



IETU starts verification of innovative solutions for water and wastewater management



According to the European Commission, eco-innovation is now – together with information technology and pharmaceutical industry – the fastest growing sector of the market. Each implementation of an innovative technology, however, is a long process, and its developers encounter a number of difficulties. Innovations at the start lose with the already existing and tested technologies, because their effectiveness is not authenticated by references obtained after the completed implementation.

The only system that enables impartial and reliable certification of the efficiency of the proposed technology according to the supplier's declaration is the Environmental Technology Verification system (ETV).

Since last year IETU has actively worked on launching a centre for verification of envi-

ronmental technologies in the field of water and wastewater management under EU ETV. In July 2016 the Environmental Technology Verification Body at IETU acquired the status of an inspection body accredited by the Polish Centre for Accreditation (PCA). It is the fourth verification body in Poland and the first in the field of water and wastewater management. The scope of our services includes verification of technological solutions for drinking water treatment, purification of wastewater from microbial and chemical contaminants as well as industrial water treatment.

The EU ETV program is a market tool which allows small and medium-sized enterprises the commercialization of innovative environmental technologies in the country and the European Union. The service is based on the highest quality and impartiality standards guaranteed by the accreditation for compliance with ISO 17020 for the inspection body type A. The service is dedicated to Polish suppliers interested in entering the European and global markets, as well as

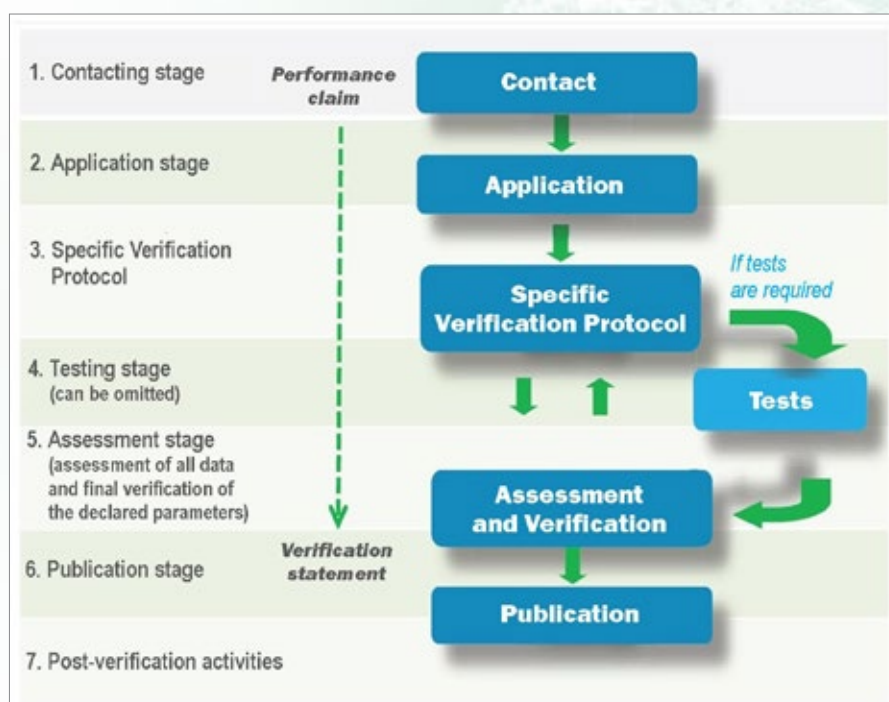
to technology providers from abroad interested in entering the Polish and EU market.

ETV aims at confirming in an impartial and independent way, based on the results of the carried out assessment and testing that under the specific operating conditions the verified technology achieves the efficiency declared by the producer. Confirmation of the innovative nature of the technology, its efficiency and environmental benefits is the Verification Statement registered in a publicly accessible register of verified environmental technologies available on the EC website <http://iet.jrc.ec.europa.eu>.

We invite developers and producers of innovative technologies for cooperation. You can contact us at: e-mail: etv@ietu.katowice.pl, phone: +48 32 254 60 31 ext. 264.

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EU ETV process and the attached scheme



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CRIS – Integrated Information System on River Catchment

The Integrated Information System on River Catchment, developed by scientists from the Institute for Ecology of Industrial Areas, Institute of Environmental Protection - National Research Institute (PIB) and the Norwegian Institute for Water Research, can provide useful information for evaluation of the quality and amount of water in the catchment. The system is designed to support professionals and decision makers involved in water management, spatial planning, environmental protection, agriculture and local economy in the appropriate water resources management and protection of these resources in the context of a river catchment, as required by the Water Framework Directive.

Demonstration of the CRIS system was prepared for the part of the Mała Wisła catchment above the dam reservoir in Goczałkowice and for the catchment area of the Vistula River in the section below the reservoir up to the river gauge in Jawiszowice.

The CRIS system consists of an automatic "engine" comprising 6, cooperating in real-time, mathematical models to simulate meteorological conditions, deposition and quality/quantity of surface and groundwater in the catchment, database and a user interface.

The user interface on the CRIS project website cris.ietu.katowice.pl provides access to 12 information services:

- precipitation on the basis of reflectivity analysis determined by a meteorological radar,
- 48-hour weather forecasts developed using MFF model,
- meteorological parameters used to calculate water balance in the CRIS system,
- daily water balance and transport of substances in subcatchments determined using SWAT model,
- daily water balance and transport of substances in watercourses determined using SWAT model,
- water flow rate in watersheds determined using SWAT model,



- state of water in the Vistula River in water gauge sections based on HEC-RAS model,

Effective use and management of water resources



The ISS-EWATUS project (Integrated Support System for Efficient Water Usage and Resources Management), implemented under the EU FP7, aims at increasing the public awareness in the field of water consumption and changing the behavior of its users.



Decision support system for a city



Decision support system for a household

One of the project outcomes is a system, developed in January 2016, which supports the use and management of water resources. The system consists of five elements with the following functionalities:

1. A central database allowing not only collection of spatial and temporal data for the project's needs, but also automatic data acquisition from monitoring systems as well as processing, reporting and making backup copies.

2. Decision Support System for efficient water use in the households. The system is currently being tested in 20 households in Poland and 20 in Greece. It combines home monitoring of water consumption and the application used on mobile devices. By connecting to a database the application provides the inhabitants participating in the demonstration with information on how much water they consume, for what purposes and how they can improve the efficiency of its use.

3. Decision Support System in the city, which is dedicated to companies responsible for water supply. The system is currently being tested by 2 companies: one in Poland (Sosnowiec) and one in Greece (Skiathos). It allows, among others, visualization and spatial analysis of water consumption in the city, imaging information on the operating parameters of the water distribution system (pressure, flow, etc.) and collecting and analyzing the reports on failures of the water distribution system. What is even more important, it allows its user to generate forecasts of water demand and information on the optimal pressure in the water supply system, that is such a pressure that will reduce water losses while meeting all the needs of the customers.

4. System for adaptive simulations of tariffs for water sales. The system provides information on different tariffs and the expected public response to water price changes and allows your company to specify the profits and losses. In addition, it gives you the ability to optimize the use of water resources - helps in finding the „golden mean” about the amount of water consumed in a city scale with a simultaneous maintaining or increasing profits for the water supplying company.

5. Social Platform promotes environmental attitudes in the field of water management at different scales. In many countries, including Poland, pro-environmental attitudes are very closely related to saving, because they translate directly into household budgets. You are invited to visit the website: watersocial.org, where you can not only find information on how to save water and how important it is for us, but you can also share this information with people from all over the world and win valuable prizes.

The ISS-EWATUS project is coordinated by the University of Silesia in Katowice, and realized by eight research units and the two companies responsible for the supply of water from 5 EU countries. One of the partners is IETU.

For more information on the project visit the website: issewatus.eu.

- daily groundwater level and the concentration of nitrate nitrogen in groundwater calculated using MODFLOW and MT3DMS models,
- hydrodynamics, temperature and water quality in the Goczałkowice Reservoir determined by GEMSS model,
- daily nitrogen deposition from the atmosphere in subcatchments based on CAL-PUFF model.

Services provide data on the current state of the catchment, short-term forecasts, as well as historical data.

CRIS project was funded from Norway Grants under the Polish-Norway Research Programme operated by National Centre for Research and Development.

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Adapting cities to climate change

Urban areas come face to face with challenges arising from climate change, the effects of which (environmental, economic and social) are becoming more and more noticeable nowadays. The occurrence of extreme weather conditions already now poses threat to life, health, property and livelihood of Europeans.

Among the specific hazards observed in Poland the most popular are floods, droughts caused by high air temperature and shortage or lack of rainfall, temperature extremes, urban heat islands and smog, particularly in winter. One of the main problems in Polish cities is the presence of street canyons and the lack of or limited ventilation. Phenomena unfavorable for urban areas are interrelated and the growing trends increase the risk of their negative effects.

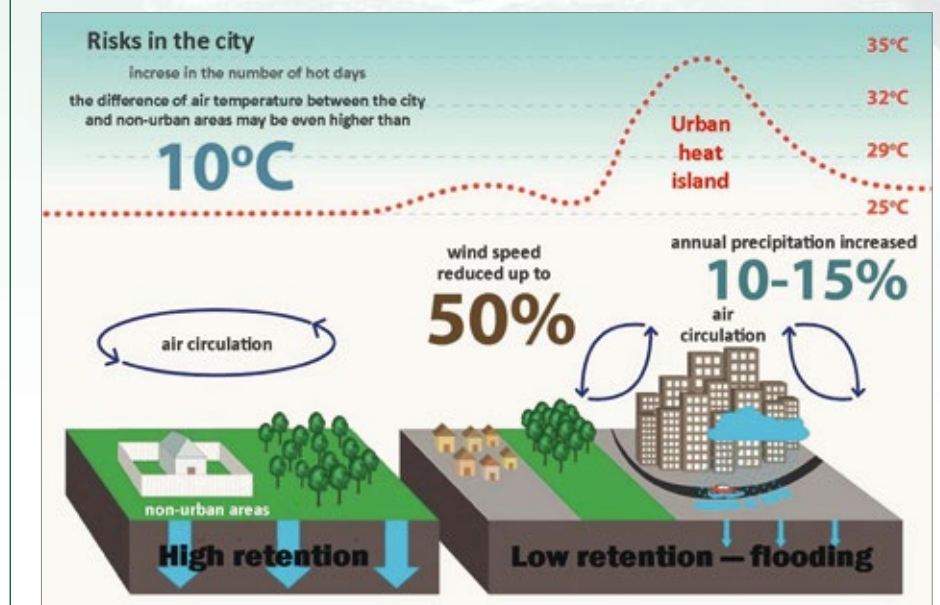
The key role in determining the city's vulnerability to the risks associated with these phenomena will be played by the future socio-economic changes, including land use and demographics. Climate change will be an additional factor affecting this vulnerability. Therefore, there is an increasing need to take appropriate actions, the planning of which is the subject of the climate policy of the European Union, including Poland. According to the Strategic Plan of Adaptation for sectors and areas vulnerable to climate change by 2020, with the perspective up to 2030

(SPA 2020), prepared by the Ministry of the Environment in 2013, it is recommended that governments develop urban plans for adaptation to climate change. They are expected to motivate public authorities and the society to make deliberate decisions to adapt to the foreseeable risks, and better prepare for their possible consequences by immunization of the most important economic sectors to climate change.

In 2014 the IETU team, commissioned by the Ministry of the Environment, made an assessment of the vulnerability of urban areas to potential risks arising from the climate change, including an analysis of specific threats in Polish cities. IETU also worked out guidelines for the preparation of urban climate adaptation plans.

Municipal plans for adaptation to the climate change are the novelty in the planning of urban policies at a local level. They are coherent with actions resulting from the global, EU and national adaptation policy and will be consistent with the river basin and flood risk management plans.

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Source: klimada.mos.gov.pl

Fir is back in the Beskid Mountains



The Beskid forests belong to the most vulnerable systems. The cause of the current situation is the change of the natural Carpathian beech forests into unstable spruce monocultures of unknown origin as a result of the nineteenth-century forest management. A significant impact on the health condition of the Beskid forests has been exerted by a long-term emission from the nearby industrial districts. That is why the natural parts of the Carpathian beech forest survived only in nature reserves, such as Oszast or Śrubita. Reconstruction of forests, carried out for many years, has been slowly changing the character and condition of the Beskid forests, which can be observed in the form of natural rebirth of spruce, beech and fir.

IETU in consortium with the Natural Habitat Association (Stowarzyszenie „Siedliska Naturowe”) from Szczecin, together with the Regional Directorate of State Forests in Katowice have begun a three-year research project on the vitality of silver fir (*Abies alba*) in the forests of Beskid Śląski and Żywiecki. The research is conducted in three forestry management areas and is aimed at changing the composition of spruce stands and improving the management of the existing fir stands.

Knowledge generated from the research and observations of the silver fir in the selected habitats of Bielsko, Ujsoły and Wiśla forest managements shall help reduce

the risk of unsuccessful new fir plantings, indicate the most favorable habitats for fir reintroduction as well as reduce the costs of forest management. Moreover, project outcomes may also find application for developing a protection plan for the Śrubita nature reserve, which is currently missing such a document.

Botanical and phytosociological studies will be carried out both in the existing commercial forests and in nature reserves. Also part of the studies will be performed in the existing fir stand research sites as well as newly established forest plantations.

In addition, three-year studies on air quality including circulation of chemical elements in the forest ecosystem will be conducted together with some observations of the climate change, which has a significant impact on the occurrence and condition of fir trees, especially on the border mountain ranges. For this purpose, IETU has launched an air monitoring station in Brenna Leśnica. The scope of the research will be complemented by dendrochronological, palynological, genetical and microbiological studies, including analyses of micro-organisms and mycorrhizae associated with fir.

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Monitoring station in Brenna

Integrated monitoring station in Brenna Leśnica is located on the slope of Stary Groń at the altitude of 800 m a.s.l. and is one of the elements of the IETU Integrated Environmental Monitoring Multipolygon. It is the highest located measurement station in Beskid Śląski and Żywiecki used to conduct comprehensive research on the functioning of forest ecosystems in the area of a high level of pollution of air masses coming mainly from the industrial centers of the Upper Silesian Industrial Region and Ostrava.

The ongoing research includes, among others, the following measurements:

- meteorological: wind direction and speed, air temperature and humidity, solar radiation, rainfall, soil temperature at the depth of 5 cm, 30 cm, 50 cm,
- air pollutants: concentration of ozone, SO₂, NO_x and suspended particulate matter (PM10, PM2.5).

The current and archival data from the monitoring station are available at: brenna.meteo.com.pl.

The monitoring station in Brenna belongs to The European Long-term Ecosystem Research Network – LTER Europe.

Ed.



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