

# Trade mission of the Polish green tech companies to Greece

#### organized by:

The Ministry of Climate and Environment of the Republic of Poland The Embassy of the Republic of Poland in Athens

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# Innovation is critical for a zero carbon sustainable future economy

#### GreenEvo

The Green Technology Accelerator is an innovative program run by Poland's Ministry of Climate and Environment designed to create friendly conditions to disseminate environmental technologies provided by Polish entrepreneurs. Its main purpose is to help Polish companies to enter into international contacts and also to provide them with necessary tools to enable their dynamic development. The actions taken under the program stimulate development in a comprehensive manner and strengthen the position of advanced green technologies in the process of building a circular economy.

# **Objectives**

GreenEvo promotes the sustainable development of companies, green technologies and, in consequence, the economy itself. Proponents of only proven, implemented and highly efficient technologies join its Laureates, thus contributing to the building of Poland's positive image in the world. It can be said that GreenEvo Laureates are credible business partners, willing to share their knowledge, experience and technologies with countries which have to cope with the local environmental problems. GreenEvo Program not only consistently builds the environmental awareness of domestic technology buyers, but also educates potential foreign partners, in respect of technologies to reduce environmental impacts which are often quite simple to use. GreenEvo strengthens the business activity of companies at the international level. It changes the approach to a company and its management – from a traditional approach to a modern, effective one, focused on measures related to corporate social responsibility.

#### Benefits

The GreenEvo Program is one of the key tools used by the Polish Government to support the transition process towards a sustainable economy and to raise the awareness of companies as to how they can operate in a responsible manner. It is the best practice in the scope of cooperation between the central administration and business. From the very start it has been created and launched by the Government administration, which, in addition, has assumed the role of a guarantor of the quality of the technologies offered. Thanks to GreenEvo, the international transfer of green technologies is stimulated and the activities of Polish companies which provide environmental and energy efficient technologies are supported in real terms abroad. Furthermore, the Program demonstrates that Poland is able to become actively involved in international actions to combat climate change, without a detriment to economic growth, but, on the contrary, supporting it with innovative, green technologies.



AGATA	4
APANET Green System	5
DAGAS	6
DAGAS	7
EKOTOP	8
FARDATA	9
FARDATA	
MarbetWil	
PROTE	
PROTE	13
PROTE	
SEEDiA	
System 3E	16
T-Master	17

#### **AGATA**

#### CELLUGUARD®



stations, heat and power plants, mines and facilities that struggle with a problem of secondary dust emissions of gasiform substances at landfills. The method consists in a hydrodynamic application of a flexible, reinforced and liquid coating to dust-emitting surfaces. In comparison to traditional methods the company Agata offers a much cheaper, more durable and a fully environmentally sound solution.

The celluguard® technology constitutes an innovative solution to a problem of secondary dust emissions at landfills of different kinds of dust-emitting raw materials. The method provides a possibility to neutralise the following substances: combustion by-products (fly ashes and slag), mine dumps (aggregates and minerals), post-flotation ore waste, dust-generating railway wagons, furnace waste, sedimentary sludge, coal dumps, street dust. The method is decidedly cheaper than other technologies used on the market to date, both in terms of its purchase costs as well as it operational costs, as the security measures against secondary dust emissions need to be undertaken only once a year. Moreover, these measures guarantee a longer-lasting protection in comparison to traditional methods such as water sprays and a better protection of bituminous masses due to the eco-reinforced coating. As a result the protective layer on the surface is durable, flexible and resistant to various weather conditions. In addition, it can also be applied on slanted surfaces such as escarpments or embankments.

#### ADVANTAGES OF THE SOLUTION

- the highest protection efficiency due to eco-reinforcement
- four degrees of protection durability: 1, 3, 6 and 12 months
- environment-friendly, biodegradable technology
- improvement of air quality in the vicinity of landfills
- elimination of unpleasant odours at landfills
- protection and monitoring of water and wind induced soil erosion
- simple and one-off application
- important water savings

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# **APANET Green System**



# Street lighting management system

The APANET Green System technology is recommended for companies, local government authorities, resident communities and entities that search for solutions reducing the costs of outdoor lighting and lowering  $CO_2$  emissions. The smart street lighting management system APANET enables to rationalize the consumption of electrical energy and as a result reduces the level of  $CO_2$  emissions. It uses traffic volume data and the readings from the weather stations to adapt the lighting system to the current traffic conditions, no more than it is required by the legal regulations and is necessary for security reasons.

The modernisation of the lighting consisting in the implementation of the management system enables the electricity consumption savings reaching of up to 70% and the reduction of costs related to the lighting system servicing of up to 55% thanks to a full control over the infrastructure. In the event of a malfunction the system automatically notifies the servicing team about the location and the source of the failure. The team does not need to turn off the power supply to find and remove the system malfunction. The main advantage of the APANET system consists in the use of open communication protocols at each stage of data transfer, which is confirmed by the certificate issued by the organisation LonMark International. Openness and interoperability are the key features of the modern systems as they allow for an integration and mutual communication between the systems that are part of the Smart City project, including in particular the ITS system.

#### ADVANTAGES OF THE SOLUTION:

- management of outdoor lighting individual and automatic powering on or off as well as power restriction functions
- monitoring the active and passive electrical energy consumption of the lamps and other devices powered from the same installation, such as Christmas lighting, monitoring, electric vehicle charging station, etc. Constant measurements of active and passive energy, power coefficient and THD
- detection of correct lamp functionality and in the event of a system malfunction the appropriate authorities are automatically notified
- reduction of the energy consumption even by 70%, reduction of management costs by 50% and reduction of the CO2 emissions by more than 55%

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#### **DAGAS**

# Reduxco catalytic converter

The REDUXCO catalytic converter is an innovative Polish product that improves the combustion efficiency of fossil fuels. It is a fluid chemical substance that lowers the energy of activation of a chemical reaction, which as a result increases the speed of oxidation of hydrocarbons, reduces fuel consumption and reduces the emissions of harmful gases emitted such as CO, CO<sub>2</sub>, NO<sub>x</sub> and SO<sub>x</sub>.



It has been registered in accordance with the REACH Regulation under the number 01-2119406877-30-0000. The product is not classified as dangerous to human health or to the environment. It has passed all necessary tests and possesses all required certificates. The REDUXCO offer includes a REDUXCO combustion catalyst, dosing installation, free installation, training concerning general operation of the installation and maintenance.

Unlike the competition, our technology ensures that the internal heating surfaces of boilers remain in good technical condition and operate soundly and stably. It is the only product of its kind to offer such a range of functions.

#### ADVANTAGES OF THE SOLUTION:

- reduction in fuel consumption
- reduction in emission of harmful gases: CO<sub>2</sub>, CO, NO<sub>X</sub>, SO<sub>X</sub>
- cleaning of heating surfaces of boilers and maintaining their good technical condition
- easy dosing
- relatively low cost

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#### **DAGAS**

# Biological wastewater treatment plant DAGAS BIO

Biological wastewater treatment plant DAGAS BIO is composed of a joint line of anaerobic, aerobic and anoxic bioreactors, equipped with adequate fibrous conveyors with large open surfaces, where adequate biocoenosis is



located. Each aerobic and anoxic biore-actor is in addition equipped with a valve connected to a blower transporting the air. At the beginning of the treatment process, starting from the side of sewage intake there are a minimum of three anaerobic biore-actors followed by aerobic and anoxic bioreactors, all of them amounting to at least four pairs.

In anaerobic bioreactors the fibrous conveyors hold anaerobic bacteria which are selected from a group of such bacteria as fermented, hydrolytic, denitrifying, reducing sulphates, heliogens and methanogens; in aerobic bioreactors – the organisms are selected from a group encompassing aerobic bacteria, protozoa, rotifers, crustacean, filter feeders, predators and fish; in anoxic bioreactors – bacteria are selected from a group of anaerobic ammonia oxidation such as Anammox, microorganisms reducing the ions of heavy metals, iron and arthrobacter. The process of biological wastewater treatment DAGAS BIO is conducted continuously without the retraction of activated sludge. The issue of sediment recirculation is non-existent and the technology significantly diminishes the amount of the excess activated sludge.

That solution takes advantage of a so-called biological conveyor and is based on biocoenosis.

#### ADVANTAGES OF THE SOLUTION:

- ten times less biomass in the treatment process
- four times smaller the volume of the bioreactors
- four times smaller the area of the treatment plant
- five times smaller the electric energy consumption
- costs of the waste logistics are limited to a minimum
- four times lower the costs of the construction of a wastewater treatment plant
- lack of activated sludge recirculation, one-direction constant process
- applicable to all types of sewage, including industrial and highly toxic such as sewage with dissolved organic substances, including xenobiotics

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#### **EKOTOP**

# Hybrid Sludge Dryers



For waste water treatment plants looking for waste management solution, we offer an ecological

technology for drying sewage sludge in hybrid dryers, using renewable energy sources. This technology allows for environmental-friendly processing of sewage sludge and reduces its amount over than 3 times. Unlike the traditional dryers using fossil fuel, it is possible to dry sludge using low-cost alternative energy sources such as heat from biogas combustion, waste heat utilization from treated sewage, waste heat from cogenerator cooling and solar energy. This allows for drying of the sludge regardless of weather conditions and increasing of process efficiency.

The hybrid sewage sludge drying installations consist of drying halls similar to green houses with steel structure covered with polycarbonate or glasses plates. The main principles of drying operation is the solar effect and heating floor exploitation to water evaporation from sewage sludge. Inside the drying hall sludge is transported, aerated and granulated by a mechanical turning sledge device. The automatic ventilation system ensures humidity removal outside the drying hall. The drying technology causes wet sewage sludge to granulate during processing. As a result the mass and volume of sludge becomes more than three times smaller. This technology is one of the cheapest solutions for water evaporation. The evaporation of 1 tonne of water uses only 20-30 kWh electrical energy. The final product dried sludge takes the form of a granulate and could be agriculturally or energetically used. The calorific value is similar to brown coal 12 MJ/kg.

#### ADVANTAGES OF THE SOLUTION

- Low operating costs
- Independent of weather conditions
- Over fourfold mass and volume reduction of the sludge
- Fully automated process, does not require a continuous supervision

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#### **FARDATA**

# ViaZone – Mobile Traffic Management System

ViaZone System is designed to a mobile traffic control for work zones, related to the reconstruction and modernization of motorways and expressways, in order to the harmonization of traffic flows. Based on the research system identify the main factors that generate travel delays, which are often also the cause of accidents at congested road locations. These are in particular:



- speeding,
- failure to keep a sufficient distance between cars,
- incorrect adherence to the "zipping" rule.

ViaZone system provides drivers with essential traffic information via the variable message signs (VMS) improving safety and driving comfort.

#### ADVANTAGES OF THE SOLUTION

- documented effectiveness in improving traffic harmonization by more than 40%
- reduction in negative impact of renovation work on traffic flow
- reduction in the number of accidents and traffic congestions
- simplicity of technology installation and disassembly

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#### **FARDATA**

# ENVIRO – Environmental monitoring station

Our company is engaged in designing, production and implementation of advanced measurement systems on daily basis. Several years of experience in that field and the character of people gathered in our team influenced our decision that the environment protection market will be the sector in which we wish to gain a leading



position. At present we are focusing on preventing negative changes in the environment and on amending the current status. We are thinking about the legacy that we will leave to future generations and about the necessity of human race to adapt to inevitable climate change.

The ENVIRO station is used for continuous and long-term registration of noise levels, vibration, vehicle traffic intensity, temperature, air humidity, atmospheric pressure, wind speed and direction, precipitation and measurements of air quality. The station may also serve as a mobile measuring system installed in a trailer. The maintenance of the station is possible through any internet browser.

#### ADVANTAGES OF THE TECHNOLOGY

- long-term monitoring
- mobile and stationary versions
- easy use and maintenance
- possibility of modification with the use of any additional components
- perfect quality-price ratio

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#### **MarbetWil**

Sultech® technology for neutralization of the hazardous materials and produce solidified composite by-products



The Sultech® technology turns hazardous waste into useful and safe products, implementing a highly demanded concept of circular economy. The product of the technology is 100% recyclable and meets low  $CO_2$  emission levels. The production process does not require the use of water, concrete or other chemical substances.

Marbet Wil Sp. z o.o. offers its original technical and technological solutions, covered by patents, that enable the recovery of hazardous waste through the processes of stabilisation using sulphur polymer Sulstar® and solidification into products dedicated to railway, road and hydrotechnical engineering. The Sultech® is a technology covered by the patent UPRP 205151 and it constitutes a solution for disposing solid waste such as dust, ash, sand or slag, while eliminating the need of landfilling. The stabilisation and recovery (economic reuse) of hazardous industrial waste in polymer concrete Sultech® is particularly useful in case of the stabilisation of waste containing heavy metals (copper, lead, iron, arsenic, cadmium, zinc, nickel, molybdenum, cobalt, etc.) which are chemically bonded to create sulphides that are insoluble in water. Other substances are inserted into a matrix and stabilised in a low-absorbent and tight material.

# ADVANTAGES OF THE SOLUTION:

- elimination of costs and technical challenges related to the landfilling of hazardous waste
- clearing the areas designated for landfills
- conversion of waste into safe and useful products
- very good utility properties of the product: high mechanical strength, full corrosion resistance in an aggressive environment (acids, sewage, sea water, brine),
- 100% recyclable
- low CO<sub>2</sub> emission
- verification and practical application of the technology

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#### **PROTE**

# PROTE-MOS Minimization/Modification of Sludge Technology



We offer the PROTE-MOS Minimization/Modification of Sludge Technology to wastewater treatment plants seeking to reduce sludge generation and improve treated wastewater quality.

Unlike other available solutions that only reduce water content in waste, our technology uses biological methods to reduce hydrated sludge production without costly facility reconstruction. With at least a 20% reduction in sludge, less chemical reagents are needed, improving wastewater parameters and reducing electricity demand.

Our proprietary solution optimizes plant operation by safely selecting technological process parameters without modifying design assumptions, promoting the development of natural microflora in activated sludge for improved resistance to hydraulic surges.

PROTE-MOS is an ecological solution that doesn't require customer investment and has measurable savings from the first month. Implementations in Poland, Russia, and Moldova have seen a 33%-73% reduction in sludge and a 31%-62% decrease in electricity consumption. As more and more countries prioritize meeting Sustainable Development Goals (SDGs) and Environmental, Social, and Governance (ESG) requirements, PROTE-MOS presents a compelling solution that can help facilities meet these goals while realizing significant cost savings. With its ability to reduce sludge production, decrease chemical reagent usage, improve wastewater quality, and reduce electricity consumption, PROTE-MOS represents a major breakthrough in the field of wastewater treatment.

#### ADVANTAGES OF THE TECHNOLOGY:

- a reduction of at least of 20% in the quantity of sewage sludge generated
- an improvement in the quality of wastewater treated through solely biological means
- a decrease in the consumption of chemical reagents, including a complete resignation from the application of ferric sulphate (PIX)
- no need to incur the technology implementation costs by the investor/licensee
- savings are evident within the first month of using the PROTE-MOS technology
- higher resilience of the plant to hydraulic surges with variable pollution loads

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#### **PROTE**

# PROTE-FOS Lake Reclamation Technology



A comprehensive service consisting in the reclamation of lakes PROTE-fos is dedicated for private and public entities which own or manage water reservoirs displaying high trophy that face the problems of progressing eutrophication. The final result of the technology is to obtain a clear-water state by curtailing the phytoplankton blooms, including cyanobacteria, as well as to improve water transparency. PROTE-fos technology consists in blocking phosphorus directly in the bottom sediments during its controlled mobilisation and afterwards through their permanent consolidation. Only the blockage of phosphorus emitted from the sediments excludes the return of water blooms after it has been cleared.

PROTE-fos technology is the main chemical method of blocking phosphorus in the sediments, which is the element responsible for algae blooms in the lakes. In order to obtain even better results the technology is supported by methods based on biological and mechanical solutions. The innovative character of PROTE-fos consists in the application of chemical substances in a controlled manner directly to bottom sediments with the help of a patented bi-component vessel named PROTEUS. Thanks to such comprehensive and individual approach to a given lake the PROTE-fos solution efficiently speeds up natural self-clearing processes.

#### ADVANTAGES OF THE TECHNOLOGY:

- innovative the method is unique and less radical than previously used solutions (eg. dredging of bottom sediments, pumping/filtering of water)
- comprehensive the technology contributes to the restoration of balance in the entire water reservoir, it does not consist only in chemical blockage of phosphorus
- confirmed efficiency the method has been successfully implemented over a few lakes in Poland and over sea areas (Bay of Puck)
- scientifically proven the technology uses the latest knowledge regarding water ecosystems and their functioning
- guarantee of ecological effect possibility to implement a project on the basis of a result agreement

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#### **PROTE**

# SYMBIO Biomonitoring System



The SYMBIO biomonitoring system from the PROTE company is an early warning system against the contamination of water intended for consumption. It combines the natural, dependable bioindication method, based on living organisms called bioindicators, with modern technology that enables automatic water monitoring and archiving the data. SYMBIO sets the current standards for water security.

The system operates based on bioindication. Eight specimens of the freshwater mussel (Latin: Unio tumidus), placed in the SYMBIO flow-through tank, are equipped with a probe that co-operates with a mag-net stuck to the mussel's shell. The probe records the degree of each mussel's openness and its natural bio-rhythm comparable to human's ECG.

The data is sent to a controller that processes it, and further, to a computer, which visualizes and archives it, and provides reports. It enables us to evaluate the cur-rent system operation, and to keep track of the mussels' activity in the past. Mollusks are sensitive organisms, thanks to which the water utility company, every single second, receives the information, whether the water is suitable for consumption. A sudden closure of the mussels' shells indicates an adverse change in the pa-rameters of water. In such a case, SYMBIO generates an alarm, to which the laboratory can quickly react, taking water samples for analysis.

As SYMBIO is an online system, it can send an alarm signal to a selected e-mail address or mobile telephone number. The mussels work in the unit monitoring the water for three months. After that time, they go back to the lake from which they came, and a new set of organisms, which will monitor the quality of water for another quarter, is installed in the system.

#### ADVANTAGES OF THE TECHNOLOGY:

- one of the most efficient technologies for water monitoring, proven by years of experience of the PROTE company (50 units operating in Poland, supervision over water quality for more than 10 million people),
- it enables a quick reaction in case an adverse change in water parameters is detected,
- the system operation increases the sense of the security of the potable water users, and it is a commonly accepted method of water monitoring,
- it guarantees a better perception of the image of its users, as the natural methods using living organisms are becoming more and more common and reliable.

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#### **SEEDIA**

# jCharge and incity.io technology for smart city

The jCharge station for on-grid small electromobility devices for modern and eco-friendly cities is designed to provide charging facilities in public spaces for electric scooters and bicycles. Thanks to jCharge charging stations, charging such vehicles becomes friendly to city residents and at the same time reduces chaos in the city, developing in users the habit of putting the vehicle away after use at a designated place, where the vehicle will additionally be charged for subsequent users. The proprietary technology obtains and manages electricity from solar energy, making a positive contribution to the green image of cities and reducing the carbon footprint.

SEEDIA

#### ADVANTAGES OF THE SOLUTION:

- energy independence
- universal module that can be mounted to any 220V or 12V infrastructure
- remote management panel connected to a mobile application
- smart charger, recognizes the type of device that is plugged in; charging is possible practically immediately after installation; jCharge independently recognizes the device it needs to charge, making it extremely user-friendly
- ability to work with island systems
- modular design

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#### System 3E

#### SYSTEM 3E



SYSTEM 3E is a groundbreaking solution, based on 3E elements made of natural raw material – perlite. The innovation of 3E results from the combination of a unique formulation, precise shape and simplicity of application, which makes it possible to erect building walls quickly without mortar and insulation. Ecologically, economically and energy-efficient.

The heart of SYSTEM 3E technology is perlite – a volcanic rock, commonly found around the world. It is lightweight, fireproof, chemically and biologically inert, and has excellent thermal insulation properties – thanks to perlite 3E walls do not require insulation such as petroleum-based Styrofoam, and during the summer it's pleasantly cool inside the building. Reduced water absorption by 3E elements increases the durability of the material and combined with vapor permeability, eliminates the risk of moisture and the development of mold or mildew on the wall. This means a healthy and safe home.

3E technology is dedicated to projects with a higher standard of energy efficiency – single-family houses, commercial and service buildings, it will also be perfect as an infill of high frame structures. 3E elements are a material with excellent thermal insulation parameters (U=0.198), which results in lower building operating costs during the heating period (up to 60% lower bills).

#### ADVANTAGES OF TECHNOLOGY:

- SYSTEM 3E offers the thinnest single-layer structural wall while maintaining the heat transfer coefficient parameter. For customers, this means more usable living space and savings on building materials
- 3E walls can be erected 365 days a year, in all weather conditions. 3E technology saves time on the construction site by eliminating technological breaks thanks to the click-click method
- the exact number of elements is delivered to the construction site so there are no cutoffs these speeds up the work, but also significantly reduces environmental pollution
- a specially composed mixture minimizes water absorption by 3E elements, so the walls remain dry throughout their life
- element 3E is made of natural perlite, a volcanic rock that is resistant to mold and fungus. This is ideal for allergy sufferers and asthmatics
- the elements are 100% recyclable, and the lack of use of mortar and insulation means that the amount of waste generated at the construction site is reduced
- the production process of the elements is ecological: water consumption has been reduced by three times and  $CO_2$  emissions into the atmosphere by 54%

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#### **T-Master**

#### T-Master



Intelligent, the only contactless ELMO (Electronic Municipal Waste Meter) bins in Poland help with

selective municipal waste collection in the city. The device replaces outdoor trash shelters. Traditional waste garbage cans housed in an aesthetically pleasing enclosure equipped with a weighing system and QR code reader make it possible to register the weight and type of waste donated by individual households of a given neighbourhood. An absolute novelty is the contactless operation of the bins thanks to automatic flaps. Colourful LEDs and friendly voice announcements make it easy for residents to use the device. In addition, access to an individual account with current information about the waste generated motivates residents to segregate. With ELMO, costs for waste collection can be billed just like water, electricity or gas.

#### ADVENTAGES OF SOLUTION

- Hygienic the devices are fully touchless, the flaps are automatic
- Intuitive operation simply scan the QR code taped to the bag and drop it into the container
- Cost-effective allows to reduce waste collection fees from residents
- Future solution thanks to legalized scales, in the future it will be possible to pay for waste like for water or gas

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# More information

