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Cross-ETP Research and Innovation Roadmap for the Energy Efficiency in Building



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Cross-ETP Research and Innovation Roadmap for the Energy Efficiency in Building

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Foreword

Building Up Research and Innovation Roadmap is intended to provide a thorough overview on targets up to 2020 and beyond related to nanotechnologies, materials and processes, necessary to be achieved in order to improve the energy efficiency in the built environment.

The document has been produced as part of the Coordination and Support Activities being carried out in the European project Building Up ("Multi-stakeholder, cross-sectorial, collaborative long term Research & Innovation Roadmap to overcome technological and non-technological barriers towards more energy-efficient buildings & districts"), that was co-financed under the European Commission's 7th Framework Programme, more specifically within the nanosciences, nanotechnologies, materials and new production technologies (NMP) thematic priority.

One of the aims of the project was the development of this roadmap, through a fruitful collaboration among European Technology Platforms (ETPs) from different sectors and industrial and research stakeholders from various Member States all gathered around a common topic: energy efficiency in the built environment.

The background for developing the roadmap was a broad review of foresight studies and other relevant sources (EU-funded work and reports, research agendas from ETPs, and other national and multinational initiatives), which take into consideration climate change, resource scarcity and demographic change as well as global changes that will affect the building sector.

Discussion, revision and validation of the roadmap were performed through several working group meetings, surveys and participation to conferences and public events.

Table of Contents

List of Figures.....	7
List of Tables.....	8
About the Building Up project	9
Executive Summary	10
List of Acronyms and Abbreviations.....	25
Definitions	25
1 Scope, objective and methodology of the roadmap	27
2 Building Up vision	30
3 Roadmap overview: focus on cross-platform (CP) research and innovation areas	32
4 CP1 - Performance Based Approach for building components, including sustainable design, Life Cycle Analysis	36
5 CP2 - Multi-materials and composites.....	41
6 CP3 - Healthy and comfortable indoor environment (including air quality, ventilation, lighting, acoustics, etc.)	46
7 CP4 - Electric generation and storage materials and systems	52
8 CP5 - Thermal generation and storage materials and systems.....	57
9 CP6 - Advanced thermal insulation construction materials for new buildings and existing buildings	65
10 CP7 - Building materials recyclability and re-use of components	70
11 CP8 - Renewable resource-based products	76
12 Expected Impact.....	80
13 Funding of the CP areas: expected cost	98
14 Conclusion.....	100

List of Figures

Figure 1 – Barriers for energy efficiency in buildings – main categories.....	11
Figure 2 – Relation between cross platform areas and barriers.....	12
Figure 3 – Overview of the Building Up Roadmap	16
Figure 4 – Structure of the Cross-Platform areas & involvement of ETPs and associations.....	16
Figure 5 – Distribution of estimated cost in terms of needed private and public funding for each CP area	24
Figure 6 – The Building Up Roadmapping Process	27
Figure 7 – Wave action along the E2BA roadmap (D&B: Design&Building; O: Operation)	30
Figure 8 – Barriers for energy efficiency in buildings – main categories.....	33
Figure 9 – Relation between cross platform areas and barriers.....	33
Figure 10 – Overview of the Building Up Roadmap	34
Figure 11 – Structure of the Cross-Platform areas & involvement of ETPs and associations.....	35
Figure 12 – Scheme of CP1 targets and priorities	36
Figure 13 – Scheme of CP2 targets and priorities	41
Figure 14 – Scheme of CP3 targets and priorities	46
Figure 15 – Scheme of CP4 targets and priorities	52
Figure 16 – Scheme of CP5 targets and priorities	57
Figure 17 – Scheme of CP6 targets and priorities	65
Figure 18 – Scheme of CP7 targets and priorities	70
Figure 19 – Scheme of CP8 targets and priorities	76
Figure 20 – Total number of people employed in the construction sector by Member State in 2006 (<i>Source: Eurostat</i>).....	81
Figure 21 – Average annual global growth composite material forecasts by market segment, 2009-2014	88
Figure 22 – Worldwide market for lighting (<i>Source: McKinsey's Global Lighting Market Model</i>).....	91
Figure 23 – OLED lighting market forecast (<i>Source: Nanomarket OLED Lighting Market Forecast Q2 2012</i>).....	92
Figure 24 – European PV market segmentation 2011 (%) (<i>Source: Global Market Outlook for Photovoltaics until 2016_EPIA</i>).....	93
Figure 25 – Global Building Integrated PV annual market segment (in MW), years 2009-2015 (<i>Source: BCC Research</i>)	94
Figure 26 – Utility-scale PV system price forecast (<i>Source: Bloomberg New Energy Finance</i>).....	94
Figure 27 – Utility-Scale Electricity Storage Technology Sales, 2008-2015 (\$ MILLIONS) (<i>Source: BCC Research</i>).....	95
Figure 28 – Global market segmentation for insulation construction materials (<i>Source: ObservatoryNANO</i>).....	97
Figure 29 – Picture of “How much do you want to spend for each CP” activity performed during the 4 th inventive meeting of Building Up project.....	98
Figure 30 – Distribution of estimated cost in terms of needed private and public funding for each CP area.....	99

List of Tables

- Table 1 – Summary of targets and priorities for each of the Cross-Platform Areas13
- Table 2 – Outcome and field of application for each CP area17
- Table 3 – Markets, Expected Benefit and reference Cross-Platform Areas.....21
- Table 4 – Outcomes and field of application for CP139
- Table 5 – Outcomes and field of application for CP244
- Table 6 – Outcomes and field of application for CP351
- Table 7 – Outcomes and field of application for CP456
- Table 8 – Outcomes and field of application for CP563
- Table 9 – Outcomes and field of application for CP669
- Table 10 – Outcomes and field of application for CP774
- Table 11 – Outcomes and field of application for CP879
- Table 12 – Markets, Expected Benefit and reference Cross-Platform Areas.....83

About the Building Up project

The strategic objective of the project is to create an effective coordination of European Technology Platforms and major initiatives whose Strategic Research Agendas (SRAs) and activities address energy efficiency in the built environment from an NMP perspective, to identify and review their needs in terms of long term research and innovation, thus accelerating the implementation of sustainable solutions by addressing non-technological barriers and gaps at programme level.

Building Up consortium, coordinated by the "Centre Scientifique et Technique du Bâtiment", (chair of the European Construction Technology Platform - ECTP), ensured an active involvement of a wide spectrum of stakeholders working in the energy efficiency of the built environment, yet coming from different technology sectors (e.g. steel, chemistry, textiles, materials development, forest-based products, water treatments, renewable energy, etc.).

Indeed, Building Up brought together the know-how and expertise from its eleven partners, covering various technology sectors. Six European Technology Platforms (ETPs), namely:

- *European Construction Technology Platform (ECTP)*,
- *European Technology Platform for Sustainable Chemistry (Suschem)*,
- *European Technology Platform for Advanced Engineering Materials and Technologies (EUMAT)*,
- *European Technology Platform for the Future of Textiles and Clothing (TEXTILE ETP)*,
- *European Steel Technology Platform (ESTEP)*,
- *Forest-based Sector Technology Platform (FTP)*,

including their national platforms, as well partners specialised in supporting innovation and technology transfer issues (Austrian Society for Environment and Technology, D'Appolonia and Steinbeis-Europa-Zentrum) joined forces with other relevant initiatives such as the ERANET ERACOBUILD in order to perform all project activities including the development of this Building Up roadmap. The project started in May 2011 and ended in October 2012, with a final public event disseminating the roadmap.

In addition to this roadmap the project website offers a good source of information on the main project activities and provides the contact details of the project coordinator and consortium partners.

<http://www.buildingup-e2b.eu/>

Executive Summary

This document aims at presenting the Building Up Research and Innovation Roadmap, detailing targets up to 2020 and beyond related to nanotechnology, materials and processes, in order to improve the energy efficiency in built environment.

This roadmap has been developed by E2BA and DAPP, supervised by the Coordinator and with the collaboration of the involved European Technology Platforms (ETPs) and Building Up project partners and stakeholders.

Moreover, other initiatives linked to project partners such as ENBRI (The European Network of Building Research Institutes) and Eracobuild (Strategic Networking of RDI Programmes in Construction and Operation of Buildings) were invited in meetings for discussion and dissemination of the roadmap.

Finally, a community of Building Up stakeholders contributed to the Roadmap through the Building Up Website (online surveys, posts, etc.).

The overall objectives of the Building Up Industrial and Research Roadmap are:

- To outline and detail cross-sectorial research and innovation targets up to 2020 and beyond related to nanotechnology, materials and processes, in order to improve the energy efficiency in built environment;
- To obtain such goal with a cross-ETP roadmapping activity, involving the Building Up network through large public consultations and debates.

Building Up long term vision is well aligned with the E2BA “2020 Research & Innovation Roadmap” which aims at driving the creation of an innovative high tech energy efficiency industry where the entire value chain will produce advanced systems, solutions and high value services for intelligent and sustainable buildings and districts.

This vision meets the 2020 targets with the overarching goal to support both Climate and Energy policies set at European level for the full decarbonization by 2050 of the European economy. This requires preparing new market conditions where building owners are ready to invest into an affordable built environment having lower energy demand and lower GHG emission footprints over their whole life cycle, while improving optimal indoor air-quality and comfort.

Mandatory energy-saving measures, including renovating public buildings, energy-saving schemes for utilities, and energy audits for all large firms mentioned in the new recently approved “Energy Efficiency Directive” will further boost the creation and development of an Energy Efficiency and new built market. In this framework Building Up project will contribute to transforming the current market into an Energy Efficiency one.

Whilst it is based on a long term vision (up to 2050), the Building Up Roadmap focuses its main targets in the short-medium term (up to 2020), with some suggested actions for longer terms (beyond 2020). In this framework, the Building Up Roadmap includes:

- 8 Cross-Platform (CP) collaboration areas in research and innovation in the NMP field, i.e. areas considered (1) of interest by several ETPs involved in the roadmapping, (2) with high impact for the energy efficiency in the built environment. These are:
 - CP1. Performance Based Approach for building components, including sustainable design, Life Cycle Analysis;
 - CP2. Multi-materials and composites;
 - CP3. Healthy and comfortable indoor environment (including air quality,