

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 Agro-Food 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.

AF.2.2: Cost-efficient consumer food packaging with increased environmental sustainability

Scope:

Consumer food packaging as well as other single use containers for food generates vast amounts of waste whose reduction, recycling and/or reuse are called for. Solutions include more sustainable packaging designs aimed at packaging waste minimization, as well as packaging items aimed at material recycling or item reuse. Product examples include, e.g. recyclable (including biodegradable/compostable) as well as reusable packaging items along with the enhancement of the infrastructure and/or logistics supporting the recycling and/or reuse practices.

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

- Tackle the “Food security, sustainable agriculture, marine and maritime research and the bio-economy” societal challenge
- Contribute at the same time to the “Climate action, resource efficiency and raw materials” challenge as well as the “Health, demographic change and wellbeing” challenge

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

- Improve food chain management
- Improve food safety
- Improve food shelf life

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

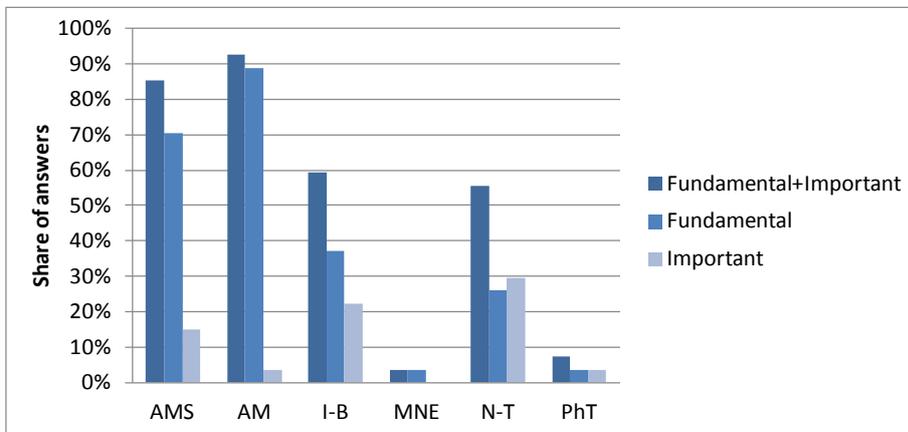
- Improvement of packaging design by eco-design approaches aimed at minimizing the use of packaging materials and/or enhancing materials separation
- Demonstration of simple, environmental friendly, biodegradable/compostable, recyclable and/or reusable packaging items aiming at the reduction of waste from packaging
- Improvement of sorting as well as separation techniques aimed at sorting/separating packaging materials toward material recycling
- Enhancement of the infrastructures and logistics enabling for the composting of compostable packaging items
- Enhancement of the infrastructures and logistics enabling for the separation as well as separate collection of recyclable packaging items
- Enhancement of the infrastructures and logistics enabling for the reuse of food packaging items

Contribution by cross-cutting Key Enabling Technologies:

In respect to this Innovation Field, the integration of KETs could contribute to the development as well as the demonstration of solutions such as more advanced environmentally friendly, biodegradable/compostable, recyclable and/or reusable packaging items aiming at the reduction of waste from packaging, including thanks to the enhancement of the infrastructure and logistics enabling the management of packaging waste.

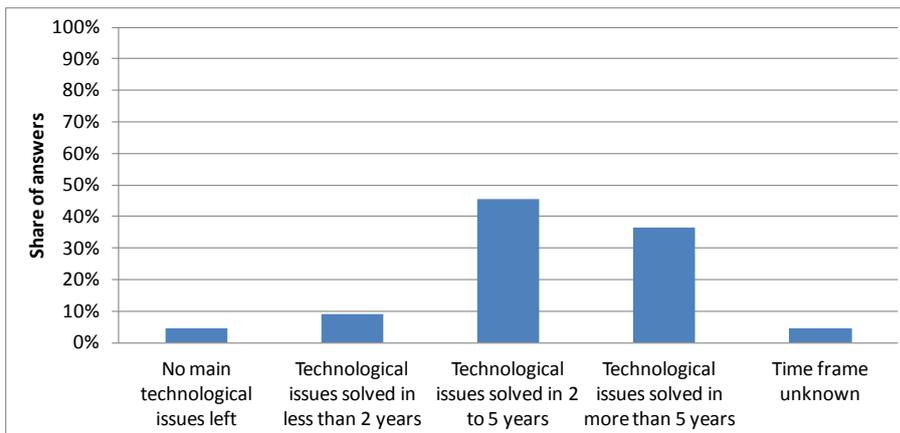
To this aim, the combination of KETs experts’ opinions collected through the dedicated survey (whose result is depicted in the below bar chart), the examination of KETs-related patenting activity in respect to this Innovation Field, and desk research activities, have allowed identifying a rather strong 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)
- Industrial Biotechnology (I-B)
- 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, yet significant consensus by experts indicates also longer periods being necessary:



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 to medium term should be taken into consideration within this framework.

Additional information according to results of assessment:

➤ **Impact assessment:**

- According to the Market Intelligence study "The Future of Sustainable Packaging to 2018", consumer demand, government legislation and technology advances will propel sustainable packaging to a 180 billion Euro market by 2018. According to the study, the most common sustainable packaging trends are downsizing/lightweighting of packaging; increased recycling and waste recovery; increased use of recycled content; increased use of renewably sourced materials; improvements in packaging and logistical efficiency. The report concludes that the issue of sustainable packaging will continue to grow in importance over the next decade thus driving innovation in this field.
- Innovation in packaging has a wide reach, particularly in the food and beverage industry. Several companies are implementing sustainable packaging not only to benefit the environment, but as well as a branding mechanism that can help in differentiating a company by appealing to environmentally conscious consumers. As a reported example, European beer maker Carlsberg recently teamed up with a group of global suppliers to develop the next generation of packaging products that are optimized for recycling and reuse. Moreover, several are the reported examples of paper packaging that incorporates cellulose-rich waste from various sources.

- Within this framework, it is also reported that the recycled material packaging market segment is currently dominated by paper packaging, followed by metal, glass and plastic. While the demand for recycled plastics remains strong, the material faces several challenges, including lack of infrastructure for collection and sorting, international market competition for existing recovered materials and compliance with requirements related to food and drug content, which all constitute opportunities for improvements in this field.
- Source: Smithers Pira, The Future of Sustainable Packaging to 2018, 2013

➤ **Results of patents scenario analysis:**

- 1 KETs-related patent identified in the period 2001-2011 for the specific Innovation Field in relation to KETs
- No significant patent-related figures can be reported in this field