

GREENEVO

TECHNOLOGY ACCELERATOR



Ministry of Climate and Environment
Republic of Poland



National Fund
for Environmental Protection
and Water Management

Best Polish green technologies

“GreenEvo - Green Technologies Accelerator” is a governmental program run by the Ministry of Climate and Environment. The aim of the program is to deliver guaranteed quality Polish green technologies to foreign markets.

It is worth choosing technologies approved and recommended by Polish government.

Competitive advantages of Polish companies

The Polish GreenEvo technologies are:

- high quality
- innovative
- low cost
- implemented and verified by independent experts
- tailored to customer needs

Thematic areas of solutions in GreenEvo

GreenEvo collects solutions which support climate change adaptation and environment protection by exploiting renewable sources, smart city solutions, energy savings, water and waste water management, waste management and circular economy technologies.

Users of the GreenEvo technologies

These solutions can be applied in industry, agriculture or transport. Their users are local governments, scientific units and individual clients.

Benefit from the potential of Polish green technologies!



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APANET Green System

Piastów 27 Ave.
52-424 Wrocław

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greensys.pl

Street lighting management system

We recommend APANET to road managers who are looking for solutions to reduce the costs of outdoor lighting, while maintaining safety and compliance with applicable regulations. The intelligent control system allows to reduce electricity consumption costs by over 70%, reduce operating costs by 50% and reduce CO₂ emissions. The main advantage of APANET is using open communication protocols, which allows the use of luminaires from different manufacturers.

SMART CITY



ENERGY SAVING



ADVANTAGES OF THE SOLUTION

- External lighting control - dimming, switching luminaires on and off
- Monitoring of active and reactive power consumption
- Automatic failure detection and reporting
- Reduction of electricity consumption, operating costs and CO₂ emissions



Environmental monitoring station ENVIRO

The ENVIRO station is used for continuous and long-term registration of noise levels, vehicle traffic intensity, air quality parameters such as PMs, gases, VOCs and additionally meteorological conditions which helps obtain more accurate measurement.

FAR DATA

Lipowa 3 St.
30-702 Kraków

+48 12 255 99 99

www.fardata.pl



SMART CITY

ADVANTAGES OF THE SOLUTION

- Easy to manage and maintain
- Measurement can be done via mobile station installed in a trailer
- Customizable
- Energy efficient



ViaZone - Mobile Traffic Management System

The ViaZone system is designed for mobile traffic control in work areas related to the reconstruction and modernization of motorways and expressways, in order to the harmonization of traffic flows. Based on the research system it identifies the main factors responsible for 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 zip merging.

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

FAR DATA

Lipowa 3 St.
30-702 Kraków

+48 12 255 99 99

www.fardata.pl



ENERGY SAVING



SMART CITY

ADVANTAGES OF THE SOLUTION

- Documented effectiveness in improving traffic harmonization by more than 40%
- Reduced negative impact of road renovations on traffic flow
- Reduced number of accidents and traffic congestions
- Simplicity of installation and disassembly





SEEDiA

Bociana 22 St.
31-231 Kraków

Artur Racicki

+48 502 655 979

www.seedia.city

jCharge and incity.io technology for smart city

The Jcharge product addresses the challenge of establishing a comprehensive and accessible charging infrastructure for e-mobility vehicles such as e-bikes and e-scooters, which are becoming increasingly popular in urban areas. The product includes a range of charging stations designed for businesses, local governments, and other organizations that want to provide charging facilities for their customers or employees. Additionally, Jcharge offers software solutions for managing EV charging operations, which can help businesses optimize their charging infrastructure and reduce costs. Overall, Jcharge aims to promote sustainable mobility by making it easier and more convenient for people to use e-mobility vehicles.

SMART CITY



RENEWABLE ENERGY



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
- Compatible with off-grid systems



PROMAR

Tadeusza Kościuszki 27 St.
85-079 Bydgoszcz

+48 52 366 80 60

www.imperius.pl

imperius®

imperius® is designed for institutions implementing Smart City and IoT projects. In addition to reducing energy and water consumption, it ensures the safety and improvement of the operation of building installations and supply area.

imperius® is a IoT cloud solution that integrates various technical installations, including measure devices, sensors and controllers responsible for facility management. imperius® also supports advanced data analysis which leads to optimization and effective management of energy and water consumption in buildings. Remote access from any place at any time to all supervised facilities, buildings and installations.

SMART CITY



ENERGY SAVING



GREEN BUILDINGS



ADVANTAGES OF THE SOLUTION

- Remote access from anywhere, anytime, to all supervised facilities
- Possibility of direct integration of third-party devices
- Constant view of energy consumption
- Ready communication device - easy and quick integration with the object



GREEN BUILDINGS

Smart Energy Management System

The Smart Energy Management System is used in buildings for coordinated control of the electricity flow between devices that produce, store, and consume electricity. Management of electrical energy flow is based on definable priorities aimed at improving environmental sustainability and user comfort. In the case of excess electricity production from PV installations, surplus energy is primarily used to recharge energy storage or the battery of an electric car. Another priority is to use excess energy to heat domestic hot water or produce heat to warm the facility.



AUTORUN
Twarda 18 St.
00-105 Warsaw

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www.autorun.solutions.pl



ENERGY SAVING



GREEN BUILDINGS

ADVANTAGES OF THE SOLUTION

- Takes into account the current electricity tariff, energy production level, presence of building occupants, and their energy requirements for current facility operation
- Manages energy independently of the technologies and equipment manufacturers involved in the energy flow
- Increases the self-consumption of energy produced by the building



IZODOM 2000 POLSKA

Ceramiczna 2a St.
98-220 Zduńska Wola

+48 43 823 23 68

www.izodom.pl

IZODOM

A complete Polish technology for the construction of energy-efficient and passive buildings. Dedicated solutions of IZOEnergy ($U=0,15 \text{ W/m}^2\text{K}$) and IZOPassive ($U=0,10 \text{ W/m}^2\text{K}$) ensure continuity of insulation, and the walls do not need additional insulation. IZODOM is the only one to use the IZOclick® system to connect the blocks without mortar, so thermal bridges are eliminated. Construction with IZODOM goes much faster, and the investment costs are lower.

GREEN BUILDINGS

ENERGY SAVING

ADVANTAGES OF THE SOLUTION

- IZODOM technology significantly reduces heating bills by up to 80%
- Construction of the building is 3 times faster than with traditional technology
- A house built in IZODOM technology reduces CO2 emissions by up to a half
- Durability of the building made of IZODOM is estimated at 150 years!

SYSTEM 3E
SYSTEM 3E

Rondo ONZ 1
00-124 Warsaw

dr Patryk Adam Bolimowski

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www.system3e.com

SYSTEM 3E

SYSTEM 3E is a groundbreaking technology, based on 3E Elements made of natural raw material – perlite. The innovative character of 3E technology is related to a unique recipe, shape and ease of application, making the technology applicable in all types of buildings with no use of mortar and insulation. In the places where 3E Elements are joined, a special angle is used to maximize friction forces between two adjacent surfaces, it makes the walls mortarless, without the use of mortars. The adopted geometry of the Morse' taper makes it possible to create a system of self-locking elements where all degrees of freedom between the blocks are eliminated. The finished partitions are characterized by above-average strength and safety, what is demonstrated by the highest possible fire classification and impact strength (REI-240+M).

GREEN BUILDINGS

ENERGY SAVING

CIRCULAR ECONOMY

ADVANTAGES OF THE SOLUTION

- SYSTEM 3E is the thinnest and warmest single-layer wall available on the market with a $U=0.198$ coefficient
- The 3E elements are made of natural perlite, a volcanic rock that is resistant to mould and fungus, which results in a healthy microclimate in the house
- No mortar or insulation speeds up construction work and helps to reduce building waste
- In perlite houses there is an optimal temperature all year round - it is warm during the winter and pleasantly cool in the summer

H-Block®

H-Block® is a patented insulating SIP, made of polyurethane foam encapsulated in a box structure and permanently connected to a wood-derivative OSB lining. This structural insulated panel is an example for energy-saving and environmentally-friendly construction materials of the highest quality, which are based on the experience of Western markets. The panels are not harmful to health and do not contain any hazardous asbestos, glass or mineral fibres. The H-Block® insulating construction panel is simultaneously a structural and shielding material. Lightweight yet very durable, H-Block® structural insulated panel is a structural material for construction of load-bearing and / or curtain walls, ceilings, roofs and floors in single- and multi-family residential buildings as well as public utility buildings. Although it is used primarily as a load-bearing element, it can also be used as a filling for wooden, steel or reinforced concrete structures.



Solcraft
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www.solcraft.pl



ENERGY SAVING



GREEN BUILDINGS

ADVANTAGES OF THE SOLUTION

- A lightweight, resilient and energy-saving construction material
- Very good insulating properties of the building – no need to use traditional heating/air-conditioning systems, no heat loss, lower heating costs of the building
- Thin walls – a larger useful area for the same built up area
- Quick assembly of residential buildings and public utility sites



Solverter® - roof powered heat pump

The idea behind the Solverter® system is to use the Thexpan® roof to capture thermal energy from the air and solar radiation. The Solverter® system can provide free energy for domestic hot water and central heating on all sunny days, without the need for a heat pump. A sufficiently large surface of a sunny roof ensures a dynamic increase in the temperature of the exchanger and energy flow to the storage tanks, even in short-term sunlight. This is impossible with traditional solar collectors. On cloudy days, Solverter® uses the thermal energy of the air. This energy, through the glycol flowing in the exchanger, supplies the heat pump as the so-called lower heat source. This source – unlike ground – never freezes because it is surrounded by air and not by soil. It also has a wider temperature spectrum of the heat source to be used, because the air does not have a constant temperature and the operating temperature necessary for the heat pump can be regulated with the temperature of the glycol supplied to the Solverter® exchanger. In the Solverter® system, there is also no need to test the ability to supply thermal energy, because air is its unlimited resource.



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www.solcraft.pl



RENEWABLE ENERGY



ENERGY SAVING



GREEN BUILDINGS

ADVANTAGES OF THE SOLUTION

- Use of renewable energy
- High energy efficiency
- No interference with the building's surroundings and the environment
- No interference with the external infrastructure of the building



ENERGY SAVING



APS Energia

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Jacek Lechecki

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www.apsenergia.pl

Emergency Power Supply System PULSTAR based on hydrogen fuel cells

PULSTAR is an electric power supply system with hydrogen energy storage. Hydrogen, as a result of electrochemical reaction with oxygen in the fuel cell, produces a constant current, from which an alternating voltage of industrial parameters is generated by converter manufactured by APS Energia type BFIH2 T 5-2000 (ICR certificate PI / NC RfG/01/2022/A1). The systems are designed for the LV 230/400 VAC network in the power range from 5 kW to 2 MW. The PULSTAR system can be used in any field where hydrogen is available as an energy source. However, for several years PULSTAR has been used in the growing renewable energy sector, reducing one of the main drawbacks of RES – irregular and unpredictable supply of power to power grids. Hydrogen is becoming the future of energy as a solution to the energy storage problem and PULSTAR solutions make it easy and environmentally friendly to convert it into electricity.

ENERGY SAVING



RENEWABLE ENERGY



ADVANTAGES OF THE SOLUTION

- **ZERO emission** - energy generation from hydrogen in PULSTAR fuel cells is small extent exothermic process and the only by-product is water. The condition is to use hydrogen from RES, the so-called „green hydrogen”. PULSTAR's energy supply is completely emission-free
- **ZERO cost** - hydrogen obtained from the sun and wind, i.e. sources that are cost-effective, renewable and are not a burden on the environment
- Energy storage in hydrogen promotes efficient and economical energy consumption in networks powered by renewable energy sources as well as conventional ones
- The System guarantees continuity, stability and proper parameters of power supply for sensitive devices and installations powered by electricity – UPS stabilization function



Fuel combustion activator Reduxco

The REDUXCO catalyst is a Polish innovative product, a chemical substance, reducing the energy of chemical reactions, which results in lower fuel consumption and harmful gas emissions.

Dagas
Gośniewska 46 St.
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www.dagas.pl



AIR



ENERGY SAVING

ADVANTAGES OF THE SOLUTION

- Intensification of combustion processes
- No need for other combustion stabilizers to be added to natural gas or fuel oil
- Reduction of CO₂ emissions by 4-5%
- Savings in operating costs



GPS Tracking System; GPS Container Tracking

GPS Tracking System is high quality technology based on the highest quality components. Top-quality technology and materials are used in design and production (no „sneaky” savings). GPS TRACKING SYSTEM uses of a sufficiently long battery backup and a large memory for the best and accurate operation of the device with saving 100% of the acquired route data and vehicle parameters (no data loss).

PETROVISION®

PETROVISION Piotr Kaczmarek

Głębczycka 27 St.
02-417 Warsaw

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www.petrovision.pl



SUPPLY CHAIN MANAGEMENT



SMART CITY



ENERGY SAVING

ADVANTAGES OF THE SOLUTION

- Unprecedented accuracy of 0.5-1.0 m
- API for each application
- Very low operation costs and costs of system use by the customer
- Driving log for settlements with the tax office
- Customer-friendly interface



RENEWABLE ENERGY



Asket®

Forteczna 12a St.
61-362 Poznań

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www.asket.pl

Biomasser® - briquetting technology of moist non-woody biomass

- Stationary and mobile lines with different productivities
- Processing the raw material of moisture content 10%-30% (without drying) - confirmed by EU ETV Statement
- 100% natural briquettes of various applications: as fuel, for biogas production, for animals (hygienic bedding, dietary fibre snack, toy)
- Processing of yearly renewable non-woody biomass (straw, hay, reed, Miscanthus)

RENEWABLE ENERGY



CIRCULAR ECONOMY



WASTE



ADVANTAGES OF THE SOLUTION

- Compact machines and only 2-step briquettes production process
- Adjustable hardness of the produced briquettes (depending on the application)
- Energy consumption 70-80kWh per 1 ton of briquettes - confirmed by the EU ETV Statement
- Quick implementation and payback time



SYENERGY – satellite data visualization platform

Biocontrol develops and validates the method of energy biomass source of origin authentication and monitoring plantations with the Sentinel 2 satellite data, according to the local and EU sustainability requirements (RED 2). The classification of energy crops plantations is performed by IGIK using the available satellite and in-situ/ancillary data as well as data possessed by Biocontrol Company. With the Syenergy platform tool you can measure trunk diameter at chest height (at 1.30 m), plant height before harvest, plant density on a plantation and obtain information on varieties of willow or poplar and plant density per ha, the cycle of biomass collection and the last harvest, the plant yield should be determined by cutting fresh mass of plants from one representative subject (plot), weighing it, and calculating the yield weight per 1 ha. The fresh biomass yield and its moisture content should be used to calculate the dry biomass yield.



Biocontrol
Waszyngtona 34/36 St.
81-342 Gdynia

Adam Sarnaszek
+48 537 50 50 53

www.bio-control.pl



BIODIVERSITY

ADVANTAGES OF THE SOLUTION

- Possibility to verify sustainability criteria for biomass fuels for energy purposes, in accordance with the RED II Directive
- Possibility of a remote verification of the cropland, without the need to cover the costs of on-site visits
- Possibility to verify origins of the imported crops thanks to an unlimited operation area (worldwide range)



RENEWABLE ENERGY



Rotary burner with special focus - ROTARY Plus burner with a rotary combustion chamber with an exhaust fan

The innovative burner with a rotating combustion chamber has revolutionized the biomass market. Thanks to patented technologies, it solves key problems with the operation of heating devices powered by pellets and is almost maintenance-free, extremely economical and ecological. The Rotary Burner developed by us is the first burner of this type on the market. This technology is protected with a patent of the Patent Office of the Republic of Poland. Currently, our offer includes burners with power from 3 to 300 kW.



BTI Gumkowski
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www.kipi.pl



ENERGY SAVING



CIRCULAR ECONOMY

ADVANTAGES OF THE SOLUTION

- The use of renewable energy sources - pellets and other biofuels such as nut shells or oil seeds
- Comfort of use thanks to the self-cleaning mechanism



RENEWABLE ENERGY



EnAlpha

Dworska 1A/1u St.
30-314 Kraków

Adam Sokal

+48 888 888 691

www.enalpha.pl

PWR Ability

Introducing Power Ability - system that predicts electricity production in photovoltaic installations. Our method is based on two data factors: historical energy production data and meteorological data provided by Meteo services. Power Ability combines meteo data with basic energy production parameters to provide highly accurate production forecast. Most of the known solutions make predictions either only on the basis of historical data or with the use of annual average weather data for a given area.

RENEWABLE ENERGY



ENERGY SAVING



ADVANTAGES OF THE SOLUTION

- Analytical platform - Profiling of electricity consumption and generation in distributed locations
- RES - Provision of RES solutions in the field of electricity and heat
- AI - Data analysis using AI algorithms based on actual consumption and weather data
- Energy Clusters - We connect local government units and local energy producers and consumers

Enerko Energy

Skrajna 41a St.
25-650 Kielce

+48 512 008 805

www.enerko.ioze.pl

Archimedes screw/Water turbines

Archimedes screw is a technology dedicated for micro hydropower. This solution can be used for very low heads. For optimal use of water potential there is a possibility to apply several Archimedes screw units in parallel arrangements or/and implements a cascade system.

RENEWABLE ENERGY



WATER



ADVANTAGES OF THE SOLUTION

- Steel trough for concreting
- Self-supporting structure
- Regulation with an inverter system
- Without regulation, fixed speed



Stack of solid oxide cells (SOC) designed to generate hydrogen or electricity

Stacks of solid oxide electrochemical cells are considered to be one of the most promising hydrogen technologies. The developed SOC stack can work as a generator of electricity and heat - fuel cell mode, produce zero-emission hydrogen - electrolyser mode, and also, can operate in a reversible mode (switching between the modes mentioned above), i.e. act as energy storage. This technology is highly efficient, can be powered by various types of H₂-based fuels, and is environmentally friendly.

Institute of Power Engineering

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www.ien.com.pl



AIR



ENERGY SAVING



RENEWABLE ENERGY

ADVANTAGES OF THE SOLUTION

- High efficiency compared to similar low-temperature solutions
- Multi-functionality - the ability to work in the fuel cell or electrolyser mode
- Highly-automated easy to scale-up fabrication techniques
- Modular construction (system power scalability - power increases with the number of stacks)



Ecological boilers fired by whole straw bales

Ekopal boilers are modern and ecological fired with whole bales of straw. These boilers are well-thought-out designs, developed for 30 years. The boilers allow for many years of trouble-free operation. They are produced in the range of 100-1500kW. Currently, R&D works are carried out on a 2.5 MW boiler and a steam boiler. Thanks to the use of modern controllers, the emission of pollutants in the exhaust gases is reduced to minimum. Return of investment can take as short as 2 heating seasons.



MetalERG

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www.metalerg.pl



ENERGY SAVING



CIRCULAR ECONOMY



RENEWABLE ENERGY

ADVANTAGES OF THE SOLUTION

- Modern, effective and cheap source of heating
- Allows you to use own or local, ecological and cheap fuel
- Return of investment already within 2 years
- Complete replacement of fossil fuels





Photo Survey

Św. Jerzego 24/2 St.
61-546 Poznań

Michał Wyczałek-Jagiełło

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www.powercob.com

Green Energy Technology from Biomass

An innovative energy system that includes a new fuel and mini power plant. Our technology allows you to obtain ecological fuel from corn cob cores and convert it into energy in two forms:

- common-use fuel: calorific agro pellets
- through our own biomass gasification line - a small cogeneration power plant

RENEWABLE ENERGY



WASTE



CIRCULAR ECONOMY



ADVANTAGES OF THE SOLUTION

- Energy independence
- Turning agricultural residues into clean energy
- Zero emissions
- Local sourcing of fuel



SYMBIONA

Agatowa 12 St.
03-680 Warsaw

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www.symbiona.com

AnoxyMem® - Anaerobic Membrane Bioreactor

AnoxyMem® the anaerobic membrane bioreactor (AnMBR) is the epitome of the circular economy. The most advanced technology of biogasification of wastewater and waste available on the market that allows to obtain up to 40% more biogas than classic AD systems. The best solution that treats high-strength wastewater, mixtures of wastewater and waste with high levels of COD (even more than 300,000 mg/l), or organic waste with a large amount of dry matter (dry matter even >10%). COD reductions can reach 99.7%, and dry matter reductions up to approx. 90%.

RENEWABLE ENERGY



CIRCULAR ECONOMY



ADVANTAGES OF THE SOLUTION

- Fully integrated digestate/wastewater separation system with very high COD and dry matter reduction – safe, economical and hermetic
- Up to 40% more biogas or biomethane from AD process means a quick return on investment
- Modularity of the system: the possibility of expanding the membrane system without shutting down the fermentation reactor



WASTE

Hybrid Sludge Dryers

The Ekotop Roman Sobczyk company offers Sludge Dryers - an ecological sludge processing technology for waste water treatment plants. Unlike the traditional dryers, it utilizes low-cost hybrid alternative energy sources. With this technology sludge drying is possible regardless of weather conditions.

ekotop
dr inż. Roman Sobczyk

Ekotop Roman Sobczyk
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64-920 Piła

Maciej Sobczyk
+ 48 695 934 625

www.ekotop.eu



CIRCULAR ECONOMY



WATER



WASTE

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





FortiFruits
Mikołaja Reja 12 St.
35- 211 Rzeszów

Lesław Ślisz
+ 48 794 020 000

Fruit elicitation as a natural method of increasing fruit colour and flavour

The technology implemented by FortiFruits consists in stimulating the berries with a factor designed to stimulate the activity of selected enzyme systems. This results in an increased production of bioactive compounds in fruits, especially low-molecular antioxidants. A properly carried out process increases the content of polyphenol, anthocyanins, antioxidants and vitamin C. The process does not generate any chemical residues and significantly increases the shelf life of the fruit. The technology is applied to organic fruit. Such fruits can be processed freely, but FortiFruits offers the product in the form of naturally enriched fruit extracts, powders made with the use of natural carriers. The new technology will revolutionize the production of processed fruit (juices, jams, chocolate, jellies), as it will allow the use of natural fruit without chemical additives for all consumers.

WASTE



CIRCULAR ECONOMY



ADVANTAGES OF THE SOLUTION

- We improve colour and flavour of berry and vegetable products > 60% (strawberry, raspberry, blueberry, cranberry, black currant, elderberry, tomato, broccoli)
- We lower cost of multifruit juices < 30%
- No waste from berry juice production but semi product

IDEALBIN

Idealbin
Podolszyny 53
37-300 Leżajsk

+48 695 758 075

www.idealbin.pl

Intelligent containers system for selective waste collection

Idealbin is an ecological solution in the form of intelligent waste segregation devices with a system and application. The devices facilitate the selective collection of raw materials and are an effective tool for waste management. Innovative technology, thanks to the use of IoT, is a source of precise data on the amount and type of waste inside the container and the level of its filling. The indisputable advantage of Idealbin is the high compression of waste, which is ensured by the compactor installed inside. Access to the devices is possible using an RFID card or application. In addition, the innovative design of the waste inlet facilitates access for people with special needs, and the shape of the containers allows the use of energy from photovoltaic panels.

WASTE



SMART CITY



CIRCULAR ECONOMY



ADVANTAGES OF THE SOLUTION

- Innovativeness - the use of IoT technology allows you to obtain accurate data on the amount, type of waste and the level of filling the container
- Efficiency - the compactor integrated with the container ensures automatic waste compression
- Ergonomics - the innovative design of the automatic waste inlet increases the comfort of using the devices
- Ecology - in line with the paperless trend, access using an RFID card and the possibility of implementing photovoltaics

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

Sultech® is a proven, ecological and innovative solution to passivize dangerous waste and lower landfill costs. Holders and producers of waste can use Sulstar® sulphur polymeric binder to stabilize hazardous materials and produce solidified composite by-products. The Sultech® composite is a thermoplastic material with high mechanical strength and total corrosion resistance. It can be used in hydrotechnical, road or railway construction as drainage systems, bank reinforcements, road barriers or road slabs.

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www.marbetwil.com



CIRCULAR ECONOMY



WASTE

ADVANTAGES OF THE SOLUTION

- No water and cement in production process
- High strength, resistance to corrosion, no water absorption and high frost resistance
- Possibility to recycle 100% of the product
- Significantly lower CO₂ emission comparing to cement-based technologies



TANK CONTROL – centralised risk management system for explosive and dangerous liquids

2AK Tank Control enables you to monitor the storage of liquid explosives. It is a convenient and reliable tool dedicated for Environment Protection Departments. The data readings from the control systems have been supplemented with their recordings and reporting. Its greatest advantage is a constant, remote and safe monitoring of tank tightness in order to prevent a potential leak of dangerous substances. It helps you to create environment safety management policy.



PETROSTER-SERWIS
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www.petroster-serwis.pl



SOIL



WASTE

ADVANTAGES OF THE SOLUTION

- Intuitive and simple reading of the amount of liquid inside the tank
- Cloud-based scalable solution
- Management of explosion-proof protection
- Reduction of dangerous, flammable and toxic liquids vapour emissions to the atmosphere



PROMONT

Jagiellońska 35 St.
85-097 Bydgoszcz

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www.promont.com

Installation for thermal treatment of medical, industrial, veterinary and hazardous waste with heat recovery or electric energy production

Thermal treatment plant for medical, industrial, veterinary and hazardous waste with thermal or electric energy recovery is based on rotary kiln technology with an afterburner chamber, combined with heat recovery and an exhaust gas cleaning system. In a rotary kiln, the process of gasification (combustion) of waste takes place. The gas produced in the gasification chamber passes into an afterburner chamber where temperature of gases reach 1100 C -1200 C. Heat recover system may produce saturated steam 6-22 bars or heat thermal oil up to 300 C or superheated steam at 40 bars from which may be produce heat, electricity or cool. Exhaust gas cleaning system meets highest EU standards.

WASTE**SAVING ENERGY****ADVANTAGES OF THE SOLUTION**

- Modern technology that meets the latest emission and technological requirements
- Reduction of post-process waste
- Production of heat or electricity for own or external needs
- Our technology is 30% cheaper than foreign solutions

**T-Master**

Stanów Zjednoczonych 32/u15 Ave.
04-036 Warsaw

Jakub Sprusiński

+ 48 721 877 977

www.t-master.pl

The Individual Waste Segregation System

Intelligent, the only contactless ELMO (Electronic Municipal Waste Meter Electronic gauge of municipal waste) 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 from 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.

WASTE**ADVANTAGES OF THE 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-oriented solution - thanks to legalized scales, in the future it will be possible to pay for waste like for water or gas





CELLUGUARD®

The celluguard® technology is dedicated for coal-fired power stations, heat and power plants, mines and facilities that struggle with a problem of secondary dust emissions of gasiform substances at landfills (tailings). The method consists in a hydrodynamic application of a flexible, reinforced and liquid coating to dust-emitting surfaces. In comparison to traditional methods, Agata offers a much cheaper, more durable and a fully environmentally-friendly solution. This technology has been successfully implemented in many international enterprises.

AGATA

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Jakub Wardzyński
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www.kontrolapylenia.pl



SOIL



WATER



AIR

ADVANTAGES OF THE SOLUTION

- The highest protection efficiency due to eco-reinforcement
- Four degrees of protection durability: 1, 3, 6 and 12 months
- Improvement of air quality in the vicinity of landfills, tailings
- Elimination of unpleasant odours at landfills





Ekoinwentyka

Szyb Walenty 26 St.
41-700 Ruda Śląska

dr inż. Damian Kasperczyk

+48 602 341 067

www.ekoinwentyka.pl

Compact Trickle Bed Bioreactors (CTBB) technology for biopurification of air from odours and Volatile Organic Compounds (VOCs)

CTBB technology is an innovative solution that uses biodegradation processes that occur naturally in nature, with the participation of microorganisms. It guarantees the required reduction of VOCs and odor generated in production processes. The advantage of the innovative technology of Ekoinwentyka is the ecological purity of the processes carried out and the lack of secondary pollutants (no CO₂ and NO_x emissions). The low energy consumption of the bio-purification process carried out in CTBB, in comparison with classical technologies, reduces operating costs several times. What's more, the CTBB installation is fully automated, that gives the possibility of full control of the process parameters.

AIR



ENERGY SAVING



ADVANTAGES OF THE SOLUTION

- Ten times lower operating costs compared to classic technologies
- Ecological purity, absence of secondary contaminants
- Long installation life
- No risk of explosion
- High degree of pollution reduction

WATER

Biological wastewater treatment plant DAGAS BIO

To facilities with various business profiles: public utility, chemical, oil refining, painting, cokery plants, printing and food facilities, etc. Dagas offers a biological wastewater treatment plant DAGAS BIO. That solution takes advantage of a so-called biological conveyor and is based on biocoenosis. DAGAS BIO is composed of a joint line of anaerobic, aerobic and anoxic bioreactors, equipped with adequate fibrous conveyors with large open surfaces, where biocoenosis proper takes place. The process of biological wastewater treatment DAGAS BIO is conducted continuously without the removal of activated sludge.



Dagas
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+48 608-305-546

www.dagas.pl



WATER

ADVANTAGES OF THE SOLUTION

- The technology significantly diminishes the amount of the excess activated sludge
- 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





AQT Water
Poznańska 148a St.
18-400 Łomża

Maciej Pawluk
+48 533 352 113

www.aqtwater.com

Wastewater treatment plants ARGO

Small wastewater treatment plants ARGO are used to treat domestic wastewater from single- and multi-family households, agricultural farms, summer and other recreation cottages and public utility buildings which are not or cannot be connected to combined wastewater collecting systems. In contrast to competing solutions, the ARGO wastewater treatment plant can operate in any terrain and climatic conditions, without using electricity, does not emit CO₂ into the atmosphere and ensures high wastewater treatment efficiency.

WATER



SAVING ENERGY



ADVANTAGES OF THE SOLUTION

- Operates without electricity or mechanical elements
- Short start-up period (up to 24 hours)
- High long-term treatment efficiency (95%)
- Odourless treated wastewater can be discharged into rivers or lakes or can be re-used to irrigate farmland or orchards



AQT Water
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QUMKAM® SBR

QUMKAM® SBR set is a high-quality adaptive system dedicated for septic tanks, drainage treatment plants and cesspools. The system creates a fully biological wastewater treatment plant. Depending on the SBR type the QUMKAM® system guarantees a cleaning performance of up to 97.7% (BOD₅) as well as 95.5% (COD).

WATER



ADVANTAGES OF THE SOLUTION

- Fits in any tank - concrete or plastic
- Silent and economic operations of the device, energy consumption up to 0,49 kWh/d
- Reliable operations confirmed by its application at over 5,000 treatment plants
- High efficiency of wastewater treatment and low costs of purchase and assembly



BDT - grey water treatment plant

BDT treatment plants (grey sewage treatment plants) are designed for gray utility water with single or multi-family buildings. The system consists of: a primary settling tank, equipped with filters limiting the penetration of solid elements, and a bioreactor – equipped with a biofiltration bed, the active part of the treatment, where the removal of factors takes place.

AQT Water
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CIRCULAR ECONOMY



WASTE



WATER

ADVANTAGES OF THE SOLUTION

- The device is made of PEHD, is small in size, easy to transport and assemble in all conditions
- BDT is characterized by high purification efficiency of >95%
- BDT works without the use of electricity and mechanical parts (energy consumption of the process is 0.00 kWh/d), the system is completely maintenance-free, quiet and not resistant to uneven inflow of waste.



Pneumatic Pumping Station EPP

For water and sewerage companies which face the problem of municipal sewage purification in the pressure sewage systems, the EkoWodrol company offers an EPP pneumatic sewage pumping station – innovative Polish technology consisting in pneumatic sewage pumping. As opposed to traditional systems equipped with pumps, EPP uses compressed air for pumping, which refreshes the sewage and prevents it from putrefying during transport. A separate dry chamber enables safe and hygienic operation with no direct contact with the sewage. The technology allows the discharge pipeline to be periodically completely cleaned, thus reducing the formation of unpleasant odors.



EkoWodrol
Słowiańska 13 St.
75-846 Koszalin

Konrad Chudzik
+48 607 799 098

www.ekowodrolnowacje.pl



WATER

ADVANTAGES OF THE SOLUTION

- Elimination of sewage putrefaction and odour formation, preventing complaints from residents
- Providing safe and hygienic maintenance with no sewage contact or risk of hydrogen sulphide poisoning
- Pumping sewage more efficiently, with no need to build a cascade of pumping stations, reducing investment costs



**The Institute of New Technologies
in Environmental Engineering**

Różana 12 St.
67-100 Nowe Żabno

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www.int.edu.pl

Climate garden - rain garden technology

Climate Garden technology – is a combination of a rain garden and a pocket park. The innovativeness of the solution lies primarily in the fact that within one facility it was possible to combine all elements of the green and blue infrastructure that are crucial for adaptation and mitigation activities for climate change, i.e.: the use of rainwater for irrigation of green areas, small retention, and use of biodegradable waste at the place of its generation; increase in biodiversity, increase in the area of green areas, local improvement of air quality as well as promotion of activities in the field of bio-food production.

WATER



BIODIVERSITY



ADVANTAGES OF THE SOLUTION

- Storage and use of rainwater for irrigation of green areas
- Construction of a small retention system
- Production and use of biodegradable waste at the place of its generation
- Increasing the surface area of green areas along with the development of local biodiversity

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Hydrophyte bioreactor - biological wastewater treatment plant

The hydrophyte bioreactor technology is an eco-innovative solution which ensures high-efficiency removal of organic compounds and nutrients from wastewater. Its design eliminates the impact of unfavorable weather conditions (e.g. sub-zero temperatures) on filter performance, maintaining it high throughout the year. The designed system of mineral and organic layers provides proper hydraulic conductivity and even spatial distribution of treated discharge into the soil. The technology is based on 3 inventions and draws on the results of its own research.

WATER



CIRCULAR ECONOMY



ADVANTAGES OF THE SOLUTION

- High efficiency - elimination of over 90% of organic pollutants
- The construction of the bioreactor is not time-consuming - it takes one day
- Low capital expenditures and operating costs
- Technology in line with the NBS mission, in line with the green and blue infrastructure and based on circular economy

PROTE-fos Lake Reclamation Technology

PROTE-fos is a comprehensive service consisting in the reclamation of lakes dedicated for private and public entities which own or manage water reservoirs that face the problem of eutrophication. The final result of the technology is to obtain a clear-water state by curtailing algal blooms and improving water transparency. PROTE-fos technology consists in blocking phosphorus directly in the bottom sediment during its controlled resuspension, and afterwards, through its permanent consolidation.

PROTE Technologies for our Environment

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+48 606 145 325

www.prote.pl



BIODIVERSITY

ADVANTAGES OF THE SOLUTION

- PROTE-fos is unique and less radical than alternative methods
- It contributes to the restoration of balance in the entire water reservoir
- Applied in a few lakes in Poland and overseas
- The efficiency of the method has been scientifically proven



WATER



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 bioindicationz, 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 magnet stuck to the mussel's shell. The probe records the degree of each mussel's openness and its natural biorhythm comparable to human's ECG.

PROTE Technologies for our Environment

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WATER

ADVANTAGES OF THE SOLUTION

- SYMBIO systems are monitoring water for more than 10 million people
- They enable a quick reaction in case of an adverse change in water parameters
- The system increases the sense of the security of the potable water users
- It improves the image the water supply companies which utilize it



PROTE Technologies for our Environment

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www.prote.pl

PROTE-MOS Minimization/Modification of Sludge Technology

For WWTPs that want to cut the amount of sludge and improve the quality of effluent, we offer the innovative PROTE-MOS technology, which optimizes the process of biological wastewater treatment. Unlike other solutions available on the market, such as sludge incineration or drying, our technology requires no investment costs (CAPEX=0), and it does not involve reconstruction of the facility which utilizes it. It significantly lowers the OPEX of the wastewater treatment plant.

WATER



ADVANTAGES OF THE SOLUTION

- Reduction of the quantity of sewage sludge generated by 20% - 73%
- Reduction of electricity consumption by up to 31% - 62%
- Improvement of the quality of wastewater treated only with the biological method
- Reduced use of polyelectrolytes and lime and cessation of coagulant dosing



SYMBIONA

Agatowa 12 St.
03-680 Warsaw

+48 22 535 30 75

www.symbiona.com

ROVAPO® – Zero Liquid Discharge

ROVAPO® is a technology of maximum recovery of water from wastewater (up to 98%), which minimizes the amount of energy needed and waste generated by the process. Depending on the application, ROVAPO® includes a number of treatment and recovery stages i.e:

- a) an integrated physico-chemical treatment system with a membrane water recovery system (RO/NF) and an evaporation stages or
- b) more efficient membrane systems (RO/NF)
- c) a combination of membrane techniques and efficient low temperature evaporators

WATER



CIRCULAR ECONOMY



ADVANTAGES OF THE SOLUTION

- Low total cost of ownership (TCO) by minimizing the amount of waste, electricity consumption, reagents and the high water recovery level provided
- Safe solution thanks to the autonomous process control system. ROVAPO® automatically adapts to the changing composition of raw wastewater, ensuring constant set recovery efficiency and reclaimed water parameters
- Maximum level of recovery of high quality water from industrial wastewater (up to 98%) with minimum amount of waste left

AnoxyBed™ - wastewater treatment technology

AnoxyBed™ EGSB (Expand Granular Sludge Bed) is a compact, efficient anaerobic treatment process for industrial wastewater that uses anaerobic granular sludge. This solution allows producers of food, beverages and juices as well as other factories that generate biodegradable wastewater (eg. breweries, ethanol, paper mills, chemical) to obtain valuable biogas from polluted wastewater, while efficiently treating it. The reactor operates stably under changing inflows and concentrations of wastewater. It treats streams with different COD (from approx. 2,500 mg/l to 20,000 mg/l COD). The special design of the AnoxyBed™ separator reduces the risk of sludge escape, which ensures safety and process reliability. Apart from the version with a settling tank in the reactor roof AnoxyBed™, can be delivered with an external separator, which allows for the modernization and improvement of the operation of existing installations without costly construction alterations. The technology can be delivered together with the supply of granulated sludge necessary for start-up and other elements such as pumps, exchangers, process control and start-up.



SYMBIONA

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WATER

ADVANTAGES OF THE SOLUTION

- High-efficiency settler - low risk of granular sludge escape
- Easy access to the EGSB settling tank during system's operation
- Low investment cost
- High installation efficiency



Ozone systems for water and wastewater

WOFIL is a market leader in ozonation systems. It provides complete solutions from pilot studies, design, production of equipment and software to assembly, monitoring and service. In addition, it is constantly developing technology in order to optimize it and reduce electricity consumption. The installations, made of the highest quality materials, are reliable, safe and environmentally friendly. Thanks to full computerization, they can be installed anywhere in the world, controlled online with full and rapid service support.



WOFIL Robert Muszański

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Dominika Turek

+ 48 731 888 081

www.wofil.pl



WATER

ADVANTAGES OF THE SOLUTION

- Ecological disinfection of water and wastewater
- High efficiency and wide range of applications
- Compact solutions
- Simple design, modularity and easy extension





**Ministry of Climate and Environment
Republic of Poland**

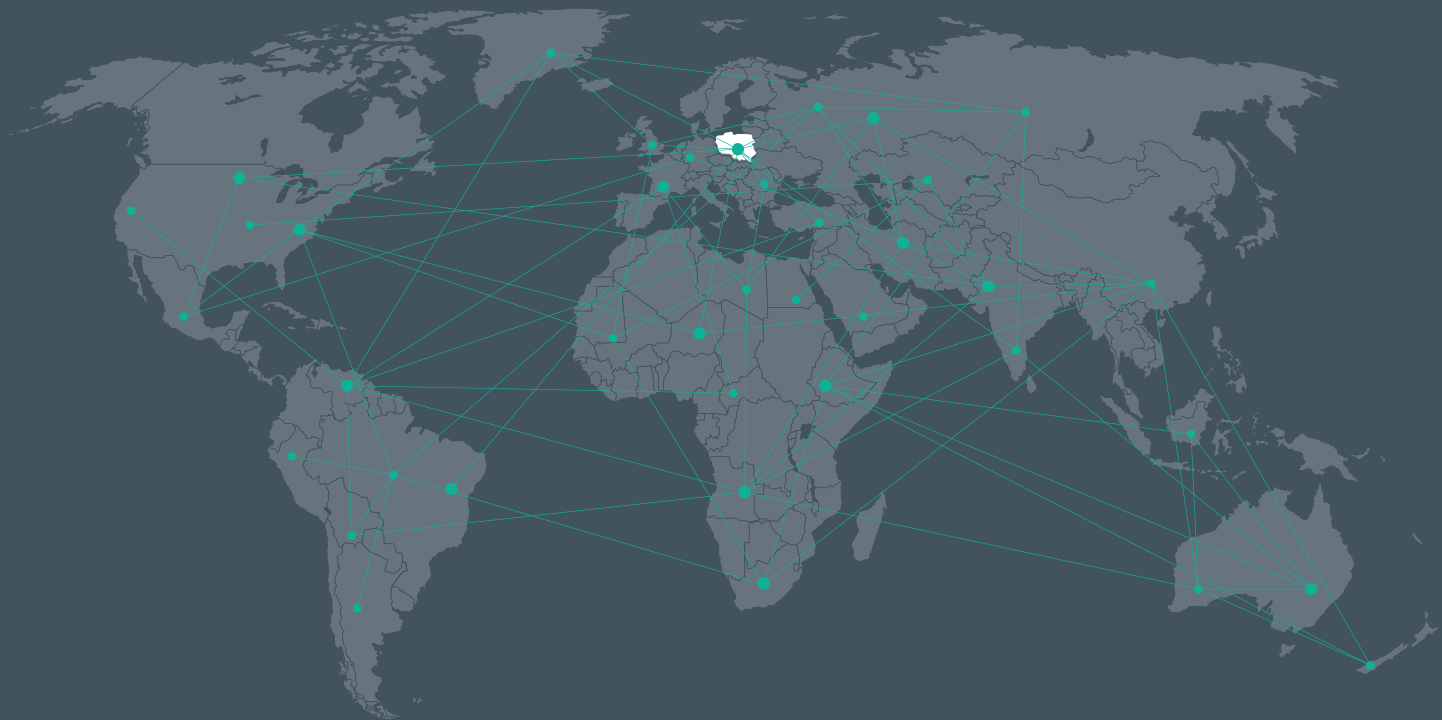
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2023

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