Annual Report

The National Centre
for Research and Development

Annual Report 2016

of the National Centre for Research and Development

The National Centre for Research and Development
47a Nowogrodzka Str.
00-695, Warsaw
Poland

NCBR

in numbers

807 contracts signed

value of entrepreneurs' own contribution
over **PLN 1,6 billion**

value of beneficiaries' own contribution
over **PLN 1,7 billion**

value of contracts signed
over **PLN 5,6 billion**

81 calls for proposals organised

2 699
projects monitored

total value of projects served
over **PLN 11,6 billion**

over **PLN 3 billion** budget for 2016

over **PLN 3 billion**
budget for 2017

Table of contents

Prof. Maciej Chorowski, DSc, Eng.

National Centre for Research and Development

It is my pleasure as a representative of the National Centre for Research and Development to present to you the 2016 edition of NCBR Annual Report. It provides a summary of the Centre's initiatives that support R&D efforts in Poland and cooperation between science and business.

For us, last year was a time of many new challenges and determined efforts aimed at supporting and commercialising projects in the priority areas for the national economy. We continued implementation of ongoing programmes, but also launched new initiatives for various industries, e.g for the automotive industry, video game producers, the power industry, steel and textiles, and even manufacturers of unmanned systems. In this way, NCBR grants are available today to an increasing number of Polish entrepreneurs. We have already spent PLN 34 billion to finance R&D, which makes the Centre the largest governmental agency supporting R&D activities in Central Europe.

Innovative projects created by NCBR beneficiaries are successfully competing today in foreign markets, and their successful implementation will have a significant impact on the shape of the Polish economy in the coming years. We are aware, however, that technological progress must go hand in hand with the development of competent staff and the effective transfer of knowledge between academic and business centres. That is why we launch numerous calls for proposals as part the Operational Programme Knowledge Education Development. They lead to the increase of the number and improve the quality of student internship programmes, but they also contribute to raising the competences of the academic staff.

The NCBR celebrates its 10th anniversary this year. From the very beginning, we have supported the most promising projects, offering their authors financial support and business know-how. At the same time, we have undertaken initiatives aimed at creating favourable conditions for conducting research in Poland. At the end of last year, we launched the first Corporate Venture Capital Fund of Funds - NCBR CVC. Its objective is to finance projects in the form of capital investments in technology companies from the SME sector. It is a milestone that will facilitate the commercialisation of innovative ideas.

I believe that this new financing instrument will complement the innovative ecosystem created by the NCBR and will help make the best use of the great potential of Polish researchers and entrepreneurs.

Prof. Maciej Chorowski, DSc, Eng.

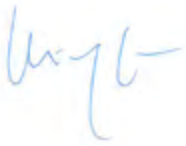
Anna Rogut, DSc, University of Social Sciences professor

Chair of the Council
National Centre for Research and Development

The National Centre for Research and Development's role and importance in the Polish ecosystem of innovation support has been systematically growing. Last year was a period of intense work for the NCBR Council to continue this trend. As a result we, i.a., developed, conducted public consultations, and subsequently approved the provisions of a strategic R&D programme focusing on the social and economic development of Poland. This is already the fourth strategic programme developed by the Council. At the same time, we initiated work on yet another programme, this time involving advanced information, telecommunication, and mechatronics technologies. The Council also actively participated in the process of evaluating and verifying strategic programmes initiated earlier. We attended meetings with steering committees, jointly assessed the outcomes, and discussed further ways to increase the effectiveness of our actions.

Last year the Council also actively worked towards extending the NCBR's programme offering. Consequently, we launched further sectoral programmes, supporting projects with the highest development potential in the pharmaceutical, forestry-woodworking and furniture sectors, as well as the recycling of minerals and wood industry.

The strategic and sectoral programmes launched by the NCBR, complemented by other national and international projects, lay the groundwork for the development of the Polish R&D sector and are the driving force of the innovative economy. We are delighted to support Polish scientists and entrepreneurs, at the same time being proud of every single project that has been implemented. The cooperation of the scientific community with business continuously improves thanks to the contribution of all our partners who care deeply for the development of Polish technological thought. I would like to take this opportunity to thank them for their commitment and express my hope that our fruitful cooperation will be continued.



Anna Rogut, DSc, University of Social Sciences professor

Key events of 2016

Bonus for the successful commercialisation of research results

Together with the Ministry of Science and Higher Education, we announced the PANDA 2 call for proposals to co-finance the maintenance of research infrastructure that serves the commercialization of R&D initiatives. Universities and research centres that cooperate effectively with business may obtain a total of PLN 250 million

Programme tailor-made for the industry. Millions for the textile sector

We announced the first INNOTEXTILE call for proposals for the textile sector. Individual entrepreneurs and entrepreneur consortia that attempt to create new technologies and innovative projects for the textile and clothing industry may apply for co-financing under the call for proposals with a budget of PLN 60 million.

Investment in students' competences – a call for proposals for universities cooperating with business

Under the Operational Programme Knowledge Education Development (OP KED), we announced the next edition of the call for proposals "Competence Development Programme". Universities will receive co-financing for: certified training and workshops, additional courses organised with employers, practical project tasks, study visits to employers, and internships. We want to spend PLN 250 million on these projects. In total, the program should involve 12,500 students, and the maximum value of support per participant in the project totals PLN 20,000.

NCBR's new call for proposals "Philsophical Education" goes beyond university walls

We announced a call for proposals for "Philosophical Education" at universities. The projects selected will encourage the teaching staff of universities to cooperate with junior high schools and secondary schools. The NCBR will allocate a total of PLN 5 million to co-finance electives in philosophy, and the value of one project will amount to a maximum of PLN 100,000.

PLN 145 million for "International Education Programmes"

We announced the call for proposals "International Education Programmes". It aims at facilitating access to international study programs, developing educational offer in foreign languages, and inviting distinguished foreign lecturers to Poland. It is addressed at students from Poland and foreign students at Polish universities. The universities selected in the call for proposals will have a total of PLN 145 million to share. The value of a single project depends on the size of the university and can range from PLN 1.5 million to PLN 5 million. One participant may receive a grant of up to PLN 30,000.

PLN 30 million for the development of the chemical industry

The new SYNChem programme, which we jointly announced with Synthos SA, the first European manufacturer of emulsion rubber, aims to support R&D work on a new generation of products in the chemical industry. Together we will invest PLN 60 million in a ratio of one to one. As part of the programme, co-financed from Operational Programme Smart Growth (OP SG), scientific and industrial consortia will be able to apply for R&D funding for a new generation of products, i.e. ecological anti-degradants, high performance elastomers, biopesticides, fibres, and composites for industry and medicine.

Call for high-flying proposals –PLN 50 million for innovative UAVs

We launched a new sectoral programme InnoSBZ, which aims to support innovative solutions in the Polish unmanned systems industry (UVS). In the first edition of this call for proposals, as part of Measure 1.2 "Sectoral R&D programmes",

entrepreneurs and business consortia had the opportunity to co-finance research on civilian, unmanned aircraft and platforms and related technologies. Applicants submitted proposals for a total amount of PLN 50 million.

The NCBR donated PLN 800 million to new technologies in medicine

We completed the third and final call for proposals in the Strategic Programme "Prevention and Treatment of Civilization Diseases" – STRATEGMED. Nine scientific and industrial consortia received over PLN 141 million for R&D efforts in the field of oncology, cardiology, neurology, and regenerative medicine. They will work on the application of 3D printing technology to create bionic pancreas, an innovative method for the diagnosis and treatment of epilepsy and neurodevelopmental disorders in children or new applications of telemedicine in the medical care of patients with heart failure.

Under the STRATEGMED programme, carried out since 2012, we have selected 44 R&D projects offering co-financing with a total value of PLN 800 million.

PLN 132 million for staff training at universities

We plan to spend PLN 132 million on improving the competences of teaching staff at Polish universities. Support can be obtained by participating in calls for proposals under Measure 3.4 OP KED "Management in Higher Education Institutions". The call for proposals will select projects aimed at training university staff. The support will be offered to a total of over 7,000 employees.

PLN 5 million to follow the "Copernicus's Paths 2.0"

We announced the call for proposals "Copernicus's Paths 2.0" under the OP KED. Higher education institutions and their partners will be invited to apply for PLN 5 million for designing and implementing unconventional courses aimed at raising the youth's curiosity, creativity and willingness to deepen their knowledge. Each idea selected in the call for proposals will receive a maximum of PLN 250,000.

PZU and the NCBR will build a venture capital ecosystem in Poland

Together with PZU Group, under the auspices of the Ministry of Science and Higher Education and the Ministry of Development, we are establishing the Witelo Fund, which will be created as FIZAN – a closed-end investment fund of non-public assets managed by TFI PZU. It will invest in leading global venture capital funds to promote Poland as a place to invest and implement innovative projects. Investment resources of the entire Witelo programme will initially total PLN 500 million.

The NCBR will support the pioneers of digital Poland

We launched e-Pioneer – a new programme targeting the ICT sector. In cooperation with specialized accelerators, we will finance innovative projects under the PCP (pre-commercial procurement) model. In the PCP formula, the contracting authority reports a specific problem that has not yet been answered by the market in the form of an identified solution. The role of the accelerators will be to liaise between public institutions and interdisciplinary teams, including e.g. programmers. A total of PLN 50 million will be allocated to the first call for proposals.

Polish innovation on a global scale supported by the of NCBR

The call for proposals under Measure 4.1.4 OP SG "Application Projects" is addressed at consortia composed of scientific entities and entrepreneurs. It aims to support the best R&D projects in the field of industrial research and experimental development, leading to creating Polish solutions that are unique on a global scale. The budget of the call for proposals is PLN 200 million.

Innovative companies from Poland to conquer foreign markets

Laser technology of bacterial identification, digital wallet platform or a device for foetal heart rate monitoring are the products created by Polish entrepreneurs among the 32 winning projects under the GO_GLOBAL.PL call for proposals. Their authors will receive a total of PLN 5 million in co-financing for foreign expansion.

PLN 250 million to support innovation in the automotive industry

INNOMOTO is our next new sectoral programme intended to act as an "insurance policy" for manufacturers of cars, car parts and accessories, protecting them against the risk of investing in innovation. It is about increasing the number of internationally competitive solutions developed by Polish research centres and companies. Prototypes of autonomous cars, ultralight vehicles or e-bus powertrain systems are examples of innovative projects that will be eligible for funding under the programme. We will spend PLN 250 million for such innovative solutions.

Two new catalysts of innovation in the Polish power industry

We created the new PBSE and IUSER programmes to boost the competitiveness of this strategically important sector for the Polish economy. These instruments are complementary: the first will be used to produce new products, e.g. power generation equipment using perovskites, and the other will support the systems for their management, e.g. using the Internet of Things. The total co-financing of the projects will be PLN 150 million and PLN 125 million, respectively, as part of the pilot call for proposals.

Almost PLN 40 million for young scientists

Nearly PLN 40 million was awarded to 35 young scientists – the winners of the 7th edition of the LIDER programme. They represent various scientific disciplines. Improving their competences in self-planning, managing and directing their own research team, they will conduct

scientific projects whose results can be implemented in the economy. Under all the previous editions of the programme, we had provided support to 251 young scientists worth a total of PLN 268 million.

INNOTABOR programme appreciated by the railway industry

The sectoral programme INNOTABOR, with a budget of PLN 196 million, is expected to intensify R&D cooperation in the local rolling stock sector and, by adapting rolling stock to higher speeds and introducing energy-efficient solutions, it will improve the competitiveness of Polish companies on the European market. This programme was appreciated by the industry monthly "Rynek Kolejowy" and the website rynek-kolejowy.pl, which awarded the NCBR at the Sixth Railway Congress in Gdansk.

Over PLN 1.5 billion for investments in Polish technology companies

Together with PFR Ventures, we created the Fund's Fund under the innovative NCBR VC (former BRIdge VC) program. We allocated EUR 450 million for the project, half of which will come from the NCBR under OP SG and the remaining 50% will be provided by private investors. The allocations from the Fund via 10 venture capital funds will be invested in small and medium sized companies operating in the field of new technologies.

Almost PLN 132 million for innovation in the steel industry

Thanks to modernization based on research results, Polish steel mills and steel companies will manufacture competitively priced products, in a more environmentally friendly way. Upon request of the Metallurgical Chamber of Industry and Commerce, we created another INNOSTAL sectoral programme. As part of the first call for proposals (out of three planned) 19 winning projects will receive co-financing of over PLN 130 million.

Almost PLN 116 million for the development of the Polish video game industry

38 innovative projects will receive co-financing of nearly PLN 116 million as part of the first call for proposals under the GameINN sectoral programme. Conducted as part of the OP SG, the programme was launched in 2016 at the request of the Polish Games Accord. It aims to increase the competitiveness of the domestic video game industry in the global market until 2023. One of its objectives is the development of R&D solutions that will facilitate efficient use of emerging technologies including, e.g. for social, educational, medical, and therapeutic purposes.

About NCBR

The National Centre for Research and Development is an executive agency of the Minister of Science and Higher Education. It was founded in summer 2007 as an institution that carries out tasks in the field of science, science and technology, and state innovation policies. At the time of its establishment it was the first of its kind to serve as a platform for effective dialogue between the science and business community.

The reform of the science system introduced in the autumn of 2010 gave the Centre more freedom to manage its financial assets, within the scope of a strategic research programme.

In addition, on 1 September 2011, the NCBR took over the Ministry of Science and Higher Education's role of Intermediate Body in three operational programmes: Human Capital, Innovative Economy, and Infrastructure and Environment. In this way the NCBR became one of the largest centres for supporting innovation in Poland. Under the EU Financial Framework 2014-2020, the NCBR acts as the Intermediate Body in the operational programmes: Smart Growth and Knowledge, Education, Development.

The Centre's activity is financed by the state and EU funds.

The NCBR Council

As an advisory and opinion-forming body, the Council performs the following tasks:

- preparing and recommending strategic R&D programmes for approval by the minister competent for science
- expressing opinions on:
  - the Centre's annual financial plan
  - the Centre's annual activity plan
  - progress reports and final reports on the implementation of the Strategic Research and Development Programme
  - the Centre's annual financial report
  - the Centre's annual activity report
  - performance of other tasks by the Centre
- authorising the disposal of the Centre's allocations above the value specified in the Centre's Statutes.

The NCBR Council consists of 30 members, including 10 representatives from the scientific community, 10 representatives of the socio-economic and financial circles, and 10 representatives of government administration. The Council's term of office lasts four years, with half of its composition being replaced every two years.

COMPOSITION OF THE COUNCIL UNTIL 29 NOVEMBER 2016

10 representatives of the scientific community:

- Marcin Chmielewski, DSc
- Lidia Gawlik, DSc, Eng.
- Prof. Jerzy Jasienko, DSc, Eng.[1]
- Dominika Latusek-Jurczak, DSc
- Prof. Antoni Waldemar Morawski, DSc, Eng.
- Artur Podhorodecki, DSc, Eng.
- Prof. Piotr Łukasz Rutkowski, MD, DSc
- Prof. Krzysztof Stańczyk, DSc, Eng.
- Krzysztof Piotr Wodarski, DSc, Eng.[2]
- Prof. Piotr Wolański, DSc, Eng.

10 representatives of the socio-economic and financial circles:

- Anna Rogut, DSc – University of Social Sciences professor, Chair of the Council
- Dawid Berny
- Zbigniew Dokurno, DSc
- prof. Leon Gradoń, DSc, Eng.
- prof. Marek Hetmańczyk, DSc, Eng.
- Dariusz Janusek, DSc, Eng.
- Michał Jaworski
- Ryszard Łęgiewicz
- Gniewko Niedbała, DSc, Eng.
- Prof. Piotr Niedzielski, DSc, Eng.

10 representatives of government administration:

- Marcin Cichy – representative of the minister responsible for Computerization[3]
- Piotr Dardziński, PhD – representative of the minister competent for Science
- Jadwiga Emilewicz – representative of the minister in charge of the Economy
- Prof. Wojciech Fałkowski, DSc – representative of the Minister of Defence[4]

[1] Due to his resignation, he was dismissed from the position of a member of the Council as of 31 July 2016

[2] Due to his resignation, he was dismissed from the position of a member of the Council as of 1 September 2016

[3] until 21 June 2016, Małgorzata Olszewska

[4] until 9 March 2016, Brig. Gen. Włodzimierz Nowak

- Andrzej P. Jarema – representative of the minister in charge of Internal Affairs[5]
- Krzysztof Łanda, PhD – representative of the minister competent for Health[6]
- Marcin Łata – representative of the minister responsible for regional development
- Jerzy Szmit – representative of the minister responsible for transport[7]
- Ryszard Zarudzki, PhD – representative of the minister competent for Agriculture[8]
- Prof. Tadeusz P. Żarski, DSc, Eng. – representative of the minister competent for Environment[9]

Due to the termination of the term of office of some of the members of the NCBR Council the Minister of Science and Higher Education, pursuant to Article 13 Section 1 of the Act of 30 April 2010 on the National Centre for Research and Development (Journal of Laws of 2016, Item 900 and Item 1250), appointed 15 new members of the Council for the period from 30 November 2016 to 29 November 2020. The composition of the NCBR Council with respect to the members whose term of office ends on 29 November 2018 remained unchanged.

COMPOSITION OF THE COUNCIL FROM 30 NOVEMBER 2016

Members representing the scientific community:

- Lidia Gawlik, DSc, Eng.
- Prof. Andrzej Karbownik, DSc, Eng.
- Leszek Kwieciński, DSc
- 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 representing socio-economic and financial circles:

- Prof. Anna Rogut, DSc – Chair of the Council
- Zbigniew Dokurno, DSc
- Prof. Jan Tadeusz Duda, DSc, Eng.
- Włodzimierz Fisiak
- Krzysztof Gulda
- Włodzimierz Hrymniak
- Dariusz Janusek, DSc, Eng.
- Krzysztof Mazur, PhD
- Prof. Piotr Niedzielski, DSc, Eng.
- Prof. Artur H. Świergiel, DSc, Eng.

Members representing government administration:

- Marcin Cichy – representative of the minister responsible for Computerisation
- Piotr Dardziński, PhD – 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
- Andrzej P. Jarema – representative of the minister in charge of Internal Affairs
- Krzysztof Łanda, PhD – representative of the minister competent for Health
- Marcin Łata – representative of the minister responsible for regional development
- Jerzy Szmit – representative of the minister responsible for transport
- Ryszard Zarudzki, PhD – representative of the minister competent for Agriculture
- Prof. Tadeusz P. Żarski, DSc, Eng. – representative of the minister competent for Environment

[5] until 22 February 2016, Border Guard Col. Mirosław Hakiel

[6] until 23 June 2016, Igor Radziewicz-Winnicki, PhD

[7] until 23 June 2016, Iwona Wendel

[8] until 23 June 2016, Marek Cieśliński, DSc, Eng.

[9] until 22 February 2016, Ewa Madej-Popiel

NCBR committees

IN 2016, SEVERAL SPECIALISED COMMITTEES WORKED AS PART OF THE NCBR COUNCIL

Committee on strategic research and development programmes

The Committee prepares drafts of the Council's recommendations submitted for approval to the Minister for Science and Higher Education, as well as drafts of the Council's recommendations on issues related to the implementation of strategic programmes. Until November 2016, the Committee consisted of:

Krzysztof Wodarski, DSc, Eng. – Chair[10]

- Lidia Gawlik, DSc, Eng.[11]
- Prof. Leon Gradoń, DSc, Eng.
- Col. Miroslaw Hakiel (Polish Border Guard)
- Dariusz Janusek, DSc, Eng.
- Andrzej P. Jarema
- Dominika Latusek-Jurczak, DSc
- Brig. Gen. Włodzimierz Nowak
- Iwona Wendel

Committee on implementation of other tasks:

The committee is responsible for drafting the Council's recommendations regarding the implementation of tasks other than those regarding strategic research and development programmes and research for the security and defence of the country. Until November 2016, the Committee consisted of:

Prof. Antoni Waldemar Morawski, DSc, Eng. – Chair

- Marcin Chmielewski, DSc
- Marek Cieśliński, DSc, Eng.
- Piotr Dardziński, PhD
- Prof. Jerzy Jasienko, DSc, Eng.
- Michał Jaworski
- Marcin Łata
- Ewa Madej-Popiel
- Prof. Piotr Łukasz Rutkowski, MD, DSc
- Prof. Piotr Wolański, DSc, Eng.

Committee on finance:

The committee is responsible for drafts of the Council's recommendations regarding the financing of the Centre, especially the financial planning, financial report or funding approval for allocations above EUR 250,000. Until November 2016, the Committee consisted of:

Zbigniew Dokurno, PhD – Chair

- Marcin Cichy
- Ryszard Łęgiewicz
- Gniewko Niedbała, DSc, Eng.
- Małgorzata Olszewska

Appeal committee:

The committee is responsible for considering with appeals against Director's decisions regarding the approval or denial of funding or the promise of the funding in the event of a breach of the call process procedure or other formal infringements. Until November 2016, the Committee consisted of:

Prof. Marek Hetmańczyk, DSc, Eng. – Chair

- Dawid Berny
- Prof. Piotr Niedzielski, DSc, Eng.
- Artur Podhorodecki, DSc, Eng.
- Prof. Krzysztof Stańczyk, DSc, Eng.

[10] Until 1 September 2016

[11] Chair between 1 September 2016 and 29 November 2016

As of December 2016, following changes in the composition of the NCBR Council, the composition of the Council's Committees is as follows:

Committee on strategic research and development programmes:

Prof. Piotr Perlin, DSc – Chair

- Prof. Jan Tadeusz Duda, DSc, Eng.
- Lidia Gawlik, DSc, Eng.
- Włodzimierz Hrymniak
- Dariusz Janusek, DSc, Eng.
- Andrzej P. Jarema
- Leszek Kwieciński, DSc
- Dominika Latusek-Jurczak, DSc
- Krzysztof Łanda, DSc
- Prof. Joanicjusz Nazarko, DSc, Eng.
- Grażyna Ewa Ptak, DSc, Eng.
- Piotr Sankowski, DSc

Committee on implementation of other tasks:

Włodzimierz Fisiak – Chair

- Marcin Cichy
- Piotr Dardziński, PhD
- Jadwiga Emilewicz
- Krzysztof Gulda
- Marcin Łata
- Prof. Krzysztof Stańczyk, DSc, Eng.
- Ryszard Zarudzki, PhD
- Prof. Tadeusz P. Żarski, DSc

Committee on finance:

Zbigniew Dokurno, PhD – Chair

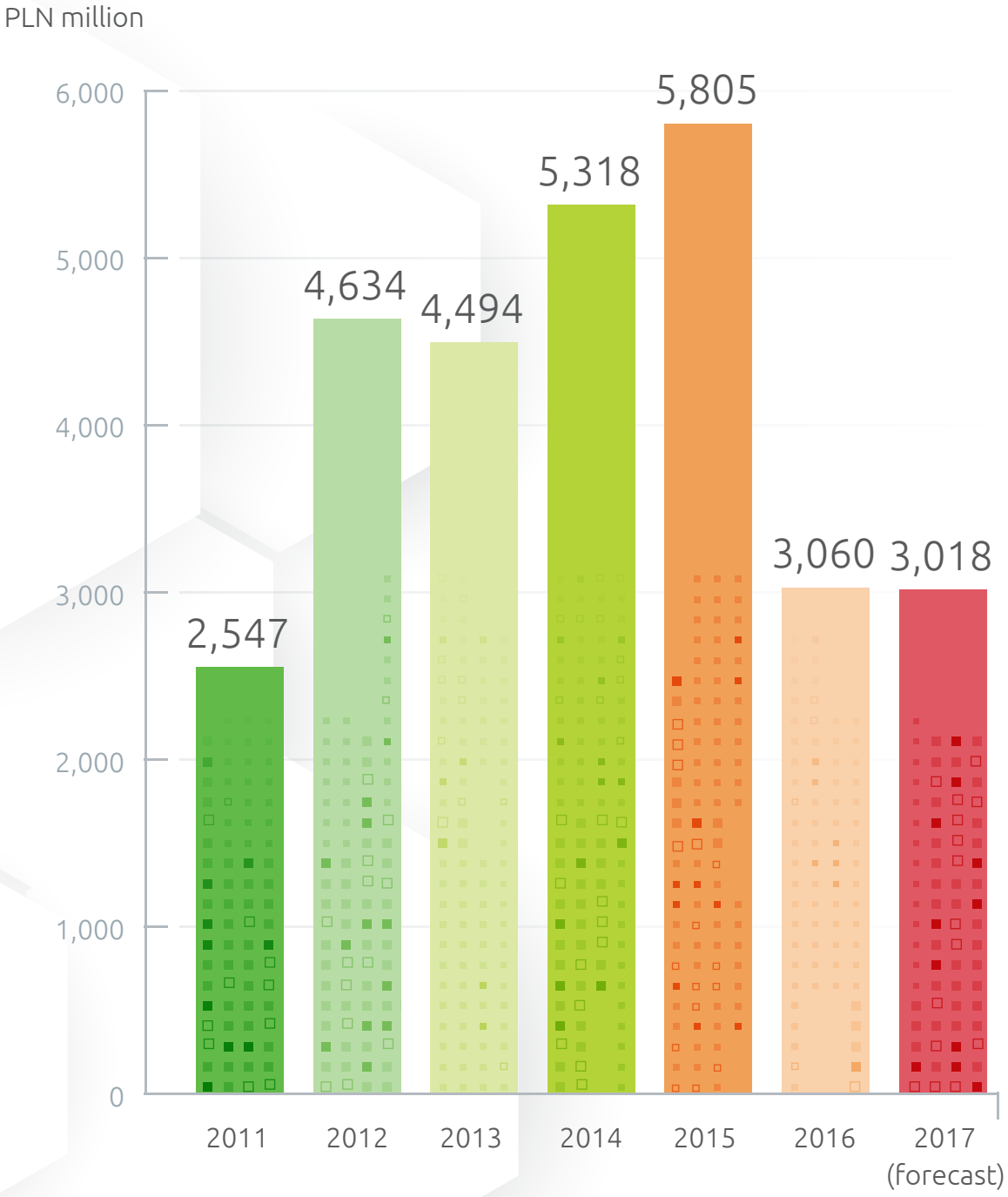
- Prof. Andrzej Karbownik, DSc, Eng.
- Krzysztof Mazur, PhD

Appeal committee:

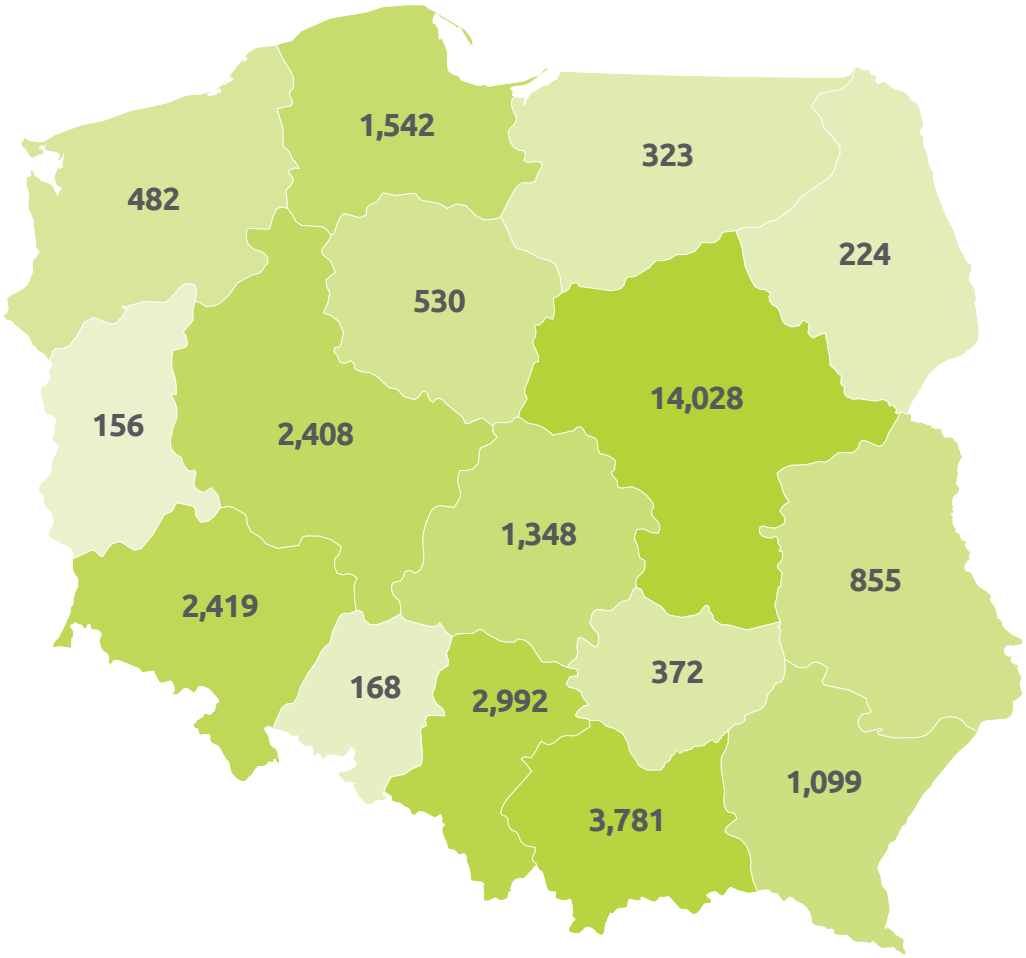
Prof. Artur H. Świergiel, DSc, Eng. – Chair

- Prof. Jan Tadeusz Duda, DSc, Eng.
- Prof. Wojciech Fałkowski, DSc, Eng.
- Krzysztof Gulda
- Leszek Kwieciński, DSc
- Krzysztof Łanda, DSc
- Prof. Piotr Niedzielski, DSc, Eng.

NCBR Budget 2011-2016



Funding allocation

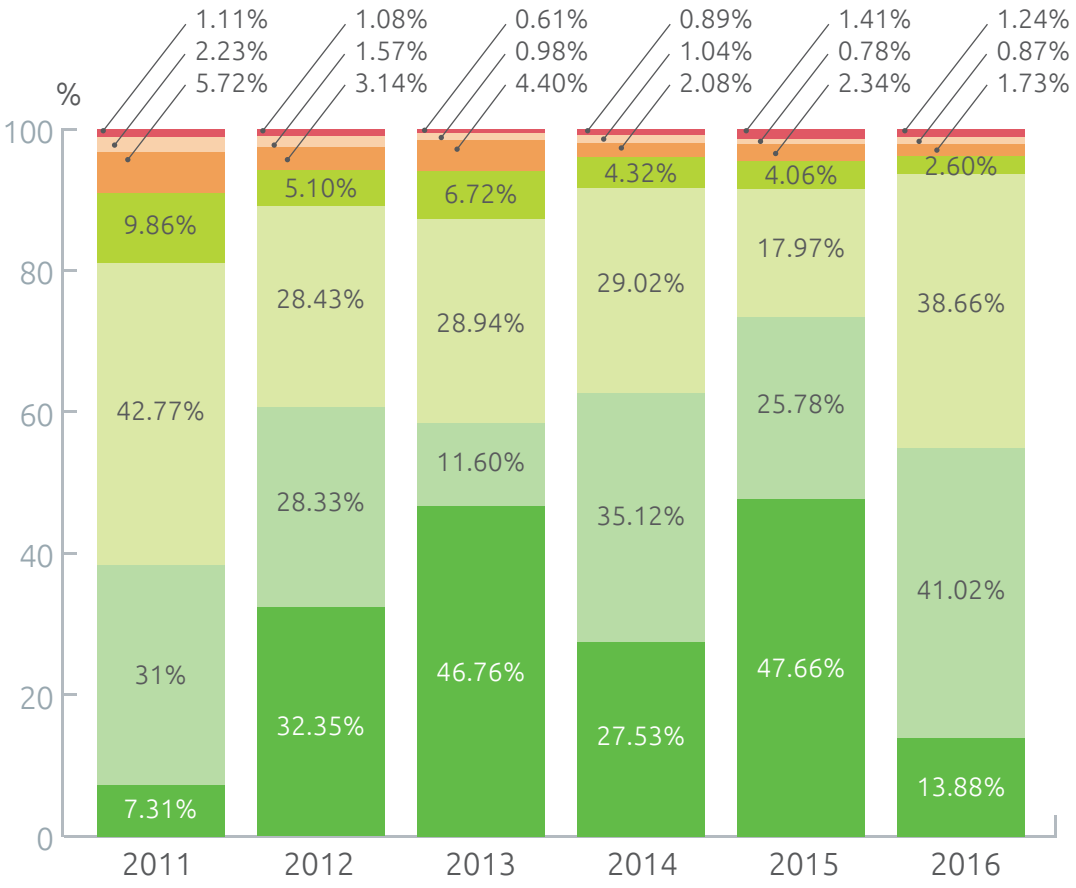


Number of projects and value of co-financing by voivodship (as of 31 December 2016)

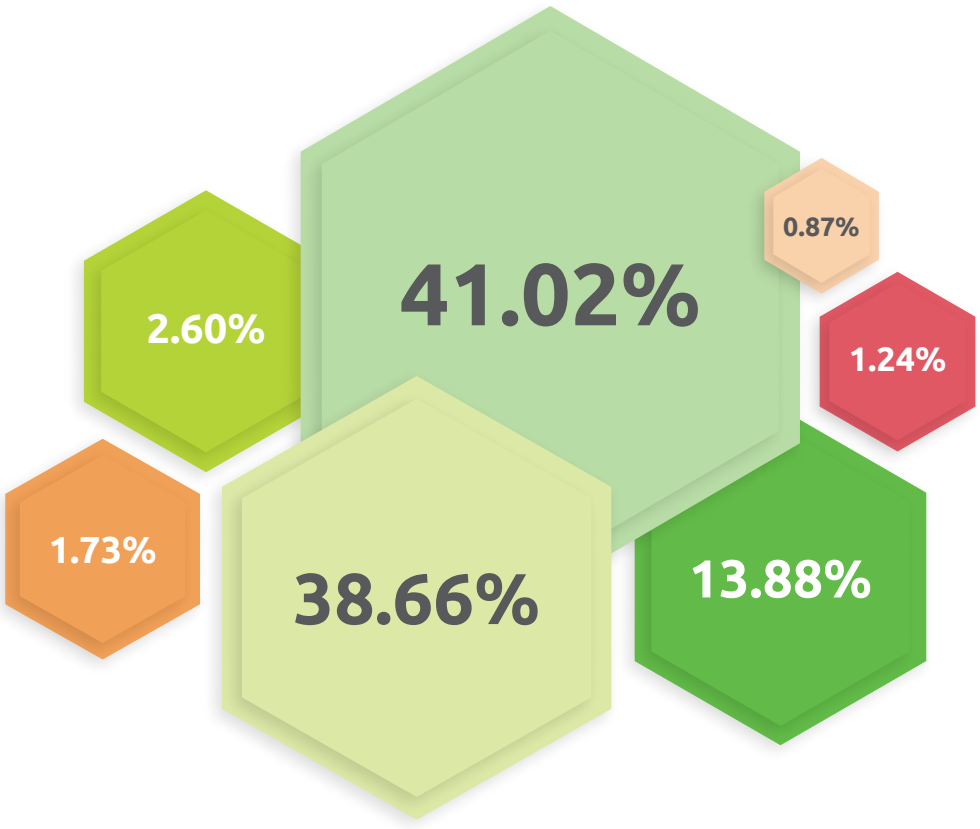
Voivodeship	Number of projects	Value of co-financing (PLN million)
Mazowieckie	2,540	14,028
Małopolskie	930	3,781
Śląskie	774	2,992
Dolnośląskie	536	2,419
Wielkopolskie	670	2,408
Pomorskie	490	1,542
Łódzkie	378	1,348
Podkarpackie	246	1,099
Lubelskie	262	855
Kujawsko-Pomorskie	197	530
Zachodniopomorskie	194	482
Świętokrzyskie	89	372
Warmińsko-Mazurskie	100	323
Podlaskie	76	224
Opolskie	90	168
Lubuskie	60	156
Total	**7,632**	**32,728**

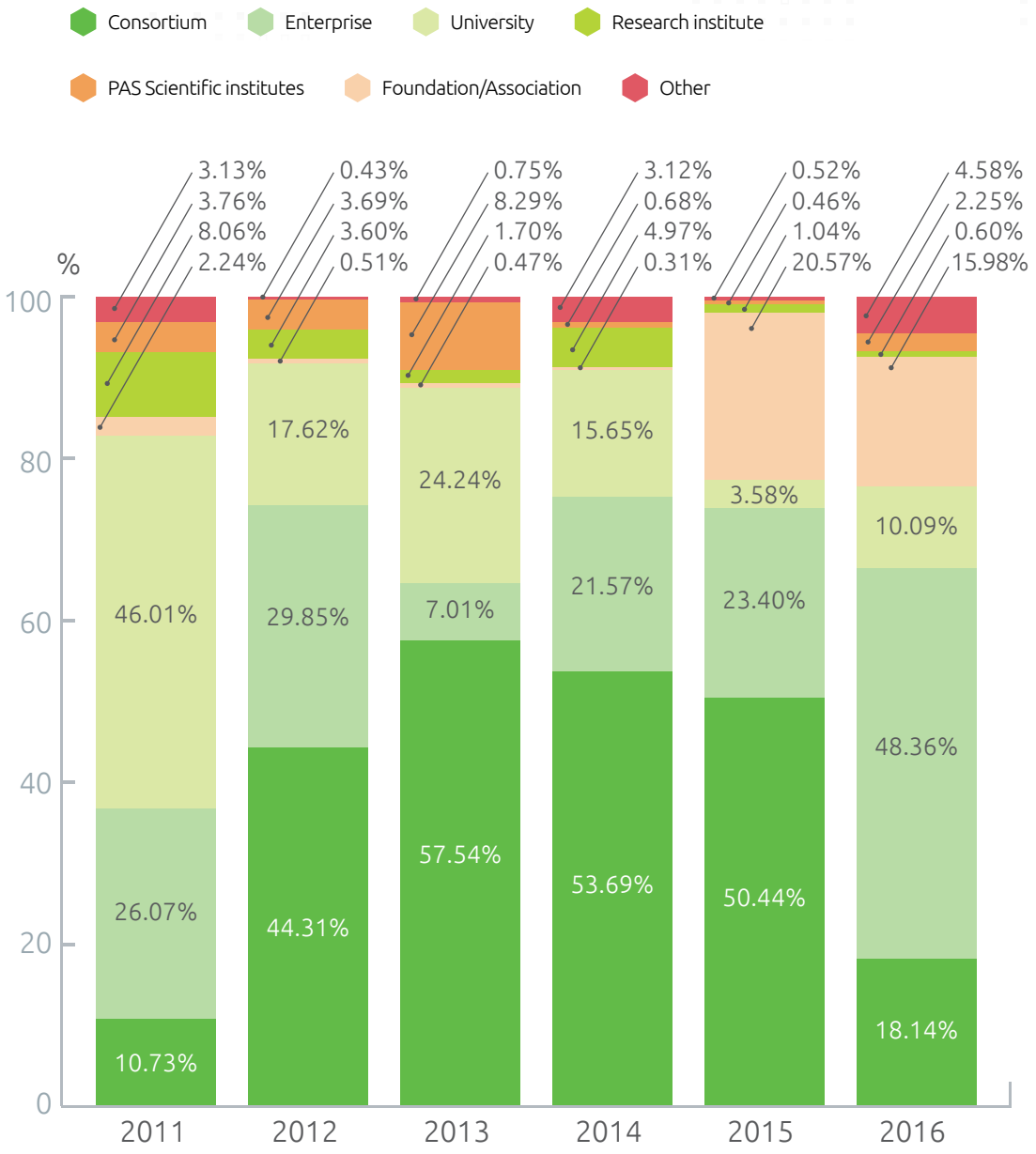
Beneficiaries

PERCENTAGE OF TOTAL CONTRACTS SIGNED BY LEGAL TYPE IN 2011-2016

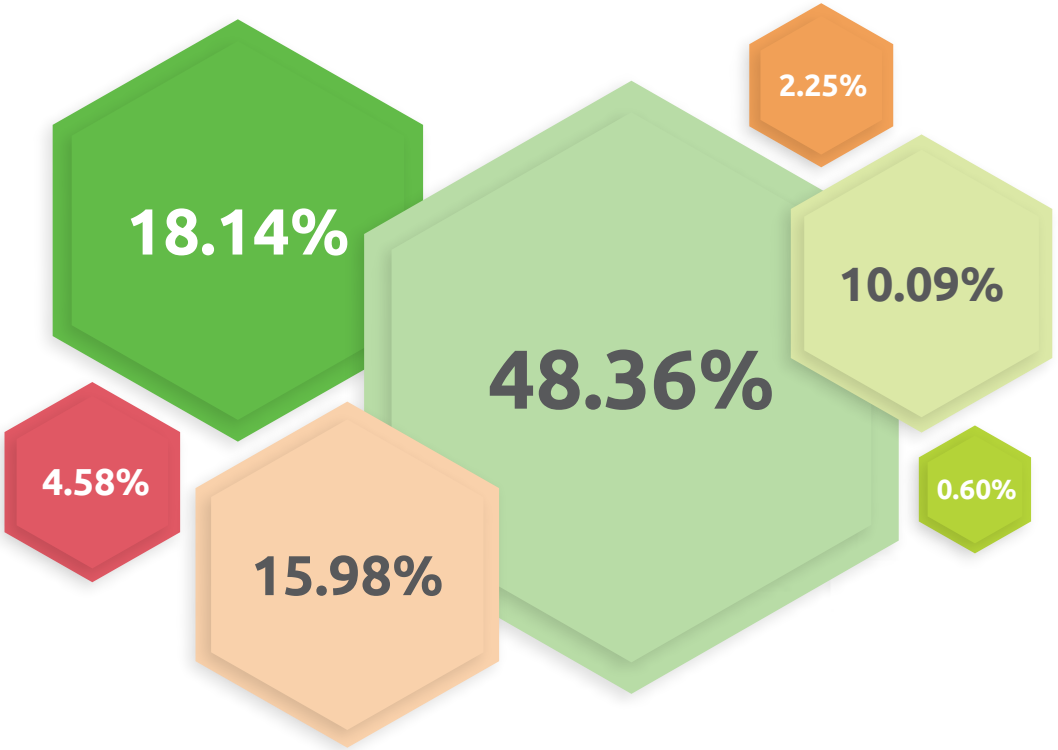


PERCENTAGE OF TOTAL CONTRACTS BY LEGAL TYPE IN 2016





PERCENTAGE OF TOTAL VALUE OF CO-FINANCING BY LEGAL TYPE IN 2011-2016



PERCENTAGE OF TOAL VALUE OF CO-FINANCING BY LEGAL TYPE IN 2016

A word of introduction

The mission of the National Centre for Research and Development is to finance R&D projects and develop innovation in the key sectors of Poland's industry, thereby contributing to a significant increase in the competitiveness of the Polish economy in the international arena.

To that end, we liaison between students and employers, scientists and business, inventions and capital for their implementation. We make sure that Polish inventions are sought after in global markets. We create an ecosystem that attracts an increasing number of investments at the highest technological level. In our programmes, we focus on the development of research in priority areas and the deployment of their results in the economy.

In this chapter – the most practical one – we show examples illustrating how these actions were implemented in 2016. Further in the chapter are presented calls for proposals that we organized in each operational programme, offering support to students, universities and their faculties, scientists and research laboratories, entrepreneurs and industry sectors. We present success stories of the people who were able to complete their research projects, create global scale innovative solutions to contribute to the development of societies and industry in many areas – all thanks to the support of the NCBR.

Perhaps they will also encourage you to co-operate with the NCBR? You will be most welcome to do so.


Layers
Protected area
Sensors
Satellite


Wydział Biotechnologii i Nauk o Żywności
Politechniki Łódzkiej
realizuje projekt dofinansowany
z Funduszy Europejskich
„Nauka dla biznesu – realizacja wysokiej
jakości staży dla studentów Wydziału
Biotechnologii i Nauk o Żywności
Politechniki Łódzkiej"


Kabaty

Anti-drone shield

Drones are everywhere... This is true also for a broad range of their applications, and the ability to reach the most remote or hard to access places, areas of particular importance, and strategic objects. Action triggers reaction. The broad range of applications of "unmanned aerial vehicles", as drones are formally called, potentially leaves room for unwanted applications too. Drones are not only useful for defence or logistics, but also can be a potential tool for attacking objects and property, a channel for economic intelligence or smuggling. The number of places that should be off limits for drones or where drones should be under constant surveillance is growing by the year. Designed and developed by Advanced Protection Systems Sp. z o.o., the "anti-drone shield" is an effective tool for preventing such intrusions. The shield is the only system in the world to receive signals from four types of sensors. The combination of miniaturised radar, acoustic sensors, a video camera, and the detector of the drone control signal, backed by suitable software and multichannel signal processing algorithm will detect drones not confusing them with birds or ball lightning, under all weather conditions, day and night, from the distance of at least 1000 m. Detection is just the first part of the job. The next is to stop the intruder, here the system does not send anything (except for the signal) into the air and is capable of neutralising any drone, taking over control or forcing it to land in a safe place immediately.

Project:

Designing and developing a multi-sensor system for the detection and tracking of unmanned aerial vehicles

Value of the project:

PLN 2,290,682

Beneficiary:

Advanced Protection Systems Sp. z o.o.

Funding:

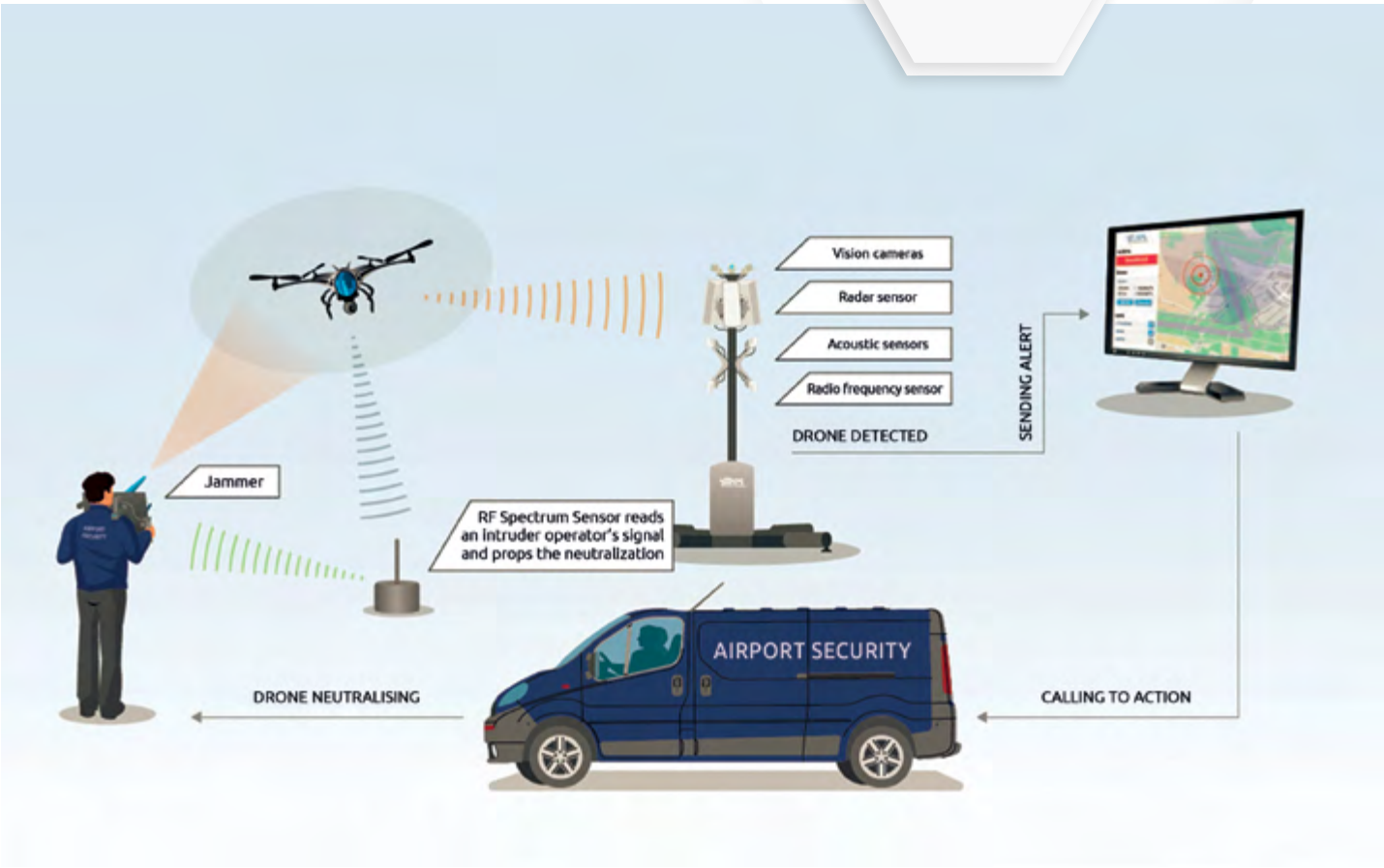
Operational Programme Smart Growth

Sub-measure 1.1.1. Industrial research and development executed by enterprises

Value of the funding:

PLN 1,750,993

System operation



As part of the project, the first version of the drone detection system has been already deployed. The beneficiary has already carried out many very successful demonstrations with various clients and is now expanding the network of international distributors.

The project was partly based on the results of the INNOTECH project, which developed a range of silicon integrated circuits for use in 10 GHz FMCW radars. In addition, the project used the results of the SafeSky project under the European Commission's SME Instrument programme, which developed the concept of unmanned aerial vehicle detection.

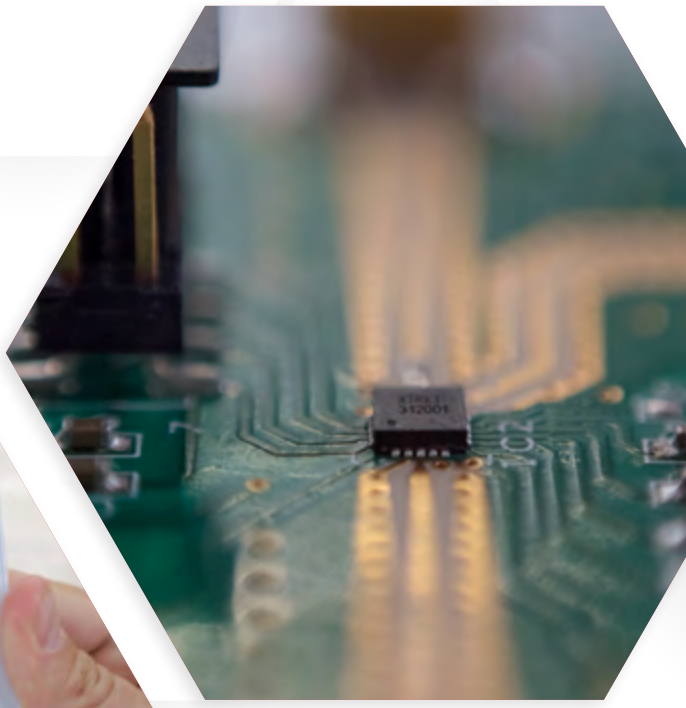
Beneficiary's opinion

Radosław Piesiewicz, DSc, President of the Management Board, Advanced Protection Systems Sp. z o.o.

Our system's advantage is not only the price: we compete with similar, although not so advanced solutions, from Israel or the USA, which are, however, ten times more expensive. Our biggest advantage is the diversification of the signal coming from our four independent sources, and the ability to neutralize drones without the use of other aerial objects. None of the existing solutions provides full site monitoring to a degree comparable to that of our umbrella solution.

We have already completed the first deployments in Poland and abroad – our solution has attracted interest of not only government or local government institutions, but also of commercial entities. Our systems ensure the security of participants of mass events, as well as individuals interested in protecting their property or business secrets. We protect public places like stadiums, airports, or special objects. Our shield has passed positive tests in one of the penal institutions, which can help significantly reduce the smuggling of equipment or drug into prisons. We keep discovering new fields of exploration for our shield with every new query, test, and client.

I have to stress that without co-financing from the OP SG, we wouldn't have this solution. We didn't have the money to hone and operationalise the concept that had such an extraordinary potential for innovation. Thanks to our collaboration with the NCBR, as part of the so-called fast track, which really turned out to be fast and easy, we were able to join the global elite of innovators and reap benefits from the fact, here in our country and for the country. The project is continued, and we haven't yet said our last word. We are working on further detection channels and on the construction of a distribution network in Europe and around the world.




192.168.1.2:5000/index.html#/
Layers
Protected area
Sensors
Satellite

The Metro (of) dreams

The Polish metro has grown out of dreams – dreams of modernity, awareness, being part of the European "mainstream". The Polish dream of modernity, symbolized by the metro has almost 100 years of tradition. The first plans for the development of the metro in Warsaw date back to the beginning of the interwar period. Those more concrete ones, already from the 1930s, approved by the team of then Mayor of Warsaw Stefan Starzyński, laid the basis (with some approximation) for development of the Warsaw underground network today. When after World War II, attempts to build a deep-level underground network were quickly skipped due to adverse geological conditions in Warsaw (one of the remnants of the system is a stretch of the tunnel until quite recently used by Imported Wine Cellars), the idea was later successfully revived! Already in 1995, 12 years after the first pile was driven into the ground in Warsaw's district of Ursynów, and 70 years after the idea of the underground in the capital emerged – here it was rolling! The metro – a symbol and a myth, almost like "a postcard from a better world". Actually hardly so, just half of the system – a district line, as it took another thirteen years for the metro to extend its line beyond the area of Mokotów. Bearing in mind those 83 years of waiting for a complete line, one could say that everything went smoothly with the second line. It has been carrying the residents of Warsaw and their guests for already two years, with an extension under construction for more than a year now.

But the rolling stock is not Polish... Why? Is our dream of modernity too weak? Although we do not have experience in the construction of

Project:

Energy-efficient metro with improved comfort and safety

Value of the project:

PLN 60,017,612

Funding:

Operational Programme Smart Growth Sub-measure 1.1.1. Industrial research and development executed by enterprises

Beneficiary:

Pojazdy Szynowe PESA Bydgoszcz SA

Value of the funding:

PLN 24,406,627

One variant of a new train's look

underground railway trains, there is a company, however, which not only draws on tradition dating back to the middle of the 19th century, but also has been producing – for almost 20 years – all kinds of rail vehicles, trams, rail buses, and trains known in every Polish voivodship and in the most remote regions of the 11 countries that are familiar with the PESA logo.

PESA – is like a phoenix, home to dreamers, showcase for the Polish dream of modernity. It is a perfect fit for the development of the metro. PESA's R&D staff from Bydgoszcz decided that they were able to handle the task of developing the first fully Polish (based on the local know how and technology) metro train with unprecedented safety, energy efficiency and travel comfort parameters. The project will make it possible to offer trains characterised by unique parameters, unprecedented in the company's offering and strengthening the Polish economy thanks to innovative solutions.

With PESA's innovators just beginning to design in the second phase of the project and finalising the stage of selecting technology and solutions, the prototype's main advantages include travel comfort (quieter, more comfortable, cleaner air – intelligent monitoring of the conditions and adjusting to the weather conditions; more ergonomic and more efficient passenger information solutions), security (detection of threats, also of terrorist nature, monitoring of life functions and responses of the train driver), and energy efficiency, which is one of the most important criteria for new underground trains used by contracting authorities.

The PESA trains will have a solid structure – which is nothing new, given the manufacturer's experience in designing durable and safe steel constructions. The vehicle's framework using composite materials and, most importantly, new ergonomic, compact and easily scalable interior and equipment elements will make the structure significantly slimmed down. Combined with multi-phase motor drives and the online system for monitoring maintenance needs this will deliver significant savings – both in terms of energy consumption and the cost of keeping the vehicle moving.

Beneficiary's opinion

Łukasz Będziński, head of innovative projects, PESA SA

Even though it uses a fairly typical carriage design, as always focusing on durability and safety, our metro, something we are working on right now, reflects the new thinking about power consumption, maintenance, design, and equipment.

The carriage will be quieter, its movement smoother. As far as energy efficiency is concerned – regenerative braking has become a standard that we have used in our rail vehicles for several years now. Here our solutions will go even further. We plan the inverter power supply, which allows for smooth control of the parameters of the current supplied and recovered. The savings not only affect energy consumption but also operating costs, because thanks to intelligent maintenance monitoring systems we are able to accurately inspect all the key components in real-time and plan for repairs in real time too. As a result, standard regularity is replaced by intelligent reactivity: a particular component is replaced or repaired exactly when it is recommended by the system based on real wear and not only according to the maintenance schedule-based indications in accordance with time and mileage. This offers gigantic savings to the operator. Innovations also apply to the driving control system that allows you to obtain information about its parameters during operation, which enables real-time response – both by the automatic systems and the driver. In near future, we will be ready to take another step forward and offer autonomous metro, because after passengers' initial mistrust, today interest in this form of transport is coming back in the most innovative public transport systems.

Much will change in terms of equipment and interior design. Modular, scalable panels installed under the ceiling will facilitate making better use of the space inside the carriage – not only will there be more space, but there will be enough space for really large passenger information system displays – no one will complain that they are barely visible, nobody will bump their heads against displays any more. The seats that are pending patents and consist of an easily scalable module of three or four simple elements that will offer not only aesthetic value, comfort and security, but also enable easy cleaning.

The role of public co-financing in our project is not to be overestimated, even though without

the support of European funds, we would have probably undertaken work on the "Polish metro" too, to meet the market demand, and make use of our experience in Poland and in 20 other countries where our rail vehicles are in service. However, we would have undertaken it much later, only when the Warsaw metro needed new rolling stock. For us, the innovative metro project means a victory against time and running ahead of market expectations. When the only metro in Poland announces a tender for new trains, we will be fully prepared to meet the challenge. And it is not easy, because Polish companies are fighting an uphill battle in Poland. Despite PESA's tremendous experience and presence in key markets, we still have to prove our value in our own country. Maybe thanks to public support, we'll find it easier to convince the first customer that our innovative solutions supported by experience are the best guarantee of quality and reasonable price. I believe that the first fully Polish metro will debut in Poland. If it succeeds, it will be easier for us to propose our innovative offer in other markets, including outside Europe.

PESA rail vehicles are used in every Polish voivodship – and outside Poland in 11 countries of the world

Detect atrial fibrillation, prevent strokes

Strokes caused by ischemia are one of the most common causes of death and disability, and their treatment is an important part of healthcare costs. Atrial fibrillation is a known risk factor for ischemic stroke. Many cases of atrial fibrillation remain undetected (the so-called silent AF). Meanwhile, it is estimated that as much as 20-30 percent of strokes of transient etiology are caused by silent AF. Therefore, the aim of the consortium of scientists is to develop a monitoring system capable of detecting atrial fibrillation and use it to assess the condition's prevalence in patients over 65 years of age.

The project is led by Silesian Medical Technology Park Kardio-Med Silesia (KMS) in Zabrze: the New Technology Centre and an R&D facility working on innovative projects in medicine and biotechnology.

Currently, the project is in the phase of epidemiological research, which involves the examination of 3,000 patients over the age of 65 from all over Poland. Participants will be divided into six age groups, where the proportion of men and women will correspond to the actual gender structure in a given range. The patients who wish to participate in the NOMED-AF trial will be provided with an external monitoring system (featuring, i.a., an

Project:

NOMED-AF – Non-invasive monitoring for early detection of atrial fibrillation

Value of the project:

PLN 15,656,685

Funding:

Prevention and treatment of civilization diseases – STRATEGMED

Value of the funding:

PLN 12,453,702

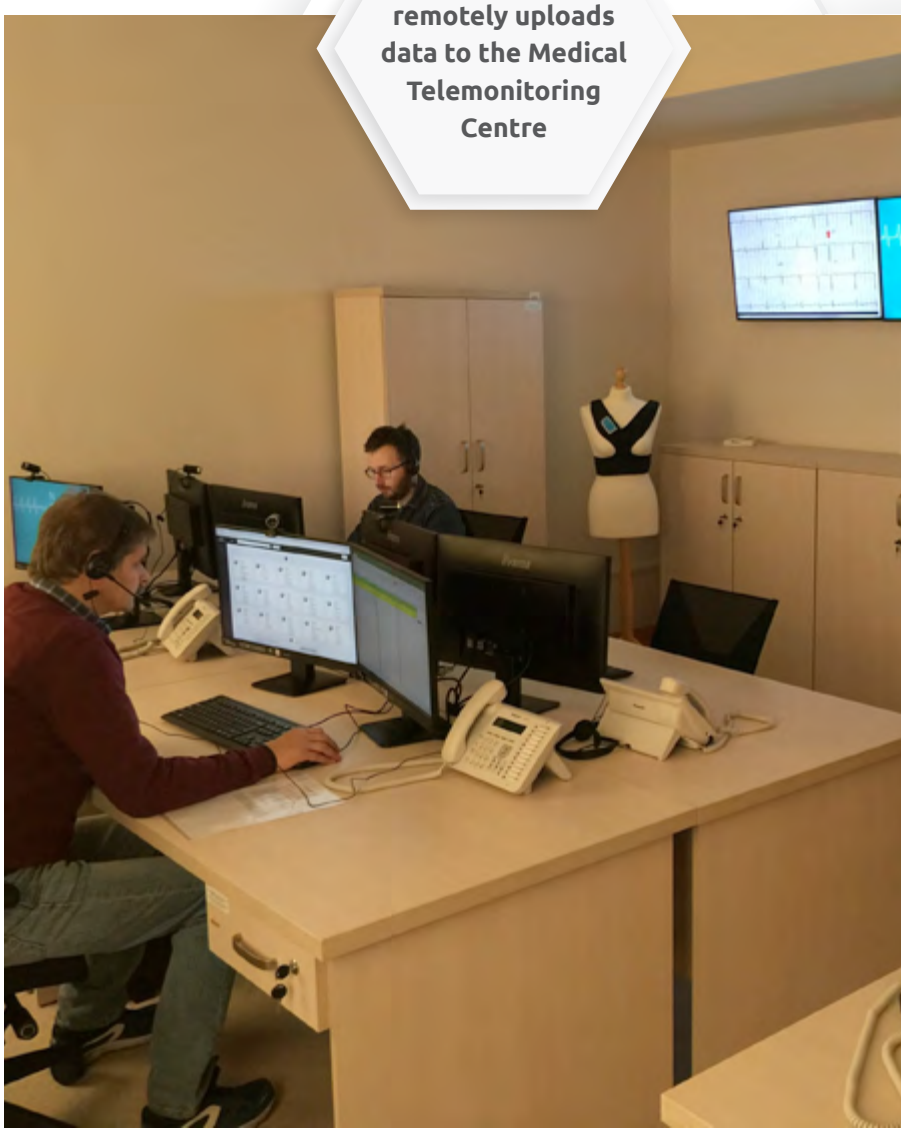
Beneficiary:

Consortium of

- **Silesian Medical Technology Park Kardio-Med Silesia (Leader)**
- **Gdansk Medical University**
- **Pomeranian Medical University**
- **Warsaw Medical University**
- **Jagiellonian University**
- **Comarch Healthcare**
- **Institute of Medical Technology and Equipment**

The monitoring kit consists of 2 vests, a docking station and 2 data loggers

The device remotely uploads data to the Medical Telemonitoring Centre



ECG vest) and will be monitored continuously for up to 30 days.

The patients who agree to participate in the study will be visited by district nurses. They will help patients complete the questionnaire, collect blood samples necessary to conduct blood counts, measure blood pressure, and take anthropometric (comparative) body measurements. Furthermore, the patients will be given a monitoring kit consisting of 2 vests, a docking station and 2 data loggers, as well as a detailed instruction for use.

The device will record heart rate data and upload it remotely to the Kardio-Med Silesian Medical Telemonitoring Centre located at the KMS headquarters in Zabrze, where daily monitoring data will be analysed by physicians. Should any instances of atrial fibrillation or other cardiac arrhythmias be detected in a participant at any time, the nurse and the family physician will be notified immediately so that the patient can receive anticoagulants as soon as possible.

The Silesian Medical Technology Park was awarded the Polish Intelligent Development Award 2016 for the implementation of the NOMED-AF project. The atrial fibrillation detector was honoured with a Gold Medal award at the 65th Brussels Innova: International Invention, Research and New Technology Fair.

Beneficiary's opinion

Professor Zbigniew Kalarus, project manager, cardiologist, electrophysiologist, head of Chair of Cardiology, Congenital Heart Failure and Electrotherapy at the Silesian Medical University in Zabrze, President of the Polish Cardiac Society

The main objective of the NOMED-AF study is the detection of atrial fibrillation in patients who are most likely to develop this type of arrhythmia, i.e. 65+ who are not aware of heart arrhythmia. Adequate early detection will facilitate preventive treatment with anticoagulant therapy, which will significantly reduce the risk of ischemic stroke. The data uploaded to the system indicating the number of episodes during a day and their duration in correlation with the collected data, including questionnaires, anthropometric measurements, and BMI will also help assess whether there are predispositions that can affect atrial fibrillation in a given group.

One year after the end of the monitoring programme, we will return to all patients taking part in the study to check their general health, ask about possible hospital stays, emergency ambulance interventions, etc.

NOMED-AF is one of the largest studies in the field of telemedicine. Its purpose is also to introduce into future everyday use devices that enable the diagnostics in patients suspected of atrial fibrillation which is, however, difficult to detect during routine testing. Comarch Healthcare IT specialists continue to improve algorithms that will help physicians in their day-to-day analysis of logs sent by the monitoring kits.

Studying? Take an internship!

Acquiring work experience by students and liaising between science and business as well as employees and employers is the goal of the call for proposals ***Studying? Take an internship,*** financed from the OP KED. It was in line with the goals of the academic staff of two universities using NCBR financing: Faculty of History of Nicolaus Copernicus University and Faculty of Biotechnology and Food Sciences, of the Lodz University of Technology.

Project:

Humanist-Trainee-Manager! Cultural heritage management

Value of the project:

PLN 1,445,601

Beneficiary:

Nicolaus Copernicus University in Torun

Value of the funding:

PLN 1,402,233

Funding:

Operational Programme: Knowledge Development Education

Measure 3.1 Competency Development Programme

Project:

Science for business – high quality internships for students of the Faculty of Biotechnology and Food Sciences of the Lodz University of Technology

Value of the project:

PLN 1,665,720

Beneficiary:

Lodz University of Technology

Value of the funding:

PLN 1,543,120

Funding:

Operational Programme:

Knowledge Education Development

The project enabled 148 interns to gain practical skills in the field of biotechnology, food sciences, and environmental sciences

In Torun, at Nicolaus Copernicus University, 108 students undertook domestic and international internships, gaining practical experience in cultural heritage management. They took internships in state institutions – archives, museums, libraries, commercial companies, and non-governmental organizations. They acquired skills in creating and managing cultural heritage protection, but also in shaping opinions and attitudes towards the preservation of monuments or the administration of the heritage.

In the case of the Faculty of Biotechnology and Food Sciences of Lodz University of Technology, the project enabled 148 interns to gain practical skills and work experience corresponding to the needs of the sector of biotechnology, food science, and environmental sciences. Unique practical skills gained during the internship will be used by the students in their future professional careers, which will translate directly into the skills of the managerial staff managing the economy in the coming years. Internships in the regions they come from, which helped not only retain educated personnel in Poland, but also encouraged graduates to return to their natural environment and contribute to the development of innovative economies in their regions.


Primo Star


BARRY CALLEBAUT
Sinsay

Beneficiary's opinion

Tomasz Olejnik, DSc, Eng., Deputy Dean for Development and Promotion at the Lodz University of Technology

Our primary objective is to make sure that our students could easily find interesting and well-paid jobs where they can pursue their professional passions. We also want our graduates to be able to apply for positions that match their interests. The programme has proven that we are able to help them do that. A large part of the 128 students who did internships in companies in Poland have received job offers. The students themselves acknowledge that the programme has helped them gain confidence and many of them have been glad to report that the three months of internship have enabled them to use the knowledge acquired during their studies in practice. We have been able to achieve that because the programme was created around the needs of our faculty's students, so that they could choose from a range of institutions that our faculty cooperates with. They could also individually look for a company and take an internship there, after obtaining prior approval from their mentor. Each intern had a tutor who was an expert in a given field. They helped interns get acquainted with the conditions of work in the company, supervised their progress and offered the necessary assistance in carrying out the tasks. As a result of this internship structure, students doing internships in food companies passed through all organisational departments from laboratories to product control. We also experienced unusual situations, when one of our students, fluent in English, was asked to take on marketing activities in China and Japan. Twenty people did internships abroad – in France, Austria, Italy, Germany, and Cyprus. That was possible thanks to our contacts with foreign companies. During their internships students received remuneration and reimbursement of the costs of accommodation, transportation, medical tests, and insurance. We are very pleased to have been able to carry out this extremely interesting project. The path to its implementation was not easy. We had to meet a number of NCBR criteria, including the number of students delegated for internship. In our case 30% of students in every course participated in project tasks. In addition, we had to meet the requirements for the appropriate number of women among participants, at the level of 80%. The project also had to comply with the horizontal policy criteria, the principle of sustainable development, equal opportunities and non-discrimination, as well as accessibility for people with disabilities.

It was worth taking the challenge, and the results encouraged us to apply for further grants. Our plans include a 2-year internship project, which has already received a positive initial verification by the NCBR, and a programme for doctoral students. We want to provide our students with such conditions that they will remain in the country after graduation, where they will have opportunities to pursue their own professional interests, thereby having impact on the development of our country's economy.

Beneficiary's opinion

Tomasz Górzyński, Faculty of History, Nicolaus Copernicus University, Torun

The programme is addressed to the students of the final year at the Faculty of History with specialisation in archaeology, archival science and documentation management, ethnology – cultural anthropology, history, art history, military science, information management, and bibliology. Our primary goal is to offer internships to students at the best cultural heritage management centres compatible with the students' internship profile and personality. The spectrum of the institutions is very broad: from companies in the economic sector, through foundations, and state-budget entities to government institutions. Today, we work with more than 30 entities specialising in cultural heritage management in Poland and abroad.

Depending on the type of their studies, the interns are delegated, e.g. to perform tasks connected to archive or documentation management. In museums, when preparing and organising exhibitions, they combine their specialised expert knowledge with an opportunity to work with clients – visitors. In government offices, they use the skills acquired in the course of their studies doing administrative work. Students delegated to do internships in cultural institutions help organize events, concerts, and exhibitions. We can also give examples of people who do project work on the preparation of formal and financial documentation for starting a business in the sector of culture.

A much needed initiative, the programme may even be indispensable. It gives great opportunities to future graduates enabling them to confront with the demanding job market, compare their perceptions of work and employers with reality, verify career plans and personal development paths. That's why, the project team has already submitted another application in the Operational Programme: Knowledge, Education, Development for the continuation of the project in years 2018-2019.

The team implementing the project at the Nicolaus Copernicus University in Torun consists of scholars from the Faculty of Historical Sciences (from the left): Rafał Kleśta-Nawrocki, PhD, Marlena Jabłońska, PhD, Natalia Pamuła-Cieślak, PhD, Tomasz Górzyński, MA, Przemysław Waszak, PhD

Zika disappears, or how to kill the virus

We know them all too well. Especially when they are a nuisance in summer – mosquitoes. Their bite usually ends with a small, itchy bubble. Provided that the bite occurs in Poland. In Africa, South America or Asia, feeding a tiny insect with our blood can have far more serious consequences. Tiger mosquitoes can infect us with the zika virus. The infection may be asymptomatic or have symptoms similar to those seen in the flu or the cold, sometimes with a rash. The virus may be especially dangerous for pregnant women, as it can contribute to microcephaly – a foetal malformation. A team of young scientists led by the laureate of our LIDER programme, Ewelina Król, PhD, of the Intercollegiate Faculty of Biotechnology University of Gdansk and Gdansk Medical University have decided to tackle the virus. The young scientists are working on a vaccine against the virus.

They say they hope that the project would enable them to obtain products that will significantly improve the prevention of zika infections:

- Potential recombinant subunit vaccine against the zika virus, ready for further clinical trials
- Specific, non-infectious viral antigens that will have potential commercial applications in the development of new diagnostic tests
- Universal methodology for the production of viral antigens on a large scale

Project:

Zika virus vaccine – innovative antigenic treatment

Value of the project:

PLN 1,195,500

Funding:

LIDER Programme, 7th Edition

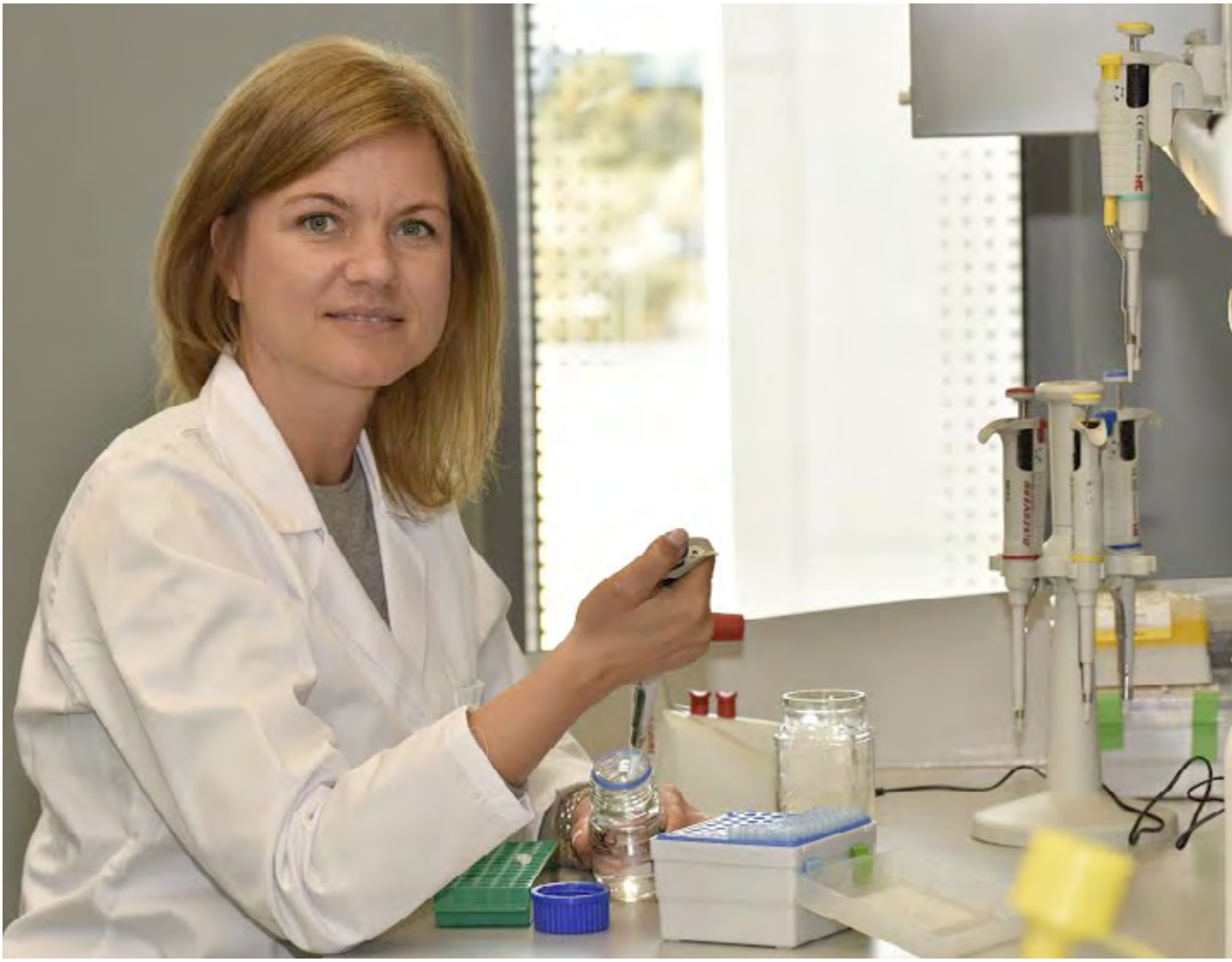
Beneficiary:

Laboratory of Recombinant Vaccines, Intercollegiate Faculty of Biotechnology University of Gdansk and Gdansk Medical University

Value of the funding:

PLN 1,100,000

Beneficiary's opinion



Ewelina Król, PhD, project manager, Laboratory of Recombinant Vaccine, Intercollegiate Faculty of Biotechnology University of Gdansk and Gdansk Medical University

The vaccine that we are working on is to be based either on the recombinant surface protein of the zica virus, or on the so-called viral-like particles (VLPs) that are made up of viral proteins but do not contain the genetic material of the virus, so they are completely safe. In order to obtain valuable viral antigens with potential protective properties, we expect to retrive recombinant proteins of the zika virus as well as virus-like particles. The final, but a very important stage of the study will be to test the ability of selected antigens to trigger a response in a living organism – a mouse. The results in pre-clinical tests will allow us to choose such an antigen variant that will appear to be the most active in inducing immunity.

The project's important practical aspect will be the creation – in cooperation with the company A&A Biotechnology – of a universal technology for the production of potential vaccines on a semi-technical scale, which will be the basis for launching production. The technology of producing a vaccine against the zika virus may also be the starting point for developing further vaccines against other dangerous viral pathogens.

Is the (drone) pilot flying with us?

To design and construct a prototype of a new class of devices that is not available on the market? No problem. For scientists and engineers at Tech Sim this is a standard, rather than one-off task. This time they tackled creating a dual system for unmanned aerial vehicles (UAVs, or simply drones) of Class MALE together with professional training software. This product will help standardise procedures and conduct effective selection and training of the personnel and teams operating drones, i.e. pilot-operator and sensor/weapon operator or pilot-operator and mission commander. The prototype's unique value is in its ability to record flight and biomedical data for use in the algorithm assisting training and in high ergonomics of the device itself, designed by experts in flight simulator ergonomics.

Project:

One of the world's first team unmanned aerial vehicle (UAV) simulator increasing the efficiency of training and selection of UAV operators

Funding:

Operational Programme Smart Growth

Sub-measure 1.1.1 Industrial research and development executed by enterprises

Value of the project:

PLN 3,874,484

Beneficiary:

Tech Sim Sp. z o.o.

Value of the funding:

PLN 2,989,401

The device will help standardise procedures and effectively select and train teams of drone operators

Beneficiary's opinion

Wojciech Sienkiewicz, CEO of Tech Sim Sp. z o.o.

The R&D project will help design and construct an ergonomic prototype of a new product class – a UAV simulator with professional training software that will enable effective training of personnel and teams operating UAV systems. The main feature differentiating our product from the competition will be the ability to analyze skills and evaluate team work in the operation of UAVs, as well as the ability to evaluate candidates for the pilot-operator job based on data from the sensors collected during training (psychophysical predisposition to work as UAV pilot-operator). The simulator created by our team will be innovative on a global scale, because no other simulator currently offers the selection functionality. The main features distinguishing it from other comparable solutions are the versatility of its design and the software used to simulate various types of drones as well as the system of testing predispositions of candidates. The modular structure will also help create a stimulator for the civilian market of drone pilot training.

You can't see it, but it works, or ultra-precision nano-conductor printing

The project's objective is to design technology for the production of a new generation of Transparent Conductive Films – (TCF). Transparent electrodes are used in thin-film solar cells and liquid crystal displays. The project aims to create a TCF layer with significantly improved optical conductivity and low surface resistance that will be inexpensive to apply and bend – without any loss of parameters. A fantasy? Not at all, as it seems, because thanks to NCBR's financing, XTPL has made this dream come true, successfully developing its patented breakthrough technology for ultraprecise printing across a wide range of nanomaterials. The goal has been achieved by developing a new method for applying ultra-thin (below 5 micrometres) conductive traces. The method is innovative on a global scale and uses specially designed ink containing nanosilver and a semiautomatic method of wet printing using electric field.

Project:

Developing innovative technology to produce a new generation of TCF layers for display applications and thin-film photovoltaic cells

Funding:

Operational Programme Smart Growth

Sub-measure 1.1.1 Industrial research and development executed by enterprises

Value of the project:

PLN 13,195,921

Beneficiary:

XTPL SA

Value of the funding:

PLN 9,846,969

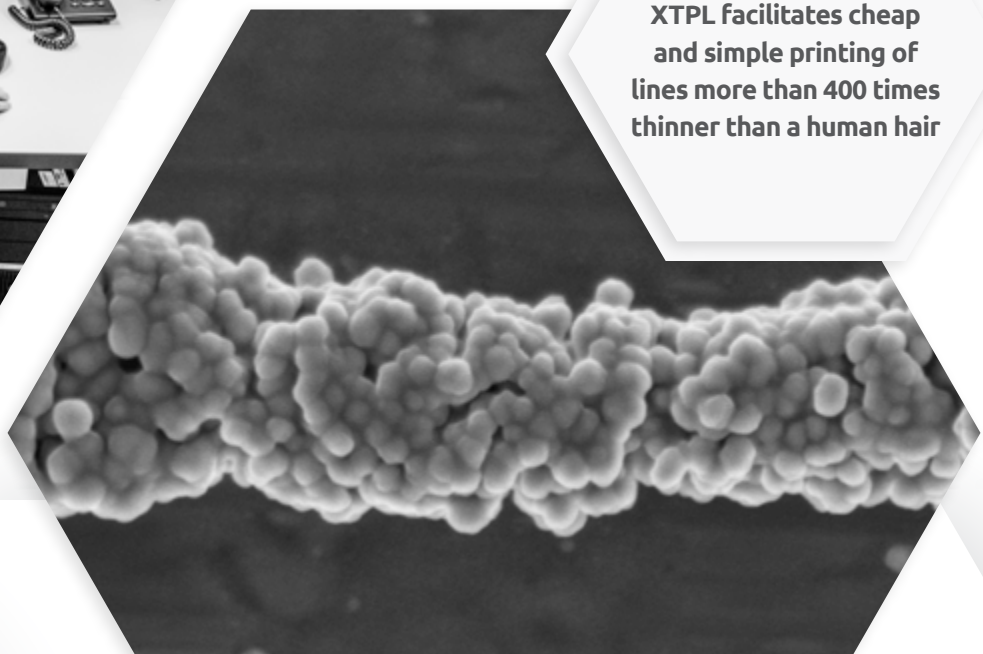
The technology of producing ultra-thin electrically conductive lines developed by a team of Polish scientists, has been tested and is being used today under laboratory conditions. XTPL's main goal is to jump to the implementation-ready stage as soon as possible as there are already many companies interested in the technology. The market expects such materials due to:

- Limited and insecure access to indium
- Advances in stretchable electronics
- Development of photovoltaics
- Customers expecting prices drop constantly and better parameters of consumer electronics

XTPL is one of the most awarded Polish technology companies. It is the winner and finalist of many competitions in Poland and abroad. The company is one of the few in Poland to have received the prestigious SME Instruments European grant. It is the first Polish finalist of IPho Venture Summit, a prestigious photonics event held biennially in Bordeaux, France. XTPL is also the first and only company to represent Poland in the final of the International Climate Venture Summit in Frankfurt am Main.

XTPL was honoured with the Technical Development Manufacturing Award (2017) – one of the most important international awards in the electronics industry

The method created by XTPL facilitates cheap and simple printing of lines more than 400 times thinner than a human hair



Beneficiary's opinion

Filip Granek, PhD,
CEO and co-founder of XTPL SA

XTPL's technology makes it possible to produce ultra-thin, transparent conductive lines that can be used, e.g. in the production of a new generation of TCF layers applied by manufacturers of displays, touch screens, and stretchable electronics, etc. Ultra-thin lines can also be applied in bioengineering, sensors, smart windows and anti-fraud protection. Thanks to support from the National Centre for Research and Development, XTPL will be able to add new specialists to the team and furnish laboratories with the necessary equipment. This step will enable us to achieve our goal of first deployments. We estimate that we will be ready launch them in 2.5 years.

NCBR Programmes and Technology Readiness Levels

Levels of technological readiness for calls for proposals planned for 2017

Strategic	GOSPOSTRATEG, TECHMATSTRATEG							
National	Improving the safety of working conditions							
		TANGO, CuBR, LIDER, CyberSecident						
Operational Programme: Smart Growth OPSG		1.1.1 OP SG “Fast Track” , 1.1.1 OP SG “Fast Track in less developed regions” 1.2. OP SG R&D Sectoral Programmes 4.1.1 OP SG Strategic research programmes for the economy 4.1.2 OP SG Regional scientific research agendas (RSRA) 4.1.3 OP SG Innovative research management methods 4.1.4 OP SG Application projects						
		1.3.1 OP SG BRIdge Alfa						
Operational Programme Digital Poland OP DP		3.3 OP DP e-Pionier						
International programmes	Era NET, Bilateral programs, others							
Defence and Security	Satellite optoelectronic earth observation system							
Programme type	TRL 1	TRL 2	TRL 3	TRL 4	TRL 5	TRL 6	TRL 7	TRL 8	TRL 9
	Basic principles observed	Technology concept formulated	Experimental proof of concept	Technology validated in lab	Technology validated in relevant environment	Technology demonstrated in relevant environment	System prototype demonstration in operational environment	System complete and qualified	Actual system proven in operational environment
	TRL Technological readiness levels								

Strategic programmes

TECHMATSTRATEG – The Strategic Research and Development Programme "Modern Material Technologies"

The programme's budget until 2021 – PLN 500m

The modernisation of transport infrastructure and ensuring the durability and reliability of buildings is one of the key challenges for the Polish economy. In order to meet this challenge, it is necessary to develop new construction materials characterised by high durability and strength, while at the same time safe for the health of society and natural environment. This is one of the issues addressed by the R&D projects under the NCBR's new strategic programme "Modern Material Technologies" – TECHMATSTRATEG.

The programme covers five strategic problem areas directly stemming from the National Research Programme, in line with the current EU's and global research priorities, which include:

- Construction materials technologies
- Photonic and nanoelectronic technologies
- Technologies of functional materials and materials with designed properties
- Waste-free material technologies and biodegradable engineering materials
- Technologies of materials for storage and transmission of energy

The deliverables of the projects implemented under the programme include the development and preparation of the deployment of new products, techniques, and technologies as well as the whole gamut of other solutions covered by the programme's thematic scope.

Allocation in the first call for proposals in 2016 totalled PLN 150m. The minimum value of eligible costs in the project is PLN 5m and the maximum amount of co-financing cannot exceed PLN 30m. According to the regulations, co-financed R&D and the activities related to the deployment preparation must be completed within 36 months.

BIOSTRATEG – Strategic Research and Development Programme "Environment, Nature, Agriculture and Forestry"

The programme's budget until 2019 – PLN 500m

The programme stimulates the growth of innovation and competitiveness of the Polish economy, especially in agriculture, forestry, and the related agri-food and woodworking industries. The deliverables of the projects implemented under the programme include the development and preparation of the deployment of new products, techniques, and technologies as well as the whole spectrum of other solutions.

The programme covers five strategic areas directly stemming from the National Research Programme and in line with the current EU's and global research priorities. These include:

- Food security and food safety
- Rational management of natural resources with a special focus on water management
- Counteracting and adapting to climate change, with particular emphasis on agriculture
- Protection of biodiversity and sustainable development of the agricultural production area
- Forestry and woodworking industry

In 2016:

- We signed 14 contracts under the 2nd call for proposals
- We granted co-financing of over PLN 188 million

GOSPOSTRATEG – The Strategic Research and Development Programme "Social and economic development of Poland in the context of market globalisation"

The programme's total budget – PLN 500m

The strategic programme "The social and economic development of Poland in a globalizing market" aims to increase the quality and effectiveness of national development policies in order to increase Poland's civilisation level, improve the quality of life of the Polish society and fulfil the development aspirations of present and future generations in accordance to sustainable development principles.

The programme covers four thematic areas:

- Middle income and average product trap
- Imbalance trap
- Demographic trap
- Institutional weakness trap

STRATEGMED – The Strategic Programme "Prevention and treatment of civilisation diseases"

The programme's total budget – PLN 800m

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 senses, as well as 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 STRATEGMED programme carried out since 2012 has included all three calls for proposals, which translated into 44 research and development projects with a total value of PLN 800 million. Thanks to support from the National Centre for Research and Development research is being undertaken into an innovative vaccine to lower insulin doses for children with type 1 diabetes, innovative laser microprobe technology for cancer diagnosis, and new therapies for psychotic disorders and Huntington's disease. In the last call for proposals, awarded in 2016, nine scientific and industrial consortia received over PLN 141 million for R&D projects in oncology, cardiology, neurology, and regenerative medicine.

National programmes

CuBR

The programme's total budget – PLN 200m

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

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

The project covers four areas:

- Mining and geology
- Ore processing
- Metallurgy, manufacturing, new materials
- Environmental protection, risk management, business efficiency

In 2016, we conducted the third call for proposals, in which we selected 20 topics. They focused on finding innovative solutions for the non-ferrous metal industry, the technological readiness of which would enable conducting their pilot tests or deployment. Their implementation requires that the beneficiaries conduct cross-disciplinary research in multidisciplinary teams. Such actions will make it possible to develop complex solutions stimulating higher innovation and competitiveness of the Polish economy and ensure their industrial commercialisation. That is why we invited not only entities directly related to the non-ferrous metals industry and mining, but also teams from other fields of science and technology. As a result of the call for proposals, we positively evaluated 12 applications.

GO_GLOBAL.PL Increasing the scale of commercialisation of R&D results of Polish companies in global markets

The aim of GO_GLOBAL.PL is to support Polish companies in increasing the scale of commercialisation of their R&D results in global markets. High-risk, venture capital funds are invited to participate in the programme, which enables them to determine the potential of Polish entrepreneurs and create new investment opportunities. The programme supports activities carried out by innovative micro-, small- and medium-sized enterprises operating in the high and medium-high technology sector. At the same time, the enterprises can verify their strategies in cooperation with the funds.

Last year, in the second edition of GO_GLOBAL.PL, our experts evaluated 80 applications for subsidy allocation. Co-financing was awarded to the most innovative companies that are planning to commercialise their R&D solutions in global markets. Each entrepreneur will receive up to PLN 150,000 to prepare global go-to-market strategies and obtain knowledge how to align their products with the specific requirements of a particular region. The funding can also be earmarked to develop and validate strategies in relation to potential investors or business partners.

Selected winning projects:

- **BioScientia Sp. z o.o.**
  The project deals with the development and validation of a strategy for the commercialisation of a fast field test for the detection of honey bee infection with *Nosema ceranae* microsporidian in the European marketplace, with a special focus on the German market.

- **BIOAVLEE Sp. z o.o.**
  The main goal of the project is market commercialisation in Germany of innovative technology for identifying bacteria by means of laser diffraction marking.

- **Enelion Sp. z o.o.**
  The authors have been trying to launch an innovative modular smartphone-operated electric car charger in the global marketplace.

- **Uni-Kat Sp. z o.o.**
  The project aims to support the company Uni-Kat in market commercialisation of Streamera, an innovative water jet cutter for soft materials in Germany.

- **uPaid Sp. z o.o.**
  As part of the project, the developers intend to expand the uPaid digital wallet platform in international markets.

- **Nestmedic Sp. z o.o.**
  The project aims to support Nestmedic in market commercialisation in Germany of PREGNABIT, an innovative product for remote monitoring of foetus well-being using the telKTG medical device. The mobile device is designed for women in the third trimester of pregnancy and developed as a result of R&D carried out by the company.

GO_GLOBAL.PL current beneficiaries include companies such as Audioteka, Sotrender, Social WiFi, and VoiceLab which have achieved considerable market success. According to a study by the NCBR, up to 80% of the programme's beneficiaries have managed to find at least one business partner internationally and 17% have found an investor. Every fifth entrepreneur has opened a foreign office or agency and every third beneficiary has reported an increase in the sales of their products or services.

TANGO

TANGO is a joint undertaking of the the NCBR and the National Science Centre (NSC) 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: development of the concept of commercialisation of research results, acquisition of partners interested in the implementation of these results and securing intellectual

property rights. The financing is also earmarked to cover the costs of market analyses, industrial research and development.

The programme is addressed to entities carrying out basic research projects financed, e.g. by the NSC, as part of the following programmes: Opus, Harmonia, Sonata, Sonata Bis, Maestro and grants awarded by the Ministry of Science and Higher Education.

Last year, in the second call for proposals in the TANGO programme, co-financing of nearly PLN 22 million was awarded to 26 out of 119 submitted projects. In addition to medical research, financing was also allocated for the development of organic light-emitting diode technology, the application of the AIA (Adaptive Impact Absorption) concept in aerospace engineering or innovative water purification technology.

In the TANGO programme, the applications were evaluated under a two-stage procedure by the NSC and the NCBR. Funds of up to PLN 1.15 million could be awarded to research institutions, scientific institutes of the Polish Academy of Sciences, academic research centres as well as individual researchers.

If a project has been qualified for the R&D phase, the entrepreneur is required to provide own contribution of at least 15% of the value of the financing received for research tasks.

As part of the first TANGO call for proposals, concluded in February 2015, 51 projects are being implemented, including:

- Marketing of the new HydroProg system for early warning of hydrological hazards
- Development of biotic technology for commercial organic berry production
- Study of materials based on functionalised carbon nanostructures as product components characterised by the best possible absorption and/or electromagnetic emission (EM)
- Research studies on innovative DNA aptamers designed to purify recombinant proteins

LIDER

The main objective of the LIDER programme is to broaden competences of young researchers in self-planning, managing, and leading their own research teams during the execution of research projects whose results can be implemented in the economy. The programme also serves to stimulate collaboration between researchers and entrepreneurs by carrying out research that can possibly be deployed and commercialised. In addition, it encourages mobility across sectors, universities, and research institutions.

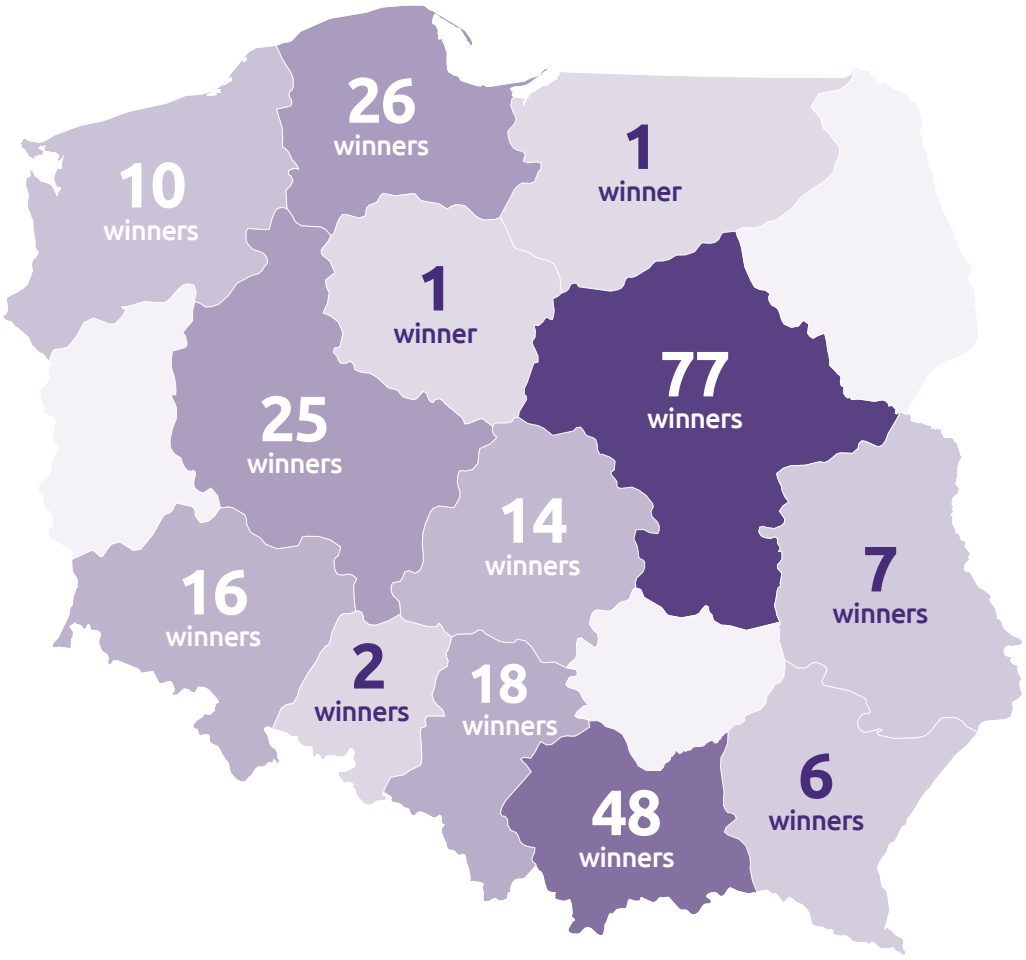
Lider VII call for proposals, we signed 35 contracts worth a total of PLN 39.6 million

In the seventh edition of the LIDER programme, the highest score was awarded to the project by Ewelina Król, PhD, from the University of Gdansk. Her interdisciplinary team carries out research on a Zika virus vaccine based on recombinant proteins or virus-like particles that do not contain the virus's genetic material. As part of the nearly PLN 1.2 million that Ms. Król received for the project, young scientists will develop a methodology for the production of the vaccine on a semi-technical scale, which will be the basis for its deployment.

The 35 projects awarded last year also include:

- Research studies in non-contact damage imaging in composite structures using laser techniques
- Research on the innovative method of bioconversion of food industry by-products
- A method of utilising waste polymethacrylate methyl for the production of special-purpose materials
- Designing, construction, and optimisation of the integrated Atomic Force Microscope and Optical Tweezers for particle and nanomaterials research
- Designing innovative healthy processed carp snacks for athletes

Under all the previous editions of the programme, we provided support to 251 young scientists from all over Poland. We allocated over PLN 268 million for that purpose. In all editions, at least 10% of all projects received a maximum value of co-financing of up to PLN 1.2 million.



Number of projects implemented by voivodship

PANDA2 research infrastructure maintenance support programme

The programme's total budget until 2020 – PLN 250m

The PANDA2 programme is addressed to research and development centres working for the dissemination of science. The funding includes infrastructure of at least PLN 50 million generated by the Operational Programme Innovative Economy that enables conducting research commissioned by third parties. The purpose of the call for proposals is to encourage research centres to work more closely with business, and researchers to commercialise the results of their research.

Outcomes of programme implementation in 2016:

- We conducted one call for proposals
- We signed 16 contracts and annexes to execute and finance projects

PATENT PLUS

The programme encourages researchers and science department leaders to apply for legal protection of the results of their research. The main objective of the programme is to increase the number of patent applications and thus increase the protection of industrial property rights in Poland, by co-financing or reimbursing the costs necessary to prepare a patent application. By facilitating the acquisition of business partners, the project implementation should indirectly result in higher commercialisation of inventions.

In 2016, the Centre exercised substantive and financial supervision over 55 projects selected in calls for proposals I – IV. Only in the 4th call for proposals we positively evaluated and recommended co-financing of 29 applications.

Outcomes of the programme's implementation in 2016:

- 16 projects were successfully completed
- 37 national patent applications were made on the national level for 9 inventions created in HEIs, research institutes or Polish Academy of Sciences research centres
- 28 national patent applications were made on the national level for 18 inventions created in Higher Education Institutions (HEIs), research institutes or Polish Academy of Sciences research centres and in international entities and in SMEs
- 15 patent decisions were granted for 12 inventions

GEKON – Generator of Ecological Concepts

The programme's total budget – PLN 400m

A joint undertaking of the NCBR and the National Fund for Environmental Protection and Water Management aiming to develop innovative environmental technologies by financing R&D projects and their implementation in enterprises. The funding can be obtained by entrepreneurs as well as consortia of researchers and entrepreneurs engaged in R&D in the areas of: unconventional gas extraction, energy efficiency and storage, protection and rationalisation of water use, obtaining energy from clean sources, innovative methods of obtaining fuel, energy and materials from waste, and waste recycling.

Outcomes of the programme's implementation in 2016:

- We signed 7 contracts and annexes to execute and finance projects
- We granted co-financing of over PLN 22 million (from the NCBR funds)
- 9 projects were initiated
- 27 projects were successfully completed
- 78 solutions or technologies were developed for implementation

BLUE GAS Polski Gaz Łupkowy (Polish Shale Gas)

Blue Gas is a joint undertaking of the NCBR and the Industrial Development Agency. It focuses on supporting large, integrated R&D activities involving test-pilots, leading to the development and commercialisation of innovative technologies in the field of shale gas extraction in Poland. The recipients of the programme include research consortia involving entrepreneurs.

Applications for co-financing should meet the following requirements:

- Object of the project is the development of innovative technologies in the area of shale gas extraction
- Under the project, new technologies will be validated/tested on a pilot scale under real-life conditions
- The leader of the project is an entrepreneur (with experience in implementing new solutions on an industrial scale) interested in implementing a technology developed as part of their business

Outcomes of the programme's implementation in 2016:

- We continue to monitor 21 projects from 1st and 2nd calls for proposals
- Projects selected in the 1st and 2nd calls for proposals are in their final stage of implementation

In November 2016, the Polish Oil and Gas Company (PGNiG), the leader of the majority of projects implemented under the Blue Gas programme, officially notified the NCBR that shale gas exploration in Poland was terminated. However, due to the level of progress of project implementation, the PGNiG proposed that the ongoing projects (except one) should be deployed. Irrespective of the company's business decision, the outcomes of the projects offer opportunities for direct application in the future.

Road Innovation Development – RID

The programme's total budget – PLN 50m

This is a joint undertaking of the NCBR and the General Directorate for National Roads and Motorways. The programme aims to support the construction and transformation of the road infrastructure, improving the competitiveness of the Polish economy. Under the programme, we will finance research projects on improving road safety and the traffic management system efficiency, as well as developing norms and standards for the planning, design, technology, construction, and optimal use of roads in Poland.

Outcomes of the programme's implementation in 2016:

- We signed 15 contracts and annexes to execute and finance projects
- We granted the total funding of over PLN 38 million, of which over PLN 19 million was co-financed by the NCBR

Applied Research Programme

The Applied Research Programme supports entrepreneurs and researchers in conducting research in a number of areas for various sectors of the economy. It goes along two tracks. Track A is dedicated for research aimed to obtain knowledge in a specific field of study having practical application. Track B makes it possible to undertake research to achieve pre-determined practical goals by applying new solutions in specific industries.

Outcomes of the programme's implementation in 2016:

- One project for the amount of PLN 4 million was initiated
- 123 projects were successfully completed
- 122 implementations were made
- 525 publications were made
- 173 domestic and 12 international legal facilities for industrial property rights were developed
- 339 engineering, masters, doctoral, and post-doctoral thesis were started
- 243 new technologies and processes were developed

GRAF-TECH

GRAF-TECH offers support to R&D initiatives into products based on the application of unique graphene properties as well as measures to prepare the implementation of R&D in this area.

Outcomes of the programme's implementation in 2016:

- 27 solutions based on the application of graphene were developed and implemented
- 9 joint projects/undertakings were carried out by the research institution and entrepreneurs as a result of cooperation in the programme
- 133 review papers that presented the results of the programme's research were published in international journals
- 5 new entities started their business as part of the programme's implementation
- Substantive and financial supervision over 55 projects selected in the first call for proposals was conducted

Social Innovation Programme

The main aim of the programme is to improve the quality of life in society, with a particular focus on the groups and areas where there is a real need for innovative solutions and new social initiatives. The programme's specific objectives include both increasing the number of implemented innovative technical solutions and innovative products, services, and procedures to address complex social problems, and increase cross-sectoral cooperation at the local, regional, and national levels.

The programme is addressed to consortia consisting of at least one scientific entity and at least one entrepreneur, or at least two scientific entities with the mandatory participation of an NGO having legal personality and the seat on the territory of the Republic of Poland.

Defence and security

The National Research and Development Centre, in agreement with the Minister of National Defence and the Minister for the Interior, conducts activities related to research on security and defence. Undertakings that are most likely to have a real impact on improving national security receive funding under calls for proposals devoted to specific research topics. The programmes and projects aim not only to increase the potential of Polish scientific and industrial entities, but also to strive for technological independence through creation of Polish know-how in technologies that are critical for national security and defence.

In 2016, we announced two calls for proposals:

- Young Scientists 2016
- R&D projects for national defence and security

Entities eligible to participate in calls for proposals include scientific entities, scientific consortia, scientific and industrial centres, and entrepreneurs.

Operational Programme Smart Growth

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. What is important is that sectoral programmes are initiated by a group of companies that act on behalf of the industry – e.g. through a technology platform, or cluster initiative, etc. This means that they first need to agree in which segments they see the greatest potential for innovative development and differentiation in the world. Subsequently, the group needs to provide us with 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. We prefer projects that match the National Smart Specialisation, including new specialisations, discovered in the innovation development of companies and industries. Under this mechanism, we dedicate funding for entrepreneurs and business consortia.

So far we have created the following sectoral programmes:

- InnoSBZ – for unmanned systems
- INNOCHEM – for the chemical industry
- INNOTEXTILE – for the textile industry
- INNOTABOR – for passenger, freight and specialised transport rolling stock
- GameinN – for video game production
- INNOSTAL – for the steel industry
- PBSE – for the power industry
- INNOMOTO – for the automotive industry
- IUSER – for the ICT industry
- INNOVATIVE RECYCLING – for the sector of recycling of mineral resources and wood
- WoodInn – for the forestry, woodworking and furniture sector and related industries
- InnoNeuroPharm – for the pharmaceutical sector

In 2016, the following programmes were implemented:

INNOSBZ

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 on the global market by 2026.

Actions implemented in 2016:

- The research agenda was approved
- We prepared and launched a call for proposals including a formal and substantive assessment
- 17 applications were submitted for a total of over PLN 74 million
- 11 applications were evaluated positively and qualified to receive co-financing of PLN over 41 million

PBSE

Initiated by the Polish Electricity Committee, the programme aims to increase the innovativeness of Poland's national power sector in the perspective of 2023.

Actions implemented in 2016:

- The research agenda was approved
- We prepared and launched a call for proposals including a formal and substantive assessment, and our decision is expected in 2017

IUSER

Launched by the National Chamber of Commerce for Electronics and Telecommunications, the programme is aimed at increasing the international competitiveness of the sector of smart devices and systems for energy generation and the management of systems and components of dispersed generation by 2023.

Actions implemented in 2016:

- The research agenda was approved
- We prepared and launched a call for proposals, including a formal and substantive assessment, that will be concluded in 2017

INNOSTAL

The programme was initiated by the Steel Chamber of Commerce and Industry. INNOSTAL's main objective is to increase the competitiveness and innovativeness of the Polish steel industry by 2026. We also want to encourage the industry to take a more active role in conducting research and making ground-breaking discoveries. We expect that this is the way to reduce the negative impact of the steel sector on the environment.

Actions implemented in 2016:

- The research agenda was approved
- We prepared and conducted a call for including a formal and substantive assessment
- 21 applications were submitted for a total of over PLN 144 million
- 19 applications were evaluated positively and qualified to receive co-financing of PLN 131 million, as a result, we increased the pool of funding earmarked in this call for proposals by PLN 11 million

INNOTEXTILE

The programme was initiated by the Association of Employers of the Clothing and Textile Industry "PIOT". INNOTEXTILE's idea 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. We hope that this is the way to reduce their environmental footprint.

Actions implemented in 2016:

- The research agenda was approved
- We prepared and conducted a call for proposals involving formal and substantive assessment, with 20 applications for co-financing for a total of more than PLN 46 million
- 13 projects received positive evaluation from experts and were qualified to receive co-financing of over PLN 31 million

GAMEINN

Submitted by the Polish Games Agreement, the programme aims to increase the competitiveness of Poland's video game industry on the global market by 2023.

Actions implemented in 2016:

- The research agenda was approved
- We prepared and conducted a call for proposals involving formal and substantive assessment of 72 applications for co-financing for a total of almost PLN 185.8 million
- As many as 38 projects were highly evaluated. As a result, we increased the pool of funding in this call for proposals. The winners will receive co-financing of PLN 115 million

INNOTABOR

The programme 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 until 2023.

Actions implemented in 2016:

- We announced the 1st INNOTABOR call for proposals with an allocation of PLN 196 million
- As a result of a formal and substantive evaluation, 14 projects were selected to receive co-financing expected to exceed PLN 156 million

INNOCHEM

Initiated by the Polish Chamber of Chemical Industry, the programme aims to improve the innovativeness and competitive position of the Polish chemical sector on global markets by 2023. The programme will ensure a better cooperation between the industry's companies and scientists. We intend to finance investments:

- Focusing on solutions that increase the utilisation of alternative raw materials and new ways of managing waste in the chemical industry
- Increasing the production of new or improved materials and core products
- Reducing energy intensity, raw materials consumption and the sector's ecological footprint.
- Increasing the production of new products and solutions in the chemical sector with the use of advanced technologies
- Increasing the use of technologies to optimise current manufacturing processes

Actions implemented in 2016:

- We prepared and conducted a call for proposals (formal and substantive assessment), with 49 applications for co-financing for a total of more than PLN 188 million
- 31 projects received positive evaluation and qualified to obtain financing of over PLN 109 million
- Already last year, we signed 25 contracts for more than PLN 94 million and 21 projects were launched

INNOMOTO

INNOMOTO's main goal is to increase the innovativeness and competitiveness of the Polish automotive sector by 2026.

We will focus on co-financing projects that will result in:

- Innovative technologies of manufacturing, regeneration, recovery, and recycling
- Innovative vehicles and propulsion systems
- Innovative parts, components, and systems for use in vehicles

Actions implemented in 2016:

- The research agenda was approved
- We prepared the first call for proposals with results to be announced in 2017

WOODINN

The programme is launched by the WOODSTRATEG Consortium of Key Woodworking and Forestry Technology Entities and a consortium of furniture companies and a scientific institute. The programme aims to increase the competitiveness and innovativeness of the Polish forestry, woodworking and furniture sector on the international arena as well as to reduce the negative impact of the sector on the environment.

Actions implemented in 2016:

In cooperation with the sector, we prepared the thematic scope of the first call for proposals, as well as the rules and criteria for recruitment. We scheduled its announcement, call for applications, and first contracts for 2017.

INNONEUROPHARM

Initiated by the Polish Federation of Pharmaceutical Industry Employers, the programme was designed in such a way as to ensure direct impact of the development of Polish enterprises and scientific institutions on the availability of the most innovative and effective therapies for patients. The Program aims to increase the competitiveness and innovativeness of the Polish pharmaceutical sector, including neuromedicine, by 2026.

Actions implemented in 2016:

In cooperation with the sector, we prepared the thematic scope of the call for proposals, as well as the rules and criteria for recruitment. We scheduled its announcement, call for applications, and first contracts for 2017.

INNOVATIVE RECYCLING

Initiated by the Non-Ferrous Metals and Recycling Chamber, the programme aims to increase the innovativeness and competitiveness of the recycling sector by 2026. Recycling is one of the youngest and most innovative sectors of the Polish economy. It brings together companies that specialise in the recycling of mineral and wood waste, so the materials that pose one of the key challenges of the global economy in terms of consumption reduction. That is why, under the programme we will focus on supporting investments related to the recycling of non-ferrous metals, mining waste, glass, ceramics, building materials, and wood.

Actions implemented in 2016:

In cooperation with the sector, we prepared the thematic scope of the call for proposals, as well as the rules and criteria for recruitment. We scheduled its announcement, call for applications, and first contracts for 2017.

Fast Track

Sub-measure 1.1.1

Industrial research and development executed by enterprises

The programme's total budget until 2020 – EUR 1,9 billion

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 filing. All to enable entrepreneurs to launch their investments and improve their innovativeness as quickly as possible.

As part of this measure, we focus on financing R&D projects executed by enterprises. We provide co-financing for investment projects that include industrial R&D or development projects (projects that do not include R&D are not eligible for co-financing). An entrepreneur – the programme's beneficiary may subcontract part of the R&D work. 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 2016, we signed 149 contracts for co-financing of PLN 574 million under the call for proposals announced a year earlier. Last year, we opened two further calls for proposals for SMEs. So far we have announced the results of one of them – awarding a total of over PLN 116 million in co-financing for 30 companies.

In 2016 one call for proposals was announced for large entities, with results to be announced in 2017. The results of the 2015 call for proposals were announced in 2016, with 15 beneficiaries receiving a total of PLN 167 million.

Demonstrator

Sub-measure 1.1.2

R&D related to pilot/demo installations

Co-financing under this measure is granted only for the execution of development initiatives, including the production of demo installations. The beneficiary may subcontract part of the R&D project, but here the limit of tasks that can be outsourced to third parties is also specified. Co-financing can be received on condition of commercialisation of R&D results – the beneficiary must implement the solutions in their own company, grant a license to another entrepreneur or sell the results of the project.

Priority in receiving support under this measure will be given to projects that fall under the category of National Smart Specialisation, including new specialisations that result from R&D or development of innovativeness in companies. Also in this case there are two categories of calls for proposals: for SMEs and for large companies. The minimum value of eligible costs of a co-financed project in this call for proposals is PLN 5 million for SMEs and PLN 20 million for large entrepreneurs.

Calls for proposals are conducted on an ongoing basis. In this case, the process of project evaluation from the closing of the call for applications to the publication of the results takes about 90 days. Last year we accepted 163 applications. We signed contracts for the implementation of 32 projects for which we granted co-financing of PLN 273 million.

Sub-measure 4.1.1

Strategic research programmes for the economy

We offer funding for research and development projects carried out by scientific as well as scientific and industrial consortia. We want to encourage scientific institutions and scientific and industrial consortia to cooperate with companies and public entities – including local governments – to carry out R&D on new technological solutions.

In 2016, we were involved in setting strategic criteria for research programmes implemented as joint undertakings, e.g, with PKP PLK SA, PGE SA, PGNiG SA and GAZ-SYSTEM SA. We also worked to establish a joint undertakings with Marshal Offices from selected voivodships.

In 2016, together with SYNTHOS SA, we launched the SYNChem programme, which implements projects for the development and implementation of innovative technologies, materials, and products. It aims to increase the innovativeness and competitiveness of the Polish chemical industry by 2023.

In total, the NCBR and Synthos will invest PLN 30 million. Under the programme, scientific and industrial consortia will be able to apply for R&D funding for a new generation of products, i.e. ecological anti-degradants, high performance elastomers, biopesticides, fibres and composites for industry and medicine.

Applications will be evaluated by a panel of experts in science and technology as well as business and economics. Applicants will be therefore required to defend their ideas challenged by specialists. Evaluation will also cover the research team and the applicants' technical resources that need to guarantee proper execution of scheduled tasks. The minimum value of eligible costs of a co-financed project in this call for proposals is PLN 1 million .

RSRA

Sub-measure 4.1.2

Regional scientific research agendas

As part of this sub-measure, we offer funding for R&D projects carried out by scientific and industrial consortia led by a scientific institution.

The Regional Scientific Research Agendas (RSRA) make it possible to select high quality projects with the greatest impact on the economic development of Poland and its 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 as part of the RSRA was conducted at the second stage on the basis of criteria accepted by the OP SD monitoring committee.

Last year we organised one call for proposals that attracted 168 applications. Co-financing allocations exceeded PLN 55 million.

Sub-measure 4.1.4

Application projects

We offer funding for R&D projects carried out by scientific and industrial consortia. We are looking for projects with potentially innovative results on the global scale. We want to increase considerably the scale of application of new technological solutions necessary for the development of companies and improving their competitive position.

Last year, 150 applications were submitted in the call for proposals, of which 19 were selected by the experts. These projects can expect co-financing of PLN 95 million.

We want to use this instrument to support selected large, strategic national or international research infrastructure projects plotted on the Polish Road Map for Research Infrastructures. At the same time, we want to provide access to this infrastructure to entrepreneurs and other stakeholders.

Projects cannot duplicate existing resources and should complement the existing R&D infrastructure.

The conditions for obtaining funding include presenting a research agenda aligned with the National Smart Specialisation and developing a plan for using and providing financial support for the R&D infrastructure after project completion.

The institution implementing the measure is the Information Processing Centre – the IPC, which has so far announced and evaluated one call for proposals. Out of 7 projects, the experts selected five for deployment. The value of eligible costs in these projects amounted to EUR 181.66 million, and the requested and recommended co-financing amounted to EUR 127.60 million.

Measure 4.2

Development of modern research infrastructure of the science sector

IRA

The Foundation for Polish Science (FPS) is responsible for the execution of Measure 4.3. OP SG International Research Agendas. The FPS is responsible, among other things, for the recruitment, monitoring, and accounting for the implementation of grant projects selected in the calls for proposals. The NCBR is responsible for substantive and financial supervision over the FPS.

Measure 4.3

International Research Agendas

International Research Agendas (IRAs) are research programmes created by applicants and representatives of the international scientific community who are world-renowned authorities in the area of the scientific institution's expertise. The programme aims to execute International Research Agendas and create specialised, world-class scientific institutions in Poland that would apply the world's best practices in:

- Identifying programmes and research topics
- Staff policy and R&D management
- 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.

The high requirements that need to be met in order to obtain funding can be illustrated by the call for proposals announced by the FPS in 2015, where 28 applications were submitted. Following detailed analyses earlier this year, one contract for co-financing of PLN 39 million was signed, while the total allocation to the call for proposals was more than three times higher.

Last year another call for proposals was announced with an allocation of PLN 140 million, 9 applications were submitted. The selection will be made this year.

Measure 4.4

Enhancing the human resources potential in the R&D sector

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 operating research equipment for business clients.

The FPS 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

The programme consists of three components:

- HOMING – puts special emphasis on encouraging eminent Polish-born scientists working in the most innovative areas to return to Poland. The total amount allocated for the programme is PLN 205.3 million. Last year, in two completed calls for proposals the FPS selected 20 winners who were awarded funding of over PLN 13 million
- POWROTY – supports those who resume research into R&D in scientific institutions or companies in Poland after a break. Last year, in two calls for proposals, the FPS selected 7 winners who can expect co-financing of over PLN 5 million
- FIRST TEAM – is intended to encourage outstanding Polish-born scientists to return to Poland or encourage researchers to resume professional activity in the field of R&D after a break in research work. Support is offered to teams that conduct research in scientific institutions or companies in Poland, working in the most innovative areas and having a scientific partner. Last year, in two calls for proposals, the FPS selected 17 winners who can expect co-financing of over PLN 32 million

TEAM TECH

The programme is designed to enable people starting their research career – students, PhD students or young PhD scholars – to gain experience in R&D by carrying out a project into the development of a technology, process or innovative product (TEAM TECH call for proposals) as well as creating and developing research services using advanced equipment (Core Facility call for proposals). The total amount allocated for the TEAM TECH programme is PLN 205.3 million.

Last year, in two calls for proposals, the FPS selected 15 winners who can expect co-financing of over PLN 48 million.

TEAM

The funding in the programme is intended to enable people beginning their research career – students, PhD students or young PhD scholars – to gain experience in R&D while conducting research work of major importance to the economy and society on an international scale. The total amount allocated for the TEAM programme is PLN 205.3 million.

Last year, in two calls for proposals, the FPS selected 17 winners who can expect co-financing of over PLN 56 million.

Summary. Outcomes of Measure 4.4 OP SG in 2016:

- 513 applications were received
- 77 projects were co-financed
- The amount of the co-financing exceeded PLN 141.4 million

Sub-measure 1.3.1

Financing R&D projects in the pre-seed phase by proof of concept funds – BRIdge Alpha

BRIdge Alfa

Our goal in developing the BRIdge Alpha programme was to build a network of investment vehicles in the form of proof of concept funds that are designed to verify and approve R&D projects in the pre-seed phase, or at a very early stage of development. The main task of the programme is to bridge the gaps in technology and biotechnology projects on the market of early stage capital investment.

The BRIdge Alpha programme provides support for R&D projects mainly originating from the scientific research community in Poland by the financing of the test phase (proof of principle, proof of concept) and capital injections into the companies established on the basis of approved projects.

The budget of one fund-vehicle ranges between PLN 10 million and PLN 30 million, with non-refundable co-financing by the NCBR under 80 percent. The remaining part must be contributed by the entrepreneurs-investors. The financing from this kind of fund offered to individual projects usually amounts to up to PLN 1 million, and in justified cases up to 3 million PLN.

Last year, we signed contracts with 5 funds.

Sub-measure 1.3.2

Public-private financing of R&D involving the participation of venture capital funds NCBR VC (BRIdge VC)

NCBR VC (formerly BRIdge VC)

This is a new programme aimed to support the commercialisation of industrial R&D that offers 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 NCBR VC, we will create a Fund's Fund managed by a professional Fund's Fund Manager, whose function will be performed by the Polish Development Fund PFR Ventures, acting jointly

with the Investment Funds Association of Bank Gospodarstwa Krajowego. The capitalisation of the fund will be EUR 450 million, half of which will come from the NCBR under OP SG and the remaining 50% will be provided by private investors. We have already credited the fund with the first tranche of EUR 25 million.

In accordance with the adopted investment strategy, the Fund Manager appointed by us will select about 10 teams with appropriate experience and potential to invest in the portfolio companies over the period of a year. The companies will manage VC funds specialised in investing in advanced technology companies that use innovative Polish solutions.

The VC funds will support R&D initiatives and commercialisation of their results by financing high-risk investment projects as venture capital investments in technology companies in the SME sector. Each of the VC funds will have a budget of EUR 20 million to EUR 50 million. The investment period will end after 4 years, when the funds will focus on the development of portfolio companies and execution of the most economically viable exit strategy.

Operational Programme Digital Poland

Third priority axis

Digital competences of society

The programme aims to improve the skills of the Polish society in using Internet, including public e-services, and to develop these services.

The project is being implemented based on the PCP model, innovative on the Polish market. It differs from a standard procurement procedure in that, rather than imposing a detailed specification of the product or service, it merely signals a problem, such as the lack of the necessary solution. This information is to be sent to interdisciplinary teams, including programmers. In order to actually achieve the goal, intermediaries are needed – NCBR's accredited accelerators – whose main task will be to liaise between public institutions and interdisciplinary teams to create solutions that address specific social and economic problems.

Last year, we managed to announce one call for proposals under this programme, which received 18 applications.

Operational Programme Knowledge Education Development

Measure 3.1

Competences in higher education

Our goal under this measure is to improve competences at universities – both competences of academic staff and students. We want to facilitate the development of their skills in line with the needs of the economy, supporting its growth and the labour market, and to make sure that our graduates have no problem finding employment, while the society obtains benefits from education. We also hope that our support under this measure will improve the attractiveness of university faculties and universities themselves, e.g. by expanding their educational offer.

Last year, we completed three calls for proposals announced a year earlier:

- **Competency Development Programme** – 69 projects received co-financing with PLN 101 million allocated to them
- **Studying? Take an internship!** – 99 projects, we allocated close to PLN 136.4 million for their financing
- **Academic Career Offices** – 28 projects with an allocation of almost PLN 19.1 million

Last year we also announced new calls for proposals:

- **New Educational Programmes** – we allocated PLN 200 million, with 206 entities applying for PLN 263 million. We selected 45 projects worth over PLN 35 million
- **Competency Development Programme** – we allocated PLN 250 million, 436 projects were submitted worth over PLN 513 million. We selected 137 applications worth PLN 126.8 million
- **Philosophical education** – we allocated PLN 5million, with 48 entities applying for almost PLN 3.8 million. We selected 22 projects worth over PLN 1,8 million

- **Copernicus's Paths 2.0** – we allocated PLN 5 million, with 106 applications for over PLN 20 million. We will finalise the procedure for selecting the best applications in 2017

Measure 3.2

Doctoral studies

We undertook this measure to improve the quality and effectiveness of doctoral education. We support interdisciplinary doctoral programmes both in Poland and abroad, international study programmes developed by co-operating universities, doctoral programmes that are key to the development of business innovation, and ensuring market commercialisation of the results of these studies.

In 2016, we announced one call for proposals, with an allocation of 155 million PLN. We plan to conclude it in 2017.

Measure 3.3

Internationalisation of Polish higher education

We aim to increase the availability of international education programmes for students from Poland and for foreigners. To that end, we want to increase the number of courses conducted in foreign languages, opportunities to study in multinational groups, inviting international lecturers or supporting student participation in international competitions.

In 2016, we announced one call for proposals **International education programmes.** Its allocation totalled PLN 145 million. We received applications from 180 entities for PLN 278 million. We selected 62 projects worth over PLN 91 million.

Measure 3.4

Management in higher education institutions

Our goal here is to support the management of the learning process, e.g. by introducing IT tools to create a central repository of MA theses, operating anti-plagiarism software, creating open learning resources, and new tools to share information and data about higher education. Under this measure, we will also support the process of university consolidation, improve teaching staff skills, especially in IT and database management, information management, team and financial management, etc.

In 2016, we announced one call for proposals **Raising the competences of teaching staff.** Its allocation totalled PLN 132 million. We received applications from 167 entities for PLN 82.3 million. We plan to conclude the call for proposals in 2017.

European Funds

European Union
European Structural
and Investment Funds

Project co-financed from European Union funds
under the European Regional Development Fund
and European Social Fund.

ISBN 978-83-936422-9-8

The National Centre
for Research and Development