European Funding of Innovative Environmental and Energy Research Projects

Climate change and a rapidly growing demand for energy are some of the greatest challenges worldwide of our era. They can only be addressed through further research and the development of innovative technologies. As part of Horizon 2020, its Framework Programme for Research and Innovation, which was recently launched, the European Union has shown its commitment to financially support promising projects. The Bavarian Research Alliance (BayFOR) helps interested scientists and companies to identify possible funding options that are optimal for their project and assists them during the application process.

The new European Framework Programme for Research and Innovation, Horizon 2020, was launched on January 1, 2014. It replaces the Seventh Framework Programme for Research (FP7), which supported European research and development projects with approximately EUR 53 billion over the past seven years. Horizon 2020 has earmarked approximately EUR 80 billion – a substantial part of which is allocated for the fields environment and energy across Europe. That means scientists and enterprises from the Free State of Bavaria will also have new, promising opportunities, for instance, to develop innovative products.

Based on the experience gained from FP7, the European Commission has optimized the new funding programme: Horizon 2020 is simpler, financially more attractive and closer to the market. It covers the entire innovation chain, extending from fundamental research through to market launch. The goal is to promote promising projects, excellent research work and the development of innovative products. The new Framework Programme

is part of the Europe 2020 growth and jobs strategy. The EU has started this flagship initiative that aims to promote intelligent, sustainable and integrative growth over a ten-year period in order to strengthen and expand Europe's position in terms of international competition.

Three Pillars as Base of the new EU Funding Programme

Horizon 2020 is built on three pillars: excellent science (1), industrial leadership (2) and societal challenges (3). The first pillar encompasses measures that are aimed to increase excellence in science. That includes both promoting individual scientists and furthering mobility as well as infrastructural measures to develop transnational cooperation and exchange programmes. Even visionary, riskier projects, which explore new technology concepts, fall into this category.

The second pillar should strengthen the leading role that the EU's industry plays in six key areas: information and communication technologies, nanotechnology, biotechnology, new materials, innovative processing and space research. These areas call for techniques and disciplines that are part of environment and/or energy research. Paying close attention to the appropriate tenders is very advisable. Another component of this pillar includes a specific support instrument for small to medium-sized enterprises ("SME instrument").

The societal challenges that exist nowadays form the third pillar and include demographic changes, food safety and sustainable agriculture, clean efficient energy, intelligent transport systems, sustainable use of raw materials and secure societies. The new work programmes for environment and energy issues among other things fall in this category. Important

focal points in the environment segment encompass waste recovery (recycling and reuse of raw materials, among other things), market-driven innovations in the water sector (drinking water, wastewater), raw materials, earth observation techniques, climate research, biodiversity and ecosystem research. The energy work programme focuses on tenders in the following areas: energy efficiency (buildings and consumers, heating and cooling, industry and products), technologies with low CO emissions (electricity, grids, storage systems, biofuels) as well as intelligent cities and communities of the future.

Focus on Small to Medium-sized Enterprises

Many amendments make Horizon 2020 more attractive compared to its predecessors. They minimize the administrative expenses and should help to transform more project results into marketable applications. Besides pure research, Horizon 2020 also focuses on pilot projects and demonstration activities. Emphasis is placed on consolidating transdisciplinary expertise, since innovations frequently evolve at interdisciplinary interfaces. Many work programmes have a deliberate focus on various disciplines in order to leverage this wealth.

The European Commission sees SMEs as an innovation driver which can swiftly turn research results into marketable products and by doing so create new jobs. This is reflected in the layout of the funding programme and the higher rate of funding: Twenty percent of all funding is earmarked for SMEs in the aforementioned pillars 2 and 3 (industrial leadership and/or societal challenges). Seven percent is tied to an area that can only be utilized by SMEs. The new SME instrument that has been established as

Close-to-market innovations in the water sector play an important role for the EU (Karin Schmidt/pixelio.de) ■

part of Horizon 2020 envisages funding throughout the entire innovation cycle: Phase 1 supports feasibility studies, phase 2 research and development projects as well as demonstration and market launch activities. In phase 3, the EU supports the marketing of products and/or innovative services. Even individual enterprises that do not have cooperation partners will be eligible to apply in the future. In addition to that, the EU Commission does demand that there is a substantial involvement of SMEs in joint research projects.

Moreover, Horizon 2020 makes it easier for SMEs to obtain risk capital: For instance, the European Investment Bank and European Investment Fund offer direct financing options. Both work together with partner institutions in the respective countries, i.e. with the Bayerische Landesbank or LfA Förderbank Bayern in Bavaria. Companies can receive further support from the largest advisory network for SMEs in Europe, the Enterprise Europe Network (EEN). In cooperation with business and innovation advisors, the EEN provides companies with free support by analyzing market potential and drawing up business plans. As EEN partner, BayFOR supports Bavarian SMEs in their efforts to successfully obtain EU funding and advises them during the entire application phase.

Simplification and Specialization

At the same time, the EU Commission has also simplified and accelerated administrative processes in Horizon 2020. All steps including formal handling now take place on a uniform IT platform. Processing time should be further reduced thanks to fewer evaluations and optimized procedures. Once a project receives a positive evaluation, applicants no longer have to wait as long as they had to in the past until the contract is signed. The grant agreement should be ready by the EU Commission at the latest eight months after the closing date for a project application. Of these eight months, the evaluation process should require a maximum of five months.

In addition to that, the EU aims to help individual regions in their technical specialization efforts. The objective is to promote structural change and enable excellent, innovative research and development and improve Europe's ability to compete. The EU intends to promote projects with non-European partners more than in the past and thus profit from the know-how and technology transfer.

Current EU-funded Energy and Environment Projects with Bavarian Participants

Horizon 2020 offers promising opportunities for enterprises and research institutes to implement their innovative product ideas. The following current projects, which have been receiving funding via a variety of European funding programmes for several

AlpBC: preservation and development of alpine building culture (Rainer Sturm/pixelio.de) ■

years now, are good examples of just some of the exciting fields that receive European research and innovation funding. BayFOR has supported scientists and companies in their efforts to identify suitable funding options and in the filing of applications and implementing projects.

AlpBC: Making Alpine Building Culture Viable for the Future

The alpine region is home to unique natural and cultural treasures, which have evolved over the centuries through adaption to local and climatic conditions and regional expertise. The objective of AlpBC is to preserve the multifaceted alpine building culture and make it viable for current and future requirements. That includes improved energy efficiency and knowledge about the impact of demographic and climate change.

The AlpBC consortium comprises institutions of the construction industry and professional associations from five different alpine countries. The twelve project partners want to ensure that the alpine building culture receives greater attention in spatial development planning on a municipal, intermunicipal, regional, national and transnational level. Emphasis is placed on an integrated approach that incorporates, for instance, both the sustainable use of regional building materials and renewable energies. To this end, AlpBC aims to sensitize and qualify regional participants with regard to this topic. The EU is providing approx. EUR 2.1 million over a 34-month period for the project that is being coordinated by the Chamber of Trades and Crafts for Munich and Upper Bavaria.

Drilling tower of the geothermal project "Geretsried-Nord" situated south of Munich in order to extract geothermal water for thermal energy and power generation (Gerold Diepolder) ■

GeoMol: Harnessing Subsurface Treasures

GeoMol examines the alpine foreland basins that reach up to 5,000 meters in depth to the north and south of the Alps and which evolved during the formation of the mountain range. They offer enormous potential for the development and use of environmentally friendly technologies for generating energy, for instance geothermal energy. The precise structures of these basins are still largely unknown. Moreover, some possible uses exclude one another at the different depths.

And since many usable underground structures extend across national borders, it is necessary to have an integrated and transnationally coordinated approach in place. As a result, the fourteen GeoMol project partners are developing harmonized procedures for assessing underground potentials. These are then to be applied in close consultation with all responsible parties in the participating countries. The results shall be directly incorporated in several 3D underground models and form a basis for deciding on the processes that ensure a sustainable use of these subsurface "treasures".

The EU provides GeoMol with funding totalling approx. EUR 2.2 million over a 33-month period. The project is coordinated by the "Bayerisches Landesamt für Umwelt" (Bavarian Environment Agency) in Augsburg.

IMAGEEN: Making Food and Beverages Environmentally Sound

We waste 1.3 billion metric tons of food every year worldwide. And as if that were not enough: The related production processes consume significant quantities of important resources like water, agricultural land, energy, labour and capital and generate a substantial amount of greenhouse gases. "Eco-design" as an environ-

mentally sound approach to design products can make an important contribution to reducing the "ecological footprint" left by food production processes.
The objective of the IMAGEEN knowledge transfer initiative is to motivate with workshops and awareness-raising events SMEs operating within the food and beverage manufacturing value chain to make their products more environmentally compatible.
At the same time, IMAGEEN aims to help these SMEs to maintain their competitive edge, since they are facing ever-increasing environmental protection requirements in Europe.
The environmentally compatible design of their products is essential for these companies to remain competitive on international markets and to satisfy the demands of major customers. In addition to that, SMEs may also save money if they are able to decrease their consumption of resources and create more sustainable packaging solutions. They also improve their public image by voluntarily reducing their CO_2 emissions. The European Commission supports the project with approx. EUR 552,000 over a 21-month period.

SIMWOOD: Sustainably Tapping Unused Reserves of Timber in Forests

Europe has 159 million hectares of forests and woodland. Timber as a natural resource is frequently not used optimally especially in privately owned woods, and at the same time the ever-increasing demand for wood for material and energy applications is becoming more and more difficult to meet. The EU project SIMWOOD aims to contribute to a more efficient use of the available supply of wood and thus bolster Europe's forestry and wood industry as well as improve wood mobilization by utilizing an integrative approach. Besides topics like forest ownership, forestry and harvesting technology, the project partners attach particular importance to the impact on a forest's capacity to carry out other functions and the participation of existing local interest groups.
There are altogether 28 project partners coming from Germany, Belgium, Finland, France, Great Britain, Ireland, Netherlands, Portugal, Sweden, Slovenia and Spain. The project also includes two European institutions (Joint Research Centre and European Forest Institute), 14 national research institutes and 12 small or medium-sized enterprises.
They are investigating optimum forest use in 14 European model regions. The EU supports the project with approx. EUR 6 million over a 4-year period. Coordinator is the "Bayerische Landesanstalt für Wald und Forstwirtschaft" (Bavarian State Agency for Forestry, LWF).

SIMWOOD: mobilization of untapped reserves of timber (Jürgen Acker/pixelio.de) ■

Identifying and Utilizing Funding Options

The EU offers a wide variety of funding options. The sheer diversity poses a major obstacle for potential applicants: Identifying an appropriate tender and submitting a successful application requires extensive know-how and expertise. To this end, BayFOR provides its experience and expertise to Bavarian scientists and entrepreneurs. The enterprise, which is funded by Bavaria's State Ministry of Education, Science and the Arts, among others, provides information about support options, conducts continuing education measures and offers active support during the project initiation phase, the setup of international consortia and the application process. After successful evaluation, BayFOR also supports participants while negotiating the contract with the European Commission or the responsible project administrators and, if necessary, even assumes administrative project management and public relations activities. BayFOR has also been commissioned by Bavaria's State Ministry of Education, Science and the Arts to look after the federal state's Funding Programme for the Initiation of International Projects (BayIntAn).

With this form of assistance, Bavarian universities and universities of applied sciences should be able to visit research and cooperation partners in other countries in order to initiate or strengthen transnational collaboration in research projects. ■

Networking as Success Factor

BayFOR has an outstanding network on a regional, national and international level. Its liaison office in Brussels represents the interests of the Bavarian universities, promoting their visibility and acting as an intermediary with the European institutions. Moreover, BayFOR coordinates the joint activities of the Bavarian Research Associations and supports their networking activities at the European level. The scientific coordination office Bayern-Québec/Alberta/International finances bilateral research projects in the partner regions.

As partner in the Enterprise Europe Network (EEN), BayFOR also offers targeted advisory services for SMEs that are interested in participating in EU research projects or want to cooperate with other SMEs on a transnational level. The EEN is a European network, which promotes cooperation, technology transfer and strategic partnerships between small and medium-sized enterprises. Especially when it comes to research and development, the German partners in the EEN help to establish contact with partners in business and science. As partner in the Bavarian "Haus der Forschung" (House of Research), BayFOR also works closely together with Bayern Innovativ, the "Innovations- und Technologiezentrum Bayern" (Bavarian Centre for Innovation and Technology, ITZB) and the "Bayerische Forschungsstiftung" (Bavarian Research Foundation). The cooperation between the four partners in the "Haus der Forschung" has resulted in the formation of a central location for European, national and Bavarian research and technology funding programmes. ■

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