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Evaluation methodology for assessing the benefits of membership of the Czech Republic in international R&D organizations

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METODIKA HODNOCENÍ PŘÍNOSŮ ČR V MEZINÁRODNÍCH ORGANIZACÍCH VÝZKUMU A VÝVOJE

EVALUATION METHODOLOGY FOR ASSESSING THE BENEFITS OF MEMBERSHIP OF THE CZECH REPUBLIC IN INTERNATIONAL R&D ORGANIZATIONS

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Content

Text neprošel jazykovou korekturou.

1. Introduction

The Czech Republic is a Member State of international research infrastructures of macro-regional, pan-European or global nature and impact. These international research infrastructures may be established and operated under various legal frameworks:

- Research infrastructures established and operated under **public international law** – international R&D organizations (e.g. *CERN – Conseil Européen pour la Recherche Nucléaire*);
- Research infrastructures established and operated under **ERIC** (*European Research Infrastructure Consortium*) legal framework (e.g. *CERIC – Central European Research Infrastructure Consortium*);
- Research infrastructures established and operated under **other legal frameworks** – e.g. national legal framework of the country on whose territory the seat of international research infrastructure is situated, either permanently or temporarily (e.g. *GmbH – Gesellschaft mit beschränkter Haftung* or *AISBL – Association Internationale Sans but Lucratif*).

In case that the international research infrastructure is not established and operated under the public international law as an international R&D organization the obligation of a Member States to contribute to its operational and investment costs is diverse. This contribution may take the form of membership fees, the form of participation on the share of direct operational and investments costs, the form of ensuring operation of a part of the research infrastructure (e.g. national "node" of distributed research infrastructure) or a combination of the above mentioned alternatives, both by "in-cash" and "in-kind" contributions. These contributions may be of mandatory or optional nature with variable components depending e.g. on the level of involvement of the Member State in the user capacity of international research infrastructure.

In case that the international research infrastructure is established and operated under the public international law as an international R&D organization the obligation of a Member State to contribute to its operational and investment costs take the form of a membership fee, which is usually also the only direct obligation of a Member State.

The presented Evaluation Methodology focuses on assessing the benefits of membership of the Czech Republic in international research infrastructures, which are established and operated under the public international law, i.e. as **international R&D organizations**. The scope of the methodology is therefore the pool of 7 international R&D organizations the Czech Republic is a Member State of and the **Ministry of Education, Youth and Sports of the Czech Republic (MEYS)** is responsible for:

- **CERN** (*European Organization for Nuclear Research*);
- **EMBC** (*European Molecular Biology Conference*);
- **EMBL** (*European Molecular Biology Laboratory*, including *ELIXIR*);
- **ESA** (*European Space Agency*);
- **ESO** (*European Southern Observatory*, including *European Extremely Large Telescope*);
- **JINR** (*Joint Institute of Nuclear Research*);
- **VKIFD** (*Von Karman Institute for Fluid Dynamics*).

The main purpose of membership of countries in international R&D organizations (hereinafter referred to as "IOs") in general is to provide the research community with long-term opportunities to carry out top quality and world-class R&D in an international environment, to increase performance of national research community, to foster innovative skills and competitiveness of national businesses, to provide training and education opportunities and to promote internationalisation of national R&D systems.

Therefore, the membership and active participation and involvement of the Czech Republic in the IOs should be considered as an important element of the Czech R&D system and policy and one of the pre-requisites for maintaining the competitiveness of the Czech Republic and it's visibility in international R&D area.

The IOs may vary in their nature (IOs managing R&D programmes, IOs managing educational or training programmes), in focus (basic research, applied research, infrastructure maintenance and operation, training) and in size of the budget of the Czech financial contribution (ranging from less than 1 MCZK to more than 300 MCZK per year, i.e. from less than 34 kEUR to more than 12,7 MEUR) totalling in the amount of about 28,6 MEUR per year.

Name of the IO	Mandatory contribution	Other contributions provided on R&D activities	Other contributions provided on activities not considered as R&D
European Organisation for Nuclear Research (**CERN**)	10,5 MEUR	2,2 MEUR (on experiment-related activities and cooperation)	-
European Molecular Biology Conference (**EMBC**)	420 kEUR	-	-
European Molecular Biology Laboratory (**EMBL**)	1,1 MEUR	-	-
European Space Agency (**ESA**)	7,86 MEUR	3,1 MEUR (optional R&D programmes)	3,4 MEUR (optional programmes not considered as R&D)
European Southern Observatory (**ESO**)	1,48 MEUR	-	-
Joint Institute for Nuclear Research (**JINR**)	5,1 MEUR	85 kEUR (on cooperation)	-
The von Karman Institute for Fluid Dynamics (**VKIFD**)	34 kEUR	-	-

Similarly to the participation of the Czech Republic in pan-European and other research infrastructures, strategic decisions on the Czech membership in the IOs are of uttermost importance. These evidence-based policy decisions shall ensure maximum added valued of the Czech membership in the respective IOs, contribute substantially to shaping the research landscape by increasing the quality of scientific and technical teams, be coherent with strategic goals of the Czech Republic and therefore enhance the competitiveness of the Czech Republic in general.

Systemic evaluation of country memberships (ex-ante, interim, ex-post) in IOs provides the necessary foundation for such strategic decisions. It offers guidance for establishment, support and termination of the Czech membership in IO's and it contributes to increasing efficiency and long-term investment planning at the national level. The evaluation methodology has significant importance for:

- Evaluation of the needs of the Czech Republic, of the maturity and capacities and capabilities (in quantitative and qualitative terms) of the user community;
- Evaluation of efficiency, benefits and quality of existing Czech memberships in IOs;
- Evaluation of needs for entering new optional R&D programmes, non-mandatory activities or upgrades of IOs;
- Decisions on terminating the Czech membership in IOs;
- Preparation of the state budget expenditures on the membership of the Czech Republic in IOs;
- Drafting recommendations on improving / developing the strategy on involvement of the Czech Republic in an IO.

The Evaluation Methodology for assessing the benefits of membership of the Czech Republic in IOs is based on already approved Evaluation Methodology for Research Infrastructures. It aims to extend the principles used for the research infrastructures assessment also to IOs and to prepare sources for a transparent evaluation. It shall enhance the quality of the Czech participation in IOs aligned with its strategic relevance and indisputable quality. In a broader context, it shall deliver inputs for an informed policy decision-making of the Government of the Czech Republic.

2. Attributes (criteria, indicators) for interim evaluation of the Czech membership in IOs

Despite the diverse scope of individual IOs, the Czech membership in IOs has some common features and attributes which must be reflected by (and integrated into) the evaluation process. These include especially the following:

A. **Description of the IO** (its purpose and alignment with the needs of the Czech research community; technologies used and developed by the IO; strategy and future development of the IO and its relevance for the Czech Republic; relations of the IO with European Research Area; overlaps or synergies with other IOs / research organisations / research infrastructures / R&D programmes / R&D projects, in which the Czech Republic / Czech research community is participating; budget of the IO and the Czech contribution to the IO; other costs related to the Czech membership in the IO – optional R&D programmes / R&D projects, non-mandatory costs related to the participation in R&D experiments; etc.).

B. **Governance of the Czech membership in the IO** – The governance structure granting the Czech participation in the IO must be set such that it ensures transparent and non-discriminating access for any entity from the Czech Republic to the IO´s research infrastructure, R&D programmes / R&D projects, etc.) In addition, the IO´s managing decisions must be cross-linked to national decisions and policies and thus, straight communication channels must exist to the MEYS. All the information about the IO must be publicly available. In particular:

- It must be clear how the Member State participates in the governance of the IO within the frame of its internal rules and principles;
- It must be clear how the Member State can participate in R&D activities of the IO (tenders; projects; access to data; access to research infrastructure); system of control of the IO (system of audits; meetings; scientific representation);
- It must be clear how the representatives of the Member State in the individual IOs´ bodies (Committee; Council; Board; etc.) are linked to the MEYS or an advisory body, which makes recommendations or decisions about the Czech participation in the IO;
- It must be clear how the information on opportunities resulting from the Czech membership in the IO are distributed (access to data; access to research infrastructure; participation in R&D programmes / R&D projects; tenders; vacancies; scholarships; etc.).

C. **Benefits of the Czech membership in the IO** – research

- Information on opportunities for the Czech research community, how it can participate in the IO, how they can access the IO or the resulting data;
    - Experimental / measuring / access time assigned to the Czech research community;
    - Form of access and R&D projects selection procedures;
    - Indicators measuring usage of data from the IO and its different activities by the Czech research community;

- Research impact (e.g. number and impact of publications with Czech co-authors and percentage of total; citation index of publications; examples of selected publications from previous 10 years);
- List of R&D projects funded or co-funded by the IO with the Czech participation and an indication of the role of the Czech partner in these projects;
- Other significant contributions to R&D experiments of the IO by the Czech research community (including definition or experimental equipment; scientific involvement in experiments management structure);

- One of the major criterions is the size and maturity of the Czech research community in the field covered by the IO.

D. **Benefits of the Czech membership in the IO** – technology development, innovation, industry, public sector, public goods

E. **Benefits of the Czech membership in the IO** – education, human resources

F. **Outreach**

G. **Total direct financial return from the IO to the Czech Republic**

H. **Other important benefits of the Czech membership in the IO** – political or export strategy, drawbacks and implications of not being a member of the IO

These attributes shall be subject to evaluation and must be verifiably documented.

3. Evaluation process

The responsible body for international cooperation in R&D of the Czech Republic is the MEYS. Thus, administrative aspects of evaluation shall be provided by the MEYS. For the purpose of evaluation, the MEYS will set-up an Evaluation Committee with adequate composition of stakeholders and external (foreign) experts. The Evaluation Committee will be chaired by an impartial, internationally renowned and recognized foreign expert with documented expertise in R&D policy.

The evaluation shall cover all the existing Czech memberships in IOs, mandatory activities, as well as optional or non-mandatory experiments or R&D programmes realised in cooperation with the IOs. Thus, the evaluation has mainly the character of interim evaluation as described in the Evaluation Methodology for Research Infrastructures. However, as the evaluation shall provide assessment of envisaged future activities in the domain, and it must allow the evaluation of potential of upcoming memberships, it contains also some ex-ante features.

The individual IOs are different in nature, *modi-operandi*, internal rules, access policies etc. Thus, the first part (points 1 and 2) that shall be accomplished for the evaluation process will summarize rather general information about the IO, including its development strategies and budgetary modalities. These mostly formal and contextual aspects (including the strategic significance of the IO) build the frame of the more detailed presentation of the IOs´ results / outputs / outcomes / impacts / and other contributions to the Czech research community and the Czech economy.

During the evaluation the membership of the Czech Republic in IOs shall be assessed according to the specified criteria and the outcome shall be:

- Recommendation for continuation of the Czech membership in the IO;
- Recommendation for termination of the Czech membership in the IO;
- Recommendations for changes improving defined aspects of the Czech membership in the IO;
- Recommendation for starting, termination or continuation of the participation in non-mandatory activities of the IO;
- Recommendation for conditional start of the Czech membership in a defined timeframe.

4. Schedule of the evaluation process

- Preparation of evaluation forms (and approval by the Evaluation Committee);
- Elaboration of background documents for an IO ("hard" data shall be obtained directly from the IO);
- Nomination of reviewers (preferably not from the Czech Republic) ensuring absence of conflicts of interest and sufficient knowledge and expertise of reviewers (at least of one IO);
- Evaluation of background documents for an IO by reviewers;
- Meeting of the Evaluation Committee, including interview with representatives of the IO´s Czech user community and MEYS, resulting in a final report and recommendations to the MEYS.

Evaluation scale	
5	The overall benefits of the Czech membership in the IO are of *excellent* quality. The level of participation of the Czech user community in the activities developed within the IO is *very high* as well as the involvement in major achievements of the IO. The relevance of R&D performed by the IO and their impact on the Czech R&D system is *very high*. The level of coordination of the Czech membership in the IO is of *very high* quality. The Czech membership in the IO is inevitable for increasing R&D performance and competitiveness of the Czech Republic.
4	The overall benefits of the Czech membership in the IO are of *high* quality. The level of participation of the Czech user community in the activities developed within the IO is *high* as well as the involvement in major achievements of the IO. The relevance of R&D performed by the IO and their impact on the Czech R&D system is *high*. The level of coordination of the Czech membership in the IO is of *high* quality. The Czech membership in the IO is substantially contributing to R&D performance and competitiveness of the Czech Republic.
3	The overall benefits of the Czech membership in the IO are of *average* quality. The level of participation of the Czech user community in the activities developed within the IO is *moderate* as well as the involvement in major achievements of the IO. The relevance of R&D performed by the IO and their impact on the Czech R&D system is *decent*. The level of coordination of the Czech membership in the IO is of *sufficient* quality. The Czech membership in the IO is not crucial for the Czech R&D performance and competitiveness of the Czech Republic.

2	The overall benefits of the Czech membership in the IO are of *low* quality. The level of participation of the Czech user community in the activities developed within the IO is *low* as well as the involvement in major achievements of the IO. The relevance of R&D performed by the IO and their impact on the Czech R&D system is *low*. The level of coordination of the Czech membership in the IO is of *insufficient* quality. The Czech membership in the IO lacks any higher importance for R&D performance and competitiveness of the Czech Republic.
1	The overall benefits of the Czech membership in the IO are of *very low* quality. The level of participation of the Czech user community in the activities developed within the IO is *very low* as well as the involvement in major achievements of the IO. The relevance of R&D performed by the IO and their impact on the Czech R&D system is *very low*. The level of coordination of the Czech membership in the IO is of *insufficient* quality. The Czech membership in the IO (also with regards to the financial contribution) shows only a very limited relevance for R&D performance and competitiveness of the Czech Republic and it is strongly recommended to re-consider the Czech membership in the IO under specific conditions.
0	The overall benefits of the Czech membership in the IO are of *poor* quality. The level of participation of the Czech user community in the activities developed within the IO is *negligible* as well as the involvement in major achievements of the IO. The relevance of R&D performed by the IO and their impact on the Czech R&D system is *poor*. The level of coordination of the Czech membership in the IO is of *insufficient* quality. The Czech membership in the IO (also with regards to the financial contribution) has practically no relevance for R&D performance and competitiveness of the Czech Republic and it is recommended to terminate the Czech membership in the IO.

5. Evaluation form

1. Description of the IO

1.1	Purpose / how the IO describes itself.		
1.2	Technologies used and developed by the IO, relation of the IO to industry (in general), knowledge transfer strategy.		
1.3	Future plans of the IO, strategy of the IO, R&D projects under preparation / consideration (Is there interest of Czech research community / firms?).		
1.4	Relations of the IO with ERA and other macro-regional research areas.		
1.5	Possible approaches to the IO (ways how to understand the IO – solely as support for industry, purely focused on science, combination of both).		
1.6	Are there any overlaps / synergies with other IOs / research organisations / research infrastructures / R&D programmes / R&D projects in which the Czech research community is participating?		
1.7	Budget of the IO, Czech contribution to the IO (sum + percentage).		
1.8	Number of employees of the IO (including temporary staff, excluding users).		
1.9	Description of contract assignment policy of the IO.		

2. Governance of the IO and of the Czech membership in the IO

2.1	Description of the system of governance of the IO.		
2.2	How the Czech participation in the IO is organised? How the dissemination of the information about the IO is ensured?		

3. Benefits of the Czech membership in the IO – research (all points are "IF RELEVANT")

3.1	Describe how the Czech research community can participate in the IO. How the data / participation in experiments of the IO are accessible?		
3.2	Usage of data from the IO by the Czech research community – number of downloads, accesses etc.		
3.3	Number and percentage (of total) of publications with participation of the Czech scientists. – Was it possible to become co-author of these publications without the membership of the Czech Republic in the IO?		
3.4	Average citation index of these publications (according to WoS).		
3.5	List of selected publications from collaboration with the IO (using data of the IO) from previous 10 years (including WoS citation index or adequate citation intensity measure).		
3.6	List of research projects with the Czech participation (rate of success, funding from the budget of IO, etc.)		
3.7	Experimental time assigned to the Czech user community + percentage of total experimental time of the IO		
3.8	Other significant contributions to the experiments of the IO by the Czech research community (including experimental equipment) – What is the interest of the Czech research community to participate in R&D projects of the IO and eventually influence them? (several examples)		

3.9	Interest of the Czech research community in R&D projects / experiments / upgrades of the IO in preparation.		

4. Benefits of the Czech membership in the IO – technology development, innovation, industry

4.1	Technology development projects with the Czech participation (a list of them + budget).		
4.2	Contracts assigned to the Czech industry in previous 10 years (supplies and services provided by the Czech firms). Please specify total amount by year and amount and percentage of high-tech[1] contracts + add list of these contracts, if possible. (If relevant in respect to the contract assignment policy of the IO)		
4.3	Knowledge transfer activities with the Czech participation.		
4.4	Other benefits (including the public sector).		

5. Benefits of the Czech membership in the IO – education, human resources

5.1	Number of Master and Ph.D students educated in the IO.		
5.2	Number of Master and Ph.D students working on R&D projects in cooperation with the IO.		
5.3	Number (in FTE) / percent of the Czech researchers involved in R&D projects in cooperation with the IO.		
5.4	Number of employees of the IO from the Czech Republic (technical; scientific as well as administrative; permanent; seconded; external experts;		

[1] As understood by Eurostat http://ec.europa.eu/eurostat/statistics-explained/index.php/Glossary:High-tech.

	etc.).		

6. PR and services to the research community / outreach

6.1	Number of articles or broadcasts in TV / radio / web about the IO and the Czech participation in the IO in Czech media (print; radio; TV; etc.).		
6.2	Number of scientific meetings, conferences, information days, and industry days in the Czech Republic related to the IO.		

7. Other important benefits of the Czech membership in the IO (political / export strategy, etc.)

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