



Development Strategy
Institute of Fundamental Technological Research
Polish Academy of Sciences

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I. Introduction

A. *About the Institute*

The [Institute of Fundamental Technological Research, Polish Academy of Sciences](#) (*Institut Podstawowych Problemów Techniki Polskiej Akademii Nauk – IPPT PAN*), established in Warsaw in 1953, is one of the largest technical sciences institutes of the Polish Academy of Sciences. IPPT PAN benefits in its activity from the experience coming from its rich tradition, successfully combined with modern and innovative approaches.

The key orientations of interdisciplinary research conducted at IPPT PAN are advanced problems linking modern mechanics, materials engineering, electronics, biomedical engineering, information and computational sciences, covering areas listed at: <https://www.ippt.pan.pl/en/about-the-institute/mission>.

The research conducted at IPPT PAN has led to the recognition of the Institute and to strengthening its position in the well-developed research and scientific international collaboration network, comprising leading centres not only in Europe but also on other continents, including both Americas, Asia and Australia. It has resulted in numerous prestigious publications, joint projects and patents. It is worth acknowledging the value of the work and achievements of a few generations of researchers, supported by other members of the Institute's community, which has contributed to the current shape and position of the Institute in science as a reference centre in Poland and the world in a number of disciplines of engineering and technical sciences.

IPPT PAN is the forge of highly skilled human resources for science and economy sectors by providing high-quality interdisciplinary [PhD education](#), conducted both independently and jointly with several other institutes of the Polish Academy of Sciences and one research institute.

The Institute has the right to confer doctoral and postdoctoral degrees in the following disciplines: mechanical engineering, materials engineering, information technology and telecommunications, automation, electronics and electrical engineering and biomedical engineering (doctoral degrees).

The achievements of the institute and its staff are awarded with many honours and prizes. IPPT PAN is awarded the highest category ranks in the regularly conducted national evaluation process of the quality of Polish scientific organisations. Since 2013 the institute has been continuously placed in the exclusive group of the organisations proudly holding the unique A+ category, which reflects its leading role in science.

The fact worth noticing is that since 2016 IPPT PAN has been holding the prestigious [HR Excellence in Research](#) Award, granted by the European Commission as a result of the quality assessment process. It confirms striving towards the full compliance and respect by IPPT PAN to the [European Charter for Researchers](#) and [the Code of Conduct for the Recruitment of Researchers](#) principles in terms of providing favourable working and career development conditions.

B. *Strategy development rationale and objective*

Since its establishment IPPT PAN has developed a set of rules and documents, taking into account the changing national and global context and settings. It has contributed to the framework vision and strategic development orientations, consistently implemented over the years. Long- and short-term development plans are subject to regular debates of the Scientific Council and the Board of Directors of IPPT PAN. These activities contribute to setting out new trends in science and to

successfully responding to emerging scientific, organisational and social and economic challenges. One of the basic documents which constitutes a key part of the strategic framework is the clearly defined mission of the Institute presented below. Another one is the [Human Resources Strategy for Researchers](#), which has been implemented since 2016. The way it is implemented and its impact on the quality of the Institute and the work environment is subject to regular monitoring and conducted by the European Commission.

The objective of developing the Strategy is to structure the existing practice and documents into a single coherent umbrella document which is publicly available and can be referred to whenever needed. The Strategy is the framework document – thus it presents the general foundations, rules and development goals. It is by default a living document and it will be revised in order to be responsive to the dynamics of the national and international social, economic and legal context and the changing role of science as well as the social and economic requirements towards it.

Taking into account the above the Strategy has no timeframe set as such a limit is not needed.

C. Fundamental values of the Strategy implementation

The Development strategy of IPPT PAN is implemented ensuring adherence to the highest ethical standards. All activities are executed with full respect to research freedom, taking into account the principles of integrity, openness, responsibility and social engagement of science, as well as to the nature and natural resources preservation approach. The Institute strives towards excellence and maximising its efficiency by developing an inspiring professional environment, which stimulates an active approach to new challenges and their consistent execution.

The work and collaboration conditions at IPPT PAN as well as the Development strategy implementation are marked by careful approach and respect to others – as the primary value.

II. Mission

The mission of the Institute was defined in the founding documents.

The key elements of the set out then mission are still valid, despite the time which has passed since the Institute was established and its mission defined, the changing environment at IPPT PAN and on the national and international level in various aspects as well as the development of science. The fundamental element of the mission is to conduct high-quality research in the areas of the focus of the world's science and technology. It is split into the [detailed mission aspects](#).

A cross-cutting element of the mission of IPPT PAN is to contribute to raising awareness and enlarging knowledge of the society about science and to make it learn the wealth and diversity of research and benefits the application of research results in practice brings. These activities are addressed to various groups of society.

III. Vision

Globalisation and the impact of civilisation development on the performance of the society in various areas require short- and long-term measures to meet the emerging societal, economic and scientific challenges. IPPT PAN creatively seeks responses to arising questions and problems and strives towards designing and implementing the best solutions.

Over the years the still valid vision of the Institute has been created as of the leading institution which significantly contributes to science, its achievements and to solving the above-mentioned challenges through high-quality research and implementation of its results, and which inspires young passionate people, educated at doctoral schools operated by IPPT PAN, and its partners in Poland and abroad. It has an impact on the growing national and international recognition of the Institute and its staff. The Institute strives not only towards maintaining its high position and recognition but also towards further increase of them in the international arena. In times of strong competition in all areas of life, economy and science the natural element of the performance of the Institute is to increase its competitiveness through constantly raising the quality of its activities and offer, and through adjusting them to meeting the needs of various addressee groups such as researchers in other institutions in Poland and abroad, entrepreneurs, decision-makers and other representatives of society. One component of the vision is the key role IPPT PAN plays in the scientific and research community as a promoter of high-quality research through conferment of scientific degrees to persons affiliated to the Institute and to those coming from other organisations in Poland and abroad.

An integral part of the created vision is the inspiring professional environment, particularly supportive to ambitious, strongly motivated personalities, and – in parallel – creating favourable conditions for effective teamwork, which is open to multiculturalism and diversity and which is open in the mindset and approach to problems and challenges, in particular in science.

IV. Strategic development goals

A. *Research and innovation goals*

The goal of scientific and research activities at IPPT PAN in the coming years is, as it has been up till now, their development in the areas which are the focus of the leading world-class centres in science and innovative technologies. The equally important goal is to create new research avenues of great significance on the national and global scale.

High quality theoretical and experimental research works, utilising modern top-class equipment, are continued at IPPT PAN. Collaboration of researchers whose expertise represents a wide spectrum of fields (engineering and technical sciences, medical sciences and health sciences, natural sciences) constitutes a strong basis and perspectives for achieving meaningful results of fundamental nature. Inter alia, the complex models of mechanical systems, materials and biological systems, having their basis in engineering, physical and biological theories, are developed. They are analysed using advanced solutions in the field of computational sciences, also in-house made, and verified experimentally.

The other goal is to put more emphasis on activities leading to the implementation of knowledge and skills of research staff in modern branches of industry, which are of key importance to economy and society, in particular in the formula of applied research, patents and implementation of innovative solutions.

B. *Cross-cutting systemic goals*

Research and innovation goals are tightly linked with the need to set out and meet cross-cutting goals on the institutional scale. A comprehensive approach and setting ambitious, and at the same time realistic, goals embracing the whole spectrum of the development plans of the Institute increase the chances for the strategy implementation success.

IPPT PAN has adopted the following cross-cutting goals:

- 1) Growing internationalisation of the Institute and its activity implemented through:
 - a) enlargement and strengthening of the scientific collaboration network, in particular with internationally recognised centres or those of promising potential;
 - b) further internationalisation of the staff structure at IPPT PAN;
 - c) internationalisation of the doctoral schools through educating future research human resources coming from any country and collaboration in the education process with centres and experts from abroad.

- 2) Continuation of modernisation of the Institute, ensuring at the same time full respect to values derived from its history and tradition. The modernisation is planned to be implemented in a multifaceted manner through: (i) an open approach and modern way of conducting research, involving the state of the art research methods, (ii) exchange of best practice and active participation in research achievements on the European and world level, (iii) attracting young, enthusiastic human resources while taking advantage of knowledge and potential of experienced research, administration and technical staff, (iv) introducing improvements to the work environment and streamlining internal procedures and processes.

- 3) Educating high-quality research human resources for the own needs of the Institute as well as for other Polish and foreign institutions, representing various economic sectors, including universities, research institutes and enterprises. Implementation of this goal allows not only strengthening the intellectual potential of the Institute and the natural generation replacement but also creation and development of the network of „ambassadors” – alumni of doctoral schools, operated by IPPT PAN, which not only fortifies the existing collaboration network the Institute is a part of and creates its new links but also contributes to promoting IPPT PAN brand.

- 4) Strengthening collaboration on the local, regional and national level with research organisations of complementary profiles allowing extended offer of interdisciplinary research and added value in the format of a comprehensive approach to identified challenges, problems and proposed solutions.

- 5) Enlarging the offer and solutions for industry and service sectors and gradual tightening of collaboration with them, which contributes to the modernisation of the economy and increases its competitiveness.

V. Implementation tools and indicators of meeting strategic goals

The strategy implementation is supported by available tools and measures such as national and international funding programmes for research, innovation, development and related activities, as well as internal mechanisms stimulating development such as regular evaluation of staff, including annual research staff assessment, of doctoral students, and the system of awarding employees and PhD students for the most outstanding achievements.

The strategy is executed the way taking advantage of the synergy derived from collaboration with various organisations and initiatives, representing both private and public sectors on different levels: local, regional, national and international. Stronger involvement of IPPT PAN in European programmes, bilateral and multilateral cooperation with foreign research organisations, industry and business sector is planned.

The pillars of the strategy implementation are: research and innovation potential, attractive education offer and well-developed structures to conduct doctoral programmes, large collaboration network on the national and international level with partners of diverse profiles, as well as committed administration and technical staff.

Implementation of the social mission of the Institute is supported by contemporary means such as the modern website of the Institute, social media, as well as traditional science communication and promotion tools, which include popular science articles, interviews and presentations. Continued and extended involvement of the staff and PhD students of IPPT PAN in events promoting science, such as Science Festival, Science Picnic, school visits to laboratories of the Institute, accompanied by attractive presentations, are planned.

The research and innovation strategic goals are achieved at IPPT PAN through:

- implementation of annual research plans, developed by individual research departments and adopted by the Scientific Council of the Institute; the plans are composed of research tasks, executed as part of the statutory research: <https://www.ippt.pan.pl/en/scientific-activities/research#statutory-research>;
- execution, individually or in collaboration with partners from Poland and abroad, of ambitious, often highly interdisciplinary, research and innovation projects (<https://www.ippt.pan.pl/en/scientific-activities/research#grants>), funded from the programmes, referred to above.

In order to meet the cross-cutting goals presented above the following groups of activities are *inter alia* undertaken:

- 1) in the framework of the growing internationalisation of the Institute and its activity, including:
 - a) enlargement and strengthening of the scientific collaboration network:
 - participation in programmes of bilateral and multilateral collaboration, scientific exchange, implementation of international, including European, projects,
 - offering mobility fellowships funded from available national, foreign and international programmes;
 - b) further internationalisation of the staff structure at IPPT PAN:
 - employing high-quality specialists from abroad, including visiting professors,
 - incoming mobility initiated within the exchange programmes, referred to above, fellowship programmes and other research funding programmes;
 - c) internationalisation of the doctoral schools:
 - enlarging the educational offer with lectures conducted by invited scientists from abroad, also remotely,
 - exploiting opportunities available within international collaboration, e.g. conferring joint or double doctoral degrees,
 - offering trainings abroad to PhD students as part of curricula.
- 2) within the continuation of modernisation of the Institute:
 - regular investment in the latest generation equipment,
 - attracting and investing in human resources of a young generation, while taking advantage of the expertise and potential of the experienced staff of the Institute,
 - raising qualifications of the administration and technical staff,

- extending the high quality administrative and technical support provided to researchers and management of the Institute,
- improving and modernising the work conditions by regular monitoring and analysing the efficiency of procedures and individual cases, and increasing the use of tools streamlining relevant processes.

The listed above activities, which include regular investments in human resources and infrastructure, covering also premises, contribute to the quality of IPPT PAN as an attractive and friendly place of work, education and development, inspiring and ensuring conditions for professional growth as well as building and strengthening links, resulting in the highest quality of undertaken activities.

The consistent implementation of the Action Plan, which constitutes the key component of the executed since 2016 [HR Strategy for Researchers](#), contributes to meeting the mentioned above targets.

The implementation of the Strategy is supervised by the Board of Directors of IPPT PAN in collaboration with the Scientific Council of the Institute. The Working Group for the monitoring of the implementation of the Human Resources Strategy for Researchers, which has been operating at IPPT PAN since 2016, plays a vital role in the process. The Group initiated the work on this document and developed it. The final version of the document was approved by the director of the Institute and the chairman of the Scientific Council.

The implementation of the Strategy is the joint responsibility of the whole community of the Institute, including its managing bodies, as well as departments and units of the Institute, according to their remits. Such an implementation scheme allows IPPT PAN to have its performance framework constantly improved and to develop it at the highest level.

The strategy performance indicators are following:

- a) within research and innovation goals:
 - being awarded with and retaining the highest category (currently A+) in the largest number of disciplines in which the achievements of the Institute are evaluated on the national level;
 - participation and being highly ranked in prestigious national and international rankings;
 - a gradual increase of the volume of bibliographic output of the highest quality and other meaningful research and innovation achievements, including implementation of research results;
 - a significant share of successful project proposals or at least scored over the threshold in the total number of proposals submitted by IPPT PAN under national and international, including European, programmes;
- b) within the cross-cutting systemic goals:
 - keeping the HR Excellence in Research award as a result of the regular assessment of the HRS4R implementation at IPPT PAN, conducted by the European Commission;
 - a significant share of foreigners in the total number of staff and PhD students of IPPT PAN;
 - a growing level of satisfaction of PhD students and staff of the Institute, expressed in regular anonymous surveys;
 - a gradual increase of qualifications of staff and PhD students of IPPT PAN and/or their positive opinion on the availability of the trainings they need.

VI. Summary

The Development strategy of IPPT PAN systemises the strategic development orientations of the Institute in the area of science and research as well as in the cross-cutting dimension, related to investing in the human capital, ensuring optimal work environment, including access to the world-class infrastructure, and growing internationalisation.

Organisations which are strong by their scientific excellence and openness, backed up by relevant intellectual and infrastructural basis, significantly contribute to improving the quality of life and economy and fulfilling the social mission of science. IPPT PAN, in its consistent activities over the years and further ambitious development plans, is undoubtedly one of them. It has been confirmed by its recognised scientific achievements, numerous applications of research results, the wide network of active international collaboration and very popular science-for-society activities. The Institute and its staff have been granted many awards and distinctions. A+ category, the highest of all classes conferred by the minister responsible for science to scientific organisations, and the prestigious HR Excellence in Research Award, granted by the European Commission, are among them.

Maintaining the high quality of activity, having an impact on the meaningful efficiency and effectiveness and tangible benefits for science, economy and next generations, is the key rationale of the Development strategy of IPPT PAN.