Universität Bremen

НАЦІОНАЛЬНА АКАДЕМІЯ НАУК УКРАЇНИ 1918

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Evaluating *Science*

a German-Ukrainian experience

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Bundesministerium für Bildung und Forschung

About the Project

The evaluation of science is well established and a frequently conducted exercise in the German science system. In many East European countries, science evaluation according to international routines is only in its initial phase. This calls for an exchange in order to learn from existing experiences, so as to avoid repeating previous mistakes and to engage in a mutual learning process.

In the years 2017 and 2018, the German and the Ukrainian Ministry of Science jointly funded the project "Eval-Science", which analysed the evaluation of research institutes in Ukraine that adopted an evaluation model from Germany fairly closely. The purpose of the project was to join forces within a German-Ukrainian research team to monitor and assess the suitability and functioning of the evaluation procedure in Ukraine.

Since the year 2016, Ukraine had started to evaluate research institutes belonging to the National Academy of Sciences of Ukraine (NASU) using the evaluation model that was developed and used within the Leibniz Association in Germany. To do this, an entire governance and committee system was established from scratch in Ukraine in short time. By the end of 2018, 92 institutes of the NASU had already been evaluated. The intermediate insights gained by the research team about the evaluation are documented in detail in the project's "Experience Report", which is freely available online.[1]

This booklet will briefly inform about the evaluation in Ukraine, the project's findings, and the achievements as well as the challenges ahead. The German-Ukrainian team would like to extend thanks for the financial support provided by the German Federal Ministry of Research and Education and the Ukrainian Ministry of Research and Education.

[1] https://www.uni-bremen.de/fileadmin/user_upload/fachbereiche/fb7/guenther/Forschung/Experience_Report_final.pdf

"Evaluating science requires quantitative and qualitative measures, which fit the context and environment as well as the mission of the relevant science organisations."

Jutta Günther. Professor of Economics, esp. Innovation and Structural Change, University of Bremen.

Evaluation in science systems

During the last 30 years, science policy-making has taken to evaluation as an instrument for assessing scientific institutions, research projects, and scientists. The aim is to improve the performance of the science system in light of the increasing importance of science and technology in the competition of national economies. In the institutional governance of universities and especially of non-university research organisations, evaluations play a prominent role as an instrument of "New Public Management". Evaluations have a "steering" role in governance arrangements that have to manage many sources of control and influence. However, evaluations are by no means consistent in their strategic orientation: they serve as instruments of legitimization for publicly funded institutes, as a basis for the assessment of resource allocation, as an instrument for assessing scientific achievements, and as a means of comparing institutes or supporting organizational development processes. Even the "targets" of evaluations are not always clearly specified; evaluations are frequently used as "multipurpose weapons".

Evaluation methods are similarly varied, whether they consist of quantitative procedures such as rankings and ratings in recent years – which have become increasingly important and „measure" achievement based on performance indicators - or of procedures based mainly on peer review, which can take into account the institutional environment and put explicit recommendations for further development processes on the agenda. The combination of quantitative methods – data collection of the performance of scientific institutions, which takes the disciplinary differences into account – and peer review, which is fundamentally accepted in the scientific communities, has become a "gold standard" of institutional evaluations.

The most important condition for "successful" evaluations is the clarity of its aims, transparency, and a peer review process which guarantees the awareness of the problems, challenges, and options of the institutions as well as a distance to them. In this way, peer review-based evaluations can be an authoritative source of validation employed by scientific institutes to develop or optimize institutional strategies.

"Evaluations should give the contracting authorities the necessary informations on the performance of the organisation being assesssed but should also help the Institute (or other research unit) with their institutional strategy and further development."

Dagmar Simon. Expert on Evaluation Science (WZB Berlin) and Co-Director of EVACONSULT.

Evaluation within the Leibniz Association

The Leibniz Association comprises 95 independent research institutes from a variety of scientific disciplines, including the natural sciences, technical sciences, social sciences, and the humanities. Leibniz institutes conduct basic as well as applied research and often provide a scientific infrastructure including services. Also, eight research museums belong to the Leibniz Association. Leibniz institutes are funded jointly by the Federation (Bund) and the Federal states (Länder), and their financing depends on positive evaluations conducted regularly by the Leibniz Association.

Institutes are subject to the evaluation procedure originally set up by the Leibniz Association itself and constantly developed further over time. This procedure follows a number of steps and includes a number of units. It is quite unique, transparent, and has been subject to scientific research and discussion itself.

The top decision making unit is the Leibniz Senate. Institutes are evaluated at least every seven years. In practice, a specialist review board visits the institute and evaluates the scientific and service work using a number of quantitative and qualitative criteria, making reference to the last evaluation, assessing the suitability of the structure as well as a judgement about the overall strategic positioning. The review board expresses a recommendation as to the further financing of the institute in its report, which can be commented by the institute. The Senate Evaluation Committee (SAE), composed of external members, assesses all documents and prepares a recommendation for the Leibniz Senate. The statement of the Leibniz Senate represents an important milestone in the procedure. The final decision making unit is the Joint Science Conference (GWK) – the assembly of political representatives of the Federation (Bund) and all Federal States (Länder). They examine the statement of the Leibniz Senate as well as the statement submitted by the Federal State (Land) which physically hosts the institute. The entire evaluation procedure lasts about 24 months. All relevant documents and reports are published online by the Leibniz Association.

"Evaluating science needs to walk the fine line between rewarding successful research without hampering courageous and uncertain approaches."

Tobias Wendler. PhD Candidate, Chair of Economics of Innovation and Structural Change, University of Bremen.

The Leibniz Association as a role model for the NASU?

The National Academy of Sciences of Ukraine (NASU) is one of the leading research organizations of Ukraine. The NASU has a relatively good reputation both in Ukraine and abroad. Most Ukrainian journals from the Web of Science database are published by the NASU. However, the NASU has preserved some features from the Soviet bureaucratic organization, which provoke criticism both in Ukrainian society and from foreign experts. Most critics refer to the obsolete managerial system and insufficient transparency in decision-making processes, including the distribution of research funds.

Hence, the goal of the evaluation procedure was to assess the real potential of research institutes, pick the best research organizations, and develop corresponding recommendations for changes within the NASU. In the course of time, Ukraine decided to utilize the German experience of the Leibniz Association due to a similar organization of the Leibniz Association and the NASU in many respects. Both organizations have research institutes in different scientific disciplines and with multidisciplinary profiles. Both rely on public funding as the main source of their activities. While the NASU is larger in terms of research personnel and number of institutes, the Leibniz Association has a much larger budget. These similarities pave the way for the implementation in Ukrainian research institutes of the successful method of evaluation applied within the Leibniz Association.

Due to the difficulties inherited from Soviet times, which were greatly aggravated during the last 25 years, especially in the financial sphere, the NASU institutes are in need of structural changes to facilitate a more rational distribution of scarce money in order to improve their performance and justify potential increases of state support. The Leibniz Association has substantial experience in the transformation and integration of research organizations as a number of its institutes stem from the research institutes of the GDR and the "Blaue Liste" institutes of West Germany. For these reasons, the Leibniz Association serves as an international reference point for the establishment of a new evaluation scheme within the NASU.

"The Evaluation of Science according to transparent criteria such as excellence, relevance and impact helps to identify the best, to facilitate competition and to prevent solidification."

Ernst Th. Rietschel. Former President of the Leibniz Association.

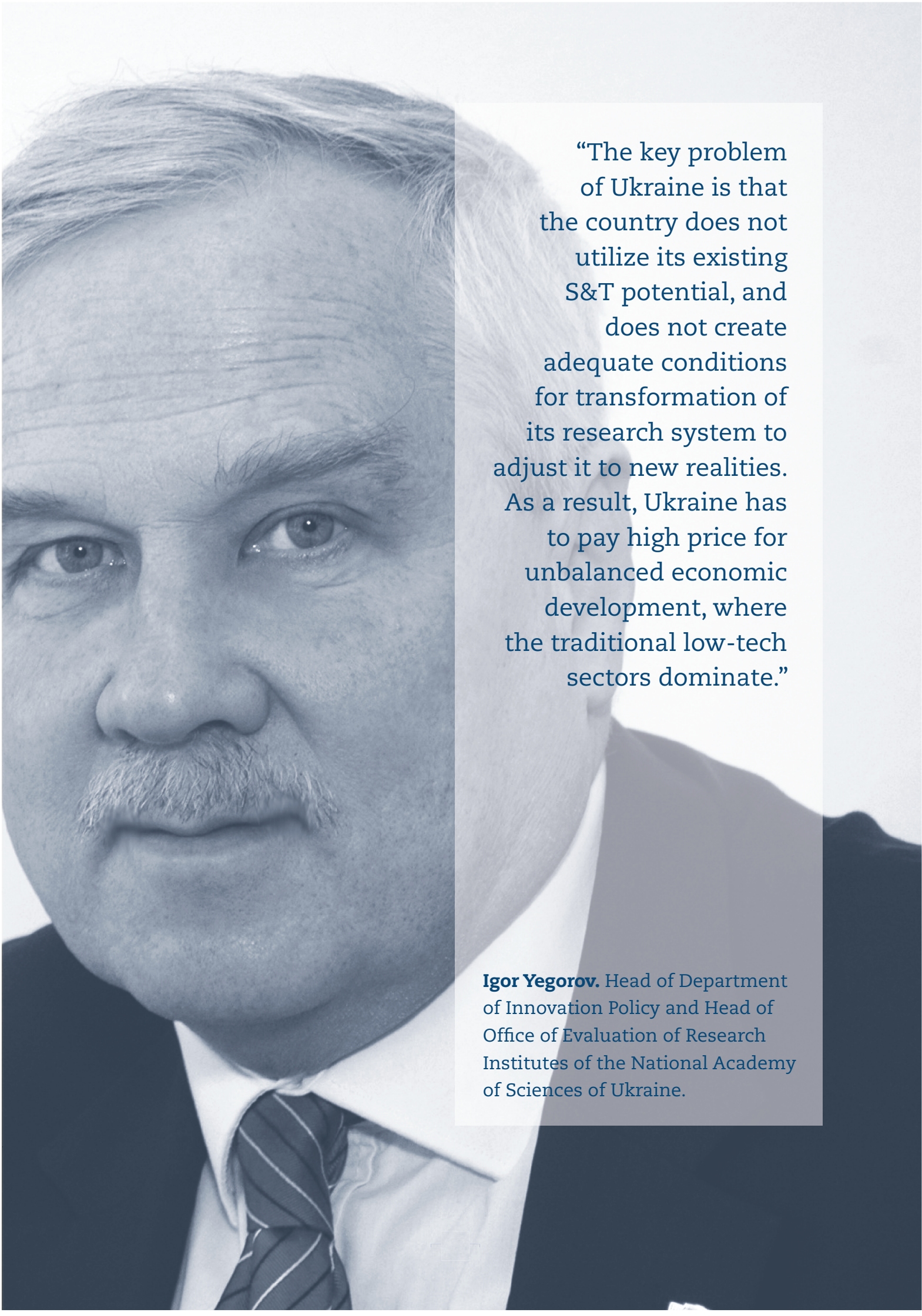
Breaking the Habits - Defining a new evaluation procedure in the NASU

To avoid issues stemming from the former evaluation procedure, the NASU gave itself some key principles to stick to during the evaluation procedure. First, international experience should be used, including national and international indicators. Second, the evaluation procedure should be more transparent and ought to have a participative procedure. Third, institutes should be given the chance to appeal evaluation results. Furthermore, rankings should not depend on a single indicator and, lastly, foreign experts should be included into expert groups and committees as evaluators.

To facilitate the compliance with these principles, the NASU defined a three-stage evaluation procedure. At the first stage, the expert group (a first-level review board, which consists of 5-6 experts) evaluates the scientific activities of the institution, including the inspection of the activities and the analysis of materials provided by the institute, resulting in a conclusion by the expert group. At the second stage, the Permanent Expert Committee on a Relevant Field of Science (second-level review board) prepares a presentation on the institution's activities in accordance with the report of the first-level group and consultations with the institution concerning the conclusions arrived at by the expert group. At the final stage the Permanent Evaluation Committee of the National Academy of Sciences of Ukraine (third-level review board) considers the presentation of the second-level board, the conclusion of the first-level group, and the statement of the institution.

A variety of criteria and indicators are considered in the evaluation procedure. These include the development of the institution in previous years and its research strategy for the next years along with scientific results, events, and public outreach as well as collaborations and the prevailing financial situation. A number of quantitative indicators are considered, such as the number of scientific publications, transfers of commercial property rights and patents, consulting activities, third-party funds or income from commercial activities.

The NASU has made a significant effort to assure the quality by means of an internal quality management and the assessment of an institution by the corresponding department of the NASU. In addition to this, the NASU created a special Evaluation Office in 2017 to facilitate the process of evaluation. The office was furthermore responsible for the organization of evaluations and consultative services for expert groups and review boards.



"The key problem of Ukraine is that the country does not utilize its existing S&T potential, and does not create adequate conditions for transformation of its research system to adjust it to new realities. As a result, Ukraine has to pay high price for unbalanced economic development, where the traditional low-tech sectors dominate."

Igor Yegorov. Head of Department of Innovation Policy and Head of Office of Evaluation of Research Institutes of the National Academy of Sciences of Ukraine.

Chart 1: Hierarchy of evaluation organs and their formation

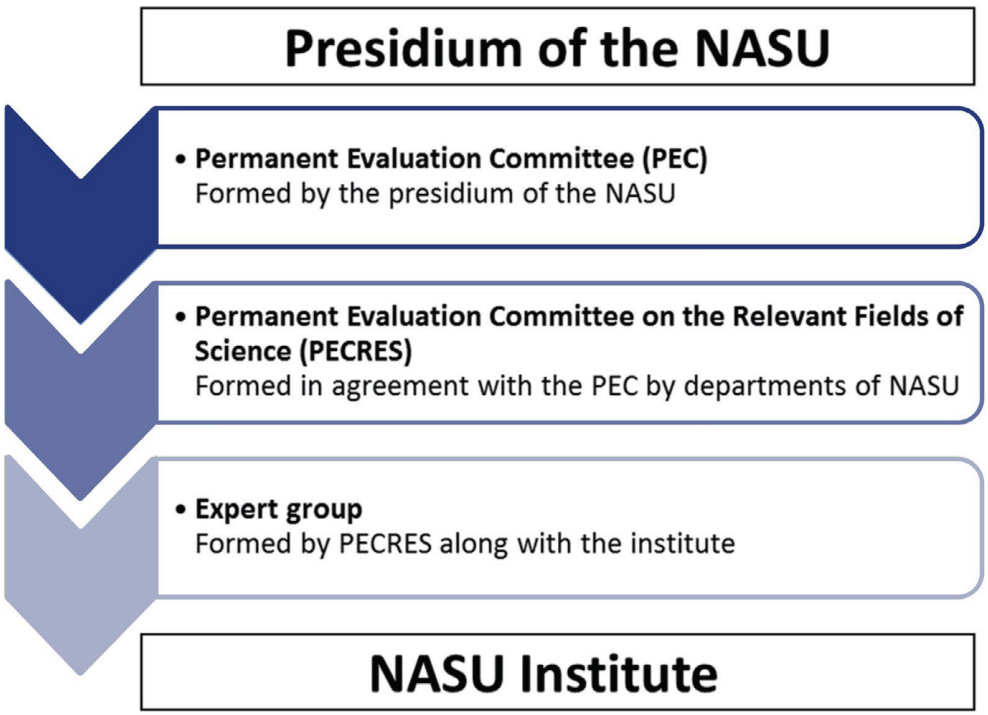
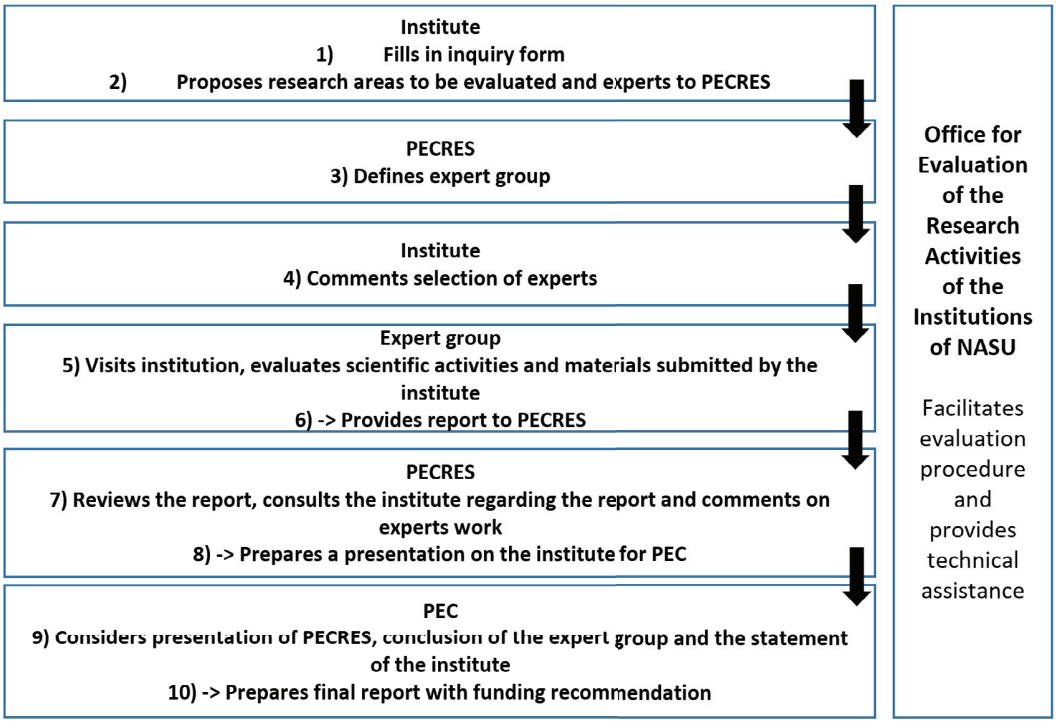


Chart 2: Flow diagram of the evaluation procedure (own diagram)



Source of Chart 1 and 2: own design.

"Art of evaluation requires extraordinary skills of finding balance between different metrics, especially in case of evaluation of research activity where quantitative data is poorly related with qualitative ones. Thus the best evaluator is the one who is being unbiased, able to get deeper to the root of every scientific output and identify possible outcomes, even those which are not visible yet."

Vitalii Gryga. Senior Research Fellow, Institute for Economics and Forecasting, National Academy of Sciences of Ukraine.

Progress and Problems - The First Evaluations and the Road Ahead

In 2016, the first thirteen institutes (one from each department of the NASU) were reviewed. Twenty-seven other institutes were added in 2017. There are plans to conduct the evaluation of 47 institutes in 2018 and more than 50 of the NASU institutes in 2019. Thus, it is expected that more than half of the NASU institutes will have been evaluated by the end of 2019.

While it is too early to arrive at final conclusions, the results of the evaluation of 40 institutes in 2016-2017 and an evaluation of approximately the same number of institutes in 2018 open the way for some important remarks. The evaluation in 2016-2018 was useful for both the NASU and the institutes. Some objective information about the situation within the institutes were received and corresponding recommendations on how to change them were made. While this is an important step forward, a number of problems of the process of evaluation have been revealed. More than half of the institutes received the highest mark for their scientific activities. In some cases, review boards (committees) had to correct the marks made by the expert groups.

Some key problems were identified during the evaluation which may provide a guideline on how to support the efforts undertaken. A difficult issue is posed by potential conflicts of interests on the part of experts. While this may be formally excluded, it is almost impossible to provide real independence of experts in a relatively closed Ukrainian research system. Furthermore, there were no resources to invite a number of foreign experts, leading to a low representation of foreign experts in the evaluation procedure. Yet, there may be several options to solve this problem. First, the initiation of projects of technical assistance on the part of the EU. Second, to involve representatives of the Ukrainian scientific diaspora more actively. Third, the involvement of the government to provide extra funds for the evaluation. The Office of Evaluation, along with the management of the Academy, has already taken some steps in these directions, yet the results of these efforts are still not clear.

Some issues appeared during the evaluation procedure. These issues are related to indicators, which should be more relevant to the reality of scientific activities of institutes in different disciplines. This type of improvement is currently under way with the help of expert groups from different scientific disciplines. Another improvement needs to be made concerning the timing of the procedure, as currently both the report of the institute and the expert conclusions are made two to three times faster than in the Leibniz procedure. Allowing for more time could help to improve the quality of evaluation related documents.

At the moment, the process of rewarding the best institutes and units needs to be further developed as it is still not clear what kind of extra benefits institutes could receive ‘automatically’ in the case of a high mark. To facilitate the internal

“Reforming a national research system will be ineffective without a proper evaluation of the R&D activities of all research organisations. In this case, firstly, it is important to follow a differentiated approach to the evaluation of research organisations of different fields of knowledge, secondly, important issue is a selection of experts for evaluation and thirdly, need to remember that the high value indicators doesn‘t always mean a quality.”

Yuliya Ryzhkova. Researcher at the Department of Innovation Policy, Institute for Economics and Forecasting, National Academy of Sciences of Ukraine.

reorganization of research institutes, it is further considered necessary to shift the focus to the evaluation of research units. Huge potential for improvements may lie in the restructuring of research organizations, more specifically by considering the possibility of merging small research organizations in order to facilitate successful and productive work in relevant research areas by optimizing the network of scientific institutions and organizations. Despite emphatic recommendations to consider this possibility, in the last two years no merger of research organizations has taken place.

The NASU has already made significant progress in implementing the new procedure and has carried out many evaluations. The work on the improvement of evaluations is continuously under way and the Ministry of Education and Science of Ukraine has announced plans to utilize the experience of NASU for other research institutes in 2019. ■

“Independent and unbiased expertise based on international peer-to-peer review is the core formula for success and future development of institutions.”

Alexandra Antoniuk. Deputy Director for Science of Institute of Mathematics of the National Academy of Sciences of Ukraine.

Some numbers

No. of researchers

Leibniz	**~ 10.000**
NASU	**> 15.000**

Budget

Leibniz	**1.900.000.000 €**
NASU	**120.000.000 €**

Budget per researcher

Leibniz	**190.000 €**
NASU	**~8.000€**

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Impressum

Evaluating Science a German-Ukrainian experience

Realisation

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