



Assumptions

Pilot testing of innovative compact wind turbine generator system „Urban WindPower Station” set in urban space.



Sources of funding

The European Commission as part of the LIFE Climate Change Mitigation component.

Additional financial support:



Dofinansowano ze środków
Narodowego Funduszu
Ochrony Środowiska
i Gospodarki Wodnej

National Fund for Environmental Protection and
Water Management.

Implementation Period

- 1.10.2018-30.09.2021

Purpose and description of the project

The project aims to confirm the efficiency and enormous innovative potential of the Urban Wind Power Station generating set.

The specific objectives are:

1. Showing the possibilities of using the energy of air streams (forced by human activity) in urban space as a new source of renewable energy for the production of zero-emission and cheap electricity.
2. Construction and testing of a prototype of an innovative generating set Urban Wind Power Station based on a modular, cylindrical wind turbine with a self-guiding system for optimal capture of air stream energy in any planes, for the production of electricity.
3. Confirmation of the potential and efficiency of Urban Wind Power Station. To obtain reliable comparative data, four prototype mobile pilot kits will be built and tested as part of the project, installed in locations with differing airflow characteristics and a potential audience.
4. Widespread awareness that the Urban Wind Power Station is universal, easily modifiable, adapted to operate both outside and inside buildings, especially in industrial lines, tunnels, subways, production plants, as well as in office buildings (ventilation ducts) etc. And it can be the basis for systemic production of electricity in a dispersed system bringing measurable ecological and economic effects.
5. Designation by testing the boundary assumptions for the widest possible implementation of the Urban Wind Power Station device in various sets.



6. To bring about a social understanding of the relationship between zero-emission distributed energy and the reduction of CO2 emissions, and the impact of this relationship on climate change mitigation.
7. Building awareness on the possibilities of operation and universal character of Urban Wind Power Station and the ability to reduce greenhouse gas emissions through its use, which is especially important in urban agglomerations, which are specific heat islands.
8. Education addressed to decision-makers at various levels, entrepreneurs and Technology Transfer Centers, who have a special impact on the process of commercialization of the device. Urządzenie może stać się ważnym elementem obniżenia emisji CO2 w przestrzeni zurbanizowanej w Europie. Wszystkie cele projektu znakomicie wpisują się zarówno w dyrektywy EU, jak i główny cel pakietu klimatyczno – energetycznego Europa 2020.

Project coordinator

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Project activities

The project includes the construction and testing of a prototype Urban Wind Power Station - a generating set based on a modular, cylindrical wind turbine with a self-guiding system for optimal capture of air stream energy for electricity production, with automatic energy collection and storage as well as fastening systems, as well as educational activities to raise public awareness of climate change and opportunities to mitigate these changes.

Activities will be carried out in several stages:

I. PREPARATORY WORK: development of projects and documentation (design and implementation) for building a prototype (including an innovative wind turbine coupled with a power generator) with 5 kW, 10 kW, 20 kW in min. 2 versions differing in the characteristics of a wind generator, including systems for adaptation to the facility's power supply network, fixing systems and automation of work control. At this stage, a catalog of air streams forced by human activity in urban space will also be created, and assembly and connection permits will be obtained.

II. CONSTRUCTION OF PROTOTYPES: construction of wind turbines, diffusers and mounts and their assembly in a modular generator set with 5kW, 10kW, 20kW power as a complete set with automatic control, mechanical fastening systems and auto-guidance of the wind engine for maximum air flow as well as reception and storage current.

III. INITIAL - PARTIAL TESTS: performing electrical and mechanical tests of all prototype nominal power models in order to synchronize a wind turbine with a mechanical generator and a current generator in electrical terms as well as optimization of these processes. Choosing the optimal model in every power variant, preparing for them documentation necessary for the assembly of prototypes and monitoring systems.



IV. REAL TESTS: monitoring of all prototype variants in real conditions (after installation on or inside selected objects) in the tested locations and development of test results and preparation of presentations.

V. PROJECT PROMOTION AND EDUCATION: in the field of renewable energy - effective access to legislative authorities, local governments, entrepreneurs, potential device manufacturers and direct recipients. The effect of the actions is to be the understanding of the problem and commercialization of the Urban Wind Power Station device.

Project results

1. Confirmation of the efficiency and ecological effect of the Urban Wind Power Station unit prototype (work 2500 - 3000 hours / year at 2.5 m / s air speed).
2. Creating a catalog of forced air streams as a new source of renewed energy for the production of zero-emission and cheap electricity.
3. Confirmation of the potential and efficiency of Urban Wind Power Station in locations differing in the characteristics of air streams (using 4 mobile sets).
4. Confirmation in tests of various locations that the Urban Wind Power Station is universal and easily modifiable.
5. Building awareness, especially among policy makers, that the lack of forced air streams to reproduce clean energy is creating energy waste in times of necessary energy optimization.
6. To commercialize the device within 2 years of project completion (device production and first installations).
7. Achieving widespread commercialization in Europe within 5 years of project completion.

European added value in reducing greenhouse gas emissions:

The level of reduction of CO₂ emissions as a result of the prototype test and after commercialization resulting from educational activities and the involvement of stakeholders in pro-commercial activities, will bring (assuming that 1kWh from coal gives about 1 kg of CO₂ emissions).

2.310.000 kg CO₂ reduction from each prototype set.

One set with a total power of 35 kW will reduce CO₂ emissions by 87,500 - 105,000 kg / year, and within 5 years of project durability 525,000 - 630,000 kg. Thus, built prototypes will reduce CO₂ emissions by 2,310,000 kg during the project's lifetime.

The reduction of CO₂ emissions resulting from the commercialization of the project depends on the scale of implementation, which is why educational activities and engaging stakeholders to support commercialization are so important. The Warsaw Metro (28 stations) can install devices with a capacity of min. 500 kW, which will reduce 1,500,000 kg CO₂ / year. Subways, e.g. in Paris, Prague, Budapest, have the potential to install a device with a total capacity of 5.5 MW, resulting in a reduction of CO₂ emissions by 13,500,000 kg / year. Entrepreneurs installing only 300 sets of avg. with a capacity of 100 kW each, can produce electricity at 75 GWh / year, which will reduce CO₂ emissions by 37.500.000.000 kg / year.

Beneficiaries



The project is implemented by the ECO FOR LIFE Foundation for Ecology Support, and sufficient partners: Institute for Research, Applied Sciences and New Technologies sp.z o.o, Adorea sp.z o.o and Gromar sp z o.o.

eco⁴life

As part of its statutory activity, the ECO FOR LIFE Foundation for Ecology Support supports the development of technology and innovation, disseminates solutions for ecology, works for European integration and cooperation in the field of ecology, especially eco-innovation. The Foundation provides special support for measures to slow down climate change. Is a partner in the platform appointed by the Ministry of the Environment, coordinated by the

Capital City of Warsaw: CLIMATE PARTNERSHIP; as well as a member of the BIOENERGY FOR REGION cluster. Members of the Foundation Council and experts acquired for the project are authors of patents, environmentalists with many years of practice, engineers.



Institute of Research, Applied Sciences and New Technologies Sp. z o.o. is a unit continuing the work of the Institute of Innovative Social and Technological Thought, established by the Senate at the College of International Relations and American Studies in Warsaw, as the Polish equivalent of the Virginia Institute of Applied Science and Technology. The INSTITUTE's original project is research on a prototype of a series of CITY Air Flow municipal sewage treatment plants, designed to purify air in urban spaces, while also reducing the temperature in cities as a result of CO2 leveling. Insytyut is a member of the platform "CLIMATE PARTNERSHIP", implementing a strategy for comprehensive, innovative, promotional and educational activities for the prevention of climate change. In addition, he is a member of the BIOENERGY FOR REGION Clusters

and POMED - INNOVATION IN MEDICINE.



Adorea Sp. z o. o.

is a company that provides advisory services on advertising and is the publisher of elite (Polish-English) lifestyle magazines: Golf & LIFE, Business & LIFE, Look & LIFE.

Both as a consulting company and as a publisher of Business & LIFE, he closely cooperates with business organizations, he reaches one of the most opinion-forming group of readers such as golfers (mainly company owners and high-level managers).



Gromar is one of the IT market leaders in Poland and Europe. It has a wide team of programmers and a multimedia production team, implements its own innovative solutions in the field of software.

He has won many awards, including "Deloitte Technology Fast 50 in Central Europe" - a prestigious distinction awarded by Forbes magazine and Deloitte.

He is also a laureate of the nationwide plebiscite "Business Creator" in the category of Human Resources companies.

Partners



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