

The cover features a large red circle in the upper right containing the title. The background is a complex network of thin red and blue lines that fan out from a central point at the bottom, creating a sense of dynamic movement and connectivity. At the top, there are clusters of dots in various shades of red, purple, and grey, some connected by thin lines, resembling a molecular or data structure.

# NCBR ANNUAL REPORT

2017



The National Centre  
for Research and Development





# NCBR ANNUAL REPORT 2017

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# NCBR IN NUMBERS

**64**

**NUMBER OF CALLS FOR PROPOSALS  
ANNOUNCED IN 2017**

PLN **7.9** BN

**ALLOCATION – AMOUNTS FOR CALLS FOR  
PROPOSALS ANNOUNCED IN 2017**

**2,896**

**NUMBER OF APPLICATIONS SUBMITTED  
IN CALLS FOR PROPOSALS ANNOUNCED IN 2017**

PLN **19** BN

**VALUE OF FUNDING APPLIED FOR IN CALLS  
FOR PROPOSALS ANNOUNCED IN 2017**

**1,698**

**NUMBER OF SIGNED CONTRACTS IN 2017**  
(total for all calls for proposals in the NCBR programmes  
regardless of the date of their announcement)

**INCLUDING IN CALLS FOR PROPOSALS  
ANNOUNCED IN 2017**

**663**

PLN **7.67** BN

**VALUE OF FUNDING IN 2017**

(total for all calls for proposals in the NCBR programmes  
regardless of the date of their announcement)

**INCLUDING IN CALLS FOR PROPOSALS  
ANNOUNCED IN 2017**

PLN **3.7** BN

PLN **18.5** BN

**VALUE OF THE FUNDING OF THE PROJECTS  
SERVED IN 2017** (current contracts regardless  
of the date they were signed)

**3,702**

**NUMBER OF PROJECTS SERVED IN 2017**

(current contracts regardless of the date they were signed)



## PROF. MACIEJ CHOROWSKI, DSC, ENG.

Director of the National Centre  
for Research and Development

### Ladies and Gentlemen,

We have an exceptional 12 months behind us. In 2017 the National Centre for Research and Development (NCBR) celebrated its 10<sup>th</sup> anniversary. It was not only a reason for us to be proud, but also a time to summarize our successes – successes many people have contributed to. Additionally, it was a great opportunity for us to answer the question about the further plan of action for the NCBR.

The past year was a record in terms of the number of calls for proposals carried out and the budget allocated for them. We announced 64 calls for proposals in which 2,896 applications were submitted. We serviced 3,702 projects with a total funding of PLN 18.5 billion. The above numbers make the NCBR the largest centre supporting the development of science and the economy, not only in Poland, but in this part of Europe.

I can say with great satisfaction, that in the scale of the country and the region, we set a new direction for institutions, aimed at stimulating economic development through linking the world of academia and business. We were the first in Poland to implement a new model of financing research, similar to that applied, for example, by American agencies such as DARPA and DOE. The essence of this new model is defining the goal of the research and the market for its results. Entities that obtain the best results have a guaranteed market for prototype solutions. They thus obtain references allowing them to exist on open markets.

An Emission-free public transport programme was launched, which aims to lead to the creation of

a new generation of electric buses. The deep market for them is created by local governments. The Bloki 200+ programme represents a chance for the Polish energy sector to maintain approx. 10 GW of installed power for the nearest decades. The common denominator of these projects is not only the search for a significant solution for the economy and a crucial problem for society, but also taking advantage of the new mode of public procurement – innovative partnership. The NCBR was the first government agency in Poland to make use of this model, in which the state plays the role of a smart purchasing entity.

This is not the only step towards changes in the process of performing the NCBR's tasks. Each year, programmes in which we apply evaluation mechanisms are of growing importance to us. We are changing ways of funding, shifting from the allocation of grants to investments. The record interest of innovators and the level of financial support that we allocated in the last year's edition of the Bridge Alpha programme testify to the demand for this type of support. We are also continuing the funding of those programmes which entrepreneurs and scientific units are interested in and are eager to make use of. This is a clear signal for us that they are needed. We participate in many bilateral and multilateral international programmes, thanks to which we enable funding of the best projects implemented by Polish teams with partners from Europe, Asia, Africa and South America. We want to find the best ideas, test their market potential and create the best possible conditions for their growth. Finally, we want to collect the fruits of our cooperation together with the beneficiaries.

In the name of the Directors of the NCBR, I would like to express my gratitude to everyone thanks to whom in the past year we could celebrate the 10<sup>th</sup> anniversary. It is impossible to mention all these people now. They are employees of the NCBR and also employees of institutions supervising and supporting our work. However, above all, they are Polish scientists and entrepreneurs – the most important ambassadors of the mission of the National Centre for Research and Development.

A handwritten signature in blue ink that reads "M. Chorowski". The signature is fluid and cursive.

**Prof. Maciej Chorowski, DSc. Eng.**  
Director of the National Centre  
for Research and Development



**PROF. ANNA ROGUT, DSC.**

President of the Board of the National Centre for Research and Development

**Ladies and Gentlemen,**

Once more we present you the report summarizing the work of the National Centre for Research and Development. The report is particularly special as it presents a period in which the NCBR celebrated its 10<sup>th</sup> anniversary.

For the Board of the National Centre for Research and Development, 2017 was a period of intense work, both on preparing projects of strategic programmes and on developing new support instruments. The effect of this work was the preparation of the project of the strategic programme GOSPOSTRATEG, dedicated to society in conditions of globalising markets, and also progress in the work on the project of the strategic programme INFOSTRATEG, which will cover information technology, telecommunications, and mechatronics. Additionally, together with the Steering Committee, the Board prepared proposals of annexes to strategic programmes already implemented - STRATEGMED and TECHMATSTRATEG. The past year was also devoted to work on joint ventures and sector programmes of the NCBR. Cooperating with the regions, the Board issued recommendations to establish joint ventures with



Lubelskie, Łódzkie, and Śląskie voivodeships, and supported the launch of yet another programme supporting the activities of R&D in the shipbuilding sector - INNOship. In 2017, together with the Board of the National Science Centre (NCN), we took part in the preparation of the third edition of the programme for scientists, TANGO, a joint undertaking of the NCBR and the NCN, opening up completely new possibilities to make practical use of the results of the work of our scientists.

I am convinced that the activities of the Board of the National Centre for Research and Development are a perfect example of successful cooperation of the scientific, socio-economic and financial communities with the state administration. This is cooperation which, as also shown last year, brings good, measurable results.

A handwritten signature in blue ink, appearing to read 'A. Rogut'.

**Prof. Anna Rogut, DSc.**  
**President of the Board of the National Centre for Research and Development**

## MOST IMPORTANT EVENTS IN 2017



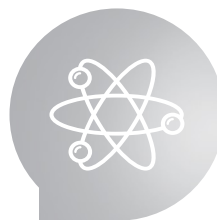
### NEW CAPITAL FUNDS OF NCBR: PLN 2 BILLION FOR POLISH INNOVATION

NCBR CVC and NCBR VC are two Funds of Funds created in 2017, which in the coming years will create investment in technology. Their total investment capital amounts to PLN 2 billion. In the coming years, both Funds of Funds will invest in small and medium-sized enterprises with a technology profile with big potential for development, and then, at a suitable moment they will make a profitable exit from the investment. Therefore, innovative Polish firms will receive support in a key phase of their development, when they are dynamically increasing the scale of their activities and need capital rapidly.

NCBR CVC will have PLN 880 million at its disposal, of which half is contributed by the NCBR. The remaining 50% is raised by corporate investors. The Funds of Funds will be managed by a consortium of PFR Ventures and BGK TFI, and the management team will be composed of the best specialists from the venture capital sector.

NCBR VC will have over PLN 1 billion at its disposal, in which at least half are the funds of private investors. It is the first professional Polish institutional investor, systemically providing finance for VC funds on fully market principles. NCBR VC will be managed by a consortium of private companies - VC3.0 Sp. z o.o. and FinCrea TFI SA - which are experienced on the venture capital market.

*"The beginning of the activities of NCBR CVC and NCBR VC is a turning point for the development of the Polish venture capital market. We are laying the foundations of the system of commercialisation of R&D projects with the use of financial instruments. This is an important supplement to the NCBR-created ecosystem of supporting Polish technology projects at every stage of development," says Piotr Dardziński, Deputy Minister of Science and Higher Education.*



### PLN 100 MILLION SUPPORT FOR "LUBLIN UPLAND OF PHOTONIC TECHNOLOGIES"

The aim of the joint venture with Lubelskie Voivodeship is to support industrial research and development works in the field of photonic technologies. The Lubelskie Voivodeship is the first region in Poland to approach us with a proposal to create a joint venture. As a result of the agreement, we will announce open calls for proposals for R&D projects in the field of photonics. Both parties contribute half of the PLN 100 million budget. The detailed subjects of the calls for proposals will cover, among others, new generation technology for digitization, research on fibre optic sensors, and works on innovative sources of light. The agreement has been concluded for a period of 10 years.

*"As the voivodeship authorities, we are interested in stimulating and extending cooperation of scientific research units with entrepreneurs of our region, but we also want to encourage cooperation of investors of the whole country who see the possibilities in our region and want to conduct and develop their activities here. We hope that the development of technological entrepreneurship in the field of photonics will translate directly into economic development in many fields and increase the competitiveness of our voivodeship's economy," says Sławomir Sosnowski, Marshal of the Lubelskie Voivodeship.*





## PLN 1 BILLION SUPPORT FOR POLISH TECHNOLOGICAL INNOVATION

PLN 1 billion is the largest ever budget of our competition. This is the total amount that the winners of the call for proposals under the BRidge Alpha project will receive for the development of their ideas. The aim of the programme is to support the most innovative projects at an early stage of development and lead them to their commercialisation. The planned investments by future Alphas include projects from a variety of fields and areas, among them, medical engineering technology, including medical biotechnologies, intelligent networks and geoinformation technologies, multi-functional materials and composites with advanced properties, including nanoproceses and nanoproducs, as well as automation and robotic technological processes.

*"The huge interest in the call for proposals and its results are proof that we have created an attractive mechanism of support by proof of concept funds for projects in the preseed phase. Thanks to the record budget, the high quality of management teams applying for support and the rich portfolio of projects announced by future Alphas, next year the number of innovative projects that have a chance to become ground-breaking will rise significantly," says Prof. Aleksander Nawrat, Deputy Director of the NCBR.*



## DUAL STUDIES — NEW DEVELOPMENT OPPORTUNITIES FOR STUDENTS VIA PRACTICAL EDUCATION

We have assigned PLN 100 million to the call for proposals "Dual Studies". We believe that the recipe for success is the effective combination of theory with practice. The idea of "Dual Studies" makes this possible. Thanks to the implementation of special programmes of alternating education, participation in didactic lessons at the university and employment in a company are possible at the same time.

The programme is addressed to universities and supports projects thanks to which didactic staff and students can have practical contact with the business environment and so better understand the expectations of potential employers.

*"We constantly see the need for the precise matching of the educational programmes implemented at the universities with the changing expectations of the labour market. This is why we put special emphasis on the practical aspect of studies. Practice supported by experience is valuable capital for young scientists and a chance for economic development based on innovation," says Prof. Maciej Chorowski, Director of the NCBR.*



## PLN 50 MILLION FOR THE DEVELOPMENT OF UNIVERSITY STAFF

The aim of the call for proposals is to increase the competences of didactic staff of universities. Public and non-public universities may apply for funding of projects. The projects will support doctors and doctoral students who make up the didactic staff of the university and at the same time are under 35. The projects should contain proposals for measures raising the qualifications of the university staff in at least two of three areas: innovative didactic skills, IT skills or teaching in a foreign language.

*"The development of Polish science, and particularly areas of science which through cooperation with business are to decide about the future of the Polish economy, requires investment in staff. The aim of the actions of the NCBR is to create new scientific career paths allowing, on the one hand, to develop didactic skills based on modern solutions, and on the other hand, to educate young people, paying special attention to the changing expectations of the labour market," says Jarosław Gowin, Deputy Prime Minister, Minister of Science and Higher Education.*



## PLN 150 MILLION FOR INNOVATIVE SYSTEM OF GENERATING ENERGY AND MANAGING ITS DISTRIBUTION

We supported innovative solutions in the electronic, information and communication technology sector amounting to PLN 150 million under the IUSER programme. The aim of the project, organised together with the Ministry of Science and Higher Education, is to support the development of a national sector of producers of devices and systems for generating energy and managing its distribution.

*"We support research and development projects wherever their implementation provides an opportunity for the development of the national economy. The energy sector is a good example, as it strongly focuses on innovation. It is important for us to create good, stable conditions of work for innovators - this is why we offer the best of them financial support in contests such as IUSER. At the same time, in the legislation on innovation, we combine into one the network of incentives to conduct research and development work," says Jarosław Gowin, Deputy Prime Minister, Minister of Science and Higher Education.*

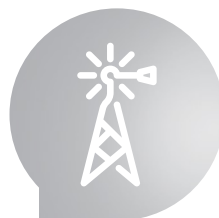


## STETHOME — THE FIRST INVESTMENT OF TDJ PITANGO VENTURES

StethoMe is a Polish company producing an intelligent wireless stethoscope that works with a smartphone. This is the first investment created under the Fund of Funds NCBR VC fund TDJ Pitango Ventures. StethoMe is an intelligent medical device to examine in home conditions the health of the lungs and heart. The electronic, wireless stethoscope

combined with a contactless thermometer works with a smartphone and thanks to the artificial intelligence module it can recognise abnormal sounds that appear during illness.

*"We always repeat that the most important thing for us are the people - the founders and all the people working around the project. The StethoMe team is a perfect example of this. We are therefore most pleased that TDJ Pitango, a partner with a worldwide reputation, also believed in this investment. Thanks to the money of the investors, the company will be able to further develop its global solutions in the field of technology and medicine," emphasises Tomasz Czapliński, member of the board of SpeedUp BRidge Alfa.*



## PLN 90 MILLION FOR INNOVATION IN THE ENERGY SECTOR

Innovative solutions and technology allow to adapt Polish energy blocks to new challenges. Thanks to the programme Bloki 200+ the best projects can receive as much as PLN 90 million. The aim of our programme is to support new technical, organisational and legal solutions that allow the adaption of power blocks to the changing conditions of their use and the new challenges related to the work of the national electrical-energy system.

*"Once again we are investing in R&D projects whose implementation will bring benefits for the whole economy. We are looking for innovative solutions and at the same time, ones that do not require large investment outlays. We care about efficient use of the existing blocks and projects allowing to reduce the costs of their modernisation and further use," says Prof. Maciej Chorowski, Director of the NCBR.*



## 1000 EMISSION-FREE BUSES FOR POLISH CITIES

PLN 2.2 billion – this is the value of the agreement that we signed in 2017 with the National Fund for Environmental Protection and Water Management. This will allow the purchase of over 1000 ecological new generation buses for Polish cities participating in the "Emission-free public transport" programme. Local governments will be able to receive as much as 100% funding for the purchase of vehicles.

We are already cooperating with 26 local governments all around Poland under the programme. Public transport that is friendly to the environment and residents is one of the priorities to the following cities: Bydgoszcz, Częstochowa, Gdynia, Jaworzno, Kraków, Krosno, Lublin, Łomża, Mielec, Nowy Sącz, Płock, Rzeszów, Siedlce, Sieradz, Sosnowiec, Starachowice, Szczecin, Tczew, Tomaszów Mazowiecki, Toruń, Tychy, Warszawa, Wejherowo, Wrocław, Zakliczyn and Żyrardów as well as boroughs associated in the Górnośląsko-Zagłębiowska Metropole.

*"Electromobility and an improvement in air quality is a strategic issue for the government. We consistently create and support solutions aimed at improving the quality of lives of the Polish people. This is perhaps best proven by the "Emission-free public transport" programme. It is also an example of how the state, using the available financial and legal means, can create a market for innovation for the benefit of its citizens," emphasises Jarosław Gowin, Deputy Prime Minister, Minister of Science and Higher Education.*



## PLN 50 MILLION IN QUICK SUPPORT FOR "SEAL OF EXCELLENCE" PROJECTS

The Seal of Excellence Certificate, awarded by the European Commission, confirms the high quality of a project which, although it met the rigorous criteria and was recommended by the experts, as a result of limitations in the call for proposals budget and strong competition in the struggle for EU grants, did not win support. Projects that have such a certificate receive a second chance in the form of support at the level of PLN 50 million. Entrepreneurs from the SME sector can take part in a new call for proposals for co-financing.

The main rules of the new call for proposals are similar to other "fast track" calls for proposals. The application procedure is simplified as much as possible since the deadline for consideration of applications is only 60 days and the substantive assessment is shortened since the projects have already obtained a positive assessment earlier.

*"A large group of projects that do not receive funding represent a high level, which is confirmed by them receiving the Seal of Excellence. To a large extent this concerns projects of Polish SMEs. With this in mind, we have simplified the rules of the competition to allow faster commencement of the implementation of very good projects that have already been positively verified in the competition procedures of the European Commission. This is another measure of the NCBR introduced with a view to the potential and needs of a specific group of entrepreneurs," says Prof. Maciej Chorowski, Director of the NCBR.*



# ABOUT THE NCBR

## **THE NATIONAL CENTRE FOR RESEARCH AND DEVELOPMENT IS AN EXECUTIVE AGENCY OF THE MINISTER OF SCIENCE AND HIGHER EDUCATION**

For over 10 years the Centre has linked the world of science and business, creating suitable conditions for conducting research and development. Through the co-financing of R&D processes, it supports Polish entrepreneurs, significantly reducing their business risk accompanying the implementation of ground-breaking research projects.

The mission of the National Centre for Research and Development is to implement tasks serving the social and economic development of Poland

and solving specific civilisation problems of its inhabitants. The activities of the Centre focus on supporting Polish scientific units in developing their ability to create and make use of innovative solutions, as well as on transferring the results of scientific research to the economy. The Centre also cares about ensuring good conditions for the development of scientific staff. Of special concern is the participation of young scientists in research programmes. This enables them to increase their qualifications in the field of entrepreneurship,



management of intellectual property, and the commercialisation of research results.

The NCBR plays the role of Intermediate Institution in the operational programmes: Smart Growth and Knowledge Education Development. It also implements a range of domestic and international programmes, as well as projects related to national security and defence.



With an annual budget for R&D works amounting to EUR 1 billion, the NCBR is currently the largest centre in the country and region for supporting the development of science and the economy.

# THE BOARD OF THE NCBR

## THE BOARD OF THE NATIONAL CENTRE FOR RESEARCH AND DEVELOPMENT IS THE CENTRE'S ADVISORY AND OPINION-FORMING BODY

Its main task is to prepare projects of strategic research and development programmes.

In 2017 there were 12 meetings of the Board of the National Centre for Research and Development under the chairmanship of Prof. Anna Rogut, DSc. The work of the Board is supported by the Board Committees on finance, on strategic research and development programmes, on implementation of other tasks, and the appeal committee. In the reporting period the NCBR Board issued 38 opinions, expressing its position in resolutions. The result of its activities was, among others, the completion of work on the project of the strategic programme

GOSPOSTRATEG, dedicated to society faced with globalising markets, and the implementation of the tasks leading to the preparation of the project of the strategic programme INFOSTRATEG, covering IT, telecommunications, and mechatronics. The Board also participated in the process of assessing and verifying proposals to establish new joint ventures of the NCBR with the Lubelskie, Łódzkie and Śląskie voivodeships. Together with the Board of the National Science Centre, the Board of the NCBR participated in developing the current and future forms of cooperation aimed at freeing the potential of Polish science.



## THE BOARD OF THE NCBR IS COMPOSED OF REPRESENTATIVES OF THE SCIENTIFIC AND SOCIO-ECONOMIC COMMUNITIES AND THE STATE ADMINISTRATION

In 2017 the Board comprised:

### Members nominated by the scientific community:

Lidia Gawlik, DSc. Eng.  
 Prof. Andrzej Karbownik, DSc. Eng.  
 Leszek Kwieciński, DSc. Eng.  
 Dominika Latusek-Jurczak, DSc.  
 Prof. Joanicjusz Nazarko, DSc. Eng.  
 Prof. Piotr Perlin, DSc.  
 Grażyna Ewa Ptak, DSc. Eng.  
 Piotr Sankowski, DSc.  
 Prof. Krzysztof Stańczyk, DSc. Eng.

### Members nominated by the socio-economic and financial community:

Prof. Anna Rogut, DSc., President of the Board  
 Zbigniew Dokurno, DSc.  
 Prof. Jan Tadeusz Duda, DSc. Eng.  
 Włodzimierz Fisiak  
 Krzysztof Gulda  
 Włodzimierz Hrymniak  
 Dariusz Janusek, DSc. Eng.  
 Krzysztof Mazur, DSc.  
 Prof. Piotr Niedzielski, DSc. Eng.  
 Prof. Artur H. Świergiel, DSc. Eng.<sup>1</sup>

### Members nominated by ministers representing the government:

**Marcin Cichy** – representative of the Minister competent for digitization  
**Piotr Dardziński, DSc.** – representative of the Minister competent for science  
**Jadwiga Emilewicz** – representative of the Minister competent for the economy  
**Prof. Wojciech Fałkowski, DSc.** – representative of the Minister of Defence<sup>2</sup>  
**Andrzej P. Jarema** – representative of the Minister of Internal Affairs  
**Janusz Karp, DSc.** – representative of the Minister competent for maritime economy  
**Jerzy Szmit** – representative of the Minister competent for transport  
**Marek Tombarkiewicz** – representative of the Minister competent for health<sup>3</sup>  
**Ryszard Zarudzki, DSc.** – representative of the Minister competent for agriculture  
**Prof. Tadeusz P. Żarski, DSc.** – representative of the Minister competent for the environment

<sup>1</sup> Due to his resignation, on 24 November 2017, Prof. Janusz Błaszczyk, DSc. Eng. was appointed.

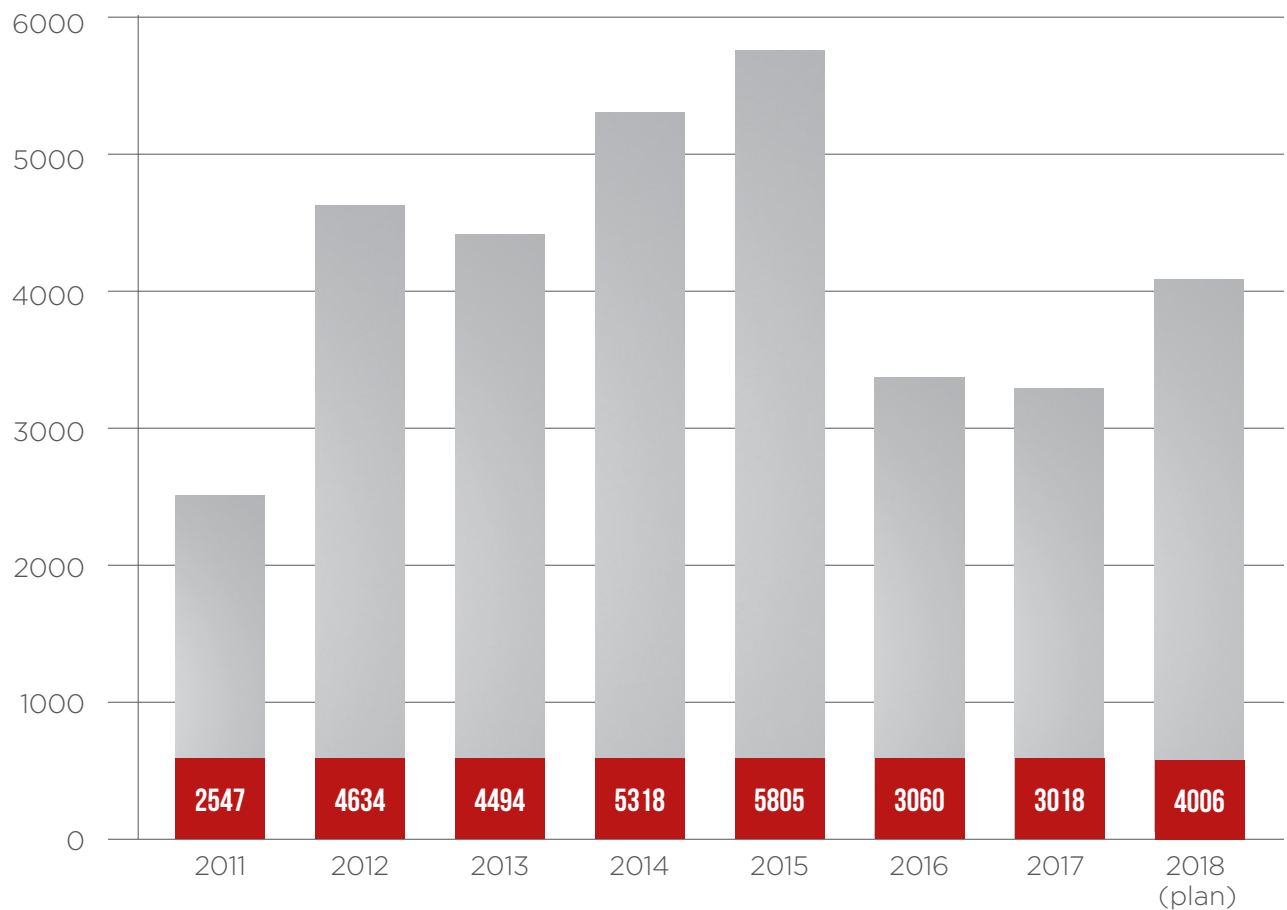
<sup>2</sup> Due to his resignation, on 1 December 2017, Dominik Smyrgała, DSc., was appointed.

<sup>3</sup> Until 4 August 2017, Krzysztof Łanda, DSc.

# THE NCBR BUDGET

IN THE YEARS 2011-2017

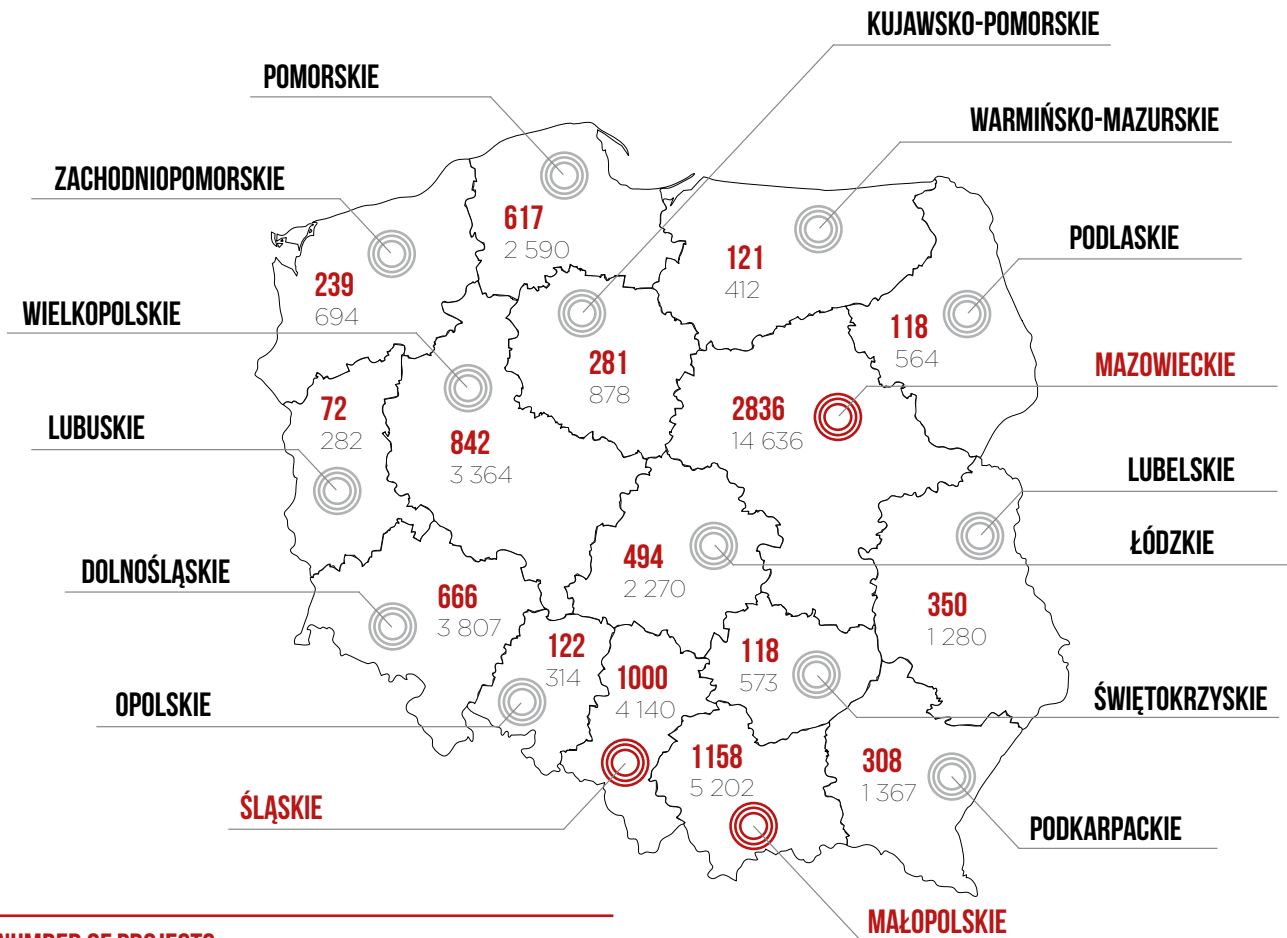
PLN mln





NUMBER OF PROJECTS AND VALUE OF FUNDING ACCORDING TO VOIVODESHIPS

# USE OF FUNDS

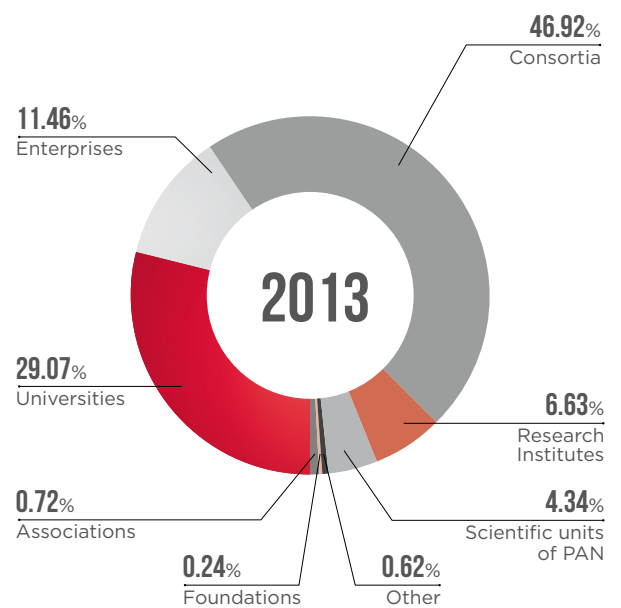
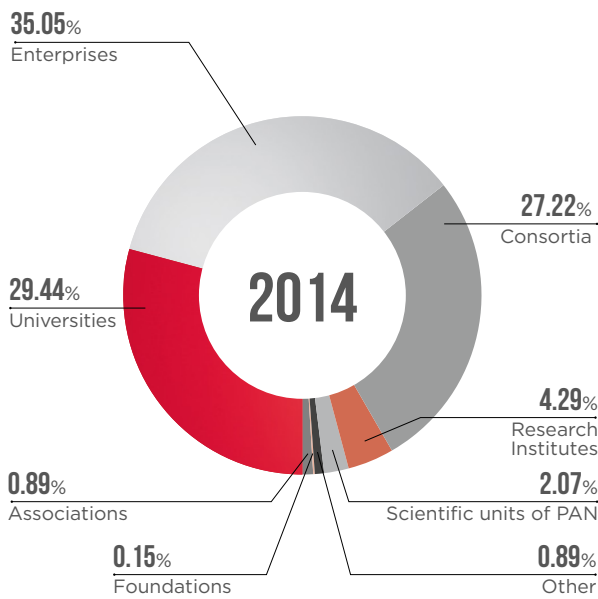
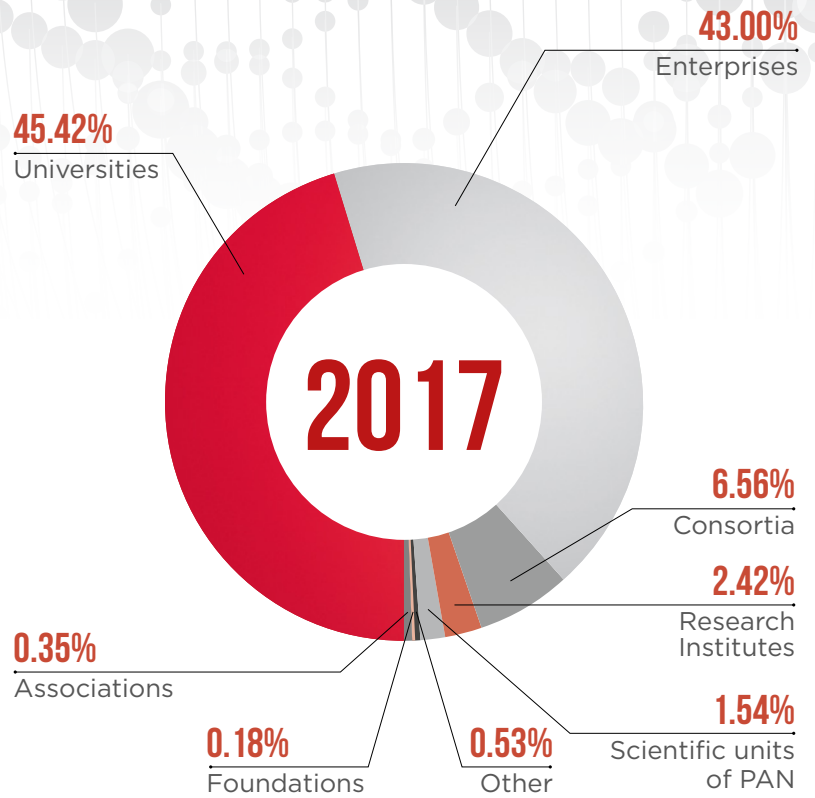


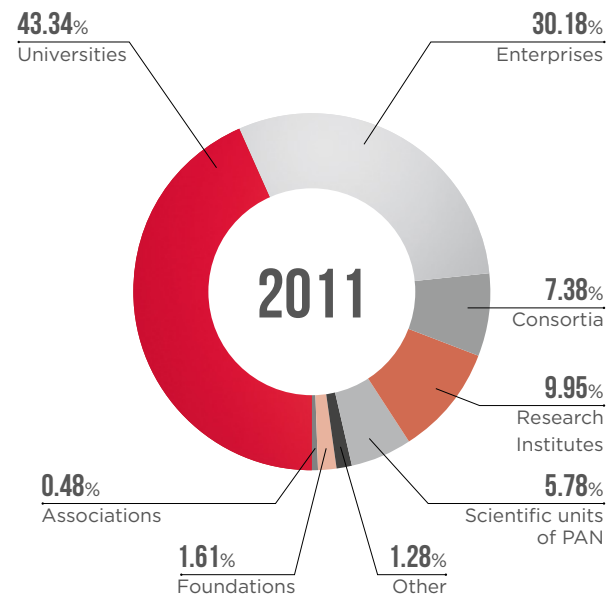
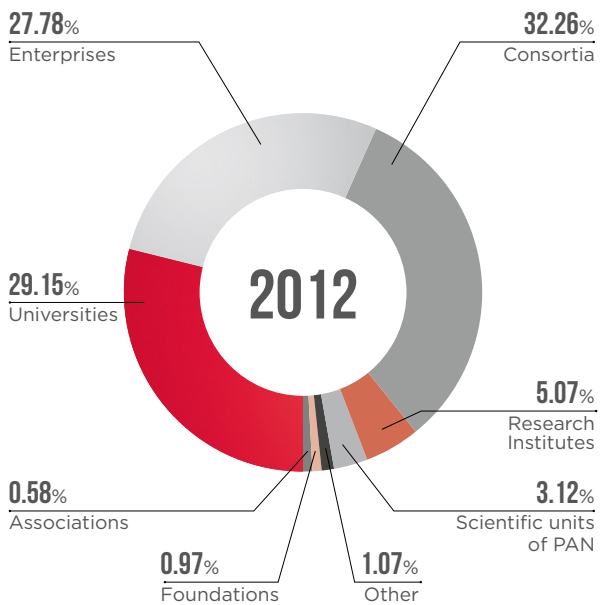
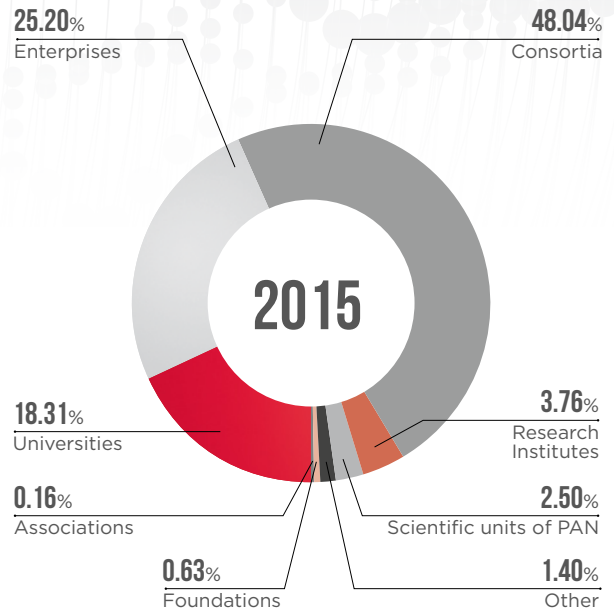
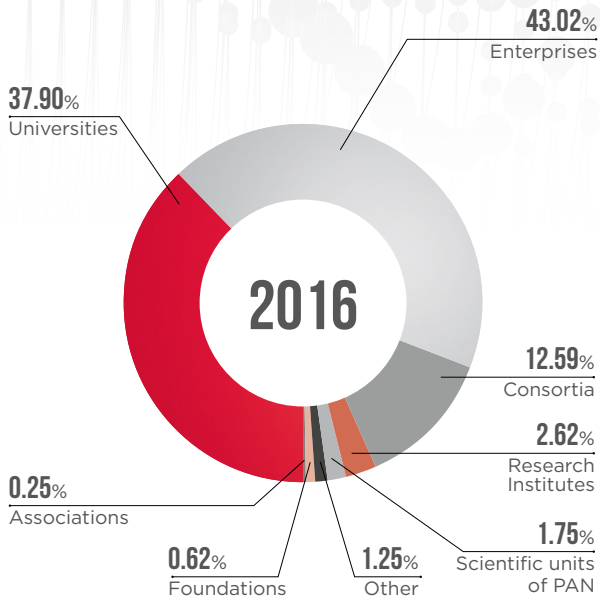
**NUMBER OF PROJECTS**

Total value in PLN mln

## BENEFICIARIES

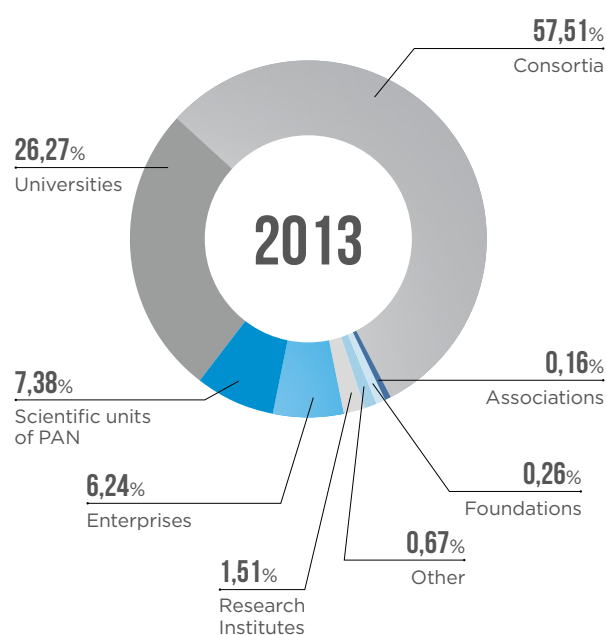
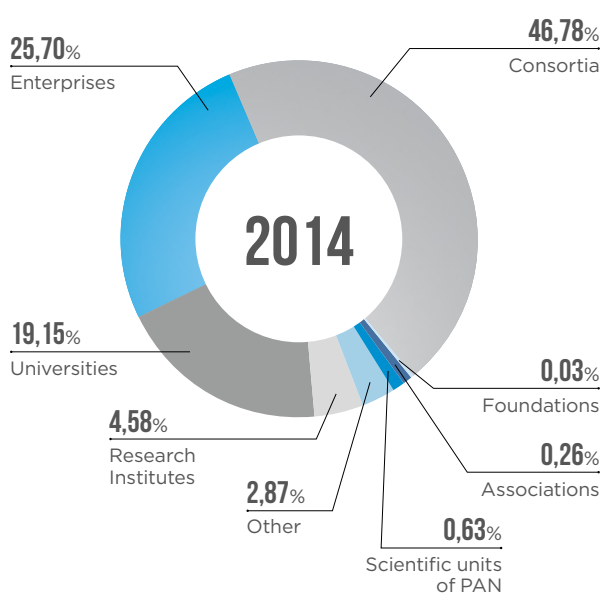
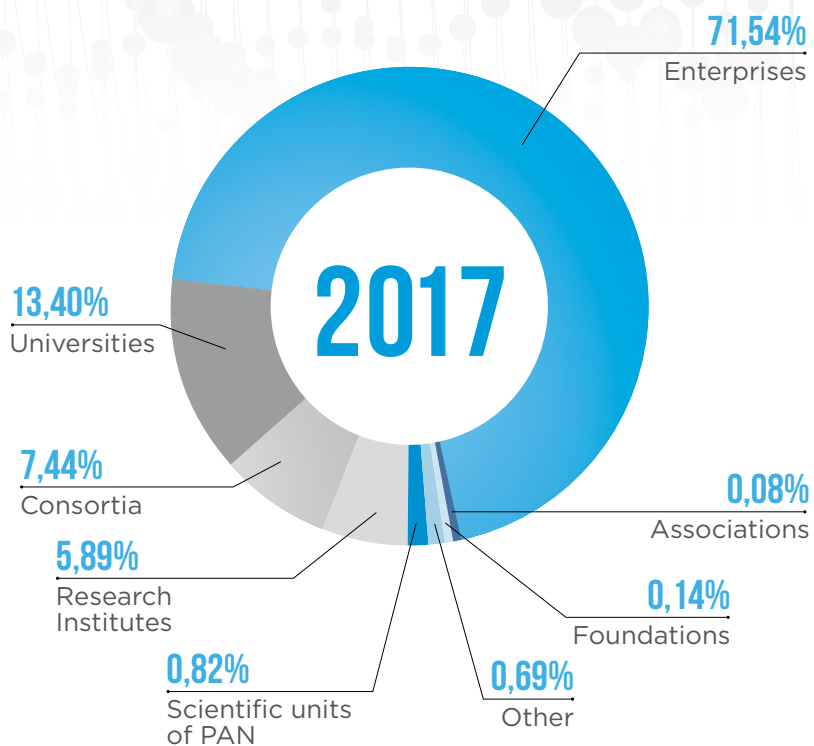
SHARE IN THE TOTAL NUMBER OF AGREEMENTS ACCORDING TO LEGAL FORM IN THE YEARS 2011-2017

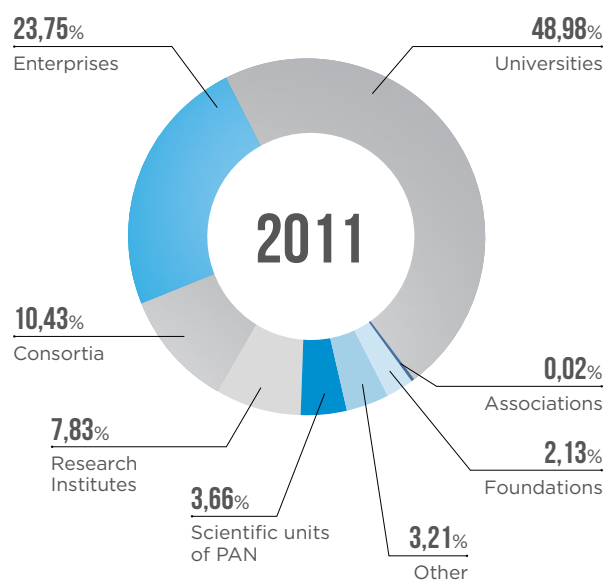
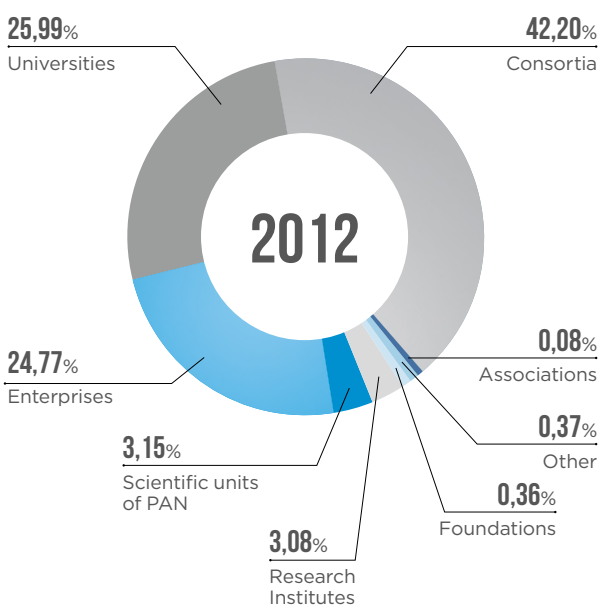
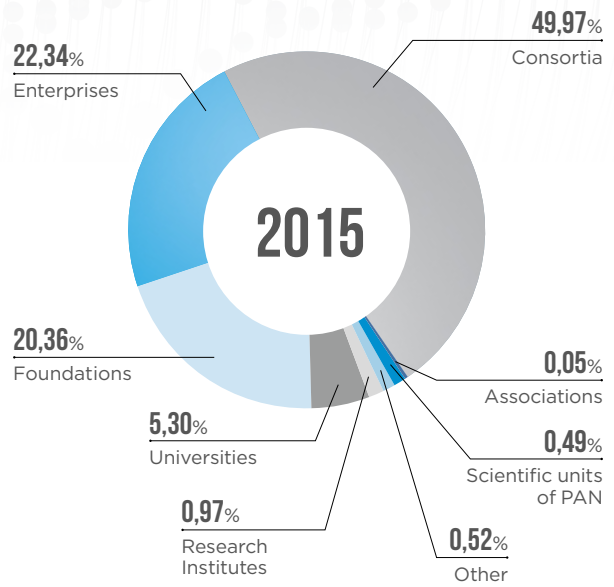
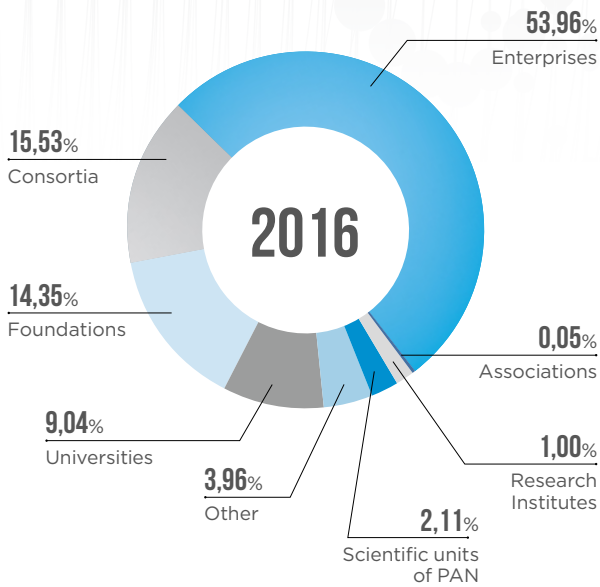




## BENEFICIARIES

SHARE OF THE TOTAL FUNDING ACCORDING TO LEGAL FORM IN THE YEARS 2011-2017







## PROJECT

ORGANFARM – SYSTEM FOR LONG-TERM EX-VIVO STORAGE OF ORGANS

**BENEFICIARY:**  
NanoSanguis SA

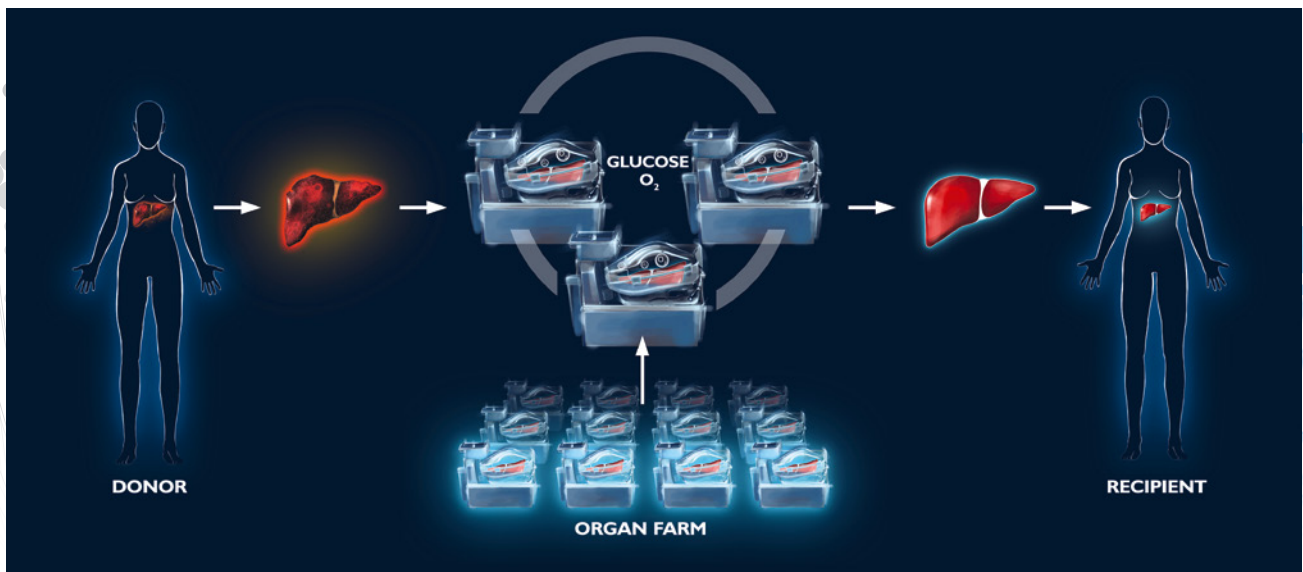


**VALUE OF PROJECT:**  
PLN **8 087 562**



**VALUE OF SUPPORT:**  
PLN **5 386 079**

**FUNDING:** SMART GROWTH OPERATIONAL PROGRAMME/INDUSTRIAL RESEARCH AND DEVELOPMENT WORK IMPLEMENTED BY ENTERPRISES



# ORGAN FARM

**THROUGHOUT THE WORLD, THE PROBLEM OF TRANSPLANTOLOGY IS NOT ONLY A DEFICIT OF ORGANS, BUT ALSO THE INABILITY TO KEEP THEM IN GOOD CONDITION DURING LONG-DISTANCE TRAVEL**

The possibility to store and transport organs in close to physiological conditions and small and effective equipment used for the transport of organs is a need that, if satisfied, will be a breakthrough in the field of transplantology.

The development by the company NanoSanguis SA of the concept of the OrganFarm system, enabling the long-term storage and transport of organs, is a response to this need. The system consists of a perfusion fluid and easily transported equipment.



NANOSANGUIS TEAM



This ensures sterile conditions, a stable temperature and perfusion of the organ as well as the possibility to monitor its parameters. The system extends the storage time of organs up to 5 days, which may increase the coverage of global demand for transplant organs by as much as 25%. The perfusion fluid, which is the key know-how of the company, has the ability to supply oxygen and glucose. This allows it to maintain the good condition of the organ and aid its regeneration. At the same time, the system provides comprehensive diagnostics of the organ, which increases the chances

of transplantation. The originator of the project, the company NanoSanguis SA, is a startup specializing in the commercialisation of R&D results. Its founders are Prof. Tomasz Ciach - chemist, biologist and nanotechnologist from Warsaw University of Technology, and Agata Stefanek, a scientist from the Faculty of Chemical and Process Engineering of Warsaw University of Technology. The Organ-Farm project has obtained almost PLN 5.4 million in funding from the OPSD programme under the budget for "Industrial research and development work implemented by enterprises".



# BENEFICIARY'S OPINION



**AGATA STEFANEK**

CEO AND CO-FOUNDER OF NANOSANGUIS SA



*OUR DREAM IS TO TURN  
AROUND THE CURRENT  
SITUATION IN WHICH PATIENTS  
WAIT FOR ORGANS  
— WE WANT ORGANS TO WAIT  
FOR PATIENTS IN NEED*

## OUR PROJECT, WHICH INVOLVES SCIENTISTS AND EXPERTS IN THE FIELD OF BIOTECHNOLOGY AND MEDICINE, ENABLES THE REALISATION OF OUR VISION

The OrganFarm system aims to provide a solution to such problems as:

- damage to organs during transport due to lack of physiological conditions (lack of energy source, oxygen source, transport in hypothermic conditions),
- large distances between donors and recipients = long transport = risk of damage to organs,
- complicated and large apparatuses.

Our equipment will allow the storage of organs in conditions as close as possible to physiological conditions: normothermia, transport of oxygen and nutrients, exchange of respiratory gases. Thanks to this, from the very moment that they are collected, they preserve their physiological functions,

e.g. the liver will continue to produce bile, and the kidneys urine. This will make it possible to constantly monitor the condition of the organ as well as aid its regeneration before the transplant to the organism of the recipient. Despite its advanced functions, the equipment will have small dimensions and a small weight (up to 7 kg), which will enable the elimination of the need to organise expensive specialist transport employing teams of several people, and will thereby lower both the costs and time of transport.

The results of the project will be implemented in the domestic and international market (among others, in the USA and EU) through the sale of licences to large pharmaceutical companies. Apart from satisfying an important market need, the implementation of the project will also improve the health and save the lives of many people, which is for us the main motivation of our work.





# BENEFICIARY'S OPINION



**PIOTR PIETRZAK**

STARTVENTURE@POLAND, MEMBER OF THE SUPERVISORY BOARD OF NANOGROUP SA

## WHAT HAS THE MONEY FROM THE FUNDING BEEN ALLOCATED TO?

The money from the funding was spent on reagents and research materials, wages of staff and external services related, for example, to obtaining the consent of the Bioethical Commission to conduct research.

## HOW DID THE FUNDING FROM THE NCBR HELP YOUR COMPANY?

When there is not yet a tangible product, but only technology, which still has to be tested, private investors are not keen to take risks. The process of conducting research is long and risky, because not all the research ideas can be transformed into a finished product.

Thanks to the fact that we received 67% of the money from the NCBR, we were able to turn a research and development idea into technology which will be implemented in health care. In this way we have passed from the pre-seed phase to a project ready for commercialisation.

**THE SYSTEM  
EXTENDS THE  
STORAGE TIME  
OF ORGANS BY  
UP TO 5 DAYS**

***THANKS TO THE MONEY  
FROM THE NCBR,  
WE TURNED A RESEARCH  
AND DEVELOPMENT IDEA INTO  
TECHNOLOGY WHICH  
WILL BE IMPLEMENTED  
IN HEALTH CARE***



## PROJECTS

SEAMLESS MULTIPLAYER, CINEMATIC FEEL, ANIMATION EXCELLENCE, CITY CREATION

**BENEFICIARY:**  
CD Projekt SA



**TOTAL VALUE OF PROJECT:**

PLN **54 968 878**



**TOTAL VALUE OF SUPPORT:**

PLN **22 229 480**

**FUNDING:** SMART GROWTH OPERATIONAL PROGRAMME/SECTORAL PROGRAMMES/GAMEINN

# WORLD OF GAMES AND FANTASY

## SMART GROWTH OPERATIONAL PROGRAMME

**IN 2016 THE COMPANY CD PROJEKT SA OBTAINED FUNDING FOR FOUR PROJECTS IMPLEMENTED UNDER THE SECTORAL PROGRAMME GAMEINN FOR A TOTAL AMOUNT OF OVER PLN 22 MLN**

All four projects are currently implemented. They are the following:

- **SEAMLESS MULTIPLAYER** – complex technology enabling the creation of unique gameplay for many players, taking into account searching for opponents, managing the session, replicating objects and support for a variety of modes of gameplay along with a set of personalized tools,

- **CINEMATIC FEEL** – complex technology enabling the provision of unique, film quality in RPG open world games, also taking into account innovative process solutions and a unique set of dedicated tools,

- **ANIMATION EXCELLENCE** – complex, advanced technology enabling a significant increase in the quality and productivity of complicated animations of the body and face for the needs of RPG open world games, also taking into account innovative process solutions and a unique set of dedicated tools,

- **CITY CREATION** – complex technology serving the creation of “live”, large-scale cities, playable in real time, based on the principles of artificial intelligence and automation as well as taking into account the development of innovative processes and tools supporting the creation of the highest quality open world games.

**AIM OF STUDIO CD PROJEKT RED:  
TO BE IN THE TOP THREE OF THE  
MOST RECOGNISED PRODUCERS  
OF VIDEO GAMES IN THE WORLD.  
TO LEAD THE STUDIO'S BRANDS  
TO THE FOREFRONT OF WORLD  
POPCULTURE**

**MISSION OF STUDIO  
CD PROJEKT RED: TO CREATE  
REVOLUTIONARY ROLE-PLAYING  
GAMES THAT WILL ENTER THE  
HEARTS OF PEOPLE ALL OVER  
THE WORLD**

## CD PROJEKT CAPITAL GROUP

CD PROJEKT SA, a holding company under which the developer studio CD PROJEKT RED operates, stands at the head of CD PROJEKT Capital Group.

CD PROJEKT SA is listed on the main market of the Warsaw Stock Exchange. The company belongs to the WIG20 index, which gathers the 20 biggest and most liquid companies on the Warsaw Stock Exchange. At the end of December 2017, the capitalisation of CD PROJEKT SA amounted to PLN 9.3 billion. In 2017 the company reported consolidated revenues of PLN 463 million from sales, which translated into PLN 200 million consolidated net profit. The stable financial situation allowed the company to focus on what it does best - the production of games and the supply of entertainment to players all around the world.

The overwhelming majority of people employed in the Capital Group CD PROJEKT work in the office in Warsaw. Additionally, CD PROJEKT has offices in Kraków and Wrocław, in which teams responsible for the studio's next productions work, as well as offices in Los Angeles and Shanghai, tasked with coordinating marketing and sales activities in the United States and on the territory of China, respectively.

## STUDIO CD PROJEKT RED

Established in 2002, the studio CD PROJEKT RED creates and publishes video games for personal computers and the latest generation of consoles.

The studio's latest RPG game - The Witcher 3: Wild Hunt - appeared in 2015 on PC computers and the consoles PlayStation 4 and Xbox One, winning over 800 awards, 250 of which were as best game of the year. The game has been published in 16 language versions in all the most important markets in Europe, both Americas, Asia, Australia, and Africa. The box version of the game was sold in shops in 109 countries and is available in digital version all over the world.

The largest productions of CD PROJEKT RED are based on its proprietary software, REDengine. This engine is constantly developed and uses the latest technology, enabling the creation of complex, open world role-playing games.

### STUDIO CD PROJEKT RED



Known throughout the world as the creators of the trilogy of games about the Witcher, the character based on the hero of Andrzej Sapkowski's saga. The third part in the series - The Witcher 3: Wild Hunt - had its premiere on 19 May 2015. By the end of 2017, games from the Witcher trilogy (The Witcher, The Witcher 2: Assassins of Kings, and The Witcher 3: Wild Hunt) sold over 33 million copies worldwide.



# BENEFICIARY'S OPINION

STANISŁAW JUST

RESEARCH AND DEVELOPMENT MANAGER



## THE CAPITAL GROUP CD PROJEKT OPERATES IN THE DYNAMICALLY DEVELOPING SECTOR OF ELECTRONIC ENTERTAINMENT — VIDEO GAMES

Our business is based on two strong foundations – production of games under the developer studio CD PROJEKT RED, and global digital distribution implemented by the service GOG.com. For over 20 years, video games have remained the central point of our lives and define who we are and how we operate. We create the highest quality innovative

entertainment and at the same time, through our own digital distribution platform, we supply players all around the world with a wide selection of titles available without problematic digital security – DRMs.

We want to be the best at what we do and have a real impact on the development of the industry in which we operate. In order to win the confidence and recognition of gamers, we attach great importance to high quality, open and honest communication. We also build the respect of our clients based on the commitment and devotion of our team.



*THE CREATION OF GAMES IS AN ULTRA-INNOVATIVE PROCESS, BUT ALSO FINANCIALLY RISKY, REQUIRING PERMANENT R&D WORK, EXPERIMENTING AND CREATING PROTOTYPES. I AM CONVINCED THAT THE INNOVATIVE SOLUTIONS APPLIED IN POLISH GAMES WILL TRANSLATE INTO AN EVEN HIGHER QUALITY OF POLISH GAMES AND WILL INCREASE OUR COMPETITIVENESS IN THE DEMANDING GLOBAL MARKET. OUR SECTOR HAS THE POTENTIAL TO BECOME AN ABSOLUTE PHENOMENON OF THE POLISH ECONOMY*

ADAM KICIŃSKI,  
CEO of CD PROJEKT SA

## **BENEFITS OF THE GAMEINN PROGRAMME**

The sectoral programme GameINN is the first systemic support for the video game sector in Poland, developed by the NCBR in cooperation with the Polish Games Association. The launch of the sectoral programme GameINN by the NCBR in 2016 opened up a new development path for Polish companies conducting activities in this sector. For the first time, Polish producers could apply for funding, which allowed them to minimize the risk associated with work on innovative solutions in the field of new technology.

As members of the Polish Games Association, we have had the opportunity to actively cooperate

in the creation of the GameINN programme. We jointly developed the rules for the functioning of the programme, which has encouraged tens of companies to invest their funds in innovative ventures in the field of video games in Poland.

With satisfaction, we observe how from year to year the NCBR, listening carefully to the voices flowing from the market, consistently introduces all kinds of improvements in the organisation of the calls for proposals under GameINN. Thanks to this, the implementation of each successive call for proposals proceeds even more efficiently. From the viewpoint of the beneficiary, it is worth pointing out that the funds obtained from the sectoral programme GameINN provide the opportunity to implement bold projects which, due to the large financial risk associated with them, would often have little chance of being implemented.



## PROJECT

### INTELLIGENT WIRELESS STETHOSCOPE WORKING WITH A SMARTPHONE

**BENEFICIARY:**  
StethoMe Sp. z o.o.



**VALUE OF PROJECT:**  
PLN **9 100 768**



**VALUE OF SUPPORT:**  
PLN **6 456 767**

**FUNDING:** SMART GROWTH OPERATIONAL PROGRAMME/PUBLIC-PRIVATE SUPPORT FOR R&D WORK WITH CAPITAL FUND PARTICIPATION - NCBR VC

## SMART GROWTH OPERATIONAL PROGRAMME

## UNDER THE NCBR VC PROGRAMME, THE FUND TDJ PITANGO VENTURES WAS CONSTITUTED, WHICH WILL INVEST USD 55 MILLION IN POLISH TECHNOLOGY COMPANIES

The Fund has been operating since May 2017. Since it was established, its team has analysed 1,200 startups, met with over 300 of them, and conducted thorough analyses of approx. 60 entities. 20 projects made it to the list of candidates for investment, of which 3 were on the preferential list. In December 2017 the agreement was signed with the first of them. This was StethoMe, a Polish company producing an intelligent wireless stethoscope that works with a smartphone. The stethoscope, bearing the same name as the company - StethoMe - is an electronic device

## ABOUT STETHOME, THE RESULTS OF ACTIVITIES OF THE FUND

with the function to measure temperature, which helps people to analyse the state of their health independently at home, without the need for a doctor's visit. The idea for such a device, making use of "machine learning" to register auscultation of the lungs and diagnostics, arose among scientists from the Institute of Acoustics of the Adam Mickiewicz University in Poznań. In January 2017 the project was positively assessed by a panel of experts and obtained a grant for R&D work from the National Centre for Research and Development.

Young Poles do not lack knowledge, ideas, enthusiasm, entrepreneurship and willingness to face challenges. However, what was lacking in our country was a network of experienced venture capital investors who not only invest money, but will also be mentors for the young entrepreneurs and will lead them from an idea to success on the global market. Venture capital investment in Poland amounts to 2.7 dollars per inhabitant (2017), which is one-tenth of the European average. In comparison, in 2017 Israel, the world leader in this type of investment, was able to boast a result of 447 dollars of venture capital investment per inhabitant.

In order to fill this gap, the National Centre for Research and Development established with two partners the Fund TDJ Pitango Ventures. One of the partners is Pitango Venture Capital from Israel – the biggest venture capital fund in Israel, with a portfolio of 250 investments and many years of experience in leading startups to the global scene, specialising in the sectors: IT and modern health care. The second partner is TDJ – a Polish investment company belonging to Tomasz Domogała. Over four decades, the activities of the Domogała family have built and developed successive enterprises and made tens of acquisitions.

## TDJ PITANGO VENTURES, SUPPORT FOR YOUNG ENTREPRENEURS

The portfolio companies managed by the family have achieved a strong position, and some of them have been floated on the Warsaw Stock Exchange. Currently, the largest investment division of TDJ is Private Equity, the acquisition of mature companies. A new chapter

in the activities of TDJ is the turn towards supporting innovative projects – venture capital.

The main areas that the new fund focuses on are: big data, the Internet of Things (IoT), artificial intelligence and machine learning, SaaS, and also mobile devices and digital media, as well as medical equipment and digital health. The fund will provide support in the early as well as later stages of development of companies (seed stage, startup, later stage expansion), among others, in the creation of business plans and strategies, as well as global expansion, mergers, acquisitions, and preparing IPOs.

As part of the cooperation, startups can count on comprehensive TDJ business support, which results from the company's decades of experience in the field of business management. Thanks to our relationships and joint ventures with foreign partners, we enable access to unique know-how in the development and scaling of global technology-based businesses.

**WHAT IS STETHOME?**

**STETHOME IS AN INTELLIGENT MEDICAL APPARATUS FOR EXAMINING THE HEALTH OF THE LUNGS AND HEART IN HOME CONDITIONS.** It is an electronic, wireless device combined with a contactless thermometer that works with a smartphone. Thanks to the artificial intelligence module, it can recognize irregular sounds that appear during illness. It is enough to place the device on the points indicated on the telephone screen, and StethoMe will conduct the diagnosis. The registered sound and temperature can be sent to a selected doctor at any time, including through telemedical platforms. With the aid of StethoMe, it is possible to monitor precisely chronic respiratory illnesses such as asthma.



# BENEFICIARY'S OPINION



**WOJCIECH FEDOROWICZ**

MANAGING PARTNER OF TDJ PITANGO VENTURES

*STETHOME,  
VERY PROMISING  
POLISH STARTUP IN THE  
FIELD OF HEALTH  
AND MODERN TECHNOLOGY,  
WITH GLOBAL DEVELOPMENT  
POTENTIAL*

*A REVOLUTIONARY  
IDEA, STRONG AND  
EXPERIENCED PRODUCT  
TEAM, PARTICULARLY IN  
THE AREA OF MACHINE  
LEARNING FORM THE SOLID  
FOUNDATIONS OF THIS  
COMPANY*

## WHY DID THREE SO DIFFERENT ENTITIES DECIDE TO CREATE A JOINT VENTURE CAPITAL FUND?

Building a Polish ecosystem for startups is important for us because we see huge potential in it. Poles are entrepreneurial, they have a high tolerance for risk and business failures. The support of talented, educated and creative people with a technical background is essential for the development of startups, and Poland occupies third place in Europe in terms of the number of engineers completing studies each year.

## IN WHAT WAY CAN TDJ PITANGO VENTURES HELP YOUNG ENTREPRENEURS WITH IDEAS FOR INNOVATIVE VENTURES?

Apart from capital investments, TDJ Pitango Ventures offers close cooperation with beginner companies. We help build a team, employ people with competences who, without our guarantee, would not always want to join a fledgeling company. We provide our startups with access to a worldwide network of contacts which our partners have built up over the years. We don't limit ourselves to a one-off investment, but we lead the company through successive rounds of funding.





Above all, our aim is to encourage in our mentees a bold vision and ambition as well as provide support in the global scaling of their businesses.

## **WHAT ADVICE WOULD YOU GIVE TO POLISH STARTUPS?**

From the very beginning, when creating the company, they should plan their global development and focus on creating unique solutions that are hard to copy.

***WHEN SUPPORTING STETHOME, WE WILL BE ABLE TO USE OUR MANY YEARS OF ISRAELI AND POLISH EXPERIENCE IN LEADING COMPANIES INTO INTERNATIONAL MARKETS***



## PROJECT

DEVELOPMENT OF A PROTOTYPE MULTIMODAL TOMOGRAPH ULTRASOUND FOR DIAGNOSING BREASTS

**BENEFICIARY:**

Dramiński SA



**VALUE OF PROJECT:**

PLN **9 383 316**



**VALUE OF SUPPORT:**

PLN **6 924 132**

**FUNDING:** SMART GROWTH OPERATIONAL PROGRAMME/INDUSTRIAL RESEARCH AND DEVELOPMENT WORK IMPLEMENTED BY ENTERPRISES

**INNOVATION  
IN HEALTH  
CARE**

**SMART GROWTH  
OPERATIONAL  
PROGRAMME**

## **BREAST CANCER IS ONE OF THE MOST COMMON CANCERS AMONG WOMEN AND NOBODY NEEDS TO BE TOLD HOW IMPORTANT REGULAR BREAST EXAMINATIONS ARE**

Currently, the most effective way is magnetic resonance, but this is a costly examination. The effectiveness of mammography is approx. 80%, but this method uses X-rays, which means it does not have a neutral impact on health and can be performed rarely, no more than every two years. Therefore, the search is on for new, better solutions that do not burden the body and that are both accurate and economical. The hybrid ultrasound tomograph created by Dramiński SA, a company from Olsztyn,

is precisely such a device. It combines the diagnostic possibilities of mammography, USG and magnetic resonance and enables cheap, fast and accurate screening tests to be performed.

The hybrid ultrasound tomograph scans the whole of the breast with the use of ultrasound waves with a frequency of 2 MHz from many directions all around, and then processes the data obtained and reconstructs images of selected cross-sections. A special algorithm developed by the team of electronic engineers, acoustical engineers and doctors automatically combines the images obtained by several methods (reflective tomography, transmission tomography, USG) and distinguishes a breast tumour. At the same time, the images obtained characterising the breast tissue with the aid of several different methods enable early detection of breast tumours as well as an assessment of the risk of their malignancy.



## THE TOMOGRAPH FROM OLSZTYN WILL ENTER THE MARKET IN 2019

Diagnostic examinations with the use of the hybrid ultrasound tomograph last a few minutes, are painless, non-invasive and completely safe, which is why they can be performed many times without any risk to the patient.

During the examination, the woman lies in a comfortable position on her stomach with her breast immersed in a container filled with heated distilled water. Over a thousand miniature piezoceramic transducers mounted on the inner side of a ring process the electrical pulses into ultrasound pulses, which are short, repetitive, high frequency and low amplitude mechanical vibrations. Thanks to them, the interior of the breast is detailed in two- and three-dimensional images. The invention is the joint project of the research and development division of Dramiński SA, headed by Vice Chairman Andrzej Wiktorowicz, and a team of scientists from the Faculty of Electronics of Wrocław University of Science and Technology. Tests on patients

THE HYBRID ULTRASOUND TOMOGRAPH COMBINES THE DIAGNOSTIC POSSIBILITIES OF MAMMOGRAPHY, USG AND MAGNETIC RESONANCE AND ENABLES THE PERFORMANCE OF CHEAP, FAST AND ACCURATE EXAMINATIONS.



were carried out in Kraków, and currently in Olsztyn, by the medical company – Centrum Zdrowia Kobiety Gyneka Sp. z o.o. The National Centre for Research and Development supported the project with funding to the amount of almost PLN 7 million from the Smart Growth Operational Programme. The co-financing allowed to fund the cooperation with Wrocław University of Science and Technology and the medical company Gyneka Sp. z o.o.



# BENEFICIARY'S OPINION



**ANDRZEJ WIKTOROWICZ**

VICE CHAIRMAN AND DIRECTOR OF RESEARCH AND DEVELOPMENT OF DRAMIŃSKI SA



*THE PROJECT HAS TAUGHT US COOPERATION WITH SCIENTISTS AND MEDICAL CENTRES, WHICH OPERATE DIFFERENTLY FROM A COMMERCIAL COMPANY*

## HOW WAS THE FUNDING FROM THE NCBR USED?

The money we received from the NCBR allowed us to purchase unique measurement equipment, components to build the prototype, to pay the wages of the team that worked on the ultrasound tomograph and also finance the cooperation with universities. For a company like ours, which has decided to tackle an ambitious construction and research project, this was an important support, without which it would have taken much longer to create the device, and on a more limited scale. Our American competitor, which is working on a similar device, has a bigger budget at its disposal, but it has not yet launched the device on the market due to problems achieving a fast enough reconstruction of images of the structure of the breast.

## WHAT WAS THE BIGGEST BARRIER IN THE IMPLEMENTATION OF THE PROJECT?

We received the money from the NCBR under the fast track; however, this tied our hands with the necessity

of complying with procedures. To launch the prototype, we needed to purchase roughly a thousand rare elements, sometimes having only one producer in the world.

## WHAT IS THE MOST IMPORTANT EXPERIENCE FROM IMPLEMENTING THE PROJECT?

The ultrasound tomograph project has become an impulse for the dynamic development of the research and development division of Dramiński, which will quickly bear fruit in the creation of successive innovative devices. We have made huge progress in developing new, better tomographic ultrasound heads. At the same time, the project has taught us cooperation with scientists and medical centres, which operate differently from a commercial company. As a result of this experience, Dramiński recognises the necessity to conduct research and development works.



## PROJECT

CRUCIAL COMPETENCIES CREATION OF STUDENTS  
OF THE FACULTY OF CHEMISTRY OF RZESZÓW UNIVERSITY OF TECHNOLOGY

**BENEFICIARY:**  
Rzeszów University  
of Technology



**VALUE OF PROJECT:**  
PLN **567 481**



**VALUE OF SUPPORT:**  
PLN **550 457**

**FUNDING:** OPERATIONAL PROGRAMME KNOWLEDGE EDUCATION DEVELOPMENT/COMPETENCES  
IN HIGHER EDUCATION

## CRUCIAL COMPETENCIES CREATION

## OPERATIONAL PROGRAMME KNOWLEDGE EDUCATION DEVELOPMENT

**SINCE JANUARY 2017, THE FACULTY OF CHEMISTRY OF RZESZÓW UNIVERSITY OF TECHNOLOGY HAS BEEN IMPLEMENTING THE PROJECT "CRUCIAL COMPETENCIES CREATION OF STUDENTS OF THE FACULTY OF CHEMISTRY OF RZESZÓW UNIVERSITY OF TECHNOLOGY", AIMED AT STUDENTS STUDYING CHEMICAL TECHNOLOGY AND CHEMICAL AND PROCESS ENGINEERING**



The aim of the project, in which companies and enterprises from the chemical industry are participating, is to develop the practical skills of students in areas connected with their future work.

Under the project, students can carry out additional practical tasks or also participate in certified professional training. However, the most important is the cooperation with potential employers: practical classes and study visits held in industrial plants,

as well as workshops developing language, communication and IT competencies.

During the classes with enterprises the students have the opportunity to get acquainted with the practical aspects of the knowledge acquired at the university. They can learn about effective ways of solving production problems and discuss with practitioners issues that they know from theory – in one word, they can acquire valuable and unique knowledge



**CRUCIAL  
COMPETENCIES  
CREATION**

**OPERATIONAL  
PROGRAMME  
KNOWLEDGE  
EDUCATION  
DEVELOPMENT**



arising from the experience of employees. Representatives of employers also visit the university's labs, carrying out classes with the students in the form of a project.

At the same time, specialist classes are held under the project which develop IT competencies (AutoCAD, Autodesk, Inventor, Aspen), language competencies (seminars, specialist language classes) and social competencies (principles of organising work time and teambuilding).

**THE FOLLOWING PARTICIPATE  
IN THE PROGRAMME:**

Grupa Azoty, ORLEN, CIECH SA, SYNTHOS, LERG SA, Tikkurila, Teknos, FFiL Śnieżka, Automet SA, Cellfast, Tire Company Dębica SA, Olimp Laboratories, Maxpol, Pass Polska, Fibrain, SPLAST, Polimarky, Engel, Asten Group, Sierosławski Group, TEREZ Performance Polymers.



# BENEFICIARY'S OPINION

**JOANNA WOJTURSKA, DSC ENG.**

VICE-DEAN OF EDUCATION  
RZESZÓW UNIVERSITY  
OF TECHNOLOGY



**THE POSSIBILITIES  
CREATED BY THE  
PROGRAMME  
KNOWLEDGE EDUCATION  
DEVELOPMENT CANNOT  
BE OVERESTIMATED**

So far we have implemented over 50 different activities under which almost thirty employers based all around the country have cooperated with us. Enterprises have invited students to visit them, provided access to their production facilities and shown enormous kindness, openness and commitment.

The classes are conducted in small groups with access to production equipment. This allows for practical exercises in production conditions, the perfecting of skills, familiarisation with cutting-edge, innovative solutions, and the creation of trial series that are later tested at the university.

The students did not waste this chance created for them and took advantage of the new opportunities. It means a lot of extra work and time devoted to its implementation, but also satisfaction, additional qualifications and higher competencies.

The implementation of this project is a big organisational challenge for the university and for the enterprises participating in conducting these tasks. Only thanks to the huge commitment of the students, university staff and the employers themselves is it possible to reconcile the programme of studies with the numerous additional classes planned in the project.

In my opinion, as Vice-Dean of Education, the possibilities created by the Operational Programme Knowledge Education Development cannot be overestimated. Rapid changes in the economy and in companies mean that there is a need to transfer knowledge originating directly from the labour market and focused on the future profession. Such expectations are fulfilled by the tasks implemented under this project.

## OPINION OF STUDENTS OF THE FACULTY OF CHEMISTRY OF RZESZÓW UNIVERSITY OF TECHNOLOGY

*The "Crucial competencies creation of students of the faculty of Chemistry of Rzeszów University of Technology" allowed me to acquaint myself with the production profile of many industrial plants from various branches of the chemical industry. Moreover, I had the opportunity to complete certified training, which gives me a better start in my profession.*

*(Paweł Wójcik, student of RUT)*

*I'm very satisfied I took part in the project "Crucial competencies creation" - with each new semester the classes are more and more interesting. The visits to the plants and meetings with the employers bring us closer to our future, potential work.*

*(Sylwia Tomaszewicz, student of RUT)*



## PROJECT

### ACADEMIC STAFF OF THE FUTURE

**BENEFICIARY:**  
Maria Curie-Skłodowska  
University (UMCS)



**VALUE OF PROJECT:**  
PLN **456 938**



**VALUE OF SUPPORT:**  
PLN **443 229**

**FUNDING:** OPERATIONAL PROGRAMME KNOWLEDGE EDUCATION DEVELOPMENT/MANAGEMENT IN HIGHER EDUCATION INSTITUTIONS

# ACADEMIC STAFF OF THE FUTURE

# OPERATIONAL PROGRAMME KNOWLEDGE EDUCATION DEVELOPMENT

**IN APRIL 2017  
THE MARIA CURIE-SKŁODOWSKA  
UNIVERSITY BEGAN IMPLEMENTING  
THE PROJECT "ACADEMIC STAFF  
OF THE FUTURE" UNDER WHICH  
ACADEMIC TEACHING STAFF FROM  
UMCS IMPROVED THEIR TEACHING  
SKILLS OVER ONE YEAR**

The aim of the project was to improve the competences of the didactic staff of UMCS in the scope of innovative didactic skills, IT skills, teaching in a foreign language and information management.

105 people took part in the project. Compulsory training consisted of "Learning-by-doing, or active methods in teaching" and "Innovative methods of presenting data - Creating presentations in Prezi and MS PowerPoint". Each participant of the project benefitted from individual methodological consultations with an educator and a coach. The aim of the meetings was to develop an innovative scenario of classes and their observation. Under the consultations participants were able to obtain feedback on their work with the students.





Additionally, every participant could choose one of three supplementary trainings:

- "Design Thinking moderator course", in other words, methods of creating innovative products and services based on a profound understanding and recognition of the problems and needs of users,
- "Scientific information management component of information competences",
- English language training at C1 level.

102 people successfully completed the project, at the same time improving their didactic competences, which was verified by tests.

#### OPINION OF PARTICIPANTS OF THE PROJECT

**Artur Wysocki, DSc., Faculty of Philosophy and Sociology, UMCS:** *After more than a dozen years of work, I realized more clearly that the current generation of students may have a different perception of reality, other needs and motivation, that is less embedded than my generation in the "print culture" and more in "image and network culture". This awareness allows better adjustment of methods to the assumed learning outcomes.*

*The project was an opportunity for me to exchange experiences with my colleagues from outside my own Institute.*



# BENEFICIARY'S OPINION



**PROF. ALINA ORŁOWSKA, PHD**

VICE-RECTOR OF EDUCATION

MARIA CURIE-SKŁODOWSKA UNIVERSITY



Suitable teaching staff is of key importance in improving the quality of teaching. Their skills, methods used, as well as the way of transferring knowledge have a great impact on shaping the necessary competences for university graduates to start a career.

The training and individual consultations proposed in the project have definitely had an impact on the personal development of the UMCS academic teachers participating in them. In a wider perspective, they will bring positive effects during their classes with the students. The training offered in the project allowed the didactic methods used by teachers to be modernised and made more attractive.


The support was carried out at a high substantive level and was based on workshop methods, during which participants could learn about modern teaching methods in practice.

The staff training sessions improved the IT competences of all the participants. Thanks to them, they are able to use professional databases and use them in the education process. The new skills have also influenced the quality of the teaching materials and multimedia presentations that the teaching staff create, which are now more transparent, consistent and interesting for the students.

## OPINION OF PARTICIPANTS OF THE PROJECT

**Jolanta Rodzoś, DSc., Faculty of Earth Sciences and Spatial Management, UMCS:** *I have greatly developed the skills to activate students, encourage them to be independent and to think creatively, based on simple solutions available to me at any moment. I was shown how to organize a discussion so that it would not be a discussion with one or two people. The methods of guiding students' projects in an effective and at the same time attractive way was revealed to me.*

*I also highly appreciate the usefulness of the methods of evaluation of classes and learning outcomes that I met during individual consultations with trainers. The workshops in which I participated helped me to assess myself as a teacher, to see my strengths and weaknesses, and indicated how to eliminate them.*



## ***PARTICIPATION IN THE PROJECT ACADEMIC STAFF OF THE FUTURE SIGNIFICANTLY CHANGED THE WAY CLASSES ARE TAUGHT***

The project has developed the skills to use online resources and tools for the management of scientific information. In addition, during the training, various types of applications and data sources that enrich the didactic workshop were learned about in practice.

Participants of the English language training, apart from improving their language competences, also learned about useful issues in the academic component, e.g. writing academic texts.

In turn, individual methodological support made each participant aware of the wealth of their own resources and abilities, strengthened creative thinking,

creativity and enabled a diagnosis of any possible competency gaps. Teachers also felt motivated to introduce changes in the didactic process. The great added value of the entire project was the exchange of insights and experiences between the participants who work on a daily basis in different departments.

The results achieved under the project encouraged us to implement other similar projects. In the near future, we will carry out a training project for teaching staff who for various reasons could not benefit from the support offered in the "Academic staff of the future" project.

### **OPINION OF PARTICIPANTS OF THE PROJECT**

**Katarzyna Krzywicka, DSc., Faculty of Political Science, UMCS:** *I learned about new active teaching methods, some of which I use during classes. The benefit that I gained from classes is the awareness of my own potential in the teaching techniques, which I have, and those aspects, that can be further improved.*

*The value of the project is the opportunity to establish contact with colleagues, research and teaching staff from other faculties of UMCS, and exchange mutual experiences. A valuable aspect of the project is also individual methodological support. In this context, I want to emphasize the professionalism of the classes.*



## PROJECT

DEVELOPMENT OF A COMPOSITE PROSTHETIC OF THE MIDDLE EAR WITH BACTERICIDAL PROPERTIES

### BENEFICIARY:

Magdalena Ziąbka, DSc. Eng.  
AGH University of Science  
and Technology



### VALUE OF PROJECT:

PLN 1 190 000



### VALUE OF SUPPORT:

PLN 1 190 000

FUNDING: LIDER PROGRAMME

FUNDING  
YOUNG  
SCIENTISTS

LIDER  
PROGRAMME

## ONE OF THE MOST COMMON AILMENTS ENCOUNTERED IN LARYNGOLOGY IS INFLAMMATION OF THE MIDDLE EAR, WHICH MAY RESULT IN PERMANENT LOSS OF HEARING DUE TO DAMAGE TO THE OSSICULAR CHAIN

The multitude of bacterial strains that cause disease and their increasing resistance to antibiotics increases the risk of damage to the ossicular chain. The only solution to this problem is to recreate its continuity by using implants. Magdalena Ziąbka, DSc. Eng., from AGH University of Science and

Technology in Kraków, is working on the creation of an otoimplant – a laryngeal implant with bactericidal properties that would improve the patients' ability to hear. In laryngology, titanium prostheses of the ossicles are already used; however, research conducted by Ziąbka, DSc. Eng., has made it possible to create a better, lightweight polymer implant with the addition of silver nanoparticles. It has bactericidal properties, accelerates convalescence and reduces the risk of infection and inflammation in the middle ear.

Magdalena Ziąbka, DSc. Eng., received funding from the LIDER programme, under which young scientists can apply for money to implement ideas and set up their own research teams. This support has allowed her to continue her work, which has lasted since 2006, including clinical trials. The otoimplant research included, among others, assessment of biological properties, biocompatibility, bactericidal properties and physicochemical properties.



THE FIRST  
IMPLANT  
OPERATION

Photo: Maciej Bernaś/ KSAF AGH  
In the photo: Prof. Jacek Składzień, MD.

Based on the obtained results, implants with the best mechanical parameters and the highest bactericidal effectiveness were selected. Then, biocompatibility tests were carried out, implanting the implants into animal muscle tissues.

In spring 2017, as part of the clinical trials, the first otoimplants were implanted in six patients with hearing loss. The research is carried out in the Clinical Department of Otolaryngology of the University Hospital in Kraków. Currently, patients are undergoing audiological and laryngological tests. In the case of all patients, improved hearing and no inflammation have been observed. Soon, the otoimplant created at AGH University of Science and Technology will help to improve the hearing for patients with a damaged ossicular chain due to inflammation, injury or congenital anomalies.





# BENEFICIARY'S OPINION

**MAGDALENA ZIĄBKA, DSC. ENG.**

FACULTY OF MATERIALS SCIENCE AND CERAMICS  
AGH UNIVERSITY OF SCIENCE AND TECHNOLOGY



*THE MONEY FROM THE  
LIDER PROGRAMME  
GIVES US SCIENTIFIC  
FREEDOM AND ALLOWS  
CREATIVITY*

## WHAT WAS THE MONEY YOU RECEIVED FROM THE LIDER PROGRAMME ALLOCATED TO?

Thanks to the funding from the NCBR, I was able to create my own interdisciplinary team. I invited biologists, biotechnicians, doctors, materials engineers, and people monitoring clinical trials to cooperate on the project. Together we went through the whole development cycle of the invention, from materials testing, in vitro biological testing on bacteria and cells, and in vivo testing on animals, to clinical trials with the participation of patients.

The research was conducted by AGH University of Science and Technology, University of Gdańsk and the Jagiellonian University, while the implant operations and clinical research was conducted in the University Hospital in Kraków. For the first time in Poland a technical university was the initiator of clinical research.

## WHAT EXPERIENCE DID YOU GAIN FROM THE PROGRAMME?

A big challenge for me as a scientist was negotiating agreements between universities, obtaining permission for experiments and consent to conduct clinical trials. This lasted 14 months. But it was highly satisfying seeing the patient after the operation, who could immediately notice an improvement in hearing. It is wonderful that the effect of my work is not stuffed away in a drawer, but helps people hear.

## WHAT ADVICE DO YOU GIVE TO YOUNG SCIENTISTS APPLYING FOR NCBR FUNDING OF PROJECTS?

That they should not be afraid of independence. The money from the LIDER programme gives us scientific freedom and allows creativity. Thanks to this we can plan and conduct research exactly how we want, implementing our own, individual scientific ideas.



### ABOUT THE LIDER PROGRAMME

In the National Centre for Research and Development's LIDER programme, young scientists can apply for money to implement ideas and set up their own research teams.

In this way, not only is the development of their scientific competences supported, but also the ability to manage a research project. The programme prepares young scientists to start with their own ideas and apply for funds for research at the European level. The LIDER programme is of an elite nature and is a unique undertaking in Poland. Its aim is to strengthen the competitiveness of Polish science and to support a new generation of scientists capable of achieving

success on a European and global scale. It also contributes to the global trend of creating specialized instruments for financing research conducted by young scientists.

The main goal of the programme is to broaden the competences of young scientists in independent planning of work, management of the work and management of their own teams during the implementation of research projects, the results of which can be implemented in the economy. The maximum amount of funding for the project in the eighth call for proposals amounted to PLN 1.2 million.



## PROJECT

**DIAMSEC – ULTRA-SENSITIVE SENSORY PLATFORM FOR RAPID DETECTION OF EPIDEMIOLOGICAL AND PANDEMIC THREATS**

**BENEFICIARY:**

Consortium POLI-DIAMENT, comprising of Gdańsk University of Technology (Project Leader), Łódź University of Technology, Warsaw University of Technology and SensDx Sp. z o. o.



**VALUE OF PROJECT:**

**PLN 7 449 484**



**VALUE OF SUPPORT:**

**PLN 6 863 879**

**FUNDING:** STRATEGIC PROGRAMMES/MODERN MATERIALS TECHNOLOGY/TECHMATSTRATEG

**DEVELOPMENT  
OF MEDICINE**

**STRATEGIC  
PROGRAMME  
TECHMATSTRATEG**

**IT IS DIFFICULT FOR A DOCTOR TO DETERMINE ON THE BASIS OF SYMPTOMS WHETHER WE HAVE A BACTERIAL OR VIRAL INFECTION. SOON HELP WILL BE PROVIDED BY THE SENSOR OF THE COMPANY SENSDX, WHICH IS BEING CREATED WITH MONEY FROM THE TECHMATSTRATEG PROGRAMME**

This will help to significantly reduce the number of cases where the doctor unnecessarily prescribes antibiotics – and Poles are in the top ten countries using the most antibiotics in the world. The sensor will be the size of a glucometer. It is enough to place a sample of saliva or nasal secretion on the interchangeable disposable tip and wait a moment for the result. A chemical connector that captures proteins found in influenza viruses is embedded on a plate made from a diamond substrate. When virus proteins are present, an electrical signal is sent indicating that an infection has occurred – even at an early stage of infection.

SensDx in cooperation with the Gdańsk, Łódź and Warsaw Universities of Technology is working in parallel on several similar biosensors that will be able to identify respiratory, genital and urinary infections, as well as find application in veterinary medicine.



The diamond that is used in the biosensors is produced artificially at a temperature of up to 1000°C



From the electrochemical point of view, diamond is better than gold, more sensitive and stable

One sensor will be able to identify several types of viruses at the same time. The device will be cheap, provide rapid diagnosis, and – despite the advanced biotechnology used for the construction of the test – it will be very simple to use.

Current methods of testing disease biomarkers, based on laboratory analysis of blood, saliva or urine of the patient, are time-consuming, which delays diagnosis and reduces the effectiveness of treatment. In addition, these methods have insufficient sensitivity to detect low levels of relevant pathogens, for example in the early stages of the disease.

The technology developed by SensDx is now ready for implementation, the finishing work on preparing the sensor for mass production is in progress.

### HOW DOES THE BIOSENSOR DETECT INFLUENZA?

*A chemical connector with the transferred antibodies is embedded on the plate (diamond substrate). The antibodies pick up proteins that are repeated in all strains of influenza.*

*If a single protein hits an antibody, the electrical parameters change and the sensor shows that an infection has occurred. If there is no virus, the electrochemical signal is low.*

*The biosensor can detect the virus even in the early stages of the disease.*



# BENEFICIARY'S OPINION

**DAWID NIDZWORSKI, DSC.**  
VICE-PRESIDENT OF SENSDX



***THE CONDITION FOR  
SUCCESS IS THE  
PROPOSED SOLUTIONS  
WHICH CARRY THE  
POTENTIAL FOR  
COMMERCIALISATION***

## **WHAT WAS THE MONEY YOU RECEIVED FOR THE DIAMSEC PROJECT ALLOCATED TO?**

We began as a two-person team, and now in several companies, including SensDx, there are 40 people. The following specialists are employed on employment contracts: biotechnologists, biochemists, chemists, and electronics engineers – specialists in robotics, automation and software – not counting people who cooperate with us. We have a laboratory and research team comparable to those existing at major universities.

We used some of the money to rent labs and equipment, and also on reagents.

Co-funding from the NCBR guarantees project security – we can maintain the pace of work, we are financially stable and therefore reliable for universities cooperating with us. Without the money from the NCBR, our development would have been much slower or completely impossible.

## **THE GROUP THAT SENSDX BELONGS TO HAS OBTAINED FUNDING FROM THE NCBR FOR EIGHT PROJECTS. WHAT DO YOU ADVISE OTHERS WHO ARE APPLYING FOR FUNDING OF PROJECTS ALONG THIS PATH?**

It pays to think about the product in the context of its commercialisation, to have a vision of existing in the market, of building distribution channels. The experts from the NCBR that assess the projects pick up on whether someone has such a vision, or on the contrary, whether their only goal is to obtain funding.

The condition for success is to propose solutions that do not exist beyond the research phase. They must also be possible in production and carry with them the potential for commercialisation.



**TELEMEDICINE, OR "REMOTE MEDICINE"**

This is a solution which allows diagnosis without the need to leave home and includes the test for detecting the influenza virus or other infections of the upper respiratory tract. Ultimately, such a test will enable the patient to remain at home - he will be able to perform the test and send the results to the doctor, who will recommend the next measures, and write out a prescription and sick leave. SensDX is also interested in tests identifying the presence of oncological biomarkers and the early signs of aneurysms.

**STRATEGIC  
PROGRAMME  
TECHNOSTRATEG**



## STRATEGIC PROGRAMMES

Strategic research and development programmes operate under big budgets and are a result of the science and innovation policy supporting the development of our country. The basis for their preparation is the National Research Programme, adopted by way of resolution of the Council of Ministers on 16 August 2011. The National Research Programme defines the strategic directions for research and development. The Board of the National Centre for Research and Development prepares strategic programme projects according to the directions set forth in the strategic programmes and submits them for approval by the Minister of Science and Higher Education.

A strategic programme comprises projects aimed at solving specific technical, scientific or social problems. They are implemented by selecting research teams and other producers by way of competition.



### TECHMATSTRATEG

Modern materials technology

#### PROGRAMME BUDGET UNTIL 2021 – PLN 500 MILLION

One of the key areas for the development of the country is the development of new, durable and resilient construction materials that will be safe for health and the environment. To accomplish this task, the strategic programme "Modern materials technologies" – TECHMATSTRATEG – was established.

The programme includes five strategic problem areas resulting from the National Research Programme and at the same time consistent with the priority directions of research conducted in the European Union and in the world, i.e.:

- technologies of construction materials,
- technologies of photonic and nanoelectronic materials,
- technologies of functional materials and materials with designed properties,
- waste-free material technologies and technologies of biodegradable engineering materials,

- material technologies for energy storage and transmission.

The result of the projects implemented under the programme will be the development and preparation of the roll-out of new products, techniques and technologies with an application in the fields covered by the programme. The addressees of the programme are scientific consortia consisting of at least three organizational units, one or more of which is a scientific unit and one or more – an entrepreneur.

#### In 2017:

- we formally and substantively assessed 48 applications and settled the results of call for proposals I,
- we considered 2 appeals against the decision to refuse to grant co-financing,
- we concluded 13 contracts for implementation and co-financing of projects,
- we prepared the documentation of call for proposals II.



## BIOSTRATEG

Natural environment, agriculture and forestry

### PROGRAMME BUDGET UNTIL 2019 – PLN 500 MILLION

The programme stimulates the growth of innovation and competitiveness of the Polish economy, especially in agriculture, forestry and related industries: agri-food and wood. The result of the projects implemented under the programme will be the development and preparation of the roll-out of new products, techniques and technologies as well as other solutions with an application in the fields covered by the programme.

The programme covers five strategic areas, resulting directly from the National Research Programme and consistent with the priority directions of research currently conducted in the European Union and the world. These areas are:

- food security,
- rational management of natural resources, with special emphasis on water management,
- counteraction and adaptation to climate change, with special emphasis on agriculture,
- protection of biodiversity and sustainable development of agricultural production space,
- forestry and wood industry.

The recipients of the programme are scientific consortia, which consist of at least three organizational units.

#### In 2017:

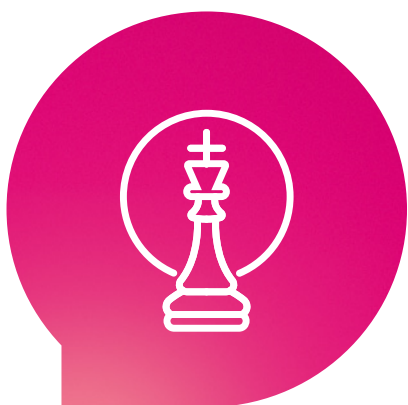
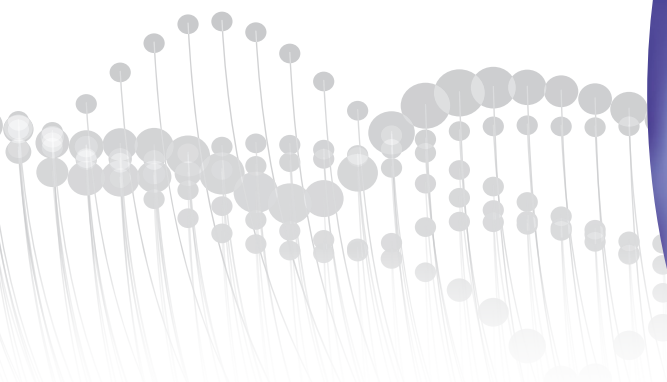
- we substantively assessed 72 applications and settled the results of call for proposals III,
- we considered 2 protests against the formal assessment and 27 appeals against the decision to refuse to grant co-financing,
- we undertook negotiations with 15 applicants,
- we concluded 8 contracts for implementation and co-financing of projects of call for proposals III,
- we monitored a total of 21 projects from calls for proposals I and II,
- we signed 16 annexes to agreements from calls for proposals I and II,
- we evaluated 21 periodic reports under calls for proposals I and II,
- we began evaluating the implementation of the programme.

#### Results of the implementation of the BIOSTRATEG programme in 2017:

**22** patent applications

**91** publications in renowned journals

**65** new products (techniques, technology, models, products, methods and procedures)



## GOSPOSTRATEG

Social and economic development of Poland in globalising markets

### PROGRAMME BUDGET UNTIL 2019 – PLN 500 MILLION

The task of the programme is to improve the quality and effectiveness of the country's development policy in various areas in order to raise the civilisation level of Poland, improve the quality of life of society, and fulfil the development aspirations of current and future generations in accordance with the principle of sustainable development.

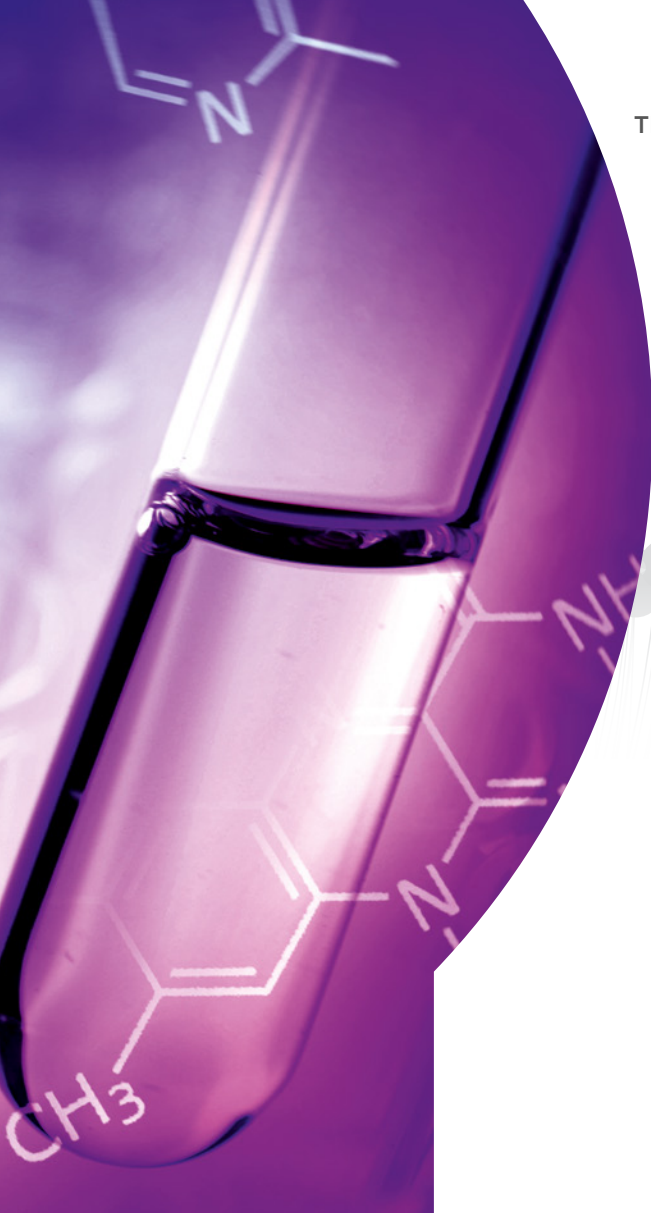
The programme operates in four thematic areas:

- middle-income trap and average product trap,
- imbalance trap,
- demographic trap,
- institutional weakness trap.

The programme is addressed to scientific consortia comprised of at least three organisational units. At least two of them should be scientific units, and one, an entity able to implement solutions that are the result of the realisation of the project.

#### In 2017:

- we prepared the competition documentation and announced call for proposals I for open projects,
- we announced call for proposals I for open projects under the programme,
- we conducted a call for proposals in the OFS system,
- we began assessing 78 applications for co-financing submitted under the competition procedure.



# INNOVATION IN SCIENCE



## STRATEGMED

Prevention and treatment of civilisation diseases

### TOTAL PROGRAMME BUDGET – PLN 800 MILLION

The programme responds to the needs of an aging population, higher incidence of chronic illnesses, and rising costs of medical care. Its main goal is to achieve substantial progress in combating civilisation diseases and in regenerative medicine based on R&D efforts in four areas: cardiology and cardiac surgery, oncology, neuroscience and the senses, and regenerative medicine.

The programme also stimulates the growth of innovation and competitiveness of the Polish economy in such areas as biotechnology and biomedical engineering. The projects will bring about the development and implementation of new preventive, diagnostic, therapeutic and rehabilitation methods. The programme is addressed to scientific consortia comprised of at least five organisational units, of which at least one is a scientific unit and at least one is an enterprise.

### In 2017:

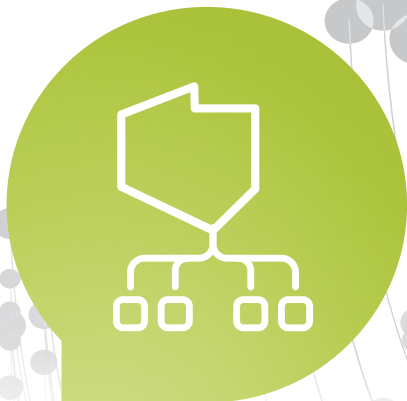
- we monitored 43 projects implemented under calls for proposals I-III,
- we signed 9 agreements under call for proposals III and 1 agreement under call for proposals II,
- we signed 32 annexes to agreements monitored under calls for proposals I-III,
- we submitted 33 reports and evaluated 28 periodic reports under calls for proposals I and II,
- we began cooperation and negotiations regarding the possibility of continuing the programme.

### Results of the implementation of the STRATEGMED programme in 2017:

**13** patent applications

**64** publications in renowned journals

**69** new research teams to implement projects under the programme



## DOMESTIC PROGRAMMES

The task of the National Centre for Research and Development is – in accordance with the Act of 30 April 2010 on the National Centre for Research and Development – to support the creation of modern solutions and technologies that increase innovation and thus the competitiveness of the Polish economy. The Centre's activities are aimed at strengthening cooperation between Polish business and contributing to the commercialization of the results of scientific research for the benefit of the Polish economy. We implement these objectives through programmes supporting applied research and R&D, financing the commercialization and transfer of results to the economy, as well as supporting the development of young scientific staff. We implement these tasks in cooperation with other entities – creating joint undertakings and sectoral programmes.



### CUBR

Programme of support for R&D for the non-ferrous metal industry

### TOTAL PROGRAMME BUDGET – PLN 200 MLN

CuBR is a joint undertaking of the NCBR and KGHM Polska Miedź SA. It aims to develop and implement innovative technologies, equipment, materials, and products to increase the competitiveness of the Polish non-ferrous metal industry, which in the long-term will secure the position of the world's leader for the industry, especially in the field of copper production.

The programme's strategy envisages an improvement in the efficiency of the manufacturing process through investment in new technologies, modernisation of infrastructure, development of new mining technologies, new solutions in the field of operating systems, effective industrial risk management, and development of the resources base through the exploitation of deep-lying deposits. The effectiveness of these initiatives depends, among others, on the comprehensiveness and quality of research and the possibilities of its implementation.

The project covers four areas:

- mining and geology,
- ore processing,
- metallurgy, manufacturing, new materials,
- environmental protection, risk management, business efficiency.

The programme is addressed to scientific consortia.

### In 2017:

- we monitored the implementation of a total of 21 projects,
- we completed the assessment of applications and settled the results of call for proposals III,
- we signed 9 agreements for projects under call for proposals III,
- we signed 18 annexes to agreements on the performance and financing of the projects,
- we evaluated 19 periodic reports,
- we began work on a new formula of the call for proposals along with documentation for call for proposals IV.

### Results of the implementation of the CUBR programme in 2017:

**17** new technological and materials solutions

**9** publications in renowned journals





## TECHNOLOGY, RESEARCH AND DEVELOPMENT



### TANGO

Project to strengthen cooperation between scientists and entrepreneurs

TANGO is a joint undertaking of the NCBR and the National Science Centre (NCN) aimed at supporting research institutions in marketing innovative technologies, products and services, as well as strengthening collaboration between scientists and entrepreneurs. It is used to finance such initiatives as developing the concept of commercialisation of research results, acquisition of partners interested in the implementation of these results and securing intellectual property rights.

The programme is addressed to entities carrying out basic research projects financed, for example, by the NCN, as part of the following programmes: Opus, Harmonia, Sonata, Sonata Bis, and Maestro, as well as by grants awarded by the Ministry of Science and Higher Education. The programme is addressed to scientific units, scientific centres, research organisations, and individual scientists.

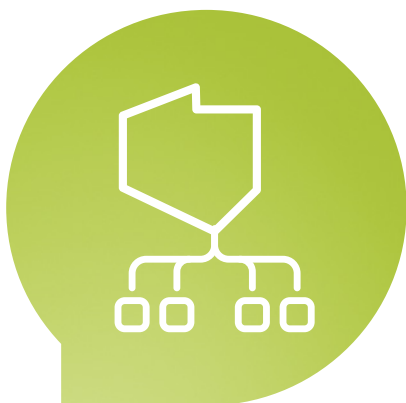
#### In 2017:

- we monitored the implementation of 66 projects from call for proposals I,
- we signed 25 agreements from call for proposals II,
- we evaluated 9 periodic reports,
- we evaluated 3 final reports,
- we signed 19 annexes to agreements.

#### Results of the implementation of the TANGO programme in 2017:

**5** new enterprises for cooperation

**806 000** PLN contributed by entrepreneurs as own contribution



## LIDER

Programme of support for young scientists

The main objective of the LIDER programme is to broaden the competences of young scientists to independently plan, manage, and lead their own research teams during the implementation of research projects whose results can be implemented in the economy. The programme also stimulates collaboration between scientists and entrepreneurs by supporting research that can possibly be commercialised.

### Lider III - VIII

- we supervised/settled 132 projects in progress with a total value of PLN 149.7 million.

### In 2017 under the Lider VIII competition:

- 183 applications were submitted with a value of PLN 202.21 million,
- we selected for co-financing 35 projects with a value of PLN 40.3 million,
- we signed 32 agreements for co-financing with a total value of PLN 36.7 million,
- the allocation amounted to PLN 40 million.

Since the beginning of the LIDER programme, 361 scientific units have taken part, and we have succeeded in establishing cooperation with 317 of them. As a result of the implementation of the programme, 499 innovative solutions have been presented. Young scientists have submitted a total of 334 utility models, roll-outs and patent applications. 1,319 scientific articles have been published in renowned international journals.



## CYBERSECIDENT

Cybersecurity and e-Identity

The research and development programme Cyber-Secident - Cybersecurity and e-Identity is aimed at scientific consortia conducting industrial research and development work aimed at increasing the security of the country's cyberspace by increasing the availability of hardware and programming solutions. The programme focuses on technological solutions that facilitate cooperation and coordination of activities between various security domains of cyberspace, with special emphasis on digital identity. The project is implemented in cooperation with the Ministry of Digitization.

The programme is addressed to scientific consortia, which include scientific units and enterprises.

### In 2017:

#### Call for proposals I: allocation PLN 70 million

- we formally and substantively assessed 10 submitted applications,
- we signed 4 agreements for co-financing and implementation of the project,
- we signed 1 annexe to an agreement,
- we awarded co-financing to the amount of over PLN 47 million.

#### Call for proposals II: allocation PLN 31.7 million

- we formally and substantively assessed 15 submitted applications,
- we published a ranking of 6 projects recommended for co-financing with a total value of over PLN 64 million.



## PANDA 2

Programme for support of costs of maintaining research infrastructure

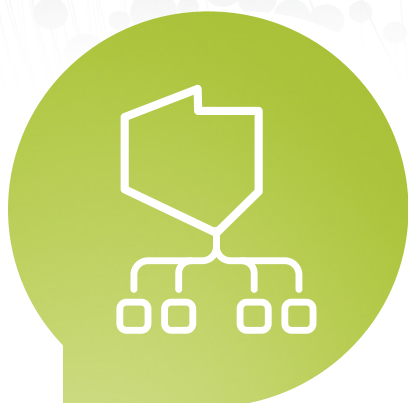
### PROGRAMME BUDGET UNTIL 2020 – PLN 250 MILLION

The PANDA2 programme is addressed to centres conducting scientific research or development work and working for the dissemination of science. The aim of the programme is to support the maintenance of R&D infrastructure with a value of at least PLN 50 million, established under the Operational Programme Innovative Economy, and enabling external entities to conduct research. The budget allocated for co-financing projects amounts to PLN 50 million per year.

The programme is addressed to beneficiaries of projects of the second round of the Operational Programme Innovative Economy, for whom co-financing amounted to at least PLN 50 million.

### In 2017:

- we monitored 16 projects.



**RID**

Development of Road Innovations

## TOTAL PROGRAMME BUDGET – PLN 50 MILLION

RID is a joint undertaking of the NCBR and the General Directorate of National Roads and Motorways. Its purpose is to support the construction and transformation of road infrastructure meeting economic efficiency criteria and having a positive impact on increasing the competitiveness of the Polish economy. The programme finances research and development projects in this area.

The recipients of the programme are scientific consortia.

### In 2017:

- we monitored 15 projects,
- we signed 24 annexes to agreements,
- we evaluated 15 periodic reports.

### Results of the implementation of the RID programme in 2017:

**46** publications in renowned journals

**1** patent obtained

**47** masters theses

**2** engineer theses

**124** papers delivered at sectoral conferences



# SUPPORT FOR SOCIAL INITIATIVES



## SOCIAL INNOVATIONS

Support for social technical and technological innovations

A programme of support for the science sector, business environment and the NGO sector in the field of undertaking and implementing innovative social activities and initiatives based on the achievements of science and technology. The programme is aimed at individuals undertaking activities that are to stimulate social development and improve the quality of life within society. The main aim of the programme is to improve the quality of life of society, with special emphasis on those groups and areas in which there is a real need for innovative solutions and new social initiatives. The specific objectives of the programme are: an increase in the number of implementations of innovative technical solutions and innovative products, services and procedures that allow solving complex social problems and an increase in intersectoral cooperation at the local, regional and national level.

The programme is aimed at research units, consortia and entrepreneurs.

### In 2017:

- we monitored 25 projects, from calls for proposals I-II,
- we signed 5 annexes to agreements,
- we evaluated 25 periodic reports,
- we evaluated 12 final reports,
- we settled 13 agreements for the performance and funding of projects,
- we completed the mid-term evaluation of the programme (2016 Q3 - 2017 Q1).

### Results of the implementation of the Social Innovations programme in 2017:

**8** intersectoral initiatives for society

**23** innovative solutions (technology, procedures, services)



## SMART GROWTH OPERATIONAL PROGRAMME

The Smart Growth Operational Programme (SGOP) is financed from funds of the European Regional Development Fund. It is the biggest programme in the European Union devoted to the development of research and the creation of innovation. The aim of the programme is to support R&D projects – co-financing is provided for the implementation of the projects, which cover industrial research and development.

The calls for proposals are carried out separately for small and medium-sized enterprises (SMEs) and for large enterprises and consortia.



### Measure 1.2

#### SECTORAL R&D PROGRAMMES

Sectoral programmes help implement large R&D undertakings important for the development of individual industries or sectors of the economy. They are intended to strengthen their innovativeness and competitiveness in international markets.

The joint ventures are initiated in the sectoral programmes by a group of companies that act on behalf of the industry – e.g. through a technology platform or cluster initiative. This means that they need to agree in which segments they see the greatest potential for innovative development and differentiation

in the world. Next, the group needs to provide an outline of the research agenda together with a specific R&D request. Co-financing is granted to projects that include industrial research and experimental development or experimental development only in the areas indicated. Above all, we support projects that match the National Smart Specialisation, including new specialisations, discovered in the innovation development of companies and industries. The beneficiaries of projects co-financed under this mechanism can be entrepreneurs or business consortia.

In the years 2015-2023 almost EUR 875 million will be available for the co-financing of sectoral projects.

In 2017 the following sectoral programmes were implemented:



### INNOSBZ

The sectoral programme INNOSBZ was initiated by the Polish Platform for Technology of Unmanned Systems. The programme aims to increase the competitiveness and innovativeness of the Polish unmanned systems production sector in the global market by 2026. Support under the INNOSBZ programme covers such thematic areas as unmanned aircraft, unmanned land platforms, unmanned platforms operating in a water environment, subsystems, subcomponents and technologies for unmanned platforms and industrial applications for unmanned systems.

#### In 2017:

- we signed 11 agreements with a total amount of co-financing of approx. PLN 44 million,
- we announced call for proposals II, which is planned to be settled in 2018 Q1; the amount allocated for co-financing projects under call for proposals II is PLN 50 million.



### PBSE

The sectoral programme PBSE was created on the initiative of the Polish Electricity Committee. The programme aims to increase the innovativeness of Poland's national power sector. We are committed to increasing the energy efficiency of the sector while reducing its negative impact on the environment. Therefore, we place special emphasis on increasing the share of energy obtained from renewable energy sources (RES), increasing the sector's readiness for intensive development of pro-consumer energy, and reducing the level of pollutant emissions generated by enterprises.

#### In 2017:

- we announced and settled call for proposals I, resulting in the signing of 23 agreements for a total amount of co-financing of PLN 88 million,
- we announced call for proposals II, which is planned to be settled in 2018 Q2; the amount allocated for co-financing is PLN 120 million.



### INNOTEXTILE

The programme was initiated by the Association of Employers of the Clothing and Textile Industry "PIOT". The aim of INNOTEXTILE is to increase the competitiveness and innovativeness of the Polish textile sector by 2023. We intend to make our technologies and production processes more technologically advanced and environmentally friendly. Under the programme we also support projects aimed at developing a sustainable market of raw materials for the textile industry. We also want to build modern IT systems for designing, producing and distributing textiles and clothing.

#### In 2017:

- we signed 10 agreements for a total amount of co-financing of approx. PLN 22 million with beneficiaries selected in the call for proposals from 2016 (allocation PLN 60 million).



### GAMEINN

The sectoral programme GameINN was initiated by the Polish Games Association and aims to increase the competitiveness of the Polish sector of producers of video games in the global market by 2023.

Projects from various areas can apply for support from the programme, including video game design and development, platform development, engines and processing techniques, application of artificial intelligence, development of new tools and interaction mechanisms, digital distribution and multiplayer online games, tools and knowledge supporting the game development process, and extending the application of technologies and tools to other fields.

#### In 2017:

- we signed 38 agreements for an amount of approx. PLN 114 million with beneficiaries selected in call for proposals I (allocation PLN 117 million),
- we planned and settled call for proposals II (allocation PLN 100 million),
- we signed 35 agreements with beneficiaries selected in call for proposals II for a total amount of approx. PLN 85 million.



## INNOSTAL

The sectoral programme INNOSTAL aims to increase the competitiveness and innovativeness of the Polish steel industry. The programme was initiated by the Polish Steel Association.

Support under the INNOSTAL programme focuses on the following:

- technology for manufacturing new, improved steel products,
- development of new and improved batch materials and alloys for metallurgical production,
- recovery and recycling of raw materials from metallurgical waste and scrap,
- optimization of energy consumption, batch materials, utilities, and metallurgical tools and equipment,
- development of innovative systems and technologies that reduce harmful emissions to the environment,
- development of innovative solutions to modernize and support metallurgical technological processes.

### In 2017:

- we signed 20 agreements for a total amount of approx. PLN 134 million with beneficiaries selected in call for proposals I announced in 2016,
- we announced call for proposals II (allocation PLN 95 million), which is planned to be settled in the second half of 2018.



## IUSER

The sectoral programme IUSER was initiated by the National Chamber of Commerce for Electronics and Telecommunications. The main aim of the programme is to increase the international competitiveness of the sector of producers of smart devices and systems for energy generation and the management of systems and elements of dispersed generation. Under the programme, we want to support the involvement of enterprises in research and development and thus increase the number of innovative products and processes and their implementation in the sector. We expect that the products and processes developed under the programme will contribute to the overall improvement of the energy efficiency of the economy.

The areas supported under the IUSER programme are primarily the following:

- energy storage in end user systems,
- control of generation and energy in dispersed systems of end users,
- development of technologies aimed at increasing energy efficiency,
- development of technology for the construction of the Internet of Things devices,
- development of systems, devices and software that improve the security of critical infrastructure networks.

### In 2017:

- we prepared and announced two calls for proposals,
- we settled call for proposals I,
- we signed 10 agreements for an amount of approx. PLN 42 million,
- the results of the second competition, whose budget initially amounts to PLN 150 million, will be announced in 2018 Q3.





## CUTTING-EDGE SOLUTIONS



### INNOCHEM

The sectoral programme INNOCHEM aims to improve the competitive position of the Polish chemical sector on global markets by strengthening the ability to generate innovative solutions in cooperation with scientists. The programme was initiated by the Polish Chamber of Chemical Industry (PIPC) and will last until 2023. The programme will support, among others, projects covering the extraction of raw materials and the production of core products and specialist products. We also want the programme to result in the development of new technologies (in particular the optimisation of current processes), including low-emission production technology.

#### In 2017:

- we announced and settled call for proposals II (allocation PLN 180 million),
- we signed 19 agreements for a total amount of co-financing of approx. PLN 80 million.



### INNOTABOR

The sectoral programme INNOTABOR was established at the request of an initiative group consisting of Pojazdy Szynowe PESA Bydgoszcz SA, NEWAG SA, Wagony Świdnica SA, Europejskie Konsorcjum Kolejowe Wagon Sp. z o.o., H. Cegielski Fabryka Pojazdów Szynowych Sp. z o.o. and Solaris Bus & Coach SA. The programme aims to increase the innovativeness and competitiveness of the Polish rolling stock sector by 2023.

The activities of the INNOTABOR programme focus on the following areas:

- development and implementation of modern construction solutions and technologies in high-speed vehicles and railway vehicles that meet the requirements of the applicable Technical Specifications for Interoperability,
- development and implementation of modern structural and technological solutions in the main sub-components of rail vehicles,
- development of means of transport in urban agglomerations and metropolitan areas,
- development of special vehicles meeting high requirements in the processes of maintenance and testing of modern infrastructure.

#### In 2017:

- we settled call for proposals I (allocation PLN 196 million),
- we signed 11 agreements for a total amount of co-financing of approx. PLN 130 million.



## INNOMOTO

The sectoral programme INNOMOTO was initiated by the Agreement for the sectoral programme of scientific research and development works "INNOMOTO", which includes the Industrial Automotive Institute, the Polish Chamber of Automotive Industry, the Polish Automotive Industry Association, the Association of Distributors and Manufacturers of Automotive Parts, the Association of Employers of Automotive and Industrial Goods, and the Association of Automotive Industry Employers.

INNOMOTO's main aim is to increase the innovativeness and competitiveness of the Polish automotive sector by 2026. Under the programme, we will support, among others, projects that will result in the development of innovative technologies of manufacturing, regeneration, recovery and recycling. We want the implementation of the programme to result in modern, innovative vehicles and propulsion systems as well as innovative systems, components, and parts for use in vehicles.

### In 2017:

- we planned and settled call for proposals I (allocation PLN 254 million),
- we signed 42 agreements for a total amount of co-financing of approx. PLN 202 million.



## WOODINN

The sectoral programme WoodINN was initiated by the partnership of Key Entities of Wood and Forestry Technologies WOOD-STRATEG and a consortium of furniture companies and a scientific institute. Its main aim is to increase the competitiveness and innovativeness of the Polish forestry, wood and furniture sector on the international arena. We also want to increase the research and development activity and innovativeness of the entities in this sector. We would like the programme to contribute to a reduction in the negative impact of the forestry, wood and furniture sector on the environment.

The WoodINN programme covers the following research areas:

- modern raw materials and materials for the forestry, wood and furniture sector,
- innovative products of the forestry, wood and furniture sector with unique functions and utility properties,
- innovative production technologies and manufacturing processes in the forestry, wood and furniture sector.

### In 2017:

- we announced and settled call for proposals I (allocation PLN 120 million),
- we signed 12 agreements for a total amount of co-financing of over PLN 34 million.



### INNONEUROPHARM

The sectoral programme InnoNeuroPharm was initiated by the Polish Association of Pharmaceutical Industry Employers (PZPPF). Above all, the programme aims to increase the competitiveness and innovativeness of the Polish pharmaceutical sector, including neuromedicine. The task of the programme is to support the research and development activities of pharmaceutical sector entities (particularly neuromedicine) and assist the development of measures leading to an increase in innovation in the sector.

The activities of the InnoNeuroPharm programme focus on the following research areas:

- innovative medicinal products,
- innovative technologies for the production of medicinal products,
- innovative diagnostic methods and new biomarkers with practical diagnostic-predictive applications in the field of neuromedicine,
- innovative methods of rehabilitation of patients in neuromedicine,
- development of tools supporting research into medicinal products.

#### In 2017:

- we announced and settled call for proposals I (allocation PLN 190 million),
- we signed 13 agreements for a total amount of co-financing of approx. PLN 144 million.



### INNOVATIVE RECYCLING

The sectoral programme INNOVATIVE RECYCLING was initiated by the Chamber of Non-Ferrous Metals and Recycling. The programme aims to increase the innovativeness of the country's minerals and wood recycling sector. In implementing this programme, we want to increase the research and development activity of the entities in this sector and thus increase the number of innovations. Under the programme we also put emphasis on activities leading to an improvement in the condition of the natural environment, including the introduction of sustainable management of natural resources in production.

The INNOVATIVE RECYCLING programme covers the following research areas:

- non-ferrous metal sector waste,
- mining waste from hard coal,
- waste from glass, ceramics and building materials,
- wood waste.

#### In 2017:

- we planned and settled call for proposals I (allocation PLN 90 million),
- we signed 12 agreements for a total amount of co-financing of approx. PLN 49 million.



## **Sub-Measure 1.1** INDUSTRIAL RESEARCH AND DEVELOPMENT PERFORMED BY ENTERPRISES



### **FAST TRACK**

We are the first public institution in Poland to have introduced a market-based financing system that reduces paperwork to a minimum and shortens decision time to 60 days after submission of documents. All this is to enable entrepreneurs to launch their planned investments and improve their innovativeness as quickly as possible.

The aim of this part of the Smart Growth Operational Programme is to support R&D projects implemented by enterprises. We provide co-financing for investment projects that include industrial R&D or just development projects (projects that do not include development works are not eligible for funding). The entrepreneur – the programme's beneficiary – may delegate part of the R&D work to a subcontractor. However, each call for proposals defines the limit for the value of work that can be subcontracted to third parties.

Calls for proposals are conducted separately for SMEs and for large enterprises.

In 2017 we opened and announced the results of a total of 6 calls for proposals, of which 4 calls for proposals were targeted at SMEs and 2 aimed at large enterprises.

### **Results of activities in 2017: SMEs**

- in call for proposals I (planned budget – PLN 1.087 billion) we evaluated 342 applications and signed 112 agreements,
- in call for proposals III "SME small projects" (planned budget – PLN 150 million) we evaluated 334 applications and signed 94 agreements,

- in call for proposals IV (planned budget – PLN 50 million) for projects awarded the certificate "Seal of Excellence", i.e. projects that had earlier obtained a positive evaluation but had not been awarded co-financing, we evaluated 13 applications and signed 4 agreements,

- in call for proposals V (planned budget – PLN 1 billion) offering co-financing of works related to the preparation of implementation of research results which as a result will enable commercialisation of the research, we received 510 applications and signed one agreement. Some of the applications will be evaluated in 2018.

In 2017 we also continued work related to calls for proposals announced a year earlier. Finalising calls for proposals I and III of 2016, we signed 57 and 67 agreements respectively.

### **Results of activities in 2017: large enterprises and consortia**

- in call for proposals II (planned budget – PLN 698 million) we evaluated 65 applications and signed 37 agreements,
- in call for proposals VI (planned budget – PLN 350 million) offering co-financing of works preparing the implementation and commercialisation of the project, we received 92 applications, of which the full evaluation will be completed in 2018.

In 2017 we also continued work related to calls for proposals announced in previous years: we signed 23 agreements under call for proposals II of 2016, and finalising call for proposals II of 2015, we signed an agreement with one applicant.



## DEVELOPMENT OF INDUSTRY



### Sub-measure 4.1.1

#### STRATEGIC RESEARCH PROGRAMMES FOR THE ECONOMY

We offer funding for research and development projects carried out by either scientific consortia or scientific and industrial consortia. We want to encourage scientific institutions and scientific and industrial consortia to carry out R&D on new technological solutions generating results that will meet the needs of specific companies and public entities, including local governments.

Our activities are carried out in two stages:

- selection of strategic research programmes indicating areas in which the work conducted

will answer technological problems defined by an entrepreneur or public entity,

- selection and evaluation of projects covering the carrying out of research and development works on issues defined in the strategic programme.

The funding is provided based on the "joint venture" formula, in which enterprises or public entities participate on the one hand, and the National Centre for Research and Development participates on the other hand. In 2017, five joint ventures were implemented – three in which NCBR's partners were enterprises, and two in which they were public entities.

## JOINT SUCCESS



### JOINT VENTURE INGA

In 2017, we signed an implementation agreement for the implementation of the INGA Joint Venture (WP INGA), consisting in the support of research and development in the gas industry. The programme is implemented by the NCBR in cooperation with Polskie Górnictwo Naftowe i Gazownictwo SA (PGNiG) and the Gas Transmission Operator GAZ-SYSTEM SA (GAZ-SYSTEM).

The main objective of the INGA Joint Venture is to increase the innovation and competitiveness of the Polish gas industry on the global market. In particular, it aims to bring about faster implementation of innovation in this area, improve the efficiency of the Polish gas industry and reduce its negative impact on the environment.

In 2017, a research agenda was prepared, a WP INGA agreement was signed, and draft documentation for the call for proposals was prepared.



### JOINT VENTURE SYNChem

The SYNChem Joint Venture is implemented in cooperation with SYNTHOS SA. It is a programme to increase the competitiveness of the Polish chemical industry. In particular, its goal is to support activities promoting innovative technologies in the chemical industry.

In 2017, the call for proposals announced in 2016 was settled. Three contracts for co-financing were signed.



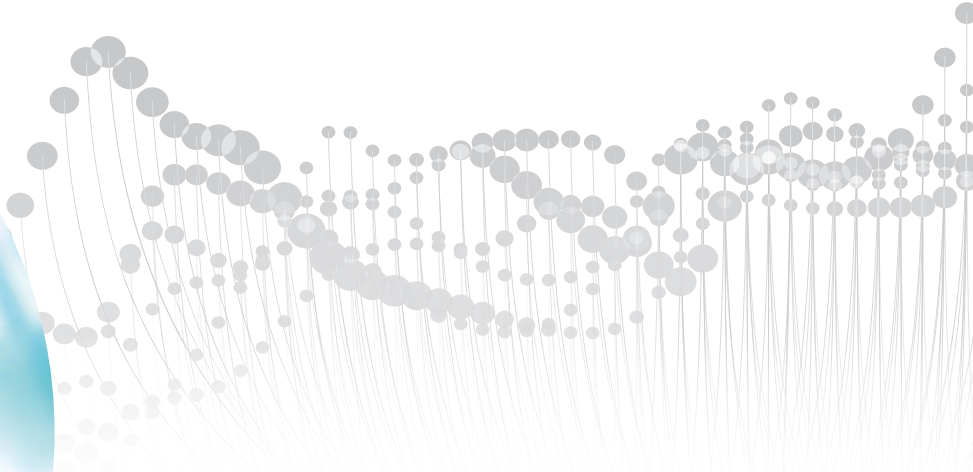
### JOINT VENTURE BRIK

The Joint Venture "BRIK - Research and Development in Railway Infrastructure" is a programme supporting research and development in railway infrastructure implemented by NCBR and PKP Polskie Linie Kolejowe SA. The main goal of the project is to increase the innovativeness and competitiveness of rail transport in Poland. The specific tasks of the programme include:

- digitalization and processing of railway traffic parameters,
- increasing the availability and durability of facilities related to travel services,
- increasing the resistance of railway infrastructure to climatic factors and interference of third parties,
- improving the maintenance and modernization process of the railway infrastructure.

We would like the programme to result in a greater number of innovative solutions, higher operational efficiency, and better management of railway infrastructure, as well as a reduction in the negative impact of railway transport on the environment.

In 2017, a call for proposals was announced with a budget of PLN 50 million (NCBR - PLN 25 million, PKP PLK SA - PLN 25 million). The call for proposals will be settled in 2018.



### JOINT VENTURE WITH ŁÓDZKIE VOIVODESHIP

The main objective of the NCBR and Łódzkie Voivodeship Joint Venture is to support the R&D activities of the Łódź province's economy and science aimed at halting and reversing the negative life expectancy trends, as well as incidence of civilization and metabolic diseases. We would like the programme to result in more activity on the part of research centres and greater involvement on the part of enterprises operating in this area.

In 2017, we signed an agreement on the implementation of the joint venture. The announcement of the call for proposals was postponed to the first quarter of 2018.



### JOINT VENTURE WITH LUBELSKIE VOIVODESHIP

The Joint Venture "Lublin Upland of Photonic Technologies" is a support programme for industrial research and development in the field of photonic technology implemented by the NCBR and Lubelskie Voivodeship. As part of the programme, we co-finance projects selected in calls for proposals organized independently by both partners. The NCBR calls for proposals include industrial research projects, and the Lubelskie Voivodeship calls for proposals cover development projects.

The main objective of the joint venture is to increase the ability of the Lublin area's economy and science to create and commercialize knowledge in the field of photonic technology. The programme is intended to increase the activity of scientific units in the field of photonics and encourage enterprises operating in this area to finance research and development.

In the programme budget, the NCBR and Lubelskie Voivodeship participate in equal parts - each contributing PLN 35 million.

In 2017, we signed an agreement on the implementation of the joint venture and announced a call for proposals that will be settled in 2018.



### Sub-measure 4.1.2 REGIONAL SCIENTIFIC RESEARCH AGENDAS

The Regional Scientific Research Agendas (RANB) make it possible to coordinate research and development works conducted by scientific and industrial consortia, in which the leader is a scientific unit. The Agendas make it possible to select the most promising projects in terms of the greatest impact on the economic development of Poland and its individual regions.

The first stage of the programme determined the thematic scope of the research agendas, while the call for proposals for co-financing R&D projects was conducted at the second stage based on criteria accepted by the OP Smart Development Monitoring Committee.

In 2017, we signed 22 agreements for a total amount of PLN 67 million as a result of the settlement of the call for proposals of the previous year (allocation PLN 400 million).

We announced the next call for proposals with a budget of PLN 340 million, and in response we received 114 applications. 35 projects were recommended for co-financing for a total amount of PLN 138 million.



## Sub-measure 4.1.4

### APPLICATION PROJECTS

Under the programme, we support R&D projects carried out by scientific and industrial consortia. The expected results of projects applying for co-financing should bring new knowledge to the current state of science and technique on a global scale.

In 2017 we announced a call for proposals with a budget of PLN 200 million, which attracted 29 applications. We signed 23 agreements for a total amount of over PLN 106 million.



## Measure 4.2

### DEVELOPMENT OF MODERN RESEARCH INFRASTRUCTURE OF THE SCIENCE SECTOR

Under this programme we support national and international research infrastructure projects located on the Polish Road Map for Research Infrastructures and at the same time provide access to this infrastructure to entrepreneurs and other stakeholders. Projects cannot duplicate existing resources and should complement the existing R&D infrastructure. Applicants should present a research agenda complying with the National Smart Specialisation, a plan for the use of the R&D infrastructure after project completion, and a plan for financing the maintenance of the R&D infrastructure after project completion.

In 2017 we announced a call for proposals with a budget of PLN 550 million, which will be settled in 2018.



## Measure 4.3

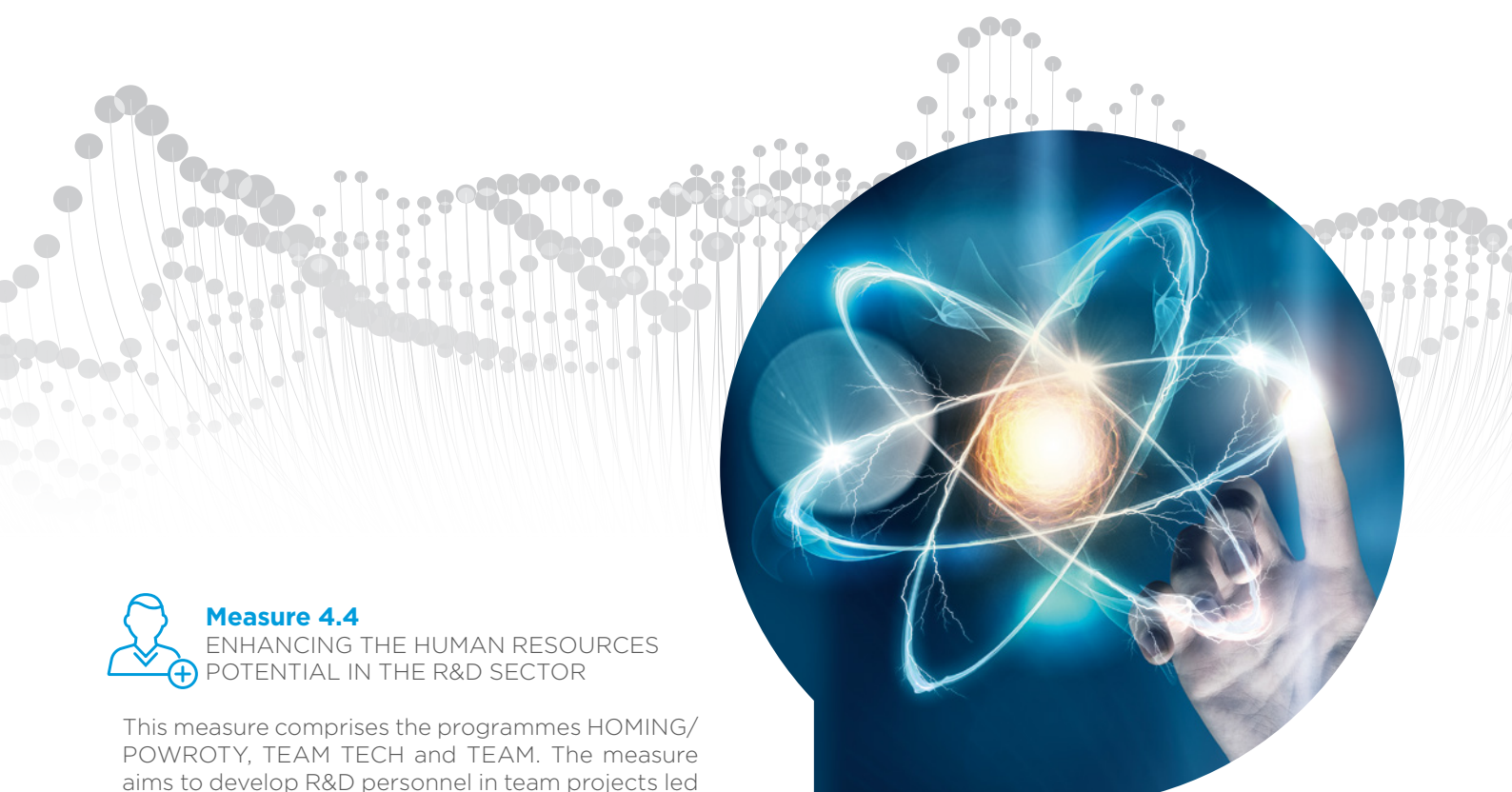
### INTERNATIONAL RESEARCH AGENDAS

The International Research Agendas (IRA) are organised by the Foundation for Polish Science (FNP), which is responsible, among others, for the recruitment and monitoring of the grant projects selected in the calls for proposals, as well as accounting for their implementation. The NCBR is responsible for substantive and financial supervision over the FNP.

International Research Agendas are research programmes created by applicants and world-renowned scientists in the area of the scientific institution's expertise. The programme aims to create specialised, world-class scientific institutions in Poland applying the world's best practices in identifying programmes and research topics, HR policy and R&D management, and commercialisation of R&D results. The total amount allocated to support the entities selected in all calls for proposals in the IRA programme is over PLN 532 million.

In 2017, under measure 4.3 International Research Agendas, 25 applications were submitted, of which 6 were granted co-financing, with a total amount of funding exceeding PLN 224 million. In addition, 4 calls for proposals were announced with a total budget of PLN 640 million, which will be settled in 2018.





**Measure 4.4**  
ENHANCING THE HUMAN RESOURCES  
POTENTIAL IN THE R&D SECTOR

This measure comprises the programmes HOMING/POWROTY, TEAM TECH and TEAM. The measure aims to develop R&D personnel in team projects led by scientists (regardless of their nationality) who have outstanding experience in implementing research results in the economy or providing research services or operating research equipment for business clients.

The Foundation for Polish Science (FNP) is responsible for recruitment, monitoring and accounting for the implementation of the grant projects selected in the calls for proposals, while the NCBR is responsible for substantive and financial supervision over the Foundation.



**HOMING/POWROTY**

Through this programme we want to support the development of R&D personnel in scientific units and enterprises in Poland. The programme consists of three components, and the total amount allocated for its implementation is PLN 205 million.



**HOMING**

The addressees are young scientists from around the world working in the most innovative areas – regardless of nationality, but with special emphasis on outstanding scientists of Polish origin, who the programme aims to encourage to return to Poland. In 2017, the FNP selected 8 winners in one of the two announced calls for proposals, awarding total funding of PLN 6.2 million. Call for proposals II will be settled in 2018.



**POWROTY**

Under this measure, post-doctoral internship projects are funded for young scientists from around the world who specialize in the most innovative areas and return to research work after a break. In 2017, as a result of the settlement of one of the two announced calls for proposals, the FNP signed agreements with 4 scientific units for a total amount of PLN 3.1 million. Call for proposals II will be settled in 2018.



**FIRST TEAM**

Support is aimed at the first research teams conducted by scientists with a PhD degree at early stages of their scientific career. Teams that can apply for the funding must conduct research in scientific units or enterprises in Poland, work in the most innovative areas and have a scientific partner. The programme aims to encourage outstanding scientists of Polish origin to return to Poland as well as encourage people to return to R&D after a break in research work.

In 2017, as a result of the settlement of one of the two announced calls for proposals, the FNP signed 9 contracts for a total amount of co-financing of almost PLN 26 million. Call for proposals II will be settled in 2018.



## TEAM

The aim of the TEAM programme is to develop the R&D staff in team projects led by eminent scientists from around the world (regardless of their nationality) in scientific units, enterprises or scientific and industrial consortia in Poland, working in the most innovative areas, with the participation of a foreign partner.

This programme is intended to enable people starting their scientific career – students, doctoral students or young PhD scientists – to gain experience in conducting R&D work during the implementation of ground-breaking international scientific research of major importance for the economy and society. The total amount allocated for the implementation of the TEAM programme is PLN 205 million.

In 2017, three calls for proposals were announced in the TEAM programme. Two of them were settled: in the first one 13 contracts were signed for a total amount of PLN 44.6 million, and under the second one, 11 projects were recommended for a total amount of PLN 37 million.



## TEAM TECH

This programme is intended to enable people starting their scientific career – students, doctoral students or young PhD scientists – to gain experience in conducting R&D work during the implementation of a project into the development of a technology, process or innovative product (TEAM TECH call for proposals) as well as the creation and development of research services using advanced research equipment (Core Facility call for proposals). The total amount allocated for the TEAM TECH programme is PLN 205.3 million.

In 2017, as a result of the settlement of two calls for proposals, 7 agreements were signed for a total amount of PLN 24 million, and another 7 projects were recommended for co-financing in the amount of PLN 20 million.



**Sub-measure 1.3.2**

PUBLIC-PRIVATE FINANCING OF R&D INVOLVING THE PARTICIPATION OF VENTURE CAPITAL FUNDS - NCBR VC



**NCBR VC**

The aim of the programme is to support the commercialisation of industrial research and development with the participation of venture capital funds already at the early stages of project financing. By creating it, we want to increase the scale of commercialisation of the results of R&D projects in Poland through cooperation of the NCBR and private entities from Poland and abroad.

Under the NCBR VC, we will create a Fund's Fund managed by a professional Fund's Fund Manager who, in accordance with the adopted Investment Strategy, will select several teams managing VC Funds (each with an indicative capitalization of EUR 50-200 million), specializing in investments in companies developing advanced technologies, being at various stages of development and operating in various industries.

The Venture Capital Fund (VC) management teams, seeking to generate a profit on the capital contributed by the Fund of Funds and investors, will create new enterprises or invest in existing companies from the high technology sector and take care of their competitiveness. Thanks to the connections of the management teams (personal, capital, institutional) with global participants of the venture capital industry, a stable system of capital financing for innovative enterprises will be created in Poland.

Such a system of commercialisation of high-risk scientific research was not previously available in Poland. In light of American, Korean and Israeli experience, the programme will ensure more effective development of Polish innovative technology.

In 2017 we created two Funds of Funds, which are managed by professional managers of Funds of Funds. Co-financing allocated for the performance of tasks amounts to PLN 1,073 million.



**Sub-measure 1.3.1**

FINANCING R&D PROJECTS IN THE PRESEED PHASE BY PROOF OF CONCEPT FUNDS - BRIDGE ALPHA



**BRIDGE ALPHA**

Our goal in creating the BRIDGE Alpha programme was to build a network of investment vehicles in the form of proof of concept funds, whose task is to verify and approve R&D projects at a very early stage of development (in the so-called pre-seed phase). In this way we want to increase the number of technological and biotechnological projects in the early stage equity investment market.

Under the programme we provide support for R&D projects implemented by Polish scientific units, financing their test phase (proof of principle) and capitalizing the companies established on the basis of the approved projects.

The budget of one fund vehicle ranges between PLN 10 million and PLN 30 million, while non-refundable co-financing by the NCBR does not exceed 80 percent. The remaining part must be contributed by the entrepreneurs-investors. An individual project can usually expect funding of up to PLN 1 million, and in justified cases up to PLN 3 million.

In 2017, under call for proposals II, 44 applications were recommended for a total amount of PLN 1,438 million.



## DEFENCE AND SECURITY

Programme for strengthening national security.



### FUTURE TECHNOLOGIES FOR DEFENCE

Call for proposals for young scientists

The National Centre for Research and Development, in agreement with the Minister of Defence and the Minister of Internal Affairs, conducts activities related to research on national security and defence.

Undertakings that will have a real impact on strengthening Polish national security receive funding under calls for proposals. The programmes and projects aim not only to increase the potential of Polish scientific and industrial entities, but also to support technological independence through the creation of Polish know-how in national security and defence.

As part of scientific research for national security and defence, in 2017 we prepared and announced:

#### Call for proposals No. 2/P/2017 "YOUNG SCIENTISTS 2017"

Projects submitted in the programme should develop innovative technological solutions and achievements or develop the operational capabilities of the Armed Forces of the Republic of Poland and services responsible for security in the following areas:

- cyber defence,
- autonomous unmanned platforms,
- missile air defence technologies.

Scientific units, scientific consortia, scientific and industrial centres, and enterprises were eligible to take part in the call for proposals.



## OPERATIONAL PROGRAMME DIGITAL POLAND

The programme aims to strengthen and take advantage of the digital potential of the Polish economy to improve the quality of life of society, among others, by ensuring universal access to the internet, implementing effective and user-friendly public e-services, and improving the digital skills of society.



### Measure 3.3 e-PIONIER

The "e-Pionier" project is carried out under measure 3.3 of Operating Programme Digital Poland. We support young, talented programmers and engineers in implementing ideas that have a chance to bring solutions to significant social or economic problems – we know them thanks to cooperation with units of public institutions. In two calls for proposals we selected so-called accelerators, which

ensure business and technological support for the most promising ideas. The NCBR not only contributes to the creation of new, needed solutions, but also at the same time builds for them a market – the solutions respond to reported problems.

In 2017 we carried out the second, and last, call for proposals under measure e-Pionier – 4 accelerators received almost PLN 40 million for the implementation of their projects.



## OPERATIONAL PROGRAMME KNOWLEDGE EDUCATION DEVELOPMENT



### Measure 3.1

#### COMPETENCES IN HIGHER EDUCATION

Our aim in this measure is to improve the skills of people participating in higher education so that they meet the needs of the economy, labour market and society. We achieve this through the following types of projects:

- development and implementation of educational programmes tailored to the needs of the economy, the labour market and society,
- improving the skills of people participating in higher education in areas that are key to the economy and development of the country, and based on the demand reported by employers/ employers' organizations,
- supporting institutions assisting students in starting their professional activity on the labour market (e.g. academic career offices).

In 2017, we settled one call for proposals announced in 2016:

#### COPERNICUS PATHWAYS 2.0

Number of projects selected for co-financing

37

Value of signed agreements for co-financing

PLN 7 067 820

In 2017 we announced 6 calls for proposals, of which 4 were settled:

#### YOU STUDY? PRACTICE! (call for proposals II)

Number of projects selected for co-financing

196

Value of signed agreements for co-financing

PLN 266 508 094

#### ACADEMIC CAREER OFFICE (call for proposals II)

Number of projects selected for co-financing

33

Value of signed agreements for co-financing

PLN 14 603 565

#### SUPPORT FOR THE BUSINESS SERVICES SECTOR

Number of projects selected for co-financing

15

Value of signed agreements for co-financing

PLN 16 525 373

#### STAFF DEVELOPMENT FOR THE CAR INDUSTRY

Number of projects selected for co-financing

9

Value of signed agreements for co-financing

PLN 11 114 144

In November and December 2017, we announced two calls for proposals:

#### YOUNG EXPLORER UNIVERSITY

#### DUAL STUDIES



**THE POWER OF EDUCATION**



**Measure 3.2**  
DOCTORAL STUDIES

Our aim here is primarily to improve the quality and the effectiveness of education at the level of doctoral studies. We want to achieve this, among others, by supporting international doctoral studies programmes and interdisciplinary doctoral programmes on a national or international scale, as well as supporting doctoral studies in key areas for the economy and society, developing innovation and ensuring commercialization of the results of studies.

In 2017 we settled one call for proposals announced in 2016:

**INTERDISCIPLINARY PROGRAMMES OF DOCTORAL STUDIES**

Number of projects selected for co-financing

**47**

Value of signed agreements for co-financing

**PLN 116 300 341**

In 2017 we announced one call for proposals:

**INTERDISCIPLINARY PROGRAMMES OF DOCTORAL STUDIES** (call for proposals II)

By the end of 2017 this call for proposals had not been settled.



## **Measure 3.4** MANAGEMENT IN HIGHER EDUCATION INSTITUTIONS

Our aim in this measure is to support organisational changes and improve the skills of staff in the higher education system. We achieve this by organising projects in the following areas:

- implementation at universities of changes in the management of the education process, in particular, IT management tools, such as the creation of a central repository system of diploma theses, operation of so-called anti-plagiarism programmes, creation of open educational resources and IT support of didactic processes,
- supporting university consolidation processes,
- improving the didactic competences of the teaching staff in the field of innovative teaching skills, IT skills, including the use of professional databases and their use in the education process, teaching in foreign languages, and information management,

- improvement of managerial skills of managerial and administrative staff in universities, such as team management and financial management, as well as support for university structures related to the use of financial resources.

In 2017 one call for proposals was settled that was announced a year earlier:

### **RAISING THE COMPETENCES OF TEACHING STAFF**

Number of projects selected for co-financing	<b>51</b>
Value of signed agreements for co-financing	<b>PLN 24 281 325</b>

In 2017 we announced one call for proposals:

### **RAISING THE COMPETENCES OF TEACHING STAFF**

Number of projects selected for co-financing	<b>17</b>
Value of signed agreements for co-financing	<b>PLN 4 186 235</b>





# KEY TO SUCCESS



## Measure 3.5

COMPREHENSIVE PROGRAMMES OF HIGHER EDUCATION SCHOOLS

Our aim in this measure is to improve the skills of people participating in higher education so that they meet the needs of the economy, labour market and society. We want to achieve this, among others, by improving the quality and effectiveness of education at a doctoral studies level, improving access to international education programmes for Polish and foreign students, as well as supporting organisational changes and improving the competences of higher education staff.

In 2017 we announced 3 calls for proposals:

**INTEGRATED SUPPORT PROGRAMMES FOR UNIVERSITIES** - path I

**INTEGRATED SUPPORT PROGRAMMES FOR UNIVERSITIES** - path II

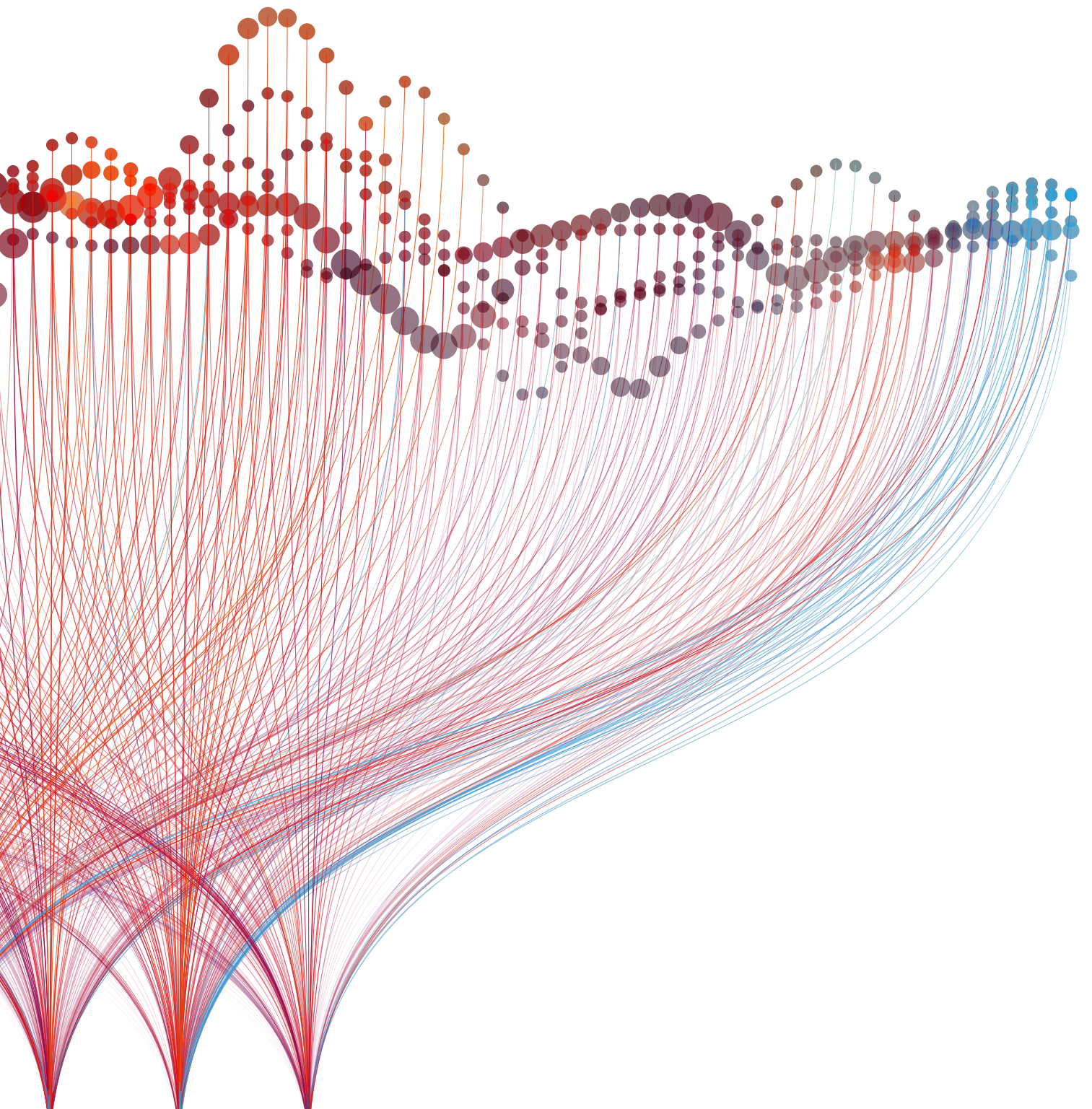
**INTEGRATED SUPPORT PROGRAMMES FOR UNIVERSITIES** - path III

Number of projects selected for co-financing

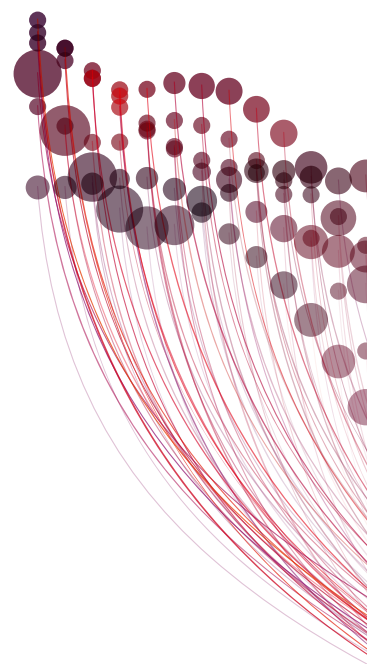
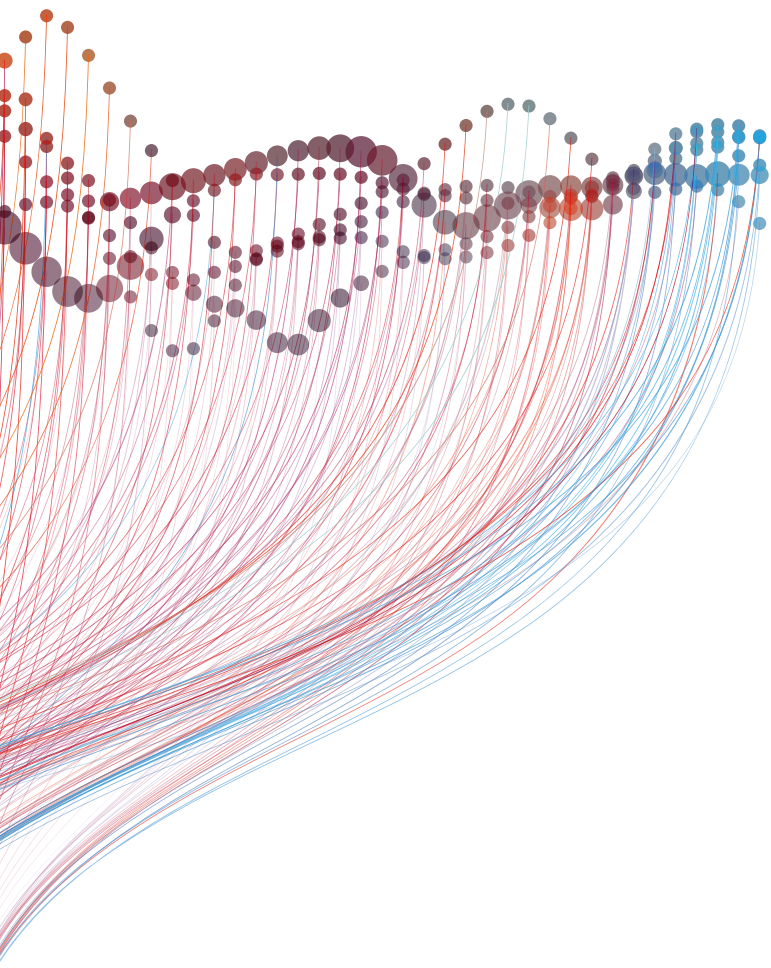
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Value of signed agreements for co-financing

PLN 368 667 793







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