





Smart-ECO

"Sustainable Smart Eco-Buildings in the EU"

Prof. Dr. Christer Sjöström, Co-ordinator Centre for Built Environment University of Gävle Sweden





Smart-ECO

SSA - Strategic Support Action - under FP6

Project Cluster *EcoBuildings*

INTECO Build ECO BUILD SMART-ECO

EcoBuildings to provide additional value to the FP6 projects





Smart-ECO

Project Aim

Evaluate technical / non-technical Innovations relative to a Stakeholder supported Vision for sustainable building

Primary Objectives

- Establish a Vision for sustainable European ECO-buildings, considering Requirements based on stakeholder views
- Prioritise elements of the vision with associated requirements
- Identify Innovations based on their potential relative Vision and Requirements; Evaluate
- Communicate the Vision, Innovations, Requirements and metrics





The Smart-ECO Concept

Anchor

- Sustainability in building construction (ISO 15392)
- Holistic life cycle approach
- Performance concept
- Sustainability "tripod"

Vision 2010 – 2030

- Anchored in business environment; Standards, policies, directives, international agendas
- Agreed by wide range of stakeholders
- Documented relevance ambitious but realistic





Overview of the Smart-ECO Vision

Key Statement (ISO 15392:2008):

 Buildings contribute to sustainable development when designed and operated to match the appropriate fitness for use, with minimum adverse environmental impacts, while encouraging improvements in economic, social and cultural aspects at local, regional and global levels.

The Vision for Sustainable Smart Eco-Buildings:

- Apply the general principles of sustainability
- Designed to meet the needs individually and collectively
- Integrated into local/regional strategy
- Life Cycle perspective in Design / Refurbishment
- Minimized adverse environmental impact over life cycle
- Deliver economic value over time

- Provide social and cultural value over time
- Healthy, comfortable and safe for users
- User friendly, simple and cost efficient in operation, measurable performance
- Adaptable throughout service life, end of life strategy





Innovation

Innovations

- Technical and non-technical new approaches
- Embedded in current technical or procedural systems
 - Incremental rather than disruptive
- "New" relative to current practice
 - Regional differences

Providing Solution

- Applied innovation solving a challenge
- Resolving conflicts of interest
- Providing better performance
- Not creating new challenges

Contribution Potential

- Efficiency of innovation
- Market ability, scale of application
- Technological and cultural applicability
- Context dependent application potential
- Impact on sustainability aspects







of Innovation supporting development towards vision

Refers to

- Vision and its elements
- Requirements based on vision
- Challenges and solutions
- Potential contribution to resolve challenge and become solution
- Qualitative description
- Quantitative metrics linking to requirements





Validating through stakeholder involvement

Goal with stakeholder involvement

- Gain feedback
- Strengthen relevance
- Establishing Research & Business perspective
- Involvement = participation = dissemination = realisation

Stakeholder involvement

- Draft vision and innovations established by the project partners
- Executive summaries / shortlists circulated for commenting to broad range of stakeholders (230 + individuals)
- Full documents scrutinized and discussed with key-stakeholders offering expertise in sustainability and buildings
- Results and process disseminated for information and commenting through CIB
- Publications and newsletters spreading the content to target audiences





Dissemination & Exploitation

Workshops and Conferences

- Directed towards stakeholders & broader
- CIB World Building Congress 2010, Manchester

Newsletters

- CIB Newsletters www.cibworld.nl

Publications

- Scientific Journals
- Conferences
- Magazines
- Targeted Information Leaflets

Standardisation

Feeding of results into ISO, "application guidance"

Uptake by UNEP





Smart-ECO project partners

- 1. University of Gävle, BMG, Sweden
- 2. CSTB, France
- 3. Tallinn Technical University, Estonia
- 4. Servitec, Italy
- 5. TNO, The Netherlands
- 6. SINTEF Byggforsk, Norway
- 7. FH-Soest, Germany
- 8. Politecnico di Milano, Italy
- 9. Endoenergy Systems Ltd, UK
- 10. MACE, UK
- 11. Hywel Davies Consultancy, UK
- 12. CIB, The Netherlands





Smart-ECO's Way of Working







Stakeholders ranking The Vision

- 1. Lifecycle of building
- 2. Minimum energy consumption
- 3. Monitoring of building
- 4. Building user manuals
- 5. Building adaptability
- 6. Local issues
- 7. Dismantling building phase
- 8. Setting-up building phase





Stakeholders ranking Support to Innovation

- 1. Applied R&D
- 2. Exchange of know how
- 3. Technology transfer
- 4. Global codes and standards
- 5. Stimulate global market
- 6. Regulatory aspects
- 7. Intellectual property rights
- 8. Basic research





Stakeholders ranking Type of Buildings vs. Impact

- 1. Residential buildings
- 2. Offices
- 3. Retail/shops
- 4. Hospitals
- 5. Stations/Airports
- 6. Warehouses
- 7. Schools



Stakeholders ranking Innovation Impact on stages of Life Cycle Process

Innovations Affecting

- 1. Design
- 2. Building Operation
- 3. Building Refurbishment
- 4. Construction Phase
- 5. Demolition and Dismantling



Stakeholders ranking Largest Impact/Effect of Innovations

- 1. Renewable energy generation
- 2. Passive design methods
- 3. Operation of building
- 4. Finance and incentives
- 5. New materials
- 6. Management and processes
- 7. Education
- 8. Policies
- 9. Recycling
- 10. Communications
- 11. Water conservation





Stakeholders ranking Energy saving technologies

- 1. Insulation
- 2. Passive cooling
- 3. Passive solar
- 4. Lighting
- 5. Orientation
- 6. Innovative materials
- 7. Water conservation and storage





Renewable Technologies vs. Impact

- 1. Solar thermal
- 2. Co-generation
- 3. Earth energy
- 4. PVs
- 5. Biomass
- 6. Wind related technologies
- 7. Fuel Cells





Stakeholders ranking Energy generation related innovations should focus on

- 1. Increasing energy generated at building level
- 2. Increased large scale renewable power generation
- 3. Develop more local / district plants
- 4. Improving power plant efficiency





Stakeholders ranking Most important 'Operation' to help improve innovation is

- 1. Building management systems
- 2. Automation for energy saving
- 3. Robustness to user behaviour
- 4. Post occupancy monitoring
- 5. Waste management plan
- 6. Intelligent ligthing
- 7. Air quality control
- 8. Daylight dependent control systems



Further information

http://www.ecobuildings.info

http://www.smart-eco.eu

THANK YOU!