CONCERTO is co-funded by the European Commission and includes 45 communities in 18 countries

CONCERTO NEWSLETTER

JANUARY 2009 ISSUE 6

EDITORIAL

Energy use in buildings accounts for over 40% of all greenhouse gas emissions, so it is no surprise that the buildings sector is important to European energy policy. What often surprises those of us who work in this sector is that the importance is not always clear to many people including stakeholders and political decision makers; perhaps we have to reflect on how we market energy performance.

Improving the energy performance of buildings not only offers the most effective means of improving the security of energy supply, reducing CO_2 and other greenhouse gas emissions and thereby preventing climate change, it also contributes to economic development and social welfare. This fact makes energy performance a powerful tool to help achieve more sustainable development and thus contributes to all aspects of more sustainable development. CONCERTO has proven that integrating energy criteria in urban planning has the potential to reduce CO_2 emissions by 2/3. It is also demonstrating that this integrated approach can be cost effective in the short term and offers additional long term collective and individual benefits.

The initiative has a role to play in providing responses to the challenges now facing planners throughout Europe, such as rising energy prices, environmental problems, social pressure and urban regeneration. The task must surely be to work towards making the integration of energy criteria within urban planning, as demonstrated by CONCERTO, standard practice throughout Europe.

As a contribution to addressing these issues, the European Commission together with CONCERTO Plus organised an expert *"think tank"* meeting in Brussels on 17th December 2008. The meeting brought together a representative group of professionals from those involved and from its extended scientific community, as well as representatives from various areas of the European Commission, including the Directorate General for Energy and Transport, the Directorate General for Regional Policy, the Directorate General for Research and the Executive Agency for Competitiveness and Innovation.

The participants in the *"think tank"* discussed *"CONCERTO: from best practices to best policies"*, focussing on ways and means to integrate energy and climate change issues in cities' strategies and operational planning. The objective was to find answers to crucial questions such as how to capitalise on experience, in order to meet the goals of the climate actions plans and the European 20 / 20 / 20 targets and also to explore the *"vision"* and the *"tools"* for the transition from the city of today to the city of the year 2020 and beyond. Synergies between CONCERTO and other EC programmes such as the Energy performance in Buildings Directive (EPBD) platform were also explored with a view to maximising the impact of the initiatives demonstration activities.

Discussions included a detailed exchange of information between the community representatives and Directorate General for Energy and Transport policy development staff, regarding the EPBD recast common position paper submitted by the 45 participating communities (an article on this issue can be found in this edition of the newsletter). It is clear that if the targets for 2020 and beyond are to be met by the buildings sector as a whole, then best performance will have to aim much higher in order to motivate the whole sector towards achieving the goal.

In conclusion, in this challenging time for Europe the CONCERTO programme has an important role to play. As the communities mature there are synergies to be exploited between the communities and European institutions and also with regional and national authorities. By embedding sustainable energy criteria in the planning for the built environment, CONCERTO is set to demonstrate benefits in environmental, social and economic terms.

Enjoy your reading and your work,

Mike Barker
Barcelona*

* Mr. Barker, formally working at the University of Barcelona, is today active as an independent Energy Consultant.

The participants of the expert meeting

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CONCERTO NEWSLETTER JANUARY 2009 ISSUE 6

Cities demonstrate energy and climate change policy

CONCERTO communities position on the EPBD recast

The CONCERTO communities, responding to the European Commission launched public consultation on a recast of the Energy Performance of Buildings Directive, took the opportunity to communicate a common position based on their own experiences. The main conclusions of the communities can be summarised in the following recommendations, supported by concrete examples experienced and addressed not only to the European Commission, but also to the Member States. In their position paper, the communities recommend to better clarify the definition of the word *"inspection"* in articles 8 and 9 of the proposal. The aim of this is to have a common understanding of what an inspection procedure consists of. The regular inspection of boilers and air-conditioning systems should be kept and include ventilation systems, although they are not considered as air-conditioning systems. The results from the inspection should be documented in an inspection report.

Secondly, the communities recommend to the European Commission and the Member States that the lowering of the 1,000m² total usable floor area threshold for existing buildings, which undergo major renovation work, should be accompanied by new systematic technical, legal and financial supporting mechanisms, defined at national level. [1]

Thirdly, the communities recommend that the energy performance certificate should include energy needs and final energy use figures, as well as the corresponding primary energy use and CO_2 emissions ratings.

For existing buildings, the actual energy consumption of the building in the past years should be clearly reported and include the energy use of all electrical appliances to sensitise the user to his own influence on consumption. The communities have demonstrated the benefit and the functioning of user feedback systems. The energy performance of the single components like heat pumps, ventilation or domestic hot water preparation systems should also be reported in the certificate.[2]

Fourthly, according to the experiences of the communities, the quality of inspections and energy performance certificates can only be ensured, if a certified profession, legally recognised for certification, is defined at national level. Member States should also be obliged to create national databases to ensure the storage of historical data and to allow for statistical analyses. Furthermore, Member States should set up a legal framework to oblige third parties, such as notaries, to authorise a transaction only when a certificate is made available.

Finally, considering the public sector, every public building should act as a front runner in energy performance aspects and have the energy performance certificate including the actual energy performance figures, placed in a prominent place, clearly visible to the public.

As advised by the CONCERTO communities...

The proposed changes in the new EC communication, energy performance certificates become real, active energy labels of houses as the European Commission introduces the principle that the certificate has to be included in all advertisements for sales and rentals and it has to be part of all sales and rental documents. Inspections of heating and air conditioning systems will advise consumers how to better use these appliances or improve their operation, in some cases even to replace them if needed. Member States have to ensure a high quality of the certificates and the inspections and to guarantee an accreditation process to select skilled and independent experts.

Another important element in the new proposal regards the role as a front runner of the public sector in putting the certificate displayed in a prominent place visible to the public: i.e. in particular if the total useful area of a building occupied by a public authority exceeds 250m² .

The scope of the Directive is broadened and in the recast, the threshold of 1,000m², for meeting the national/regional minimum energy performance requirements when the buildings undergo major renovation, is deleted.

Member States will develop plans to increase the number of low or zero energy buildings, such as passive houses. The public sector should show a leading example investing in such buildings.

The full version of the CONCERTO position paper on EPBD is available at: **www.concertoplus.eu**

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1. Lesson learnt: According to the experience of the German CONCERTO communities, single or multi-family houses have enormous energy saving potentials. The same applies to medium size flats or commercial buildings. The expected benefits in both environmental and socio-economic aspects are huge: by including private houses, CO_2 emissions will be reduced, higher housing quality will be achieved and the building value will be increased.
2. Lesson learnt: In Ireland the certificate relates to the final energy use of a building but also displays the carbon emissions per m². Thereby more emphasis is put on the CO_2 emissions. The reference value used for calculation as well as the definitions of the units used should be specified on the certificates. According to the Swiss CONCERTO Communities the construction period of the building and technical installations should be indicated in the energy performance certificate.

SOCIO-ECONOMIC ACTIVITIES IN THE CONCERTO INITIATIVE: APPROACHES, INSTRUMENTS AND PRELIMINARY FINDINGS

Why a socio-economic assessment?

Socio-economic (SE) impact assessments highlight the effects policies or projects have on the social and economic conditions of a given community or region. At the community level, awareness of socio-economic effects is important so that local planners can be prepared for changes that are likely to arise as a result of a specific policy or project. At regional and national level, assessments may also provide decision makers with important information to weigh up the potential positive and negative effects of an action.

The CONCERTO Plus SE approach and framework

The major initial challenge faced by CONCERTO Plus was to devise a framework to grasp the impact of sustainable interventions and that was suitable for the various contexts to be able to find a common structure for the SE analysis of the communities.

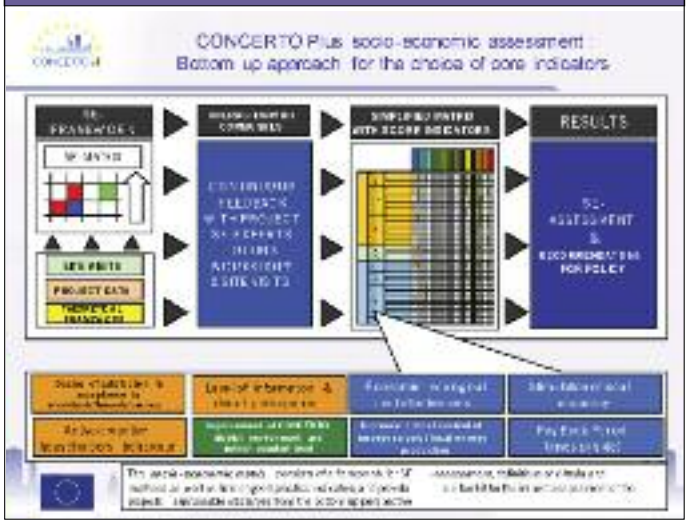
Initial tasks concentrated on:

- designing a common framework to analyse and evaluate the impact of (demo-sites) or accompanying CONCERTO measures which fit to the different contexts and situations, and
- developing a common methodology with performance indicators for monitoring the progress of local communities.

The framework is designed to understand the impact of CONCERTO measures on the demonstration sites and, more in general, on the participating communities. This framework has been discussed with a selected number of CONCERTO projects for validation and feasibility to their local context.

The result of the analytical work of the period 2006-2008 can be summarised by the so called "socio-economic matrix" (see Figure 1). Based on the clustered information on the indicators planned or already used by the communities, the CONCERTO Plus SE team has selected a set of 8 common core indicators. These have been defined and agreed upon in an ad-hoc SE-workshop with CONCERTO communities in June 2008. For each core indicator a unit and scale of measurement has been proposed for qualitative and quantitative criteria.

Figure 1 "Framework"



Communities´ preliminary findings

A number of communities carry out ambitious SE activities to enhance the acceptance of the CONCERTO measures and increase quality of life in the demonstration districts. It can be already said that the initiatives carried out in some communities to explain the CONCERTO measures and to involve the citizens have proved crucial to increase the acceptance, as in the case of POLYCITY.

Socio-economic research and activities have been carried out in all three communities of POLYCITY (Ostfildern (D), Turin (I) and Cerdanyola (E)). The common framework for the analysis at all three sites has encompassed:

- clear definitions of socio-economic indicators and indicator-categories (social, demographic, economic, environmental and regional development);
- questionnaires and stakeholder interviews as an important component to assess socio-economic parameters;
- various analyses according to social structure, and
- a dissemination and communication strategy.

Article continues on page 3

Socio-economic activities in Ostfildern

Socio-economic activities in Ostfildern have concentrated on Scharnhauser Park (SchaPa), a conversion area of about 140 hectares. Until 1992 this has been the location for a military base of the US-Army.

Today SchaPa represents a model-neighbourhood designed in a family-friendly way, with high ecological standards and good connections to public transport and high quality public green spaces. It is an extremely young and growing district marked by high population dynamics. For the whole community, SchaPa has an important role and can be considered as the driving force of Ostfildern's development.

For the analysis of the social structure in SchaPa, demographic data provided by the city of Ostfildern has been evaluated. Furthermore, specific indicators have been designed. The major activities aimed:

- to derive information about the acceptance of renewable energies and energy efficiency, as well as quality of life aspects;
- to develop a calculation routine/procedure or a common evaluation of sustainability;
- to steadily refine and optimise the indicators by adding new data from monitoring results of individual pilot projects.

A survey has been carried out to obtain information about the inhabitants´ acceptance of renewable energies and measures in the field of energy supply and energy efficiency. Opinions about quality of life aspects were derived by requesting the degree of satisfaction with the district by several attributes. The issues addressed in the performed questionnaires, designed with both open and closed questions are:

Ostfildern

- the opinion towards renewable energies in general;
- the satisfaction with SchaPa;
- the perception of energy efficiency measures and the use of renewable energies in SchaPa, and
- the state of information.

The results of the questionnaires (expressed on a four point-scale) show that inhabitants in SchaPa are very satisfied with their living conditions (3.21). Public transport is also rated very high (3.72).

Furthermore, the inhabitants widely accept renewable energies (3.67) and endorse a stronger use in future (3.62) and appreciate the biomass CHP-unit in SchaPa (3.46).

Also the mandatory use of district heating can be considered as widely accepted (1.75), even if some respondents were unsatisfied with this obligation. A value of 4 would mean that the inhabitants are strongly bothered by this regulation while a rate of 1 means they are not affected at all.

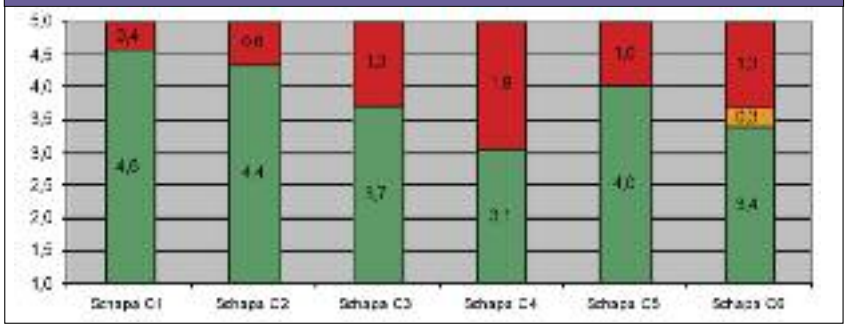
The survey also shows that costs have a crucial impact. While inhabitants generally support renewable energies, they would be far less willing to bear higher costs (2.0).

With regard to the state of information it can be stated that the energy related knowledge of inhabitants is rather limited, but the interest in information is rather high.

The POLYCITY project has developed its own SE-indicators. These are either based on a single item or an aggregation of a few items and are mostly compatible with the CONCERTO Plus indicators. The indicator set includes the three classic dimensions of sustainability (environmental, economic and social). The following figure illustrates the selected social indicators for Ostfildern, which have been derived and transformed into a five point-scale.

C1: General opinion towards existing or planned RES C2: Opinion towards local energy (or RES) supply system C3: Disturbances by local energy system C4: Level of satisfaction with energy related information C5: Perception of district C6: Security of Supply

Figure 2



Although the SE activities have not been completed yet, it is possible to draw following preliminary conclusions:

- The planned/implemented measures could be realised smoothly due to a relatively high acceptance. The inhabitants of SchaPa generally appreciate their district and also value the interventions and new energy supply systems.
- Costs have a crucial impact for the realisation of renewable technologies. This applies both to inhabitants and stakeholders. The case of SchaPa demonstrates that (nearly all) stakeholders are not willing to adopt a technology if it is connected with additional costs. 33% of the inhabitants are willing to bear higher costs in order to use renewable energies.
- For the future planning and marketing process it should be considered that non-energy-specific aspects seem to outweigh energy-specific factors from the investor´s point of view. Therefore the marketing strategy should be focussed on the fundamental site-related factors.

AERIAL THERMOGRAPH IN NEUCHÂTEL

This Swiss community of Neuchâtel works together with Dundalk (Ireland) and Mödling (Austria) in the HOLISTIC project. The three cities, each of about 30,000 inhabitants, will undertake concentrated demonstration activities within a defined zone in each town. The key is acting on every aspect of the community and selecting the most appropriate technology solution in each case.

PICTURE 1: In Situ Picture of the buildings presented in picture 2 and 3. Retrofitting of these typical buildings of the 1970's is one of the demonstration measures undertaken in Neuchâtel. The objective is to achieve energy saving of 53%.

Selecting appropriate actions

One of the technologies applied to acquire detailed information of the building quality and therefore target measures undertaken for managing demand (picture 1) is the use of thermal infrared imaging. This is a valuable tool for inspecting and performing non-destructive testing of building elements, detecting where and how energy is leaking from a building's envelope, etc.

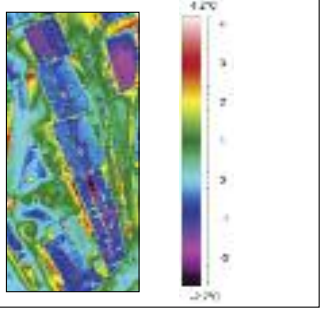
By utilising this technology it is possible to "see" the surface temperature characteristics of any object, that is the end-effect of heat transfer by conduction from within the object to its surface and assess the amount of radiated heat that is associated to an estimate of its surface temperature (picture 2). In Mödling ground thermographs were taken of the foreseen refurbished buildings. In Neuchâtel aerial pictures of not only the whole area, but also the whole city were taken. This makes sense as more than 20% of the heat is lost through the roof.

Realising and interpreting aerial thermographs

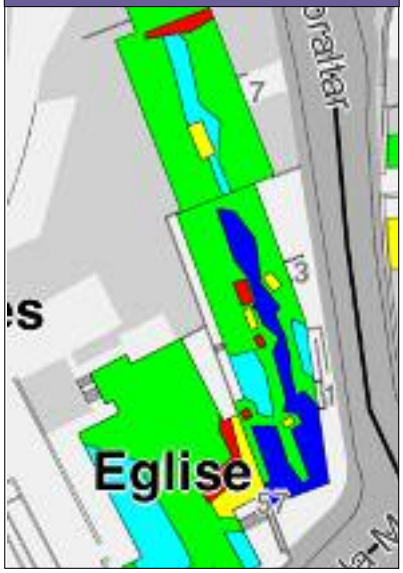
A specialised company (French company Trading Corporation Consulting (TCC)) has taken the pictures on February 11 and 12, 2008. The helicopter, equipped with an infrared camera, flew over Neuchâtel at a distance of 500 meters high over the roofs. The meteorological conditions were good with an external temperature of about 2 degrees celsius.

More than 7,000 pictures have been taken. Thanks to the GPS positioning system, it has been possible to establish a thermic map of the HOLISTIC zone. This map shows each building of the zone according to the thermic quality of the roof (picture 3).

PICTURE 2: The digital picture of an object, presents various temperature levels of the building parts with different colours. The higher the temperature is the stronger losses are.



PICTURE 3: The thermic map identifies buildings with very few losses (dark blue) to extreme high losses in term of energy (pink). The green colour characterises area with rather strong losses. Insulating the roof is foreseen during the retrofitting of the buildings.



A tool to sensitise the population

This first phase of data acquisition has been well covered by the local press. Following these articles, the city of Neuchâtel received a lot of requests from buildings owners to access these data. To answer them an exhibition was organised in Neuchâtel to present the results to the building owners and the inhabitants. Owners of the buildings also have the opportunity to receive the aerial picture. In exchange, they are asked to provide the amount and type of heat energy they use every year as well as the heated surfaces of their buildings.

This gives the opportunity to the city to set up a dialogue and to give specific information on how to improve energy performances based on concrete results on particular buildings.

ADAPTATION OF EXISTING BUILDINGS TO CONNECT DIRECT COOLING NETWORK

(CUEPE-UNIGE, UNIVERSITY OF GENEVA)

The TETRAENER project supports, in Geneva, the GLN project ("Genève Lac Nations"), namely undertaken by the State of Geneva, the City of Geneva, the SIG (Geneva utilities provider), the FIPOI (Building Foundation for International Organizations), as well as the University of Geneva and Engineering Schools of Geneva and Lausanne.

The objective of the GLN project is the construction of a district polygeneration network, which spans an area of around 2 km² near the Lake Geneva, including most of the International Organization buildings of Geneva. This network will distribute cold water from the deep lake for ensuring cooling needs of these buildings, but also heating needs for new buildings thanks to the use of Heat pumps. During summer, it should yield about 16 to 18 GWh/year of cold energy from the renewable source.

The "Deep Lake Water Direct Cooling" (DLWDC) concept aims at providing cool water for direct use in the existing cooling installations of the buildings, avoiding as far as possible the operation of cooling machines. Ideally these machines should only be activated as spare, when the available renewable energy is not sufficient.

The distributed (lake) temperature lies between 8 and 9°C during summer, while most of the existing cold installations use distribution loops at 6/12°C. Therefore energy transfer optimization involves constraints on the operating temperature levels, which are usually not a problem in the traditional cooling installations.

But as deliverable energy is closely related to the operating temperature levels in the building installations, a specific study should be performed on the buildings to be connected, in order to analyse the potential and the limitations of their ability to use the services of this kind of network.

A specific analysis of the buildings (existing or to be built) in the concerned area is therefore needed on one hand to determine the location and size of pipes to be installed, and on the other hand to establish energy prices - according to investments - in order to ensure the financial viability. This price will be function of the volume of contracts, while the contracts are themselves dependent on the competitiveness of the energy price (fixed a priori by long-time contracts)…

Then, in order to accept the challenge of a shift to this new concept of cooling energy supply, building owners should be aware of their actual cooling service price, and of possible or necessary improvements in the building concept or air-conditioning installations.

To assess the project's feasibility, all buildings candidates in the concerned area should then be audited in this respect. The CUEPE (UNIGE-University of Geneva) first performed a survey of the existing auditing methods concerning Air Conditioning Installations, founding very few auditing methods for evaluating the cooling energy needs/consumption, most of them addressing the technical equipments.

The more complete and useable auditing method has been established by the European project AUDITAC, and can be used "as such". Moreover, none of these auditing methods even mentions the operating temperatures, whereas this element is crucial for Geneva DLWDC project.

Therefore, using some measurements on two existing buildings, UNIGE have analysed the characteristics of the potential energy transfer from GLN network to the building as a function of the operating temperatures, and the effects of alternative control strategies.

The main result is that at partial loads (most of the time), unlike usual practices, the chilled loop temperature should be increased up to the limit at which the end-user cooling needs may be met. If necessary, the worst transfer elements (Air Handling Units, Fan Coils units, etc.) which prevent this increase should be resized or replaced.

This condition enables both to get a maximum of energy from the Lake circuit, and to optimize required flow from the network. In the measured example, passing from the unchanged control strategy to an optimised one, would allow the use of 98% instead of 58% of the total needs from the Lake, for a water flow in the network reduced by a factor 4 (see figures below).

The aim of UNIGE study was to establish a general auditing method addressing these requirements, and proposing solutions for the more critical points of the installation which would prevent optimising the operating temperatures.

This was established using careful measurement of one building, and has been tested by applying it to a second big building. The auditing method is available since the beginning of 2008.

For further information, contact: Bernard Lachal (Building Physics professor), bernard.lachal@cuepe.unige.ch

FIGURE 1

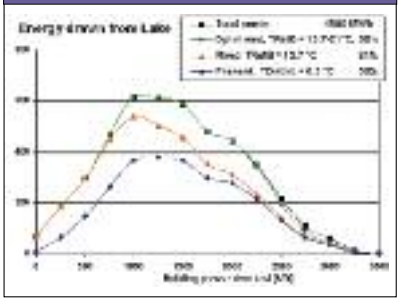
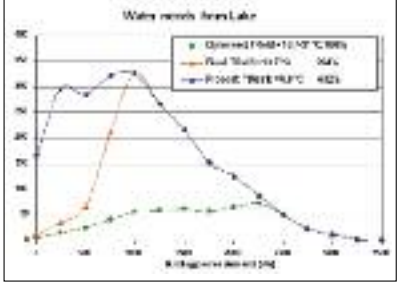


FIGURE 2



TOWARDS ENERGY EFFICIENT HOUSING: FROM CONCERTO TO IEE

Within the framework of the 3rd EU Sustainable Energy Week (EUSEW) CONCERTO, together with the Executive Agency for Competitiveness and Innovation, will organise a conference on how to overcome the main barriers for energy efficiency in buildings. The EUSEW is the key annual reference point for sustainable energy issues in Europe, taking place in Brussels and many other European cities from Monday 9 to Friday 13 February 2009 with a variety of events.

The technology and expertise on how the energy consumption of buildings can be minimised already exists. The CONCERTO communities and different projects from the Intelligent Energy Europe programme set a powerful example of how energy efficient buildings can be realised on the European level.

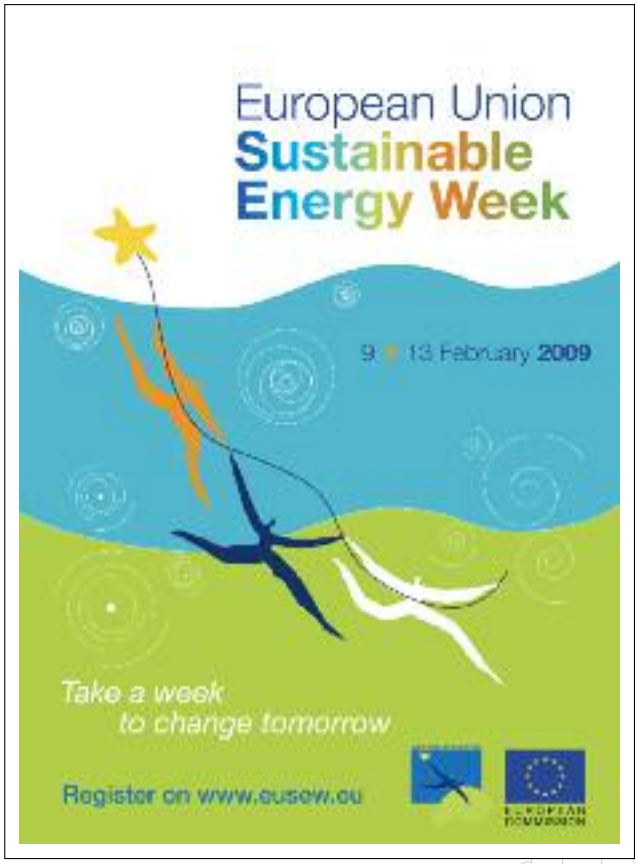
As the building sector has one of the largest potential for energy savings in Europe, action has to start immediately, but is often limited, delayed or even stopped by various economic, regulative and social barriers in the area of energy efficient housing.

The half-day conference will therefore showcase best practice examples on how the projects succeeded in tackling and overcoming these challenges.

The presentations will focus in particular on the following four main issues:

- Raising awareness and training
- Promoting the integrated approach
- Access to capital
- Changing behaviour

The event will start with an official opening by Vincent Berrutto, Executive Agency for Competitiveness and Innovation (EACI), Head of Unit, which will be followed by a presentation on the opportunities and challenges in the residential sector. It will summarise the energy saving potential and the factors affecting the development of the market and give an overview on the European policy strategy in this important field.



Each of the above mentioned challenges will be addressed by one representative of both the CONCERTO Initiative and the Intelligent Energy Europe programme, who will alternately present the solutions and strategies they developed in order to solve these problems of the European cities in the 21st century.

The conference programme will be completed by an open discussion forum, providing the opportunity for questions, comments and a lively debate. The content of the presentations as well as the results and findings of the debate will be finally recapitulated in the final conclusions, which will be reported in the next issue of the CONCERTO newsletter.

CONCERTO Plus cordially invites you to this exciting conference, taking place on 9 February 2009.

Please register well in advance at **www.eusew.eu**, where you can also find additional information.

UPCOMING EVENTS & CONFERENCES

Visit www.concertoplus.eu for more and detailed information on events!

EVENT / CONFERENCE	LOCATION	DATE
International Symposium Solar and Renewable Cooling *www.cep-expo.com*	STUTTGART, GERMANY	30 JANUARY 2009
International seminar "Sustainable energy projects in urban areas : Practical feed-back"	GENEVA, SWITZERLAND	3 FEBRUARY 2009
EU Sustainable Energy Week 2009 *www.eusew.eu*	BRUSSELS, BELGIUM	9 FEBRUARY UNTIL 13 FEBRUARY 2009
EUSEW Conference: Towards energy efficient housing: from CONCERTO to IEE	BRUSSELS, BELGIUM	9 FEBRUARY 2009
World Sustainable Energy Days *www.wsed.at*	WELS, AUSTRIA	25 FEBRUARY UNTIL 27 FEBRUARY 2009
Ecobuild & Futurebuild Conference 2009 *www.ecobuild.co.uk*	LONDON, UK	3 MARCH UNTIL 5 MARCH 2009
European Wind Energy Conference & Exhibition; Marseille, France *www.ewec2009.info*	MARSEILLE, FRANCE	16 MARCH UNTIL 19 MARCH 2009
5th International Congress for South-East Europe Energy Efficiency & Renewable Energy Sources	SOFIA, BULGARIA	6 APRIL UNTIL 8 APRIL 2009
Energy Efficiency Global Forum & Exposition *www.eeglobalforum.org*	PARIS, FRANCE	27 APRIL UNTIL 29 APRIL 2009
International Conference on Sustainability in Energy and Buildings *www.seb09.sustainedenergy.org*	BRIGHTON, UK	29 APRIL UNTIL 1 MAY 2009
4th European Solar Thermal Energy Conference *www.estec2009.org*	MUNICH, GERMANY	25 MAY UNTIL 26 MAY 2009
Renewable Energy World Europe Conference and Expo *http://ree09.events.pennnet.com*	COLOGNE, GERMANY	26 MAY UNTIL 28 MAY 2009
17th European Biomass Conference & Exhibition	HAMBURG, GERMANY	29 MAY UNTIL 3 JULY 2009
European Offshore Wind Conference and Exhibition 2009 *www.offshorewind2009.info*	STOCKHOLM, SWEDEN	14 SEPTEMBER UNTIL 16 SEPTEMBER 2009

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