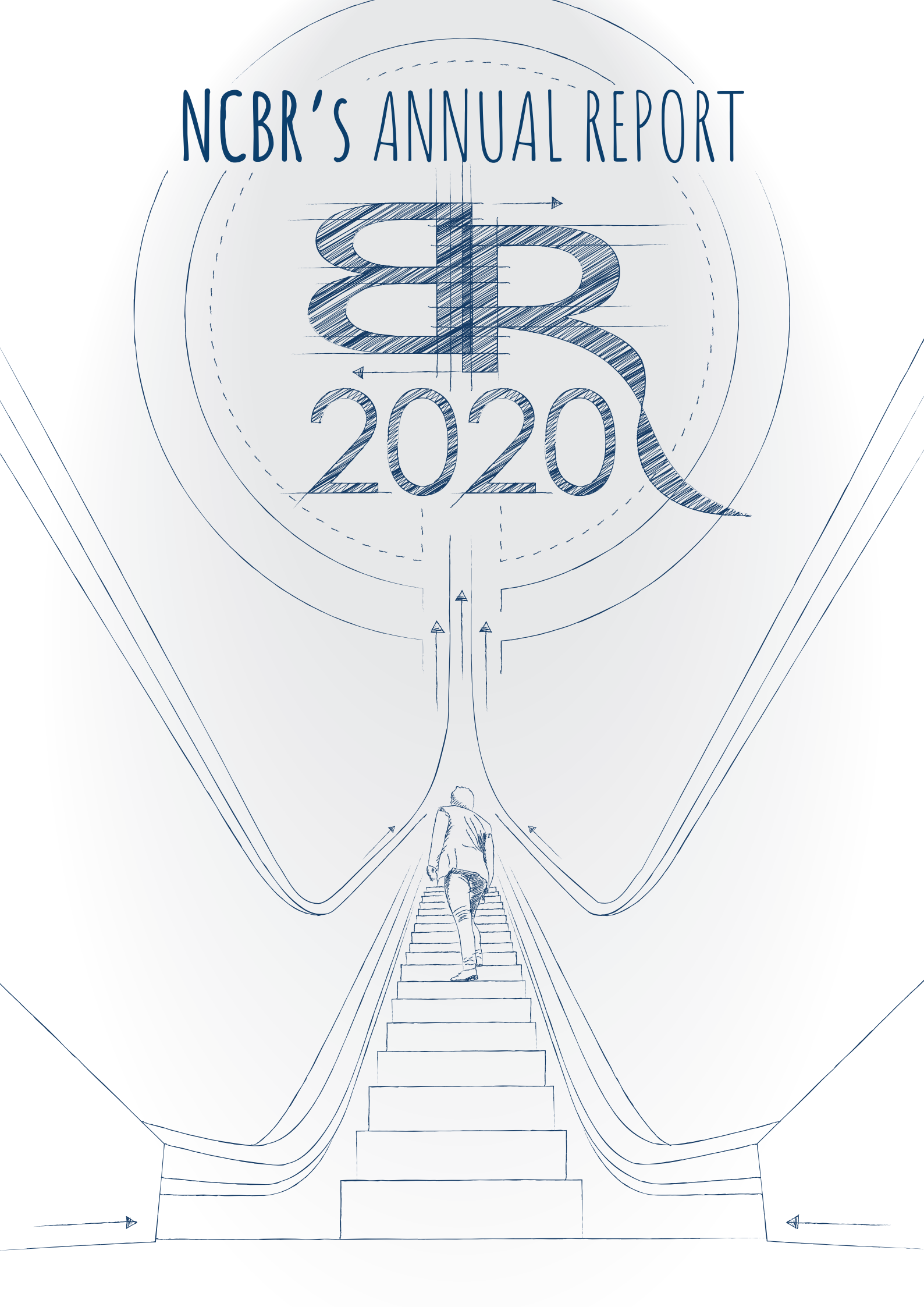


NCBR'S ANNUAL REPORT

₹
2020



NCBR'S ANNUAL REPORT 2020

CONTENT LIST

FOREWORD BY THE CENTRE DIRECTOR	1
FOREWORD BY THE PRESIDENT OF THE CENTRE COUNCIL	3
NCBR - WHO WE ARE	4
NCBR'S ACTIVITIES IN NUMBERS	12
NCBR'S BENEFICIARIES IN 2020	19
NCBR'S PROGRAMME PORTFOLIO	59
NCBR - A RESPONSE TO TRENDS	79
SUMMARY	110



FOREWORD BY THE CENTRE DIRECTOR



Dear Readers,

Another year of NCBR's functioning is behind us. It is common for us to say that we are facing unusual breakthrough times, but such words are often a figure of speech rather than a reality. However, behind us is a year that presented us all with some unexpected and unforeseeable challenges. When I was preparing the foreword to NCBR's previous annual report, we had already been struggling with the outbreak of the pandemic. However, no one back then could accurately predict the forthcoming events. COVID-19 definitely changed our lives. On the one hand, we had to learn to function in a world in which human life and health were put at risk. On the other hand, our economy had to adapt to the circumstances, challenges and threats brought by the pandemic.

Already in the spring last year, NCBR organised its work in such a way that its activities could be successfully continued. Applicants and customers got perfectly accustomed to the panels, contacts and exchange of information mainly taking place in a remote manner. The new situation did not lower the applicants' interest in the services NCBR offers. These extraordinary circumstances also made us support various attempts at

controlling the pandemics. We launched special competitions as well as offered our support for dedicated COVID-19 hospitals. What was extremely important in those efforts was our prompt reaction and concrete response to the challenges we all had been forced to face.

The pandemic has not slowed down our activities and programmes. Nor did it hamper the ongoing work of our beneficiaries. Here you will find an extensive study on the projects completed in 2020. It can serve as a partial response to the question of what outcomes the support provided by NCBR has brought and how the invested money has fostered our beneficiaries' work. Importantly, the word "our" does not refer to NCBR only but is intended to mean "all of us". The funds at the executive agencies' disposal – including our Centre – are, after all, not the property of any particular agency or person but a common capital for our future. We support those who can best use that money. This is quite a responsible task and we are fully mindful of that. Therefore, we are constantly advancing our project selection and implementation monitoring procedures. All this certainly bears fruit as is evidenced in the report.

WOJCIECH KAMIENIECKI, PH.D. ENG., DIRECTOR AT NCBR

The year 2020 brought some significant changes at the Centre itself, which are presented in detail later in the report. We established the IDEAS company, which will conduct research and implementation work in the field of artificial intelligence. The National Contact Point (NCP), which now forms part of the International Cooperation Office, will support Polish innovators in applying to the new Horizon Europe programme. We expanded our activities in the field of developing and supporting eco-friendly solutions and creating the Green Deal. It was also the period of work on NCBR's new operational strategy. The document preparation process was completed in December 2020, and at the start of 2021 it entered the implementation phase. It outlines our mission and vision, underlines the values we are guided by, and determines the objectives of our activities in a few-year perspective.

NCBR has been changing. You can find expert elaborations prepared at the Centre; we communicate with you more and more frequently via social media, and we are increasingly present on the forum of international cooperation. This text offers limited space for summarising in detail such an intensive year as 2020 was, but you will find

a lot of interesting information further in the report. To conclude, I would like to make two important remarks. First of all, we would like the intensive cooperation that we have established with our partners, stakeholders and you to continue to develop dynamically, as this is the issue to which we really attach much importance. Second, what we manage to do at NCBR is indeed thanks to the people working here: outstanding specialists and experts. Without them our achievements would simply not be possible. Let me, therefore, end by expressing sincere gratitude to our partners for their cooperation and kindness, and to the Centre staff for their concerted efforts.

Wojciech Kamiński

FOREWORD BY THE PRESIDENT OF THE CENTRE COUNCIL

ANDRZEJ STANISŁAWEK,
PROF. PH.D., PRESIDENT OF THE COUNCIL



Dear Readers,

This report provides a summary of what NCBR was dealing with in the year behind us that was rather unusual. This remark was also made by Director Wojciech Kamieniecki in his foreword. This document makes us reflect and take a broader look at NCBR's operations as a key institution for building an innovation ecosystem in Poland.

The Centre Council, which I have the honour to lead, does not manage NCBR's ongoing activities, neither does it act as its supervisory board. Our tasks focus on providing advice and issuing opinions on research tasks aimed at the implementation of strategic research and development programmes. This particular position of the Council gives us an insight into the Centre's operation and thus a look at what is happening in the field of innovation development in our country.

The reality shaped by the pandemic, along with its consequences, has raised questions for all of us about the feasibility of our previous plans. In many cases, it has forced

us to abandon some of our activities, and in others it has made profound changes indispensable. It has also verified our ability to adapt to truly challenging conditions. Looking from the perspective of 2021, I can see that NCBR has managed to meet these challenges. As Director Kamieniecki was right to note, all activities of the Centre were adapted very quickly to the new difficult and uncertain circumstances. All these changes met with support and kindness from the Centre Council. The summary of NCBR's performance, as presented in this report, allows us to conclude that, after all, it was a good year for us. What is more important, it also offered some hope and prospects for the future. I believe that 2021 will let us clearly notice the effects of the new strategy. It is also the year which will see the new EU perspective being launched. I started by saying that 2020 was an unusual year, but I am convinced that, when summing up this year, we will also be speaking about extraordinary times.

Stanisławek A.



NCBR – WHO WE ARE?

The National Centre for Research and Development (NCBR) is an executive agency of the Minister of Science and Higher Education.

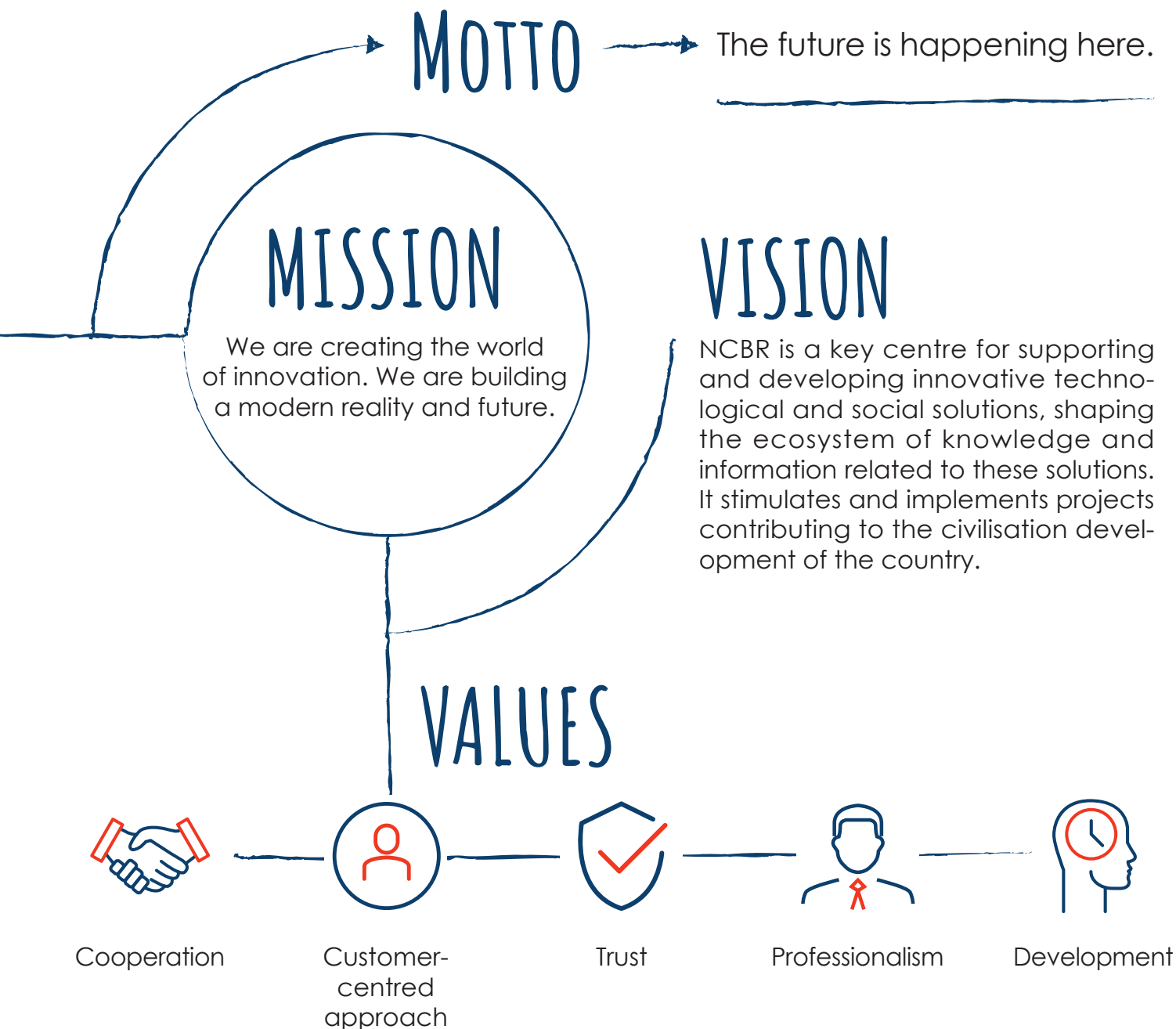
The support provided by NCBR is mainly addressed to Polish entrepreneurs and the scientific circles. The instruments offered allow for cutting down the risk involved in developing innovative solutions in various areas of Polish economy. The support provided by NCBR also encourages entrepreneurs to invest their own funds in research and development projects launched by domestic companies operating in diverse industries.

Apart from programmes addressed to entrepreneurs, programmes aimed at strengthening cooperation between scientists and entrepreneurs, and at supporting scientific units in the process of introducing modern technologies, products and services into the market, constitute essential elements in the Centre's offer.

Thanks to NCBR's assistance, scientific units can obtain co-funding to develop concepts for the commercial use of research work

outcomes, for acquiring partners interested in implementing project outcomes, and for securing intellectual property rights. The cooperation between scientific units and entrepreneurs related to the implementation of R&D projects aimed at solving clear-cut practical problems provides a unique opportunity for overcoming the barriers resulting from diversified needs and specificities of these environments.

In 2020, in order to effectively fulfil the role of an executive agency, NCBR developed and adopted a new strategy for 2021-2025. It is based on four priorities, i.e. high operational effectiveness, a diversified support offer, a strong international position, and the role of a key knowledge and competence centre. By focusing on these priorities, NCBR will be well suited to effectively support the implementation of projects which are essential for Poland. The long-term objective of the strategy is to transform NCBR into a specialised, modern and effectively-operating executive agency.



NCBR'S STRATEGY

Since the beginning of its operation, NCBR has been supporting the development of innovations in Poland. This strategy is meant to provide a response to the Centre's present and future challenges. The new EU perspective, the Horizon Europe programme, the ongoing technological revolution, the transformation of the Polish economy and the development of innovations will all shape the reality and determine Poland's economic and social development.

Owing to the implementation of this strategy, NCBR will be able to support innovations in the Polish economy in a more effective manner. Entrepreneurs and innovators wishing to benefit from European and domestic funds will receive effective assistance. The Centre will become both a modern governmental agency capable of coping with the dynamic economic changes and a partner in the implementation of projects essential for the country. Moreover, a centre of knowledge and competence in the field of innovation creation will be established, and NCBR will be effectively carrying out its mission to foster and shape the development of innovations in Poland.



NCBR's strategy – directions and operating model

The strategy, based on the analysis of NCBR's current operating environment and the assumed development directions, provides for:

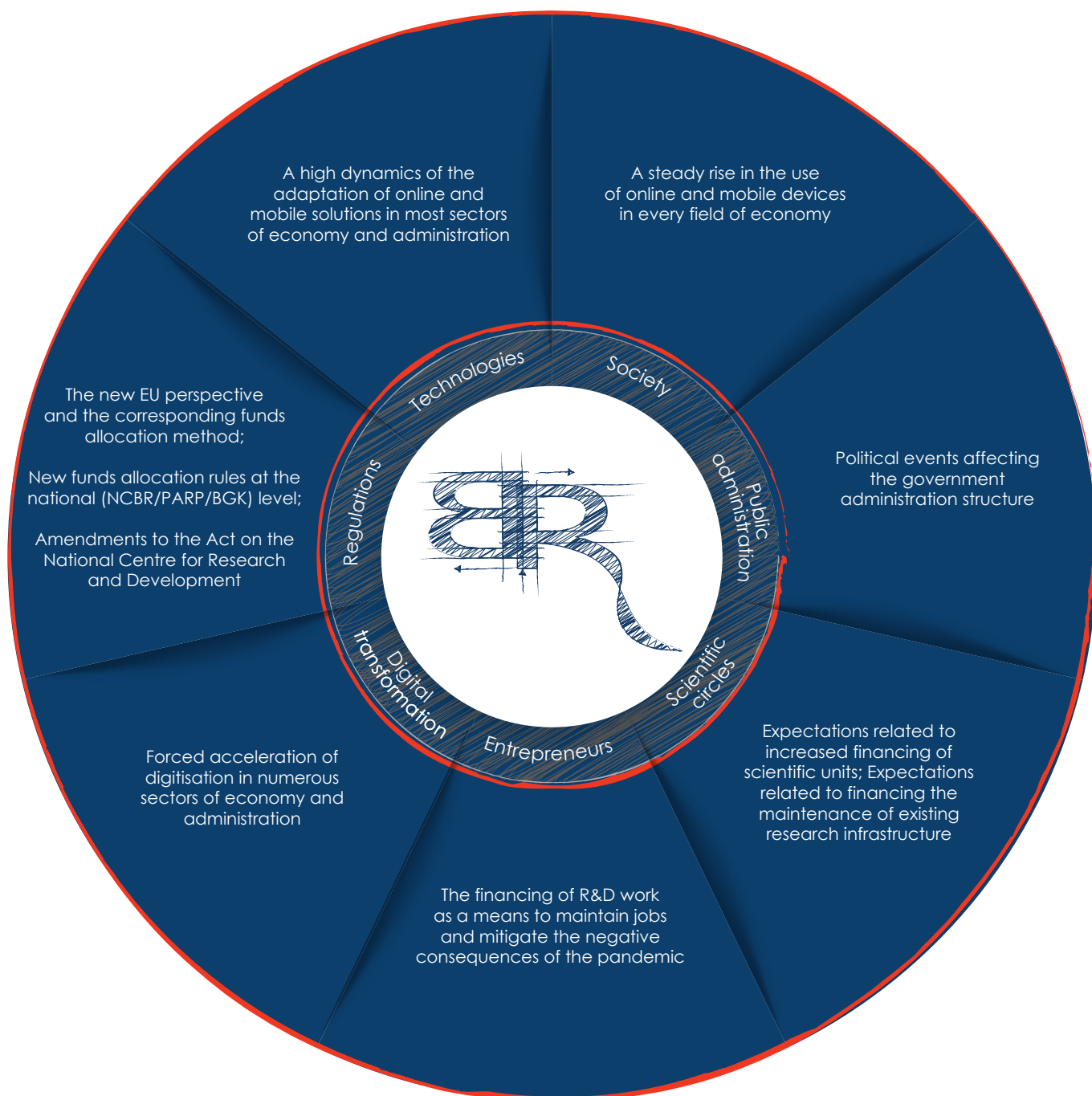
- strengthening NCBR's role in fostering the development of strategic projects crucial for the country,
- expanding NCBR's role in the development of modern technologies and solutions, such as big data, artificial intelligence and life sciences,
- designing and implementing initiatives and projects aimed at utilising the research and development potential of scientific entities and research institutes participating in innovative projects,
- improving cooperation between the scientific and business circles,
- focusing on prospective areas and financing high-TRL projects, which also includes making the programme offer better tailored to the expectations and needs of key customers and shaping operational specialisation,
- building a strong position of NCBR in the innovation eco-system, competitive in relation to other entities dealing with a similar area of activity,
- attaching much importance to commercialising the results of R&D work that NCBR finances,
- introducing business principles to the organisational model while upholding the requirements arising from the role of IP and a public administration unit,
- changing the organisational structure based on developing the competencies and resources which will prompt a flexible response to the emerging challenges.

Assumptions to NCBR's strategy

1. The strategy is an umbrella document as it indicates the underlying directions for many specific areas.
2. General guidelines have been adopted in the strategy, i.e. strategic priorities, as well as sub-strategies indicating selected objectives and strategic initiatives which will be monitored at the management level. At the operational level, KPIs and milestones for individual organisational units will be indicated within those sub-strategies.
3. From the point of view of strategy implementation, a very important issue is the need to build an appropriate competence development model which will enable the organisation to operate effectively in different structures while promptly adapting to the changes in the environment.
4. The works on the preparation of NCBR's strategy were conducted in parallel with the works on amendments to the Act on the National Centre for Research and Development of 30 April 2010. The pending amendments to that Act will have a significant impact on the shape and operations of NCBR, and thus may provide reasons for introducing changes to NCBR's strategy.

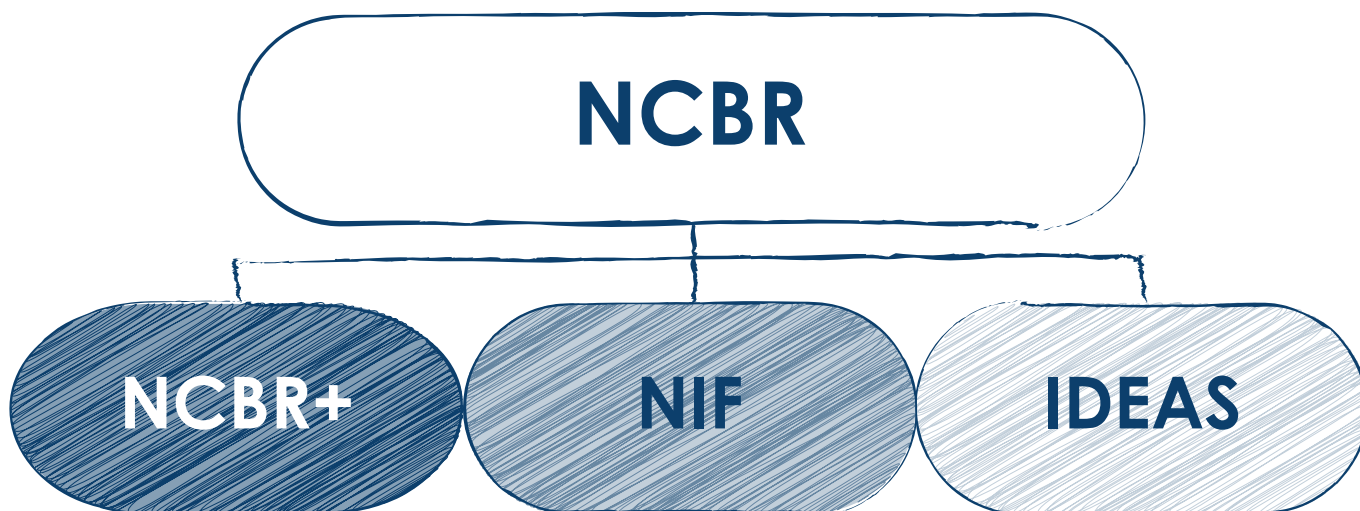
Environmental diagnosis

NCBR faces a number of challenges connected with the new EU perspective and changes occurring in its operating environment (prompted, e.g., by the pandemics), which trigger the need for the Centre to quickly adapt to new circumstances.



NCBR GRUP

NCBR's duties are implemented by four entities – the Centre itself and three affiliated companies: NCBR+ Sp. z o.o., NCBR Investment Fund and IDEAS. These entities jointly form the NCBR Group.



NCBR+ sp. z o.o. is a private-law company set up in January 2018, its objective being to support the implementation of statutory goals of the National Centre for Research and Development – the company's sole shareholder. The company is a provider of professional services in the field of administrative services, HR services, legal consulting, public relations, IT services, and accounting and controlling services. It also offers comprehensive support in conducting the recruitment and supervision of projects financed and subsidised by the Centre. At present NCBR+ renders services for the National Centre for Research and Development and other entities operating within the NCBR Group.

NCBR Investment Fund ASI S.A. (Fund) is a venture capital co-investment fund owned by the National Centre for Research and Development. The Fund specialises in investing in small and medium-sized enterprises (SMEs) which are at the development or expansion stages, commercialising the results of research and development work (R&D&I). The Fund's annual investment budget exceeds PLN 100 million, with the value of a single investment ranging PLN 3-64 million.

In the last days of December 2020, in response to the need to intensify the development of Poland's competences and potential in the field of AI, the Centre set up another entity within the NCBR Group – the **IDEAS NCBR** company. The company will directly perform R&D&I tasks in one of the most promising areas, which is currently the field of artificial intelligence (AI). The organisational form of the new undertaking – a limited liability company – offers much leeway as regards undertaking various initiatives in order to make the most effective use of the accumulated scientific potential, experience and competence. At the same time, it enables the NCBR Group to tap on its potential, e.g. in the area of cooperation with business circles, and facilitates the commercialization of project outcomes and expertise. The company's activities will also guarantee NCBR greater influence on determining the directions of R&D&I works in the area of AI with particular consideration of digital economy.

2020



2020 HIGHLIGHTS

Prompt response to the pandemic

The Centre promptly responded to the outbreak of the pandemic by arranging targeted support in the fight against COVID-19, i.e. "Support for dedicated COVID-19 hospitals in controlling the spread of SARS-CoV-2 virus infection and in treating COVID-19" or the Fast Track – Coronaviruses.

The "Advanced Information, Telecommunication and Mechatronic Technologies" INFOSTRATEG Strategic Programme has been devised to support the development of Polish artificial intelligence (AI) potential by creating solutions based on AI and blockchain, with direct practical applications. The first competition under the programme was announced in 2020.

The "New Energy Technologies" programme is focused on issues that will allow Poland to achieve climate neutrality by implementing solutions improving the country's energy security and enhancing the competitiveness of Polish economy.

New programmes

Work has also begun on the "Water Management and Inland Navigation" programme which is meant as a response to one of the most important ongoing challenges related to the proper management of the ever decreasing water resources.

In the field of international cooperation, a pilot IdeaLab formula was launched with the support from the Norwegian Financial Mechanism. In the first quarter of 2020, a workshop for future contractors – originators of R&D projects – was organised. Then, a competition was announced in which the Polish-Norwegian consortia established during the workshop could apply for co-funding for their ideas developed during the workshop.

STARTER

STARTER is a pilot initiative launched in July 2020. The Centre collects ideas for new support programmes and instruments, as well as identifies new thematic areas, industries and technologies in need of further development. The submitted proposals are subject to formal and substantive evaluation. STARTER allows stakeholders to co-create a programme portfolio so that it is adapted to the changing environment and needs of our customers and partners.

Important Projects of Common European Interest (IPCEI)

Important Projects of Common European Interest (IPCEI) is a European mechanism under which co-funding is provided to projects displaying a high level of innovation and strategic importance, from the point of view of the European Commission and the recommending Member States. The projects must be initially evaluated by the EC as having a positive impact on the internal market and society of the entire European Union, and as consistent with the shared European objectives. In 2020, NCBR granted co-funding to the first Polish project under the Fast Track – IPCEI competition. That project received PLN 332 million, which was the highest funding ever granted by NCBR.

Acceleration action with the state of Nevada

In February 2020, NCBR also launched a pilot edition of the acceleration action with the American state of Nevada, under the name of NCBR-NAP: NCBR-Nevada Acceleration Program. Within its framework, representatives of top 10 start-ups operating in industries of key importance for both Poland and Nevada will participate in a one-week-long acceleration programme in Reno and Las Vegas, with an opportunity to commence their activity in the state of Nevada. A formal and substantive evaluation of applications to participate in this initiative was carried out in 2020. Because of the spread of the COVID-19 pandemic, amendments were made to the agreement concluded with the programme operator, extending its duration until 30 September 2021.

NCBR's publication cycles – Innovation Landscape

In 2020, NCBR launched its publication series entitled "Innovation Landscape". The first publication concerned the OP SG and was published under the following title: "Analysis of research trends in the applications for co-financing submitted to NCBR under the OP SG 2016-2019". The publication focused on the supply of innovations in particular fields based on analysing the applications for co-financing submitted to NCBR under the OP SG 2016-2019.

New website

NCBR's website was rebuilt and formed part of the gov.pl portal. The new website, which is navigated via the gov.pl portal with two addresses: gov.pl/ncbr and gov.pl/innowacje, displays structured information on NCBR's offer. With the new website, all data on competitions, initiatives and actions can be conveniently found in one place – the "Financing" tab. They are presented in a comprehensible language and with a transparent layout. For the first time, the website presents VC and CVC funds. Importantly, the site includes a search engine for competitions and funds, being both digitally accessible and responsive.

MAJOR PROCESSES IN 2020

NCBR's Strategy

In 2020, NCBR's strategy for 2021-2025 was adopted with the following four priorities: high operational effectiveness, a diversified support offer, a strong international position, and the role of a key knowledge and competence centre. Within the next five years, NCBR will continue to increase its operational efficiency, consistently implementing the plan for digitisation and optimisation of internal processes.

NCBR in the new European programme supporting development and innovations for 2021-2027

NCBR has joined the works on the new operational programme for 2021-2027 which will serve as the follow-up to the OP SG 2014-2020. The programme is to ensure the continuation of some of the existing instruments, e.g. the support for R&D projects launched by enterprises and their consortia. New options of co-funding, e.g., for the implementation of R&D project outcomes, digitisation, the development of competences or international cooperation are also planned to be introduced. NCBR would play the role of an Intermediate Body in priority axes I and II. Priority axis I envisages the support for complex projects composed of modules selected in accordance with entrepreneurs' needs. NCBR would provide funds to large entrepreneurs and their consortia. In turn, priority axis II envisages, among other things, financial instruments and support for business environment institutions and research infrastructure.

IDEAS NCBR Sp. z o.o.

In 2020, responding to the need to streamline the development of Poland's competence and potential in the field of AI, the Centre set up another entity in the NCBR Group – IDEAS NCBR. The company will directly implement R&D&I tasks in the area of artificial intelligence (AI), which is currently one of the most promising areas.

Customer at the Centre

In 2020, based on a thorough analysis of the results of the applicants' and beneficiaries' satisfaction surveys, the "Customer at the Centre" programme was launched with the aim of improving the quality of customer service, e.g. by unifying the applicable procedures and standards, and by promoting employees' involvement in customer service. The next step will include activities which translate directly into the speed and reliability of the customer service process through automation and monitoring of customer contacts, regular satisfaction surveys and the use of ICT technologies.

NCP within NCBR's structure

On 1 November 2020, the National Contact Point (NCP) operating at the Institute of Fundamental Technological Research of the Polish Academy of Sciences was transferred to NCBR. The task of managing the NCP for the Horizon Europe programme was commissioned to NCBR by the Minister of Science and Higher Education. This implies that NCBR will actively participate in the process of preparing another framework programme for scientific research and innovation – Horizon Europe.

NCBR'S ACTIVITIES IN NUMBERS

88%



Panel meetings held online (national and European competitions)

73



Announced competitions

2588



Evaluated applications

PLN 6.9 billion



Allocated to calls for proposals in 2020

29,7%



Overall success rate

2998



Projects monitored in the sustainability period

3816

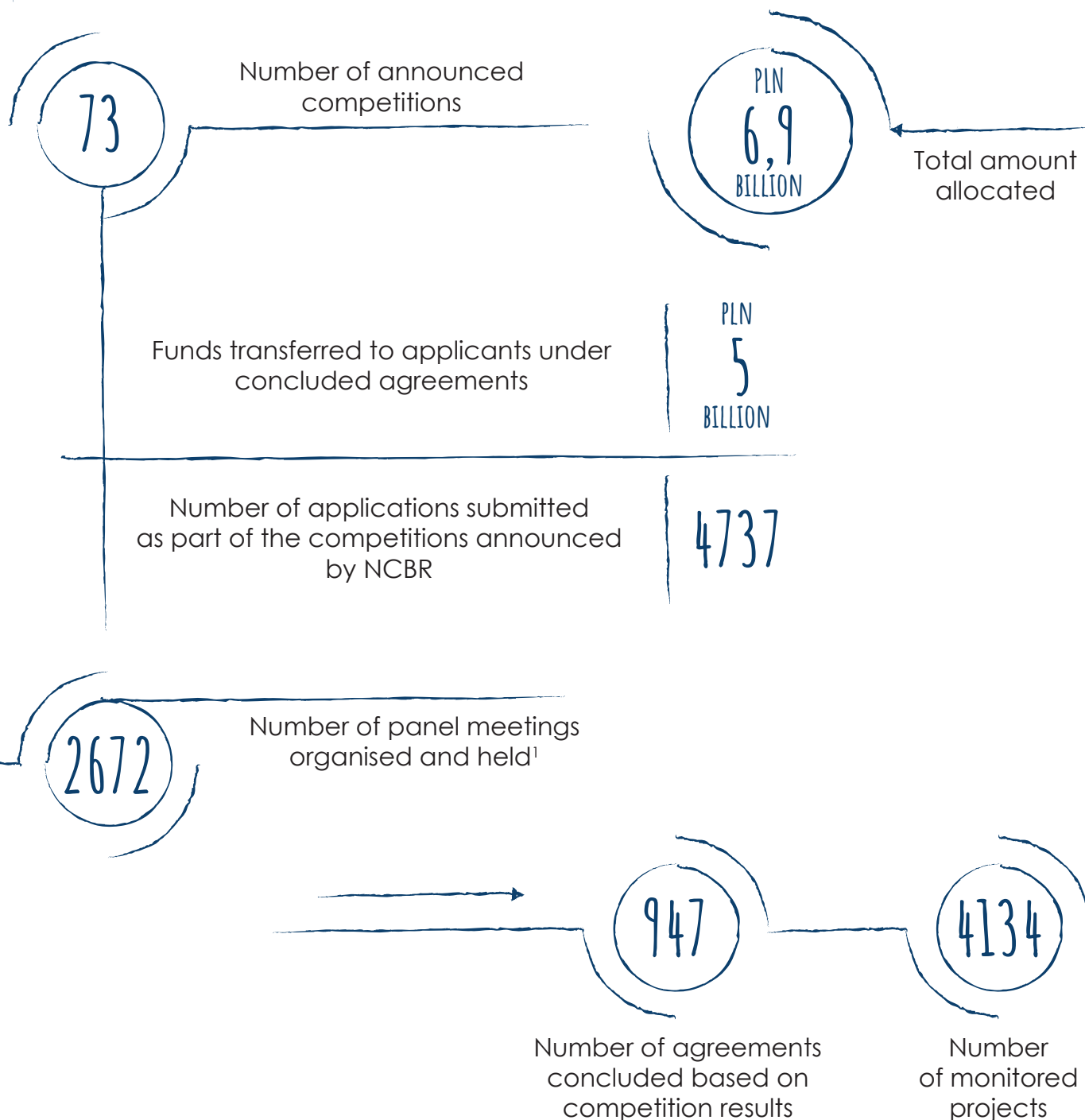


Financed agreements

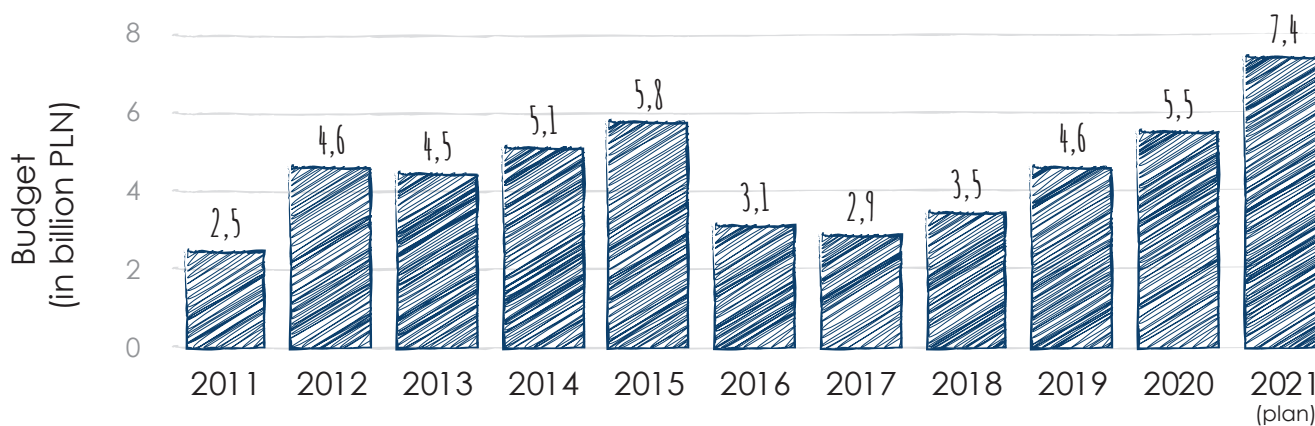
1200



Meeting and workshop participants



NCBR'S BUDGET IN 2011-2021



NCBR'S BUDGET ON THE IMPLEMENTATION OF PROGRAMMES IN 2020²

NCBR's budget performance on the implementation of programmes in 2020

PLN 5 041 746 000

NATIONAL PROGRAMMES
PLN 789 960 000

STRATEGIC PROGRAMMES
PLN 170 527 000

TECHMATSTRATEG
PLN 78 683 000

GOSPOSTRATEG
PLN 45 807 000

BIOSTRATEG
PLN 27 144 000

STRATEGMED
PLN 18 893 000

NATIONAL PROGRAMMES
PLN 385 548 000

MAZOVIAN TRACK
PLN 102 720 000

LEADER
PLN 54 526 000

OTHER
PLN 228 302 000

DEFENCE AND SECURITY
PLN 233 885 000

PNATIONAL DEFENCE AND SECURITY PROJECTS
PLN 180 596 000

SAPPHIRE
PLN 36 473 000

OTHER
PLN 16 816 000

EUROPEAN FUNDS
PLN 4 142 557 000

SG OP
PLN 3 265 815 000

FAST TRACK
PLN 1 759 146 000

SECTORAL PROGRAMMES
PLN 290 887 000

BRIDGE ALFA
PLN 185 788 000

ACTIVITY 4.2
PLN 340 700 000

OTHER
PLN 689 294 000

THE OP KED
PLN 857 949 000

INTEGRATED ACADEMIC PROGRAMMES
PLN 544 062 000

INTEGRATED ACADEMIC PROGRAMMES FOR REGIONAL DEVELOPMENT
PLN 68 358 000

OTHER
PLN 245 529 000

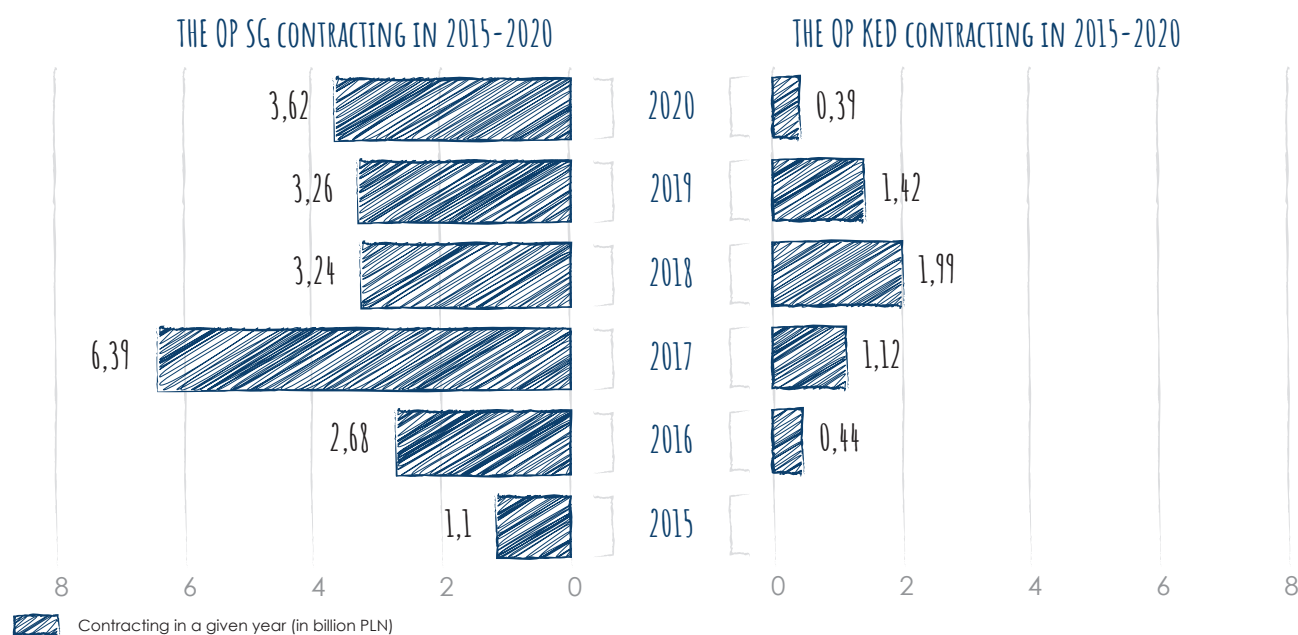
THE OP DP
PLN 18 697 000

THE OP SG
PLN 96 000

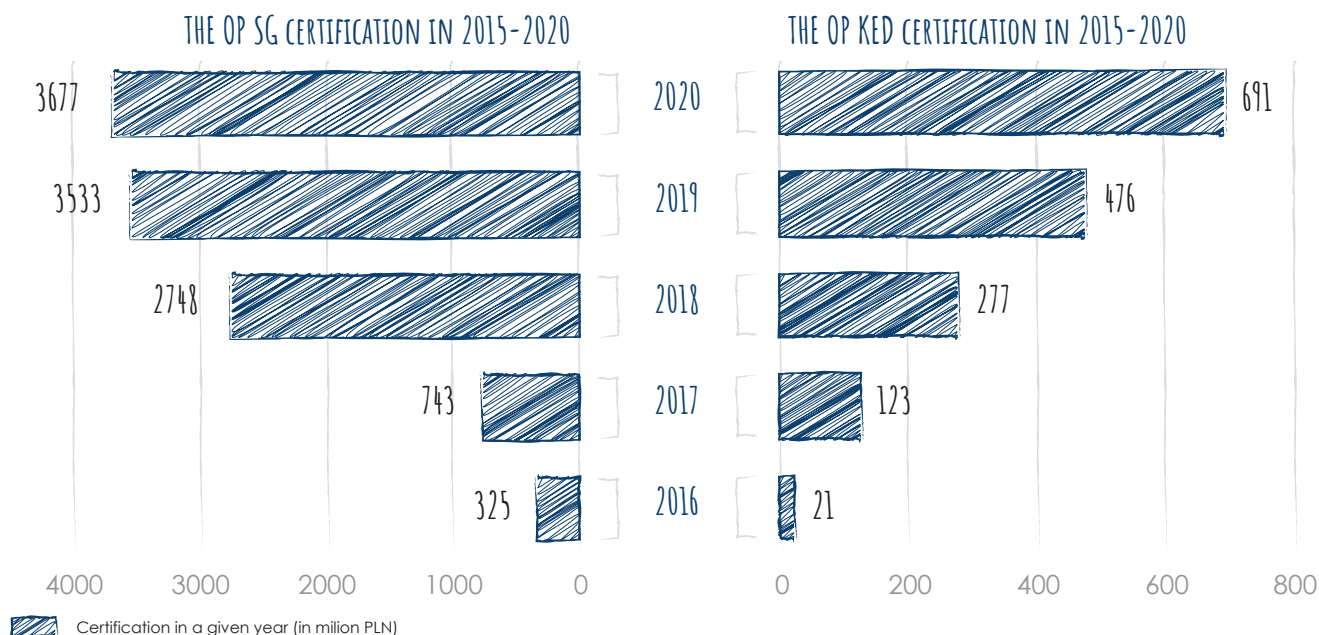
INTERNATIONAL PROGRAMMES
PLN 109 229 000

THE OP SG AND OP KED CONTRACTING AND CERTIFICATION

The OP SG and OP KED contracting in 2015-2020



The OP SG and OP KED certification in 2015-2020



The number of applications under evaluation, submitted in the second half of 2020, will make it possible to fully achieve the contracting objective assumed for the whole OP SG programme period. However, in order to attain the planned level of the OP KED certification, it will be necessary to make up for the previous years' backlog. The contracting level cumulatively, as of 31 December 2020, was 86% for the OP SG and 97% for the OP KED.

The OP SG tasks implementation in 2020

In 2020, the Operational Programme Smart Growth (OP SG) attracted a record number of applications (43% more applications were submitted in 2020 than in 2019) and achieved a high level of contracting (90% of the OP SG target level for the entire financial perspective). Due to the epidemic situation in the country, remote solutions have been introduced on a wide scale, including virtual expert panels, remote project inspections, e-training and webinars for applicants and beneficiaries, as well as certain features to facilitate project accounting.

The Fast Track – Coronaviruses competition (5/1.1.1/2020) was also launched in response to the current situation in the country. Within three rounds of that competition, a total of 391 applications were submitted with the co-funding amount exceeding PLN 2 billion.

The two Fast Track competitions announced in 2020 with no strictly defined thematic scope attracted huge interest. In competition 1/1.1.1/2020, 794 applications were submitted with the co-funding amount exceeding PLN 6 billion. In the second round, the allocation was increased so that all positively evaluated projects proposed by large entrepreneurs could be co-financed. Increasing the allocation in the fourth round additionally allowed co-financing all positively evaluated projects submitted by SMEs. In competition 6/1.1.1/2020, which was the second general Fast Track competition announced in mid-2020, 915 applications were submitted, which are still being evaluated, for the amount of PLN 5.9 billion.

The Mazovian Fast Track competition (3/1.1.1/2020) also enjoyed much interest, with a total of 281 applications for co-funding being subject to evaluation.

Under the Fast Track – IPCEI (8/1.1.1/2020) competition, funding was provided to the first Polish project of common European

interest, for which the European Commission issued a positive decision approving the financial aid (the IPCEI project). That project received as much as PLN 332 million – the highest funding ever granted by NCBR.

In 2020, under Sub-action 1.1.1., the following thematic competitions were also announced: Fast Track – Agrotech (7/1.1.1/2020) and Fast Track – Renewable Energy in Transport (4/1.1.1/2020).

Applications submitted under the GameINN sectoral programme (competition 4/1.2/2019), addressed to the video game industry, displayed a high substantive quality and, out of 93 applications that had been submitted, 43 were evaluated positively, accounting for 46% of all proposals.

In 2020, under OP SG Priority Axis IV, the evaluation of applications submitted under competition 2/4.1.4/2019 – Application projects was completed, and competition 1/4.1.4/2020 was announced, attracting 85 applications.

Huge interest among the participants was observed as regards the Grand Challenge: Energy. Of note is the positive feedback regarding the competition formula and the simplified rules of its organisation. Almost 200 teams applied to participate in the Grand Challenge, of whom 84 passed the initial selection. This appears all the more important as it was a completely new competition formula engaging a totally different group of participants. The level of interest in the initiative seems promising when it comes to the subsequent competitions of this type, which NCBR is planning to organise.

The OP KED tasks implementation in 2020

Given the tremendous interest among universities in the “Accessible university” competition announced in 2019, and mindful of the essence of this activity, NCBR decided to launch another similar competition in 2020 under the Operational Programme Knowledge Education Development (OP

KED). The allocation of funds for the competition, originally determined at the level of PLN 150 million, was again exceeded twice. With the consent of the OP KED Managing Authority, the allocation was eventually increased to PLN 260 million, so that all applications positively evaluated and recommended by experts for co-funding could receive the grant.

Universities selected for co-funding receive the support intended for eliminating barriers in access to studies and can introduce activities to make their curricula accessible for students with disabilities (e.g. online exams or lectures, the opportunity to settle student affairs via the Internet). Importantly, the projects cannot concern exclusively activities related to eliminating architectural barriers in buildings, but they must also include other activities increasing the accessibility of education for this group of people.

The planned contracting target has been achieved

One of the key measures in the field of the OP KED programme operation as regards certification was the rearrangement of work, a significant increase in resources for task performance, and the introduction of mechanisms and tools aimed at NCBR staff's work optimisation. Consequently, record numbers of payment applications (an increase by 60%) and correspondence (an increase by nearly 100%) were processed. The OP KED certification level increased in 2020 by over 45% relative to 2019.

NCBR – SUBSTANTIVE EVALUATION OF PROJECTS

Experts cooperating with the Centre play a vital role in the process of substantive evaluation of the projects submitted in the calls announced by NCBR. They implement a range of tasks, starting with the selection of projects for co-funding through to their implementation: they participate in the substantive evaluation of grant applications, they issue opinions on the reports submitted by beneficiaries and applications for changes at different project implementation states, and they formulate other expert opinions as may be required by NCBR.

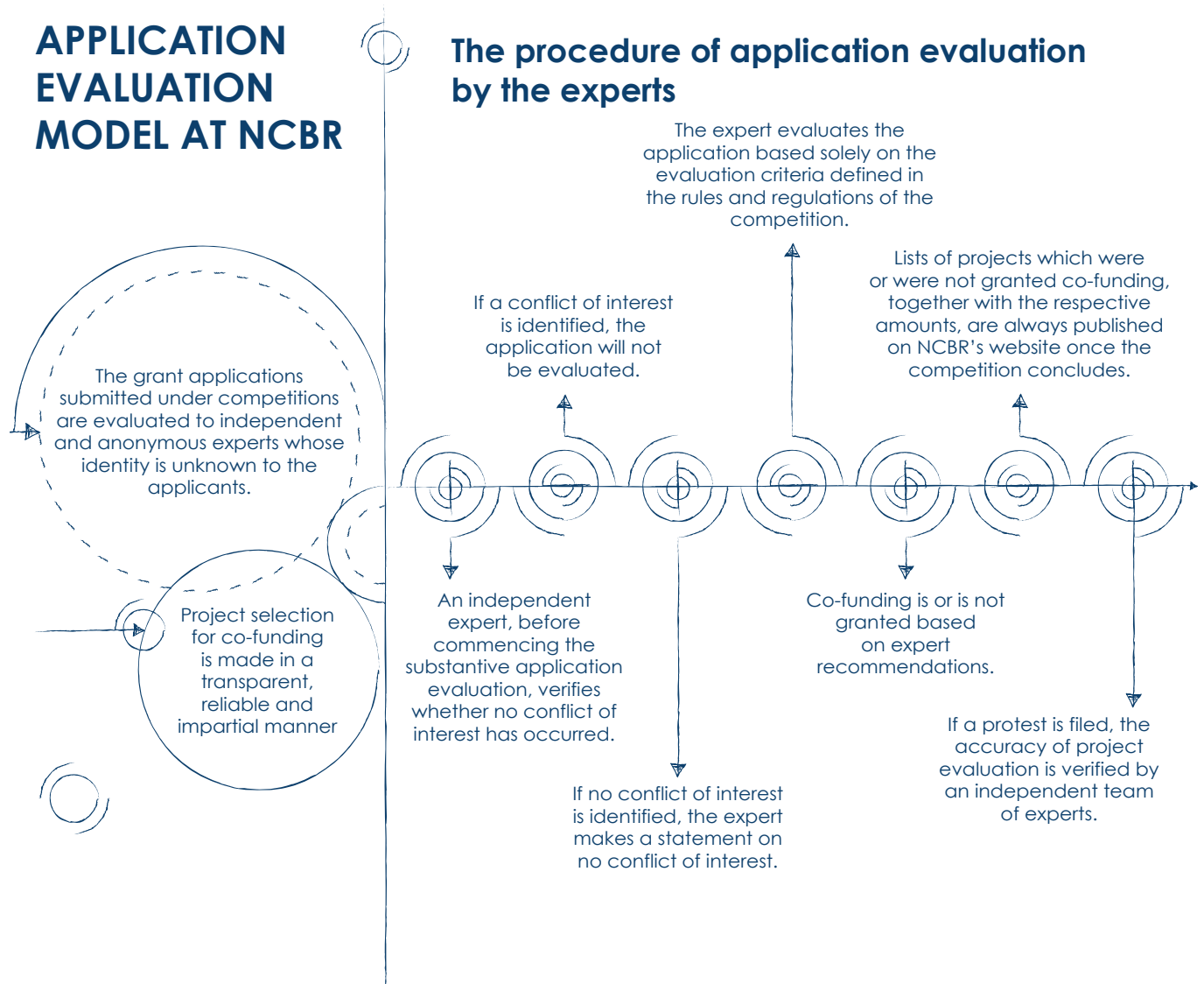
Each project successfully passing the verification of formal conditions is subject to substantive evaluation. The evaluation is carried out in line with the criteria specified in the rules and regulations of a given competition. The projects are evaluated by experts in the project specific field who are mainly selected using the NCBR Expert Database, and in the case of national security and defence programmes, they are also appointed by competent ministries. Among them are recognized scientists, specialists in the fields of economy and finance, employees of consulting institutions or venture capital funds. Some NCBR experts are also foreign specialists who contribute with their knowledge and international experience.

The exact project assessment procedures depend on the types of programmes. However, as a rule, they consist of written reviews and/or panel evaluation (during which a group of experts gathered at a session jointly evaluate the project). Depending on the programme, the attendees of the expert panel can meet with the applicants who have the opportunity to present their projects, respond to questions and clear any doubts expressed by the experts. Other instruments also envisage conducting negotiations as a result of which the ultimate project scoring is determined.

In the case of written reviews, the anonymity rule is applied, i.e. the applicant does not know the identity of experts evaluating the application. Furthermore, before receiving project documentation from NCBR (i.e. the application with attachments), each expert must rule out the conflict of interest and sign an appropriate statement to confirm the lack of such conflict under pain of criminal liability. The expert and NCBR staff undertake to keep confidential all information obtained in the course of project evaluation, and undertake not to use such information in any way unrelated to the evaluation process. Ultimately, the project can be evaluated positively or negatively, and NCBR each time notifies the applicant of whether or not to grant the co-funding

for the project. If the evaluation is negative, the applicant, apart from justification, is also informed about the possibility to lodge a protest or appeal. The applicants participating in a given competition has the right to access documents related to the evaluation of their applications, subject to maintaining the anonymity of evaluators.

APPLICATION EVALUATION MODEL AT NCBR





NCBR'S BENEFICIARIES IN 2020

Previous annual reports drawn up by NCBR presented selected beneficiaries representing various areas of the Centre's diverse competition offer. Those were examples of successful projects. This year, the section devoted to NCBR's beneficiaries will focus on analysing R&D trends in innovations resulting from projects financed by the Centre and implemented in 2020. This approach will allow us to focus on the expected effects and predictions of what we can expect on the national innovation market. It is worth remembering that the intrinsic feature of R&D projects is their implementation. Based on the analysis presented here, an attempt has been made to present information on which areas of the economy are likely to see the emergence of new and innovative solutions (products, technologies, services). It is worth noting that the process of implementing such solutions on the market may take even several years. However, the fact of the successful completion of the R&D process itself offers some hope for the actual marketing of a new solution as this will translate into increased competitiveness of Polish companies on global markets.

The purpose of the analysis is to outline the achievements of beneficiaries who have successfully completed projects implemented with NCBR's support. A total of 797 projects were analysed: **245 projects were implemented with the support of the OP SG funds, 188 projects used the support provided under national programmes, 6 projects were completed using the funds allocated for the competitions concerning national defence and security, 252 projects were implemented within the framework of the OP KED, 29 projects were carried out within the framework of the LEADER programme, and 77 projects used the funds allocated for international competitions.**

It should be emphasized that the presented analysis, and the phenomena and trends observed, result from taking a rather unusual approach to the issues of beneficiaries who managed to complete their projects in 2020 which posed many challenges related to the ongoing pandemic. The analysis presents the beneficiaries' success stories by showing completed projects financed from individual programmes.

METHODS

The underlying method employed in the preparation of this analysis was the desk research method, based on which the available data were collected and analysed by NCBR's substantive departments in charge of conducting the competition process in specific areas. In total, 797 projects completed in 2020 were analyzed. The projects were collected according to the criterion defined in this part of the report as "successfully implemented". This should be understood as projects which were completed in line with the original assumptions, between 1 January and 31 December 2020,

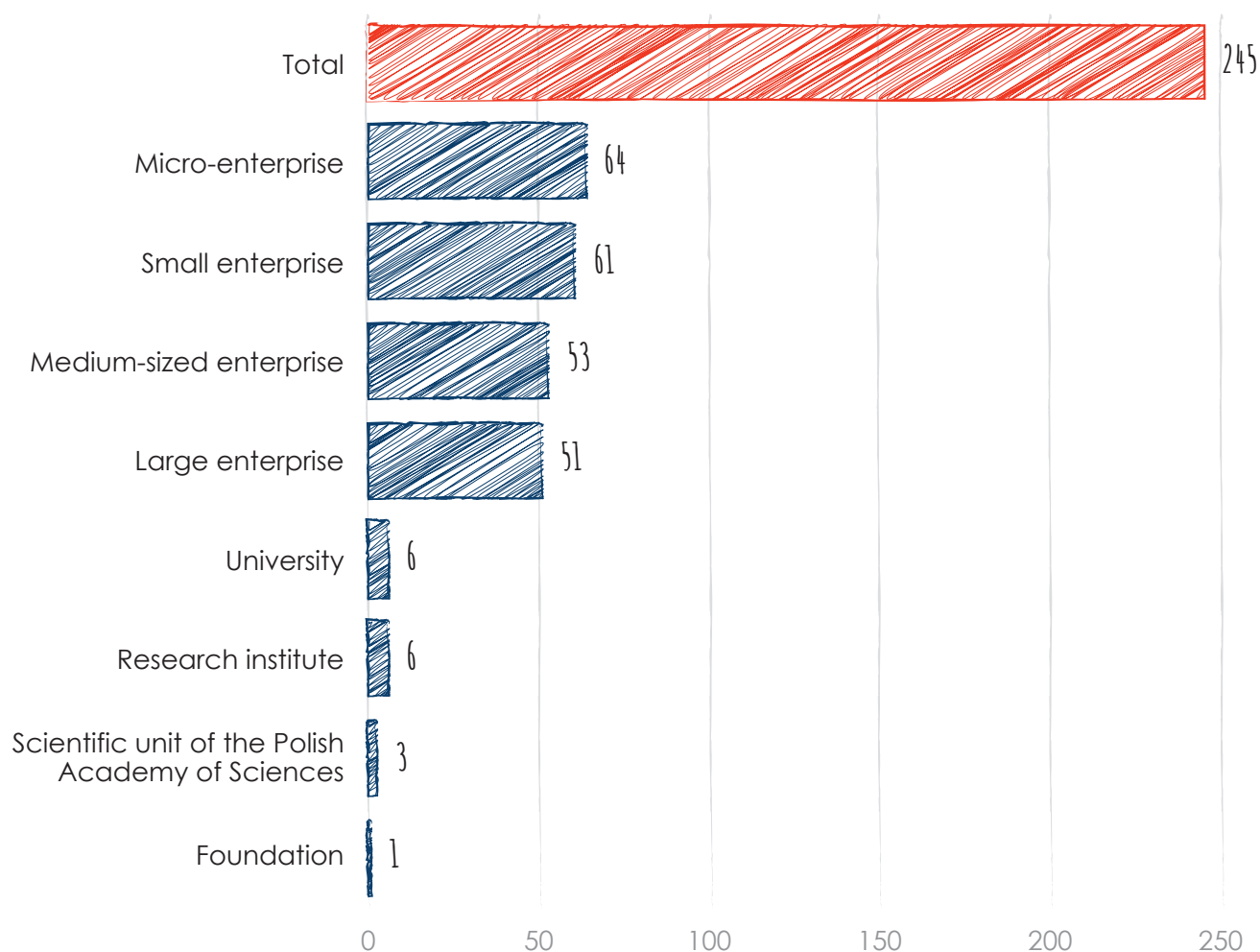
and which were accounted for financially and substantively, as well as in the case of which information was received from NCBR, as an Intermediate Body, about the project completion. The analysis did not take into consideration projects terminated due to the lack of possibility to continue research or conduct further activities, which was not due to the beneficiary's fault but which resulted from the circumstances that were unforeseeable on the application submission.

SUCCESSSES ATTAINED BY BENEFICIARIES IMPLEMENTING PROJECTS CO-FINANCED FROM EU FUNDS UNDER THE OP SG, I.E. FROM AN IDEA TO INDUSTRY

Overall, 245 beneficiaries completed their projects under six sub-actions envisaged in the OP SG programme:

Sub-action	Number of projects	Co-funding amount	Average project value
1.1.1 (Fast Track)	120	PLN 381 028 636.42	PLN 3 175 238.64
1.1.2 (Demonstrator)	15	PLN 192 026 253.19	PLN 12 801 750.21
1.2 (Sectoral programmes)	88	PLN 278 513 921.66	PLN 3 164 930.93
4.1.1 (Joint undertakings)	1	PLN 959 410.00	PLN 959 410.00
4.1.2 (Regional research agendas)	7	PLN 17 227 057.99	PLN 2 461 008.28
4.1.4 (Application projects)	14	PLN 49 997 496.65	PLN 3 571 249.76

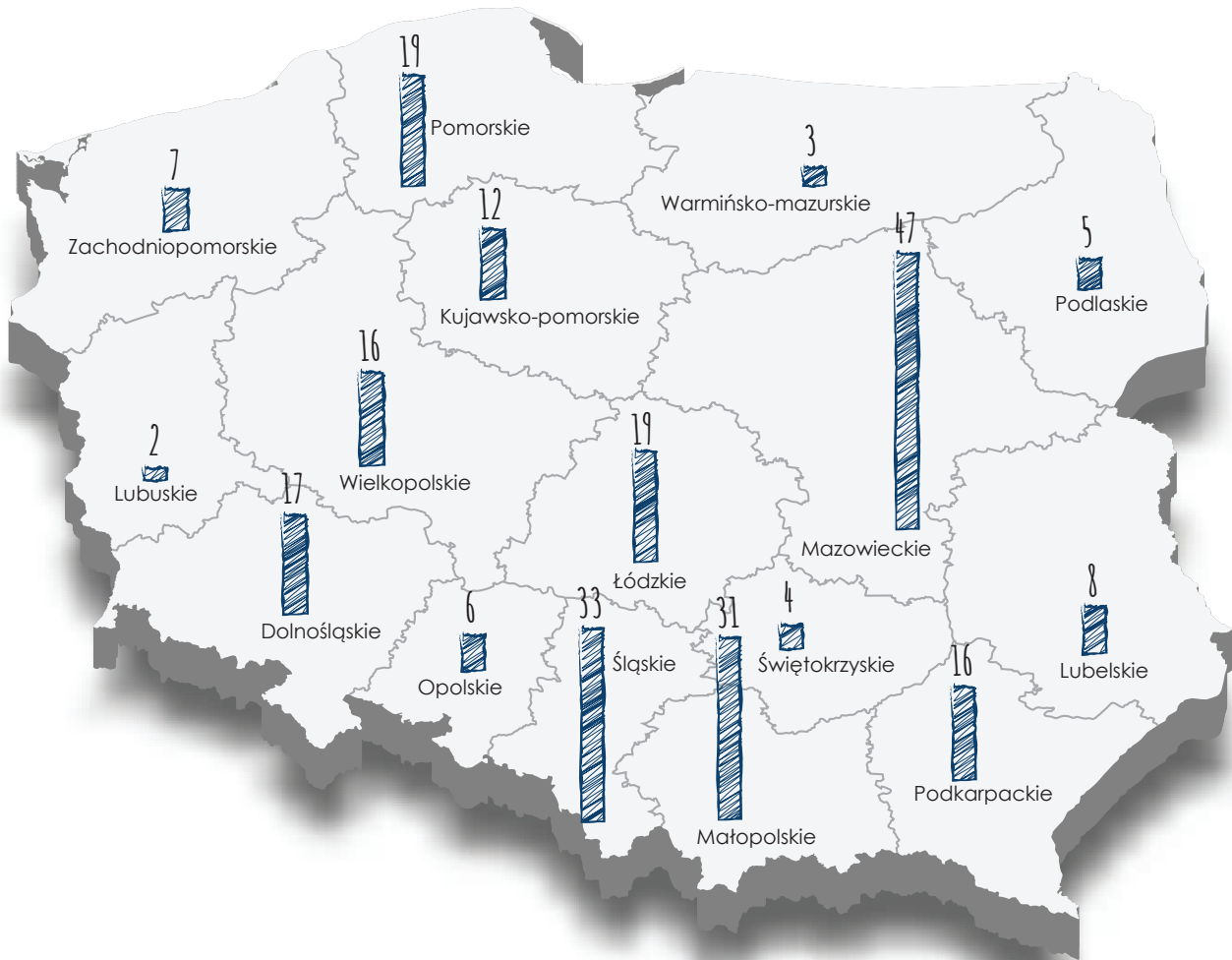
Division of beneficiaries completing their projects in 2020 under the OP SG by form of legal activity



The projects completed in 2020 display a strong predominance of business representatives. Most projects were completed by representatives of the SME sector (178 entities) and large enterprises (51 entities). Representatives of the scientific circles completed a total of 15 projects, and only one foundation can boast about the completion of its project. Such a division of projects by form of legal activity should not come as a surprise, given especially that 120 projects were completed within the framework of NCBR's flagship programme, the Fast Track (Sub-action 1.1.1). The Operational Programme Smart Growth itself has been targeted in particular at entrepreneurs implementing an innovative idea, at least on a national scale (product, technology, service).




























Number of beneficiaries completing their projects in 2020 under the OP SG by voivodeship



The above figure illustrates the distribution of projects completed in 2020 by voivodeship. The largest number of projects was completed in the Mazowieckie voivodeship (47 projects), while the smallest in the Lubuskie voivodeship (2 projects). The average value of a project completed in 2020 was PLN 3 754 092.96 and the average project duration was 31.5 months. The duration of the vast majority of projects did not exceed 36 months (173 projects), and most projects were completed within 24-36 months (123 projects).

Division of completed projects under the OP SG based on the OECD classification

OECD classification	Number of projects
 1.2 Computer and information sciences	20
 1.4 Chemical sciences	11
 1.5 Earth and related environmental sciences	1
 1.6 Biological sciences	1
 2.1 Civil engineering	8
 2.10 Nano-technology	3
 2.11 Other engineering and technologies	32
 2.2 Electrical engineering, electronic engineering, information engineering	61
 2.3 Mechanical engineering	29
 2.4 Chemical engineering	5
 2.5 Materials engineering	33
 2.6 Medical engineering	8
 2.7 Environmental engineering	5
 2.8 Environmental biotechnology	1
 2.9 Industrial biotechnology	4
 3.1 General medicine	2
 3.2 Clinical medicine	4
 3.3 Health sciences	1
 3.4 Medical biotechnology	5
 4.1 Agriculture, Forestry, and Fisheries	2
 4.2 Animal and Dairy science	2
 5.3 Educational sciences	1
 6.2 Languages and Literature	3
 6.4 Arts (arts, history of arts, performing arts, music)	1
 6.5 Other humanities	2

In terms of the OECD classification, most projects implemented in 2020 belonged to category 2.2 Electrical engineering, electronic engineering, information engineering (61 projects). Beneficiaries were also eager to implement their projects in the following categories: Materials engineering (33 projects), Other engineering and technologies (32 projects), Mechanical engineering (29 projects), and Computer and information sciences (20 projects).

The OP SG Sub-action 1.1.1 – Fast Track – NCBR’s flagship competition

Within Sub-action 1.1.1 of the OP SG, support was provided for the implementation of research projects, i.e. those which include either both industrial research and development work or development work only; it was also possible to obtain co-funding for pre-development work. The solution established as the project outcome had to be a product or process innovation at least on a national scale and fit into at least one National Smart Specialisation.

NCBR has been conducting its flagship Fast Track competition since 2015, within Sub-action 1.1.1, which continues to attract great interest from applicants. One of its features that contribute to the popularity of this competition is the lack of thematic restrictions on projects and a high maximum amount of co-funding which can be granted for a single project, reaching EUR 50 million. As a result, each year several hundred applicants submit applications for co-financing. It is worth reminding that, starting from 2019, NCBR has been conducting Fast Track competitions based on the “simple rules – minimum formalities” model. The measures taken by NCBR to simplify the application process, as well as amendments to the law allowing applicants to supplement their applications once they are submitted (following recommendations from a panel of independent experts), have made the Fast Track one of the most important instruments for supporting innovators across the country.

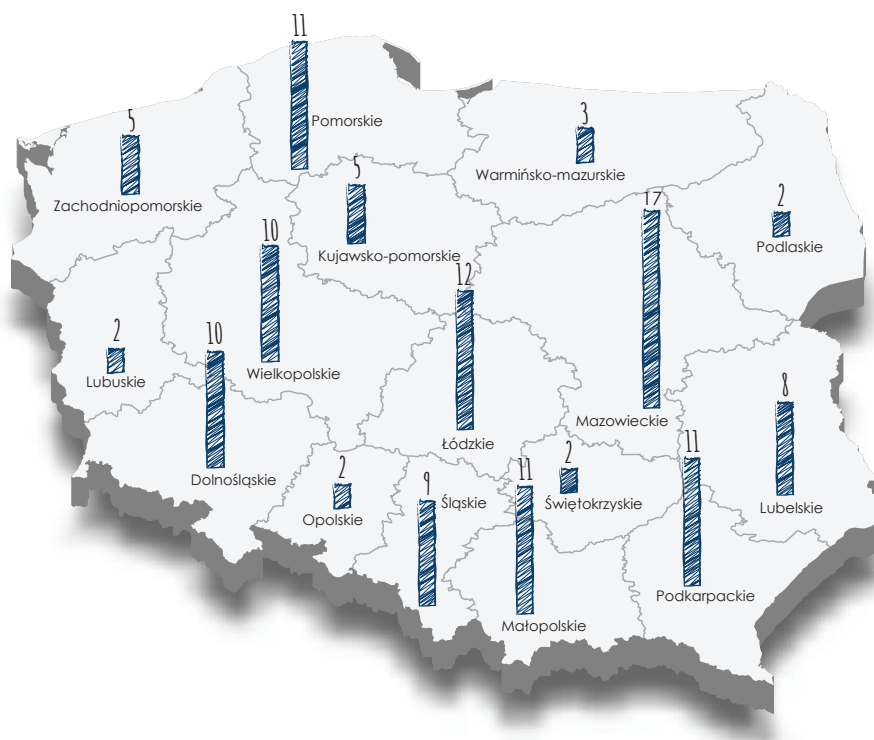


In 2020, as many as 120 beneficiaries successfully implemented their projects, with the total amount of funding exceeding PLN 380 million, and with the average level of funding per application reaching nearly PLN 3.2 million.

The table below shows a trend indicating a correlation between the highest number of completed projects in 2020 as the project implementation venue, and the number of completed projects included in NCBR’s analysis of applications submitted under the OP SG 2016–2019³. The regions declared by applicants as their project implementation venues coincide with this year’s analysis of projects completed with success. It is worth stressing that in 2019 NCBR announced the Fast Track competition addressed particularly to Mazovia, which enabled the implementation of projects under Sub-action 1.1.1 also in the Mazowieckie voivodeship.

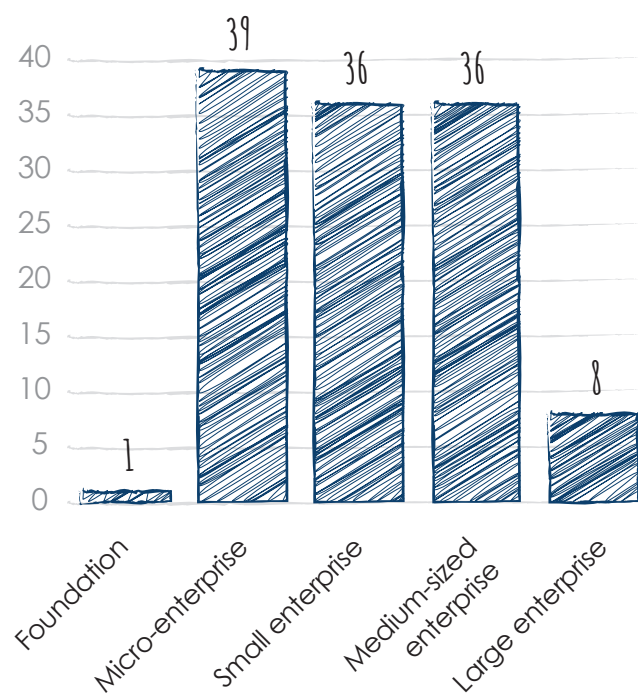
³ “Analysis of research trends in the applications for co-financing submitted to NCBR under the OP SG in 2016–2019”, National Centre for Research and Development, Warsaw 2020, <https://www.gov.pl/web/ncbr/analiza-trendow-badawczych>.

Number of beneficiaries completing their projects in 2020 under Sub-action 1.1.1 by voivodeship




















The following analysis shows the trends in applying for funds from the OP SG for innovative solutions among representatives of the SME sector. It is worth noting that the list reflects accurately the global trends in the size of entities applying for R&D co-funding, showing the predominance of micro-enterprises, including start-ups, and special purpose vehicles set up with the aim to minimise the potentially negative outcomes of the implementation of innovative projects which entail a very high scientific risk. In the analysis carried out by NCB⁴, the involvement of a micro-enterprise, as an applicant or consortium leader, concerned nearly 39% of cases. It should be noted that the average duration of a project completed in 2020 under Sub-action 1.1.1 was 30 months, with the shortest project lasting 9 months and the longest 53 months.

Division of beneficiaries completing their projects in 2020 under Sub-action 1.1.1 by form of legal activity



When the OECD classification areas of the OP SG projects completed in 2020 with are presented in relation to the number of applications submitted to NCBR under the OP SG in 2016-2019⁵, one can note certain areas that clearly stand out.

Division of projects completed in 2020 under Sub-action 1.1.1 based on OECD classification

OECD classification	Number of projects
 1.2 Computer and information sciences	6
 1.4 Chemical sciences	7
 1.5 Earth and related environmental sciences	1
 1.6 Biological sciences	1
 2.1 Civil engineering	3
 2.10 Nano-technology	1
 2.11 Other engineering and technologies	15
 2.2 Electrical engineering, electronic engineering, information engineering	29
 2.3 Mechanical engineering	22
 2.5 Materials engineering	13
 2.6 Medical engineering	6
 2.7 Environmental engineering	2
 2.8 Environmental biotechnology	1
 2.9 Industrial biotechnology	3
 3.2 Clinical medicine	1
 3.3 Health sciences	1
 3.4 Medical biotechnology	2
 4.1 Agriculture, Forestry, and Fisheries	1
 4.2 Animal and Dairy science	1
 6.2 Languages and Literature	3
 6.4 Arts (arts, history of arts, performing arts, music)	1

⁵ "Analysis of research trends in the applications for co-financing submitted to NCBR under the OP SG in 2016-2019", National Centre for Research and Development, Warsaw 2020, <https://www.gov.pl/web/ncbr/analiza-trendow-badawczych>.

Thematic fields of the applications for co-financing submitted to NCBR under the OP SG in 2016-2019:

2073

Electronic engineering and IT

1844

Transport and mechanical engineering

985

Medicine, pharmacy and biotechnology, biology

759

Materials engineering

368

Chemistry

310

Electrical engineering

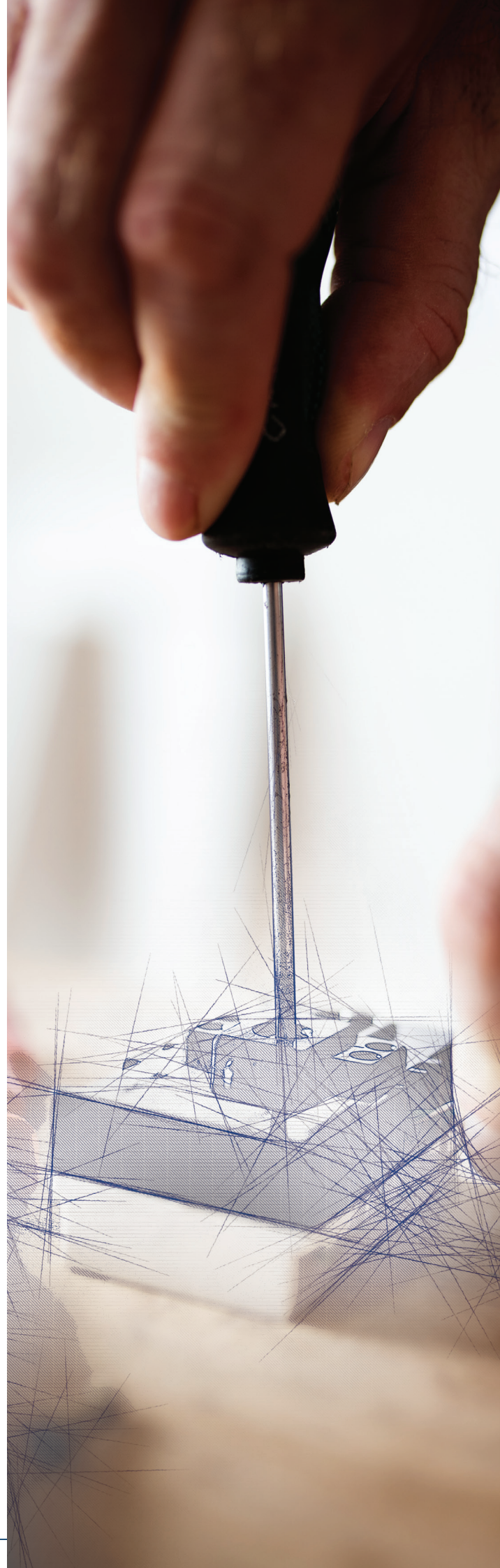
285

Agricultural sciences and environmental protection

137

Social and economic sciences

Bearing in mind the fact that innovation projects entail a high degree of risk of implementation failure, having made a comparison, it can be observed in which areas of the economy there is a high potential for implementing product and process innovation.



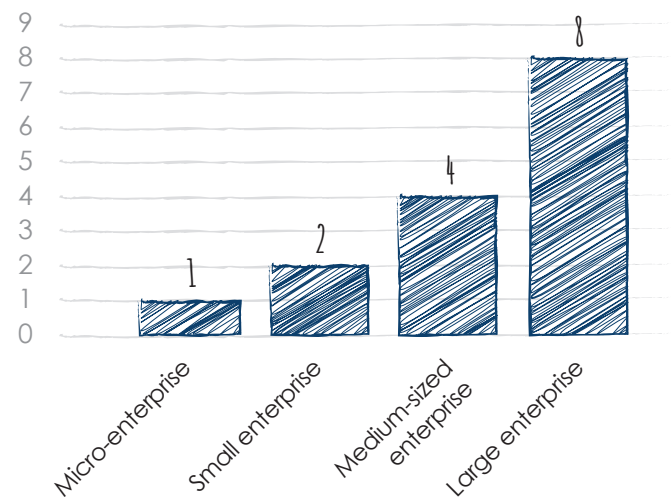
THE OP SG Sub-action 1.1.2 – Demonstrator

Within Sub-action 1.1.2, NCBR held the Demonstrator competition, its aim being to select projects which will contribute, to the greatest extent, to achieving the objectives of the OP SG and the objectives of Sub-action 1.1.2 as specified in a detailed description of the OP SG priority axes. The underlying objective is to increase the level of innovativeness of enterprises by using the results of R&D work. The competition focused on R&D work connected with the creation of a pilot/demonstration installation, and co-funding was granted to those entities whose ideas displayed an exceptionally high level of innovation, i.e. at least the 6th level of technological readiness (TRL), which included only development work involving the creation of a demonstration installation.

It is worth paying attention to the specificity of projects completed in 2020 under Sub-action 1.1.2, which were distinguished by a very high level of co-funding, resulting from the competition participation conditions. In line with the competition rules and regulations, the maximum value of eligible costs was PLN 5 million in the case of projects implemented by micro, small or medium-sized enterprises or PLN 20 million in the case of projects implemented by enterprises other than mentioned above.









In 2020, 15 projects under Sub-action 1.1.2 were completed, their total amount of co-funding exceeding PLN 190 million. As regards this sub-action, it is worth noting that the average duration of a project completed in 2020 was about 40.5 months (the duration of projects implemented under Sub-action 1.1.1 was, in average terms, by 10 months shorter).

Division of beneficiaries completing their projects in 2020 under Sub-action 1.1.2 by form of legal activity



The table below presents the number of completed projects based on the OECD classification. The projects were implemented in 10 voivodeships: Dolnośląskie (1), Kujawsko-Pomorskie (1), Łódzkie (1), Małopolskie (3), Mazowieckie (3), Opolskie (1), Pomorskie (1), Śląskie (2), Świętokrzyskie (1) and Wielkopolskie (1).

Division of beneficiaries completing their projects in 2020 under Sub-action 1.1.2 based on the OECD classification

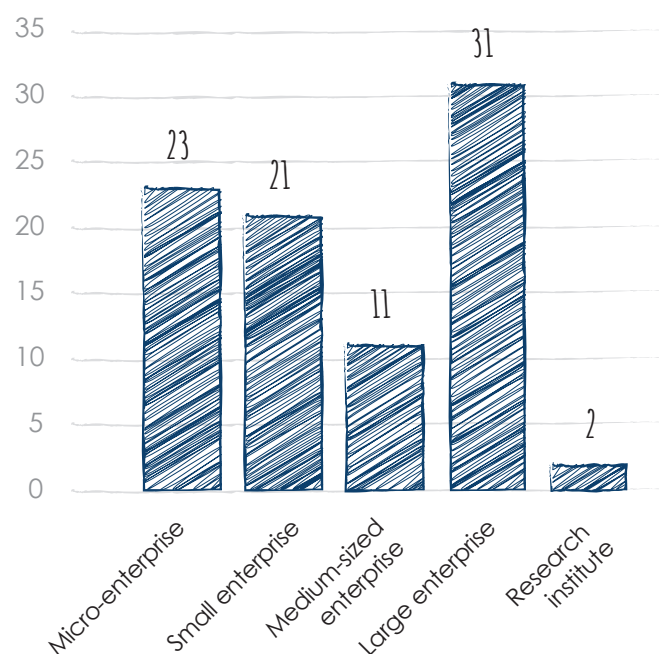
OECD classification	Number of projects
 1.4 Chemical sciences	1
 2.10 Nano-technology	1
 2.11 Other engineering and technologies	2
 2.2 Electrical engineering, electronic engineering, information engineering	6
 2.3 Mechanical engineering	1
 2.4 Chemical engineering	1
 2.5 Materials engineering	2
 3.1 General medicine	1

THE OP SG Sub-action 1.2 – Sectoral programmes

Under the Sub-action 1.2, NCBR held sectoral competitions in which co-funding was granted to projects involving either both industrial research and development work or development work only. Projects receiving the financial support under this competition had to concern one of the topics listed in the thematic scope of the competition (related to a given sector of the economy).

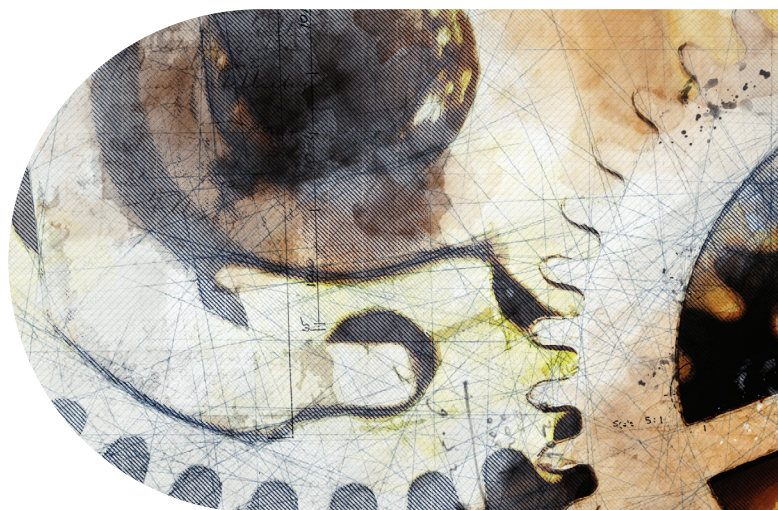
In 2020, 88 projects financed from the funds allocated for sectoral competitions were completed, with their amount totalling almost PLN 279 million, where the average value of project co-funding exceeded PLN 3.1 million. The average project duration was about 30 months. Among beneficiaries implementing research projects under Sub-action 1.2 in 2020, 55 represented the SME sector, 31 were large enterprises, and two were beneficiaries from research institutes.

Division of beneficiaries completing their projects in 2020 under Sub-action 1.1.2 by form of legal activity



















In terms of the OECD classification, projects completed in 2020 were, to a large extent, consistent with the trend presented in the analysis of applications funded by the OP SG in 2016-2019. It should be emphasised at this point that the sectoral competitions concerned very specific industries, which may have given rise to this trend. Importantly, some of the sectoral competitions for a given industry were announced only once, while other competitions, such as GamelNN, were announced several times. The multidisciplinary character of some projects is also a significant issue.

This is particularly visible in areas where IT⁶ comes at play. It is commonly known that most industries where innovative processes (product/process) take place are based, along with their main fields, on IT elements. In recent years, a germinating trend associated with the increasing use of artificial intelligence in the creation of innovative ideas has been observed in Poland.



Division of beneficiaries completing their projects in 2020 under Sub-action 1.2 based on the OECD classification

OECD classification	Number of projects
 1.2 Computer and information sciences	14
 1.4 Chemical sciences	2
 2.1 Civil engineering	3
 2.11 Other engineering and technologies	14
 2.2 Electrical engineering, electronic engineering, information engineering	20
 2.3 Mechanical engineering	4
 2.4 Chemical engineering	4
 2.5 Materials engineering	15
 2.6 Medical engineering	2
 2.7 Environmental engineering	2
 2.9 Industrial biotechnology	1
 3.1 General medicine	1
 3.2 Clinical medicine	2
 3.4 Medical biotechnology	1
 5.3 Educational sciences	1
 6.5 Other humanities	2



THE OP SG Sub-action 4.1.1 – Joint undertakings

Under Sub-action 4.1.1, competitions – joint undertakings were announced, which were implemented by NCBR together with partners. Joint undertakings are a mechanism of financing research and development work used by the Centre based on collaboration with an external entity. The purpose of this project was to direct the activity of scientific units to research and development work focused on technological solutions for which demand was expressed by specific entrepreneurs or other public institutions.

In 2020, under Sub-action 4.1.1, together with Łódzkie voivodeship, a competition was organised entitled "Łódzkie in good health", as a result of which one project was completed. As part of the competition, support was offered for the implementation of projects which would improve the quality of life, and foster an active and healthy ageing. In the Łódzkie voivodeship, several areas were diagnosed in which integrated financing of innovation would bring the greatest benefits, both regionally and (ultimately) nationally.

The beneficiary (a small enterprise) implemented its project within 13 months with the co-funding of PLN 959 410. The project field, based on the OECD classification, was 3.2 Clinical medicine.






THE OP SG Sub-action 4.1.2 – Regional research agendas

The aim of this action was to support the best-rated projects which included either both industrial research and experimental development work or experimental development work only, consistent with the regional research agendas. These agendas were established based on the research topics indicated by regional self-governments. Under the Sub-action in question, the project could be implemented only within a consortium consisting of at least one research unit and at least one enterprise,

with the consortium leader being solely the research unit. The condition for receiving a grant was the beneficiary's commitment to implement the project outcomes of the project as part of its own business, or to grant a licence or sell the project outcomes in order to implement them within the business activity of another entrepreneur. The project implementation period could not exceed three years.

In 2020, seven beneficiaries completed their projects financed under Sub-action 4.1.2 for the total amount of over PLN 17 million. The average project duration was 33 months, and the average level of funding almost PLN 2.5 million per application. The projects were implemented in seven voivodeships: Dolnośląskie, Małopolskie, Mazowieckie, Podlaskie, Śląskie, Wielkopolskie, and Zachodniopomorskie. The leaders of the scientific and industrial consortium were scientific entities, of which four entities were public universities (technical universities), two were research institutes, and one was a scientific entity operating within the Polish Academy of Sciences.

Division of beneficiaries completing their projects in 2020 under Sub-action 4.1.2 based on the OECD classification

OECD classification	Number of projects
 2.1 Civil engineering	1
 2.2 Electrical engineering, electronic engineering, information engineering	2
 2.3 Mechanical engineering	2
 2.5 Materials engineering	1
 3.4 Medical biotechnology	1

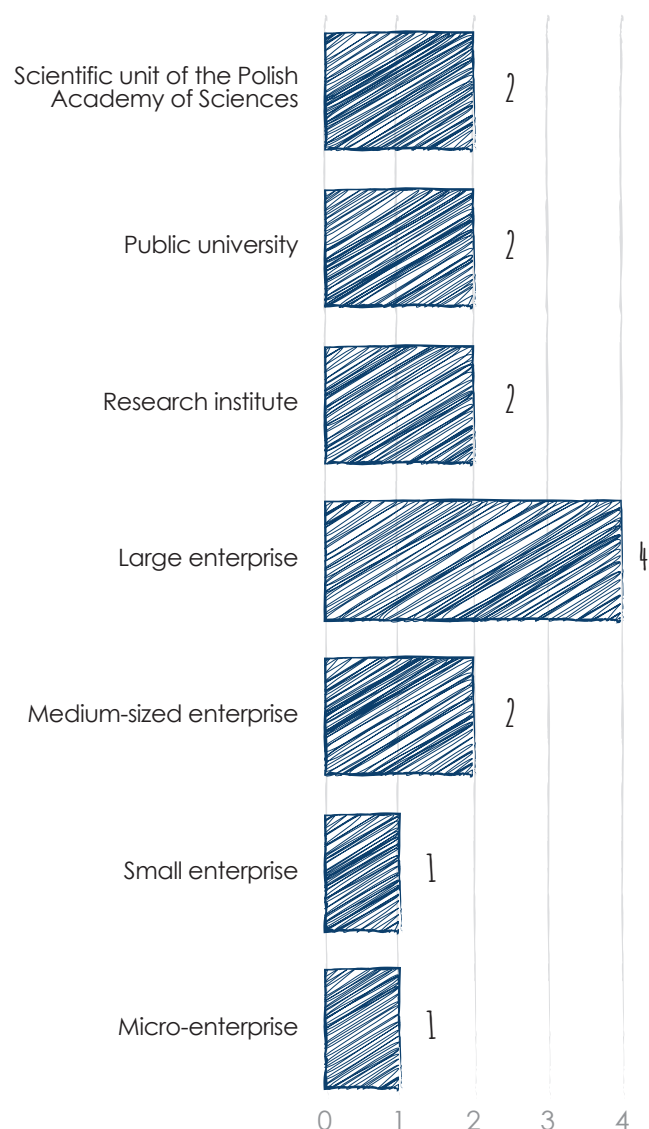
THE OP SG Sub-action 4.1.4 – Application projects

The aim of the competition was to select for co-funding those projects that would contribute most to the increase in the scale of application of new technological solutions necessary for the development of enterprises and improvement of their competitive position. The projects were implemented only within a consortium which consisted of at least one research unit and at least one enterprise. The project could obtain co-funding if it included either both industrial research and experimental development work or experimental development work only. The project could additionally include pre-implementation works which served as preparations for the implementation of the results of industrial research and development work as part of business activity. Their purpose was to advance the solution developed within the project to the stage of commercialisation. The competition did not strictly define the thematic scope but a project that received co-funding had to be consistent with at least one National Smart Specialisation (NSS).

Application projects, just like the Fast Track, enjoyed great interest among applicants. A similar nature of the competition (with no strictly defined thematic scope), coupled with the minimum project value of PLN 1 million, and the opportunity for scientific entities to participate as leaders, contributed to the popularity of this mechanism of support for innovators.











In 2020, under Sub-action 4.1.4, 14 projects were completed with the total amount of co-funding of nearly PLN 50 million, where the average project value was over PLN 3.5 million per application. The most expensive project completed in 2020 was subsidised with the amount of over PLN 5.2 million, and the average project duration was 36 months.

Division of beneficiaries completing their projects in 2020 under Sub-action 4.1.4. by form of legal activity



As regards the division projects based on the OECD classification, there was a noticeable trend indicating the prevalence of technical sciences and engineering, corresponding to the trend associated with the predominance of fields such as electronics and IT. Certainly, the reason for this was the fact that the competition attracted strictly technical scientific units. The relatively small number of projects completed under Sub-action 4.1.4 in 2020 was connected with the duration of the implemented projects (36 months on average), with the first project included in the analysis receiving co-funding in 2015 and taking 52 months to complete.

Division of beneficiaries completing their projects in 2020 under Sub-action 4.1.4. based on the OECD classification

OECD classification	Number of projects
 1.4 Chemical sciences	1
 2.1 Civil engineering	1
 2.10 Nano-technology	1
 2.11 Other engineering and technologies	1
 2.2 Electrical engineering, electronic engineering, information engineering	4
 2.5 Materials engineering	2
 2.7 Environmental engineering	1
 3.4 Medical biotechnology	1
 4.1 Agriculture, Forestry, and Fisheries	1
 4.2 Animal and Dairy science	1

SUCCESS STORIES OF BENEFICIARIES IMPLEMENTING NATIONAL DEFENCE AND SECURITY PROJECTS CO-FUNDED BY NCBR



In 2020, six beneficiaries completed, with much success, their projects related to national defence and security. These projects were funded under the following initiatives: development projects – competition No. 7/2015 (3 projects), the 1st edition of the 1/P/2016 “Future technologies for defence – competition of young scientists” programme (2 projects), and development projects – competition No. 8/2016 (1 project).

The total value of co-funding of the completed projects exceeded PLN 24 million, while the average value of a project was just above PLN 4 million. The lowest co-funding among the described projects was over PLN 1.2 million, and the highest over PLN 7.7 million.

Development projects – competition No. 7/2015

This initiative was announced with a view to enabling performance and financing projects in the field of scientific research or development work for national defence and security. The competition was targeted at scientific consortia consisting of at least one scientific unit and at least one entrepreneur; scientific and industrial centres or entrepreneurs. The organiser of the competition provided a list of project topics for which co-funding could be sought.

Three projects completed in 2020 under competition No. 7/2015 were carried out in a scientific and industrial consortium. In two cases, the project contractor was a public university, and in one case, it was a research institute.

The above projects were co-funded with the amount of over PLN 14.5 million. The projects were carried out in the Mazowieckie voivodeship and the average project duration was 56 months.

The end user of two projects was the Fire Brigade – the projects concerned counter-acting flood-related hazards and construction of ergonomic fire-fighting vehicles. The user of the third project is the Border Guard – the subject of the project was related to interference in radio transmission.

According to the OECD classification, the projects were assigned to the following categories: 1.5 Earth and related environmental sciences, 2.2 Electrical engineering, electronic engineering, information engineering, and 2.2.7 Engineering and technology/ Electrotechnology, electronics, engineering.

Development projects – competition No. 8/2016

Competition No. 8/2016 was the second edition of the initiative described above, as part of which one project, whose contractor was a research institute, was completed in

2020 in a scientific and industrial consortium. This project received co-funding of nearly PLN 4 million, lasted 45 months, and was carried out in Mazovia. The end user is the Ministry of Defence, and the subject of the project concerned laser correction of the flight path of air bombs.

The implemented project corresponds to category 2.3.4 Engineering and Technology/ Mechanical engineering/ Aerospace engineering of the OECD classification.

1/P/2016 “Future technologies for defence – competition of young scientists” programme (1st edition)

The programme of scientific research for national defence and security, entitled “Future technologies for defence – competition of young scientists” was launched by NCBR with the aim to develop breakthrough and innovative technological solutions, and to acquire or develop operational capabilities of the Polish Armed Forces and services responsible for security in the following areas:

- cyber defence – within the area of information and network technologies,
- autonomous unmanned platforms (air, land, sea),
- missile technologies for air defence – within the area of “precision weapons and armaments”.

Solutions in the area of cyber defence are to serve the development of the Polish Armed Forces capabilities of ensuring cyber security of the ICT systems and communications systems of the Ministry of Defence and also the capabilities of conducting operations in cyberspace. These solutions can also be useful in the case of systems related to the security of critical infrastructure of the Republic of Poland, crisis management, as well as in information and communication systems used in the Police, Border Guards and the National Fire Service.

Solutions in the field of unmanned platform technology, as proposed by the applicants, aimed at improving the Polish Armed Forces capabilities of troop survival and protection; combat in urbanized terrain; reconnaissance, surveillance, and target indication; striking; and the ability of engineering troops to counter improvised explosive devices. The unmanned battlefield platform technologies can also be widely applied in internal security and crisis management systems.

Solutions in the field of air missile defence technologies aimed at improving the Polish Armed Forces capabilities of striking, and troop survival and protection. It appears especially advisable to develop tracking and guidance solutions for short- and medium-range missiles displaying a high level of innovation.

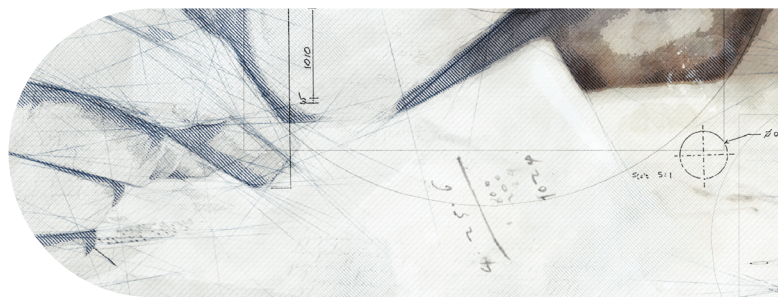
In 2020, two projects were completed under the 1/P/2016 programme, which were carried out at a public university and a research institute. The implemented projects were subsidised with the amount exceeding PLN 5 million, and the average project duration was 43 months.

Both projects correspond to 2.2.7 Engineering and technology/ Electrotechnology, electronics, information engineering/ Other – Electrotechnology, electronics, information engineering of the OECD classification. The end user is the Ministry of Defence.

The implemented projects addressed the research problem of an attack radar system and thermal batteries of a rocket system.

THE OPERATIONAL PROGRAMME KNOWLEDGE EDUCATION DEVELOPMENT

The Operational Programme Knowledge Education Development (OP KED) supports projects aimed at improving public policies and actions for the labour market, educa-



tion and the economy as a whole. EU grants enable supporting higher education in such contexts as the need to improve both the level and quality of teaching, and promote social innovation and transnational cooperation. The OP KED is implemented by NCBR, which acts as an Intermediate Body for Priority Axis III – Higher education for the economy and development. The addressees of the measures are universities and entities participating in higher education, students, doctoral students, academic staff and other persons involved in higher education. The main beneficiaries include universities and other entities providing higher education services, the minister in charge of higher education and the National Agency for Academic Exchange. The support is dedicated to Polish universities – both public and non-public.

In 2020, 252 projects were successfully carried out under 16 competitions financed from the OP KED budget. The amount which our beneficiaries had obtained from NCBR totalled PLN 204,833,268.24, while the average project value amounted to PLN 812,830.43. The average project duration in 2020 was 22 months, with the shortest project taking 11 months to complete, and the longest 35 months.



Within the framework of the OP KED, 252 beneficiaries completed their projects co-funded under 16 competitions

Competition	Number of projects	Amount of co-funding	Average amount of co-funding
Academic Career Offices – 1st edition	17	PLN 9 376 888.33	PLN 551 581.67
Academic Career Offices – 2nd edition	4	PLN 1 067 523.10	PLN 266 880.78
Philosophical education	19	PLN 1 552 128.84	PLN 81 690. 99
Staff development for the automotive sector	1	PLN 255 310.06	PLN 255310.06
Staff development for the business services sector	2	PLN 2 272 334.38	PLN 1 136 167.19
International Education Programmes	3	PLN 2 837 515.23	PLN 945 838.41
New Education Programmes	1	PLN 579 208.82	PLN 579208.82
Increasing competences of academic staff – 1st edition	20	PLN 7 306 231.80	PLN 365 311.59
Increasing competences of academic staff – 2nd edition	3	PLN 495 959.87	PLN 165 319.96
Competence Development Programme – 1st edition	27	PLN 37 145 777.90	PLN 1 375 769.55
Competence Development Programme – 2nd edition	28	PLN 22 504 436.79	PLN 803 729.89
Study? Practise! – 1st edition	23	PLN 29 922 304.38	PLN 1 300 969.76
Study? Practise! – 2nd edition	64	PLN 80 539 671.61	PLN 1 258 432.37
Copernicus Pathways	19	PLN 3 267 156.34	PLN 171 955.60
Third Mission of Universities	1	PLN 203 724.00	PLN 203 724.00
University for Young Explorers	20	PLN 5 507 096.79	PLN 275 354.84

Academic Career Offices – 1st and 2nd editions

The “Academic Career Offices” competition was launched under Sub-action 3.2 Competences in higher education of the OP KED. The co-funding could be applied for by public and non-public higher education institutions, its amount depending on the size of the institution.

The “Academic Career Offices” competition was addressed to universities conducting activities aimed at professional activation of students and graduates. The projects submitted as part of the competition had to envisage activities lasting no less than one year and involve tasks related to direct support for students, obligatorily including the assistance of a career counsellor. In order to ensure the effectiveness of the implemented measures, the project had to include tasks carried out jointly by career offices and labour offices, as well as NGOs or employers' organisations.

As part of the two editions of the “Academic Career Offices” competition, in 2020, a total of 21 projects were successfully implemented with the co-funding exceeding PLN 10 million. Grants were awarded to 12 public and 9 non-public universities from 10 voivodeships. Most beneficiaries were located in Wielkopolskie (4 universities), followed by Dolnośląskie and Mazowieckie (3 universities in each), Małopolskie, Pomorskie, Śląskie and Zachodniopomorskie (2 universities in each), and Podkarpackie, Kujawsko-Pomorskie and Świętokrzyskie (1 university in each). The average project duration was nearly 29 months.

Staff development for the automotive sector and Staff development for the business services sector

The purpose of launching both competitions was to establish internship programmes for both sectors, which would provide students with opportunities to improve their competences. The programmes also created

an opportunity for those universities which applied for NCBR funds, providing them with a unique chance to make selected fields of study more attractive. The programmes were specifically dedicated to universities which at least 100 students. One of the conditions to be fulfilled in order to obtain NCBR funds and attend the programmes was establishing cooperation with at least one entrepreneur operating in a given sector. Both competitions were launched under Action 3.1 Competences in higher education, financed from the OP KED budget.

Under both programmes, 3 projects were completed in 2020 with the total amount of funding exceeding PLN 2.5 million. The projects were implemented by public universities in three voivodeships: Mazowieckie, Podkarpackie, and Śląskie, and the average project duration was 19 months.

International Education Programmes

The International Education Programme was financed under Action 3.3 Internationalisation of Polish higher education within the framework of the OP KED budget. Its objective was to improve the accessibility of international education programmes for Polish people and foreigners participating in higher education. The programme assumed three forms of activities within higher education – first, the implementation of education programmes in foreign languages addressed to both Polish and foreign students; second, providing the support for the implementation of international study curricula; and third, the organisation of international summer schools in Poland. Such integration enabled foreigners to study with us and provided support to Poles searching for their way in an international environment. Moreover, thanks to the projects selected in the competition, Polish universities could attract foreign lecturers with a record of achievements in their scientific, professional or artistic career.

In 2020, three projects worth a total of nearly PLN 3 billion were successfully implemented by public universities in two regions (Warmia-Mazury and Wielkopolska). The programme funds were used to support various fields of study, i.e. the curriculum for the second-cycle studies in the majors of innovation, geodesy and geoinformatics, and journalism and social communication.

New Education Programmes and the Third Mission of Universities

The “New Education Programmes” competition is addressed to higher education institutions, and is related to the implementation of education programmes of general or practical profiles. They require adaptation, based on analyses and forecasts, to the actual needs of the economy, labour market and society. An important component of these activities should be the involvement of employers in the entire process.

In 2020, one project worth nearly PLN 600 000 was completed. It was carried out for 29 months at a non-public university in the Dolnośląskie voivodeship. It dealt with specialist languages and industry-specific translations for DIS areas. The competition was financed under Action 3.3 Internationalisation of Polish higher education, within the framework of the OP KED budget.

The “Third Mission of Universities” was an initiative which included NCBR’s co-funding for the diversification of the university’s offer as regards the implementation of its third mission as a forum for social activity, e.g. through programmes carried out in cooperation with non-governmental organisations, which contribute to the development of key competences which meet the needs of the labour market, economy and society. The competition was addressed to higher education institutions. As part of the “Third Mission of Universities” programme, in 2020 one project worth PLN 203 000 was successfully implemented at a public university in the Zachodniopomorskie voivodeship. The

project took 15 months to complete and its subject was the Academy of Young Lawyers. The competition was financed under Action 3.1 Competences in higher education, within the framework of the OP KED budget.

Philosophical Education

The “Philosophical Education” competition announced by NCBR provided funding for projects aimed at developing the university’s offer as regards the implementation of its third mission as a forum for social activity. The way to fulfil this mission was to use the teaching staff’s potential and to engage universities in cooperation with junior and senior high schools in order to develop student competences related to accurate argumentation, critical and independent thinking, logic and heuristics.

The competition was financed under Action 3.1 Competences in higher education, within the framework of the OP KED budget.

In 2020, 19 Philosophical Education projects were completed for a total amount exceeding PLN 1.5 million (with the average project co-funding amounting to over PLN 81 000). The co-funding was granted to 12 public universities and 7 non-public universities, and the projects took on average 18 months to complete. The NCBR funds were used by universities operating in 9 voivodeships. Most projects were implemented in Mazowieckie (4) and Podkarpackie voivodeships (4), 2 projects (in each case) were carried out in Lubelskie, Małopolskie, Śląskie and Zachodniopomorskie voivodeships, whereas 1 project (in each case) was implemented in Dolnośląskie, Łódzkie and Opolskie voivodeships.



Increasing competences of academic staff – 1st and 2nd editions

Under Action 3.4 Institutional management in higher education funded from the OP KED budget, NCBR announced the “Increasing competences of academic staff” competition.

The competition covered only activities aimed at increasing the level of teaching competences of academic staff in at least three of the following sets of skills: innovative teaching competences (e.g. learning-by-doing, design thinking); IT competences, including the operation of professional databases and their use in the learning process; foreign language teaching skills and information management skills.

In 2020, under the two editions of the competition (first and second), 23 beneficiaries successfully implemented their projects with the total amount of co-funding exceeding PLN 7.8 million (the average co-funding per application was nearly PLN 340 000). There were 3 non-public and 20 public universities among the beneficiaries and the average project duration was nearly 21 months. The projects were implemented in 11 voivodeships, including Mazowieckie (4 projects), Małopolskie (3), Śląskie (3), Wielkopolskie (3), Kujawsko-Pomorskie (2), Pomorskie (2), and Dolnośląskie, Podlaskie, Świętokrzyskie, Warmińsko-Mazurskie and Zachodniopomorskie (1 project in each of these).

Competence Development Programme – 1st and 2nd editions

NCBR – within its Competence Development Programme – allocated funds under Action 3.1 Competences in higher education, implemented within the framework of the OP KED, to projects whose substantive scope included activities aimed at shaping the competences which employers expect from their prospective staff. The projects covered by the competition were aimed to increase the level of competences of

those participating in higher education in the fields that are crucial for both the economy and country's development. The scope of these competences was defined based on analyses and forecasts, as well as the needs reported by employers and employer organisations.

The competition was addressed to universities, whether acting individually or in groups; in the latter case, the project was to be implemented with one of them acting as a leader.

In 2020, under the two editions of the Competence Development Programme, the beneficiaries completed 55 projects in total, for a total amount of nearly PLN 60 million (the average project co-funding was over PLN 1.2 million) and the average project duration was 29 months. Projects under the Competence Development Programme were implemented by universities in 13 voivodeships: Dolnośląskie (3), Kujawsko-Pomorskie (4), Lubelskie (4), Lubuskie (2), Łódzkie (4), Małopolskie (6), Mazowieckie (10), Podkarpackie (2), Podlaskie (2), Pomorskie (6), Śląskie (6), Wielkopolskie (3), and Zachodniopomorskie (3).

Study? Practise! – 1st and 2nd editions

NCBR – within the framework of two editions of the “Study? Practise!” programme addressed to higher education institutions – provided support to projects aimed at establishing unique student internships at universities. The universities, in cooperation with entrepreneurs, created and organised high quality internship and apprenticeship initiatives directly related to the fields of study. With the support from NCBR, the universities could cooperate more closely with entrepreneurs, jointly developing internship programmes, which allowed students to use their theoretical knowledge outside the academic walls. The co-funded projects lasted 12-24 months and involved students pursuing the final semesters of their studies. The subject areas of internships

were directly related to the fields of study in order to ensure the practical application of educational results in the course of tasks performed during the internship. The minimum duration of the internship was 120 hours with at least 20 hours per week. The competition was dedicated to universities with at least 100 full-time students and was financed under Action 3.1 Competences in higher education, within the framework of the OP KED budget.

In 2020, 87 projects were successfully implemented under the “Study? Practise!” programme, with the total co-funding amounting to over PLN 110 million (the average co-funding per application was nearly PLN 1.3 million). The projects were implemented by public (72) and non-public (15) universities, and the average project duration was nearly 20 months. Universities from 13 voivodeships: Dolnośląskie (6), Kujawsko-Pomorskie (8), Lubelskie (2), Łódzkie (5), Małopolskie (10), Mazowieckie (12), Opolskie (4), Podkarpackie (2), Podlaskie (3), Pomorskie (5), Śląskie (7), Wielkopolskie (16) and Zachodniopomorskie (7) obtained the co-funding.

Copernicus Pathways

NCBR, within the framework of the “Copernicus Pathways” competition, granted financial support to those universities which, as an attempt to diversify their offer, undertook activities falling within the scope of the third mission, as a forum for social activity. This mission was pursued through teaching activities aimed at developing participants' competences related to communication, cooperation, critical and creative thinking, problem solving and innovative activities. The university's resources were used for this purpose (e.g. teaching staff, laboratories and research equipment) with the intended outcome of creating and carrying out unconventional teaching modules, including ways and methods to stimulate young people's curiosity, creativity and desire to expand their knowledge. One of the main objectives of the competition

was to inspire increased interest in science by encouraging young people to explore its mysteries and also to show local communities how scientific discoveries influence their daily lives. Copernicus Pathways was financed under Action 3.1 Competences in higher education, within the framework of the OP KED budget.

In 2020, 19 beneficiaries successfully implemented their projects under the "Copernicus Pathways" competition. NCBR subsidised those projects with the total amount exceeding PLN 3.2 million (with the average project co-funding amounting to over PLN 170 000). The average project duration was 19 months. The projects were implemented by 13 public and 6 non-public universities in 8 voivodeships: Kujawsko-Pomorskie (1), Łódzkie (3), Małopolskie (4), Podkarpackie (2), Podlaskie (1), Śląskie (5), Świętokrzyskie (2), and Zachodniopomorskie (1).

University for Young Explorers

The "University for Young Explorers" competition launched by NCBR was addressed to public and non-public universities which, by acting jointly with entities operating in the field of education, were to carry out a series of educational and research activities for children and young people aged 6 to 16. Those activities were to take place at universities and research institutions under the supervision of scientists. The projects to be carried out under the competition were to include the development of curricula and the implementation of teaching activities aimed at developing the participants' competences with the aim to increase their cognitive curiosity; stimulate the intellectual, axiological and social development of young people; inspire creative thinking and the development of interests and passions; disseminate the culture of innovation; and familiarise the participants with the academic environment and the university as a venue for taking a scientific look at the reality. The projects were also meant to integrate local communities around academic

centres by paving grounds for conducting organised extracurricular educational and dissemination activities, as well as for supporting activities and improving the quality of already conducted educational activities.

The "University for Young Explorers" competition was dedicated to universities which would prepare projects enabling children and youth to develop key competences and universal skills, the so-called transversal skills, such as abilities in the fields of mathematics and natural sciences, the command of foreign languages, literacy, creativity, entrepreneurship, critical thinking, problem solving or team work skills in the context of the working environment.

In 2020, under the "University for Young Explorers" competition, 20 beneficiaries completed their projects. NCBR subsidised them with the total amount exceeding PLN 5.5 million, and the average project co-funding amounted to PLN 275 000. The average project duration was 14 months and the projects were implemented in 7 voivodeships: Dolnośląskie (1), Kujawsko-Pomorskie (2), Lubelskie (4), Łódzkie (2), Małopolskie (1), Mazowieckie (5), Śląskie (4), and Świętokrzyskie (1). 13 beneficiaries implemented their projects at public universities and 7 at non-public ones.

NATIONAL COMPETITIONS

One of the underlying objectives of the Centre, arising directly from the Act on NCBR, is to support the development of cutting-edge solutions and technologies which increase innovativeness, and thus also competitiveness of the Polish economy. NCBR's activity should foster cooperation between Polish entrepreneurs and contribute to the commercialisation of scientific research results for the benefit of the Polish economy. The Centre pursues its objectives by developing programmes to support applied research and R&D works, financing the commercialisation and transfer of project outcomes to the economy, as well as supporting the development of young scientific staff.

In response to the market needs, NCBR announced and carried out competitions targeted at specific industries and sectors of the national economy. These competitions were aimed at prompting the development of innovative and cutting-edge solutions by Polish enterprises, and thus at shaping the competitive edge of the Polish economy in the world.

We present you a synthetic description of national competitions under which the beneficiaries completed their projects in 2020. The purpose of the following description is to outline the thematic scopes of the programmes. This important issue will be presented in more detail when summarizing the national projects.

The LEADER programme was launched in 2009 and so far has been the longest continuously running programme implemented by the National Centre for Research and Development. It is addressed to young and talented scientists who have the potential and motivation to lead research and development projects. The underlying objective of the programme is to increase the competences of young scientists in the fields of independent planning, management and



leading of their own research teams in the course of implementation of scientific projects whose outcomes can be transposed to the economy.

The conducted research indicates that the implementation of the LEADER programme contributes to the development of leaders, both in terms of their competences and scientific careers. On the one hand, the programme gives them an opportunity to gain experience in managing R&D projects, thus contributing to the development of potential managers of future projects financed by the Centre. On the other hand, it allows them to build research staff – a team capable of performing applied research. Owing to the LEADER programme, young scientists can extend their portfolio with applied research, and acquire the competences and experience which will then enable them to apply for the support for more advanced research and development projects. The LEADER programme is of exclusive character and is addressed to representatives of various scientific disciplines. It is a complementary project in terms of financing science in Poland. It provides a robust basis for strengthening the competitiveness of Polish science and for educating a new generation of Polish scientists on a European and global scale. It is also part of the global trend of establishing new targeted instruments for financing research conducted by young scientists.

Applicants submit their applications under the LEADER programme together with units conducting research or development work, e.g. research organisations (public or private).

In 2020, 29 leaders completed their projects under three editions of the LEADER competition (6th, 7th and 8th editions). More specifically, 4 projects were completed under the 6th edition, 16 projects under the 7th edition, and 9 projects under the 8th edition. The total value of the projects completed under the LEADER programme and co-financed by NCBR amounted to

nearly PLN 33 million, and the average project value exceeded PLN 1.1 million. The average project duration was close to 40 months.








LEADER – 6th edition

Four projects subsidised with a total amount of PLN 4.5 million were successfully implemented under the 6th edition of the LEADER programme. The average project duration was nearly 48 months and they were implemented in 2 voivodeships: Mazowieckie (2 projects) and Małopolskie (also 2 projects). Three leaders implemented their projects in collaboration with a public university, and one with a scientific unit of the Polish Academy of Sciences. The projects corresponded to three fields of the OECD classification; 2 projects represented category 2.5 Materials engineering, 1 project category 2.3 Mechanical engineering, and 1 project category 3.4 Medical biotechnology.

LEADER – 7th edition

Projects implemented under the 7th edition of the LEADER programme formed the largest group of initiatives completed in 2020 under the reference programme – 16 of them were successfully implemented. The total amount of NCBR funding granted to the leaders in the 7th edition exceeded PLN 17.8 million, and the average co-funding per application was over PLN 1.1 million. The average project duration was 42.5 months. The leaders implemented their projects in collaboration with research institutes (3 projects), with a scientific unit of the Polish Academy of Sciences (1 project), and with public universities (12 projects).

Division of beneficiaries completing projects in 2020 under the 7th edition of the LEADER programme based on the OECD classification






OECD classification	Number of projects
 1.4 Chemical sciences	3
 2.2 Electrical engineering, electronic engineering, information engineering	3
 2.3 Mechanical engineering	3
 2.5 Materials engineering	3
 2.9 Industrial biotechnology	1
 3.3 Health sciences	1
 4.3 Veterinary science	2

The projects implemented under the 7th edition of the LEADER programme were carried out in 10 Polish voivodeships: Dolnośląskie (1), Łódzkie (1), Małopolskie (4), Mazowieckie (2), Pomorskie (2), Śląskie (2), Warmińsko-Mazurskie (1), and Wielkopolskie (3).

LEADER – 8th edition

Nine projects were successfully implemented under the 8th edition of the LEADER programme, with the total co-funding exceeding PLN 10 million (and with the average project co-funding of PLN 1.1 million). The average project duration was nearly 32 months. The leaders of the 8th edition of the programme put their ideas into practice in collaboration with foundations or research institutes (2 projects each), or public universities (5 projects).

Division of beneficiaries completing projects in 2020 under the 8th edition of the LEADER programme based on the OECD classification

OECD classification	Number of projects
 1.3 Physical sciences	1
 2.11 Other engineering and technologies	1
 2.2 Electrical engineering, electronic engineering, information engineering	1
 2.3 Mechanical engineering	1
 2.5 Materials engineering	5

The projects were implemented in 6 voivodeships: Łódzkie (1), Małopolskie (2), Podkarpackie (1), Śląskie (2), Świętokrzyskie (2), and Wielkopolskie (1).

Of note is the fact that the largest number of projects completed in 2020 under the LEADER programme were implemented in the broadly defined area of materials engineering (10). Projects in the field of electrical engineering, electronic engineering and information engineering (4), as well as mechanical engineering (5), were also of great interest to the leaders.

In 2020, 188 beneficiaries completed with success their projects co-funded under national competitions⁷. The beneficiaries put their ideas into practice through 12 programmes, including also joint ventures – Blue Gas Joint Venture I and II (6 projects), CuBR Joint Venture I and II (6 projects), RID Joint Venture (8 projects), GEKON Joint Venture I and II (5 projects), TANGO Joint Venture I and II (16 projects), INNOLOT (1 project), INNOMED (7 projects), INNOTECH I, II and III (9 projects), Social Innovation I and II (9 projects), Patent Plus III and IV (6 projects), PBS I, II and III (114 projects), SPIN-TECH (1 project).

7 Excluding the LEADER programme which was the subject of separate analysis.

Blue Gas – Polish Shale Gas Joint Venture

was part of a joint venture launched by NCBR and the Polish Agency for Enterprise Development SA (ARP). The objective of the competition was to support large integrated research and development projects involving pilot testing of a developed solution eventually leading to the development and commercialization of innovative technologies related to shale gas production. The principal objective of the project was to develop technologies in the field of shale gas production in Poland, and then to implement them in the economic activities of enterprises operating in the country.

CuBR Joint Venture was established as a result of cooperation between NCBR and Kombinat Górniczo-Hutniczy Miedzi Polska Miedź SA (KGHM). Its idea was to support research and development work in the non-ferrous metals industry. The principal objective of the project was to undertake joint activities for the development and implementation of innovative technologies, equipment, materials and products in order to improve the competitive edge of the Polish non-ferrous metals industry as a global market and world economy player. This, in turn, is expected to contribute to the attainment of the position of a global leader by the Polish non-ferrous metals industry, especially in copper production.

RID Joint Venture – i.e., Road Innovation Development – was established as a result of cooperation between NCBR and the General Directorate for National Roads and Motorways (GDDKiA). Its idea is to support research or development work in the road engineering area. The principal objective of the project was to carry out and implement the outcomes of research projects in the area of road safety improvement and traffic management system efficiency, as well as to attempt at developing the optimal norms and standards for road planning, design, technology, construction and operation in Poland.

GEKON Joint Venture – i.e. Generator of Ecological Concepts – is the outcome of cooperation between NCBR and the National Fund for Environmental Protection and Water Management (NFOŚiGW). The principal objective of the project was to increase the innovativeness of the Polish economy through the development of eco-friendly technologies, including the development and implementation of a new financial instrument supporting the creation of such technologies, the development and implementation of new innovative technologies of this kind in the Polish economy, and the stimulation of cooperation between the enterprise sector and scientific entities.

TANGO Joint Venture is a result of cooperation between NCBR and the National Science Centre (NCN). It is meant to provide a response to the need to build a bridge between fundamental research and industrial research and development work. The main objective of the project is to increase the degree of commercialisation of technologies based on the results of fundamental research obtained in basic projects. The way to attain this objective is to draw up a plan for the development of such technologies and to promote engagement of entrepreneurs in this process.

INNOLOT is a national programme aimed at increasing the competitiveness of the Polish economy in the area of high technology products for the aviation sector. It can be defined by two underlying objectives, i.e. increasing the number of innovative solutions implemented in the aviation sector and strengthening cooperation of research units and entrepreneurs in the area of R&D of the Polish aviation sector. INNOLOT was initiated by way of an agreement with the Polish Aerospace Technology Platform.

INNOMED is a programme aimed at financing research and development work in the field of innovative medicine. The programme was the outcome of an agreement concluded between NCBR and a group of enterprises associated in the Innovative Medicine Polish Technological Platform. The

principal objectives of INNOMED include increasing the competitiveness of the Polish economy; increasing the availability of technologically advanced medical products for Polish patients; increasing the number of innovative technologies developed and implemented in our country, as well as strengthening cooperation between scientific groups with adequate know-how and research infrastructure, and R&D departments of pharmaceutical companies.

INNOTECH is a programme intended to support science and business in the implementation of innovative projects in various fields of science and industry (the In-Tech programme pathway) with special focus on advanced technologies (the Hi-Tech programme pathway). The programme was addressed to entities undertaking research activities and preparatory work for the implementation of research results, targeted at the development and implementation of innovative technologies, products or services. The principal objective of the programme was to prompt an increased share of high technology products in the income structure of enterprises participating in the initiative, which in the long run should translate into a dynamic growth in the share of high technology products in the gross domestic product in the Polish economy.

Social Innovation is a programme intended to support the scientific sector, non-governmental organisations and the business environment in the launching and implementation of innovative projects and social initiatives based on scientific and technical achievements. The principal objectives of the programme were to be accomplished by improving the quality of life of society, with special focus on those groups and areas where a real need for innovative solutions and new social initiatives was identified. The implemented projects were expected to foster the increase in the number of innovative technical solutions and innovative products, services and procedures facilitating the solving of complex social problems, as well as development

and tightening of intersectoral cooperation at the local, regional and national levels.

Patent Plus is a programme launched to encourage both scientists and managerial staff of scientific units to apply for legal protection of outcomes of their research. The principal objective of the programme was to raise the number of patent applications, and thus to improve the protection of industrial property rights in Poland. The programme was implemented by subsidising or refunding the expenses incurred in connection with patent application preparation.

PBS or the Applied Research Programme consisted of two approaches. The first one, i.e. the so-called pathway A, assumed carrying out research works aiming at gaining knowledge in a given field of science displaying the potential of practical application, e.g. research of a material showing certain desirable properties in terms of their possible use in specific products or technologies. The second one, pathway B, was intended to foster research aimed at achieving some predetermined practical objectives through the application of new solutions in specific industries, e.g. modification of a material used in a specific product in order to improve its parameters. The fields of science covered by the programme include chemical sciences, geology, mining and construction, information technologies, electronics, automation and robotics, energy and electro-technology, materials and material technologies, mechanics and transport, medical and pharmaceutical sciences, biological, agricultural, forestry and veterinary science, and an interdisciplinary area.

SPIN-TECH is a programme announced with the aim of supporting operating activities of special purpose vehicles set up by state-owned scientific units (public universities, research institutes and scientific institutes of the Polish Academy of Sciences), in particular those established by universities in order to commercialise the outcomes of their research and development work.

As part of national competitions, 188 projects were completed within the framework of the following programmes:

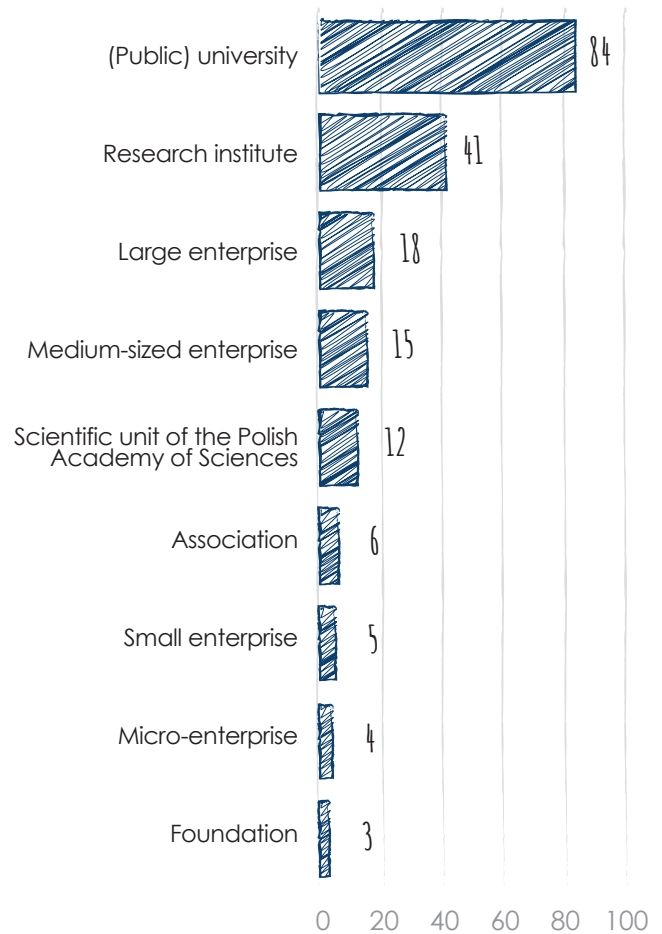
Programme	Number of applications	Amount of co-funding	Average amount of co-funding
Blue Gas	4	PLN 43 924 757.00	PLN 10 981 189.25
Blue Gas II	2	PLN 19 655 125.00	PLN 927 562.50
CuBR I	2	PLN 9 074 600.73	PLN 4 537 300.37
CuBR II	4	PLN 10 458 834.32	PLN 2 614 708.58
GEKON 1	2	PLN 10 911 548.00	PLN 5 455 774.00
GEKON 2	3	PLN 14 579 849.00	PLN 4 859 949.67
INNOLOT	1	PLN 26 250 000.00	PLN 26 250 000.00
INNOMED	7	PLN 41 151 126.22	PLN 5 878 732.32
INNOTECH	1	PLN 2 300 000.00	PLN 2 300 000.00
INNOTECH II	4	PLN 22 200 615.00	PLN 5 550 153.75
INNOTECH III	4	PLN 6 618 912.00	PLN 1 654 728.00
SOCIAL INNOVATION	1	PLN 947 310.00	PLN 947 310.00
SOCIAL INNOVATION II	8	PLN 6 662 666.92	PLN 832 833.37
PATENT PLUS 3	1	PLN 45 883.84	PLN 45 883.84
PATENT PLUS 4	5	PLN 1 184 606.47	PLN 236 921.29
PBS I	7	PLN 43 408 060.00	PLN 6 201 151.00
PBS II	26	PLN 74 910 712.07	PLN 2 881 181.23
PBS III	81	PLN 196 244 954.67	PLN 2 422 777.22
RID	8	PLN 10 838 686.77	PLN 1 345 835.85
SPIN-TECH	1	PLN 422 985.00	PLN 422 985.00
TANGO	14	PLN 13 753 12.17	PLN 982 372 30.00
TANGO 2	2	PLN 2 210 000.00	PLN 1 105 000.00

NCBR subsidised 188 projects with the total amount of PLN 557 754 445.18, and the average co-funding per application amounting to PLN 2 966 778.96. The average project duration was 39 months. On average, it took 37 months for business entities to implement their projects, compared to 40 months in the case of scientific units.

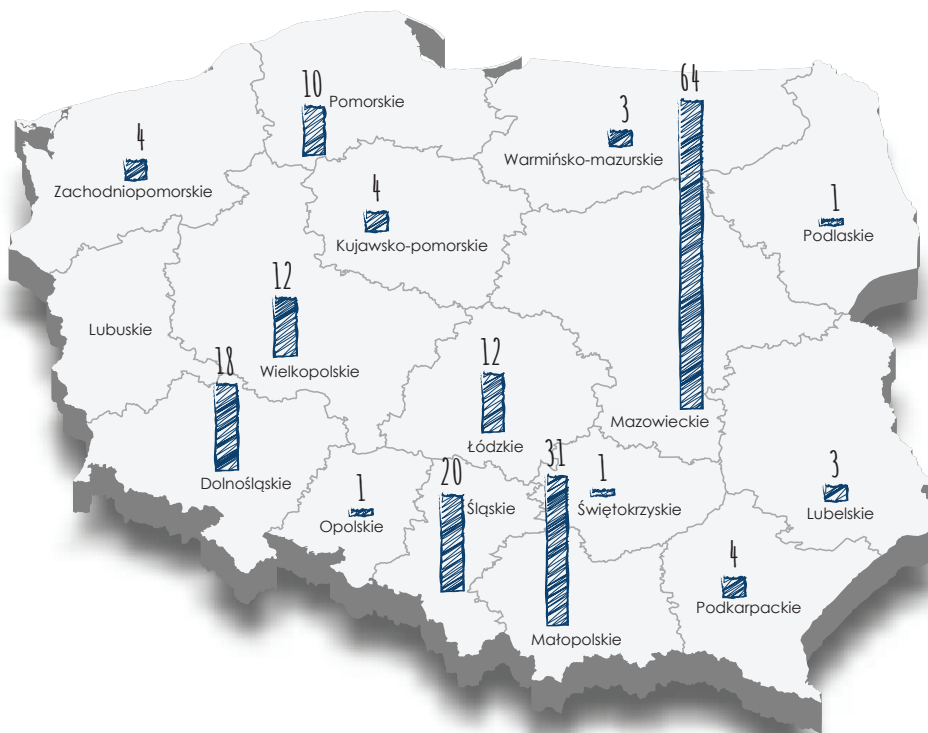
73% of those beneficiaries who successfully implemented projects in 2020 were scientific units, 22% were representatives of the industry, and 5% were foundations or associations.

The division of projects according to the implementation venue closely corresponds to the legal form of the beneficiaries' activity. In view of the fact that 73% of the beneficiaries were scientific units, the project implementation venues are closely related to the distribution of leading scientific centres in the country (Mazowieckie, Dolnośląskie, Małopolskie, and Śląskie voivodeships). The existence of effectively operating scientific units open to cooperation increases the companies' interest in such cooperation and in carrying out R&D activities.

Division of beneficiaries completing their projects in 2020 under national programmes by form of legal activity






















Number of beneficiaries completing their projects in 2020 under national programmes by voivodeship













In the case of projects completed in 2020, co-funded under national programmes, one can hardly speak of any clear-cut research trend. This is largely due to the specific economic scope of a given programme. By briefly describing the programmes, we wanted to highlight their principal objective, clearly translating into economic sectors. A summary of the classification of projects in terms of OECD categories shows a strong dispersion, i.e. the occurrence of a small

number of projects, and sometimes even one project, in a given category. Most projects represented the following category: 2.2 Electrical engineering, electronic engineering, information engineering (31 projects, accounting for as few as 16%), and in this case a certain phenomenon can be noted, which as a trend is visible only in the case of projects co-funded under the OP SG.

Division of beneficiaries completing their projects in 2020 under national programmes based on the OECD classification

OECD classification	Number of projects
 1.2 Computer and information sciences	1
 1.3 Physical sciences	4
 1.4 Chemical sciences	7
 1.5 Earth and related Environmental sciences	2
 1.6 Biological sciences	1
 2.1 Civil engineering	11
 2.10 Nano-technology	3
 2.11 Other engineering and technologies	15
 2.2 Electrical engineering, electronic engineering, information engineering	31
 2.3 Mechanical engineering	18
 2.4 Chemical engineering	3
 2.5 Materials engineering	23
 2.6 Medical engineering	5
 2.7 Environmental engineering	17
 2.8 Environmental biotechnology	1
 2.9 Industrial biotechnology	2
 3.1 General medicine	5
 3.2 Clinical medicine	6
 3.3 Health sciences	1



 3.4 Medical biotechnology	5
 3.5 Other medical sciences	1
 4.1 Agriculture, forestry, and fisheries	5
 4.2 Animal and dairy science	2
 4.3 Veterinary science	3
 4.4 Agricultural biotechnology	10
 4.5 Other agricultural sciences	3
 5.3 Pedagogy	1
 5.4 Sociology	1
 6.5 Other humanities	1

STRATEGIC PROGRAMMES

Strategic research and development work programmes are high-budget programmes arising from the state's scientific and innovation policy, serving the purpose of social and economic development of Poland. The basis for their preparation is provided by the National Research Programme, established by way of a resolution of the Council of Ministers of 16 August 2011, which defines strategic directions for conducting research and development work. Based on the directions laid down in the document, the NCBR Council prepares projects of strategic programmes and then submits them for approval to the minister in charge of science.

A strategic programme consists of projects aimed at addressing specific technical, scientific or social problems. The calls for proposals are of top-down character, which means that applicants should fully comply with the requirements specified therein. The implementation of strategic programmes contributes to the consolidation of the best research teams, and the integration of scientific and economic circles around issues of key importance for the country's development.

In 2020, 12 beneficiaries succeeded in completing their projects implemented with the funds provided under the following strategic programmes: BIOSTRATEG (5 projects) and STRATEGMED (7 projects). The projects were subsidised by NCBR with the total amount of PLN 205 082 622.00, and the average project value amounted to PLN 17 090 218.50. The average project duration was 45.5 months (the shortest project took 27 months to complete and the longest 59 months).

STRATEGMED – i.e. “Prevention practices and treatment of civilisation diseases”. The programme was meant as a response to the needs of the aging society, with the increasing incidence of chronic diseases and growing costs of medical care. The main objective was to achieve fundamental progress in combating civilisation diseases based on

the results of scientific research and development work conducted in 4 areas: cardiology and cardiac surgery; oncology; neurology and senses; and regenerative medicine. The programme was designed to foster increased innovativeness and competitiveness of the Polish economy in such areas as biotechnology and biomedical engineering.

BIOSTRATEG – i.e. “Environment, Agriculture and Forestry”. The programme covered five strategic areas: food security and safety; rational management of natural resources, with special focus on water management; prevention of and adaptation to climate change with special focus on agriculture; biodiversity protection and sustainable development of agricultural production space, forestry and timber industry. The projects were carried out by the following entities: three large enterprises, four public universities, three research institutes, one medical centre and one scientific unit of the Polish Academy of Sciences.

In the case of strategic projects, as in the case of national ones, it is hard to indicate the precise market trend. The reason for this is the strict thematic division of the programmes. Projects under both strategic programmes were implemented in eight voivodeships: Lubelskie (1), Małopolskie (1), Mazowieckie (2), Opolskie (1), Pomorskie (2), Śląskie (2), Wielkopolskie (1), and Zachodniopomorskie (2).

Seven projects implemented in 2020 with the co-funding granted from the STRATEGMED programme represented two OECD categories: 3.2 Clinical medicine (6 projects) and 3.4 Medical biotechnology (1 project). Among the five projects carried out under the BIOSTRATEG programme, one can see a stronger diversity in terms of the OECD classification compared to the STRATEGMED programme, i.e. 1.4 Chemical sciences (1 project), 1.5 Earth and related environmental sciences (1 project), 2.4 Chemical engineering (1 project), 2.5 Materials engineering (1 project), and 4.4 Agricultural biotechnology (1 project).

INTERNATIONAL PROGRAMMES

International cooperation pursued through various international projects results directly from the provisions of the Act on NCBR and is one of the duties fulfilled by the Centre. Within the framework of the cooperation, NCBR undertakes various competition initiatives together with its foreign partners from all over the world. With regard to their type, the projects can be divided into ERA-NET initiatives (partnerships within the EU framework programmes), other multilateral initiatives, bilateral cooperation and programmes financed from Norway Grants and EEA Grants. The implementation element that required for some programmes, aimed at the practical implementation of the outcomes of successfully completed projects, is of special value⁸.

In 2020, 77 international projects were successfully implemented within the framework of bilateral cooperation (15 projects), multilateral initiatives (28 projects), and ERA-NET initiatives (34 projects). The completed projects were subsidised with the total amount of PLN 64,694,242.95 (with the average project co-funding exceeding PLN 840 000).

International projects – bilateral cooperation











Within the framework of bilateral cooperation, in 2020 our beneficiaries successfully implemented 15 projects, with the total co-funding exceeding PLN 15 million (the average project co-funding was around PLN 1 million). The average project duration was 37 months. As part of those 15 completed projects, our beneficiaries obtained co-funding in the following competitions: Polish-Taiwan and Polish-Taiwan V (7 projects), Polish-Berlin (2 projects), Polish-German II (4 projects), Polish-Turkish II (1 project), and V4-Korea (1 project)⁹.

⁸ More information can be found in the NCBR publication "International R/D projects at NCBR – application, implementation, success", National Centre for Research and Development, Warsaw 2021, <https://www.gov.pl/web/ncbr/miedzynarodowe-projekty-br-w-ncbr-aplikowanie-realizacja-sukces>

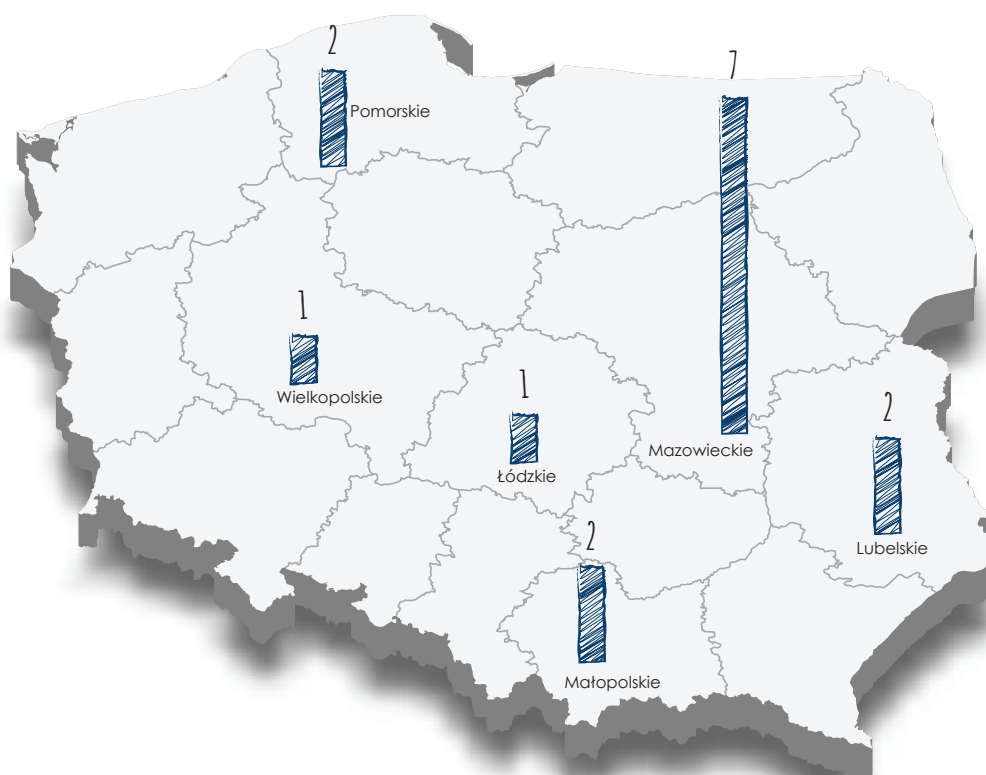
⁹ A synthetic description can be found in the NCBR publication "International R/D projects at NCBR – application, implementation, success", National Centre for Research and Development, Warsaw 2021, <https://www.gov.pl/web/ncbr/miedzynarodowe-projekty-br-w-ncbr-aplikowanie-realizacja-sukces>

All the projects were carried out by scientific units – two projects were implemented by research institutes, three by scientific units of the Polish Academy of Sciences, and 10 projects by (public) universities.

Division of beneficiaries completing their projects in 2020 within the framework of international bilateral cooperation based on the OECD classification

OECD classification	Number of projects
 2.2 Electrical engineering, electronic engineering, information engineering	3
 2.5 Materials engineering	2
 2.4 Chemical engineering	2
 1.4 Chemical sciences	2
 3.4 Medical biotechnology	1
 3.1 General medicine	1
 2.11 Other engineering and technologies	1
 2.10 Nano-technology	1
 1.7 Other natural sciences	1
 1.5 Earth and related environmental sciences	1

Division of beneficiaries completing their projects in 2020 within the framework of international bilateral cooperation by voivodeship

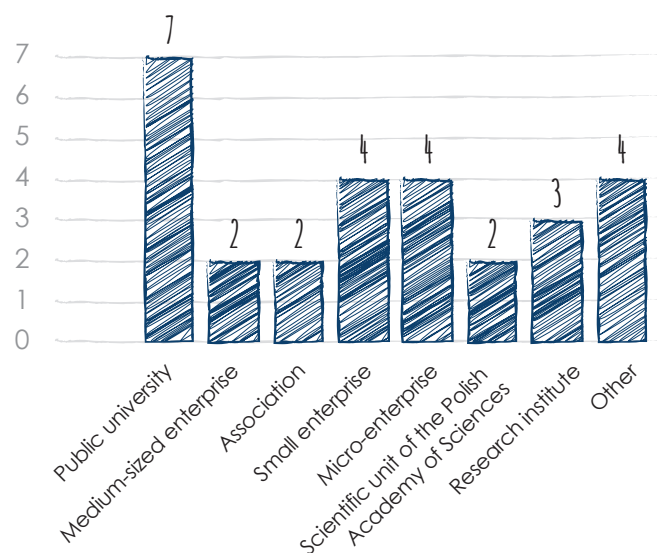


International projects –multilateral initiatives

Diverse competitions for research projects, often dedicated to specific groups of recipients, are organised within the framework of international multilateral programmes. Such initiatives are financed from the budgets of the agencies which announce these competitions. The range of competition rules and topics depends on the originator of a given initiative. Multilateral programmes have a very important feature – at their core is cooperation of research groups from countries that are parties to a given programme, which allows for the exchange not only of expertise, but also of good practices and often results in the formation of scientific partnerships¹⁰.

In 2020, 28 projects were completed using the funds provided under six international multilateral programmes, including AAL II (3 projects), BONUS 185 (10 projects), CORNET (5 projects), ECSEL Joint Undertaking (4 projects), EUREKA 2 (3 projects), and EUROSTARS II (3 projects). The total amount of project co-funding was PLN 23 740 105.75 (with the average co-funding per project reaching PLN 847 860.92). The average project duration was 34 months.

Division of beneficiaries completing their projects in 2020 within the framework of international multilateral cooperation by form of legal activity












¹⁰ More information can be found in the NCBR publication "International R/D projects at NCBR – application, implementation, success", National Centre for Research and Development, Warsaw 2020, <https://www.gov.pl/web/ncbr/miedzynarodowe-projekty-br-w-ncbr-aplikowanie-realizacja-sukces>



Division of beneficiaries completing their projects in 2020 within the framework of international multilateral cooperation by voivodeship



Division of beneficiaries completing their projects in 2020 within the framework of international multilateral cooperation based on the OECD classification

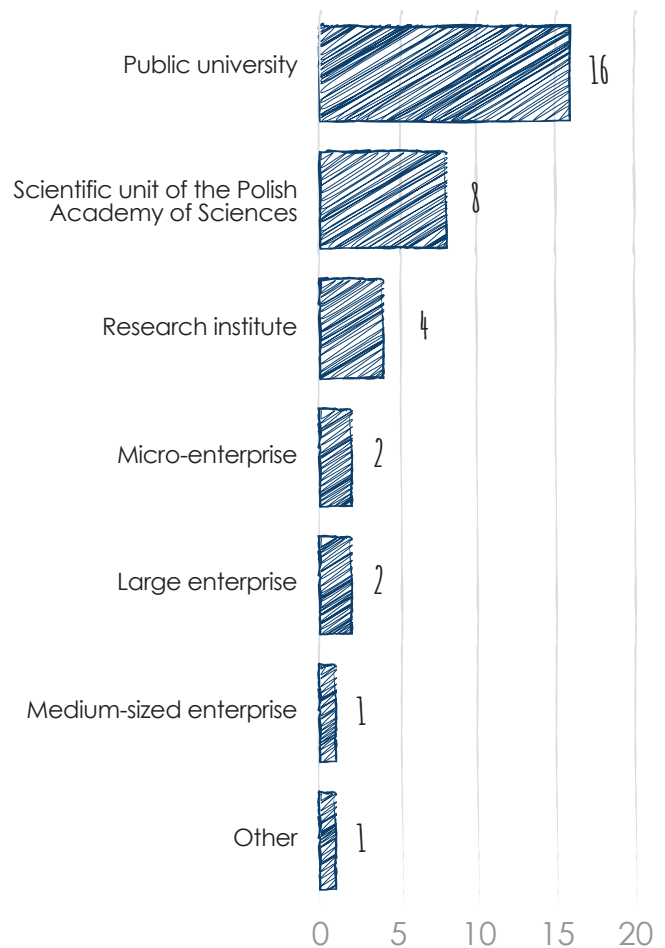
OECD classification	Number of projects
 5.2 Economics and business	1
 4.4 Agricultural biotechnology	2
 2.7 Environmental engineering	1
 2.5 Materials engineering	5
 2.4 Chemical engineering	1
 2.2 Electrical engineering, electronic engineering, information engineering	6
 2.11 Other engineering and technologies	3
 2.1 Civil engineering	1
 1.5 Earth and related environmental sciences	8

International projects – ERA-NET initiatives

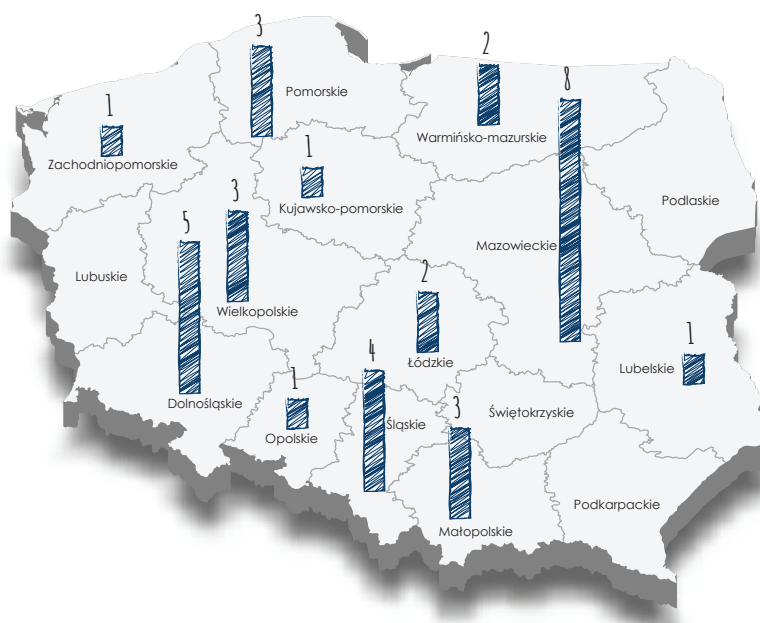
The formula of ERA-NET group programmes is based on the pursuit of the Community goal of establishing the European Research Area (ERA). It envisages consolidating the financial and scientific potential of Member States with a view to raising the level of competitiveness of the European economy. The participants of these undertakings may include institutions implementing research financing programmes in various European countries, e.g. ministries, agencies financing research projects and scientific councils. NCBR's role in ERA-NET initiatives is to establish cooperation and participate in the projects within international competitions for research and R&D projects, financed from national resources, are launched.

In 2020, 34 projects subsidised within the framework of 17 ERA-NET initiatives¹¹ were completed, with the total co-funding value of PLN 25 528 603.24 (the average co-funding per application amounted to PLN 750 841.27). The average project duration was 35 months.

Division of beneficiaries completing their projects in 2020 within the framework of ERA-NET initiatives by form of legal activity



















Division of beneficiaries completing their projects in 2020 within the framework of ERA-NET initiatives by voivodeship



¹¹ Co-funding is provided to beneficiaries under the following ERA-NET initiatives: ERA-NET Bioenergy (2 projects), ERA-NET Co-Fund ERA-GAS (1 project), ERA-NET Co-Fund FACCE SURPLUS II (1 project), ERA-NET Co-Fund SusAn (2 projects), ERA-NET Co-Fund WaterWorks2015 (2 projects), ERA-NET Electric Mobility Europe (EMEurope – 4 projects), ERA-NET EuroNanoMed II (1 project), ERA-NET IB 2 (1 project), ERA-NET LAC (5 projects), ERA-NET MARTEC II (2 projects), ERA-NET MarTera (2 projects), ERA-NET Neuron Cofund (4 projects), ERA-NET SOLAR (1 project), ERA-NET TRANSCAN (1 project), ERA-CVD (2 projects), ERA-HDHL (1 project), and M-ERA.NET 2 (2 projects).

Division of beneficiaries completing their projects in 2020 within the framework of ERA-NET initiatives based on the OECD classification

OECD classification	Number of projects
 5.3 Educational sciences	1
 4.2 Animal and dairy science	1
 4.1 Agriculture, forestry, and fisheries	2
 3.4 Medical biotechnology	4
 3.3 Health sciences	1
 3.2 Clinical medicine	2
 3.1 General medicine	2
 2.9 Industrial biotechnology	2
 2.8 Environmental biotechnology	1
 2.5 Materials engineering	3
 2.4 Chemical engineering	1
 2.3 Mechanical engineering	3
 2.2 Electrical engineering, electronic engineering, information engineering	1
 2.11 Other engineering and technologies	2
 2.1 Civil engineering	4
 1.5 Earth and related environmental sciences	3
 1.4 Chemical sciences	1

In the case of international programmes implemented by NCBR, it is hard to indicate any clear-cut trends. This results from the strictly sectoral character of individual programmes, which prompts the submission of applications under a competition with a specific thematic scope. It is also difficult to determine the trend concerning the division of beneficiaries by form of legal activity –

this difficulty resulting from the restrictions imposed by the rules and regulations of individual programmes. The presented analysis implies that the largest group of beneficiaries represent public universities. The only strongly visible trend, which was shown in the analysis of international programmes, is the project implementation venue (region), which corresponds well with

a wider analysis included in NCBR's publication¹². Most projects were completed in the Mazowieckie, Pomorskie and Małopolskie voivodeships. Based on the analysis conducted by the Centre, the largest number of international projects are carried out by Warsaw University of Technology, Gdansk University of Technology, and AGH University of Science and Technology in Krakow¹³.

It is further worth noting that German entities are the most numerous representation among foreign partners implementing projects jointly with Polish institutions. They are followed by representatives of the following countries: Spain, France, Norway, Sweden, Italy, the Netherlands, Finland, Austria, and Belgium¹⁴.

SUMMARY OF BENEFICIARIES' SUCCESSES IN 2020

The adopted methodology reveals that in the previous year beneficiaries succeeded in completing 797 projects implemented under the programmes. The total amount of project co-funding exceeded PLN 2 billion. The previous year, just like this year, saw strenuous attempts to control the global COVID-19 pandemic. More than a year has passed and we are still struggling with the effects of restrictions in many spheres of both economy and private life. Our beneficiaries have also been strongly affected by the fight against the coronavirus in implementing their projects. We are all the more delighted that so many of these were completed with success. It is worth stressing that the vast majority of these projects were research- and implementation-oriented, translating into innovative solutions in the form of new technologies, services or products that appear extremely necessary for our economy and society.

By performing an extensive analysis of the projects completed in 2020, we have managed to show some noticeable trends and phenomena in individual thematic areas, types of programmes and beneficiaries' operational specificities. This makes it clear how complicated and often time-consuming the process of developing innovations is. The indicated amounts, allocated for individual programmes, are meant to illustrate the scale of financial resources necessary to successfully carry out the entire R&D process

and the subsidies granted by NCBR to see such initiatives through.

It is worth emphasising that the R&D projects took an average of three years to complete. This implies that the projects completed throughout the past year were, in the vast part, commenced in the first half of the financial perspective 2014-2020.

Moreover, the presentation of the project implementation venues by region was intended to show in which voivodeships there exist robust scientific centres and companies implementing research and development projects. We are mindful that a full landscape of innovation in Poland will only be seen by referring to a complementary analysis of all projects co-funded under the financial perspective 2014-2020, but we still need to wait a few years for that. Today, it is our pleasure to provide you with this synthetic study which outlines the successes of our beneficiaries who have managed to complete extremely complex and demanding projects.

¹² "International R/D projects at NCBR – application, implementation, success", National Centre for Research and Development, Warsaw 2021, <https://www.gov.pl/web/ncbr/miedzynarodowe-projekty-br-w-ncbr-aplikowanie-realizacja-sukces>.

¹³ Ibidem.

¹⁴ Ibidem.



NCBR PROGRAMME PORTFOLIO

STATE-FUNDED PROGRAMMES

STRATEGIC PROGRAMMES

NCBR programme portfolio presentation starts with strategic research and development programmes – they are high-budget programmes arising from the state's scientific and innovation policies promoting the social and economic development of Poland. They are prepared on the basis of the National Research Programme adopted by way of the Resolution of the Council of Ministers of 16 August 2011, which defines the strategic research and development priorities. Based on the guidelines laid down in the said document, NCBR Council prepares strategic programme projects, and submits it for approval to a minister responsible for science and higher education. Following approval, the programmes are submitted for implementation with NCBR.

In 2020 NCBR implemented five strategic programmes:

- GOSPOSTRATEG
- TECHMATSTRATEG
- BIOSTRATEG
- STRATEGMED
- INFOSTRATEG
(first competition announced in 2020)

totalling PLN 170.5 million in project funding.

GOSPOSTRATEG

Established in: 2017

“Poland’s social and economic development in the context of market globalisation”

Main objective:

To improve the utilisation – by 2028 – of social and economic research results in developing national and regional development policies.

Specific objectives:

- implement policies, strategies, operational documents and specific solutions developed as part of the Programme,
- implement the solutions developed as part of the programme to bolster the social capital necessary to carry out national and regional development policies.

The following was achieved in 2020 in the GOSPOSTRATEG Programme:

- three competitions announced,
- over PLN 45.8 million paid to beneficiaries,
- two agreements signed,
- 31 projects monitored,
- 21 reports evaluated.

TECHMATSTRATEG

Established in: 2015

„New material technologies”

Main objective:

To develop knowledge in programme-specific fields to support the transfer of innovative solutions developed in the Programme to the social and economic environment, and elevate Poland’s international research & development position in this area.

Specific objectives:

- invigorate cooperation between research units with businesses and other economic actors,
- prepare for the implementation of innovative solutions developed in the Programme,
- increase Polish research teams’ participation in European research & innovation programmes specific to the Programme’s field,
- stimulate research activity in the private sector in Programme-specific fields.

The following was achieved in 2020 in the TECHMATSTRATEG Programme:

- one competition for proposal announced,
- over PLN 78.6 million paid to beneficiaries,
- five agreements signed,
- 31 projects monitored,
- 22 reports evaluated,
- 14 projects monitored during their durability period.

BIOSTRATEG

Established in: 2013

„Environment, Agriculture and Forestry”

Main objective:

To develop knowledge in the Programme-specific fields to elevate Poland's research & development position in these fields, and to transfer innovative solutions developed in the Programme to the social and economic environment.

Specific objectives:

- develop cooperation between research units and external entities,
- prepare for the implementation of innovative solutions developed in the Programme,
- increase Polish research teams' participation in European research & innovation programmes specific to the Programme's field.

The following was achieved in 2020 in the BIOSTRATEG Programme:

- over PLN 27.1 million paid to beneficiaries,
- 24 projects monitored,
- 36 reports evaluated,
- 14 projects monitored during their durability period.

STRATEGMED

Established in: 2014

“Prevention and treatment of civilisation diseases”

Main objective:

To achieve substantial progress in counter-ing lifestyle diseases and in regenerative medicine based on the results of research and development in the fields of cardiology and cardiothoracic surgery, oncology, neurology and sensory science, regenerative medicine.

Specific objectives:

- significantly elevate Poland's international research & development position in Programme-specific fields,
- create dynamic, young international research teams with a proven international standing,
- transfer the know-how and new technologies related to disease prevention, diagnostics, therapy and rehabilitation from Polish scientific institutions (public research organisations) to the economy.

The following was achieved in 2020 in the STRATEGMED Programme:

- almost PLN 19 million paid to beneficiaries,
- 25 projects monitored,
- 27 reports evaluated,
- 17 projects monitored during their durability period.

“Advanced information, telecommunication and mechatronic technologies”

The INFOSTRATEG Programme aims to promote the development of Polish AI capabilities by developing AI- and block-chain-based solutions with direct practical application.

In 2020 one competition was announced as part of the INFOSTRATEG Programme.

Specific Programme objectives consistent with the scope of the first competition include:

- create sets of test data as a basis for developing standards to choose the best solutions,
- develop Poland's AI-related research capabilities,
- significantly increase the market activity of Polish IT teams,
- create solutions based on machine learning to improve product and service quality, and streamline processes.

NATIONAL PROGRAMMES

In accordance with Articles 29 and 30 of the Act of 30 April 2010 on the National Centre for Research and Development, the Centre's remit is to promote the development of advanced solutions and technologies to drive the Polish economy's innovativeness and, by extension, competitiveness. NCBR works to strengthen cooperation between Polish businesses and contributes to the commercialisation of research results to benefit the Polish economy. These objectives are pursued through Programmes designed to support applied research and R&D work, the financing of THE commercialisation and transfer of research results to the economy, and support for young scientists. In pursuing its objectives, NCBR also cooperates with other entities to implement joint projects and sectoral programmes. Furthermore, the Centre continues its work related to monitoring projects commissioned by the Minister of Education and Science.

So far, NCBR has announced 11 national programmes, under which a total of **more than PLN 385 million** has been granted to beneficiaries in 2020. In addition, in 2020 NCBR launched the IDEAS venture in the form of a subsidiary, and also adopted

and prepared framework objectives for the INFRASTART and AI Excellence Centres Programmes.

Additionally, in 2020 NCBR initiated an IDEAS project in the form of a company subsidiary, prepared the assumptions and adopted the INFRASTART and AI Excellence Centres (artificial intelligence) programmes.

Competitions completed in 2020:

- Joint project of NCBR and NCN-TANGO IV
- Cybersecurity and eidentity – CyberSecIdent IV
- “Things are for people” as part of the Accessibility Plus Programme
- LIDER XI
- INFRASTART I
- Joint project of NCBR and NCN-TANGO V

National, non-competitive projects:

- “Improvements in security and working conditions” multiannual programme
- Dedicated hospitals

A total of PLN 646 million has been allocated for these initiatives.

JOINT PROJECT OF NCBR AND NCN – TANGO

Established in: **2013****Main objective:**

To support the development of technology based on fundamental research.

Specific objectives:

- formulate a strategy for the development of technology based on fundamental research,
- review the potential to commercialise the results of fundamental research.

The following was achieved in 2020 as part of the joint project of NCBR and NCN – TANGO:

- one competition announced,
- PLN 6 million provided to beneficiaries,
- 13 agreements signed,
- 31 reports evaluated,
- 56 projects monitored,
- 53 projects monitored in their durability period.

CYBERSECURITY AND EIDENTITY – CYBERSECIDENT

Established in: **2017****Main objective:**

To enhance the cyberspace security of the Republic of Poland by improving access to hardware and software-development tools by 2023.

Specific objectives:

- implement technological solutions to facilitate cooperation and coordination between different domains of cybersecurity, with special emphasis on digital identity,
- implement identification and authentication methods and techniques.

Additional information:

A cooperative programme carried out in cooperation with the Ministry of Digital Affairs.

The following was achieved in 2020 as part of the CyberSecIdent:

- one competition announced,
- over PLN 31 million provided to beneficiaries,
- three agreements signed,
- one project monitored during its durability period.

"THINGS ARE FOR PEOPLE" COMPETITION AS PART OF THE "ACCESSIBILITY PLUS" PROGRAMMEEstablished in: **2013****Programme description:**

The "Accessibility Plus" government programme aims to improve the quality of life of, and ensure self-sufficiency for, people with special needs, including the elderly and persons with permanent or or temporary limitations of mobility and perception. This will be achieved through providing better accessibility to public spaces, architecture, transport, products and services on a large scale.

In 2020 a total of 107 applications were submitted in the "Things are for people" competition as part of the "Accessibility Plus" government programme.

LEADEREstablished in: **2009****Main objective:**

To promote the development of young scientists, particularly at the outset of their careers.

Specific objectives:

- expand young scientists' competencies related to independent planning, managing and leading their own research teams, and implementing research projects with the potential to be applied in the economy,
- allow scientists at the outset of their careers to establish their own research teams and implement their own projects,
- stimulate scientists' cooperation with businesses by allowing the implementation of research with the potential to be commercialised and implemented,
- increase the expenditures of businesses on scientific research and development work which benefits the economy,
- strengthen cooperation between businesses and public research units.

A total of 11 editions of the LIDER programme.

The following was achieved in the LIDER programme:

- one competition announced,
- PLN 54.5 million provided to beneficiaries,
- 155 reports evaluated,
- 60 agreements signed,
- 157 projects monitored,
- 169 projects monitored during their durability period.

INFRASTART – PROGRAMME TO INCREASE THE EFFICIENCY OF R&D INFRASTRUCTURE USE

Established in: 2020

Main objective:

To increase the use of R&D infrastructure and promote the internationalisation of research units' activities.

Specific objectives:

- increase the commercial use of the supported R&D infrastructure in research and development projects,
- increase international R&D cooperation using the supported R&D infrastructure,
- professionalise R&D infrastructure management for commercialisation and international cooperation purposes.

The INFRASTART Programme was approved for implementation in December 2020.

"IMPROVEMENTS IN SECURITY AND WORKING CONDITIONS" MULTIANNUAL PROGRAMME – STAGE 5

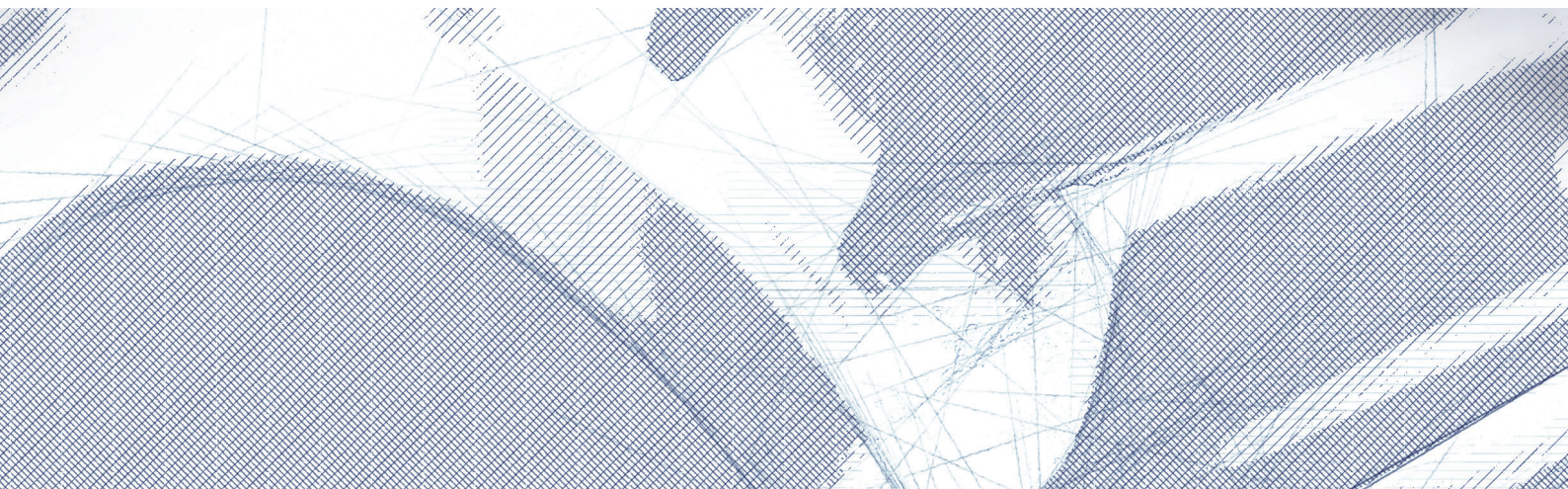
Established in: 2019

Main objective:

To develop innovative organisational and technical solutions designed to promote the development of human resources and new products, technologies and management approaches and systems the use of which will contribute to a substantial reduction in the number of employees exposed to hazardous, harmful and noxious conditions, and in work-related accidents, occupational diseases and the associated economic and social losses.

The following was achieved in 2020 as part of the "Improvements in security and working conditions" multiannual programme – Stage 5:

- PLN 12.5 million provided to beneficiaries,
- one agreement signed,
- one project monitored,
- two projects monitored during their durability period.



"SUPPORTING DEDICATED HOSPITALS IN COUNTERING THE SPREAD OF SARS-COV-2 INFECTIONS AND IN THE TREATMENT OF COVID-19" PROJECT, WITHOUT COMPETITIONS

Established in: **2020**

The "Supporting dedicated hospitals in countering the spread of Sars-Cov-2 infections and in the treatment of Covid-19" Project was announced at the outset of the pandemic in Poland. The project was one of the two efforts (the other being "Fast Track – Coronaviruses") launched as NCBR's quick response to the immense social challenge of countering the coronavirus pandemic.

Main objective:

To implement methods of preventing the spread of and countering SARS-CoV-2 infections or the COVID-19 disease as the underlying cause of the state of epidemic.

Specific objectives:

- develop drug-based and non-drug treatments to counter COVID-19, and treatment schemes and medical procedures,
- develop new solutions and technologies to reduce the spread of the SARS-Cov-2 virus and and to diagnose COVID-19,
- create dedicated IT tools to collect epidemiological and therapeutic data.

The following was achieved in 2020 as part of the "Supporting dedicated hospitals in countering the spread of Sars-Cov-2 infections and in the treatment of Covid-19" Project:

- PLN 72 million was provided to beneficiaries,
- 20 agreements were signed,
- 20 projects were monitored.

Other initiatives implemented by NCBR as part of national programmes in 2020:

- Track for Mazovia,
- Joint project of NCBR and KGHM Polska Miedź SA – CuBR,
- Applied Research Programme,
- Programme to support the finding of research infrastructure maintenance – PANDA 2,
- Bridge Classic,
- Bridge VC pilot project.

DEFENCE AND SECURITY PROJECTS

Defence and security projects are implemented by NCBR in consultation with the Minister of National Defence and the Minister of the Interior and Administration. These programmes and projects aim to enhance Poland's defence capabilities and national security.

Defence and security programmes and projects:

- designed to promote the capabilities of Polish research and industrial entities;
- aiming to promote technological self-sufficiency by developing Polish know-how in state security and defence capabilities.

Three programmes and 14 competitions have been launched so far to implement research & development projects related to security and defence. A total of **more than**

PLN 233 million were provided to beneficiaries under these measures in 2020.

Four initiatives under these programmes were announced in 2020:

- Programme No. 1/SZAFIR/2020,
- Programme No. 2/SZAFIR/2020,
- Development projects competition No. 11/2020 (round 1),
- Development projects competition No. 3/N/2019.

A total of PLN 1.1 billion was allocated for these initiatives.

THE DEVELOPMENT OF ADVANCED TRANSFORMATIVE TECHNOLOGIES PROMOTING STATE DEFENCE AND SECURITY – "SZAFIR" PROJECT

Established in: **2019**

Main objective:

To stimulate initiative and encourage activity by creative researchers, innovators and technological visionaries, and to guide their work towards fields and subject areas of critical importance for state defence and security.

Additional information:

The programme will lead to overcoming technological and technical barriers, aiming to develop advanced materials, sub-assemblies, assemblies and systems to be used to devise new designs of military equipment and integrate systems and equipment for improved state security. Priority areas were defined based on the National Research Programme recommendations and on the needs of the Ministry of the Interior and Administration and the Ministry of National Defence for the years 2013-2022".

The following was achieved in 2020 in the SZAFIR programme:

- two competitions announced,
- almost PLN 36.5 million provided to beneficiaries,
- six agreements signed,
- six projects monitored.

DEVELOPMENT PROJECTS COMPETITION NO. 11/2020 (ROUND 1)Established in: **2020****Main objective:**

To finance projects with the greatest potential to actually improve state security. These projects aim to promote technological self-sufficiency by developing Polish know-how related to critical security and defence technologies.

Specific objectives:

The subjects and framework objectives of the projects, including core and specific objectives, required technology readiness levels and desirable project completion dates will be defined in the Competition Rules and Regulations.

The following was achieved in the “Development projects” competition No. 11/2020 (round 1):

- one competition announced,
- 23 applications were submitted and under evaluation.

DEVELOPMENT PROJECTS COMPETITION 3/N/2019 – CONFIDENTIALEstablished in: **2019****Main objective:**

To finance projects with the greatest potential to actually improve state security. These projects aim to promote technological self-sufficiency by developing Polish know-how related to critical security and defence technologies. This is the third competition held on a confidential basis under the Decision of the State Defence and Security Research and Development Steering Committee. The reason for confidentiality is that some projects involve access to classified information.

The following was achieved in Development projects competition No. 3/N/2019:

- one competition announced,
- two applications submitted and under evaluation,
- the competition is held on a confidential basis.

Other programmes implemented by NCBR in 2020:

- State defence and security research programme called “Future defence technologies – a competition for young scientists”.
- Strategic programme called “New directed energy defence and weapon systems”.

PROGRAMMES FINANCED FROM EUROPEAN FUNDS

SMART GROWTH OPERATIONAL PROGRAMME

The Smart Growth Operational Programme is the largest programme in the European Union aimed at financing research, development and innovation. Thanks to the funds from the European Union entrepreneurs and scholars have a chance to receive financing, i.a., for joint research and development undertakings, and the results of the R&D works can find their practical application in economy. From idea to industry – this is the main assumption of this programme. This means support for innovation development: from creating a concept of innovative products, services or technologies, through preparing prototypes, pilot lines, all the way to commercialisation.

NCBR is supervising three ventures as part of measures related to EU Funds:

The Smart Growth Operational Programme (SG OP): the largest R&D grant and innovation funding programme in the European Union; it co-finances joint R&D undertakings carried out by scholars and entrepreneurs; the results of the R&D works find their application in economy.

The Knowledge Education Development Operational Programme (KED OP): EU grants awarded as part of the KED OP allow the strengthening of higher education focused on development needs, promotion of social innovation and supranational cooperation.

The Digital Poland Operational Programme (DG OP): support the extension of Internet access, development of citizen-friendly e-administration which facilitates the arrangement of multiple matters via a computer, and the dissemination of knowledge and skills related to the use of computers.

As regards the Smart Growth Operational Programme (SG OP), NCBR plays the role

of an Intermediate Body and finances activities as part of:

- SG OP Priority Axis I: “Support for R&D activity of enterprises” (Fast Track, sectoral programmes, programmes involving capital funds),
- SG OP Priority Axis IV: Increasing the research potential (research programmes for the economy, joint undertakings, regional R&D agendas, application projects, state-of-the art research programmes using the problem-driven research model).

In 2020 NCBR announced nine competitions, including eight as part of the Fast Track (five with a thematic scope), as a response to specific needs in a given economy sector, and the Fast Track – Seal of Excellence competition, and application projects.

Competitions announced in 2020:

- 1/1.1.1/2020 Fast Track,
- 2/1.1.1/2020 Fast Track – Seal of Excellence,
- 3/1.1.1/2020 Fast Track for Mazovia,
- 4/1.1.1/2020 Fast Track - RES in Transport,
- 5/1.1.1/2020 Fast Track - Coronaviruses,
- 6/1.1.1/2020 Fast Track,
- 7/1.1.1/2020 Fast Track - Agrotech,
- 8/1.1.1/2020 Fast Track – IPCEI,
- 1/4.1.4/2020 Application projects.

Through various initiatives as part of the SG OP in 2020, our beneficiaries received over PLN 3.2bn, out of which PLN 1.7bn as part of the Fast Track competitions, over PLN 290m as part of sectoral programmes, over PLN 185m from Bridge Alfa, and over PLN 340m as part of Action 4.2, and over PLN 689m allocated for other initiatives.

In 2020 NCBR decided to launch competitions in a new Pre-commercial Procurement formula (PCP). The decision contributed to the extension of NCBR's competition portfolio. Four initiatives in the PCP formula were announced in 2020.

Moreover, the following competitions were held in 2020:

- 4/1.2/2019 GameINN,
- 3/4.1.1/2019 Joint Undertaking with the Lubelskie Province Lublin heights of photonic technologies,
- 2/4.1.1/2019 Joint Undertaking with the Śląskie Province Silesia under a blue sky,
- 4/4.1.1/2019 Joint Undertaking INGA,
- 2/4.1.4/2019 Application projects,
- 7/1.1.1/2019 Fast Track – Innovative environmentally friendly fertilizers,
- 8/1.1.1/2019 Fast Track – Heating devices.

SUB-ACTION 1.1.1 – FAST TRACK

Established in: **2015**

Sub-action 1.1.1 is aimed at supporting R&D projects implemented by enterprises. Starting from competition No. 2/1.1.1/2019, announced on 28 February 2019 support as part of this sub-action may also be granted to scientific and industrial consortia. Funding is granted for the implementation of projects which include industrial research and experimental development, or only experimental development. The support is addressed to projects comprising National Smart Specialisations, including new specialisations arising from the entrepreneurial discovery process. The financing of pre-implementation works constitutes an additional support for R&D works.

In 2020, as part of Sub-Action 1.1.1 – Fast Track:

- eight competitions were announced, including five calls with a thematic scope,
- the beneficiaries were granted the amount of over PLN 1.7 billion,
- 502 agreements were signed,
- 882 reports were reviewed,
- 198 projects in their durability period were being monitored.

ACTION 1.2 – SECTORAL PROGRAMMES – GAMEINN SECTORAL PROGRAMME

Established in: 2016

Main objective:

Increasing the competitiveness of the national video game developer sector on the global market by 2023

Specific objectives:

- Increasing R&D activities in the video game sector by 2023,
- Increasing the number of innovations in the video game sector by 2023.

Additional information:

The GameINN sectoral programme was developed on the initiative of the Polish Games Association.

In 2020, as part of the GameINN programme:

- the beneficiaries were granted PLN 69.3 million,
- 43 agreements were signed,
- 89 projects were monitored,
- 69 reports were reviewed, and
- eight projects in their durability period were monitored.

SUB-ACTION 4.1.3 - NON-COMPETITIVE PROJECTS

Established in: 2019

Grand Challenge: Energy (WWE)**Main objective:**

Increasing the use of wind power by individual users.

Specific objectives:

- developing a device capable of transforming wind power into electricity and its storage in the most effective way,
- building environmentally friendly approaches in society,
- raising the ecological and energy awareness among the society,
- developing the interest in technical sciences among wide circles of recipients, and promoting innovation,
- bolstering the integration of academic circles and businesses operating in the green energy sector.

In 2020, as part of the Grand Challenge: Energy:

- a conference for participating entities was organised - the "Participant Handbook" was presented, and all the rules concerning the WWE programme were discussed,
- the call for participants was finished – over 180 of interested parties expressed their wish to participate in the programme,
- 84 participants were selected for the next WWE stage – quarter finals.

E-VAN

The purpose of the undertaking:

The purpose of the procedure is to select contractors who would develop electric and hydrogen category N1 vans and technologies aimed at improving their parameters. Ultimately, the vehicles to be designed as part of the undertaking should be characterised by parameters which are currently not present on the market – 100kg load capacity and a 250 km reach for battery electric vehicles – BEV) or 400 km (for fuel cell electric vehicles –FCEV). The undertaking is implemented in the Pre-Commercial Procurement (PCP) formula.

In 2020, as part of the e-Van undertaking:

- the e-Van procedure was launched on 7 May 2020,
- 14 applications were filed,
- 10 contractors were qualified for participating, and agreements were made with them,
- the first stage of the undertaking was being implemented between 27 September and 28 December 2020.

„Sewage treatment plant of the future”

The objective of the undertaking:

The purpose of the procedure is to select contractors who will develop and implement on the market innovative technologies for sewage treatment plants, allowing the application of a strategy for waste-free economy, i.e. the technologies which provide an opportunity to return and reuse the products obtained from a technological process (closed circuit), or to process the products so that it is possible to reuse them in other spheres of economic life (products/industrial or utility semi-finished products. The undertaking is implemented in the pre-commercial procurement formula (PCP).

In 2020, as part of the undertaking entitled “Sewage treatment plant of the future”:

- the assumptions behind the undertaking were prepared – technical dialogue was prepared and held, featuring 20 companies; required expert opinions and analyses were provided,
- documentation was prepared for the undertaking, including documents required to announce the procedure,
- procedure No. 92/20/PU/P88 “Sewage treatment plant of the future” was announced on 23 December 2020.



“Energy- and process-efficient construction”

The objective of the undertaking:

The procedure is aimed at selecting contractors who will develop module/prefabricated technologies as part of R&D works and climate-neutral technologies for single-family and multi-family residential buildings. The undertaking is implemented in the pre-commercial procurement formula (PCP).

In 2020, as part of the undertaking entitled “Energy- and process-efficient construction”:

- the assumptions behind the undertaking were prepared – technical dialogue was prepared and held, featuring 10 companies; required expert opinions and analyses were provided,
- documentation was prepared for the undertaking, including documents required to announce the procedure,
- procedure No. 84/20/PU/P79 “Energy- and process-efficient construction” was announced on 23 December 2020.

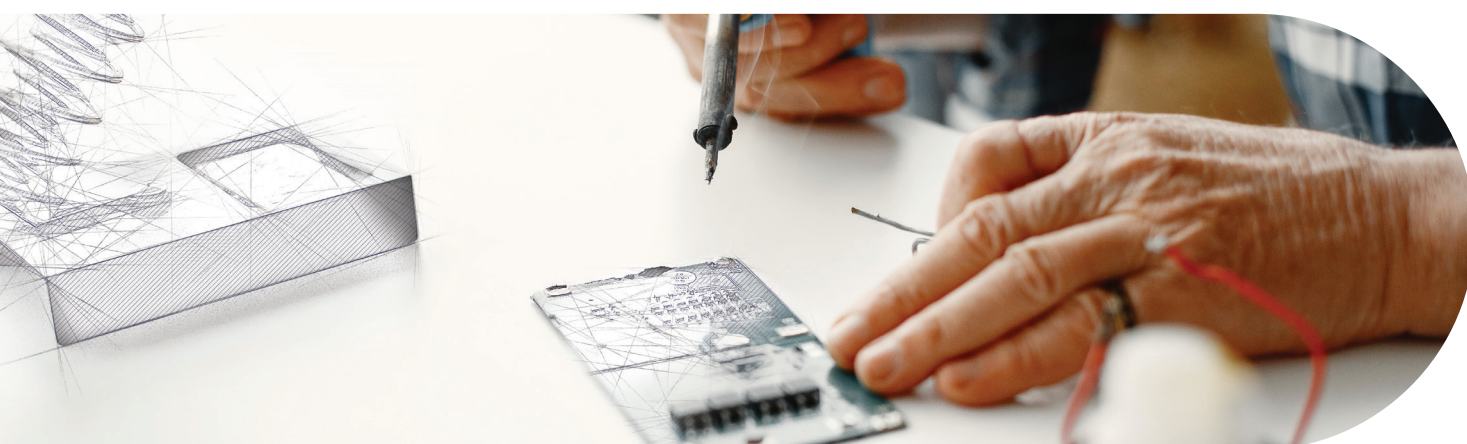
“Innovative biogas plant”

The objective of the undertaking:

The procedure is aimed at selecting contractors who will develop an innovative technology for a universal biogas plant as part of R&D works, where a diversified stream of organic substrates would be processed to biogas which would further be refined to biomethane.

In 2020, as part of the undertaking entitled “Innovative Biogas Plant”:

- the assumptions behind the undertaking were prepared – technical dialogue was prepared and held, featuring 20 companies; required expert opinions and analyses were provided,
- documentation was prepared for the undertaking, including documents required to announce the procedure,
- procedure No.98/20/PU/P80 “Innovative Biogas Plant” was announced on 23 December 2020.



The objective of the undertaking:

The objective of Sub-Action 4.1.4 is to significantly increase the scale of applying new technological solutions necessary to ensure the development of enterprises and improve their competitive position. The projects should be characterised by the novelty of the expected results at the scale of at least the Polish market. The Sub-Action supports industrial research and development works carried out by consortia (minimum one enterprise and one research centre). The financing of pre-implementation works constitutes an additional support as part of R&D projects.

In 2020, as part of the Application Projects programme:

- beneficiaries were awarded a total of PLN 158.8m,
- 20 agreements were signed,
- 132 projects were being monitored,
- 117 reports were reviewed,
- two projects in their durability period were being monitored.

Other initiatives implemented¹⁵ at NCBR in 2020 as part of the SG OP:

- Sub-Action 1.1.2 – pilot lines,
- Action 1.2 – Sectoral programmes:
 - INNOSTAL sectoral programme,
 - INNOSHIP sectoral programme,
 - INNOCHEM sectoral programme,
 - INNOMOTO sectoral programme,
 - INNONEUROPHARM sectoral programme,
 - INNOSBZ sectoral programme,
 - PBSE sectoral programme,
 - INNOTABOR sectoral programme,
 - INNOTEXTILE sectoral programme,
 - Innovative recycling sectoral programme,
 - IUSER sectoral programme,
 - WOODINN sectoral programme,
- INNOLOT sectoral programme,
- INNOMED sectoral programme.
- Sub-Action 4.1.1 – joint undertakings:
 - Joint undertaking of NCBR and Dolnośląskie Province,
 - Joint undertaking of NCBR and the Śląskie Province,
 - Joint undertaking of NCBR and the Lubelskie Province,
 - Joint undertaking of NCBR, PGNiG and GAZ-SYSTEM -INGA,
 - Joint undertaking of NCBR and PKP PLK SA – BRIK,
 - Joint undertaking of NCBR and Synthos SA – SYNChem,
- Sub-Action 4.1.2 – Regional research agendas.

¹⁵ As part of various initiatives, NCBR was undertaking activities related to the payment of funds, and project monitoring.

KNOWLEDGE EDUCATION DEVELOPMENT OPERATIONAL PROGRAMME

The Knowledge Education Development Educational Programme (KED OP) is aimed at improving the policy and public efforts for the labour market, education and the entire economy. EU grants will allow the strengthening of higher education focused on development needs, the promotion of social innovation and supranational cooperation. KED OP is implemented by NCBR which acts in the capacity of the Intermediate Body for Priority Axis III Higher education for economy and development.

As part of the Programme, the Centre is conducting the following actions financed from EU Funds:

- 3.1 Competences in higher education,
- 3.2 PhD studies,
- 3.3 Internationalising Polish higher education,

- 3.4 Management in higher-education institutions,
- 3.5 Comprehensive university programmes.

In 2020, as part of KED OP NCBR granted over PLN 857m from European Funds for projects implemented as part of the following initiatives: Integrated Programmes of Higher Education Institutions – over PLN 544m, Integrated Programmes of Higher Education Institutions for Regional Development – over PLN 68m, and over PLN 245m for other initiatives.

In 2020, the Centre announced two competitions financed from EU funds as part of KED OP: Accessible University II, and the Accessibility Knowledge Centre. A total of PLN 290m was allocated for the two initiatives. We supported 75 projects through funding.

ACCESSIBLE UNIVERSITY

Established in: **2019**

Description of the competition (two editions):

The primary objective of the competition is to undertake activities which would allow higher-education institutions to become accessible to persons with disabilities.

Specific objectives:

- Supporting organisational changes in higher-education institutions towards accessibility,
- Raising the awareness and competencies in the sphere of disabilities among the university staff,
- Ensuring communication accessibility, managed websites, IT tools, and education procedures as part of tertiary education,
- Introducing modifications to course programmes with a view to ensuring their accessibility to persons with disabilities, and implementing measures in the sphere of accessible architecture.

In 2020, as part of the Accessible University programme:

- one competition was announced,
- the beneficiaries were granted the amount of PLN 60.7m,
- 75 agreements were signed,
- 100 projects were being monitored.

Other initiatives implemented at NCBR in 2020 as part of KED OP:

- Action 3.1 – competences in higher education:
 - Competences development programmes,
 - Do you study? Practice,
 - University Career Offices,
 - New education programmes,
 - Philosophical education,
 - Copernicus Paths 2.0,
 - Development of human resources for the automotive industry,
 - Development of human resources for the business support sector,
 - University of Young Explorers,
 - Teacher training programme,
 - Universities' Third Mission,
 - Dual degree programmes,
 - Massive Open Online Courses.
- Action 3.2 – PhD studies:
 - Interdisciplinary PhD course programmes.
- Action 3.3 – Internationalising Polish higher education:
 - International education programmes.
- Action 3.4 – Management in higher education institutions:
 - Improving the competences of teaching staff.
- Action 3.5 – Comprehensive university programmes:
 - Integrated programmes of higher-education institutions,
 - Integrated programmes of higher-education institutions for regional development,
 - Accessible University,
 - Universal design.

DIGITAL POLAND OPERATIONAL PROGRAMME

The Digital Poland Operational Programme (DP OP) is an initiative financed from EU Funds, aimed at strengthening the digital foundations of the Country's social and economic development. Wide access to fast Internet connection, effective and user-friendly public e-services, and a growing level of the society's digital competence are of key importance in this context.

As part of DP OP, NCBR is implementing the **e-Pionier** programme.



ACTION 3.3 E-PIONIER

Established in: 2016

Main objective:

Developing solutions in the form of minimum viable products (MVP) in response to specific socio-economic challenges from public institutions. MVPs will be created by interdisciplinary teams composed of, i.a. software developers.

Specific objectives:

- Improving the professional competences of talented software developers: project management skills, and broadly understood production, logistic, and organisational processes, entrepreneurship, conducting R&D works, and interpersonal skills,
- Raising social awareness on the role of advances digital competence in solving specific socio-economic issues.

The level of reaching the indicators as part of the e-Pionier programme exceeded the expected values in 2020:

- 778 software developers obtained support, which is 2.7 times more than expected,
- as a results of the conducted works, 52 solutions to socio-economic challenges were proposed, i.e. 1.8 times more than planned,
- 39 MPV¹⁶ solutions were adopted by public institutions,
- the beneficiaries were awarded nearly PLN 18.7m,
- two projects implemented as part of the e-Pionier programme entered their durability period in 2020.

INTERNATIONAL PROGRAMMES

International cooperation is a substantial part of NCBR's operations. One of the Centre's tasks is to participate in the implementation of international Research & Development programmes, including those co-financed from foreign funds. The main objective of international cooperation run by NCBR is to improve the international competitiveness of Polish research teams by their collaboration with international partners, gaining international experience, know-how transfer and strengthening Poland's international position. NCBR participates in organising competitions for international research and R&D projects, and provides financing to Polish entities (research units, enterprises, research consortia) which implement international projects by participating in numerous competitions as part of bilateral programmes, numerous ERA-NET initiatives, joint undertakings and

programmes (including Eurostars, AAL, JU ESCEL) and in CORNET and EUREKA initiatives and many others. In total, the Centre is implementing over 70 international initiatives under:

1. the EU Framework Programme,
2. bilateral cooperation programmes,
3. multilateral cooperation,
4. Norway Grants and EEA (European Economic Area) Grants.

As part of the aforementioned initiatives, NCBR distributed over PLN 109m

BILATERAL COOPERATION

Main objective:

Increasing the international competitiveness of Polish research teams through cooperation with foreign partners, gaining international experience, know-how transfer and strengthening Poland's position in the sphere of science, research, and innovation.

Specific objectives:

Bilateral cooperation refers to initiatives under which the Centre directly collaborates with institutions responsible for funding research in a given country, and the competitions entail research cooperation between entities from Poland and from the partner state.

INITIATIVES UNDER THE HORIZON 2020 PROGRAMME

Main objective:

Developing European science and technology to stimulate economic growth.

Specific objectives:

This group of international initiatives includes all programmes which are implemented under the auspices of the European Commission as part of the Horizon 2020 framework programme.

OTHER MULTILATERAL INITIATIVES

Main objective:

Increasing the international competitiveness of Polish research teams through cooperation with foreign partners, gaining international experience, know-how transfer and strengthening Poland's position in the sphere of science, research, and innovation.

Specific objectives:

This group includes all initiatives which are implemented by the Centre, but their essence is not based in bilateral cooperation or support under the Horizon 2020 programme. They are related to, for example, cooperation continued from previous EU framework programmes, grass-roots activities of groups related to specific thematic areas, or the willingness to pursue wider cooperation with a given country/countries from outside the EU.

THE APPLIED RESEARCH PROGRAMME

Main objective:

Improving the quality of applied research in Poland by fostering the research cooperation between Poland and Norway. The collaboration is to be developed on the basis of a fully mutual partnership between Polish and Norwegian research organisations and enterprises.

Specific objectives:

The programme is implemented under the Memorandum of Understanding on the Implementation of the Norwegian Financial Mechanism 2014-2021 and the Memorandum of Understanding on the Implementation of the EEA Financial Mechanism 2014-2021.



NCBR – OUR RESPONSE TO TRENDS

THE DIGITAL TRANSFORMATION PROCESS AT NCBR

In 2020 NCBR was forced to face a difficult challenge which entailed running effective operations during the pandemic. It was a time of tremendous effort across the entire organisation for its staff, and also applicants and beneficiaries.

In 2020 the Centre proved that it is a flexible entity and can adapt to unexpected situations. As the outbreak of the pandemic progressed, all activities pursued by NCBR were moved to the virtual space quickly and effectively.

Looking back at the past year, it can be said that we successfully managed to overcome difficulties, and become a much more digital organisation than before in just a few days. Operations departments endeavoured to cater for the needs of applicants and beneficiaries. The call deadlines were extended, an individual approach to settlements was applied, audits were car-

ried out remotely, and, last but not least, as many as 88% of panel meetings were held online in 2020.

Each year the Centre was undertaking a number of measures in the form of direct meetings and consultations with potential applicants. NCBR continued a popular project called NCBR for Business also in 2020. However, the pandemic imposed a fast and effective modification of the formula of this undertaking, which had previously been based on face-to-face and frequent meetings with the applicants. The moment the government announced the epidemic threat, the Centre immediately switched to the interactive online formula entailing a series of theme-specific webinars under a joint title "NCBR online." All the webinars, adjusted to the needs of persons with dysfunctions, were uploaded on the NCBR channel on YouTube.

In 2020 NCBR website was also successfully reconstructed (gov.pl/ncbr and gov.pl/innowacje). Emphasis was placed on the comprehensive presentation of information about NCBR's portfolio based on website users' experience. All details of competitions, initiatives and other activities can be found in one place, in the "Finansowanie" ["Programmes"] tab. They are described using plain language, and demonstrated in a clear layout, as well as VC and CVC funds were included for the first time. It is worth noting that the website has a competition and fund browser. It is digitally accessible and responsive.

The Centre introduced a number of digital and automation tools, making our day-to-day work more efficient. The paperless organisation model is being successively implemented - and it covers e-signatures and access to digital data archives. As part of the e-Faktura [e-invoice] project, which streamlined and optimised work time through the introduction of an electronic invoice circulation system with the use of available tools, i.a. Electronic Document Management (EDM) and an accounting and finance system called QNT (AZF). The upgrade of the LSI [Local IT System] Application Generator is currently under way, a system facilitating cooperation with experts is being prepared, and collaboration platforms for knowledge management have been implemented. The platforms, which support work effectiveness and remote work, proved particularly useful during the pandemic. The Centre is continuously raising cybersecurity standards in the organisation.

In 2020 the process architecture was described in NCBR. The conducted activities and the acquisition of process data are monitored on an ongoing basis. To this end a number of digital tools, providing integrated dashboards, were made available to managers in 2020. NCBR has been using project portfolio management software since 2020. Optical archive was also launched, and a part of the competition documentation was digitised and archived.

NCBR support departments were also successful in fulfilling their tasks, by taking care of a secure and efficient use of equipment during remote work, adjusting documentation, online training sessions, or providing updates on the current situation.

NCBR KNOWLEDGE HUB – PUBLICATIONS AND RESEARCH

Publications and research are a vital part of NCBR operations. They are a source of information about current trends and project results. It is also a valuable material for our current beneficiaries, prospective applicants, and all those who are interested in the development of the Polish innovation system. NCBR publications are intended to contribute to an in-depth reflection on the significance of innovative, state-of-the art solutions for the economy in Poland, and to become a starting point of discussions on the future and directions of economic and civilizational transformations.

A series of publications entitles "Innovation Landscape" was inaugurated with the issue of the 2019 Annual Report and continued with further publications in 2020 and 2021.

PUBLICATIONS

“The Analysis of Research Trends Based on Funding Applications Submitted to NCBR as part of SG OP in 2016-2019”

It is the first publication released in print in 2020 as part of NCBR series entitled “Innovation Landscape.” Its objective was to analyse research trends emerging from projects filed with NCBR as part of SG OP, divided by eight separate thematic fields. The analysis shows trends in the supply of innovation in specified spheres, which demonstrates the enterprises' readiness to develop new technologies in selected sectors. The presented research trends and further prospects of the growth of individual fields comprise unique observations – there is no similar study in the public domain which would have so much detailed data forming the basis for conclusions related to the future of specific areas in the light of the general technological progress.



“State Aid – the Effects of Implementing the Support Programme in 2014-2019”

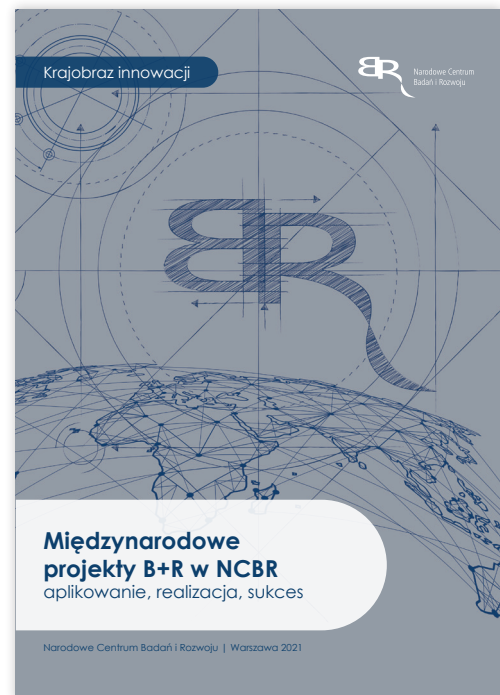
It is another NCBR publication forming part of the “Innovation Landscape” series, prepared in 2020 and released in 2021. The publication constitutes the first preliminary summary of the results of state aid provided by NCBR between 2014 and 2019. The study was prepared on the basis of the results of two evaluations conducted between 2017 and 2020¹⁷. The NCBR Support Programme is a response to the issue of a low level of innovation in Polish economy, including insufficient R&D activities of enterprises. The publications describes two forms of support for enterprises: the first one, being the largest in terms of funds and the number of programmes, consists in grants for R&D projects, and the second one included support for R&D works with the participation of Venture Capital funds.



¹⁷ The study of grant instruments was conducted by a consortium of Idea of Development Foundation (Fundacja Idea Rozwoju), IMAPP, PAG Uniconsult, and the Centre for Evaluation and Analysis of Public Policies at the Jagiellonian University in Krakow, whereas the study of financial instruments was conducted by a consortium of Taylor Economics and Ecorys Polska. Due to the diverse nature of the instruments analysed in the publication, the results were provided taking into account this division.

“International R&D Projects at NCBR – application, implementation, success”

This is the third proposal of NCBR as part of the “Innovation Landscape” series which refers to the issues of international cooperation and activities. This publication constitutes a summary of NCBR operations in the sphere of collaborations reaching territories outside Polish boundaries. It is also an attempt to provide information on the specific nature of taking part in such projects to potential applicants. The publication was being prepared until early 2021, and was released in May 2021.



The Innovation Landscape in 2021

NCBR publications have become a pretext to opening a discussion on innovation, in particular in the face of challenges of 2020. In 2021 NCBR is planning to issue further publications related to numerous interesting threads – innovative public procurement, conclusions drawn from the implementation of the Knowledge Education Development Operational Programme, the analysis of applications in the sphere of ICT under the Smart Growth Operational Programme, just to name a few. NCBR is becoming a centre of knowledge of Polish innovation, and is building effective support mechanisms for R&D undertakings in the domestic economy.



RESEARCH

The evaluation of older NCBR Programmes was completed in 2020¹⁸. Their first long-term outcomes can be observed, including those related to the implementation and practical use of results, and the continued development of RDI projects can be assessed. The effectiveness of the implemented programmes, measured by the degree of implementations, can be evaluated as very high. It generally ranges between 75 and 88% (INNOTECH, Demonstrator+, 1.3.1 SG OP – 1.4 SG OP). One of the programmes which is particularly noteworthy in this context is INNOTECH¹⁹, where the total revenue from the sale of project results declared by the beneficiaries amounted to PLN 2.34bn, thus exceeding the value of the granted funding fourfold in all four calls as part of the programme. The results of support can also be observed in programmes which did not include the implementation requirements, and as part of which projects of up to 6 TRL (Technology Readiness Level) were subsidised – the Applied Research Programme and Graf-Tech sectoral programme – approximately 50%. About 80% of beneficiaries are expanding on the works initiated as part of projects financed by NCBR with funds from other sources, mainly own funds, thus increasing the chance for commercialisation of R&D work results.

The effectiveness of the implemented programmes, measured by the degree of implementations, can be evaluated as very high. It generally ranges between 75 and 88%.

It is also worth mentioning the low degree of using public funds available in the RDI support system for the implementation or continuation of a R&D/innovation project. Most of further activities are financed from

own resources. The analysis of applicants' turnover between institutions, such as NCN (National Science Centre) and FNP (Foundation for Polish Science), as well as NCBR and PARP (Polish Agency for Enterprise Development), showed that only a small percentage of scientist and entrepreneurs seek public support in more than one RDI support organisation. Only around 5% of enterprises implemented projects both at NCBR and PARP. Moreover, a vast majority of beneficiaries (3/4) implemented one project only. **NCBR is undertaking measures to facilitate cross-institutional collaboration (NCBR – NCN) in order to ensure a seamless use of instruments provided by individual institutions.**

International cooperation in the sphere of R&D works was the subject of the evaluation of ERA-NET programmes, completed in 2020. ERA-NET programmes are to help beneficiaries acquire the experience needed to implement projects as part of EU framework programmes. The analysis results clearly showed a statistically and substantively significant influence of the award of ERA-NET grants on the obtainment of other grants under framework programmes. Each five grants awarded to Polish applicants contributed to one additional grant 6-7FP/H2020 within five years of the results of the ERA-NET competition. The participation of Polish entities in an international project consortium implementing projects as part of ERA-NET also translates into the development of international cooperation networks. It refers both to the strengthening of cooperation with entities which took part in previous projects, and with partners encountered in the course of preparing and implementing a given current project. The greatest benefits are gained by the participants of projects related to agricultural, engineering and technical sciences. The following exemplifies the characteristic features of benefits derived by beneficiaries representing specific fields of science:

¹⁸ Measures 1.3.1 and 1.4 SG OP and domestic programmes (including programmes financed under Action 1.5 SG OP): INNOLOT, INNOMED, PBS, Graf-Tech, INNOTECH, and Spin-Tech.

¹⁹ The INNOTECH programme was aimed at developing technological innovations (increase in their number), increase in the expenditures of enterprises for R&D projects, and was to encourage businesses to boost their cooperation with the science sector. It was a horizontal programme.

- **Further grant applications** – the greatest benefits in agricultural sciences, and the smallest in life sciences,
- **Collaboration with business** – the greatest benefits are derived from projects covering engineering and technical sciences, and the smallest benefits – from medical sciences,
- **Application of results in economy** – the most beneficial projects are related to agricultural sciences, while engineering and technical sciences are beneficial to a slightly smaller extent,
- **Patents** – the greatest benefits are derived from projects related to engineering and technical sciences, and the smallest ones from agricultural sciences.

2020 saw the completion of the review of NCBR's pilot project called e-Pionier, implemented as part of DG OP. As part of the E-Pionier project, the level of achieved indicators exceeded the expected values in 2020: support was granted to 2.7 times more software developers (778) than expected. As a result of the activities performed, the participants proposed 1.8 times more solutions to socio-economic challenges (52) than expected; 39 MVP²⁰ solutions were adopted by public authorities. The effects of the projects should be discussed from a wider perspective – the promotion of good practices of implementing R&D projects for the improvement of public services, additionally in the innovative formula of pre-commercial procurement. The results of the evaluation of the E-Pionier project show that the experience gained from project implementation translates into a further use of pre-commercial procurement by public institutions and the extension of accepted MVPs by new functionalities. The E-Pionier project is useful and beneficial to interdisciplinary teams, and its formula is particularly friendly to start-ups. Their staff may retain their intellectual property rights, and may offer the solutions they developed to other public institutions in Poland.

As part of the E-Pionier project, the level of achieved indicators exceeded the expected values in 2020.



²⁰ MPV – minimum viable product – a solution which has a minimum set of features allowing its use, while its aim is to verify the interest in such solution among potential customers.

NCBR PROGRAMMES IN A NEW R&D FORMULA

NCBR's proposal comprises several crucial elements – these are competitions, initiatives, undertakings, and a comprehensive portfolio of VC and CVC funds. Special rules concerning the application procedure, implementation and settlement of projects to be financed apply to each of the aforementioned components of NCBR portfolio.

NCBR is seeking and applying innovation funding methods which would best respond to the needs of the market, and ultimately the public. In the course of searching for alternative innovation funding methods, NCBR is implementing programmes in the so called new R&D formulas. Thanks to relying on the best global practices in the sphere of R&D project funding, and drawing inspiration from American DARPA (Defense Advanced Research Projects Agency), a model was developed on the basis of the problem-driven research idea. As part of projects based on the new formula, key importance is assigned to specific challenges which cannot be solved with the use of available tools and resources, so the objective is to develop new solutions to a clearly defined problem in the course of R&D works. NCBR acts as a contracting authority which specifies a given challenge, thus creating a new market for innovative products.

This chapter includes a description of the new approach being adopted by NCBR in the context of financing R&D works – including issues related to a theoretical and practical approach to the implementation of programmes in the new R&D formula at NCBR.

The origin of IP and PCP at NCBR

The new R&D support formulas – pre-commercial procurement and innovation partnership - have been applied by NCBR since 2016. The first instrument organised in the PCP formula was a project called "e-Pionier – supporting talented programmers in order to solve identified social or economic problems" as part of Action 3.3 DP OP. The project was implemented in the form of a cascade programme – the Centre itself was not responsible for the use of the PCP procedure which was applied by selected accelerators responsible for collaboration between teams working on solutions to a given problem (so called interdisciplinary teams) and by public sector entities. After that, a portfolio of programmes implemented as part of Sub-Action 4.1.3 SG OP was created, where NCBR tested project management based on the PCP and IP models at a larger scale. They included "Blocks 200+", "Hydrogen storage (H2)", "Zero-Emission Public Transport (BTP)", and an undertaking called "e-Van – a universal electric-powered category N1 van." In 2020 NCBR launched three further programmes, called "Innovative biogas plant", Sewage treatment plant of the future, and "Energy- and process-efficient construction." Nearly all the programmes, except BTP, were organised in the pre-commercial procurement formula. "Zero-Emission Public Transport" was the only programme implemented in the Innovation Partnership formula.

New R&D formulas based on IP and PCP procedures have not been applied at a large scale in Poland, and they are relatively rarely used in other EU Member States. However, the organisation of programmes in new R&D formulas is consistent with current trends regarding the creation of innovativeness in European countries and with the guidelines of the European Commission.

In international practice, the formulas are used as an element of state demand-oriented policies, aimed at building innovative

economies, mainly in the sphere of social challenges and problems. For that reason, the subject-matter of procurement includes, i.a., e-health, energy, pharmaceuticals, transport, logistics, security, digitisation, counteracting global warming, or ageing society issues. Innovative public procurement procedures conducted by public institutions should focus on providing measurable benefits for the society or selected social groups, in response to clearly defined and confirmed needs.

Pre-commercial procurement (PCP) and innovation partnership (IP) – a different approach to innovation

The new R&D support formulas applied at NCBR differ in several respects. The distinguishing features are already demonstrable in the definitions of IP and PCP procedures. **Pre-Commercial Procurement is a non-statutory solution allowing the performance of R&D works with a view to addressing a socio-economic problem which cannot be solved using methods available on the market.** The PCP procedure is possible to conduct under Communication from the Commission of 2007 – “Pre-commercial Procurement: driving innovation to ensure sustainable high quality public services in Europe.” The essence of PCP is not the provision of a ready-made product or solution, but the commencement of R&D works itself. The search for solutions is done through its design, prototyping, development and preliminary product testing. Pre-commercial procurement procedures may direct and stimulate innovation in given spheres or industries. As regards PCP, recipients responsible for implementing results are not specifically defined. Hence, PCP may be used to establish partnership networks bringing together entities conducting R&D works, and to bridge the identified technology gaps. Their role is also to arouse interest in social challenges identified by a given public institution among research entities. The organisation of a programme on the basis of PCP might precede innovation

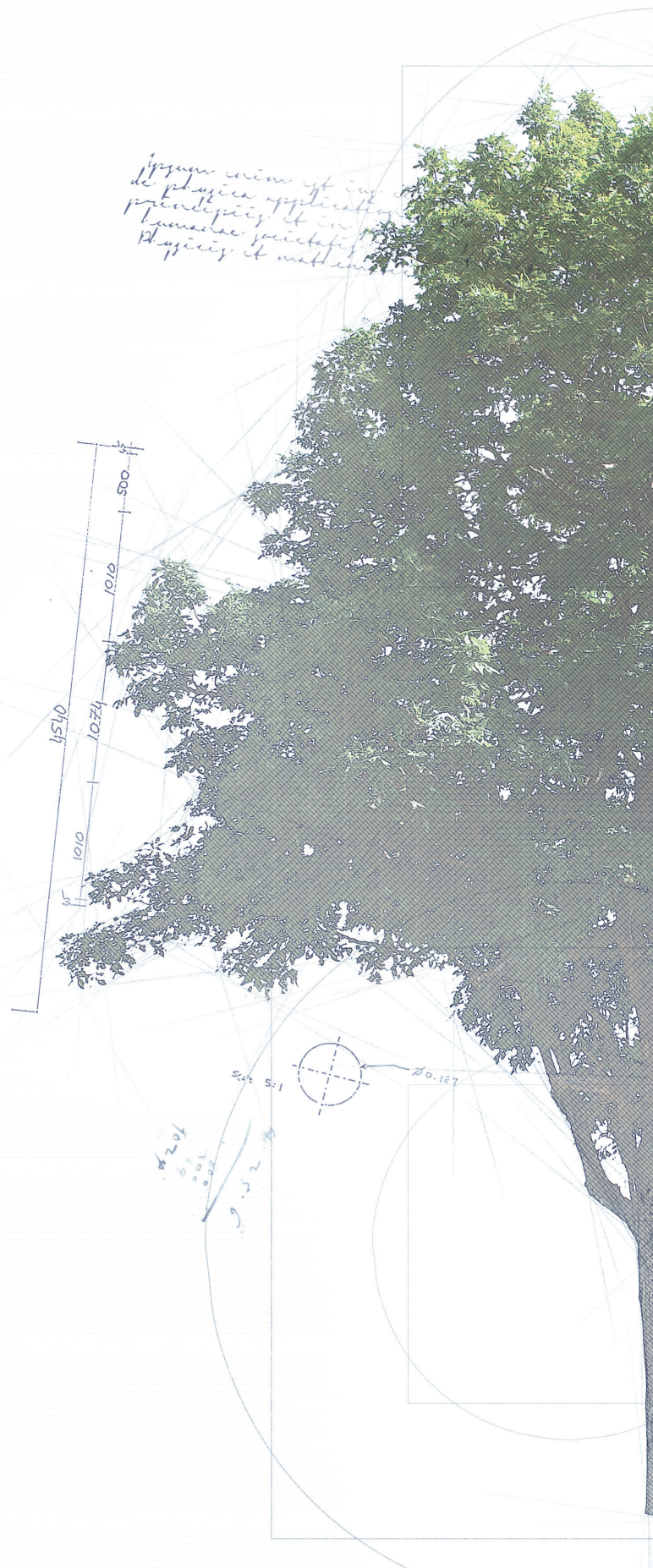
procurement.

Innovation partnership (IP) was introduced to European Union legal regulations later than PCP, in 2014, and belongs to the category of innovation procurement. In Poland, innovation partnership was introduced in the Public Procurement Law under an amendment of 2016. **The primary objective of innovation procurement is to cater for specific societal needs or to conduct a public organisation mission, resulting in the development of new products, services or processes.** Further diffusion of innovation created on the basis of public procurement is possible. Public procurement of innovation consists in ordering the development of previously unknown solutions which have the potential to allow a public institution to perform specific functions which are not yet performed as at the moment of order placement or announcing a call for tenders, while such functions might be performed in a specified time with the use of a new or improved product. As part of the IP procedure, the entity responsible for implementing results must be clearly indicated.

To better understand the differences between the two models, we can propose the following analogy: PCP resembles a mandate contract (covering the performance of a given task, but without any warranty as to the achievement of final outcomes), while the IP procedure can be compared to a contract for a specific task (settled following the achievement of the expected results). PCP and IP also differ in terms of the technology readiness of a given solution, and in terms of potential time left to launch and commercialise the product. As part of Innovation Partnership, new or significantly improved products are close to be launched on the market.

Public procurement of innovative solutions (PPI) - procurement closer to the market

PCP and IP are not the only forms of non-standard solutions allowing the purchase of an innovative solution at NCBR. Public procurement of innovative solutions (PPI) is the third option. The procedure differs from PCP and IP in terms of the readiness of the solutions and its fast commercialisation. Public procurement of innovative solutions is applied in situations, where a problem encountered by institutions or social groups may be addressed with the use of innovative solutions which are close to commercialisation, or are commercialised at a small scale. What distinguishes PPI from PCP is the fact that pre-commercial procurement is aimed at conducting research & development works, where no solutions close to being launched on the market exist. It may happen that R&D works are being performed but the product concerned has not been commercialised or implemented yet, and the public sector acts as a launch customer buying innovative solutions. That is where PPI can be applied. Public procurement of innovative solutions may use any existing contract award procedure, excluding the procurement of R&D works. Therefore, PPI is often based on existing technologies and solutions, but utilises them in a different and innovative way. PPI is often a step following the conclusion of the PCP procedure. That is why, a desired outcome of PPI is the diffusion of innovation at a larger scale²¹.



NCBR SUPPORTS THE EUROPEAN GREEN DEAL

Designing the new financial perspective for 2021-2027, the European Union has undertaken measures aimed at counteracting climate change and devastation of the natural environment, considering them as a vital threat to Europe and the world. Therefore, a new strategy was developed with a view to transforming Europe into a modern, resource-efficient and competitive economy:

- where there are no net emissions of greenhouse gases in 2050,
- where economic growth is decoupled from resource use,
- and where no one is left behind.

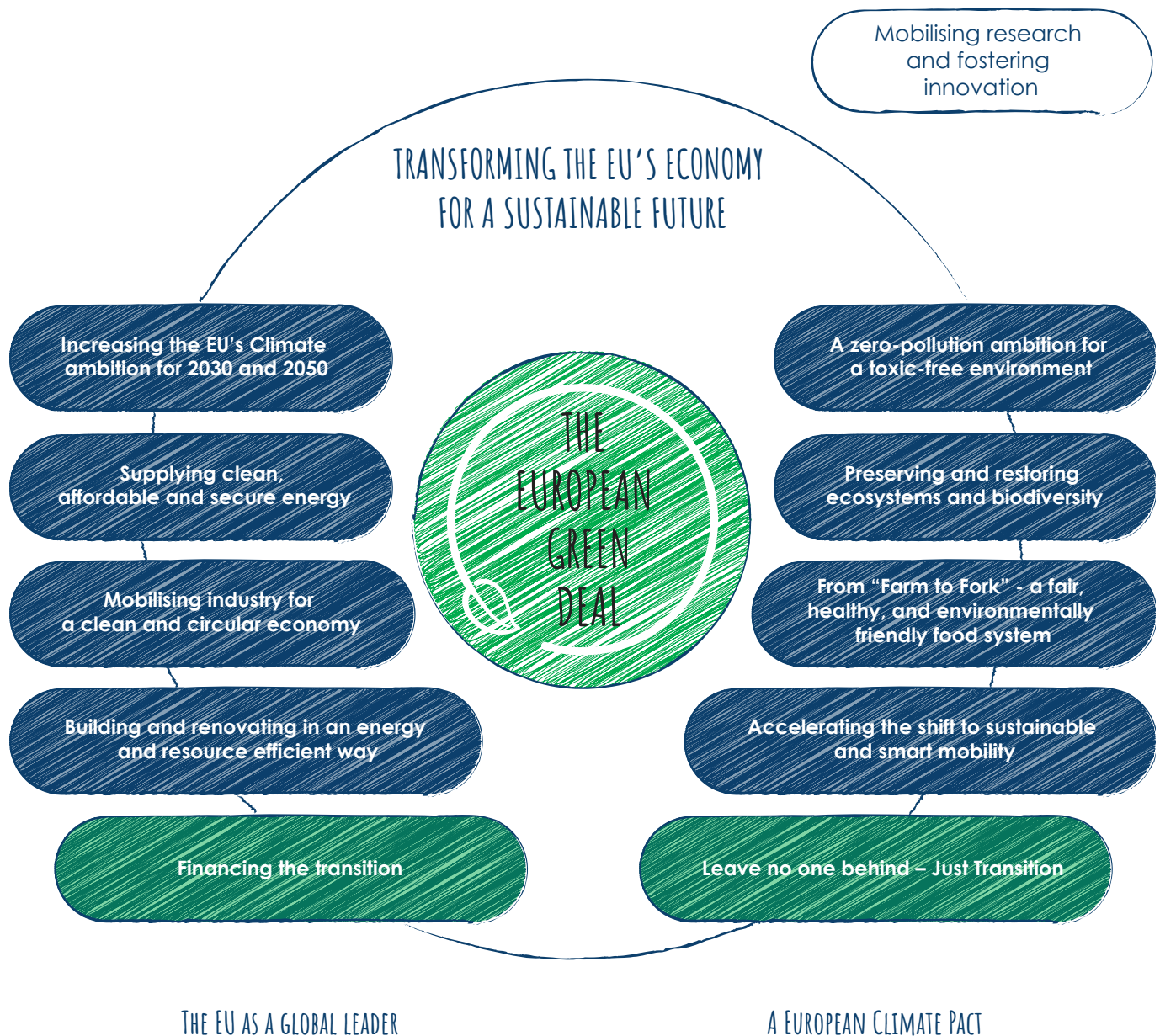
The European Green deal is an action plan for sustainable EU economy. The objective can be achieved by transforming challenges related to climate and the environments into new opportunities in all policy areas, and by ensuring just transition favouring social inclusion.

The European Green Deal includes a plan for actions enabling:

- more effective use of resources thanks to turning to clean circular economy,
- counteracting biodiversity loss, and reducing pollution.

The European Green Deal outlined a map of areas which require profound transformation. The topics of undertakings implemented in new R&D formulas were selected in such a way so as to respond to the challenges of this European strategy on the one hand, and focus on solutions concerning fundamental human needs, such as the provision of high-quality food, housing, clean water and air, on the other hand.

The elements of the Green Deal²²



The key activities include:

1. maximising the benefits arising from energy efficiency, with particular emphasis on zero-energy buildings,
2. implementing renewable energy sources, and the use of electricity to phase out fossil fuels,
3. promoting e-mobility combined with system-based changes in transport,
4. integrating the power-supply, transport, construction, heavy industries and other sectors by exploiting the digitisation potential,
5. circular economy and the effectiveness and competitiveness of industry,
6. effective, sustainable, and CO₂-absorbing use of biomass.

Based on the above assumptions a strategy for the European Green Deal was prepared. The most important point is **reaching climate neutrality by 2050**. The EU is to become a climate-neutral continent. To this end the commission is undertaking a number of initiatives aimed at protecting the natural environmental and driving green economy.

NCBR projects

Through its operations, NCBR has responded to the challenges of contemporary times, initiating a range of projects whose scope is consistent with the philosophy of the European Green Deal. These include projects concerning:

- efficient biogas plants processing waste and sewage treatment plants of the future serving the purpose of closing the nutrient cycle, ensuring a long-term soil welfare, and eliminating pharmaceutical micro-pollution,
- affordable energy-efficient housing, and affordable user-friendly ventilation with heat recovery, and CO₂-concentration control in schools and multi-family residential buildings – it is aimed at reducing energy use and smog, improving the living comfort and reducing construction costs,
- house water-retention technology which caters for the need to ensure effective water management in buildings and improve local retention,
- energy storage in the form of chemical agents, energy storage in the form of heat and cool air, and combined heat and power plants of the future which address the challenges related to the extension of the power-supply system largely based on dispersed renewable energy sources, supplying power with very low end costs, but irregularly.

At the end of 2020, NCBR commenced a procedure aimed at selecting contractors whose task will be to develop innovative solutions as part of three initiatives: “Sewage treatment plant of the future”, “Energy- and process-efficient construction” and “Innovative biogas plant”. The projects are being implemented in the pre-commercial procurement (PCP) formula.

„Sewage treatment plant of the future”

The undertaking called “Sewage treatment Plant of the Future” is one of the activities performed by NCBR in the PCP formula.

The objective of the undertaking is to select contractors whose task will be to develop innovative technologies for sewage treatment plants in the scope of:

- managing treated wastewater (water renewal and recovery),
- reducing the loss of nutrient elements and related pollution of water bodies (removal and recovery of nutrients),
- eliminating micro-pollution from wastewater,
- effective handling of sewage sludge.

NCBR expects that the developed technologies to be used in sewage treatment plants will allow:

- the improvement of the quality and condition of aquatic environment through the removal of micro-pollution and the removal and recovery of nutrient substances,
- the reduction of the consumption of water resources, and water recovery from treated sewage,
- the improvement of society's living conditions due to an extended system of water and sewage management,

- the reduced extraction of minerals used for the manufacture of mineral fertilizers used in farming,
- reducing the nuisance of sewage treatment plants for their immediate surroundings (reduced odour emissions),
- low construction and operation costs of new and upgraded sewage treatment plants by, i.a., increasing the plant's energy self-sufficiency,
- the development of a technologically innovative sector and new cooperation links in the country and abroad.

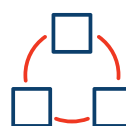
Benefits from sewage treatment plants of the future



Reduced consumption of water resources



Reduced mineral extraction



Reduced nuisance of plants' operation



Improved living conditions of the society



Improved quality and conditions of the aquatic environment and soil



The development of a technologically innovative sector

The developed technologies will be used for the purpose of implementing a project as part of the construction of a Technology Demonstrator (upgrade of an existing sewage treatment plant, or the construction of a new sewage treatment plant).

In 2020 the assumptions of the undertaking were developed – technical dialogue was prepared and held, with 20 businesses participating, as well as the required expert opinions and analyses were provided. Based on the aforementioned activities the

documentation for the undertaking was prepared, including the documents needed to institute a relevant procedure. On 23 December 2020 Procedure No. 92/20/PU/P88, called "Sewage Treatment Plant of the Future" was announced. The budget of the undertaking is **PLN 27 million**²³.

„Innovative biogas plant”

The undertaking entitled “Innovative biogas plant” is yet another activity pursued by NCBR in the PCP formula. The objective of the undertaking is to select contractors whose tasks will be to develop innovative technology of a universal biogas plant, and to demonstrate it in the form of an operational full-scale installation – Technology Demonstrator.

NCBR expects that the technology developed as part of the undertaking will be characterised by:

- an efficient and reliable gas fuel production (biomethane) with a quality allowing its discharge to the distribution network,
- substrate universality – using a wide range of organic substrates in the technological process,
- odourless processes, starting from the unloading of substrates on the installation to the stage of transporting the digestate matter out of the biogas plant for further handling,
- use of nutrients in a closed-circuit system – producing high-quality digestate for reuse as a product with marketing authorisation,
- high degree of automation,
- energy self-sufficiency based on the produced biogas,
- low operation costs.

Benefits from innovative biogas plant



Improved soil quality



Reduced greenhouse gas and odour emissions



A lot of new and sustainable local workplaces in rural areas



Reduced import of natural gas and fossil fuel mining



Development of biogas technologies producing biomethane



Reduced odour nuisance

The solutions and the technology to be developed by the contractors as part of the undertaking will be implemented and demonstrated in the form of eight Fractional Technical Systems (stage I) and one full-scale system – Technology Demonstrator (Stage II).

In 2020 the assumptions of the undertaking were developed – technical dialogue was prepared and held, with 20 businesses participating, as well as the required expert opinions and analyses were provided. Based on the aforementioned activities the documentation for the undertaking was prepared, including the documents needed to institute a relevant procedure. On 23 December 2020 Procedure No. 98/20/PU/P80, called “Innovative biogas plant” was announced. The budget of the undertaking is **PLN 32.5 million**²⁴.

„Energy- and process-efficient construction”

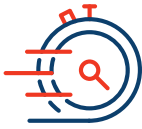
The undertaking called “Energy- and process-efficient construction” is one of the activities pursued by NCBR in 2020 in the PCP formula. The objective of the undertaking is to select contractors whose task will be to develop the technologies for designing and building cost-efficient prefabricated (2D) or module (3D) single-family and multi-family buildings.

NCBR expects that the technologies to be used in demonstration buildings will allow:

- low construction and operation costs over the life-cycle expected to last at least 30 years,
- the generation of annual net zero or net positive energy,
- the management of storm water and grey water, which will contribute to water savings, and the reduced consumption of water from the water-supply system,
- the use of recycled materials for construction, to the greatest extent possible, and materials characterised by lowest possible carbon footprint,
- high degree of large-scale replicability in Poland and abroad.



Benefits from state-of-the-art construction



Accelerated process, reduced construction and operation costs



Export of ready-made houses with equipment



New workplaces



Energy independence of houses



Opportunities for the development of the Mieszkanie+ (House+) programme and housing for senior residents



Increased accessibility of residential premises

The technologies will be used for the construction of two demonstrative buildings as part of the undertaking: a multi-family community housing building, multi-family residential building for senior residents, and two single-family buildings.

undertaking called "Heat Plant of the Future", aimed at developing and demonstrating an innovative technology of a universal energy generation, processing and storage system for heating purposes. The budget of the undertaking is **PLN 38 million**.

In 2020 the assumptions of the undertaking were developed – technical dialogue was prepared and held, with 10 businesses participating, as well as the required expert opinions and analyses were provided. Based on the aforementioned activities the documentation for the undertaking was prepared, including the documents needed to institute a relevant procedure. On 23 December 2020 Procedure No. 84/20/PU/P79, called "Energy- and process-efficient construction" was announced. The budget of the undertaking is **PLN 37.5 million**²⁵.

In April 2021, NCBR announced another un-

²⁵ The undertaking is financed from the funds of the non-competitive project under Sub-Action 4.1.3 SG OP called "Increasing the economy innovation level through the implementation of research undertakings in line with the innovation procurement procedure to support the implementation of the European Green Deal Strategy, No. POIR.04.01.03-00-0001/20.

Grand Challenge: Energy

NCBR initiated the first Grand Challenge: Energy in the history of our country. The challenge was initiated in 2019, and continued through 2020.

The Grand Challenge: Energy is a unique formula referring to Grand Challenge competitions initiated in 2004 by the American DARPA (Defense Advanced Research Projects Agency). In collaboration with science partners, NCBR issued a research challenge which is a technological response to a vital existing social issue.

The challenge entails the development of a compact device for individual use, able to transform wind power into electricity and its effective storage. This way, NCBR is taking efforts to reduce smog and greenhouse gas emissions, and increase the use of renewable energy sources. The solution to be developed as part of the challenge will provide access to off-grid electricity, and most of all, will contribute to savings in households.

A wide circle of participants were invited to develop such solutions – from scientists and enterprises, through students and student clubs, to innovators or “garage” inventors and technology enthusiasts. Thanks to the open formula, minimum formal requirements and a relatively low costs of preparing a response to the challenge, every inventor has a chance to participate. The winner of the Grand Challenge: Energy will receive a prize of PLN 1 million.

Small-sized wind power plants, though they have a lot of advantages, are still not a popular source of renewable energy in Poland. As regards popularity, they have given way to photovoltaic systems whose power increased by nearly 300% last year in relation to 2019. NCBR is going to reverse this trend, as it provides to the participants of the Grand Challenge: Energy an opportunity to create technological innovation which has the potential to revolutionise

the small-scale wind power market in our country.

The insufficient popularity of household wind power plants in Poland can be seen in the data from the Polish Economic Institute, according to which only 73 wind power micro-installations with a total capacity of 0.385 MW were operating in Poland at the end of 2019. Compared to other countries of the world, the Polish figures are not impressive – in 2018, the total capacity of wind micro-turbines reached 537 MW in China, while at the same time the USA and the UK recorded a total power of 150 MW.

In 2020, a conference for participants was held - the “Participant Handbook” was presented, the principles and rules of the challenge were discussed together with any doubts which arose. The recruitment of participants was also completed (over 180 interested persons submitted their candidacies). Following the selection of participants based on videos submitted to NCBR, 84 teams were invited to take part in further stages of the Grand Challenge: Energy (quarter finals).

The start-up market in Poland in 2020

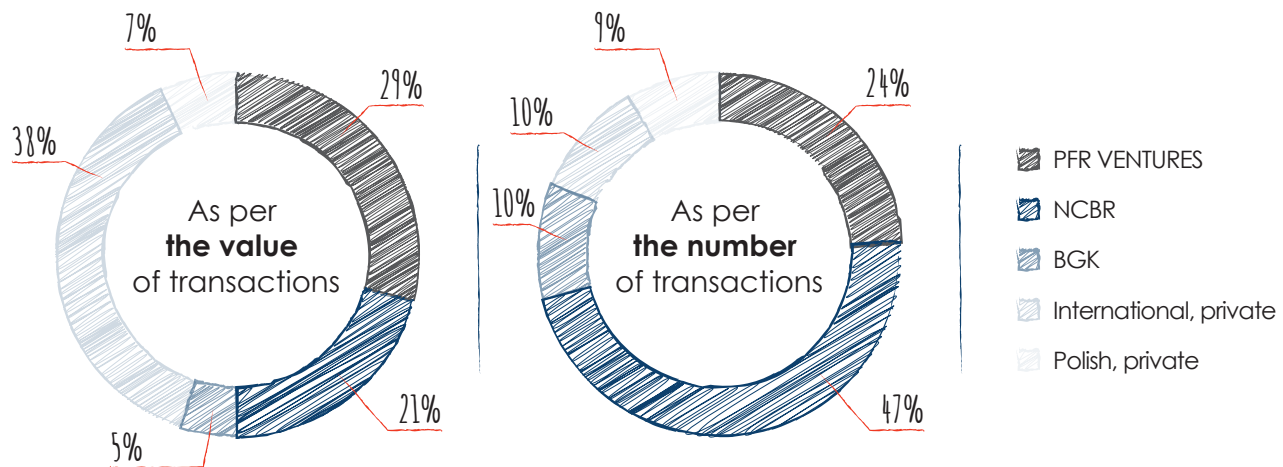
The experience related to the pandemic in 2020 was difficult for the entire market and all its sectors. The discussions on the issue differ only in terms of loss and the range of challenges enterprises and investors had to face. Without any doubt, it can be stated that 2020 was a break-through time, a period in which the potential of the broadly understood business was verified. How did the market of young business initiatives behave in those circumstances?

Investments in the Polish start-up market amounted to PLN 2.1bn in 2020, nearly a billion more than in 2019. NCBR funds generated 21% of the value, which means that every fifth zloty in this pool was generated by the Centre's instruments. It seems even more impressive if the number of transactions is taken into account – NCBR accounted for nearly half of them. Perhaps the crisis resulting from the pandemic contributed to the increased attractiveness of VC funds, and made investments in

innovation a way to “escape forward.” Notwithstanding the epidemic situation, the state did not resign from supporting valuable projects. As part of BRIDGE programmes, NCBR allocated nearly PLN 900m for the Polish ecosystem.

The new EU financial perspective is underway, with great emphasis placed on the development of instruments financing innovation, NCBR has the capacity and the resources to grasp the opportunity²⁶.

Sources of capital – public programmes and private capital in 2020



(1) The charts do not include outliers. (2) A particular transaction has been allocated based on predominant private or public-private financing. (3) Transactions of international funds include all transactions in which at least one international fund participated. (4) Some of the transactions classified as "PFR Ventures" came from the PFR NCBR CVC programme co-developed with the National Centre for Research and Development. (5) Some of the transactions in the "PFR Ventures" category were also co-financed by BGK funds.

Data from the report entitled "Polish VC Market Outlook 2020", prepared by PFR Ventures and INOVO fund, in collaboration with partners, including NCBR.

In a report entitled "Polish Start-ups 2020. Covid Edition. Startup Poland, Warsaw 2020" it was indicated that the dominant trend among start-ups is their flexibility and the ability to skilfully adapt to changes. Over a fourth of companies changed their business models, seeking new opportunities in the pandemic. 14% of the start-up covered by the survey pointed to a very negative impact of the pandemic, while for 25% of the start-ups the influence was rather negative. 34% of the start-up reported a positive influence of the pandemic (including 115 – very positive), whereas 12% of the respondents did not experience any

effects of the circumstances arising from the coronavirus pandemic. Without doubt, the fact the pandemic affected the operations of start-ups in various ways is related to the objects of their activities and products²⁷.

Start-ups providing telemedicine, education, cybersecurity or gaming solutions are in a much easier and favourable situation than those which cooperate with sectors most affected by the lockdown of the economy, such as the tourist industry. This results from a smaller impact of restrictions on the sectors, and from moving a substantial part of operation to the digital sphere.

Based on the analyses and current observations it can be assumed that investors will in a greater extent turn to start-ups operating in biotechnology, medtech, SaaS, cybersecurity and greentech/cleantech sectors. This is mostly due to, i.a., less noticeable impact of pandemic restrictions on these industries, the transfer of a substantial part of operations to the digital sphere, as well as from the notable energy transformation processes, raised environmental awareness, and the significance of green energy. Surely the sphere of broadly understood digital transformation – with particular attention to new and innovative solutions in the scope of data transfer, cloud solutions, artificial intelligence (AI), high-performance computing (HPC) or cybersecurity in general – will attract the attention of potential investors²⁸.

Innovation, agility, openness to change and readiness to take risks are immanent characteristic features of start-ups which, in this difficult time of the pandemic, facilitated a response to sudden challenges which require fast decision making. It was a difficult, yet a very dynamic moment for business – it was often the case that company plans prepared for a few years in advance had to be implemented in just a few months. This mostly refers to plans entailing company digital transformation and the use of digital tools in business communication. 37% of the respondents taking part in the Startup Poland survey indicated that the pandemic would have a rather positive influence on their operations in 2021²⁹.

The image of the Polish start-up community during the pandemic is – similarly to the entire economy – a battlefield site. According to initial analyses, including “Polish Start-ups 2020. COVID Edition”, prepared by Startup Poland, the youngest businesses were affected in a relatively smallest extent due to their agility, and what is particularly important, they did not lose their optimism. They are acquiring new customers and increasing sales. Nearly half of the respondents stated that the greatest success of the past months was the ability to retain key

personnel (only 6% of the surveyed start-ups intend to reduce employment). This means that the Polish market is becoming increasingly professional, and it is people that are, and will continue to be, its greatest value, both on the part of scholars and investors. Positive signals are also coming from the investment side, and it is confirmed by hard data. According to the report on the VC market, co-created by NCBR and PFR, this market sector saw a record-breaking year with the transaction value of PLN 2.1 billion.

Signals which are not as enthusiastic can surely also be heard. The aforementioned survey indicated that 60% of start-ups expect increased support on the part of the state. NCBR and partner funds are coming to an end of the current financial perspective, and they still have significant amounts to spend on good ideas, even several hundred million zloty. Innovation is due to play an even more substantial role in the new financial perspective 2021-2027. This means considerable funds and even greater challenges which every participant of the innovation ecosystem will need to face.

NCBR argues that trust – not only between innovators and investors, but also mutual trust between the market and the regulator – may prove crucial in this process. It is a difficult topic, burdened by numerous past tensions and prejudice which NCBR needs to deal with fast to be able to transform these challenges into opportunities. The state sector is currently offering an extensive range of support instruments “from idea to industry.” They include both investment vehicles, i.e., nearly 60 Bridge Alfa funds financing ideas in the seed and pre-seed stages, VC/CVC fund proposal which NCBR creates with business partners and PFR, and co-investment proposal of NCBR's daughter company, NIF³⁰. The Centre is also working on acceleration concepts, and is maintaining contacts with partner institutions, such as PFR, PARP and BGK – which also offer support instruments to start-ups.

²⁸ Taken from a statement by Krzysztof Szubert – president of NCBR Investment Funds ASI SA.

²⁹ Report entitled „Polish Start-ups 2020. COVID Edition”, Startup Poland, Warsaw 2020.

³⁰ NCBR Investment Fund ASI SA specialises in investments in small and medium-sized enterprises (SME) in their growth or expansion stage commercializing the results of research and development works (RDI). The budget for investments is PLN 700 m, while the value of a single investment ranges between 3 and 64 m – Krzysztof Szubert, president of NCBR Investment Fund ASI.



NCBR ON THE VERGE OF TWO HORIZONS

In November 2020, the National Contact Point, previously operating at the Institute of Fundamental Technological Research of the Polish Academy of Sciences, was incorporated in NCBR structures. The decision resulted in fostering international activities of the Centre, pursued by the International Cooperation Office, including the NCBR Office in Brussels operating as part of Business & Science Poland. In 2020, Poland and the European Union came to an important historic and financial point – the Horizon 2020 programme was coming to an end and the works on the new Horizon Europe framework programme, to be implemented in 2021-2027, were underway. The significance of international cooperation pursued by NCBR was reflected in the Centre's strategy put forward in 2020. In this document, international issues constitute one of the major pillars of growth, interest spheres and activities of NCBR.

To better understand the strategy in its international sphere, this part of the report includes the analysis of the historical context of EU framework programmes, related to the experience of the Horizon 2020 programme, and plans for the upcoming financial perspective of the European Union. These EU-related analyses will be followed by a description of Poland's place on the map of European innovation.

EU Framework programmes

Multiannual framework programmes are the main instruments of EU research and innovation policy. They have been implemented since 1983, initially as four-year programmes, currently covering a time span of seven years. The initiatives encourage cooperation between research teams representing various states and disciplines, which is of key importance to breakthrough discoveries.

The key objectives of the framework programmes include the increase of competitiveness and innovativeness of European economy by:

- strengthening the position of the European Union in science,
- developing industrial innovation, i.a., by investments in key technologies, improved access to capital and support for small and medium-sized enterprises,
- seeking solutions for the most important societal issues, such as climate change, environmentally-friendly transport, or renewable energy sources,
- guaranteeing that the results of research will be exploited for the production of useful goods with an actual commercial potential – also by initiating cooperation between representatives of industries and government authorities,
- fostering international cooperation in the sphere of research and innovation.

The main platform for conducting a research policy in the European Union is the European Research Area (ERA). Its objective is to create a uniform research space which would allow the transfer of scholars, knowledge and technology.

Horizon 2020, EU framework programme covering research and innovation, will be implemented until the end of 2021. It is the eighth EU framework programme for the years 2014-2020 with a budget of nearly EUR 80 billion. It is founded on an excellent research base, competitive industry, and taking on societal challenges. Cooperation criteria and partners are indicated in relevant work programmes which define research areas and innovations which require funding.

In the period of planning for 2021-2027, the new European Research Area is going to provide even better conditions for research and innovation activities in Europe, and to intensify EU transformation towards climate

neutrality and leadership in the digital technology sector. ERA is also planning to support the recovery of states affected by the crisis resulting from the COVID-19 epidemic, and undertake measures aimed at eliminating differences as a result of its social and economic outcomes, and at mitigating EU vulnerability to future crisis situations.

The new EU framework programme for research and innovation, Horizon Europe, will be launched in May 2021, with a budget of approximately EUR 95 billion. It is intended as the largest programme of this type in the history of Europe. It will be composed of three pillars:

1. excellent science (further development of high quality knowledge and skills),
2. global challenges and European industrial competitiveness (development of industrial technologies in such fields as digital technologies, power industry, mobility, food and natural resources),
3. innovative Europe (promoting innovation through the European Innovation Council and the European Institute of Innovation and Technology).

Horizon Europe also entails research and innovation missions covering five areas: adapting to climate change, including societal transformation, climate-neutral and smart cities, cancer, healthy oceans, seas, coastal and inland waters, soil health and food.

Growth rate of states in the sphere of innovation

Each year the European Commission publishes a ranking demonstrating the performance of all countries in the sphere of innovation – the European Innovation Scoreboard. In 2020 Scandinavian countries took the leading position. The innovation performance of the EU has improved by 8.9% since 2012. On a global scale, Europe recorded better scores than the USA for the second year in a row. The ranking shows that the performance of the European Union's innovation system, including Poland, has been steadily growing each year – thus we are gaining on more innovative states, such as Japan.

In the European Innovation Scoreboard 2020, Poland was ranked 24th, followed only by Croatia, Bulgaria and Romania³¹. Our country is classified in the group of countries called moderate innovators. It is the third group of countries, following innovation leaders (including such European countries as Denmark, Finland, Luxembourg, the Netherlands, and Sweden), and strong innovators, including Austria, Belgium, Estonia, France, Germany, Ireland and Portugal. Poland is in a group of 13 moderate innovators in the EU, with such countries as Croatia, Cyprus, the Czech Republic, Greece, Hungary, Italy, Latvia, Malta, Slovakia, Slovenia and Spain. Only two countries, Bulgaria and Romania, were placed in the last group of modest innovators.

Poland performs particularly well in two areas of the Report – it was ranked 8th among EU States in the innovation-friendly environment area, and 13th in the employment impacts area. Moderate innovators, such as Poland, Malta, Lithuania, and Spain, demonstrate good results above the EU average in the sphere of innovation-friendly environment. The results improved significantly between 2012 and 2019 – the highest rate of performance improvement was re-

corded in Poland (182.7%), Finland (162.3%), Malta (128.6%), Spain (127.6%), and Portugal (109.2%).

The Report acknowledged Poland in terms of entrepreneurship and staff with tertiary education, in particular in the innovation sectors, whereas our country showed poor performance in areas related to innovators and attractive research systems.

Poland in Horizon 2020

Poland's share in the distribution of funds from the Horizon 2020 programme (with public private partnerships and Knowledge & Innovation Communities of the European Institute of Innovation and Technology) amounted to EUR 818.4 m, which accounts for 1.3% of the budget allocated for the Horizon 2020 programme³², while in the preceding framework programme, implemented between 2007 and 2013, Poland received EUR 441 m. Thus, Poland recorded a rise in the use of funds from EU programmes in the last financial perspective by over EUR 377m. A new investment programme devoted to research and innovation, called Horizon Europe, will be launched in May 2021. The programme is connected with the 2021-2027 financial perspective, and has a budget of approximately EUR 95bn to be allocated for research and innovation. The purpose of Poland's activities, including NCBR, as part of the Horizon Europa programme is to increase the share in funding to 3% in the offered European funds.

As part of the Horizon 2020 pillars, the number of Polish organisations which benefitted from the European budget for research and innovation increased to 877. Small and medium-sized enterprises, and research institutes proved to be most effective in reaching for the Horizon 2020 funds. As part of Horizon 2020, Poland has participated in nearly 17 thousand applications and over 1900 projects, and achieved a success rate of 12.6%.

³¹ European Innovation Scoreboard <https://ec.europa.eu/docsroom/documents/42981>.

³² Statistical data from the National Contact Point of EU Research Programmes (KPK PB UE) based on the data from the European Commission of 5 March 2021 <https://app.powerbi.com/view?r=eyJoiYjY4NTkzY2EiNGY3ZS00OTkyLWUwMTAtOGUwNGRlMmE4ZjBiliwidCI6IjExNDUxMWJLWJlNWIiNDRhNy1iMmFmLWU4MzJkZWU5ZC1mMjQh9>.

The contracted net funding from the EC amounted to EUR 753,445,573.84, with the total funding application amount of EUR 3,636,780,067.47. Polish participation is visible in all pillars and thematic areas of Horizon 2020, in particular in MSCA – Marie Skłodowska-Curie Actions (405 participations, 245 projects, 78 coordination activities), ICT – Information & Communication Technologies (290 participations, 212 projects, 33 coordination activities) or as part of the “Safe, clean and efficient energy” area (253 participations, 174 projects, 10 coordination activities). The above data reflect the actual status as at **March 2021**.

The objectives of Polish innovation policy for the years to come include the increase in the automation and robotisation levels of the Polish economy, the digitisation of Polish enterprises, the development of Artificial Intelligence, and support for circular economy. They are to be achieved through, i.a., tax reliefs, the AI School, or support for green investments. The Polish innovation policy will be based on four pillars:

- Digitisation and transformation towards Industry 4.0 – for example, digital innovation hubs, implementation of the artificial intelligence policy, AI School, tax reliefs for automation,
- Improvement of the competences of Polish population, e.g. courses for entrepreneurs, development of skills in the sphere of individual technologies, development of management and pro-innovation competences,
- Green economy – e.g. Green Innovation Hub, support for activities beneficial for the achievement of zero emissions, environment clauses in commercial contracts and public procurement,
- Innovation, start-ups, new technologies – industrial property rights, GovLab, support aimed at verifying the commercial viability of inventions.

The statistical data of Poland's participation in the Horizon 2020 programme is available on the European Commission website³³, and on the website of the National Contact Point³⁴. They include detailed information about the projects, the number of scholars engaged, the number of participations in projects, success rate, and the value of the funding awarded. In every EU Member State National Contact Points also provide individual advisory services covering the Horizon 2020 programme. In Poland the function of National Contract Point was assumed by NCBR which has a National Contact Point Department. Visitors to the website of the National Contact Point of EU Research Framework Programmes (NCBR) can also find information about projects implemented as part of Horizon 2020 and information about the Horizon Europe programme (kpk.gov.pl).

Polish science and business circles are particularly interested in the New Horizon Europe programme, as part of which competitions will be held. The most recent information of Horizon Europe can be found on the website of the European Commission (ec.europa.eu/info/horizon-europe), and on the website of the National Contact Point of EU Research Framework Programmes (NCBR) (kpk.gov.pl/horyzont-europa).



Horizon Europe

Horizon Europe is the ninth European Union framework programme for research and innovation, and it is more ambitious than any other previous programme. Its budget is over EUR 95bn, which makes it the largest international project of this kind in the world.

The Horizon Europe programme is aimed at promoting science excellence and supporting the best scientists and innovators. It is to allow the extension of the boundaries of science, knowledge and skills. This will help address social and economic challenges which Europe is facing.

A vital cross-sectional component of the programme is to support the increase in participation and strengthen the European Research Area in which the Pact for research & innovation in Europe was proposed. The pact was defined as a voluntary initiative, and should result in fostering co-operation and levelling regional, national, and European investments. It will be based on key principles and values, leading increased transparency, managing European activities, and supporting four policy goals:

1. prioritising investments and reforms in the sphere of research and innovation and focusing on the digital and green transformation, and economic recovery,
2. improving access to science excellence, striving for greater excellence across the EU, and stronger research and innovation systems, allowing a faster dissemination of best practices in Europe,
3. using the results of research and innovation in the economy with a view to increasing resilience and competitiveness of economic ecosystems and societies,
4. bolstering cooperation as part of the European Research Area aimed to further drive free knowledge flow, in particular through the change in approach – from coordination to enhanced integration of national policies.

Horizon Europe will also support research based on cooperation between business and science, and boost the technological and industrial potential through thematic clusters covering a full range of global challenges.



In addition, the programme provides new instruments, such as the European Innovation Council (EIC) and research missions and partnerships aimed at improving the situation in the sphere of R&I in Europe.

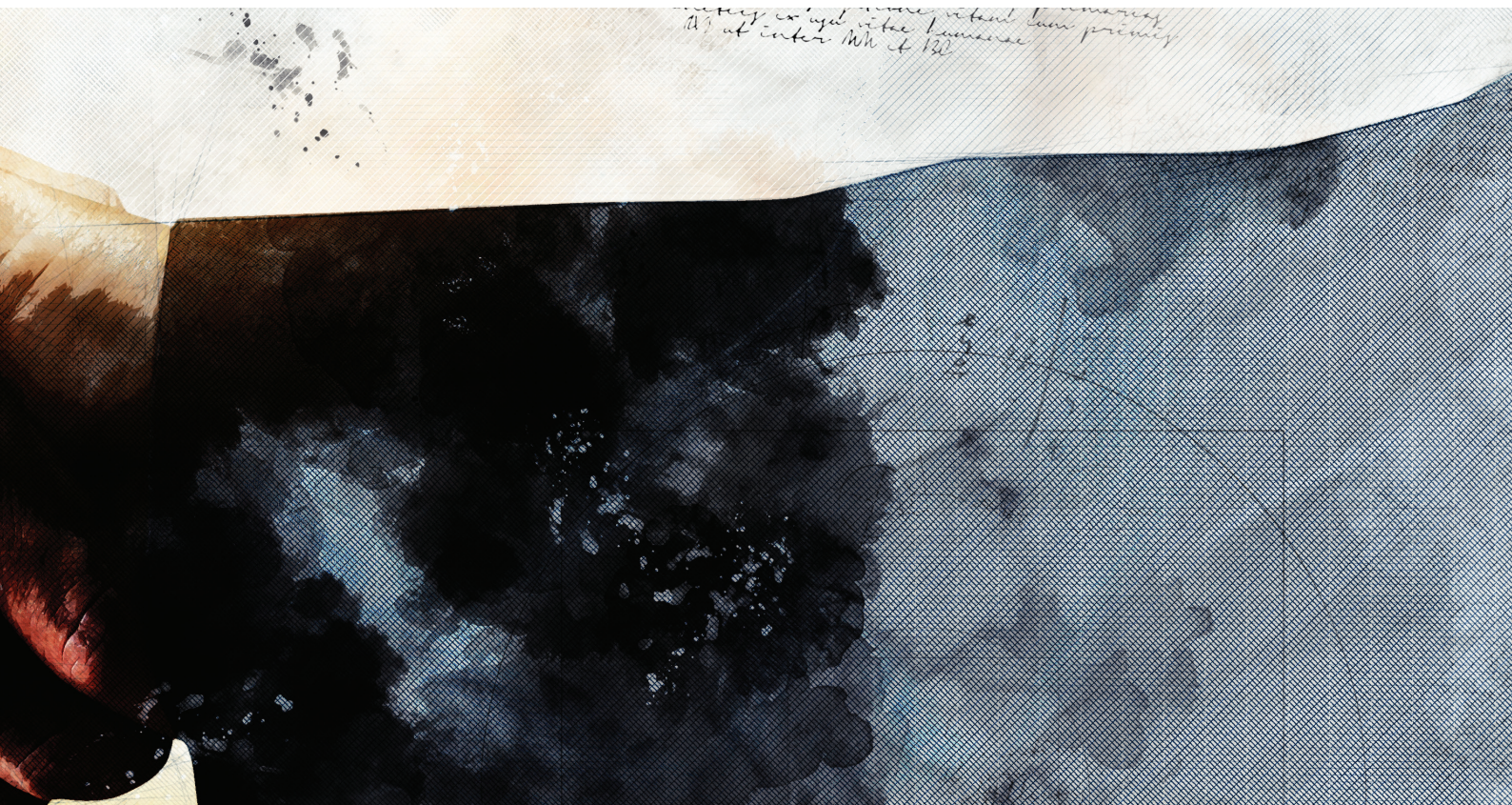
The mission will focus on the issues which affect our daily lives – from cancer to adaptation to climate change, living in greener cities, the protection of waters and oceans, healthy soil with healthy food in mind, and resilience of regions to climate change. Covering key areas such as energy, transport, biodiversity, health, food and circular economy, the improved European partnerships will encourage wide participation of partners from the public and private sectors.

A new approach to European partnerships will enhance transparency and quality of strategic management. The number of partnerships has decreased significantly - from over 120 as part of the Horizon 2020 programme, to 49 in Horizon Europe.

The European Innovation Council which was operating in its pilot stage for two years of

Horizon 2020 will now provide support for the new and breakthrough innovation in start-ups, SMEs and medium-sized companies. The operations will supplement the activities of the European Institute of Innovation & Technology (EIT). Moreover, thanks to establishing contacts with regional and national innovators, the European innovation ecosystems are due to be strengthened.

The new Horizon Europe programme carries a plethora of interesting opportunities for Polish research centres and enterprises. NCBR – as the National Contact Point – is preparing a comprehensive and innovative education and consulting proposal for Polish applicants, to effectively exploit the vast potential of the programme.



CLIENT ECOSYSTEM AT NCBR

Client-oriented approach is one of the values that the NCBR Group has fostered to build its efficient ecosystem of services for our clients. The importance of this value can be seen in the change that took place in 2020, leading to the development of services for our clients. During the coronavirus pandemic, NCBR has rapidly moved its operations online, using the available technological tools and solutions. We were facing new needs, but at the same time developed new ideas for external communication. With new technology, NCBR could be available online.

Our efforts to build a client ecosystem were driven by the following goals:

- to increase businesspersons' and scientists' awareness of opportunities for developing innovative ideas,
- to promote the most exciting products developed by beneficiaries,

- to promote the brand of NCBR as a government agency that operates in R&D.

Each year, the Centre undertakes measures involving face-to-face meetings and consultations with prospective applicants. Similarly to 2019, this year NCBR continued its vastly popular project known as NCBR dla Firm (NCBR for Businesses). However, as a result of the pandemic, we had to quickly and efficiently change the project format, which used to rely on frequent face-to-face meetings with applicants. When the government announced that there was a risk of epidemic, the Centre immediately adopted an interactive online format based on creating a series of thematic webinars which shared the title „NCBR online.” All those webinars, which are disabled-friendly, can be found on our YouTube channel.

In 2020, the Centre organised:

- **44 speeches** (19 in-person meetings and 25 online meetings),
- meetings with **3,285 persons** (in 2019 with 2,600 persons, which means an increase by 26%),
- individual consultations, which were attended by **202 persons** (in 2019, by 400 persons).

Online solutions were also implemented at our **Information Desk**. One of Information Desk's jobs was to organise face-to-face meetings with applicants to present our services. In 2020, when restrictions were introduced to manage COVID-19 epidemics, our Information Desk adjusted its operations to maintain continued online contact with Centrum's representatives, who provided information about our existing services and available R&D&I funding opportunities.

- Information Desk, Helpline – about **4,500 inquiries** handled (4,627 inquiries in 2019).

NCBR's staff also shared their expertise as part of a conference series entitled „IoT Prospects: Future Local-Governments,” organised by the Ministry of Digital Affairs and the Chancellery of the Prime Minister. Seven meetings held across Poland were attended by 1,300 persons, who were presented our contest opportunities in the field of IoT.

In addition, we collaborated with the Platforma Przemysłu Przyszłości (Future Industry Platform) Foundation to reach specialist industries and share information about our contests. This was intended to encourage potential applicants to apply, and involved training for our Call Centre and development of information materials to be used for the active searching of potential applicants.

Strengthening the image of NCBR as an institution that is key for the implementation of Poland's innovation strategy, sets the directions for growth, and has a rich portfolio and many measurable accomplishments:

Our active communication translated into **61,000** neutral or positive mentions of NCBR in traditional, electronic, and social media. In 2020, NCBR took patronage over 85 events, including 54 honorary patronages, 30 regular patronages, and one scientific patronage.

NCBR – we are there for you online:

- providing support in improving the quality of applications – continuation of the Innovation Assistant service, and launching and management of the Budget Assistant – more than **3,000 visits**,
- preparing and launching on NCBR online **40 practical webinars** to help our clients successfully apply and manage projects with NCBR funding – this content was **displayed over 25,000 times** by the end of the year,
- promoting our operations and beneficiaries' achievements using #SukcesyBeneficjentów (BeneficiarySuccessStories) in social media:
 - 463 posts on Facebook. At the end of 2020, NCBR profile was followed by almost 22,000 users. Compared to 2019, this is an increase by 35%.
 - With 588 posts published, our account on Twitter is enjoying growing interest. There was also a 24% increase in the number of our followers compared to 2019. NCBR is followed by nearly 9,000 users!
 - NCBR's profile on LinkedIn is incredibly popular. In 2020, it had more than 14000 followers, which corresponded to an increase by as much as 139% compared to 2019. Similarly to previous years, LinkedIn is used for regular communication between our Director and clients.
 - NCBR's channel on YouTube also enjoyed strong interest in 2020. We had 2546 new subscriptions, which corresponded to a 44% increase com-

pared to 2019. In total, our videos were viewed 184,438 times. Without a doubt, this major increase in the channel's popularity was related to the recording and uploading of our series of webinars in response to the educational and informational needs in the era of the coronavirus pandemic. It is important to note that first webinars were published back in Q1 2020.

New website

In 2020, NCBR redesigned its website and migrated it to gov.pl. The new website, gov.pl/ncbr, has our portfolio information organised better. All data about our contests, initiatives and other measures can now be found in one place. All these are described in simple terms and neatly arranged under the „Financing” tab. In addition, the website now presents VC and CVC funds. And, what is particularly important, to make the website easier to navigate for applicants, we added a search engine for contests and funds. All information, photos, and icons are accessible to people with disabilities. The website is fully responsive, so it can be viewed on mobile devices. On gov.pl, we reserved an additional domain, gov.pl/innowacje, to improve NCBR's SEO as a synonym of innovation. On this

new webpage, under the „Knowledge” tab, Centre's experts share latest R&D&I news in a user-friendly form by presenting NCBR publications (analyses, trends, and reports). For inspiration, we also share our beneficiaries' success stories. Our website has some new tabs, such as „Applicant”, „Beneficiary”, and „Expert”, with comprehensive information for our clients. An important component of the website is the „International cooperation” tab, which contains information about our new operations, which we expanded in 2020. The Polish version of the service is accompanied by an English website designed for a different audience and with different content.

The previous website of the National Contact Point (KPK) at kpk.gov.pl/ was redesigned and adapted to meet the needs and requirements of the new EU Horizon Europe Programme UE. We also started to redesign and integrate NCBR's social media, including KPK's previous social media profiles.



Key communication measures in 2020:

- editorial cooperation with nationwide and regional media to inform audiences about NCBR's new initiatives (93 press releases, more than 50 interviews and expert commentaries, 108 answers to media inquiries),
- cross-sectional reports on specific domains prepared with third-party partners, including „Digital Health” with Startup Poland and „Kompetencje jutro” (Future Skills) with Polityka Insights, two quarterly reports about the VC/CVC market with PFR, and the „Biogaz w Polsce” (Biogas in Poland) with the Biomasa magazine,
- two industry supplements „Bezpieczna przyszłość to innowacje” (Safe Future Means Innovation) with Przegląd Techniczny, and „Innowacje - Wdrożenia - Bezpieczeństwo - Obronność 2020” (Innovation - Implementation - Security - Defence 2020) with Portal Mundurowy,
- organisation of five press conferences with beneficiaries, presentation of projects and R&D teams as part of our own and third-party initiatives (72 speeches by NCBR experts/beneficiaries during our own and third-party events),
- commercial cooperation with selected media outlets (107 advertorials with 18 digital marketing formats accompanying selected publications, 100 radio spots in six versions, four animations),
- promotion of case studies prepared as part of Polski Produkt Przyszłości (Future Polish Product) and LIDER (LEADER) initiatives/events,
- promotion of the Centre's operations and selected beneficiary projects using new marketing technologies, such as e-mail marketing, and continued SEO/SEM, resulting in a 55% increase in visits to NCBR's website YoY (926 493 visits),
- regular updating of the „Beneficiary Success Stories” tab on our website (about 40 new stories); reporting good practices by beneficiaries to the Managing Authority,
- preparing and distributing external newsletters to 18,500+ recipients – in 2020, we sent 32 general newsletters and 10 thematic newsletters.



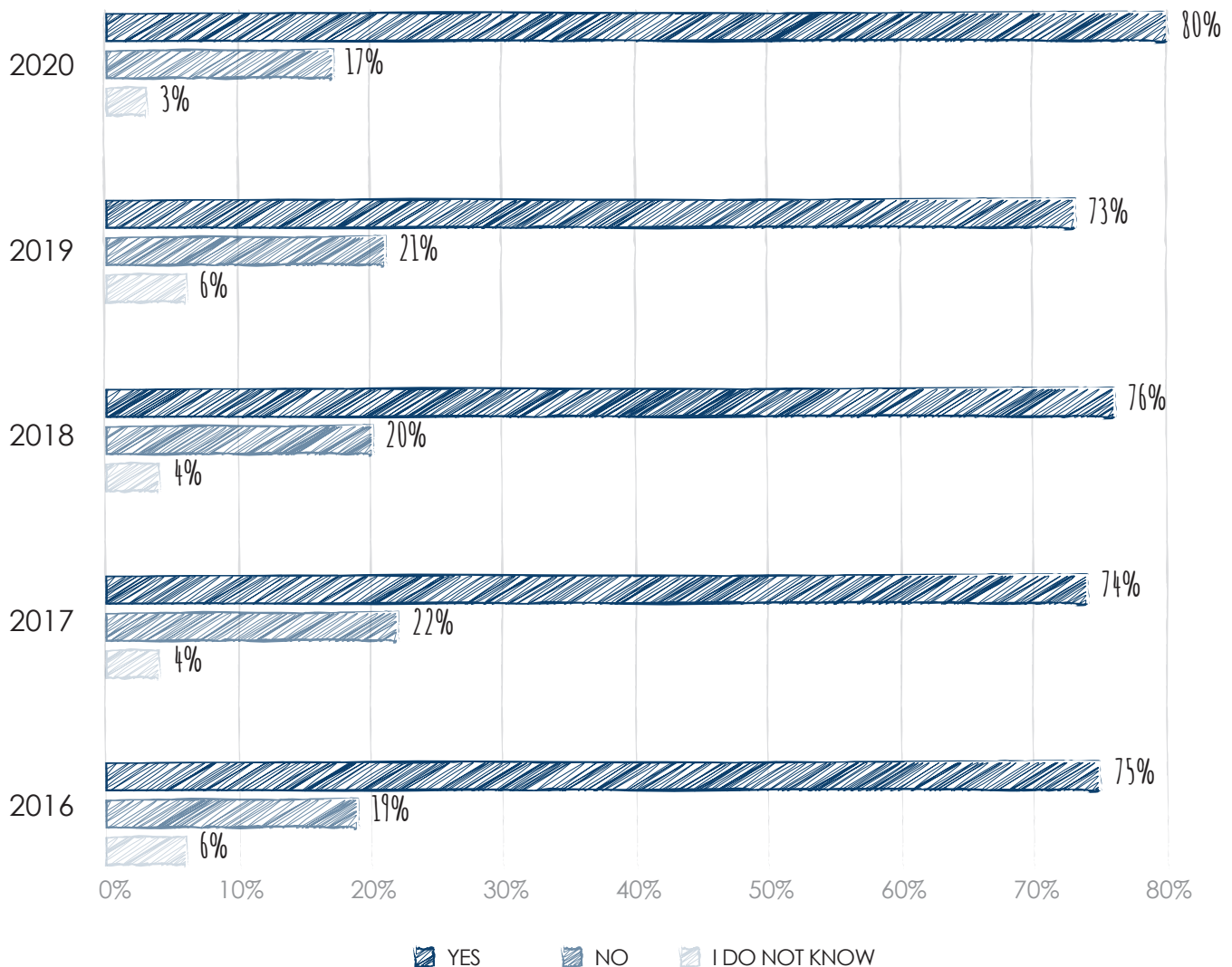
Monitoring beneficiary satisfaction

Beneficiary satisfaction survey is a regular study conducted by NCBR since 2016. In addition, in 2020 we also monitored beneficiary satisfaction with project management. The primary goal of the survey is to analyse beneficiary satisfaction with NCBR services at each stage of project implementation.

Beneficiary satisfaction monitoring is best illustrated by answers given to the ques-

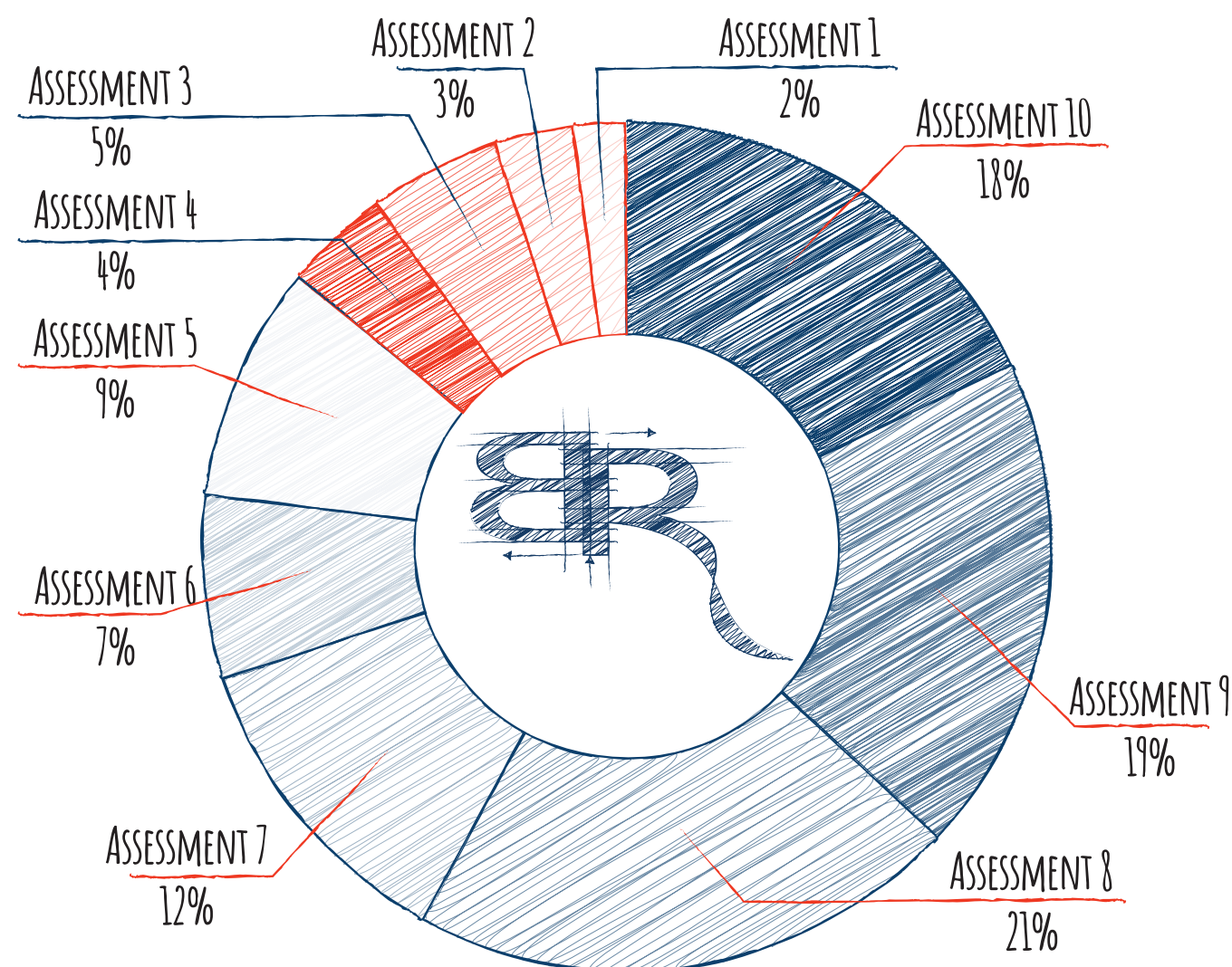
tion 'Would you be willing to complete the NCBR fund application process once again, if necessary, e.g. if your application was rejected, or would you like to secure financing for another project?'. In 2020, as many as 80% of respondents gave affirmative answers.

Monitoring applicant satisfaction – answers to the question Would you be willing to complete the NCBR fund application process once again, if necessary, e.g. if your application was rejected, or would you like to secure financing for another project?



In the satisfaction survey, beneficiaries expressed their general satisfaction with project management by NCBR on a scale from 1 to 10, where 1 meant „Definitely not satisfied”, and 10 „Definitely satisfied.”

General beneficiary satisfaction with NCBR services (n = 1483)



Improvements in agreement implementation

Beneficiaries who completed the survey could also suggest what could be improved in terms of agreement implementation. The largest number of proposed improvements, which also shows the range of areas that need to be improved, was observed for three aspects: „Project Supervisor”, „Communication with NCBR”, and „Payment Requests.” It is also important to note that, in addition to the many

improvements proposed by beneficiaries, there were as many fully satisfied beneficiaries, who were happy with the effective and successful cooperation with their previous or current Project Supervisors.



SUMMARY

This report is an overview of NCBR operations in 2020. We have said multiple times that it was a unique year, marked by challenges related to the pandemic. 2021 is a time when we continue to struggle with the pandemic, but also strive to return to normal in social and economic life.

The pandemic took millions of lives across the globe, and many sectors of the economy suffered a real collapse. Some of the adverse economic and social consequences might continue to affect us for a long time. This reality forced us to address many fundamental questions related to the condition of healthcare, the future of the power industry, the development of international and global cooperation, and the building of supply chains. We also discussed possible models of work.

What gave us hope was the quick development of vaccines. This is where science and innovation manifested their true strength, helping to actually save hundreds of thousands, if not millions, of people. This is a key element in the debate on the reasonable-

ness of allocating funds to innovation and development. And it gives us hope for more advancements that will change our lives and the environment we live in.

The issues we have described are one of NCBR's main areas of interest. The Green Deal, modern power engineering, health, the job market, Artificial Intelligence – these are no longer abstractions, but parts of our everyday life in the post-pandemic world.

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