



Energy Efficiency in construction: challenging for research and business

EUROSCIENCE OPEN FORUM

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ACCIONA INFRAESTRUCTURAS

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- Buildings use 40 % of total EU energy consumption
- The built environment generates 1/3 of GHG in Europe
- Even new buildings are far from being all energy efficient
- Replacement rate is very small (1 to 2 % per year)
- The renovation of the existing stock is a real challenge
- Many experiments are made but actual impacts are limited

We have a clear responsibility and objective :
To provide NOW solutions for new and existing buildings
at a very large scale

Political and Legislative instrument of current and future scenarios on EE in buildings

- The Barcelona 3% RTD intensity objective
- Directive on Energy Performance of Buildings
- Action Plan on Energy Efficiency in Europe – saving 20% by 2020.
- Directive on end-use energy efficiency and energy services
- White book on Renewable Energy Sources (RES)
- Green Paper on Energy Efficiency – “Doing More with Less”
- Directive on electricity from renewable energy sources
- Directive on eco-design of end-use energy consuming equipment
- Directive on appliances energy labeling
- Directive on heat demand based high efficient cogeneration
- European Strategic Energy Technology Plan (SET PLAN)
- EU Sustainable development strategy
- European Energy independency
- Kyoto and Bali
- "EU Lisbon Strategy for Growth and Jobs.

Targets for 2020

"

- Reduce the energy consumption by 20% compared to the figures of 2005
- Reduce the GHG emission by 20% compared to 1990 emissions
- Contribution of RES of 20% of the total primary energy

from Vision Paper for EU SET Plan, Nov 15th, 2007)

Targets for 2050

"Stabilizing energy consumption at the level of 1990 by 2050 and reducing CO₂ emissions by 60 to 80% implies the following targets for 2050:

- Double the present energy efficiency targets i.e. achieve a 40% improvement
- Expand the contribution from renewables to more than 1/3 of total primary energy
- Tend towards a zero-emission electrical sector
- Reduce emissions in the transportation sector by 40% while tending to zero emission houses within the residential sector "

from Vision Paper for EU SET Plan, Nov 15th, 2007)

Existing solutions that can be uptaken to improve energy efficient in the market

- Bioclimatic architecture...
- Materials: PCM, vacuum insulation, glazing with solar control ...
- HVAC systems: geothermal heat pump, condensing boiler, variable refrigerant volume air conditioner (VRV), seasonal storage...
- Lighting: electronic ballast, LED...
- ICT: control and monitoring
- RES: solar thermal panel, PV, pellet boiler, geothermal...

- It is of strategic and vital importance for our countries
- It should be seen at transnational level
- In a construction market with a fragmented organisation
- With existing Community instruments that are not adequate

But this challenge raises high hopes because it could:

- Significantly contribute to CO2 reduction
- Solve market failures
- Provide competitive advantages to European companies
- Bring new knowledge, raise awareness of all
- Start a worldwide change

Business as usual is not an option

BARRIER FROM THE OFFER

- Lack of technical knowledge
- Some non cost-effective solutions
- Lack of financial incentives
- Lack of commitment of the enterprises and/or their employees involved.
- Not enough integration of the whole supply chain
- Lack of innovative business models



BARRIERS FROM THE DEMAND

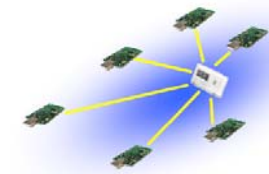
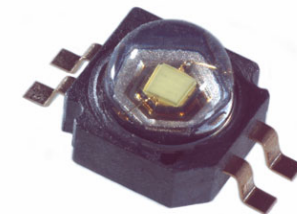
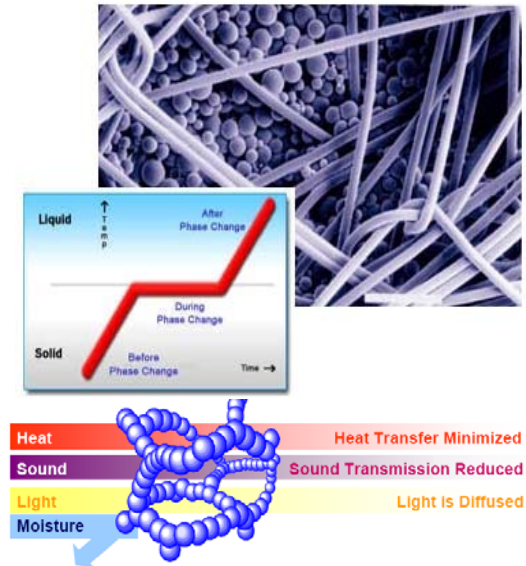
- Lack of information
- Lack of knowledge about the associated impact
- Lack of financial incentives
- Final cost high (real and/or perceived)
- Public procurement not addressing innovation enough
- Lack of harmonisation at European level:
standardisation, certification

A more efficient envelope :

- Improved materials (insulation, glazing, energy storage)
- Bioclimatic architecture (natural ventilation, solar radiation, color, vegetation and water...)
- Improve design, new concepts

Better equipment and systems :

- Highly efficient HVAC equipment
- More efficient lightning and electric appliances
- ICTs for energy efficiency, monitoring and Building Energy Management Systems (BEMS)
- Stronger systemic approach



Stronger integration of renewable energies

Solar PV

- Solar thermal
- Wind turbines
- Biomass
- Geothermal....

New performance based commissioning

Change collective and individual behaviour-socio-economic research

- By harmonized EU regulations
- Promotion of EE by public sector
- Disseminate global costing, think long-term
- Improve individual behavior



FP7

- NMP /DG RESEARCH
- ENERGY/DGRESEARCH/DGTREN
- ICTs/DGINFSO
- E2B JTI

CIP

- IEE
- ICTs for policy

EUREKA**National Programmes**

E2B JTI: *Energy Efficient Buildings Joint Technology Initiative*

" The overall objective of E2B JTI is to deliver, implement and optimize building and district concepts that have the technical, economic and societal potential to drastically cut the energy consumption and reduce CO2 emissions due to existing and new buildings at the overall scale of the European Union.

E2B JTI will speed up research on key technologies and develop a competitive industry in the fields of energy efficiency processes, products and services, with the main purpose to reach the goals set forth for 2020 and 2050 to address climate change issues and contribute to improve EU energy independence thereby transforming this challenge into a business opportunity "

Some Figures:

- 160 Million buildings in Europe (2005)
- Existing building consumption 700 Mtoe (40% of total energy consumption 1750 Mtoe)
- 20%reduction: 140 Mtoe
- New buildings (2005-2020) consumption 25Mtoe
- The existing building stock should reduce 165 Mtoe
- Expected contribution of RES will be 50Mtoe
- The building sector must assume 165 Mtoe in energy reduction and contribute with 50Mtoe from RES in 2020
- On top investment of the industry about 70 billion €/year as an average taking into account different pay back periods based in interventions and experiences in Ecobuildings and Concerto.
- Market for innovative products: several hundreds of billions/year

Through the SEH Action Lines

- **homeLAB**: Understanding the end user, their behaviour, needs and wishes manifested in the home and using this as the basis to develop innovative solutions
- **DEMOhome**: Addressing the needs for internationally visible, showcases having an impact beyond the national/regional market
- **Support smart**: Addressing the scarceness of information on how to realize innovative housing solutions

NEW CONCEPT AND CONTRIBUTION FROM CONSTRUCTION COMPANIES (1)

NEW:

Cooperation among construction companies and the whole supply and value chain at European and national level

- ECTP- European Construction Technology Platform- E2B JTI
- Participating in other European Technology Platforms: PV, Solar-Thermal, H2 and Fuel Cells, SUSCHEM, EUMAT and other JTIs: ARTEMISIA
- National Construction Technology Platforms
- Network of Interplatforms construction/energy related lead by ECTP
- ENCORD
- EUROACE

NEW CONCEPT AND CONTRIBUTION FROM CONSTRUCTION COMPANIES (2)

- The ecoefficient construction will growth in the next years specially if cost reductions are achieved
- In Spain and in Europe it is expected this growth due also to the legislation, economic development and social demands
- CONVINCCE the costumer and user have to think in the Life Cycle of the building and All the actors of the supply and Value Chain to work together
- OFFER new BUSINESS MODELS with 2 categories of Innovation: Regarding the offer: “EEB pack“ including financial instrument and Regarding the different clients: PPP,

NEW CONCEPT AND CONTRIBUTION FROM CONSTRUCTION COMPANIES (3)

- The ecoefficient construction requires a high level of knowledge and especial technologies
- Acciona, member of SEH is very well positioned for this market and become a reference in Europe a reference in Europe



THANK YOU FOR YOUR ATTENTION

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