

## KMU-innovativ – giving the green light for top research by SMEs

It is often small and medium-sized enterprises (SMEs) that use and drive forward the most efficient technologies. They are therefore the pioneers of technological progress in many fields. Resource efficiency is improved through their own innovations or by catching onto highly innovative methods at an early stage. The BMBF “KMU-innovativ” funding initiative is supporting SMEs in the development of innovative technologies and services for improved resource and energy efficiency.

### Innovations for resource and energy efficiency

KMU-innovativ is open to all topics within the field of resource and energy efficiency and is aimed at all innovative SMEs across all industries. The BMBF has been using “KMU-innovativ” to provide SMEs with new opportunities since 2007 by facilitating access to research funding in areas key to our future, as the risks associated with top research are often difficult to calculate. The BMBF has therefore improved consultancy services for SMEs and has simplified and accelerated the application and approval process.

### Technology field: “sustainable water management”

One of the greatest challenges for the future is to ensure the supply of clean water to the global population. Population growth, water contamination and a growing water consumption per capita are all having a negative effect on water quality. Large-scale changes to climate and land usage are also affecting global and regional water cycles and are therefore calling the medium and long-term availability of water into question. The BMBF is supporting research and development projects in the following areas in order to develop solutions:

Innovative procedures for obtaining drinking water

- Strategies and technologies for saving water (including recycling technologies)
- Efficient irrigation technologies
- Energy-efficient wastewater treatment procedures and recovering energy from wastewater
- Innovative concepts and technologies for coupling material flows (e.g. water/energy/waste) and where applicable recovering materials/nutrients



Efficient water treatment is a central funding area for KMU-innovativ

- Resource-efficient and energy-efficient adaptation measures to increase export capability within the water sector

The following three projects are examples from this funding initiative.

### 1. Intelligent soil moisture sensor for efficient irrigation

Rising temperatures, dry summers and increasingly wet winters are causing the general availability of water to drop dramatically. The many places already experiencing a lack of water for irrigation are feeling this effect even more, and water as a resource is generally becoming a potential source of conflict.

The aim of the project therefore is to develop an intelligent soil moisture sensor to increase the efficiency of irrigation systems. The sensor is fitted with a microcontroller to enable autonomous detection of the soil’s hydraulic properties (water tension curve), which enables it to determine exactly when to irrigate and how much water to use. Intelligent algorithms detect changes to the soil’s hydraulic properties over time and adapt the irrigation logic accordingly. Contact partner: Parga Park- & Gartentechnik GmbH & Co. KG, Markus Blind, e-mail: blind@parga-online.de

## 2. Developing new solutions for water and energy-efficient irrigation technology

New solutions are being sought to improve irrigation efficiency within Egyptian farming in the Kalabsha region near the Aswan Dam, an undertaking by the Egyptian ministry for agriculture with substantial support from the World Food Programme (WFP). One problem along the Nile is that the growing population is increasing the amount of water used for farming. This results in environmental damage, e.g. through salinisation of irrigated farmland, and an increase in energy consumption for operating the pumps. The PREFARM project, a module intending to solve these irrigation efficiency problems, is being funded as part of the BMBF KMU-innovativ programme. drip irrigation products (dip GmbH), Alternativ Elektrobau Renger (AER) and Energiebau Solarstromsysteme GmbH are working together with the Institute for Technology and Resources Management in the Tropics and Subtropics (ITT) at the Cologne University of Applied Sciences to continue the successful co-operation between the ITT and Egypt on the Kalabsha project to introduce innovative drip irrigation systems.

The aims of the project are:

- Develop innovative drip irrigation systems (dip GmbH drip irrigation products, Ellefeld)
- Innovative optical procedures for detecting water supply and bio-activity (AER Alternativ Elektrobau Renger Elektromeisterfachbetrieb, Ellefeld)
- Record measurement data for climate, water consumption and soil properties and ensure self-sufficient energy and water supplies through solar energy (Energiebau Solarstromsysteme GmbH, Cologne)
- Co-ordinate field work and the socio-economic analysis of innovative water and energy-efficient irrigation technologies across the overall project (Cologne University of Applied Sciences – Institute for Technology and Resources Management in the Tropics and Subtropics (ITT), Cologne; contact partner: Prof. Dr. Sabine Schlüter, Institute for Technology and Resources Management in the Tropics and Subtropics ITT, Cologne University of Applied Sciences)

## 3. Innovative sampling and measuring technology to protect groundwater resources

The resources of untreated water for the public water supply are increasingly representing an area of tension as a result of climate change. The national and international demand for water requires procedures for cost-effective planning, implementation and monitoring of how untreated water resources are used to obtain drinking water.

Climate-related changes to the supply of water are being examined as part of the BMBF research project entitled “Process-based Management Tool Water” by Trinkwasserversorgung Magdeburg GmbH (TWM) and the Grundwasserforschungsinstituts GmbH Dresden (GFI) using the Colbitz waterworks in Saxony-Anhalt as an example.

The Groundwater Center Dresden is developing innovative sampling and measuring technology to monitor groundwater – a resource worthy of protection. This involves:

- “Verfälschungsfreies Grundwasser-Probenahmesystem” (distortion-proof groundwater sampling system) – protecting the [aquifer](#) ◀ upstream of the primarily chemically altered standing water and depth-oriented, isobaric sampling
- “Milieu-Fluid-Sampler” – pressure-maintaining deep water sampling down to 500 m and geophysical multi-parameter probe

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