

This fiche is part of
the wider roadmap for
cross-cutting KETs
activities

'Cross-cutting KETs'
activities bring together
and integrate different
KETs and reflect the
interdisciplinary nature of
technological development.
They have the potential to
lead to unforeseen
advances and new
markets, and are important
contributors to new
technological components
or products.

The complete roadmap for
cross-cutting KETs activities
can be downloaded from:

<http://ec.europa.eu/growth/industry/key-enabling-technologies/eu-actions/rockets>

Potential areas of industrial interest relevant for cross-cutting KETs in the Construction domain



This innovation field is part of the wider roadmap for cross-cutting KETs activities developed within the framework of the RO-cKETs study. The roadmap for cross-cutting KETs activities identifies the potential innovation fields of industrial interest relevant for cross-cutting KETs in a broad range of industrial sectors relevant for the European economy.

The roadmap has been developed starting from actual market needs and industrial challenges in a broad range of industrial sectors relevant for the European economy. The roadmapping activity has focused on exploring potential innovation areas in terms of products, processes or services with respect to which the cross-fertilization between KETs can provide an added value, taking into account the main market drivers for each of those innovation areas as well as the societal and economic context in which they locate.

Taking the demand side as a starting point, cross-cutting KETs activities will in general include activities closer to market and applications. The study focused on identifying potential innovation areas of industrial interest implying Technology Readiness Levels of between 4 and 8.

CS.1.1: Energy-efficient interconnected and versatile lighting

Scope:

To develop more energy-efficient interconnected and versatile lighting solutions (interoperable, adaptable, highly comfortable and customizable).

Demand-side requirements (stemming from Societal Challenges) addressed:

- Tackle the “Climate action, resource efficiency and raw materials” societal challenge as well as the “Secure, clean and efficient energy” societal challenge in the first instance, thanks to lowering the amount of embodied energy in materials used during the construction process and the energy demand during the use-phase of buildings
- Contribute to achieve net zero-energy buildings in the future, serving as driver to boost the market for novel renewable energy applications in the residential sector (according to the Energy Performance of Buildings Directive (2010/31/EU))
- Contribute at the same time to the “Health, demographic change and wellbeing” societal challenge thanks to providing comfortable, well-designed, and energy efficient living spaces for all

Demand-side requirements (stemming from market needs) addressed:

- Enhance competitiveness of the construction sector
- Optimise the life-cycle cost of the built environment
- Provide comfortable, well-designed, energy efficient living spaces for people
- Reduce energy consumption (resulting in savings over the conventional energy purchase for private end-users and in the overall reduction of the energy demand on a global scale)
- Enhance the urban environment, creating a built environment that is accessible and usable for all
- Improve health, safety and security of the built environment
- Make construction activities more efficient, precise and with greater risk avoidance
- Improve health and safety conditions during construction processes

Specific technical/industrial challenges (mainly resulting from gaps in technological capacities):

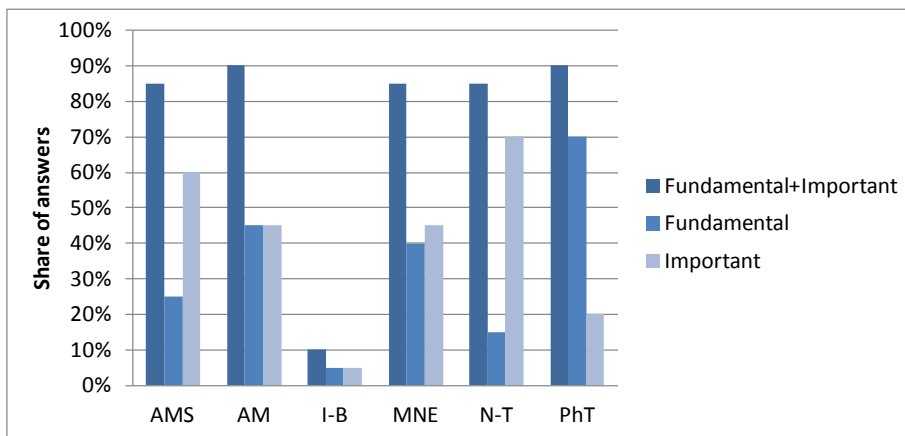
- Development and cost-effective production of lighting equipment (following the “smart home” approach: interoperable, adaptable - in colour, hue, intensity, etc.)
- Design of low consumption highly comfortable and customizable lighting solutions

Contribution by cross-cutting Key Enabling Technologies:

In respect to this Innovation Field, the integration of KETs could contribute to the development of cost-effective, more advanced, low consumption, highly comfortable and customizable lighting solutions and related lighting equipment, and to the related production methods and processes.

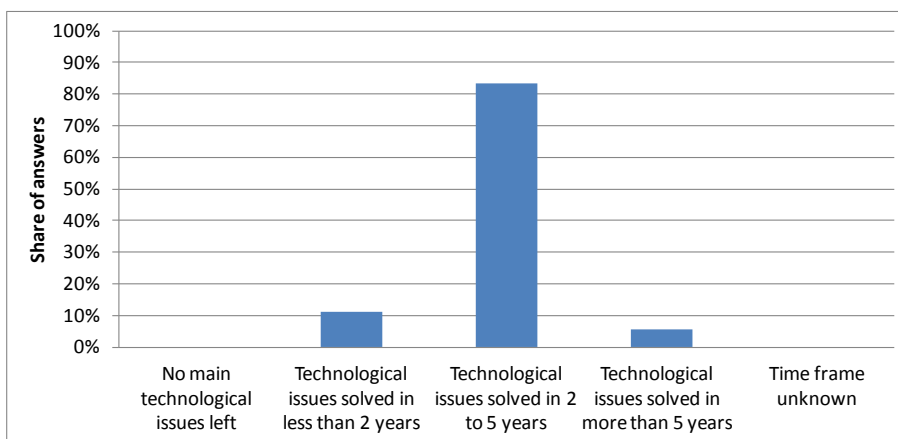
To this aim, the combination of KETs experts’ opinions collected through the dedicated survey (whose result is depicted in the below bar chart), the examination of KETs-related patenting activity in respect to this Innovation Field, and desk research activities, have allowed identifying a rather strong interaction of KETs with respect to this Innovation Field, with either fundamental or important contribution mainly by the following KETs:

- Advanced Manufacturing Systems (AMS)
- Advanced Materials (AM)
- Micro- and Nano-Electronics (MNE)
- Photonics (PHT)
- Nanotechnologies (N-T)



Timing for implementation:

According to the majority of KETs experts' opinions (whose result is depicted in the below bar chart), desk research, and in line with the KETs-related patenting activity in this field, it is considered that the main technological issues holding back the achievement of cross-cutting KETs based products related to this Innovation Field could be solved in a time frame of 2 to 5 years:



Hence, depending on the specific technical and/or industrial challenges holding back the achievement of cross-cutting KETs based products related to this Innovation Field, the provision of support in the short term should be taken into consideration within this framework.

Additional information according to results of assessment:

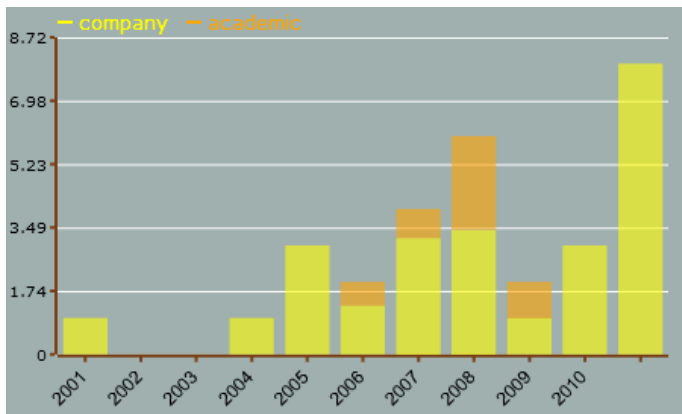
➤ Impact assessment:

- Approximately 85% of lamps currently in EU homes are energy inefficient.
- Within this framework, significant growth is being driven in the European energy efficient lighting market primarily by European Union legislation to phase out incandescent lamps and other inefficient lighting technologies. There is a large push in fact by Europe to adopt energy efficient lighting (among other home appliances) in order to boost energy savings. All EU28 countries are required to use energy more efficiently at all stages of the energy chain – from the transformation of energy and its distribution to its final consumption. The new Energy Efficiency Directive will particularly help removing barriers and overcoming market failures that impede efficiency in the supply and use of energy and provides for the establishment of indicative national energy efficiency targets for 2020. The Directive on the Energy Performance of Buildings, moreover, which imposes certain energy efficiency standards on buildings, including lighting products, will play an important part in achieving the objective to phase out incandescent lamps and other inefficient light sources across Europe.
- As a result of this strategy, the European energy-efficient lighting market is reported to have earned revenues of 0.8 billion Euro in 2011 and estimates this to reach 1.4 billion Euro in 2018. While compact fluorescent lamps are currently the major product segment, the Light-Emitting Diodes (LED) segment is expected to grow rapidly as the technology improves and prices fall.

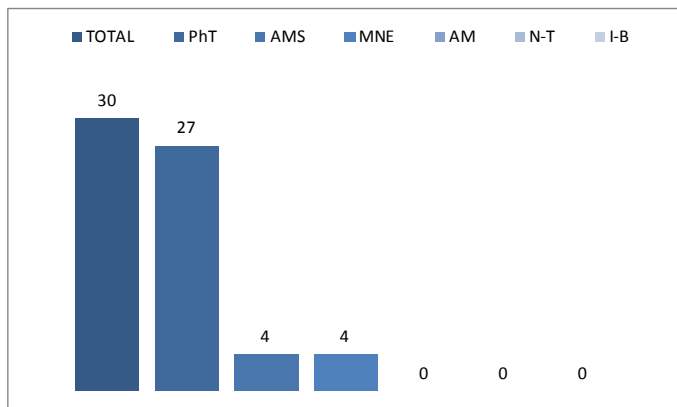
- Yet a switch to more efficient lighting in homes will require significant manufacturing changes within the lighting companies, which the lamp manufacturers are committed to manage in any case.
- Sources: The European lamp industry's strategy for domestic lighting, www.lightingeurope.org; European market energy-efficient lighting update, 2012, www.proudgreenhome.com

➤ **Results of patents scenario analysis:**

- 30 exclusively KETs-related patents identified in the period 2001-2011 for the specific Innovation Field
- Growing trend curve (number of patents per year)
- Highest share of industrial applicants:



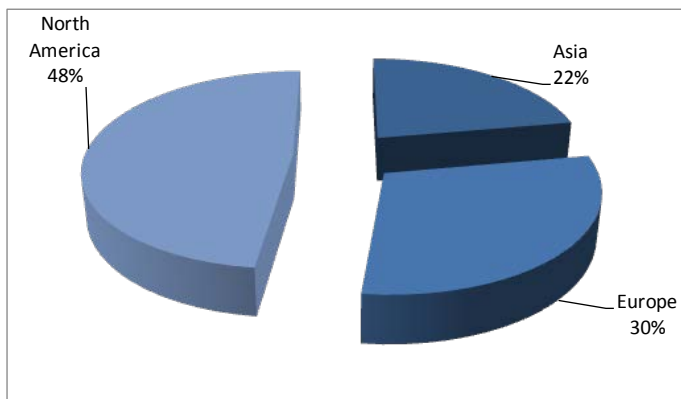
- Patents by KET(s):



- Patents by KET(s) and relevant combinations of KETs:

KET(s)	Number of patents
AMS	4
AMS/PhT	1
MNE	4
MNE/PhT	4
PhT	27

- Patent distribution by (Applicant) organization geographical zone:



- Patent distribution by geographical zone of priority protection:

