Key Enabling Technologies - Biotechnology

A major component of 'Leadership in Enabling and Industrial Technologies' are Key Enabling Technologies (KETs), defined as micro- and nanoelectronics, photonics, nanotechnology, biotechnology, advanced materials and advanced manufacturing systems[20]. Many innovative products incorporate several of these technologies simultaneously, as single or integrated parts.
While each technology offers technological innovation, the accumulated benefit from combining a number of enabling technologies can also lead to technological leaps. Tapping into cross-cutting key enabling technologies will enhance product competitiveness and impact. The numerous interactions of these technologies will therefore be exploited. Dedicated support will be provided for larger-scale pilot line and demonstrator projects.

This will include cross-cutting activities that bring together and integrate various individual technologies, resulting in technology validation in an industrial environment to a complete and qualified system, ready for the market. Strong private sector involvement in such activities will be a prerequisite and implementation will therefore notably be through public private partnerships. To this extent and through a dedicated governance structure, a joint work programme for cross-cutting KETs activities will be developed. Taking into account market needs and the requirements of the societal challenges, it will aim at providing generic KETs building blocks for different application areas, including societal challenges.

1.4. Biotechnology

1.4.1. Boosting cutting-edge biotechnologies as future innovation drivers

The objective is to lay the foundations for the European industry to stay at the front line of innovation, also in the medium and long term. It encompasses the development of emerging tools such as synthetic biology, bioinformatics, systems biology and exploiting the convergence with other enabling technologies such as nanotechnology (e.g. bionanotechnology) and ICT (e.g. bioelectronics). These and other cutting-edge fields deserve appropriate measures in terms of research and development to facilitate effective transfer and implementation into new applications (drug delivery systems, biosensors, biochips, etc).

1.4.2. Biotechnology-based industrial processes

The objective is twofold: on the one hand, enabling the European industry (e.g. chemical, health, mining, energy, pulp and paper, textile, starch, food processing) to develop new products and processes meeting industrial and societal demands; and competitive and enhanced biotechnology-based alternatives to replace established ones; on the other hand, harnessing the potential of biotechnology for detecting, monitoring, preventing and removing pollution. It includes R&I on enzymatic and metabolic pathways, bio-processes design, advanced fermentation, up- and down-stream processing, gaining insight on the dynamics of microbial communities. It will also encompass the development of prototypes for assessing the techno-economic feasibility of the developed products and processes.

1.4.3. Innovative and competitive platform technologies

The objective is to develop platform technologies (e.g. genomics, meta-genomics, proteomics, molecular tools) triggering leadership and competitive advantage on a wide number of economic sectors. It includes aspects, such as underpinning the development of bio-resources with optimised properties and applications beyond conventional alternatives; enabling exploration, understanding and exploitation in a sustainable manner of terrestrial and marine biodiversity for novel applications; and sustaining the development of biotechnology-based healthcare solutions (e.g. diagnostics, biologicals, bio-medical devices).

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