

## European campaign for Smart Energy Buildings

### Forging a Common Industrial Position on Smart Energy Buildings

**In 2011, a European campaign for Smart Energy Buildings will be launched by a consortium of leading associations, agencies and companies specialising in renewable energy, energy efficiency and sustainable communication. It is supported by the Intelligent Energy Europe Programme of the European Commission.**

The objective of the campaign is to achieve a massive EU-wide mobilisation and empowerment of citizens, the industry sector, public bodies, parliamentarians and the media. It shall contribute to a fast and significant development of Europe's building stock towards nearly zero energy standards of both private and public buildings.

This Industry Report outlines the ways in which all stakeholders must mobilise in order to move Europe's buildings to this standard over the coming decade and beyond.

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Improving the energy performance of and reducing carbon emissions from our existing and future building stock requires the concerted contribution of all partners from legislators, to building professionals, to homeowners. Europe is dotted with examples of energy smart buildings, both new and retrofitted, demonstrating that it is technically and economically possible to move a significant percentage of the existing building stock to this level.

However, in many Member States there is little evidence that the number of smart energy buildings will be increased to a great extent without further mobilisation of governments, businesses and societal groups. Significant progress will not be achieved purely through the market. Shifts in behavioural change in consumers and an understanding and acceptance of the benefits of such buildings are also a necessity if we are to see a major increase in investment decisions for retrofitting, in particular. In parallel, the right conditions need to be put in place to ensure the work is carried out effectively in terms of providing sound fiscal incentives as well as trained personnel to advise on, install and maintain the necessary equipment.

#### Quantifying the Challenge

According to the preliminary results of the study 'Energy Savings 2020' by Ecofys and Fraunhofer ISI, published in September 2010, a full tripling of EU policy measures is necessary to achieve the 20% energy savings target in order to reduce energy bills annually by €78 billion, create 1 million jobs and save 560Mt of CO<sub>2</sub>. If activity in this

arena is not significantly accelerated, Europe will only reach 50% of its energy savings target by 2020.

Improving the energy efficiency of and use of renewable energy in buildings, which account for 40% of Europe's energy consumption, offers a bigger potential energy savings than any other sector. The 2006 Energy Efficiency Action Plan from the European Commission highlighted the fact that improving the energy efficiency of buildings provides an overall negative cost method of achieving Europe's goals on energy security, carbon abatement and economic recovery. What does this mean in practice?

It translates into a guaranteed large-scale renovation programme to be carried out across Europe over the next decade. There is a massive untapped potential for improving the energy performance of all types of buildings at cost-effective level. The rate of deep energy renovation needs urgently to increase by a factor of two or three up to 2020 and stay at this level until 2050 if Europe is to meet its short and long-term energy, carbon and economic goals.

An EU strategy for widespread deployment of deep renovation in the existing building stock is required to capitalise on this potential and to avoid a lock-in situation in the building stock if not done properly the first time

To meet short- and long-term climate change and energy goals, all buildings should be renovated by 2050. This translates into an average of 5 million buildings a year across Europe to be renovated over the next 40 years. Up to 2020, it will thus be necessary to upgrade around 50 million buildings. This only represents a doubling of the business as usual renovation turnover, albeit to a deeper level.

### Roadmap to Smart Energy Buildings

There are some essential ingredients required to making nearly zero energy buildings a norm rather than a novelty.

- ✓ **Mandatory target:** Market forces alone cannot transform the building sector, especially given the recent economic downturn. The mandatory approach has clearly been more effective for meeting EU-level targets. As such a **mandatory roadmap at national level for deep renovation** of the existing building stock is required.
- ✓ **Definition:** A clear definition of energy deep renovation of a building in an energy-efficient way is needed, differentiated for the improved energy performance levels that could be achieved.
- ✓ **Integrated Approach:** there are both demand-side and supply-side solutions to sustainable buildings, both of which have an important contribution to make. The sustainable energy performance of buildings should thus follow the principles of the Trias Energetica applied to the building:
  1. The energy demand is first minimised,
  2. Renewable energy sources are introduced, and,
  3. If still applicable, the use of fossil fuels is done as efficiently as possible.

A holistic approach is also recommended where the long-term considerations of better energy performance of a building are always taken into account.

- ✓ Smart systems: Smart efficiency solutions should be connected to intelligent energy management systems (smart meters, smart grids, etc.) with a view towards constant improvement of energy efficiency.
- ✓ Incentives: A key factor is financing of building upgrades. Gaps remain in the access to funding and the different funding mechanisms that are available or could be put to use by Member States. This missing link needs to be tackled in a comprehensive way at EU level. The right mix of stick and carrot is paramount to persuading owners and tenants to invest in the energy performance of their buildings. Incentives, rather than hand-outs, will facilitate a more successful move towards smart energy building level.

It is important that the correct level of financial incentive is applied and which encourage deeper renovation levels at all times. For example, preferential interest rates could be given for projects depending on the renovation factor level to be applied. Programmes should also be stable and predictable, as opposed to stop-and-go measures, in order to allow the market to anticipate demand in advance.

In many cases, adequate levels of financing exist but are not tapped into due to technical barriers. More innovative ways need to be found to ensure that these monies reach the fragmented and diverse building sector investors. In particular, the European Investment Bank is prepared to provide billions in euros at a preferential rate for energy efficiency and renewable measures in buildings. With regard to EU monies, such as the Structural and Cohesion Funds, these are readily available but under-utilised by Member States when it comes to building upgrades. Furthermore, such funds are not always used in line with the objectives of the EU. These funds should be opened up further to a wider range of buildings and building system upgrades, and effective guidance should be developed for Member States on how to use these funds specifically for upgrading their building stock.

The EU could also develop a system for financing smaller investments. The German KfW model is highly-developed and extremely effective and could be used to serve as a financing model at EU level.

- ✓ Public (and private) Procurement: A change in attitude is needed regarding public (and private) procurement practices for smart energy buildings. It's about buying energy performance, not products, which offer the best value for money economically during the investment period rather than only lower upfront costs at the moment of investment. In other words, integrated, holistic and smart solutions, always taking life-cycle considerations into account. This repeats ongoing calls to always consider the most economic tender – not the cheapest.
- ✓ Energy Performance Contracting: Much more needs to be done to create and encourage demand for energy performance contracting (EPC) by energy service companies (ESCOs). EPC is the primary third party financed energy reduction method employed in Europe but it is currently under-utilised despite being stated explicitly in legislation such as the Energy End-use and Energy Services directive (ESD). One reason why many Member States are not promoting it is because they don't know what it is or how it works. More needs to be done to promote and explain the many benefits of EPC and ESCOs to Member States.

Essential actions, apart from raising the awareness in the public and private sector of energy performance contracting, is to address accounting and budgeting rules that can prevent or discourage EPCs. Ideally, an ESCO contract should be over multiple years (e.g. 10 years or more) with no up-front investment costs and aimed at the existing building stock where the biggest energy saving potentials are located. Operators in the public sector (ministries, hospitals, schools, universities etc) need to have the strong incentive of being certain that they will retain the financial benefits of reduced energy costs and not just see their efforts translated into budget reductions; they also need to be able to engage in long-term contracts.

Both these critical factors are often impossible to realise due to budgetary and accounting rules; and Member States need to remove such administrative barriers so there is a real incentive to engage in long-term partnerships with ESCOs. Similarly, in the private sector the benefits of avoiding up-front costs in refurbishing existing building stock is discouraged by taxation rules that impose liabilities from the start and greatly shorten the potential timescale of ESCO contracts – typically only two to three year pay back periods with limited energy gains are possible, instead of much greater energy reduction potentials that can be realized over a ten year period.

- ✓ Split incentive dilemma: A significant barrier that applies to both residential and commercial buildings is that the beneficiary of the building upgrade (the tenant) is often not the one who makes the investment (the landlord). Alternatively, if the landlord pays the energy bills, the tenant is not incentivised to demand or use smart energy technologies. The issue between landlord and tenant requires specific and innovative solutions.
- ✓ Education and Training: The job creation potential of the building sector is compelling. Over one million new jobs could be mobilised through the introduction of energy efficiency and renewable technologies for buildings. Furthermore many of these jobs are local jobs in small and/or family-run businesses, which cannot be outsourced abroad and will therefore directly benefit the European economy.

Special attention should, therefore, be given to ensuring that a large and competent workforce is available to undertake successful wide-scale renovation projects by using integrated skills. These skills should be taught in a system-based approach alongside product-based approaches which would allow installers and other buildings professionals to take an active role in advising on the systems available and thus promoting (deep) renovation. This would include not only in installing and maintaining a high energy performing building, but also in providing investment grade Energy Performance Certificates to building owners and tenants.

Education and training is necessary for all those involved in designing, building, maintaining and/or financing a building. Concrete steps should be taken to ensure that all relevant technical courses, particularly for the construction industry, include a full understanding of the holistic benefits of improving energy efficiency and renewable use in all parts of a building. Those acquiring specialist training on a specific product/system within a building should also be provided with training regarding other energy efficiency and renewable aspects of a

building (integrated skills). All training programmes should include an understanding of the overall context of smart energy buildings.

While existing national training schemes shall always be respected, at EU level, there should be a mutual recognition of training programmes for building professionals at all levels, as well as a harmonised system for the accreditation of inspectors and assessors. European funds are available to finance national training activities. EU rules should require Member States to implement technical courses for buildings and that all building design courses should have a sustainability element.

- ✓ Awareness Raising: In order to facilitate behavioural change and an increase in investment decisions, awareness-raising programmes and the facilitation of best practice exchange is a soft but key target for moving Europe towards deeper and greater renovation levels. More dialogue on the benefits and cost-effectiveness of smart energy buildings should be aimed at citizens, policy makers and professionals.
- ✓ Enforcement: Further action is necessary to ensure that all actors are taking necessary and obligatory action required to push the market for smart energy buildings. Non-bureaucratic procedures, sufficient resources and dissuasive sanctions should be implemented.

#### Key Recommendations:

**Residential Buildings:** Residential housing accounts for the bulk of energy consumed in buildings overall. Due to fragmented ownership and a reluctance on the part of governments to mandate homeowners, it has not been easy to address this sector. However, with increased use of technologies within homes and rising comfort levels, energy consumption is unfortunately on the rise and needs to be tackled urgently.

Homeowners are generally motivated, not always by a better energy performance of the building, but in many cases by cost, comfort, immediate/urgent repair requirements and potential appearance. There is also an information gap in the potential for a deep retrofit as opposed to installing one or more technologies at a time, usually based on what carries the biggest subsidy, or what the homeowner can afford to pay at one time. And while there are great gains to be made in the majority of residential homes, the average payback period for a deep retrofit project would be well over 10 years before subsidies.

Old and inefficient multi-family buildings, which are most common in newer Member States, represent a particular challenge in that it is more economical to design a retrofit for the whole building whereas the investment decision has to be made by a group of landlords. Every legislative effort must be undertaken to facilitate group decisions there.

Current incentive schemes are too low or too simple to promote a move towards deep retrofit investment decisions. Innovative finance solutions are the key to mobilising change in this sector. These can range from attaching a renovation loan to the building via the energy service provider rather than to the building tenant or owner (Pay As You Save), to reducing taxes on the sale of a smart energy home.

Tenants, landlords and homeowners alike must be given the tools and information to support a change in energy use behaviour. Relevant information, which is easy to understand, on the energy efficiency potential and on the financing mechanisms available for a building is supplied via the Energy Performance Certificate. Therefore, it is imperative the energy audits are carried out in a thorough, professional and, as far as

possible standardised, way. A greater understanding is also required on the long-term financial returns rather than a focus on the initial, up-front costs. A lifecycle approach will allow users and owners to better understand the long term benefits and savings of renovation.

Energy audits in the residential sector need to become more widespread and sub-metering at apartment level should be required so that exact energy use and performance can be measured and understood by the user.

**Commercial Buildings:** The commercial sector, of which the office subsector represents a considerable floor space, is characterised by changing and more flexible workspaces, and tend to be owned and/or managed by property investment companies bringing in the split incentive issue. A move towards increased use of computers and technical appliances has significantly increased the energy use in this sector. Energy costs are only slowly becoming a compelling factor for developers, investors or tenants, compared to overall price, location and functionality.

The use of energy performance auditing of commercial buildings needs to become more widespread in order to raise awareness of the energy, carbon and financial implications of a low performing building. A culture of energy management also needs to be fostered in this sector, perhaps with the appointment of an energy manager in a building to monitor and assess energy performance. Monitoring of energy efficiency and renewable use could also become a mandatory feature of routine periodic health, safety and fire inspections.

The energy performance of a building should be factored into the evaluation of a building in the same way as a kitchen or bathroom renovation increases the value of a property. More weight should be given to the lower running costs a property owner would benefit from when buying a smart energy building.

**Public Buildings:** Public authorities need help in changing mindsets towards procuring energy smart buildings. Governments should show more initiative and leadership by prioritising sustainable energy use in their own buildings first (EPBD). It could be made compulsory for the public to implement all recommendations received with an energy performance certificate, within a clearly defined time limit/, for example. The public sector in each Member State needs to make an overall and systematic plan to renovate the public sector building stock. If resources are pooled to renovate multiple buildings at the same time, a higher cost-savings can be achieved. Scaling up in this way will not only bring the best economies of scale, but also of knowledge and best practice. Doing this, national/regional achievement reports (which could include quantifiable goals) should be made available for benchmarking purposes.

**Social Housing:** The construction and rehabilitation of housing for the low-income sector requires some specific action compared to other building types. In particular, this relates to up-front financing of projects which are prohibitive for this income group.

In parallel, policy supporting measures are vital to ensure that the board of directors of social housing groups and local governments are receptive to making buildings more sustainable.

Awareness needs to be raised of the full benefits of smart energy buildings, which not only include a reduction in energy consumption but also an improvement of interior comfort, a significant decrease in energy bills and reduced energy dependency.

The occupiers of such buildings should also be given adequate information on how to properly use and maintain the building in order to ensure optimal energy performance.

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Without swift and innovative change, energy use in buildings will increase at a far greater level than can be withstood given the EU's goals on climate change, energy security and economic recovery. A mass mobilisation of all types of actors is required to make nearly zero energy buildings the norm rather than the exception. The building professionals are fully committed to providing the products, services and skills necessary to facilitate a wide-scale renovation revolution over the coming decade and beyond. Other actors must also play their part in order to make smart energy buildings a reality for all.