build

homes in the UK. Penwith Housing Association completed the first social housing new-build project to include them in 1998. However, very few ground-source heat pumps had been fitted to existing houses in the UK.

The idea of fitting GSHPs to existing homes had been a theoretical possibility for some time, but the logistics of producing a replicable and affordable method of installing them in many homes had not

been addressed. The site, Chy An Gweal, was ideal to demonstrate the potential for a renewable energy technology to solve this problem. Off the gas network, the residents struggled to cope with solid-fuel heating, and whilst the homes were well insulated, the heating system still had high running costs and CO<sub>2</sub> emissions.

By June 2003, Penwith Housing Association obtained a grant offer for the project from the Clear Skies programme and the design and contract preparation stage started. A number of key decisions were made:

- Vertical borehole systems were chosen as the best



means of installing ground loops to allow installation in small gardens;

- Heat pumps were to be installed in small purpose-built enclosures outside the dwellings. This avoided loss of internal space in the small homes;
- Heat distribution inside the homes would be by high-water-content radiator systems. The systems were designed to include the special hot-water cylinder supplied with the Powergen HeatPlant kit, which delivers 100% of the hot water system requirements.

Alongside the design process, contracts were arranged for drilling, groundwork and heat-distribution systems. The installation work was carried out between January and July 2004.

### Could it be repeated?

Before this project there was no practical experience in the social housing sector of drilling boreholes in close proximity to occupied homes, and the viability of the technology to deliver reliable heating had not been proven. It was also not known if this technology would be acceptable to the occupiers of the homes. The project demonstrated that all of these challenges could be met successfully.

A number of technical lessons were learnt from the project. It became clear that installing plumbing systems to suit ground-source heat pumps was not unduly different to conventional heating systems. However, the challenges for a social housing landlord in employing a drilling contractor were considerable.

There was therefore a question mark against the likelihood of other social housing providers being willing to replicate the procurement method used for this project. The Powergen HeatPlant scheme has been changed and it now includes complete installation of the ground-source heat pump and all groundwork.

This effectively removed the most significant element of risk from future projects, and was perhaps a turning point in establishing the viability of GSHP technology in the UK social housing sector.

There is a need for plumbing and heating engineers to familiarise themselves with the operating characteristics of GSHP systems, but once this has been done the plumbing and heating installation process for

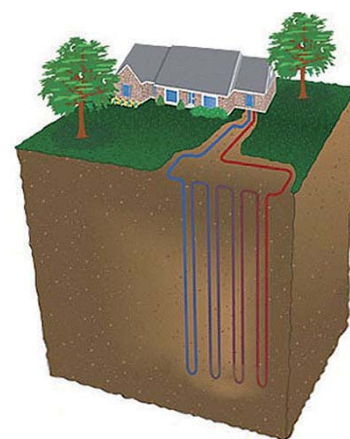
radiator systems involves no greater challenges than for fossil fuel systems. However, there is a need for an expert installer, particularly for assessing the suitability of ground conditions at proposed sites and to design the ground loop correctly.

### The results

The project has proved that ground source heat pumps can deliver space and hot water heating with low CO<sub>2</sub> emissions at an affordable cost.

The project has encouraged other social housing landlords to install ground source heat pumps. Over 25 housing associations and local authorities have GSHP installations either completed or in progress, with around 700 systems running or being installed.

Cornwall leads the UK in expertise in this sector. The project has also won several regional and national energy and building awards, which have done much to raise awareness of the technology.



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## Tackling **energy consumption** at **regional level**

### **Energy in Minds! – sustainable energy use on a regional scale**

**Energy agency of the Zlín region, Czech Republic**

Energy in Minds! is an international project targeting the reduction of energy consumption from fossil fuel sources. In the Czech city of Zlín, the scheme is constructing new low-energy-use family houses and refurbishing existing buildings, including the installation of new renewable energy sources. Communication and co-operation with homeowners, citizens, companies and public organisations is an important part of the project.

#### **The aim of the scheme**

Energy in Minds! aims to reduce consumption of energy from carbon-intensive sources in the city of Zlín, without negative impacts on living standards. This is to be tackled in three ways:

- Increasing the use of renewable energy sources, especially solar energy and biomass;
- Reducing energy loss through the refurbishment of buildings, the construction of new low-energy-use houses and the reconstruction of the district's heating system;
- Information and education campaigns.

#### **The partners**

Energy in Minds! is an international project financed by public and private sources. EU subsidies represent €1,730,000, split between the cities of Neckarsulm (Germany), Weiz-Gleisdorf (Austria), Falkenberg (Sweden) and Zlín (Czech Republic).

In Zlín, partners include Teplo Zlín, which supplies heat and hot water in the central part of the city, the Green Housing Association and Ekosolaris Kromeriz, which supplies solar-thermal and photovoltaic systems.

The Energy Agency of the Zlín region gives advice on efficient energy use and renewable energy sources; arranges meetings between important suppliers and consumers; updates the renewable energy sources catalogue; and

monitors, evaluates, and publishes the results of the Energy in Minds! project.

#### **How it worked**

As an initial step, the area of the project was defined, with energy checks made on all office, private and industrial buildings to identify the least energy-efficient buildings, and companies and home owners in the area were invited to join the project.

Then the first subprojects were carried out, including installing better thermal insulation and new windows into existing buildings. In addition, solar heating systems for combined heating and domestic hot water were fitted in several family houses and commercial buildings and six small- and two large-scale photovoltaic systems were installed in the demonstration area.

A large number of other subprojects were carried out, including the installation of a fermentor for reprocessing biodegradable waste in a municipal waste depot. The plant can be used for reprocessing bio-wastes like waste biomass, sludge from the sewage plants, kitchen and other organic waste.

Promotion of new energy-saving technologies is a very important part of the Energy in Minds! project. An eco-settlement is being built by the Green Housing Association in the north-west of the area, composed of





low-energy earth-sheltered houses, one of which is a training centre for study visits, mainly for schools from the region.

### Could it be repeated?

The project area is a diverse one and includes family houses (old and new), multi-apartment buildings, and industrial and commercial buildings. Due to this heterogeneity, the experiences of this project could be applied in a wide spectrum of built-up areas.

In general, co-operation between commercial and municipal organisations was straightforward, due to their experience in financial and administrative procedures. Complications occurred when communicating with homeowners' associations in multi-apartment buildings. Their members are often afraid of high investment costs and administrative complications and it can be difficult to communicate with them.

The most important advantage of the project Energy in Minds! is information sharing. The objectives and results of the project are published in regional media and study visits to new low-energy houses present aspects of life in this type of building to citizens. Local



construction companies benefit from learning how to build low-energy houses or install thermal insulation in existing buildings. Regional public administrations also gain from their experiences of implementing new ecological legislation.

### The results

Concrete outcomes so far include the installation of six photovoltaic (PV) systems in private family houses (5 kWp each) and two large-scale PV systems (40 and 550 kWp) in commercial and public buildings. The fermentor plant is able to reprocess biodegradable wastes into a certified combustible compost, with a capacity of 1,500 tonnes of biodegradable waste and an output of 900 tonnes of biomass fuel. Combusted in the centralised district heating plant, the energy yield is approximately 2.88 GWh/year.

The optimisation of the heat and domestic hot water supply in the conurbation of Podhoří has resulted in savings of up to 10% for heat, and 38% for electricity. Additional actions to improve energy efficiency in the community include the refurbishment of 12 family houses, 120 apartments in multi-family houses, one public, and four office buildings, with the goal to reduce the energy demand for heating by a minimum of 50% compared to before the refurbishment and 30% below the current national standards.



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# Giving **SMEs** the **power to change**

## Energy Gain, Lidköping municipality, Sweden

Individually, SMEs do not have a huge environmental impact, but collectively their ecological footprint is massive. Lidköping in Sweden is raising awareness among local small and medium-sized enterprises (SMEs) of the environmental and business benefits of better managing their energy use.

### The aim of the scheme

The Swedish city of Lidköping launched its Energy Gain programme to raise awareness among local enterprises of energy-related issues and to help them find more environmentally friendly energy options. Funded equally by the municipality and the Swedish Environmental Protection Agency, Energy Gain aimed to train at least 100 SMEs from a variety of sectors, including manufacturing, agriculture, real estate and retailing and encourage them to enter voluntary energy agreements.

### The partners

- Lidköping municipality
- The Swedish Environmental Protection Agency
- Local business-support organisations and associations, such as Miljöpunkten, a network for business-driven environmental development.

### How it works

As part of Lidköping's efforts to slash its area's CO<sub>2</sub> emissions by 25% (50% for local authority bodies) by 2010 compared with 1990 levels, the town of 25,000 inhabitants has decided to target local businesses.

The Energy Gain programme, which was set to pass its target of 100 SMEs, is divided into two distinct components: educational and practical. Delivered through seminars and study visits, the training focuses on energy use and is tailored for each sector.

For the practical component, the SMEs are helped to carry out an audit of their energy use and using that

information to develop a strategy for energy-efficiency measures and switching to renewable energy.

The Lidköping municipality put a lot of effort into stimulating interest and confidence in the project in its initial phase. In addition, it developed tools to facilitate the practical work before the first training rounds began.

### Could it be repeated?

Lidköping municipality has declared Energy Gain a success. A key factor was close co-operation between the municipality and local businesses, particularly through the representative organisations.

Recommendations for other local authorities wishing to launch similar programmes include:

- The use of existing networks and marketing channels;
- Developing mechanisms for the exchange of experience and knowledge;
- Combining theory and practice;
- Easy-to-use and versatile tools;
- Ensuring 'buy-in' and commitment through voluntary agreements.

### The results

- A set of tools to help SMEs draw up energy action plans;
- A training method has been developed and tailored for several groups of SMEs: manufacturing companies, workshops, agricultural enterprises, real estate companies, groceries, supermarkets and automotive retailers. The first evaluation shows that the vast majority of the participants are content with the training;



- By November 2007, 86 companies had completed the training and received the action plan tools. The programme was on track to surpass its objective of reaching 100 companies;
- Platforms for the discussion of energy issues have been created for nine different business sectors, enabling employees in charge of energy issues to exchange knowledge and experiences;

By November 2007, 50 companies had already gained knowledge of their own energy situation through individual site visits and had created energy plans.



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## The road to efficiency

**Tyne and Wear Freight Partnership,  
Tyne and Wear Local Transport Plan Core Team, UK**

Developing a strategy to improve the efficiency, safety and sustainability of freight movement can reap both financial and environmental rewards. The Tyne and Wear Freight Partnership brings together stakeholders to understand and address the challenges faced by the freight industry in this area of north-east England.

### The aim of the scheme

The partnership promotes a safer, more sustainable and energy-efficient freight industry. From a financial perspective, the aim is to reduce freight distribution costs and improve operational efficiency by disseminating information and working together to find more efficient routes and road networks, reducing operator miles. On a technical level, the intention is to facilitate the efficient movement of goods traffic in the Tyne and Wear conurbation, decreasing route mileages and increasing energy efficiency.

### The partners

The scheme brings together operators, industry representatives, local authorities, the Highways Agency and local key stakeholder groups. The annual costs of the project, which in the most recent financial year amounted to £95,500 (€133,537), are covered by six Local Transport Plan (LTP) partners: Newcastle City Council, Gateshead Council, Sunderland City Council, North Tyneside Council, South Tyneside Council and the regional passenger transport executive Nexus.

Organisations who regularly attend the quarterly meetings include AG Barr, the Co-operative Group, Elddis Transport, Government Office North East, the Freight Transport Association, the Road Haulage Association, and the Highways Agency.

### How it worked

The partnership was established following government guidance set out in 'Sustainable Distribution: A Strategy', which promotes the development of partnerships between local authorities, the freight industry, business communities, residents and environmental groups. The first step was a study into the nature of freight in the area which provided a solid foundation for the development of a realistic strategy and action plan.

Amongst the tasks undertaken in the first year were establishing freight communication links, including quarterly meetings and a newsletter, and producing and marketing an advisory freight routing map. Longer-term aims included the promotion of driver training programmes and an assessment of the case for the development of a Freight Consolidation Centre.

### Could it be repeated?

The partnership has been successful in bringing together a range of organisations, including transport operators, industry representatives, local authorities, the Highways Agency and key local stakeholder groups in actions to improve the sector's efficiency, safety and sustainability. All elements could be replicated elsewhere in Europe. Key elements for a successful freight partnership are:

- Initial research undertaken with operators, both within the area in question and elsewhere;





- Engagement with transport operators, industry representatives, local authorities, the Highways Agency and key local stakeholder groups;
- Identification of a clear action plan, focusing on the delivery of tangible outputs;
- Sufficient resources and expertise;
- Good communication between the partnership and a wider audience, using newsletters, press releases and the internet;
- Regular progress reviews and consultation on work already under way and future actions.

## The results

Although it is difficult to measure progress in kWh saved and costs reduced, the scheme has brought about a number of concrete changes since its inception in 2005. A freight routing strategy for Tyne and Wear has been developed, including the creation of a strategic freight map and of 11 tailored freight destination maps which show suitable detailed road networks around specific destinations. So far, 2,000 copies of the map have been produced and distributed to local authorities, airports, transport operators and truck stops.

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A review of signage has been carried out with the Highways Agency to ensure that it is appropriate to freight, and a number of recommendations on road use made.

In addition, a website has been launched and a review of lorry parking facilities and rail freight undertaken.



## Energy management for industry

### Promotion of Energy Management Practices in the Textile Industries of Greece, Portugal, Spain and Bulgaria – EMS Textile

SIGMA Consultants Ltd, Greece

High fuel prices and global warming mean that energy conservation and management are more important than ever for energy-intensive industries. Although companies in many European countries have already made investments in energy efficiency, improvement of energy management is often not a priority. The EMS-Textile project aimed to promote better energy management practices in the textile industries of Greece, Portugal, Spain and Bulgaria.

#### The aim of the scheme

The ultimate scope of the project was to improve energy efficiency in the textile industries of the four countries and bring a greater awareness of energy management concepts and practices. It developed an energy management system for the specific needs of typical small and medium-sized enterprises (SMEs) in the sector.

Support structures were put in place, including information leaflets and workshops, with specialised energy management training for technical staff. All this was publicised via a website, the press, and presentations at energy and environmental conferences and textile exhibitions.

#### Could it be repeated?

Many textile companies are reluctant to implement energy management because their financial situation has worsened due to competition from lower-cost Asian rivals, so greater awareness of the benefits is needed.

The project has shown that real management commitment is the key for the successful implementation of energy management, with adequate financial and human resources and not just written policies.

#### The partners

The EMS Textile scheme was organised and carried out by SIGMA Consultants (Greece), in partnership with the Hellenic Fashion Industry Association (Greece), the Centro Tecnológico das Industrias Têxtil e do Vestuário (Portugal), the Asociación de la Investigación de la Industria Textil (Spain), the Bulgarian Association of Apparel and Textile Producers and Exporters, and the Black Sea Regional Energy Centre. The project's total budget was €600,000, co-financed (50%) by the Intelligent Energy Europe Programme.

#### How it worked

An energy-audit methodology and tools appropriate for the textile sector were developed, based on benchmarking from a number of countries. Three pilot energy audits were then conducted in each participating country and energy conservation and efficiency measures were recommended for energy-intensive textile operations.



In countries where some minimum energy management practices are enforced by law, such as Portugal, results were positive but a cautious approach is needed to prevent unnecessary burdens on companies. Many firms are willing to develop energy conservation or renewable energy investments when respective grants exist.

### The results

The scheme had a number of concrete results, beginning with the development of an energy-audit methodology customised for the textile industry. Energy management systems have been implemented in many companies in the sector.

Textile Energy Efficiency Offices have been created in the each of the participating countries and will continue to provide support to businesses after the project. A specific Energy Management Standard has been developed, based on internationally accepted standards.

In general, awareness of the concept of energy saving and management has been increased in the sector due to the project.

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## Sustainable investment

### Biomass for Fronius – A Third Party Finance Project

Fronius International Austria

Many companies are aware of the potential savings and environmental benefits that increased energy efficiency and renewable energies can have for their operations. However, upfront costs and lack of know-how can deter them from investing in such technologies. This project saw the implementation of a biomass heating system for an Austrian technology company, Fronius, using a third-party financing agreement. A long-term contract was signed whereby the financial and technical aspects of the sustainable energy system are managed by a specialist energy company.

#### The aim of the scheme

The aim of the project was to supply the company's new production and logistics centre with a cost-efficient and environmentally friendly heating system using locally available biomass. The building is used by 600 employees and covers 37,000 m<sup>2</sup>.

The company management chose a third-party financing scheme for the construction and running of the heating plant. An agreement was signed with an energy service company (ESCO) to take over all financial and technical responsibilities for the duration of a long-term contract. This gives the company predictable energy costs for 15 years.

#### The partners

Fronius operates in the fields of welding, battery-charging systems and solar electronics. The company is based in Sattledt/Upper Austria and has more than 1,500 employees worldwide.

Energy service company Aigner Wasser-Wärme-Umwelt was selected as the contractor to carry out the project. It planned, financed and constructed the heating plant and is thus responsible for the future operation and servicing of the heating system.

O.Ö. Energiesparverband, the energy agency of Upper Austria, gave support and advice throughout the project.

The whole investment costs of the third-party financing scheme were €556,000. National and regional subsidies totalled around €260,000, with special support from the Upper Austria region for the use of the TPF scheme of around €26,000.

#### How it worked

Fronius bought around 100,000 m<sup>2</sup> of land in 2000 and planned a building with a total heated area of 37,000 m<sup>2</sup>. Fronius decided early on that they wanted to have a heating system powered by regional biomass.

However, they realised that they needed a specialist to take charge of the construction and operation. The energy service company, Aigner Wasser-Wärme-Umwelt, was selected to be responsible for the planning, financing, construction and the operation of the plant.

A heat supply contract was made through the third-party financing scheme. In this contract a long-term price for heat supply is fixed.

The investment costs of the ESCO are refinanced by selling heat to the third-party financing scheme client.

The project started in November 2005, with a construction stage from March to July 2006. By August 2006, the plant was operating.

The biomass heating plant has two boilers with 1,200 kW for the





heat supply in winter and 350 kW in summer, as well as a peak load gas boiler with 1,300 kW as a back-up system. The heating system includes the feeding system for the fuel, the flue system, flue gas cleaning, safety system, control and remote-control systems. The total length of the micro grid for the heat supply is 80m. The annual heat demand is about 5,000 MWh, with wood chips sourced directly from local farmers. A remote-control system, as well as tele-monitoring, ensures 24-hours maintenance of the ESCO.

### Could it be repeated?

The project has a high transferability as third-party financing is designed to put the design, organisation and operation of sustainable energy systems in the hands of specialists. Fronius realised from an early stage of the project that co-operation with an ESCO was a good option for them. They noted that one advantage was the short period needed for the planning, contracting and construction phases.

They also highlight a number of advantages in the operation of the plant – the ESCO, as a specialist in this field, can ensure a cost-efficient and timely supply of biomass, leaving Fronius to focus on their core business activities and ensure a continuous heat supply at calculable costs.

### The results

The decision in favour of a biomass heating system has brought considerable environmental and climate benefits. Up to 95% of the annual heat demand of Fronius can be covered by biomass, saving around 1,000 tonnes of CO<sub>2</sub> per year compared to a natural gas heating system.

Fronius itself did not have any investment costs nor any maintenance costs as this was included in the heat price paid to the ESCO. Long-term predictability of the costs for the company is ensured, with an energy supply contract signed for 15 years. The agreement also creates regional employment as woodchips are sourced from local suppliers.



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# Powering sustainable urban development

**Polycity, Hochschule für Technik Stuttgart, Germany**

Polycity is a large-scale project designed to green the energy supplies of three cities in Germany, Italy and Spain.

## The aim of the scheme

Part of the EU-backed CONCERTO initiative, Polycity seeks to boost the sustainable development of three large urban areas – Ostfildern (DE), Barcelona/Cerdanyola (ES) and Turin (IT) – through energy optimisation and the use of renewable energies. The five-year project, which kicked off in 2005, aims to reduce fossil fuel use by bolstering the use of solar, geothermal, and bio-energy.

Polycity research teams are also working on optimising the design and operation of eco-buildings, innovative supply systems, the development and implementation of a communal energy management system, and socio-economic analyses. Low-temperature heating and cooling systems are one area of special interest.

Polycity's overarching objective is to deliver high-quality urban development showcases which can act as excellent models for replication across the EU, as well as to solve urgent societal problems concerning land-use management in inner cities and emission levels.

In concrete terms, the project aims for energy savings of 55% in Cerdanyola, 46% in Turin and 30% in Ostfildern. For renewable energy, the targets are 80% in Ostfildern, 33% in Cerdanyola and 5% in Turin.

## The partners

- Centre for Applied Research into Sustainable Energy Technology, Stuttgart University of Applied Sciences
- Energy service companies
- Local municipalities

- Construction companies
- Urban development companies
- Urban planners and architects
- Research centres and universities

Total funding for the project is €17 million, €8 million of which comes from the European Union.

## How it works

Polycity researchers have been analysing different innovative applications for integrated energy systems. Research focuses on four issues: optimising the design and operation of eco-buildings, innovative supply systems, developing a communal energy management system, and the socio-economic factors affecting implementation.

Research into eco-building design focuses on the main challenges facing large building complexes, such as hybrid ventilation strategies, solar gains optimisation versus solar shading, passive cooling through night ventilation, and low-temperature distribution systems.

Supply systems being researched include clean biomass combustion in large co-generation plants, innovative plant technologies such as organic rankine cycles, as well as better integration of different thermal-cooling technologies in the heat networks fed by co-generation units or large solar thermal systems. The project is developing a communal energy management system to enable active control and management of supply and demand – a feature lacking in conventional facility management



systems. Socio-economic research analyses implementation, identifies barriers to change and helps improve participation processes.

### Could it be repeated?

Knowledge transfer and replication is an integral goal of Polycity, and the project was designed with this in mind from the offset. In this context, Polycity organised several workshops and representatives have attended a number of conferences to disseminate information on the project and raise awareness of its transferability to other cities. In addition, Polycity has been integrated into a number of Master's and PhD programmes. Special meetings, site visits and events for students, professionals and the public were also organised. On its own, the innovative biomass gasification plant Cerdanyola has attracted an observer community of about 40 cities across Europe.

This means that, despite the complexity and cost of greening urban energy supplies, every effort has been made to make this project a useful demonstrator pointing the way forward for other urban areas.

### The results

Given the large scale of the project, it is still too early to estimate its impact accurately. Here are some preliminary results:

- Construction of supply plants begun or completed in the three cities;
- Installation of photovoltaic plants in 2008/9;
- Communal energy management systems in the three cities;
- Construction of several eco-buildings and related performance analysis.



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## A rewarding walk to school

### Environment and Innovation

Millfield Primary School, UK

A survey carried out by Millfield Primary School revealed that 55% of pupils were brought to school and taken home by car. This not only causes congestion and bottlenecks around the school, but it is also environmentally unfriendly. Stamp Stanley, an award-winning initiative, has managed to persuade pupils to walk to school in order to reduce their carbon footprint.

#### The aim of the scheme

Previous efforts to reduce the congestion and pollution associated with the daily 'school run' – such as 'walk to school' and 'jam-buster' weeks – were successful, managing to boost eco-friendly journeys by up to 77%. However, their effects were temporary. The school wanted to devise a scheme that would make these gains more durable. The school also sought to educate a new generation of children in the importance of sustainability and the various benefits of walking.

#### The partners

- Millfield Primary School
- Toyota Europe – main sponsor
- Berry Plastics UK – designed, development and manufactured the checkpoints
- Interconnector UK – sponsor
- Keys Estate Agent – minor sponsor
- Victory Swim and Fitness Centre – provider of Park-and-Stride car parking, and donations of swim vouchers

#### How it works

The school created and recruited Stamp Stanley, a shoe-shaped checkpoint that stamps a smiley face on tokens that the children carry. There are five checkpoints, each of which is around 800m from the school and an additional one closer to school for children who live in its direct proximity. Every time pupils walk to school,

they get a stamp from Stamp Stanley on their tokens. The tokens can be saved up and exchanged for a range of rewards, and spent tokens are entered into an additional prize draw. Children who are unable to walk to school for health reasons can earn reward tokens for other environmental activities. Within four weeks, 96% of pupils were walking to school, while 64% have made every journey a green one.

As far as the school is aware, this is the first time such checkpoints have been created for this purpose. Millfield is considering patenting the system to protect it from commercial exploitation and to allow other schools to benefit from it.

But that is not the only innovative aspect of the project: the checkpoints have been carved out of solid waste plastics that are produced by moulding machines. These would normally be thrown away, but provided an ideal material from which the solid plastic shoe units could be carved.



Stamp Stanley was the final winner of the first cycle of the Environment and Innovation project (2005-2007), which was organised by the Eco-Schools International Programme Coordination.

#### Could it be repeated?

The success of Stamp Stanley has surpassed Millfield School's expectations. In addition to the undoubted ecological benefit of



such a high percentage of pupils walking to school, Millfield also noted a number of other advantages. At a time of growing concern about obesity, the walk to school improves children's health and many parents are also using the walk to school to improve their fitness. The children have also gained other valuable life skills, including saving and budgeting – some have even taken to calling the tokens 'Millfield money'.

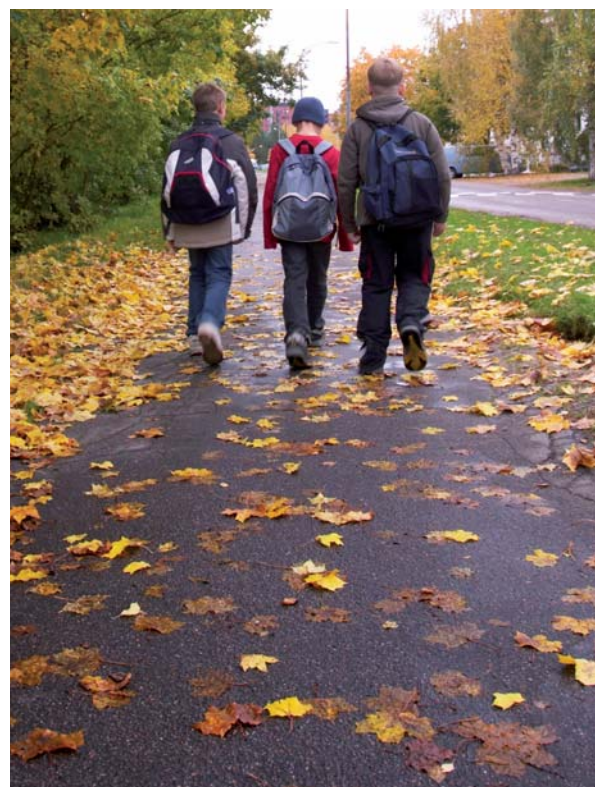
Millfield believes that other schools can benefit from its experiment and it should not be too difficult to launch similar initiatives, since the required investment is relatively low and can be covered through sponsorships and partnerships.

### The results

- 96% of pupils have taken part in the scheme, while 64% walk to school every day;
- Overall percentage of 'green journeys' has risen from 45% to 82%;
- Some pupils have worked out ways of advertising the scheme at other schools.

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## Further information

The ManagEnergy initiative website (<http://www.managenergy.net/>) includes:

- Details of EU energy policies and funding opportunities
- Full contact details for local energy agencies across the EU
- A range of case studies and good practice from across the network
- Information on events
- Partner search facility
- Links to information on other websites

ManagEnergy also provides internet broadcasts of energy events, and an archive of on-line video recordings at:  
<http://www.managenergy.tv>

More information on the Intelligent Energy – Europe programme is available at:  
[http://ec.europa.eu/energy/intelligent/index\\_en.html](http://ec.europa.eu/energy/intelligent/index_en.html)

The European Commission's Energy and Transport DG has a website with a wealth of information on EU policies in these two related fields. In particular it covers:

Climate action:

[http://ec.europa.eu/environment/climat/climate\\_action.htm](http://ec.europa.eu/environment/climat/climate_action.htm)

Renewable energy sources:

[http://ec.europa.eu/energy/renewables/index\\_en.htm](http://ec.europa.eu/energy/renewables/index_en.htm)

Energy demand management:

[http://ec.europa.eu/energy/demand/index\\_en.htm](http://ec.europa.eu/energy/demand/index_en.htm)

An Energy policy for Europe:

<http://europa.eu/scadplus/leg/en/lvb/l27067.htm>

The Commission's 2000 Green Paper on security of energy supply can be found via:

<http://europa.eu/scadplus/leg/en/lvb/l27037.htm>

The Commission's 2001 White Paper on transport policy can be found at:

[http://ec.europa.eu/transport/white\\_paper/documents/index\\_en.htm](http://ec.europa.eu/transport/white_paper/documents/index_en.htm)

Action plan for energy efficiency: Realising the potential - saving 20% by 2020:

[http://ec.europa.eu/energy/action\\_plan\\_energy\\_efficiency/index\\_en.htm](http://ec.europa.eu/energy/action_plan_energy_efficiency/index_en.htm)

Renewable Energy Road Map - Renewable energies in the 21st century: building a more sustainable future:

<http://europa.eu/scadplus/leg/en/lvb/l27065.htm>

Green Paper on Urban Transport:

[http://ec.europa.eu/transport/clean/green\\_paper\\_urban\\_transport/index\\_en.htm](http://ec.europa.eu/transport/clean/green_paper_urban_transport/index_en.htm)





