

All of these activities shall be undertaken in such a way as to provide support throughout the research and innovation cycle, strengthening the competitiveness of the European based industries and development of new market opportunities.

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improving disease management and prediction; treating disease; transferring knowledge to clinical practice and scalable innovation actions; better use of health data; active ageing.

Bitte beachten Sie, dass es thematische Überlappungen mit den anderen Herausforderungen gibt! Für Fragen stehen Ihnen die Mitarbeiter/-innen der NKS-Lebenswissenschaften gerne zur Verfügung!

making and regulatory needs; and optimising the efficiency and effectiveness of healthcare systems and reducing inequalities by evidence based decision making and dissemination of best practice, and innovative technologies and approaches.

2. FOOD SECURITY, SUSTAINABLE AGRICULTURE, MARINE AND MARITIME RESEARCH AND THE BIO-ECONOMY

2.1 Specific objective

The specific objective is to secure sufficient supplies of safe and high quality food and other bio-based products, by developing productive and resource-efficient primary production systems, fostering related ecosystem services, along side competitive and low carbon supply chains. This will accelerate the transition to a sustainable European bio-economy.

Over the coming decades, Europe will be challenged by increased competition for limited and finite natural resources, by the effects of climate change, in particular on primary production systems (agriculture, forestry, fisheries and aquaculture) and by the need to provide a sustainable, safe and secure food supply for the European and an increasing global population. A 70 % increase of the world food supply is estimated to be required to feed the 9 billion global population by 2050. Agriculture accounts for about 10 % of Union greenhouse gases emissions, and while declining in Europe, global emissions from agriculture are projected to increase up to 20 % by 2030. Furthermore, Europe will need to ensure sufficient supplies of raw materials, energy and industrial products, under conditions of decreasing fossil carbon resources (oil and liquid gas production expected to decrease by about 60 % by 2050), while maintaining its competitiveness. Bio-waste (estimated at up to 138 million tonnes per year in the Union, of which up to 40 % is land-filled) represents a huge problem and cost, despite its high potential added value. For example, an estimated 30 % of all food produced in developed countries is discarded. Major changes are needed to reduce this amount by 50 % in the Union by 2030²⁶. In addition, national borders are irrelevant in the spread of animal and plant pests and diseases, including zoonotic diseases, and food borne pathogens. While effective national prevention measures are needed, action at Union level is essential for ultimate control and the effective running of the single market. The challenge is complex, affects a broad range of interconnected sectors and requires a plurality of approaches.

²⁶ COM (2011)0112

More and more biological resources are needed to satisfy market demand for a secure and healthy food supply, bio-materials, biofuels and bio-based products, ranging from consumer products to bulk chemicals. However the capacities of the terrestrial and aquatic ecosystems required for their production are limited, while there are competing claims for their utilisation, and often not optimally managed, as shown for example by a severe decline in soil carbon content and fertility. There is under-utilised scope for fostering ecosystem services from farmland, forests, marine and fresh waters by integrating agronomic and environmental goals into sustainable production.

The potential of biological resources and ecosystems could be used in a much more sustainable, efficient and integrated manner. For examples, the potential of biomass from forests and waste streams from agricultural, aquatic, industrial, and also municipal origins could be better harnessed

In essence, a transition is needed towards an optimal and renewable use of biological resources and towards sustainable primary production and processing systems that can produce more food and other bio-based products with minimised inputs, environmental impact and greenhouse gas emissions, enhanced ecosystem services, zero-waste and adequate societal value. A critical effort of interconnected research and innovation is a key element for this to happen, in Europe and beyond.

2.2 Rationale and Union added value

Agriculture, forestry and fisheries together with the bio-based industries are the major sectors underpinning the bio-economy. This latter represents a large and growing market estimated to be worth over EUR 2 trillion, providing 20 million jobs and accounting for 9 % of total employment in the Union in 2009. Investments in research and innovation under this societal challenge will enable Europe to take leadership in the concerned markets and will play a role in achieving the goals of the Europe 2020 strategy and its Innovation Union and Resource Efficient Europe flagship initiatives.

A fully functional European bio-economy – encompassing the sustainable production of renewable resources from land and aquatic environments and their conversion into food, bio-based products and bioenergy as well as the related public goods - will generate high European added value. Managed in a sustainable manner, it can reduce the environmental footprint of primary production and the supply chain as a whole. It can increase their competitiveness and provide jobs and business opportunities for rural and coastal development. The food security, sustainable agriculture, and overall bio-economy – related challenges are of a European and global nature. Actions at Union level are essential to bring together clusters to achieve the necessary breadth and critical mass to complement efforts made by a single or groups of Member States. A multi-actor approach will ensure the necessary cross-fertilising interactions between researcher, businesses, farmers/producers, advisors and end-users. The Union level is also necessary to ensure coherence in addressing this challenge across sectors and with strong links to relevant Union policies. Coordination of research and innovation at Union level will stimulate and help to accelerate the required changes across the Union.

Research and innovation will interface with a wide spectrum of Union policies and related targets, including the Common Agriculture Policy (in particular the Rural Development Policy) and the European Innovation Partnership 'Agricultural Productivity and Sustainability', the Common Fisheries Policy, the Integrated Maritime Policy, the European

Climate Change Programme, the Water Framework Directive, the Marine Strategy Framework Directive, the Forestry Action Plan, the Soil Thematic Strategy, the Union's 2020 Biodiversity Strategy, the Strategic Energy Technology Plan, the Union's innovation and industrial policies, external and development aid policies, plant health strategies, animal health and welfare strategies and regulatory frameworks to protect the environment, health and safety, to promote resource efficiency and climate action, and to reduce waste. A better integration of research and innovation into related Union policies will significantly improve their European added value, provide leverage effects, increase societal relevance and help to further develop sustainable land, seas and oceans management and bio-economy markets.

For the purpose of supporting Union policies related to the bio-economy and to facilitate governance and monitoring of research and innovation, socio-economic research and forward looking activities will be performed in relation to the bio-economy strategy, including development of indicators, data bases, models, foresight and forecast, impact assessment of initiatives on the economy, society and the environment.

Challenge-driven actions focusing on social and economic benefits and the modernisation of the bio-economy associated sectors and markets shall be supported through multi-disciplinary research, driving innovation and leading to the development of new practices, products and processes. It shall also pursue a broad approach to innovation ranging from technological, non-technological, organisational, economic and social innovation to for instance novel business models, branding and services.

2.3 Broad lines of activities

(a) Sustainable agriculture and forestry

The aim is to supply sufficient food, feed, biomass and other raw-materials, while safeguarding natural resources and enhancing ecosystems services, including coping with and mitigating climate change. The activities shall focus on more sustainable and productive agriculture and forestry systems which are both resource-efficient (including low-carbon) and resilient, while at the same time developing of services, concepts and policies for thriving rural livelihoods.

(b) Sustainable and competitive agri-food sector for a safe and healthy diet

The aim is to meet the requirements of citizens for safe, healthy and affordable food, and to make food and feed processing and distribution more sustainable and the food sector more competitive. The activities shall focus on healthy and safe foods for all, informed consumer choices, and competitive food processing methods that use less resources and produce less by-products, waste and green-house gases.

(c) Unlocking the potential of aquatic living resources

The aim is to sustainably exploit aquatic living resources to maximise social and economic benefits/returns from Europe's oceans and seas. The activities shall focus on an optimal contribution to secure food supplies by developing sustainable and environmentally friendly fisheries and competitive European aquaculture in the context of the global economy and on boosting marine innovation through biotechnology to fuel smart "blue" growth.

(d) Sustainable and competitive bio-based industries

The aim is the promotion of low carbon, resource efficient, sustainable and competitive European bio-based industries. The activities shall focus on fostering the bio-economy by transforming conventional industrial processes and products into bio-based resource and energy efficient ones, the development of integrated biorefineries, utilising biomass from primary production, biowaste and bio-based industry by-products, and opening new markets through supporting standardisation, regulatory and demonstration/field trial activities and others, while taking into account the implication of the bio-economy on land use and land use changes.

3. SECURE, CLEAN AND EFFICIENT ENERGY

3.1. Specific objective

The specific objective is to make the transition to a reliable, sustainable and competitive energy system, in the face of increasingly scarce resources, increasing energy needs and climate change.

The Union intends to reduce greenhouse gas emissions by 20 % below 1990 levels by 2020, with a further reduction to 80-95 % by 2050. In addition, renewables should cover 20 % of final energy consumption in 2020 coupled with a 20 % energy efficiency target. Achieving these objectives will require an overhaul of the energy system combining low carbon profile, energy security and affordability, while at the same time reinforcing Europe's economic competitiveness. Europe is currently far from this overall goal. 80 % of the European energy system still relies on fossil fuels, and the sector produces 80 % of all the Union's greenhouse gas emissions. Every year 2.5 % of the Union's Gross Domestic Product (GDP) is spent on energy imports and this is likely to increase. This trend would lead to total dependence on oil and gas imports by 2050. Faced with volatile energy prices on the world market, coupled with concerns over security of supply, European industries and consumers are spending an increasing share of their income on energy.

The roadmap to a competitive low-carbon economy in 2050²⁷ shows that the targeted reductions in greenhouse gas emissions will have to be met largely within the territory of the Union. This would entail reducing CO₂ emissions by over 90 % by 2050 in the power sector, by over 80 % in industry, by at least 60 % in transport and by about 90 % in the residential sector and services.

To achieve these reductions, significant investments need to be made in research, development, demonstration and market roll-out of efficient, safe and reliable low-carbon energy technologies and services. These must go hand in hand with non-technological solutions on both the supply and demand sides. All this must be part of an integrated low-carbon policy, including mastering key enabling technologies, in particular ICT solutions and advanced manufacturing, processing and materials. The goal is to produce efficient energy technologies and services that can be taken up widely on European and international markets and to establish intelligent demand-side management based on an open and transparent energy trade market and intelligent energy efficiency management systems.

²⁷ COM(2011) 112