



**LARGE RESEARCH
INFRASTRUCTURES**



MINISTRY OF EDUCATION,
YOUTH AND SPORTS

ROADMAP OF LARGE RESEARCH INFRASTRUCTURES OF THE CZECH REPUBLIC FOR THE YEARS 2016-2022 UPDATE 2019

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CONTENTS

1. Ministry of Education, Youth and Sports – mission
2. Large research infrastructures – funding instrument
3. Roadmap of large research infrastructures – update 2019
4. Large research infrastructures – funding framework 2022
5. Internationalisation of large research infrastructures



1. MINISTRY OF EDUCATION, YOUTH AND SPORTS – MISSION

- Leading public administration body of the Czech Republic responsible for **policy-making and public funding of R&D**, including international cooperation and use of the European Structural and Investment Funds (ESIF) in public R&D sector
- National authority of the Czech Republic in charge of **large research infrastructures**, both in terms of strategy setting – “**roadmapping**” – and granting financial support from public funds, including payments of fees for memberships in international legal entities
- **Managing authority** of the state budget expenditures (= operations) and the ESIF (= investments) to **finance large research infrastructures**
- Czech memberships in **European Research Infrastructure Consortia (ERIC)**, as well as **international R&D organisations**
- Delegation of the Czech Republic to the **European Strategy Forum on Research Infrastructures (ESFRI)**



2. LARGE RESEARCH INFRASTRUCTURES – FUNDING INSTRUMENT

- **Minimal key requirements** → Compliance with definition of large research infrastructure, introduced by the national legislation on support of R&D and innovations from the public funds of the Czech Republic and Framework for State Aid for Research, Development and Innovation (2014/C 198/01)
- A large research infrastructure is a **unique facility** necessary to conduct comprehensive research, development and innovation, which has a **high knowledge, technological and, possibly, financial cost**, and is operated by its host research organisation for all potential users on the **open access** policy basis. A large research infrastructure is **approved by the Government of the Czech Republic** on proposal submitted by the Ministry of Education, Youth and Sports, including the costs of its acquisition, operations and investments.
 - **Strategy investment**
 - **Unique R&D facilities**
 - **Exceptional knowledge**
 - **Top-class technologies**
 - **Open access services**
 - **Scientific excellence**
 - **Outstanding results**
 - **Wide user community**
 - **Nation-wide impact**
 - **International overlap**



UNIQUENESS

- A large research infrastructure represents an exceptional and unique facility gathering a critical mass of **technological devices and knowledge expertise** necessary to perform cutting-edge basic/applied research, develop state-of-the-art technology and introduce breakthrough innovations of high added value and potential for application on market

OPEN ACCESS

- A large research infrastructure is operated by a research organisation for a **broad user community** that is provided with services on the basis of calls evaluated by experts, i.e. any scientist or a research group has open access to large research infrastructure, regardless of affiliation to parent institution

EXCELLENCE

- Scientific results reached by using the capacities of a large research infrastructure are of **high-quality**, and also highly relevant from the value for money point of view, and they substantially contribute to development of given R&D field



NATIONAL IMPACT

- A large research infrastructure has nation-wide importance, significance and impact within the Czech Republic and serves a **broad portfolio of users** from research community (open access) and innovative enterprises (contractual research)

INTERNATIONAL OVERLAP

- A large research infrastructure is inter-linked to research infrastructures located abroad and participates in **macro-regional, pan-European and global** networks, clusters or legal entities, thus having significant international overlap



HOW TO BECOME A LARGE RESEARCH INFRASTRUCTURE?

- Compliance with the **minimal key requirements** (legislative definition) and highly positive outcome of **international peer-review assessment** exercise, arranged on a regular basis
- Recommendation for public funding issued by the **Research, Development and Innovation Council** (advisory board) and approval adopted by the **Government of the Czech Republic**

WHAT ARE THE ELIGIBLE COSTS?

- **Personal costs** – management, researchers, technicians, administration and other staff
- **Operation costs** – materials, energy, services (subcontracts), international mobility of research infrastructure staff, overheads (either flat rate or full-cost methodology), etc.
- **Membership fees** – participation in the international research infrastructure networks, clusters, consortia or other legal entities linking research infrastructures internationally
- **Investments** – renovations, upgrades and acquisitions of new technologies, devices and other R&D resources that keep the research infrastructure at top-class level and ensure that users have access to exquisite service portfolio, which satisfactorily meet their R&D needs

ELIGIBLE

LARGE RESEARCH INFRASTRUCTURES – AGENDA DEVELOPMENT

2010

Czech National Roadmap

The Ministry of Education, Youth and Sports released the very 1st Large Research Infrastructures Roadmap of the Czech Republic. Updates to the Roadmap followed in 2011, 2015 and 2019.

2018

Czech Presidency in ESFRI

Dr Jan Hrušák – long-term Czech delegate to European Strategy Forum on Research Infrastructures, was elected new ESFRI Chair, the 1st one coming from the Central and Eastern European countries.

2009

Legislative Framework

Amendment to the Act No. 130/2002 Coll., on Support of R&D and innovations has introduced “large research infrastructure” instrument for providing public funds to finance these facilities. First projects entered the financial scheme in 2010. Ever since, the investment costs have been to a large extent covered by the ESIF.

2014

International Assessment

The Ministry of Education, Youth and Sports arranged the international evaluation on the Czech large research infrastructures for the first time. The second round of the peer-review evaluation was held in 2017, resulting in 48 top-class open access based R&D facilities to enter the Roadmap in 2019, with funding secured until 2022.

2019

Internationalisation

The Czech Republic is a Member State of 14 ERIC (and prospective Member of 6 emerging ones) and international R&D organisations of a world-wide importance. The Czech Republic also applied to become the Host Country of ELI ERIC to operate the Extreme Light Infrastructure (ELI).

ROADMAP OF LARGE RESEARCH INFRASTRUCTURES



2010



2011



2015



2019

NEW EDITION

3. ROADMAP OF LARGE RESEARCH INFRASTRUCTURES – UPDATE 2019

- Strategy and **policy-making document** prepared by the Ministry of Education, Youth and Sports and adopted / acknowledged by the Government of the Czech Republic
- Complementary to the Roadmap of European Strategy Forum on Research Infrastructures – “**ESFRI Roadmap**” – and contribution of the Czech Republic to the research infrastructure landscape in Europe and worldwide

WHAT IS THE STRUCTURE?

- **Foreword** by Minister of Education, Youth and Sports on the importance of agenda
- **Overview** of the agenda development since 2009, with a policy view to 2029
- **Landscape analysis** and **scientific and technical description** of individual large research infrastructures
- **Annexes** (maps, tables, charts, etc.)

WHAT IS THE CONTENT?

- Introduction to **international peer-review evaluation methodology** used by the MEYS
- **Typology** of large research infrastructures of the Czech Republic (national-based / abroad)
- Inventory of **memberships** in international research infrastructures (ERIC, international R&D organisations, etc.)
- 48 large research infrastructure **one-pagers**

HOW 48 LARGE RESEARCH INFRASTRUCTURES ENTER THE ROADMAP?

- Following the 1st round organised in 2014, the Ministry of Education, Youth and Sports held the 2nd **international assessment of Czech large research infrastructures in 2017**, both **interim** for facilities already funded and **ex-ante** for brand new project proposals submitted to enter the Roadmap of large Research Infrastructures in 2019
- Assessment methodology was to a large extent inspired by the evaluation procedures used by the **European Strategy Forum on Research Infrastructures (ESFRI)** and based on international peer-review principles
- **International assessment committee** was composed of the Chair and 6 Scientific Boards per 5 Members, each formed by internationally recognised experts (including 1 Member from the Czech Republic)
- Two **in-person meetings** of Scientific Boards, coordination **video-conferences** of Scientific Board Chairs with the Chair, external inputs delivered by **another 3 reviewers**, **interview** with large research infrastructures' directors

→ **Comprehensive assessment**



WHAT ARE THE ASSESSMENT CRITERIA APPLIED?

SCIENTIFIC EXCELLENCE

- Importance and contribution of facility to development of respective R&D area
- Knowledge and technology expertise provided to the user community
- Open access policy and arrangements and capacity use by user community
- Scientific results achieved by users and knowledge / technology transfer
- Cooperation at national and international level with public and private R&D sector

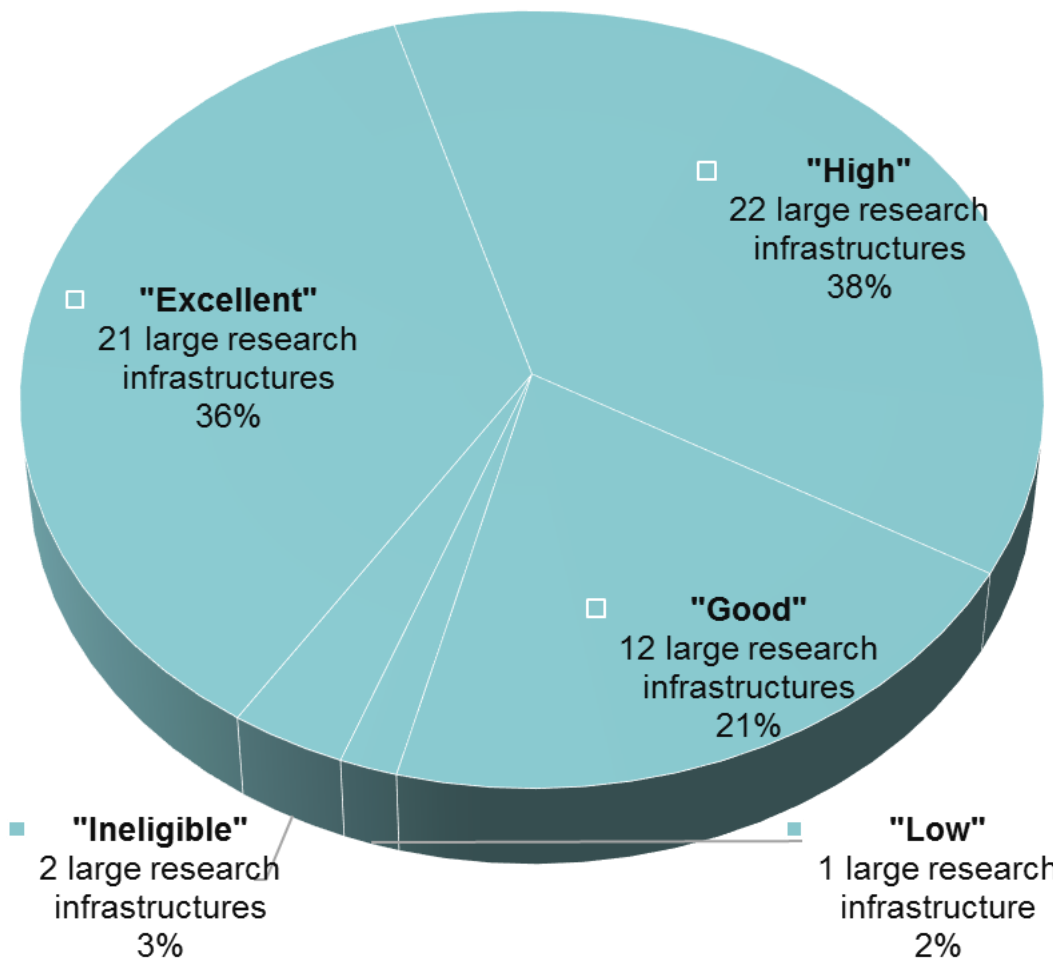
ASSESSMENT

IMPLEMENTATION PLAN

- Organisation and management structure and human resources development plan
- Implementation / long-term investment plan, feasibility study and SWOT analysis
- Reaching milestones and fulfilment of key performance indicators
- Costs and budget, including detailed description of budgetary items, etc.
- Communication strategy, marketing, outreach activities, media coverage

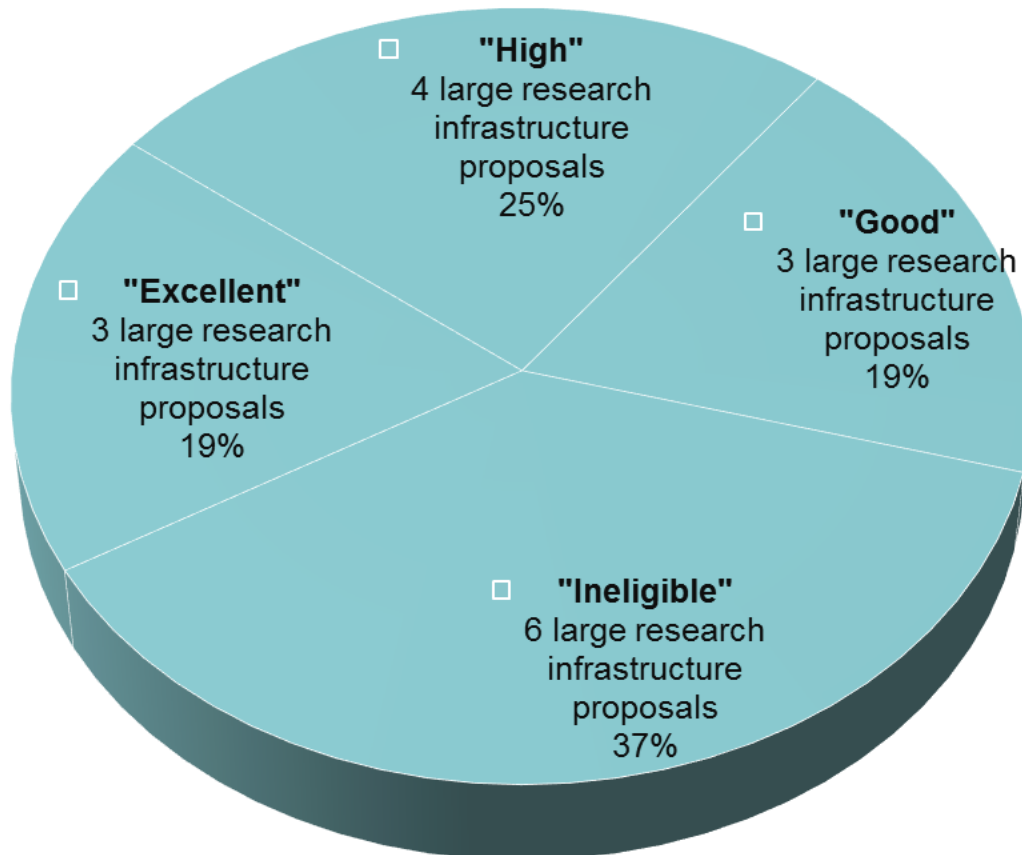
QUALITY CHECKED

INTERIM ASSESSMENT OF LARGE RESEARCH INFRASTRUCTURES





EX-ANTE ASSESSMENT OF NEW LARGE RESEARCH INFRASTRUCTURE PROJECT PROPOSALS



4. LARGE RESEARCH INFRASTRUCTURES – FUNDING FRAMEWORK 2022

OPERATION COSTS

- Budgetary chapter of the **Ministry of Education, Youth and Sports**
- **State budget expenditures** of the Czech Republic on R&D and innovations – the “**large research infrastructures**”
 - **1 890 million CZK** (\approx € 73.5 million) per year in the years 2020-2022
- **State budget expenditures** of the Czech Republic on R&D and innovations – the **membership fees** for international R&D organisations and ERIC participation
 - \approx **950 million CZK** (\approx € 37 million) per year in the years 2020-2022

INVESTMENT COSTS

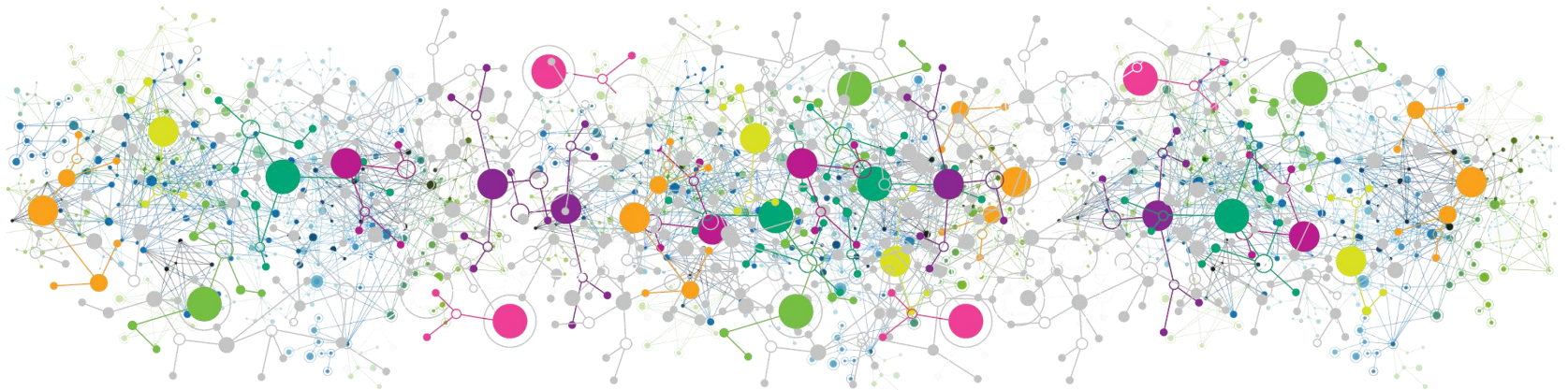
- Budgetary chapter of the **Ministry of Education, Youth and Sports**
- **European Structural and Investment Funds (ESIF)** – Operational Programme Research, Development and Education
- **1 000 million CZK** (\approx € 39 million) per year in the years 2020-2022



5. INTERNATIONALISATION OF LARGE RESEARCH INFRASTRUCTURES

WHY DO WE COOPERATE AT INTERNATIONAL LEVEL?

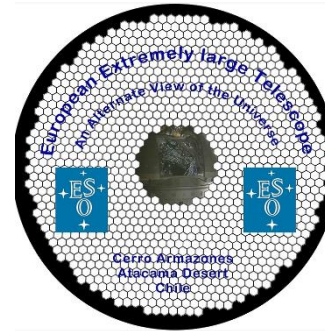
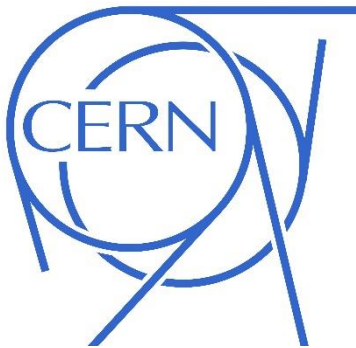
- Even the world's largest, most advanced and richest countries cannot meet the socioeconomic challenges they are facing on their own, using solely their national capacities and capabilities → Therefore, we:
 - Pool limited human (knowledge), material (technology) and financial (budget) resources
 - Build joint capacities (research infrastructures) and capabilities (expertise and know-how)
 - Share good practice examples in policy-making and funding (methodology frameworks)
 - Network, cluster and create common legal entities (international R&D organisations, ERIC)



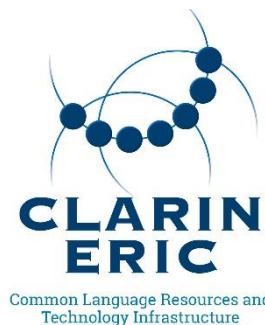
HOW DO CZECH LARGE RESEARCH INFRASTRUCTURES NETWORK?

- **The Czech Republic is a Member State of:**
 - 8 International R&D organisations established under the international public law, including the ITER Organisation (via membership in EURATOM) and VKIFD (via membership in NATO)
 - 14 European Research Infrastructure Consortia (ERIC) founded under the European Union legal framework, and prospective Member of 6 other ERIC legal entities, including ELI ERIC
 - International research infrastructures operated on the basis of national legal framework of their host countries (such as the Jules Horowitz Reactor in Cadarache, France, etc.)
- **The Roadmap of Large Research Infrastructures includes:**
 - 12 Large research infrastructure projects (out of a total of 48), which secure participation of the Czech research community in international research infrastructures located abroad, both in Europe and America (such as the European Spallation Source, Sweden, etc.)
- **Large research infrastructures of the Czech Republic participate in:**
 - 23 “ESFRI Landmarks” (out of a total of 37 “ESFRI Landmarks” on the ESFRI Roadmap 2018)
 - 5 “ESFRI Projects” (out of a total of 18 “ESFRI Projects” on the ESFRI Roadmap 2018)

INTERNATIONAL RESEARCH & DEVELOPMENT ORGANISATIONS



EUROPEAN RESEARCH INFRASTRUCTURE CONSORTIA (ERIC)





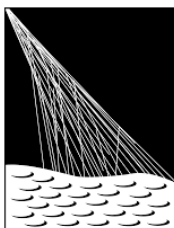
EUROPEAN RESEARCH INFRASTRUCTURE CONSORTIA (ERIC)
PROSPECTIVE MEMBERSHIPS



OTHER INTERNATIONAL RESEARCH INFRASTRUCTURES PARTICIPATED BY THE CZECH RESEARCH COMMUNITY



EuroHPC
Joint Undertaking



PIERRE
AUGER
OBSERVATORY



BROOKHAVEN
NATIONAL LABORATORY







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MINISTRY OF EDUCATION,
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Thank you for your attention!



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