European Network on New Sensing Technologies for Air Pollution Control and Environmental Sustainability - *EuNetAir*

COST Action TD1105

WGs and MC Meeting at ISTANBUL, 3-5 December 2014

Action Start date: 01/07/2012 - Action End date: 30/06/2016

Year 3: 1 July 2014 - 30 June 2015 (*Ongoing Action*)

Presentation of the IEQ Cluster Paper given to EC Policy-Makers

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cost EUROPEAN COOPERATION IN SCIENCE AND TECHNOLOGY

EuNetAir
European Network on New Sensing Technologies for Air-Pollution Control and Environmental Sustainability

COST is supported by the EU Framework Programme

ESF provides the COST Office through a European Commission contract

Indoor Environment Quality (IEQ) cluster

- At ECTP conference 2014 in June in Brussels
  - 1st meeting of the IEQ cluster
    - European projects
    - Cost action EuNetAir
    - EeB: Advanced Material & Nanotechnology cluster (AMANAC)
    - National projects

- Outcome: Research Ideas for IEQ contributing to
  - Renaturing Cities: Addressing Environmental Challenges and the Effects of the Economic Crisis through Nature-based Solutions
  - Materials & technologies for improved Indoor Environment Quality
- 2nd meeting: EuNetAir workshop in Istanbul 3rd-4th December 2014

Research Ideas IEQ Cluster (1 of 2)

- **Impact of material emissions on the Indoor Environment Quality (IEQ)**
  - Renewable materials for construction, conservation, cleaning, etc.
  - Safety requirements (flame retardants, biocides, etc.)
- **Outdoor pollution influences IEQ**
  - Renaturing cities could lower this impact
  - Modelling and assessment at district level and tools for monitoring, treatment and filtering
- **New control strategies to improve IEQ**
  - Tools for efficient comfort systems (thermal, moisture, illumination, and noise)
  - Self-cleaning capacity and smart materials with controllable properties

Research Ideas IEQ Cluster (2 of 2)

- **Management, maintenance and monitor the IEQ**
  - Sensing systems for specific pollutants (VOCs, dust, particulates, biological and chemical)
  - Standardisation of sensor technologies and assessment of health and toxicological impacts of pollutants
- **Human behaviour and perception**
  - Influence on IEQ together with pollutant's properties and building characteristics
  - Subjective human IEQ perception vs. real IEQ measured
- **Benchmarking and assessment strategies (stakeholders, policy makers)**
  - Procedures to measure progress and identify changes in IEQ
  - Identification of best solutions to improve IEQ

Possible fields for contribution

- Energy efficient Buildings (EeB) cPPP
- Renaturing Cities with Nature based solutions
- Others?
  - Health?
  - ICT?

European Conference "Renaturing Cities: Addressing Environmental Challenges and the Effects of the Economic Crisis through Nature-based Solutions"

Brussels, 13-14 May 2014

Birgit de Boissezon
Head of Unit

"Sustainable Management of Natural Resources"

Research and Innovation

European Commission

Main outcomes, key messages (i)

Resolving trade-offs

- Nature–Based Solutions should resolve trade-offs between nature, society and the economy.
- These innovative solutions for renaturing cities should be cost effective, have a strong social added value for human health and wellbeing and contribute to a more sustainable management of the environment.

- Cities have an important role as stewards of multiple value creation, by encouraging the adoption of new business models in line with nature and by attracting more private funding through Public-Private Initiatives on Nature-Based Solutions.

Main outcomes, key messages (ii)

Enhancing attractiveness

- Nature-Based Solutions should be used for an innovative urban design to reshape the built environment and attract citizens' interest in greener and healthier cities.
- These innovative solutions should be seen by municipalities as a way to attract the interest of the private sector, meaning not only construction companies but also service providers.
- European cities may use Nature-Based Solutions to create innovative spaces that attract the interests of tourists not only in Europe but worldwide.

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Main outcomes, key messages (iii)

Increasing resilience

- Nature-Based Solutions can make our cities more resilient and increase their adaptive capacity to face climate change.
- The integration of Nature-Based Solutions within the overall urban planning will also contribute to disaster risk reduction.
- Nature-Based Solutions should be placed at the core of sustainable land-use and management to regenerate urban districts and reduce vulnerability in urban and peri-urban areas.

Main outcomes, key messages (iv)

Boosting creativity

- Cities are seen as hubs of creativity.
- There is a need to explore new and creative ways for engaging different stakeholders by promoting a science-policy-business-civil society interaction.
- Citizens' creativity is key in promoting the adoption of Nature-Based Solutions at the local level.

Materials & technologies for improved Indoor Air Quality

ECTP conference

Brussels, 19th June 2014

Dr Monique Lévy

European Commission

DG RTD

Directorate D

"Key Enabling Technologies"

Rationale

Indoor Air Quality in buildings has become a major concern for several reasons:

- The trend towards energy efficiency leads to more tightly sealed buildings (passive houses).
- Increasing use of synthetic building materials and furnishings or natural products formulated with chemicals accentuates the issue.
- Materials play a key role in indoor air quality.

Indoor Air Quality in Energy efficient Buildings and Horizon 2020

Indoor Air Quality deals with two of the pillars of Horizon 2020:

- Industrial leadership: leadership in enabling and industrial technologies
- Societal challenges: health, well-being of citizens, climate action, resource efficiency, reduced energy needs…

How to improve impact of individual projects? Clustering!

Objectives:

- To ensure best synergy and larger impact for projects funded on one precise topic and on similar topics
- To carry out common activities as desired
- To allow a higher weight to influence decision makers (standardisation, policy…)
- To give feedback on desired future research needs

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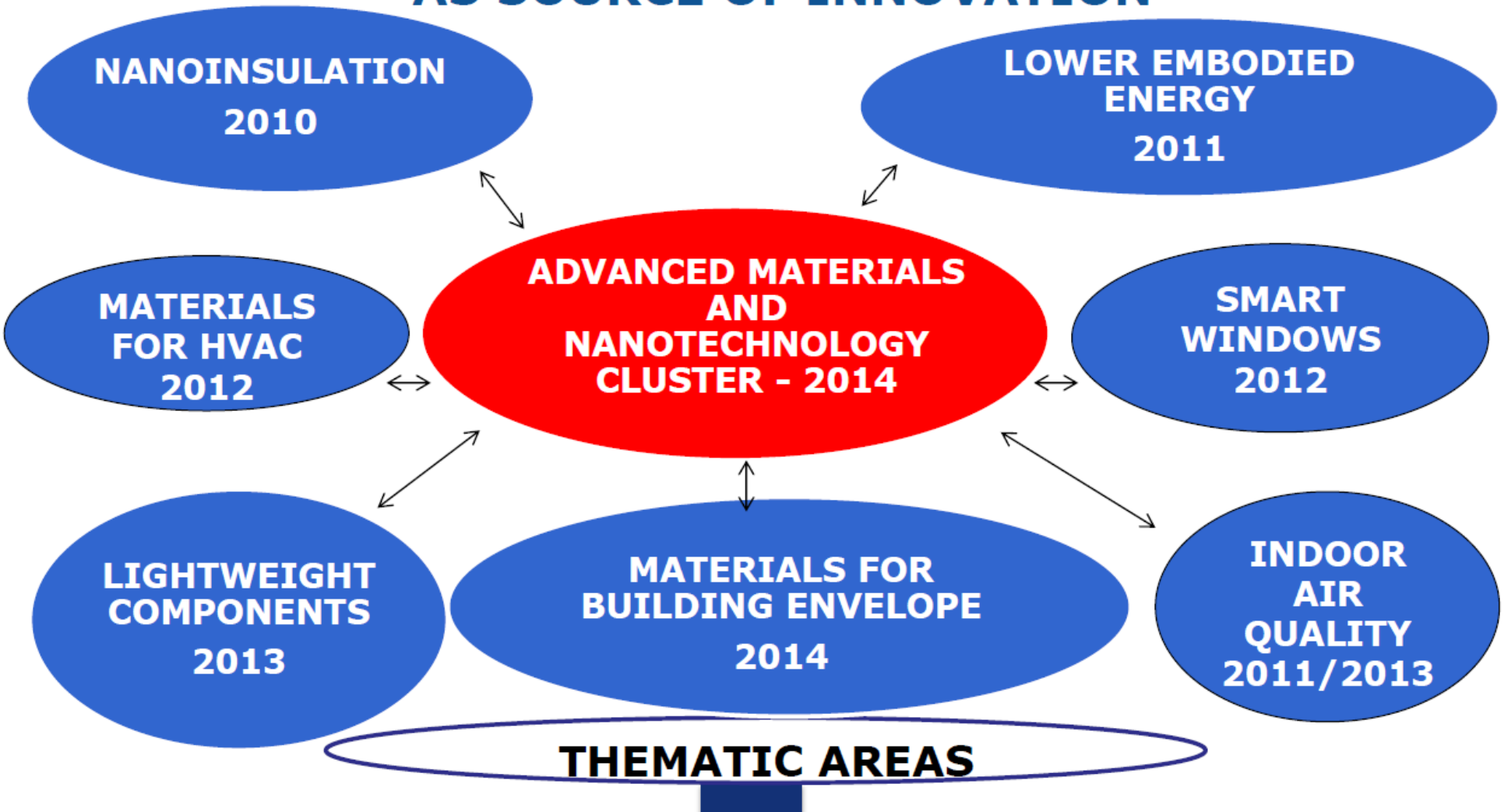
CLUSTER OF MATERIALS AS SOURCE OF INNOVATION



Further research needed in materials for improved Indoor Air Quality

Sources:

- Regular contacts with stakeholders
- Roadmap on Materials for Construction presently under preparation, to be issued in 2015
- Questionnaire in July – September 2014 to identify research needs in Materials for Construction
- Feedback from research projects and from clustering
- Investigate interest on Indoor Air Quality research outside building applications

Indoor Air Quality has a major IMPACT on EU policies!

1. Economic impact:

1. Growth, competitiveness and job creation in Europe
2. Benefits for States, enterprises and for citizens

2. Environmental impact

1. Cleaner planet, use of wastes, of natural products, reduced energy use, reduced raw material use…

3. Societal impact

1. Better living and working place: health, well-being of citizens…

Opportunities in EeB-Calls 2015

- EeB 5 – 2015: Innovative design tools for refurbishment at building and district level
  - **Expected impact:** … Optimised design of integrated energy-efficient buildings, considering the different physical dimensions in a coupled and holistic way (energy, comfort, air quality, acoustics etc.)
- EeB 7 – 2015: New tools and methodologies to reduce the gap between predicted and actual energy performances at the level of buildings and blocks of buildings
  - **Scope:** … A positive impact on health and safety (e.g. hygienic aspects of ventilation or DHW systems) as well as comfort is an aspect to consider.

Opportunities in EeB-Calls 2015

- EE 2 – 2015: Buildings design for new highly energy performing buildings
  - Scope: … The focus should lie on solutions for appropriate indoor air quality and comfort, design adapted to local climate and site, passive solutions (reducing the need for technical building systems which consume energy) or active solutions (covering a high share of the energy demand with renewable energies), building energy management systems (where appropriate), highly efficient Heating, Ventilation and Air-Conditioning (HVAC, e.g. low temperature systems, solar cooling), electric and/or thermal energy storage of renewable energy onsite and nearby.
    … where buildings are active contributors to energy production and environmental quality in particular when new districts are planned (e.g. net-zero energy neighbourhoods).

- Deadline: 4th February 2015

Opportunities in ENV-Calls 2015

- **WASTE-6-2015: Promoting eco-innovative waste management and prevention as part of sustainable urban development**
  - **b) Eco-innovative strategies**: Development of innovative and sustainable strategies for waste prevention and management in urban and peri-urban areas. Proposals should highlight how urban patterns, drivers, consumer behaviour, lifestyles, culture, architecture and socio-economic issues can influence the metabolism of cities. Proposals should highlight the possible benefits to be derived from ecosystems services and green infrastructure, and their gender sensitive application.

Next steps

- Update of research agenda
  - Could we define champions for the themes?
- Hosting of IEQ cluster by ECTP as interest group (www.ectp.org)

ECTP Committees/Working Groups

The following Committees/Working Groups are established for the Association:

- **Energy Efficient Buildings (E2B)**, with the particular purpose of fully adopting and implementing the commitment taken by the Association in the framework of the cPPP EeB signed on December 17, 2013 with the European Commission.
- **Research for Future Infrastructure Networks in Europe (reFINE)**, with the particular purpose of comprehensively tackling the challenges infrastructures are facing, and providing the grounds to facilitate innovative approaches for the needs of European society.
- **Active Ageing in the Built Environment (AABE)**, with the particular purpose of undertaking RDI approaches for the design of integrated and ICT-driven age-friendly environments.
- **Materials,** with the particular purpose of identifying and implementing the RDI needs of the Construction sector with regards to the development and use of materials.
- **Cultural Heritage,** with the particular purpose of identifying and implementing the RDI needs of the Construction sector with regards to the conservation, management and promotion of European built heritage.

Next steps

- Update of research agenda
  - Could we define champions for the themes?
- Hosting of IEQ cluster by ECTP as interest group (www.ectp.org)
- Next meeting?
  - Proposal for host: AMANAC cluster