



European funding instruments for research on Environment and Energy

For decades, the European Union has been committed to the protection of the environment and focuses particularly on the close interaction of environmental and energy policies.

Whilst the European Union stands for remarkable unity and a strong ability to negotiate on the world stage, for instance through the conclusion of international climate agreements, it shows its dedication for a sustainable climate policy above all within Europe itself.

The Europe 2020 strategy for a smart, sustainable and inclusive growth substantiates the goal of the European environmental policy to reduce greenhouse gas emissions, to increase the proportion of renewable energies and to enhance energy efficiency. Following this strategy, the European Commission prioritises the creation of a European Energy Union, which shall lead to secure, affordable and sustainable energy for Europe (including the implementation of an internal energy market). The development of renewable energies will contribute to European and globally agreed climate targets, and increase Europe's independence of resource and energy imports, thus guaranteeing the energy security of about 500 million Europeans. The mentioned elements of the

European environmental policy aim at achieving a decarbonised and sustainable economy, protecting natural resources as well as safeguarding health and quality of life of all Europeans. Simultaneously, the competitiveness of the EU on an international level shall be increased.

How can the political willingness to adjust the European economy to sustainability and to implement the Energy Union based on renewable energies to combat climate change be realised, while ensuring the living standards for all Europeans and the competitiveness of Europe?

The EU invites all societal stakeholders to work together and across borders towards innovative, creative and forward-thinking solutions for a future worth living in. The needs of the ambitious European climate and energy policy will be met by exploring and developing new technologies and instruments.

To realise its environmental and energy policy, the European Union has consequently invested for years in research and innovation, whilst increasing Europe's competitiveness through innovative project results. One instrument of this investment is the EU Framework Programme Horizon 2020, which represents the largest

funding programme for research and innovation worldwide. From 2014 to 2020, Horizon 2020 provides nearly 80 billion Euros, of which 10 billion are available for energy and environmental research.

The European Union pursues a holistic approach with its research and innovation policy, which focuses on the development of disruptive innovations and in particular on the involvement of different societal stakeholders. Scientists from universities and research institutes cooperate in interdisciplinary projects with researchers from industry and representatives from communities and political authorities. Moreover, the participation of private persons as citizen scientists becomes increasingly relevant. The participating partners benefit from the knowledge and research culture of other countries, while increasing their international visibility through transnational cooperation.

Horizon 2020 follows the principle of the three "Os". Open Science allows the unhindered knowledge transfer in all areas of society. Open Innovation opens the innovation process and hence promotes knowledge exchange as well as the cross-linking of know-how. The principle open to the world acts in this spirit as well, as Horizon 2020 explicitly welcomes the cooperation with partners from around the world, thereby

widening the European research area by a global perspective and creating a value added for Europe.

The Horizon 2020 work programme for 2018 to 2020 funds projects in the environment and energy sectors, which contribute to a low-carbon and climate-resilient future, to the implementation of the Paris Agreement and to the greening of the economy in line with the UN Sustainable Development Goals (SDGs).

In tangible terms, this implies creating cost-effective and more efficient production technologies that are integrated better into a smart, flexible and robust energy system. Energy efficiency shall be amplified in industrial processes and the EU building stock (new and existing buildings). By granting an citizens and consumers active role in the energy transition, the understanding of the socio-economic context shall be improved and the market acceptance of environment and energy innovations will be increased.

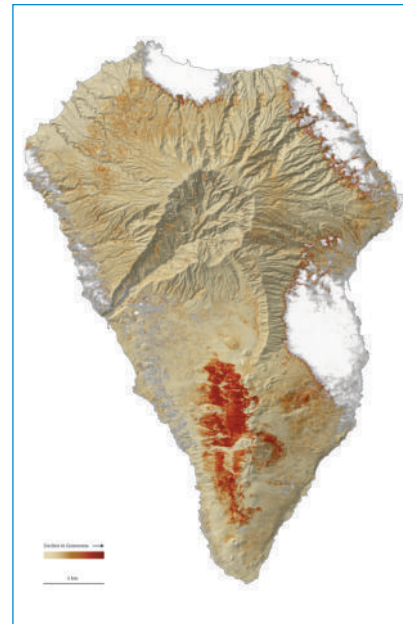
Regarding the transition to a circular economy, resources need to be used more effectively and efficiently, thereby contributing to sustainable economic and societal models. EU funded projects shall enhance the development of innovations that allow access to non-energetic, non-agricultural resources for industrial purposes. Funding measures in the environmental sector with an emphasis on water aim at supporting and accelerating the implementation of European water-, resource efficiency and water-dependent industry policies. In this context, the protection and further development of natural and cultural assets, biodiversity, ecosystems and material cultural heritage play an important role to use their value for economy and society. Earth observation data and informa-

tion will be used to support the goals for sustainable development.



This is already pursued in **ECO-POTENTIAL** (Improving Future Ecosystem Benefits through Earth Observations). In this EU funded project, 47 universities and research institutes from 11 EU countries and seven non-EU states (i.a. Israel, South Africa, Australia, and Kenia) cooperate to investigate and conserve ecosystems and nature reserves by using data from continuous earth observation via weather and radar stations, airplanes and satellites.

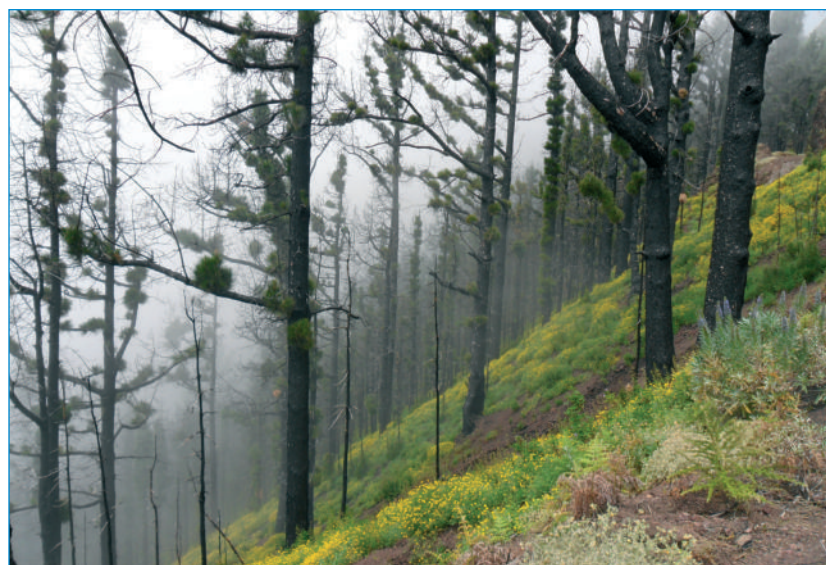
The research area of the greatest European nature reserve project, which has ever been financed, covers a variety of climatic zones throughout Europe. The consortium also deals with legal and political framework conditions of environmental management in the EU member states and participating third countries in order to use concepts and guidelines for the management and



Satellite imagery show what happens in nature – in this case, the loss of leaves between July and August 2016 on the Canarian island La Palma. A huge human-induced forest fire happened in a large area in the South of the island. Clouds formed by the trade wind, cover the white spots on the map. ■

conservation of natural reserves and systems.

Another priority in the Horizon 2020 working programme is sustainable urban development, for example in Smart City Projects. Therein, funded cities and municipalities (so-called lighthouse cities) work together for a safe, adaptive and sustainable urban development.



The Canarian pine is adapted to forest fires: the trees survive and sprout again after the fire has destroyed their needles. Researchers can understand such dynamics better due to the conjunction of earth observation and field data.

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The City of Munich is one of these lighthouse cities and develops solutions for a liveable city of the future together with its partner cities Vienna and Lyon as well as various local stakeholders from the academic and economic sector. The EU project **Smarter Together** aims to improve the quality of life of residents, increase the energy efficiency and create integrated mobility offers. One of the major district development areas in Germany, Neuaubing-Westkreuz/Freiham, serves as a real-time laboratory to experiment in the areas of energy, mobility and technology, to develop i.a. intelligent light poles, multimodal mobility

offers as well as multifunctional “Shared District Boxes”, and to apply those technologies in the research area. Additionally, a SmartCity App connects all offers and services in the district smartly, thus creating a real benefit for the inhabitants. The local citizens are actively engaged in this process by co-creating the activities. Ideas and solutions that have proven to be successful and are well received by citizens shall be further developed and implemented in the long term in other districts of Munich and European cities.

Besides Horizon 2020, there are various other programmes in the environment and energy sector, promoting research and innovation for a liveable future.

Due to its natural beauty, variety of landscapes, rich biodiversity and cul-

tural heritage, the Alpine region plays a crucial economic and ecological role. This was emphasised in the EU strategy for the Alpine Region (EUSALP). Simultaneously, the Alpine Region is faced with considerable challenges due to economic globalisation trends, demographic change, climate change, energy problems and its role as transit region.

The INTERREG-Programme Alpine Space provides 116 million Euro in total to transnational projects that target cross-border challenges and develop new visions for an intelligent, sustainable and integrated growth in the Alpine Region. The topics “Innovative Alpine Space”, “Low Carbon Alpine Space”, “Liveable Alpine Space” and “Well-governed Alpine Space” tackle most urgent tasks in the field of innovation and public services, low-carbon transport and mobility options, sustainable valorisation of the natural and cultural heritage of the Alpine Space as well as the protection and ecological connectivity of alpine ecosystems.



The Alpine Space financed project **GRETA** (Near-Surface Geothermal Resources in the Territory of the Alpine Space) fosters the use of near-surface geothermal energy for covering the increasing heating and cooling energy demand in the Alpine Region. Geothermal energy serves as a renewable energy source, which is climate-friendly, sustainable and independent of weather conditions. GRETA also addresses innovative use cases, like the heating of swimming pools and train stations as well as the cooling of supermarkets, hotels or office buildings.

In consequence of the manifold opportunities for European funding for research and innovation, nu-



Project area/subject street lamps. Copyright: Dominik Parzinger ■



Geothermally heated railway tracks. Copyright: GRETA Project ■

merous service points at national and regional level support potential applicants.

The Bavarian Research Alliance (BayFOR) offers interested parties a comprehensive advisory service regarding European funding instruments and an active support in all phases of the proposal writing process. Thanks to its offices in Munich, Nuremberg and Brussels, BayFOR is widely connected on a regional and European level. Additionally, BayFOR is a partner institution in

the Bavarian Research and Innovation Agency. BayFOR supports project consortia with at least one Bavarian project partner. BayFOR's scientific officers support and advise potential applicants throughout the application process. This includes consultation on European funding instruments, specialisation on certain calls, assistance for national and international partner search, and the hands-on support during the entire process of proposal writing as well as the grant preparation phase with the funding body.

Alongside universities and research institutes, European projects focus especially on small- and medium-sized enterprises (SMEs) as well as municipalities. BayFOR has further established an advisory unit for SMEs and is a partner organisation in the Enterprise Europe Network, the biggest consultation network for SMEs. Since BayFOR's entire range of services is pre-financed by the Land of Bavaria, there are no additional costs for consortia during the application phase.

The benefit of European projects becomes obvious when projects are actually funded and consortium partners profit from grants, knowledge exchange and increased visibility due to international cooperation. Above all, the real value added of the projects evolves, when partners present successful solutions for a liveable future and experience by way of collaboration the meaning of being unified in diversity. ■



Installation of a borehole heat exchanger in the Aosta Valley, Italy. Copyright: GRETA project. ■

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