ANNUAL REPORT

2022

NCBR

The future is happening with us!

CONTENTS

Warsaw 2023

ISBN: 978-83-967832-2-6

PREFACE

It is with great pleasure that we present the Annual Report of the NCBR for 2022. Our mission is "to build a modern present and future" and for 16 years we have been making every effort to fulfill it. 2022 was a time for us to implement important changes – we changed both internally and externally. First of all, supervision over the NCBR was entrusted to the Ministry of Funds and Regional Policy. Changing the location of the NCBR's headquarters was a great challenge for our organization. The new headquarters is located in the very center of Warsaw, in the Varso Tower building, which is a modern place suitable for the needs of the entire NCBR Group, but also adapted to the needs of persons with disabilities.

Despite the changing environment and working conditions, we have maintained continuity of the NCBR's operations, in particular in terms of preparing new programs financed from European funds. Therefore, the completion of the negotiation processes and the final approval of the new operational programs – the European Funds for Modern Economy (EFME) and the European Funds for Social Development (EFSD) – by the European Commission can be considered a success. The NCBR acts as the Intermediate Body within these programs, having a multi-billion budget at its disposal.

Cooperation is the key to success, so we are pleased to announce that in 2022 we concluded an agreement with the National Agency for Academic Exchange regarding cooperation under the "Polish Returns" program and we signed a bilateral cooperation agreement with the Korean Institute for Energy Technology Planning and Evaluation (KETEP), which will contribute to development of innovative energy technologies and expansion of the national R&D work.

In 2022 we announced the first competitions under two new national programs. The first of them, NEON, is a joint venture implemented with Polish Oil Company "ORLEN", which concerns support for R&D work for the petrochemical industry. The second program is NUTRITECH, which aims to increase availability of solutions in the field of proper nutrition by 2030.

Increasing information security is our priority, so obtaining the certificate of compliance with the ISO/IEC 27001 standard in 2022 – after a successful security audit – can be considered another success. In addition, we continued work on the digitization and computerization of processes inside the NCBR to ensure the best possible conditions for hybrid work. We developed the LSI 2.0 platform, the JIRA platform and implemented the Office 365 service for all our employees.

The most important in every organization and every activity are people who are the foundation on which we can build a common future. And this is the case with the NCBR. Our staff stand behind these achievements. Their experience, commitment, knowledge, passion and daily support are invaluable. We are convinced that the best specialists and managers join the NCBR's ranks.

We invite you to read this "Annual Report"!

NCBR – WHO WE ARE

The NCBR is an executive agency of the central government. The financial support offered by the NCBR is addressed primarily to domestic entrepreneurs and research communities. Our activities reduce the business risk associated with developing and implementing groundbreaking projects. At the same time, the NCBR is an institution that, through its activities, encourages both experienced and fresh entrepreneurs to work on innovations.

Our offer includes competitions financed from various sources. First of all, these are European funds available under two important operational programs: the “Smart Growth” Operational Program (SG-OP) and the “Knowledge, Education, Development” Operational Program (KED-OP), in which the NCBR serves as the Intermediate Body. The implementation of the SG-OP and the KED-OP is coming to an end, in the financial perspective for 2021-2027, we have competitions from the European Funds for Modern Economy (EFME) and the European Funds for Social Development (EFSD). We also finance activities from domestic sources and as part of international competitions. Every year we provide our beneficiaries with an average of PLN 5 billion for their projects.

We support Polish entrepreneurs from various industries, regardless of the size of their organizations. An important place in our offer is held by programs aimed at strengthening cooperation between researchers and entrepreneurs and supporting scientific units in commercializing modern technologies, products and services. Cooperation of researchers with entrepreneurs in the implementation of R&D projects related to specific practical problems creates a unique opportunity to overcome barriers resulting from the diverse needs of these environments.

European Funds for a Modern Economy

EFME – the NCBR as the Intermediate Body in the new perspective 2021-2027

The "European Funds for Modern Economy 2021-2027" program is a continuation of two previous Operational Programs: "Innovative Economy 2007-2013" and "Smart Growth 2014-2020".

WE SET THE FOLLOWING GOALS FOR THE EFME PROGRAM:

- **increasing research and innovation potential and using advanced technologies**
- **strengthening competitiveness of small and medium-sized enterprises (SMEs)**
- **developing skills for smart specialization, industrial transformation and entrepreneurship**
- **transformation of the economy towards Industry 4.0 and green technologies**

The EFME program will support R&D and implementation of projects that are innovative and boosting competitiveness of the Polish economy. The program will benefit entrepreneurs, institutions from the science sector, consortiums of enterprises and business environment institutions, in particular innovation centers, among others.

European Funds for Social Development

EFSD – the NCBR as the Intermediate Body in the new perspective 2021-2027

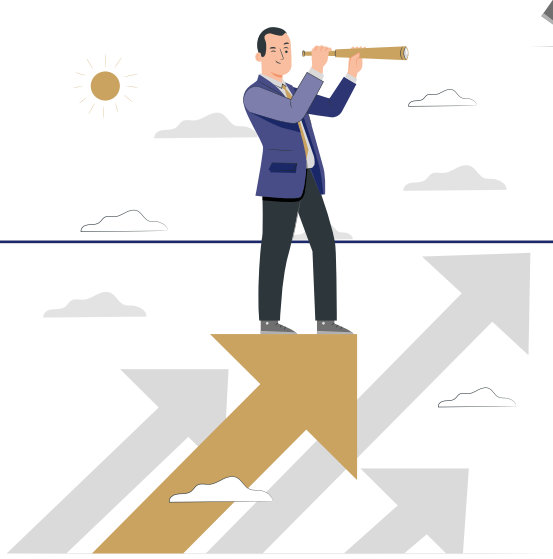
The "European Funds for Social Development 2021-2027" program is the successor to the "Knowledge, Education, Development" Operational Program (KED-OP), constituting the next stage in the further social and economic development of the country. The EFSD program will support the following activities:

- **improving the situation of people on the labor market**
- **increasing accessibility for persons with disabilities**
- **providing childcare**
- **improving quality of education and developing competences**
- **social integration, development of social services and social economy**
- **healthcare**

Together with the institutional development strategy adopted for 2021-2025, the NCBR is becoming a modern government agency. As an institution with a strong international position offering a wide range of forms of support, we focus on increasing operational effectiveness of our beneficiaries. We strive to assume the role of a key knowledge and competence center. All our activities are aimed at implementing government policies in the area of developing innovation and strengthening the Polish economy on the European and global markets as effectively as possible.

OUR MISSION

We create a world of innovation.
We are building a modern present and future.

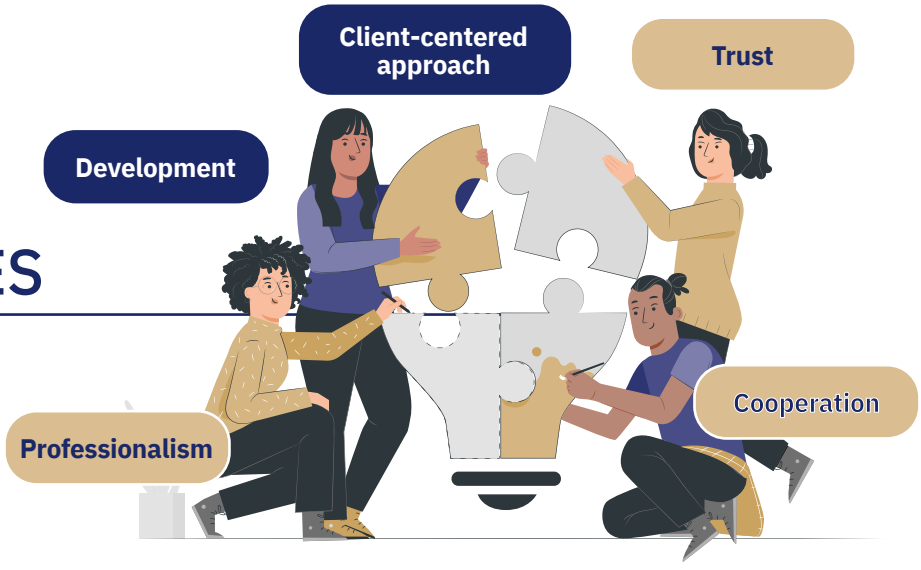


OUR VISION

The NCBR is a key center for supporting and creating innovative technological and social solutions. We develop an ecosystem of knowledge and information and initiate and implement projects contributing to civilizational development of the country.

OUR VALUES

Cooperation
Client-centered approach
Trust
Professionalism
Development



The future is happening with us!

15 years of building the strength of Polish innovations

From the very beginning in 2007 it was clear what, for whom, why and why we wanted to do. But how to translate this into everyday work? The NCBR team was tasked with preparing procedures, regulations and program assumptions. We launched our first competitions very quickly and already in the second year we took over a large number of activities related to Poland's participation in international research projects. Our employees prepared further programs, projects and competitions covering an increasing number of fields of science and economy and strengthening scientific and technical cooperation between Polish research units and enterprises.

We spread our wings in the breakthrough year 2011. A breakthrough one because it was then that the NCBR became the Intermediate Body in the expenditure of European funds for three Operational Programs: "Innovative Economy", "Human Capital" and "Infrastructure and Environment". We took on new tasks and organized a number of support initiatives for an increasingly wider group of addressees. Month by month, the NCBR was gaining momentum, expanding its offer to include further strategic programs, Polish-Norwegian Research Cooperation programs and joint ventures with business entities and institutions, among others. Another milestone was the creation of Bridge VC – the largest advanced technology fund in Poland.

The “Innovation Horizon” Conference. The NCBR’s 15th anniversary. Warsaw, October 27-28, 2022

The next years will be the next financial perspective of the European Union. In 2015 the NCBR launched the first competitions under the new Operational Programs for 2014-2020: “Smart Growth” and “Knowledge, Education, Development” including the “Fast Track”, which has become the largest program supporting the innovation of Polish enterprises. We also became a beneficiary of the “Digital Poland” Operational Program, launching an initiative to support talented programmers in solving social and economic problems.

Over 15 years we have donated over PLN 70 billion to support R&D in Polish enterprises, universities and research institutes, creating conditions for the implementation of valuable ideas by both experienced and start-up entrepreneurs and researchers. Most of these funds came from European funds.

By building bridges connecting the science and business sectors, more and more innovative solutions appear on the market. Not a day goes by without the media reporting on an invention that has or is being developed with help from the NCBR. It is also an impulse for further development of R&D activities, for example by creating specialized departments within companies.

Today the NCBR is a dynamic center for supporting and creating innovative technological and social solutions and developing an ecosystem of knowledge and information. We initiate and implement projects contributing to civilizational development of the country. Our ambition is to further stimulate cooperation between science and industry, activity of enterprises in industry organizations, various types of associations and clusters, as well as ensure more effective implementation of tasks serving the social and economic development of Poland and solving specific problems of its inhabitants.

NCBR IN NUMBERS

Activities in 2022

Announced competitions	**50**
Evaluated applications	**over 1600**
Amount of funds transferred	**PLN 6.5 billion**
Cumulative success rate	**30,5%**
Projects monitored during their lifetime	**2765**
Signed contracts	**284**
Monitored projects	**3965**

Budgets in 2012-2022

	PLN billions
2012	**4,6**
2013	**4,5**
2014	**5,1**
2015	**5,8**
2016	**3,1**
2017	**2,9**
2018	**3,5**
2019	**4,6**
2020	**5,5**
2021	**6,7**
2022	**7,8**

NCBR GROUP

The Group consists of the NCBR and its four subsidiaries: NCBR+ Sp. z o.o., NCBR's Investment Fund, IDEAS and Akces.

NCBR+	**NCBR+ Sp. z o.o. is a private company established in January 2018 to support the pursuit of the statutory objectives of the NCBR, the sole shareholder. NCBR+ provides professional administrative, HR, legal consulting, PR, IT, accounting, and controlling services. It also offers comprehensive support in the implementation of recruitment processes and supervision of projects financed and co-financed by the NCBR. It serves the NCBR and other members of the Group.**
NIF NCBR Investment Fund ASI	**The Fund is a co-investment venture capital fund owned by the NCBR. The Fund specializes in investments in the SME sector, in the growth or expansion phase, which commercialize results of their research, development and innovation (R&D&I) work. The Fund's annual investment budget is over PLN 100 million and the value of a single investment ranges from PLN 3 to 64 million.**
IDEAS NCBR	**IDEAS NCBR Sp. z o.o. is a R&D center whose mission is to support development in the area of artificial intelligence and digital economy in Poland. Its goal is to build the largest Polish platform connecting the academic and business communities and supporting innovative research. The company wants to educate a new generation of researchers focused on practical applications of developed solutions and their subsequent commercialization in industry, finance, medicine and other branches of the economy. An integral part of IDEAS NCBR's activities is cooperation with universities and scientific institutions. Its aim is to provide young researchers with attractive conditions for conducting research, organized in the form of scholarships and mentoring for the duration of projects.**
AKCES NCBR	**Akces NCBR Sp. z o.o., another member of the NCBR Group, was established in December 2021. This new company owned by the NCBR focuses on comprehensive acceleration of projects and on cooperation with business mentors. It also works to internationalize finished solutions and projects. By establishing this entity, the NCBR aimed to create conditions for incubation and acceleration of R&D projects in higher-risk areas. The company focuses on providing assistance in the implementation of R&D projects that include advanced technologies with a significant contribution of R&D. It finances preparations for the implementation of results of R&D work. The company will support commercialization of R&D results as well as development of scientific staff.**

SUBSTANTIVE ASSESSMENT PROCESS

Experts cooperating with the NCBR play an important role in the process of substantive assessment of projects submitted in calls announced by the NCBR. They carry out a number of tasks: from selecting a project to the handling of its financing and implementation. They participate in the substantive assessment of applications for funding, give opinions on reports submitted by beneficiaries and requests for changes at various stages of project implementation, or prepare other expert opinions and opinions for the NCBR.

Each project that successfully passes the verification of formal compliance is subject to substantive assessment. The evaluation is carried out in accordance with the criteria specified in the regulations of the respective competition. Projects are assessed by specialists in the fields of the projects. Experts are mostly selected from the NCBR Expert Database and, in the case of state security and defense programs, additionally appointed by the relevant ministries. They include renowned researchers, specialists in the fields of economy and finance, and employees of consulting institutions and venture capital funds. Some of them are foreign specialists who share their knowledge and international experience with the NCBR.

The project evaluation procedure depends on the type of project but usually consists of a written review stage and/or a panel evaluation stage during which a group of experts jointly evaluate the project during a meeting. Depending on the program, participants of the expert panel may meet with the applicant who can then present their project and answer questions or doubts from specialists. Other instruments also include a negotiation stage in which the final score of the project is determined.

In the case of written reviews, the principle of anonymity applies, i.e. the applicant does not know the identity of the experts assessing the application. Moreover, before receiving project documentation from the NCBR, each expert must declare nonexistence of a conflict of interest and sign the declaration which must be true under pain of criminal liability. Experts and employees of the NCBR undertake to keep confidential all information they obtain during the assessment and not to use it in any way unrelated to the assessment.

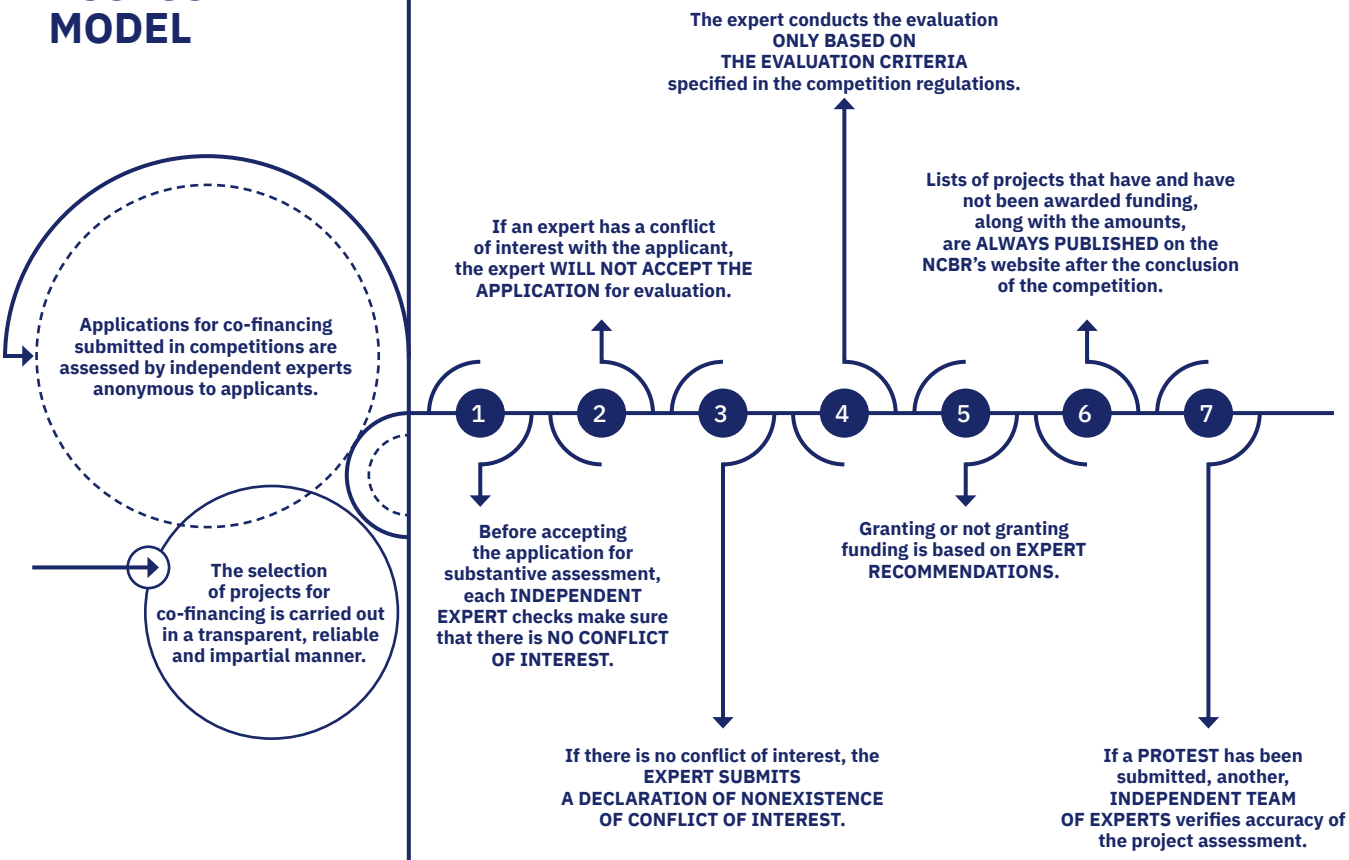
As a result of the assessment, the project may be accepted or rejected and the NCBR each time provides the applicant with information about granting or not granting funding. If the application is rejected, the applicant receives a justification and information on the possibility of filing a protest or appeal. The applicant participating in a competition has the right to access documents related to the evaluation of their application, while observing the principle of anonymity of the evaluators.

APPLICATION ASSESSMENT MODEL

Applications for co-financing submitted in competitions are assessed by independent experts anonymous to applicants.

The selection of projects for co-financing is carried out in a transparent, reliable and impartial manner.

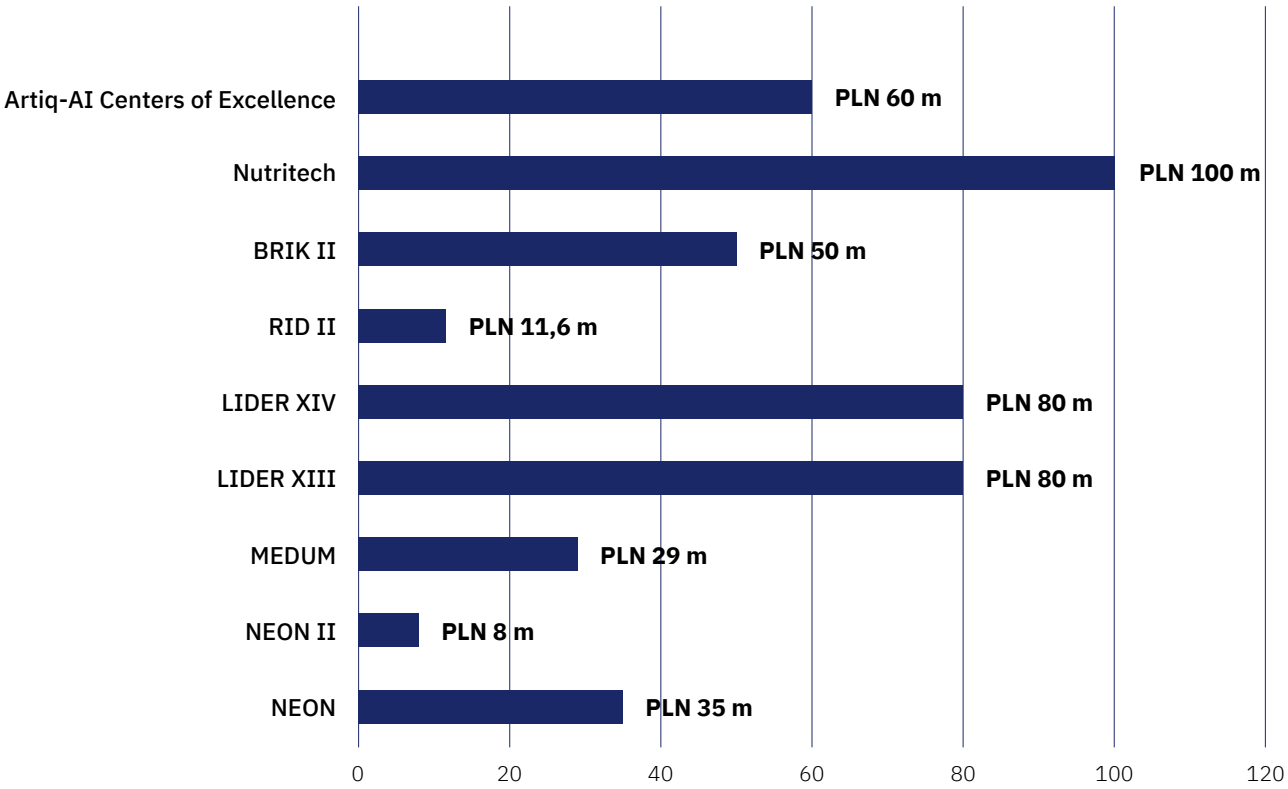
HOW DO EXPERTS ASSESS APPLICATIONS?



COMPETITIONS IN 2022

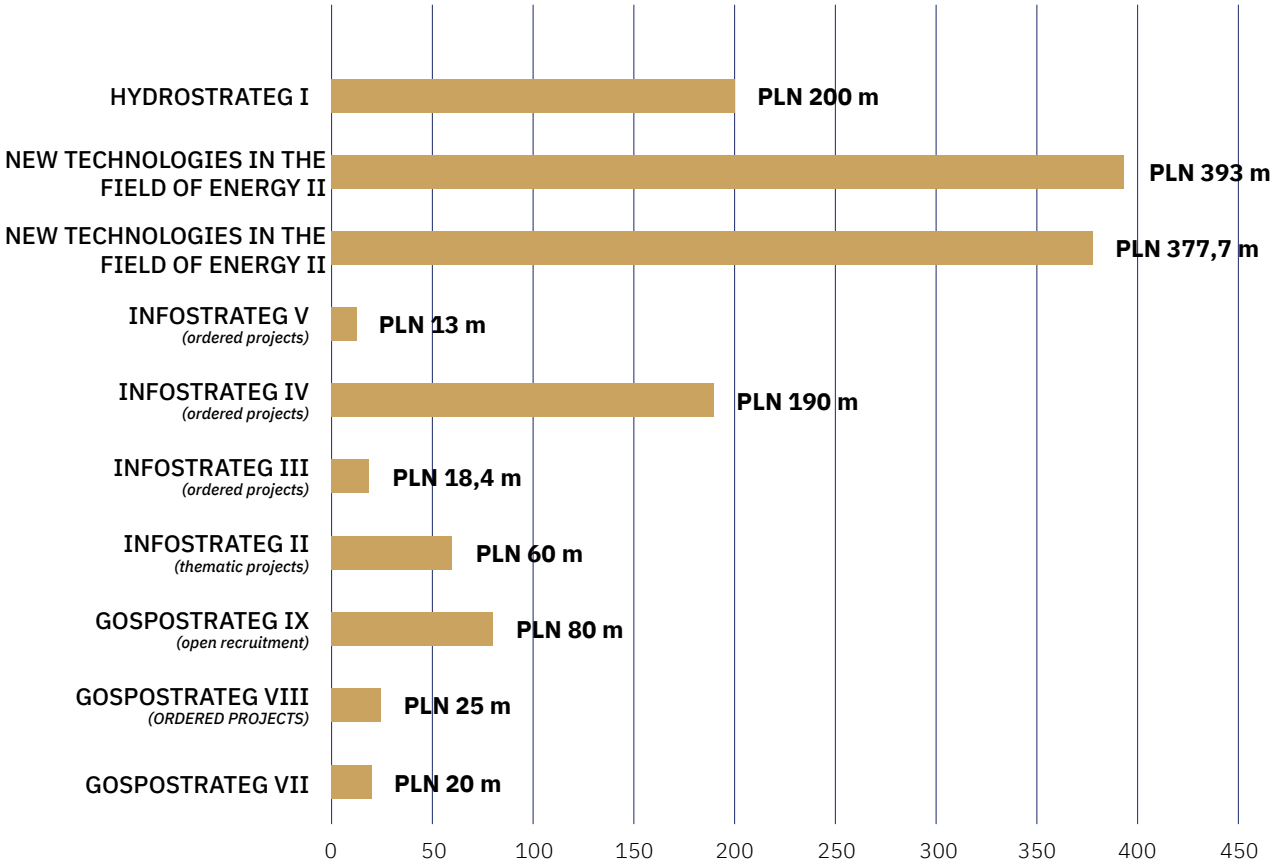
NATIONAL PROGRAMS

Competitions in 2022



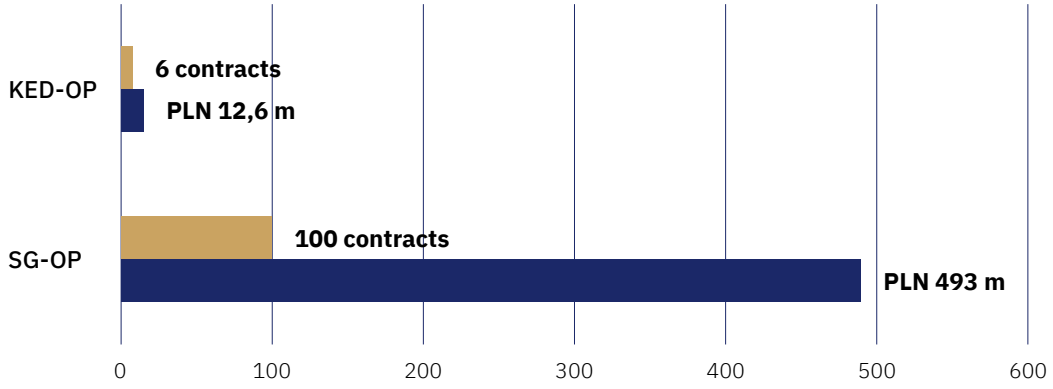
STRATEGIC PROGRAMS

Competitions in 2022



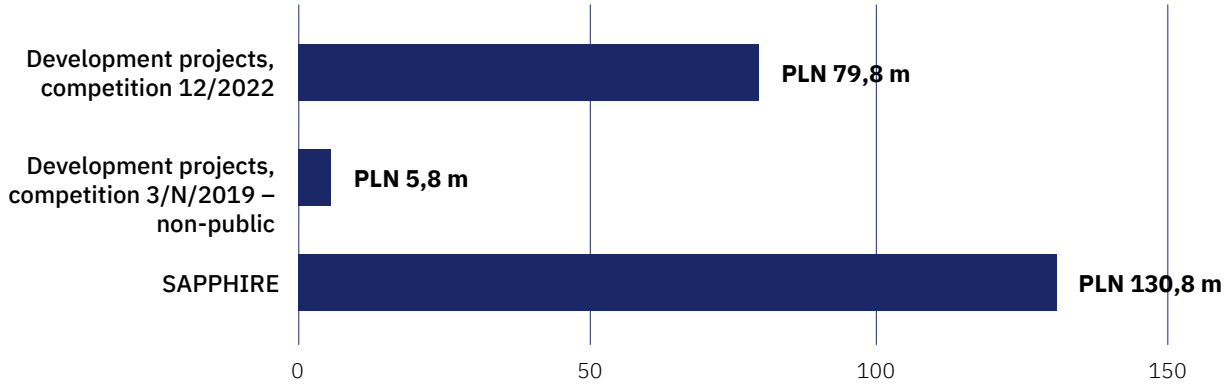
EUROPEAN FUNDS

Competitions in 2022



PROGRAMS FOR NATIONAL DEFENCE AND SECURITY

Value of contracts in 2022 (in PLN million)



INTERNATIONAL PROGRAMS

Value of contracts in 2022 (in PLN million)

HORIZON 2020 initiatives	**57 m**
Bilateral cooperation	**10,5 m**
Multilateral initiatives	**27,2 m**
EEA Financial Mechanism and Norwegian Financial Mechanism (Norwegian and EEA funds)	**4,7 m**
Horizon Europe Partnerships	**12,7 m**
Total	**112,1 m**

BENEFICIARIES

In this “Annual Report” we present selected successes of our beneficiaries who managed to complete projects financed by the NCBR. The NCBR is the Intermediate Body in two large Operational Programs: “Knowledge, Education, Development” (KED-OP) and “Smart Growth” (SG-OP). In addition, we implement a number of international initiatives, competitions for national defense and security, as well as competitions financed from domestic funds. Innovative products, technologies and services developed by the NCBR’s beneficiaries in completed projects enter the market every year thanks to support from the NCBR.

The national economy is strengthening its international position, competing not only on European but also global markets largely thanks to European funds. New technologies mean not only innovative solutions but also new jobs, a higher position of Poland on the international arena and an improvement in quality of life of each of us. Solutions developed by the NCBR’s beneficiaries are increasingly gaining recognition around the world and are used in the strongest global economies.

In this part of the report we present selected projects implemented by the NCBR’s beneficiaries – including those financed from European funds, under international programs, state defense and security programs and national programs.

EUROPEAN FUNDS

“SMART GROWTH” OPERATIONAL PROGRAM (SG-OP)

The “Smart Growth” Operational Program is the largest European Union’s program designed to finance research, development and innovation. Thanks to it, entrepreneurs and researchers obtain funding for joint R&D projects, among other things, and results of their R&D work find practical applications in the economy. From an idea to industry – this is the main assumption of this program. It means supporting the creation of innovations: from conceiving innovative products, services or technologies, through preparing prototypes and pilots, to their commercialization.

EMITTERS FOR OLED DISPLAYS

Project	NOCTILUCA
Beneficiary	Noctiluca S.A.
Competition	BRIdge Alfa – support for R&D projects in the pre-seed phase by proof of concept-type funds
Project value	PLN 1,105,111.00
Grant	PLN 840,000.00

NOCTILUCA designs and produces new 3- and 4-generation emitters for OLED displays, including those for TVs, monitors and smartphones. Emitters are chemical compounds in the form of powder that glows when activated by energy. This is a key part of every OLED display and determines its parameters such as color, contrast and lifetime. Noctiluca emitters are developed for both traditional OLED display production and for their printing. They allow for high brightness of screens produced using them. They are fully organic and do not contain rare earth or heavy metals, such as iridium or platinum, which are found in 2-generation emitters. Within a few years, they could replace the 1st and 2nd generation emitters because they are more environmentally friendly, less energy-intensive, cheaper to produce, and can last longer. Additionally, displays with such emitters do not experience the burn-in effect – the problem with OLED displays for computers is that static image causes many permanent GUI elements to “burn-in” (for example, toolbars, icons or the logo of a TV station). The commencement of the company’s operations was possible thanks to funds from the BRIdge Alfa program. Noctiluca SA is now listed on the NewConnect market of the Warsaw Stock Exchange and plans to move to the main market with a public offering in 2024.

- Chemists in a Noctiluca’s laboratory in Toruń

AVA PRO HOME ALARM SYSTEM

Project	An innovative alarm system enabling integration with smart home solutions and operation via mobile applications
Beneficiary	EBS Sp. z o.o.
Competition	Fast Track
Project value	PLN 14,346,515.88
Grant	PLN 8,095,190.49

The innovative AVA PRO home alarm system from EBS can be integrated with smart home solutions and operation via mobile applications. One of the goals of the project was to simplify and accelerate the alarm system installation process. A distinguishing feature of AVA PRO is contactless user identification, thanks to which you can easily arm and disarm the alarm without having to remember the code. Older people experience problems with arming and disarming alarm systems because entering a wrong code triggers the alarm, which is a stressful situation. The introduction of the AVA KEY solution for disarming the alarm system using a proximity key fob, without the need to enter the right code, is the answer to this problem. The AVA PRO system has a modular design, which makes it easier to adapt it to the needs of both individual users and companies. It facilitates remote configuration and diagnostics thanks to the EBS Config 2.0 application for installers, available in desktop and mobile versions. On the other side, the user has the EBS Security application which allows them to manage the system from anywhere in the world using a smartphone. The mobile application also has a panic button, which, when used, causes the security company to respond immediately in the event of a threat to life or health.

LARGE-FORMAT SINTERS

Project	Development of a new range of large-format ceramic tiles using the BIa-group gres technology, in accordance with the EN 14411 standard, with a unique decoration throughout the ceramic mass, similar to the design of natural materials such as stone or wood
Beneficiary	Ceramika Paradyż Sp. z o.o.
Competition	Fast Track
Project value	PLN 125,757,216.97
Grant	PLN 50,311,964.91

■ An example of interior design using large-format sinters

reach a size of 1,800 x 32,00 mm and a thickness of up to 30 mm. Their structure, quality, durability and other functional parameters are similar to those of natural materials, such as stone, but the product is free of their flaws. Problems such as susceptibility to scratching, staining or brittleness, as in the case of natural marble, or insufficient resistance to UV radiation and high temperatures, as in the case of conglomerates, have been eliminated. Large-format sinters can be used both indoors and outdoors – on stairs, walls, window sills, kitchen and bathroom countertops, as well as on entire facades including ventilated ones. An extremely important aspect is also the depletion of natural resources. Thanks to this project, it is possible to prepare products that can successfully replace real stone.

This renowned ceramics manufacturer has launched a new line for the production of tiles and large-format ceramic slabs using a globally innovative pressing technology with simultaneous “through and through” decoration. Thanks to this, Paradyż offers an unprecedented range of large-format ceramic tiles with decorative effects visible in the entire cross-section of the ceramic mass, also after the machining of edges. Slabs produced using this technology can

■ TPV3000 cutter and PCR3000 press as central elements of a line for the production of large-format slabs

"KNOWLEDGE, EDUCATION, DEVELOPMENT" OPERATIONAL PROGRAM (KED-OP)

The "Knowledge, Education, Development" Operational Program (KED-OP) aims to improve quality of public policies and activities for the labor market, education and the entire economy. Subsidies from the EU allow for the strengthening of tertiary education in aspects such as the need for development, promotion of social innovations and transnational co-operation. The KED-OP is implemented by the NCBR which acts as the Intermediate Body for Priority Axis "III. Tertiary education for the economy and development". The activities are addressed to universities and entities involved in tertiary education, students, postgraduates and university staff. The main beneficiaries are universities and other entities providing tertiary education, the minister responsible for it and the National Agency for Academic Exchange (NAWA).

IMPROVING QUALITY OF EDUCATION AND MANAGEMENT AT THE LEON KOŹMIŃSKI ACADEMY

Project	"Academy 360" – an integrated quality improvement system at the Academy
Beneficiary	Leon Koźmiński Academy
Competition	Integrated University Programs
Project value	PLN 11,851,315.29
Grant	PLN 11,494,590.66

The idea behind the project was the desire to improve quality of education and management at the Academy. It was a response to the needs of the socio-economic environment and to challenges posed by changes in several areas of the Academy's operation: the teaching, development of academic and administrative staff, development of students' careers and IT infrastructure. Three innovative fields of study were developed and launched as part of the project:

- Big Data Analysis
- Management & Artificial Intelligence in Digital Society
- Enterprise Development Management

A total of 137 students have graduated from the Academy. All the programs were implemented with involvement of institutional partners – leading companies from the IT and finance industries. 154 persons took part in the comprehensive teaching staff development program, and 190 people participated in the program addressed to administrative staff. The institution has also developed and implemented a new model of individual and group career counseling. The CAREER+ counseling model is built on a methodical, comprehensive approach to the process of supporting students in choosing a career path. 811 students took advantage of it during the project. The university enabled 290 people to complete paid internships. A CRM system built on the Salesforce platform was also implemented and became the central point of service for the Academy's students.

UNIVERSITY ACCESSIBLE TO PERSONS WITH DISABILITIES

Project	Banking University in Toruń – friendly to persons with disabilities
Beneficiary	Banking University in Toruń
Competition	Accessible University
Project value	PLN 974,537.87
Grant	PLN 945,297.86

The implementation of the project allowed for eliminating barriers, adapting separate areas and creating a comprehensive university accessible to persons with all types of disabilities. An elevator for wheelchair users was installed at the entrance to the university as part of the project. Evacuation chairs were purchased and multimedia magnifying monitors were installed in classrooms. Critical places are now marked with anti-slip contrast tape. All rooms and offices are marked with Braille signs, and lecture halls are equipped with tables for wheelchair users. The project has also resolved the problem of faculty libraries in Toruń and Bydgoszcz, which struggled with insufficient adaptation of reading rooms to the needs of persons with disabilities. Thanks to the funding, students and lecturers with disabilities who use both libraries have at their disposal computers with customized hardware – Braille displays, magnifying scanners and Da Vinci stationary scanners – as well as profiled chairs and adjustable desks. Numerous amenities make it easier for students with disabilities to find their way within the university walls and go through the educational process.

Evacuation chair

Office door with a Braille plate

Library equipment

PROGRAMS FOR NATIONAL SECURITY AND DEFENSE

The NCBR, in consultation with the Minister of National Defense and the Minister of Internal Affairs, implements projects related to research for security and defense. In competitions concerning specific research topics, projects are financed that have the greatest promise of actually increasing national security. The aim of the programs and projects is not only to increase the potential of Polish scientific and industrial entities, but also to strive for technological independence by creating Polish know-how of critical technologies in the field of national security and defense.

ERGONOMIC FIRE TRUCK

Project	Optimization of the arrangement of equipment on fire trucks to reduce the height of the vehicle
Beneficiary	Consortium: Jarosław Dąbrowski Military University of Technology, Szczęśniak Pojazdy Specjalne Sp. z o.o., Military Institute of Armor and Automotive Technology
Competition	The project is implemented for the defense and security of the state
Project value	PLN 4,102,253.00
Grant	PLN 3,335,165.00

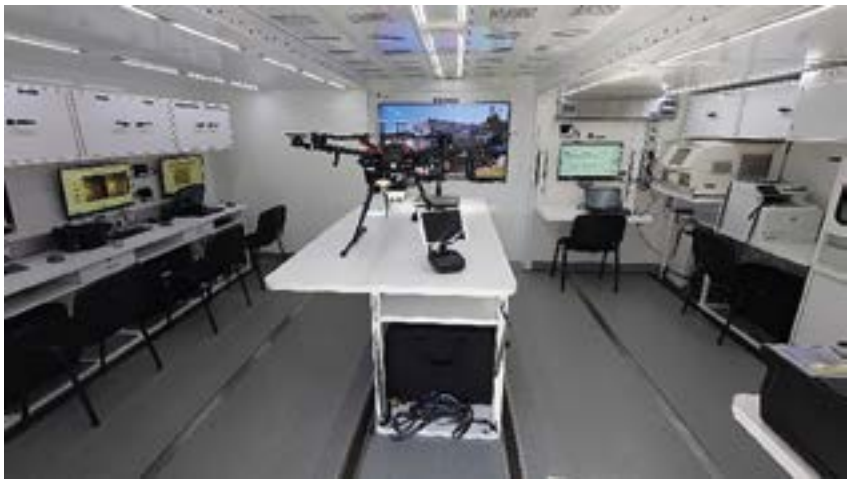
In recent years, the requirements for equipment used by fire protection units have been constantly increasing both in terms of safety of use and effectiveness of operation. Such equipment includes fire vehicles which are becoming increasingly safer thanks to technological development. The existing guidelines concern legal regulations and technical and operational aspects of vehicles and their equipment, which, however, do not sufficiently take into account the ergonomics of their use. The project responded to these needs. As a result, a prototype of a medium-sized rescue and fire-fighting vehicle was created, intended for use as the first one in the mission, equipped in accordance with the "Guidelines for the standardization of equipment for fire-fighting vehicles and other means of transport of the State Fire Service". This modern fire-fighting vehicle ensures greater ergonomics of use than other vehicles of this class commonly available on the market. The innovative nature of the solutions lies in optimizing the arrangement of equipment in the vehicle body to the extent that allows the vehicle's height to be reduced. Thanks to this, the ergonomics of using the vehicle while collecting equipment from its compartments by the rescuer were improved. In addition, the vehicle has a lower center of gravity, which improves its stability and controllability when cornering at high speed.

■ The prototype of a medium-sized rescue and fire-fighting vehicle on the Renault D16 4x4 chassis

MOBILE FORENSIC STATION

Project	A Mobile Forensic Platform for quick identification of persons at the scene of a mass incident – a terrorist attack or a disaster
Beneficiary	Chief Commander of the Police
Competition	The project is implemented for the defense and security of the state
Project value	PLN 10,562,371.00
Grant	PLN 10,562,371.00

The project is addressed to the Polish uniformed services including forensic technology units and forensic laboratories: the Police, Border Guard and Military Police. Until the project was implemented, they did not have a single all-in-one mobile investigation station for simultaneous examining a large crime scene, securing traces and then conducting on-site identification tests in key forensic specialties. These include DNA profiling, taking fingerprints, examining weapons, testing ballistics, tracing cell phones tests, monitoring analyzes and documenting the scene of the incident using a drone. As a result of the work, a prototype of a station ready for operations at the site of a mass incident, disaster or terrorist attack was created: the Mobile Forensic Platform. The project turned out to be a complex undertaking combining advanced integration of machines with specialized forensic equipment. The most serious challenge was designing and containing workstations for six experts (forensic technicians) and specialized research equipment they use in a small space, in a way that would enable comprehensive analysis.



The interior of the Mobile Forensic Platform ready for work

The Mobile Forensic Platform in transport

PORTABLE EXPLOSIVE DETECTOR

Project	Portable trace detector for triacetone triperoxide (TATP) and hexamethylene triperoxide diamine (HMTD)
Beneficiary	Consortium: Military Institute of Chemistry and Radiometry (leader), Military Institute of Armament Technology, KONWIT Paweł Witkowski
Competition	The project is implemented for the defense and security of the state
Project value	PLN 6,088,500.00
Grant	PLN 6,088,500.00

Detection of explosives is important for ensuring national security. A particular challenge is posed by home-made improvised explosives which are very difficult to detect. Such a group of explosives are peroxides which include triacetone triperoxide (TATP) and hexamethylene triperoxide diamine (HMTD). The main goal of the project was to build a light portable device for detecting trace amounts of TATP and HMTD without the need for direct detection, i.e. contact sampling of the tested material. Due to very high sensitivity of such materials to excitation, there is a high risk of initiating an explosive reaction. The innovation of the solution lies in the use of the differential ion mobility spectrometry (DMS). The advantages of the device include short analysis time – up to ten seconds, high sensitivity to explosive material vapors and simultaneous detection of TATP and HMTD. Potential users of the project result include the State Protection Service, the army, the Police and other entities responsible for public safety.

- Portable TATP and HMTD trace detector

SYSTEM FOR DETECTING TRACE QUANTITIES OF EXPLOSIVES

Project	Development of an innovative stationary system for detecting trace amounts of explosives
Beneficiary	Consortium: Military Institute of Chemistry and Radiometry (leader), Military Institute of Armament Technology, WIMECH s.c. Roland Ignatowski Anna Ignatowska, WSB Academy, Transfer Technologii Sp. z o.o.
Competition	The project is implemented for the defense and security of the state
Project value	PLN 6,382,350.00
Grant	PLN 6,382,350.00

Modern technologies enabling the detection of explosives are extremely important in counteracting or preventing terrorist attacks. The subject of the project was to develop an innovative stationary system for detecting trace amounts of explosive materials on people passing by near the device. The measurement at the gate is based on the principle of sampling air from the hands, pocket areas and shoes of the tested person. Two differential ion mobility spectrometers were used as detectors, operating in two different modes: one with a semi-permeable membrane for the detection of high vapor pressure explosives, the other without a membrane for the detection of low vapor pressure explosives. The main function of the innovative stationary system is quick (taking 5 seconds), precise and non-invasive detection of trace amounts of certain explosives. The project results can be used by entities responsible for national security, including the Border Guard, the State Protection Service and the Civil Aviation Office.

- Innovative stationary system (gate) for detecting trace amounts of explosives

INTERNATIONAL PROGRAMS

International cooperation, pursued thanks to various types of international projects, results directly from the provisions of the Act on the NCBR and is one of the tasks performed by the NCBR. As part of our cooperation, we undertake various types of competition initiatives with foreign partners from all over the world. Due to the type, they can be divided into initiatives such as ERA-NET (partnerships under the EU's framework programs), other multilateral initiatives, bilateral cooperation and programs financed by the Norwegian Funds and EEA funds. Of particular value is the implementation element required in some programs, aimed at practical application of results of successfully completed projects.

HyBiCo HYBRID COMPOSITES

Project	High-strength hybrid composites for injection molding reinforced with fibers from natural materials (HyBiCo)
Beneficiary	West Pomeranian University of Technology in Szczecin (coordinator), EKOTEX Sp. z o.o., DTJ Sp. z o.o., GAMAPLAST K.J. Gamalczyk i wspólnicy Sp.k., Riga Technical University, Kaunas University of Technology
Competition	M-ERA.NET Joint Call 2016
Project value	EUR 545,000
Grant	EUR 523,000

The aim of the project was to develop new hybrid composites produced by injection technology, reinforced with short fibers derived from natural materials. The technology responds to the need for lightweight high-strength construction materials. Two types of composites have been developed. The first, a polypropylene composite, uses hybrid reinforcement in the form of regenerated cellulose fibers and lignocellulosic microfibers – wood flour and microfibers obtained from grain husks. This reduced the material cost and increased the share of the natural reinforcement. The problem of brittleness typical of composites reinforced with wood flour (wood-plastic composite, WPC) was also eliminated. The other composite is polypropylene reinforced with PET polyester fibers, and it is possible to use recycled r-PET and bio-PET. These materials can be easily implemented into production in any injection molding plant, which was confirmed by a demonstration at Gamaplast. They are intended for companies looking for new materials for their products, including those of biological origin. The use of regenerated cellulose fibers, lignocellulosic microfibers and PET fibers instead of glass fibers facilitates the disposal of composites through energy recycling.

UNDERWATER VEHICLE WITH BIONIC DRIVE

Project	New observation tools for remote monitoring of the marine environment and their application in submarine groundwater discharge (SGD) and seabed research
Beneficiary	NOA Sp. z o.o.
Competition	BONUS call 2015: Blue Baltic
Project value	PLN 3,112,475.28
Grant	PLN 1,039,606.84

NOA develops innovative technologies for the maritime industry regarding underwater vehicles inspired by biomimetics. The scope of the project implemented by NOA is consistent with the thematic objective 5.2 of the Research Agenda of the BONUS program – "Development and verification of modern, remote techniques for conducting research in the Baltic Sea area". The SEAMOUNT project was conceived in response to the increasing eutrophication of the Baltic Sea waters, which means an abundance of nutrients. It causes adverse physical, chemical and biological changes and disturbs the ecological balance of the ecosystem. The project focuses on examining the impact of submarine groundwater discharge (SGD) into the sea. The main goal of the project was to develop a modern solution enabling remote research of the Baltic Sea ecosystem. The project was implemented by a consortium of seven entities from four countries of the Baltic Sea region. The technology developed by the project is unique. The vehicle does not get entangled in vegetation and avoids other underwater obstacles. It operates very quietly, making it safe for aquatic animals. The patented NOADRIVE bionic drive ensures high efficiency, power and maneuverability as well as long battery recharging intervals. The large payload (up to 100 kg) allows installation of a larger number of sensors and devices for a single mission. The vehicle's inertia has been reduced to a minimum: even with the maximum load, it stops from walking speed to zero in a distance of less than one meter, which significantly increases mission safety. The vector ballast system allows the vehicle to stay on the bottom for a long time and glide over long distances even with a heavy load.

■ Course stability tests in the Bay of Gdańsk at a depth of 20 m

NATIONAL PROGRAMS

The aim of national initiatives is to support development of modern solutions and technologies that increase innovation and thus competitiveness of the Polish economy. Their goal is also to strengthen cooperation between Polish business and science. We pursue these goals by developing programs to support applied research and R&D work, financing commercialization of scientific research results and transfer of results to the economy, and supporting development of scientific staff. We also carry out work related to monitoring projects commissioned by the Ministry of National Education and Science. As part of national programs, projects are also implemented in cooperation with an external entity that is obliged to contribute to the financing.

LIGHT RAIL BUS "PLUS"

Project	Light rail bus for regional traffic
Beneficiary	Consortium: Łukasiewicz Research Network – Rail Vehicles Institute "TABOR" (leader), H. Cegielski – Fabryka Pojazdów Szynowych Sp. z o.o.
Competition	Applied Research Program
Project value	PLN 23,074,750.00
Grant	PLN 6,600,000.00

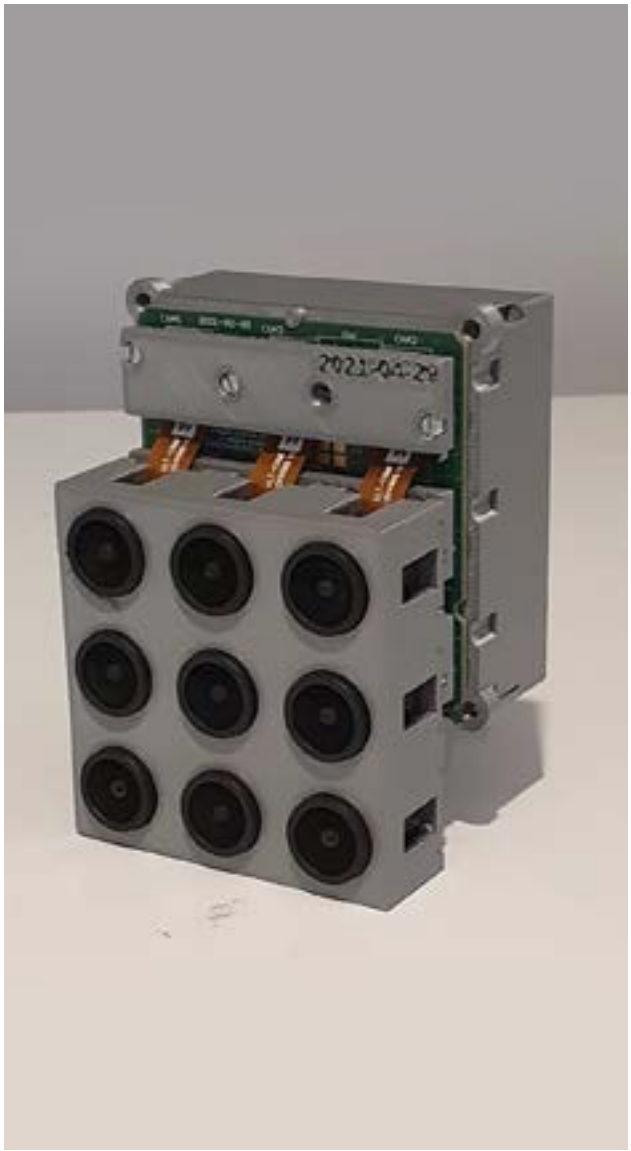
As a result of the project, a rail bus demonstrator called "PLUS" was designed, adapted for operation on electrified and non-electrified lines – without the need to change trains. The two-unit, diesel-electric vehicle is powered by the overhead line (3 kV DC) and power packs with combustion engines that meet the requirements of the latest Stage V exhaust gas emission standard. The modular structure of the vehicle allows it to be adapted to the needs of various carriers (number of doors, seats, toilets, etc.). The design of the vehicle allows for the use of innovative power sources in the future – batteries, storage cells or hydrogen cells. The rail bus can be conveniently used by persons with disabilities and lovers of eco-friendly bicycles. Reduced exhaust gas emissions contribute to environmental protection, as well as the health of passengers at railway stations and city residents. The Rail Vehicles Institute "TABOR" expanded its competences by participating in the innovative project and commercialized the result by licensing the solution. H. Cegielski FPS Sp. z o.o. acquired know-how and expanded its market offer. The solutions developed as part of the project were also the subject of two doctoral theses.

- Light rail bus for regional traffic – demonstrator of the new "PLUS" rail vehicle platform

“MUCHA” SPATIAL IMAGE RECORDING AND PROCESSING SYSTEM

Project	MUCHA – spatial image recording and processing system
Beneficiary	Poznań University of Technology
Competition	LIDER VIII
Project value	PLN 1,196,912.50
Grant	PLN 1,196,912.50

The technology for building modular light field cameras allows for recording the surrounding world with unprecedented precision. The light field camera allows not only to record colors of incoming light but also precisely measure the direction from which a given ray reached it. Thanks to this, the device allows for spatial reconstruction of the observed world in the form of high-quality moving 3D models – all at a speed of up to thirty 3D models per second. Thanks to its modular design, the technology enables the recording of both very small objects and entire outdoor sceneries. The design uses only commonly available parts, which significantly reduces the cost of implementing the camera. The technology includes not only the camera but also a package of specialized software for processing and displaying spatial data. The project results will primarily benefit the virtual reality (VR) industry where there is a need to record high-quality moving 3D models. The camera can also be used in robotics and on production lines where precise 3D measurements are crucial for correct operation of entire systems. Thanks to specialized software and a unique design, the solution can compete with active systems such as lasers but it is devoid of the disadvantages of active technologies, such as low RAM speed or the dazzling of other sensors.

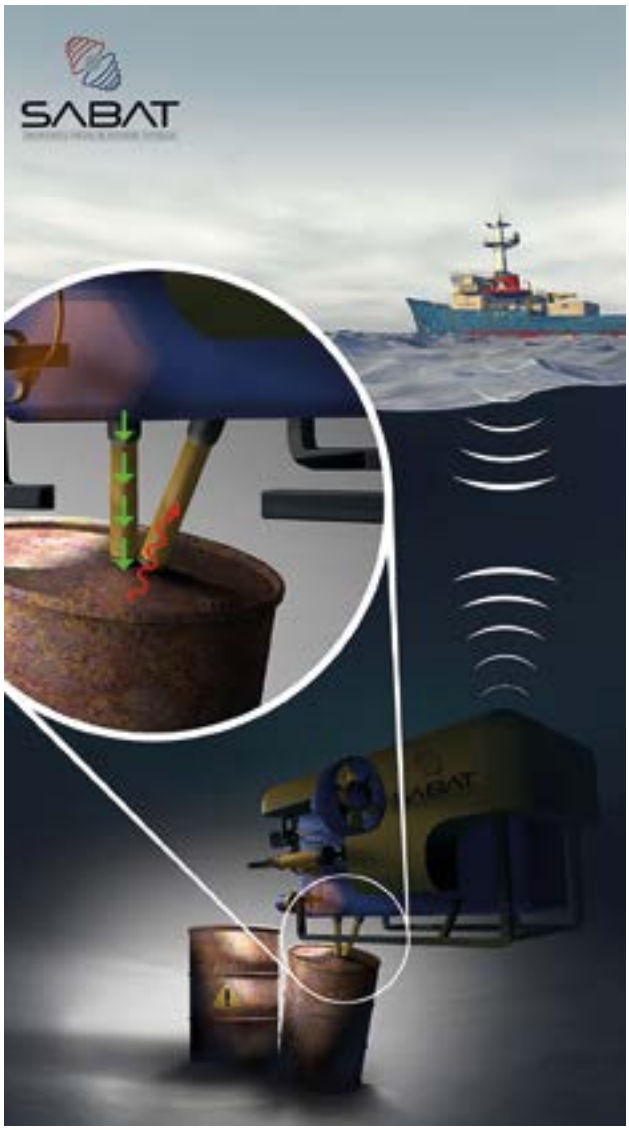


- “MUCHA” – spatial image recording and processing system

"SABAT" DEVICE FOR NON-INVASIVE DETECTION OF HAZARDOUS SUBSTANCES IN AQUATIC ENVIRONMENT

Project	Construction of a prototype of a mobile device for non-invasive detection of hazardous substances in aquatic environment
Beneficiary	Jagiellonian University
Competition	LIDER VII
Project value	PLN 1,200,000.00
Grant	PLN 1,200,000.00

The subject of the project is a device for non-invasive detection of hazardous substances in aquatic environment, such as unexploded ordnance, mines or combat gases, using neutron beams. The project is addressed primarily to companies and institutions involved in demining and searching for dangerous substances at the sea bottom. The devices can also be used by the Navy and for port security. Currently there are no solutions enabling effective monitoring of threats at sea resulting from the remnants of war. Magnetometers and sonars are commonly used, which methods can only detect shapes and densities of objects under the water surface. However, assessing the level of threat requires collecting samples or inspecting objects by qualified divers at the risk of their lives. It is also very expensive, especially in the Baltic Sea, where several thousand tons of chemicals such as sarin, soman, yperite and explosives were dumped after World War II. This poses a threat to the navy and civilian population and is a serious ecological problem that can only be solved if we know the actual quantity and distribution of these remains. A possible solution is neutron activation techniques based on the interaction of fast neutrons with the tested object, which causes its excitation. This causes the emission of gamma radiation (high-energy light), which is recorded by the detector. The energy and intensity of this radiation are the "fingerprint" of each element and allow the substance to be identified without opening the object containing it. This technology allows for cheap, safe and quick detection of hazardous substances and for detailed determination of the location and size of the arsenal sunk in the Baltic Sea.



■ "SABAT" device (Stoichiometry Analysis by Activation Techniques)

STRATEGIC PROGRAMS

Strategic R&D programs are high-budget undertakings resulting from the government's scientific and innovation policies serving social and economic development of Poland. The basis for their preparation is the National Research Program launched by the resolution of the Council of Ministers of August 16, 2011, which defines the strategic directions for conducting R&D work. Based on the directions set out in the document, the NCBR's council prepares draft strategic programs and then submits them for approval to the minister responsible for science.

The strategic program consists of projects aimed at solving specific technical, scientific or social problems. Competitions under the project are top-down, which means that applicants should fully take into account the requirements specified in the call. The implementation of strategic programs contributes to consolidation of the best research teams and integration of scientific and economic communities around issues that are crucial for the country's development.

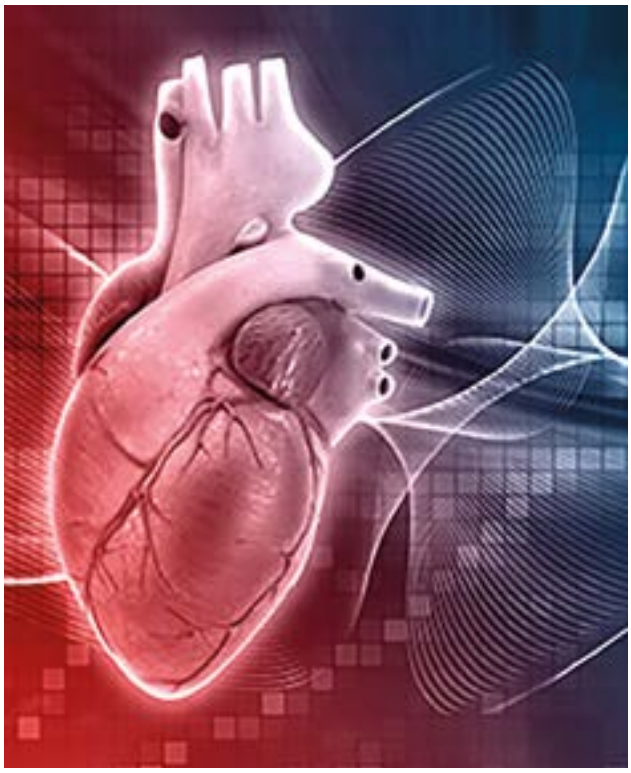
SELECTED PROJECTS UNDER THE PROGRAM IN 2022:

HEART HEALTH SUPPORT

Project N°	STRATEGMED2/266798/15/NCBR/2015
Project title	Introduction to clinical practice of the original Polish implantable centrifugal heart support pump and the system for remote monitoring and remotely supervised rehabilitation of patients on heart support (RH ROT)
Entity name	Prof. Zbigniew Religa Foundation for Development of Cardiac Surgery
Grant	PLN 26,019,015.76

Project goal

The aim of the project is to make progress in the use of mechanical heart support in the treatment of heart failure in Poland. This will be achieved through development and implementation into clinical practice of innovative technology for long-term heart support using implantable centrifugal pumps and advanced medical methods that improve safety and effectiveness of long-term cardiac support. The project includes the introduction into pilot production and clinical practice of the innovative centrifugal pump for long-term heart support – the original Polish ReligaHeart ROT system (including the production of a prototype batch and preclinical and clinical tests of the system); development and implementation into clinical practice of a nationwide system for remote monitoring of patients supported by implantable centrifugal pumps (LVAD type) staying outside the hospital (for various heart support devices currently available); and development and implementation into clinical practice of a new model of comprehensive cardiac rehabilitation for patients supported by implantable centrifugal pumps (LVAD type).



NEW ECO-ENERGY TECHNOLOGIES

Project N°	BIOSTRATEG3/344128/12/NCBR/2017
Project title	New eco-energy technologies for sustainable development of rural areas and low-emission agricultural production
Entity name	Institute of Fluid-Flow Machinery of the Polish Academy of Sciences
Grant	PLN 17,132,521.00

Project goal

The project aims to develop technologies for using natural resources to produce electricity and heat in agricultural and forest areas. As part of the project, eco-energy technologies will be developed, which will contribute to sustainable development of rural areas and will enable popularization of low-emission agricultural production. The research tasks of the project were planned in such a way that they would enable the achievement of the program objectives.

MATERIAL FOR TISSUE RECONSTRUCTION

Project N°	TECHMATSTRATEG2/406384/7/NCBR/2019
Project title	Multifunctional composite material with antimicrobial and pro-regenerative properties for the reconstruction of bone tissue
Entity name	Łukasiewicz Research Network – Institute of Ceramics and Construction Materials
Grant	PLN 6,884,252.00

Project goal

The aim is to develop and produce a bioactive material for filling bone defects, providing a matrix for cells and at the same time supporting regeneration of damaged tissue. The use of this biomaterial will significantly speed up the treatment process and eliminate a number of postoperative complications.

FIGHTING THE DEMOGRAPHIC TRAP

Project N°	GOSPOSTRATEG1/381773/17/NCBR/2018
Project title	Care farms for development of rural areas in the face of demographic challenges
Entity name	Ministry of Agriculture and Rural Development
Grant	PLN 4,095,742.00

Project goal

The aim of the project is to develop a model (standard) of a care farm and prepare a system for its implementation. These activities are a response to the problems that make the demographic trap, diagnosed in the Strategy for Responsible Development. The proposed project will also contribute to elimination of other significant development barriers for Poland, such as inequalities between cities and rural areas in access to social services, problems with the organization of public services at the local level, low quality of social capital and social inequalities, as well as insufficient coordination of public policies.

PUBLICATIONS

In 2022, we continued the "Landscape of Innovation" publishing series in which we share with the market our professional and unique knowledge supported by many years of experience. In our publications we cover various topics related to R&D, largely related to implementation of programs financed from European funds. On the occasion of the 15th anniversary of the NCBR, we have published a special issue.

The R&D&I support system in Poland in the context of implementation of selected programs of the NCBR

The publication summarizes results of a study in which effects of the NCBR's intervention – nine programs launched by the NCBR in 2012-2013 – were presented in the context of the support system and the R&D&I process, including financing from European funds. The study showed that the use of public funds by beneficiaries within a single R&D&I project is rare in the structure based on the breakup of support resulting from the financing of successive project phases by different institutions. Barriers related to the transition between the financing of applied research and implementation / commercialization will be partially removed in the new financial perspective 2021-2027, financed from European funds, thanks to the possibility of financing all stages of a single project by one institution.

The digital future is happening with us

We present in the publication the landscape of Polish innovations in the area of digital technologies. The analysis contained in "The digital future is happening with us" was prepared in connection with the international UN Digital Summit – the Internet Governance Forum held in Katowice in 2021 – and clearly indicates that Poland has a potential to become one of the digitalization leaders in Europe. In addition to a number of interesting data, the publication also contains comments from experts: representatives of business (Google, Microsoft) and science (Łukasiewicz Research Network), foundations ("The Future Industry's Platform" Foundation) and institutions creating the innovation support ecosystem in Poland (NCBR Investment Fund ASI, the Polish Agency for Industrial Development).

Venture capital. A guide to the most important issues in the context of supporting innovation.

We describe in the publication, among other things, what venture capital is, how VC funds operate, the track record of VC in Poland and how its development is supported. This is another the NCBR proposal in which we share knowledge based on case studies resulting from our experience gained over many years. We provide the reader with knowledge about support and valuable projects with a market potential for implementation with help from venture capital. We describe the importance of venture capital for the economy and its innovativeness. We based the presented case studies on conclusions from research on the NCBR's programs conducted in 2016-2022 and on a summary prepared on their basis – the so-called "meta-evaluation".

The horizon of innovation. The 15th anniversary of the NCBR.

The publication shows achievements of our beneficiaries who received funds – also European – for implementing innovative R&D projects. We showcase on examples of selected results of work of the NCBR's beneficiaries a panorama of what innovators do for our health, environment, accessibility, transport, digitalization, education, industry, defense and security. This is just a small sample of the broad range of innovations created by our beneficiaries. This album is also a word of thanks to everyone who took the risk and effort to innovate with support from the NCBR, thus strengthening the country's economic potential.

THE “GREEN” NCBR

The NCBR is strongly involved in activities aimed at counteracting the climate change and environmental degradation. Our competition offer is consistent with the guidelines of the European Union for 2021-2027, aimed at transforming it into a modern, resource-efficient and competitive global economy. Actions under the European Green Deal focus on eight main areas.[1].

The benefits that solutions will bring to people, including future generations, as a result of the European Green Deal[2]:

[1] Source: European Commission

[2] Source: European Commission

GREEN DEAL PROJECTS

Project name	Signed contracts	Demonstrators	R&D budget in PLN million
Innovative biogas plant	3	1	49,5
The sewage treatment plant of the future	3	1	33,8
Energy and process efficient construction	9	3	54,0
The heating plant of the future, i.e. a heating system with RES	7	1	52,8
Heat and power plant in the local energy system	10	1	59,0
Ventilation for schools and homes	7	4	11,9
Home retention technologies	4	4	9,6
Electricity storage	5	2	14,5
Heat and cold storage	9	5	15,9
Modern methods of hydrogen storage			21,5
e-Van venture			51,8
Total	**57**	**22**	**374,3**

I. INNOVATIVE BIOGAS PLANT

Total budget of the project: PLN 49.5 million gross

As part of the "Innovative Biogas Plant" project, a technology for odorless production of organic fertilizers and biomethane from various waste from the agri-food sector is being developed. This technology will be energy self-sufficient and will close the loop of circulation of nutrients in the environment. The elimination of odors will solve the problem of public protests caused by such noxious emissions and the production of gas fuel (biomethane) will be very efficient. The gas can be introduced into local distribution networks or compressed and then used in transport.

Biomethane – purified biogas refined to the quality of natural gas

As a result of the work, a technology demonstrator will be created: a full-scale plant with a power equivalent to 499 kW, built on the property of the University of Life Sciences in Poznań, the strategic partner of the project. The performance of the demonstrator will be tested under real operating conditions.

Microbiogas plant of the Barczewo Energy Institute, the winners of stage I

View of the micro biogas plants implemented in stage I

II. WASTEWATER TREATMENT PLANT OF THE FUTURE

Total budget of the project: PLN 33.8 million gross

The project focuses on a new look at the municipal sewage stream as a resource of water, energy and materials for recycling. At the same time, the system will meet the basic requirements for sewage treatment plants, such as guaranteed sanitary safety and optimized operating costs. The "wastewater treatment plant of the future" is an innovative and completely waste-free technology for wastewater management. It enables wastewater treatment (water renewal and recovery), as well as reducing the loss of biogenic elements and contamination of aquatic environment (through nutrient recovery).

Biogenic elements – those that play a key role in bodies of living organisms

The new technology will also allow for the removal of micropollutants from sewage (pharmaceuticals, pesticides, microplastics, heavy metals) and for effective management of the resulting sewage sludge. Digestate, i.e. the residue from biogas production, will be processed into organic fertilizer or soil improver. The creation of this new technology will allow us to radically reduce production of mineral fertilizers and save huge amounts of energy consumed by this process.

ZEWERO plant (gasification of sewage sludge)

ZEWERO installation (gasification of sewage sludge) – gas-fueled power generator

III. ENERGY - AND PROCESS - EFFECTIVE CONSTRUCTION

Total budget of the project: PLN 54 million gross

The subject of the project is the development of new technologies for the construction of modular single- and multi-family buildings intended for young families and seniors. The project is implemented in three "streams": social, senior and single-family.

The future buildings will be constructed largely from recycled materials in order to reduce carbon dioxide emissions as much as possible. The implementation of the project will reduce the carbon footprint throughout entire life cycles of buildings. The development of this energy-efficient modular prefabricate technology will allow for reduction of construction and operating costs and faster commissioning of buildings. A fully finished building, even factory-equipped with household appliances, will be built within a few months (from modules).

Carbon footprint – the total amount of greenhouse gases emitted directly or indirectly by an individual, organization, event or product

View of a single-family building

Visualization of the interior of an apartment in a seniors' building

These homes will produce more energy than their inhabitants consume, also for heating, cooling, hot water and electric appliances. The use of the building will be almost cost-free due to its energy self-sufficiency and smart water management.

This type of construction is also a huge development opportunity for Poland. Buildings totally green, energy-saving, well-managed (thanks to the storage of electricity, heat and cold), quick to construct and cheap to maintain is an opportunity to support young families and, above all, seniors.

View of a social building

IV. THE HEATING PLANT OF THE FUTURE WITH RES

Total budget of the project: PLN 52.85 million gross

The main goal of the project "Heating plant of the future with RES" is to convert existing heating plants operating on fossil fuels to 100% renewable energy sources (RES) without biomass combustion. The system developed as part of the project will be characterized by efficiency and repeatability of the conversion process with extensive use of RES.

Biomass – biodegradable products, parts of products, waste and residues of biological origin

Another desired benefit resulting from the proposed solutions will be the ability to add a new feature of cost-effectiveness to existing conventional heating systems that currently burn fossil fuels (sometimes with co-combustion of biomass). The new system will operate using local renewable energy sources and heat storage facilities.

Seasonal heat storage filled with water before closing the top cover

Photovoltaic farm powering a heating plant

V. HEAT AND POWER PLANT IN THE LOCAL ENERGY SYSTEM

Total budget of the project: PLN 59 million gross

The aim of the project is to convert existing combined heat and power plants operating on fossil fuels to 100% renewable energy sources (RES) without biomass combustion. The key element of the technology being developed will be a cogeneration system using energy stored in the form of biofuel, for

Fermentator budowany na potrzeby elektrociepłowni OZE

example biogas or biohydrogen. The innovative idea of cogeneration is based on the principle that electric power is generated when it is needed (i.e. when the supply of solar and wind energy is insufficient). Heat, on the other hand, is a "byproduct" which is stored for the time when it will be needed.

RES – renewable energy sources

The system will be used to stabilize and self-balance local power systems and convert them for the use of renewable energy sources. The project will create innovative solutions for modernization of heating systems based on fossil fuels. The system solutions will additionally enable stabilization of local energy markets.

Cogeneration engine powered by biogas and biomethane running at peak demand

VI. VENTILATION FOR SCHOOLS AND HOMES

Total budget of the project: PLN 11.9 million gross

The main goal of the "Ventilation for schools and homes" project is to develop innovative cost-effective mechanical ventilation systems with controlled supply air temperature, without energy loss. The project deliverables are intended for existing classrooms and apartments.

The new technology is also supposed to solve the problem of poor air quality in schools and multi-family buildings. This will be done by reducing the concentration of carbon dioxide and microbiological pollutants, as well as filtering PM2.5 and PM10 dust particles, while reducing the energy demand for heating.

PM2.5 – dust particles with diameters up to 2.5 micrometers

PM10 – dust particles with diameters up to 10 micrometers

Additionally, the systems will support programs for thermal modernization of building, ensuring that heat will not escape through ventilation. The technologies being developed will have a huge impact on human health, and will also help prevent the spread of pathogenic microorganisms and improve efficiency of mental work.

Demonstrator of the ventilation system for schools and homes

Room controller designed for classrooms and ancillary premises

VII. HOME RETENTION TECHNOLOGIES

Total budget of the project: PLN 9.6 million gross

The planned result of R&D work in the "Home retention technologies" project is an innovative system for storing and purifying rainwater. This system will minimize water uptake from mains (replacing it with rainwater) and the amount of sewage ending in the sewage system. Properly treated sewage will be used to water gardens or drained into infiltration boxes.

The system will contribute to rational and economical management of groundwater, maximizing the use of rainwater for the needs of households and schools. The systems will allow a home or school to become self-sufficient in water management because all rainwater collected during the year will cover 100% of the residents' needs. Moreover, the new technology will help counteract the effects of floods and adapt home infrastructure to the effects of the climate change, such as droughts and heavy rains.

Torrential rain – also known as "cloudburst"

■ Assembly of a rainwater retention and purification system for a single-family building in Bieruń by contractor AquaSmart from Krakow

VIII. ELECTRIC ENERGY STORAGE

Total budget of the project: PLN 14.5 million gross

The subject of the project is the development of an innovative galvanic cell technology (the "Battery" stream) and an electrical energy storage system for home and industrial applications (the "System" stream) based on materials available in Poland. As part of the project, a comprehensive product will be created: a chemical storage with all controls and electrotechnical components necessary for connection to the power grid.

The technology will solve the problem of significant demand for electricity storage for home and industrial applications, which is a consequence of the instability of supply from renewable sources (RES). In addition to supplying energy to the house, the technology can also be used to charge a car, for example.

The storage cells will be highly recyclable and ensure high energy density and cell life, and their production will be based as much as possible on materials of domestic origin.

■ Central device prototype (inverter)

■ Tests of prototype galvanic cells

IX. HEAT AND COLD STORAGE

Total budget of the project: PLN 15.9 million gross

The "Heat and cold storage" project aims to develop technologies for maintaining thermal comfort in homes (stream 1 – "Single-Family House") and offices (stream 2 – "Office Building"). The solution is to be based on heat pumps and heat and cold storage in seasonal and short-term cycles, i.e. daily or weekly. The seasonal variant is intended to allow for the accumulation of heat in summer and its distribution in winter, or the storage of cold when it is cold and its use in summer. The technology being developed will allow heat pumps to operate when electricity is cheapest and produce heat for storage. This technology will be emission-free. Moreover, it will reduce costs of heating and cooling homes and offices.

According to experts, thermal comfort in summer means 24-28 °C and in winter 20-23 °C.

Phase-changing heat and cold storage facilities

Equipped system buffer

X. HYDROGEN STORAGE

Total budget of the project: PLN 21.5 million gross

The aim of the project is to develop a hydrogen storage technology to power fuel cells and demonstrate its operation in a hydrogen-powered passenger car. Stored hydrogen can be used to refill fuel cells that generate electric power in an environmentally safe manner.

Hydrogen tank connected to a passenger car (Toyota Mirai) during a test

Hydrogen tank installed in a delivery vehicle

XI. E-VAN – VERSATILE DELIVERY VEHICLE WITH CATEGORY N1 ELECTRIC DRIVE

Total budget of the project: PLN 51.8 million gross

The e-Van project is to lead to the creation of an electric delivery vehicle weighing up to 3.5 tons, featuring yet unseen performance: a load capacity of 1000 kg and a minimum range of 250 km. This project is intended to be a stimulus for Polish manufacturers of e-vehicles and components for the electromobility sector.

Electromobility – the body of issues related to the application and use of electric vehicles

As part of the e-Van project, the NCBR plans to intensify development of technologies in the Polish automotive sector and solutions used in delivery vehicles by financing R&D under the pre-commercial procurement (PCP) procedure.

In addition to the use of innovative alternative energy sources, the resulting vehicle will be distinguished by high reliability and durability, functional and ergonomic interior and modern appearance, among others. Moreover, it will be based on a versatile chassis and will be intended for various special and single-purpose body designs.

Electric delivery vehicle up to 3.5 tons

Evan_2 – electric delivery vehicle up to 3.5 tons

NATIONAL CONTACT POINT

SUPPORT NETWORK ACROSS POLAND

At the beginning of 2022, the NCBR established a network of Horizontal Contact Points (HCP), operating in six macroregions of Poland. These units support the National Contact Point (NCP) in activities aimed at increasing participation of Polish entities in "Horizon Europe".

The HCP network, image-wise and organizationally integrated with the NCP, operates in the following macroregions:

NORTHERN POLAND:
Pomorskie, Kujawsko-Pomorskie
and Warmińsko-Mazurskie provinces

WESTERN POLAND:
Wielkopolskie, Lubuskie
and Zachodniopomorskie provinces

SOUTH-WEST POLAND:
Opolskie, Śląskie
and Dolnośląskie provinces

SOUTH-EAST POLAND:
Małopolskie, Podkarpackie
and Świętokrzyskie provinces

EASTERN POLAND:
Lubelskie and Podlaskie provinces

CENTRAL POLAND:
Łódzkie and Mazowieckie provinces
(without Warsaw)

The network's offer is comprehensive thanks to specializations assigned to individual HCPs and a common calendar of seminars and training courses, which take place primarily online, making them available without geographical restrictions.

1,000 STUDENTS OF THE MANAGER'S ACADEMY

The next strategically and systemically important step was the Manager's Academy of the "Horizon Europe" (HE) framework program, organized by the National Contact Point with support from the Horizontal Contact Points. It was a huge success and received enthusiastic opinions from the participants.

The following events were organized online during 12 weeks between September 21 and December 8, 2022:

- 12 substantive modules during which NCP Department experts guided participants step by step through the HE program according to the concept of "from the idea, through the project, to the settlement";
- 7 accompanying meetings during which HCP presented good practices of beneficiaries in project implementation.

Participants who successfully passed the knowledge test after at least ten modules received a certificate of completion of the HE Manager's Academy, which was a huge advantage of the initiative. The Academy was attended by almost 1,000 participants; Nearly 600 certificates of knowledge acquisition in the implementation of projects under the "Horizon Europe" program were issued. What is also nice, representatives of various types of organizations participated in the Academy: companies (37%), universities (31%), research institutes (20%), public administration (7%) and consulting (5%).

BONUS FOR THE ACTIVE (PAKT)

In 2022 we presented the benefits of using the PAKT, together with the Ministry of Education and Science, during many meetings and consultations. NCP experts participated in the development of new remuneration rules for the implementation of projects co-financed by the "Horizon Europe" program. The PAKT is a solution replacing the support instruments used in the implementation of the "Horizon 2020" program – the "Horizon Bonus" and the "Horizon Bonus 2" support instruments. The PAKT allows for the payment of increased salaries to Polish beneficiaries from EU funds when implementing "Horizon Europe" projects. The draft PAKT has been consulted with the Commission services regarding compliance with the program guidelines and financial and audit regulations. However, since PAKT means remuneration regulations covering not only "HE" projects, each unit must prepare individual rules, which of course raises many doubts and leads to questions from beneficiaries. Visit NCP for advice!

GENDER EQUALITY IN HORIZON EUROPE

Our experts also offered support in the field of the obligation to have a Gender Equality Plan (GEP), introduced in 2022, for certain categories of applicants for "Horizon Europe" funds – public entities, scientific institutions and universities. We have prepared an extensive guide on this topic, available on the NCP's website, and we also conducted ongoing consultations and training webinars to support these units in this new aspect of implementing "Horizon Europe" projects. In the first weeks of 2023, we will also make available a new guide (in the form of an electronic publication) devoted to the practical aspects of preparing and implementing GEPs, in particular in local government units.

GREEN YEAR WITH THE NCP

In spring, we shared knowledge about EU green policies with our colleagues from the NCBR – internal synergies are a systemically important aspect of our activities, influencing coherence of the Polish and European grant systems. In autumn 2022, we held a "Green Week with Horizon Europe", open to everyone. This is another initiative of the NCP Department that enjoyed great interest. A series of webinars was held on November 14-18, during which NCP experts discussed the main strategies and documents of the European Commission related to the European Green Deal and showed how the competitions announced in the "Horizon Europe" program fit into them. The strategies presented included: "Farm to Fork", "Circular Economy Action Plan", "Biodiversity Strategy 2030", "New European Bauhaus", "REPowerEU" and "European Missions".

A total of 350 persons registered for the Green Week and there were over 780 logins to individual events. We received very good notes from the participants, for which we are grateful!

In order to expand and consolidate the green message, the NCP Department also prepared a publication entitled "European Green Alert. Understand the EU's green policy to participate more effectively in 'Horizon Europe' competitions". This publication is a guide to the European Green Deal, its specific strategies and related European Commission's initiatives.

APPLY FOR ERC'S GRANTS EVEN MORE CONFIDENTLY

We are pleased with the great interest of Polish researchers in the Mentoring Initiative of the European Research Council, which is implemented and coordinated in Poland by the National Contact Point.

The Mentoring Initiative is an initiative proposed by the European Research Council (ERC) in order to increase the uptake of the ERC's grants by institutions from countries that are less successful in applying for grants from framework programs (including Poland). The Council has set up a database of mentors, including researchers who previously sat on the ERC's evaluation panels, and the ERC's grant winners (786 names in total), and made this database available to the member states.

The largest research financing agencies in Poland have joined this initiative launched by the NCP in April 2022: NCBR, National Science Center, National Agency for Academic Exchange and the Foundation for Polish Science.

ANOTHER WEEK WITH CLUSTERS

Another edition of the event called "Week with Clusters" took place in May. It was a series of information meetings on competitions and initiatives in 2022 undertaken as part of six thematic clusters in the second pillar of the "Horizon Europe" program. As always, the event was attended by representatives of the European Commission, experienced experts from the NCBR's NCP and beneficiaries who shared their experiences and practical tips on the preparation and implementation of projects with the participants. Over 600 persons took part in the "Cluster Week".

"HORIZON 2020" SUMMARY

In order to accurately assess Polish participation, the NCP published in spring an almost hundred-page report that was a comprehensive summary of the participation of Polish units in the previous framework "Horizon 2020" program under which the last competitions were held in 2021. The report not only contains a detailed analysis of the results, with comments from the NCP's area experts, but also a large part is devoted to conclusions and recommendations.

AND ALSO ...

the following features in the NCP's activities 2022:

- Organization of several dozen training courses and workshops on various aspects of participation in the "Horizon Europe" program, attended by a total of approximately 10,000 persons
- Cooperation with the European Commission and other member states and countries associated with "Horizon Europe" by participation in numerous meetings of several configurations of program committees under "Horizon Europe"
- Cooperation with our colleagues from the NCBR's International Cooperation Office – the NCBR's office in Brussels and the International Cooperation Department – with whom we collaborate in missions and partnerships under "Horizon Europe", among others
- Participation in many conferences, meetings and external workshops as experts of the "Horizon Europe" program
- Implementation of several "Horizon Europe" grants intended specifically for National Contact Points and financing agencies.

CLIENT-CENTERED APPROACH

One of our values is “Client-centered approach”. We are gradually developing cooperation tools to adapt to current problems and needs.

We are a knowledge hub, providing our clients with specialist knowledge through our “Landscape of Innovation” publications and reports available on the website.

We promote our beneficiaries both on the website, in our social media channels and during stationary events. We present achievements of Polish inventors to a wider audience, promoting new products, technologies and services.

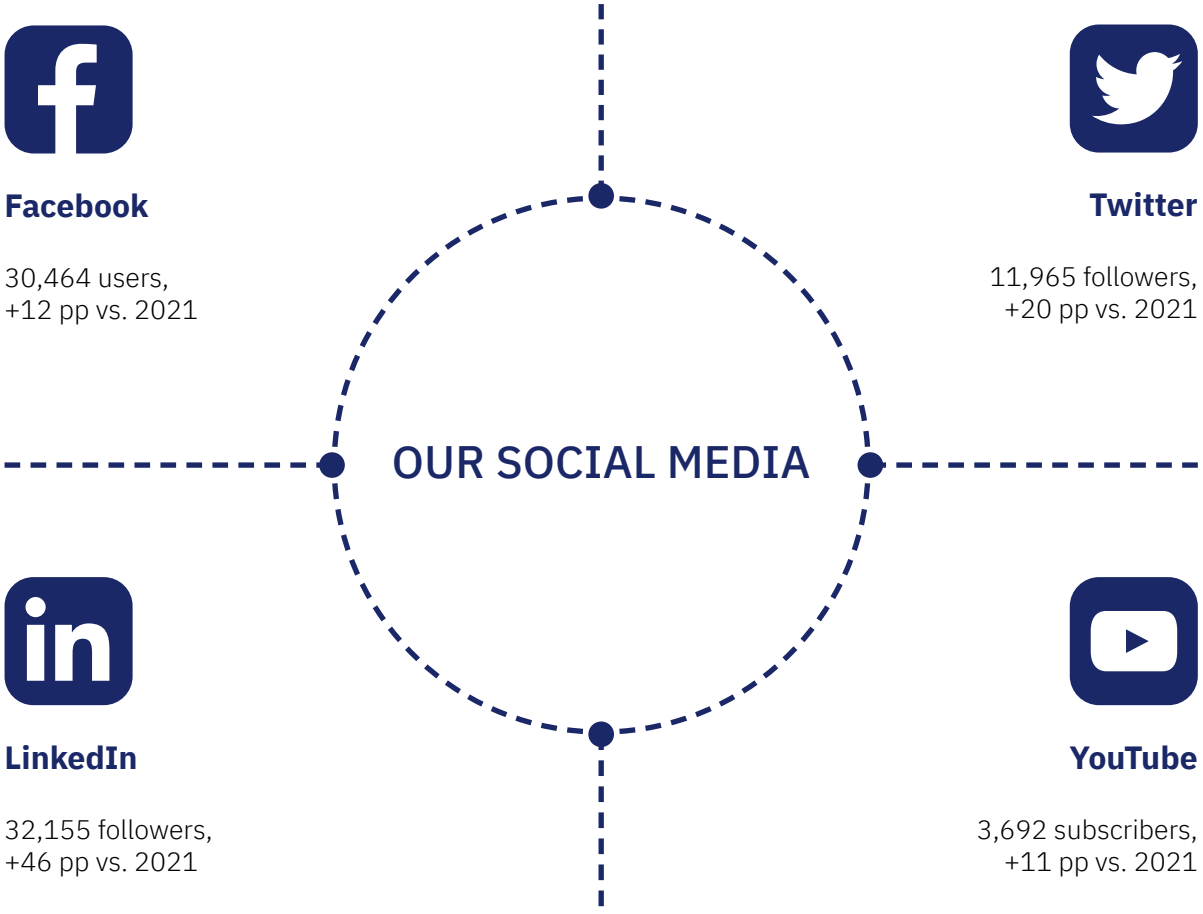
We have organized 29 training courses, webinars and external “Info Day” information meetings for over 6,200 participants. Prospective beneficiaries could learn during the meetings about the rules of competition, financing issues and many other aspects necessary to effectively apply to the NCBR for grants.

CONTACT CENTER (CC)

The NCBR's Information Point operating within the CC is one of the first points of contact for clients. It is contacted by those who are undertaking cooperation with the NCBR, but also by those who are already implementing their projects. In 2022, the NCBR's Information Point handled nearly 10,000 telephone calls and responded to nearly 8,000 e-mails. The total conversation time was over 400 hours. The NCBR's Information Point has become an obvious point of contact for our clients.

In 2022, we sent 54 external newsletters to over 21,000 of our subscribers. In the same year, the NCBR granted a total of 117 patronages including 74 honorary ones.

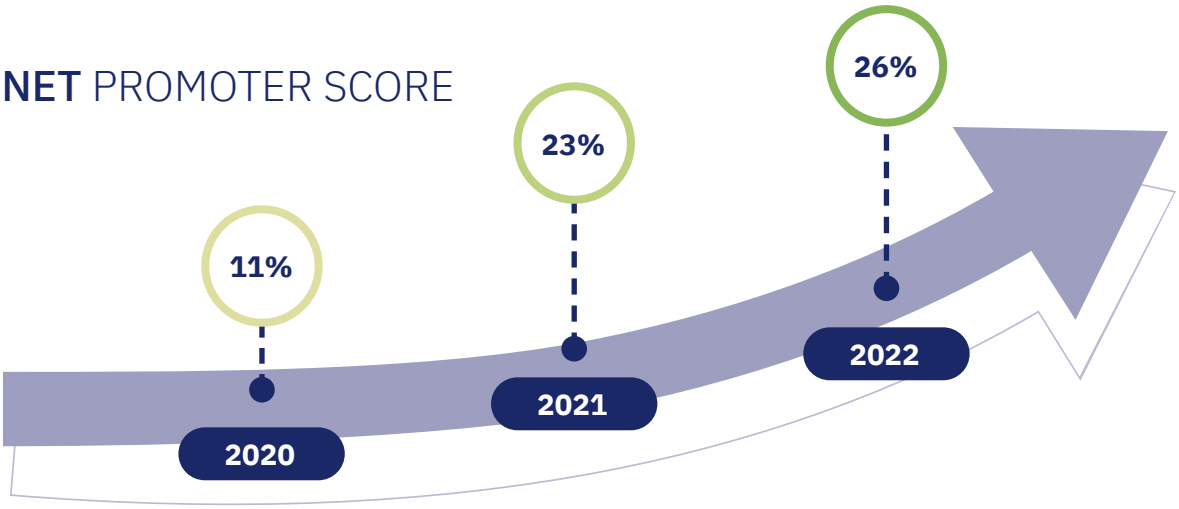
OUR SOCIAL MEDIA



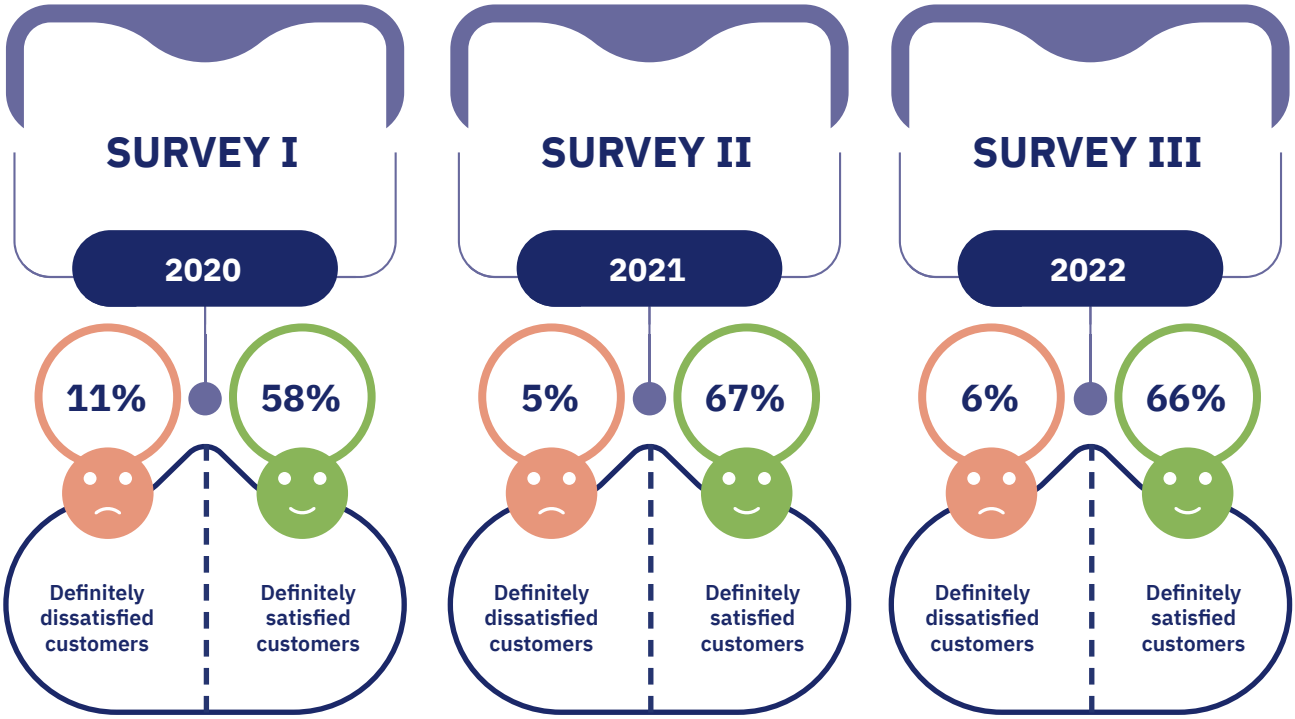
Our services:
ncbr.gov.pl
akces-ncbr.pl
ideas-ncbr.pl
nifasi.pl
kpk.gov.pl

MONITORING OF BENEFICIARIES' SATISFACTION

At the NCBR we attach great importance to quality of client service. We conducted another round of our beneficiary satisfaction survey in 2022. The results shows that the net promoter score (NPS), a tool for assessing client loyalty, increases year by year. We can therefore talk about stabilization of the level of beneficiaries' satisfaction.



The percentage of definitely satisfied and definitely dissatisfied (6%) beneficiaries, compared to the survey results in 2021, remains at a similar level, as does satisfaction with the service at subsequent stages of project implementation.



The highest percentage of people definitely satisfied with the project management and a clear increase in positive ratings were recorded among beneficiaries of the KED-OP programs. Compared to the previous editions of the survey, the issue of timeliness of verification of grant applications has also improved significantly. Improvement proposals submitted by beneficiaries in each round of the survey also showed a gradual improvement in quality of communication with the NCBR.

ABOUT THE NCBR

The NCBR is an executive agency within the meaning of the Act of August 27, 2009, on public finances, established to implement tasks in the field of state science policy. Since August 1, 2022, the institution has been supervised by the Minister of Funds and Regional Policy.

The Center operates based on the provisions of the Act of April 30, 2010, on the NCBR and under the statute annexed to the Regulation of the Minister of Science and Tertiary education of September 9, 2010, on the Statute of the NCBR. The operation of the NCBR is also governed by a number of legal acts and executive regulations related to the implementation of programs financed from European funds.

The NCBR's primary task is to manage strategic research and financial programs. The NCBR also manages and finances or co-finances R&D work for the national defense and security. The institution also supports commercialization of results of R&D work and other forms of their transfer to the economy.

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