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The background of the slide is a dark, teal-toned image. It features a hand holding a transparent, rectangular chip or wafer. The chip has intricate circuitry and patterns on its surface. The lighting is dramatic, highlighting the edges of the chip and the texture of the hand. The overall aesthetic is technological and futuristic.

Research Infrastructures of the Czech Republic in the context of European Research Area

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1. Ministry of Education, Youth and Sports – mission

- The leading public authority of the Czech Republic responsible for policy-making and public funding of R&D, including the international cooperation in R&D and use of the European Structural and Investment Funds
 - **National Research, Development and Innovation Policy** of the Czech Republic for the years 2016-2020 (the responsibility shared with the Research, Development and Innovation Council)
 - **Operational Programme Research, Development and Education** (EU cohesion policy instrument for programming period 2014-2020)
 - **National ERA Roadmap** of the Czech Republic for the years 2016-2020 (complementary to the European Research Area Roadmap for the years 2015-2020)
 - **Roadmap of Large Infrastructures for Research, Technology Development and Innovation** of the Czech Republic for the years 2016-2022 (complementary to the ESFRI Roadmap)
 - **Action Plan for International Cooperation** of the Czech Republic in R&D and Internationalisation of R&D Environment in the Czech Republic for the years 2017-2020
 - **Action Plan for Human Resources Development and Gender Equality in R&D** in the Czech Republic for the years 2018-2020



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- **Most important public funding provider for R&D in the Czech Republic**
 - Institutional funding for higher education institutions
 - Specific university research performed by Master and Ph.D. students
 - Large research infrastructures funding instrument
 - National sustainability programmes I and II
- **In charge of international cooperation of the Czech Republic in R&D**
 - COMPET, RWP, ERAC, ESFRI, GPC, SFIC, Horizon 2020 PC, etc.
 - Membership in international R&D organisations and ERIC legal entities
 - Participation in international R&D initiatives and programmes
- **Responsible for European Structural and Investment Funds dedicated to public R&D sector of the Czech Republic**
 - Operational Programme Research, Development and Education for the EU cohesion policy period 2014-2020
 - Complementary to the Operational Programme Entrepreneurship and Innovations for Competitiveness (Ministry of Industry and Trade)



2. Large research infrastructures – funding scheme

- Legal definition of a **large research infrastructure** is introduced by the national legislation on the support of research, development and innovation from public funds of the Czech Republic
 - *“Research infrastructure, which is essential for comprehensive research and development with heavy financial and technological demands, which is approved by the Government of the Czech Republic and established for use of other research organisations.”*
- Common characteristics criteria of large research infrastructures
 - **Uniqueness**
 - **Open access**
 - **Excellence**
 - **National impact**
 - **International overlap**



→ Service facility!



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● Uniqueness

- A large research infrastructure represents an exceptional and unique facility gathering critical mass of technological devices and knowledge expertise needful for cutting-edge basic/applied research, development of state-of-the-art technologies and breakthrough innovations

● Open access

- A large research infrastructure is operated by a research organisation for the use of other entities from the research community and provides external users with services on basis of tenders evaluated by experts

● Excellence

- Scientific and innovation results reached by using the large research infrastructure respond to socio-economic challenges and are of high-quality and highly relevant from the “value for money” point of view





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● National impact

- A large research infrastructure has nation-wide importance, significance and user impact within the Czech Republic

● International overlap

- A large research infrastructure is linked to research infrastructures located abroad and participates in macro-regional, pan-European and/or global networks, thus having significant international impact





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- **Requirements for public funding** of a large research infrastructure
 - Compliance with **general qualitative criteria** stipulated by the national legislation of the Czech Republic on support of research, development and innovation from public funds
 - Positive outcome of the **international peer-review evaluation** organised by the Ministry of Education, Youth and Sports (being responsible for policy-making and public-funding)
 - Recommendation for funding issued by **Research, Development and Innovation Council** (advisory board to the Government of the Czech Republic)
 - Adoption of funding proposed by the Minister of Education, Youth and Sports on the **Government of the Czech Republic** session





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- **Once approved by the Government of the Czech Republic**
 - Inclusion in the **Roadmap** of Large Infrastructures for Research, Technology Development and Innovation of the Czech Republic
 - Funding of **operational costs** by state budget expenditures on R&D
 - Personal costs – costs of management, researchers and technicians operating the large research infrastructure
 - Operation costs – materials, energy, services (subcontracts), international mobility, overheads (flat rate x full-cost), etc.
 - Membership fees – participation in international research infrastructures' networks and legal frameworks (ERIC, etc.)





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- **Once approved by the Government of the Czech Republic**
 - Eligibility for particularly dedicated call of the Operational Programme Research, Development and Education for covering the **investments**
 - Complementary use of state budget expenditures of the Czech Republic on R&D and European Structural and Investment Funds
 - Mandate for the Minister of Education, Youth and Sports to enter – on behalf of the Czech Republic – **international legal framework** (e.g. ERIC) that a large research infrastructure is coordinated within



3. Roadmap of large research infrastructures of the Czech Republic for the years 2016-2022

- Strategy and policy document of the Czech Republic prepared by the **Ministry of Education, Youth and Sports** and adopted by the **Government of the Czech Republic**
- For the very first time issued in 2010, afterwards updated in 2011 and 2015, the latest **update planned for 2019**, following a comprehensive international evaluation of large research infrastructures in 2017
- Overview of genesis of the agenda, evaluation mechanisms, strategy outlook, landscape analysis, description of individual large research infrastructures in 6 scientific areas
 - **Physical sciences and engineering**
 - **Energy**
 - **Environmental sciences**
 - **Biomedicine / Health and food**
 - **Social sciences and humanities**
 - **ICT / e-infrastructures**

www.esfri.eu/national-roadmaps



● Typology of large research infrastructures

- Research infrastructures **located in the Czech Republic** that have significant international overlap and are networked within international legal frameworks such as the ERIC
- Participation in research infrastructures **located abroad**
 - Active involvement in all levels of the governance structure
 - Development of experimental devices and in-kind deliveries
 - Running a regional partner facility in the Czech Republic
 - Access point for user community from the Czech Republic
 - Bringing significant added value to the research infrastructure





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- Participation in research infrastructures **located abroad**
 - **Auger-CZ** – Pierre Auger Observatory
 - **BNL-CZ** – Brookhaven National Laboratory
 - **CERN-CZ** – European Organisation for Nuclear Research
 - **CTA-CZ** – Cherenkov Telescope Array
 - **ESS Scandinavia-CZ** – European Spallation Source
 - **EST-CZ** – European Solar Telescope
 - **EU-ARC.CZ** – Atacama Large Millimeter / Submillimeter Array
 - **FAIR-CZ** – Facility for Antiproton and Ion Research
 - **Fermilab-CZ** – Fermi National Accelerator Laboratory
 - **JHR-CZ** – Jules Horowitz Reactor
 - **LSM-CZ** – Laboratoire Souterrain de Modane
 - **SPIRAL2-CZ** – Système de Production d'Ions Radioactifs Accélérés en Ligne





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- **Membership in European Research Infrastructure Consortia (ERIC)**
 - **BBMRI** (Biobanking & Biomolecular Resources Research Infrastructure)
 - **CERIC** (Central European Research Infrastructure Consortium)
 - **CESSDA** (Consortium of European Social Science Data Archives)
 - **CLARIN** (Common Language Resources & Technology Infrastructure)
 - **EATRIS** (European Infrastructure for Translational Medicine)
 - **ECRIN** (European Clinical Research Infrastructure Network)
 - **EU-OPENSREEN** (European Infrastructure of Open Screening Platforms for Chemical Biology)
 - **ESS** (European Social Survey)





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- **Membership in European Research Infrastructure Consortia (ERIC)**
 - **ESS** (European Spallation Source)
 - **ICOS** (Integrated Carbon Observation System)
 - **INSTRUCT** (European Integrated Structural Biology Infrastructure)
 - **SHARE** (Survey of Health, Ageing and Retirement in Europe)
- **ERIC soon to be established with membership of the Czech Republic**
 - **ELI** (Extreme Light Infrastructure)
 - **Euro-BioImaging** (European Research Infrastructure for Imaging Technologies in Biological and Biomedical Sciences)

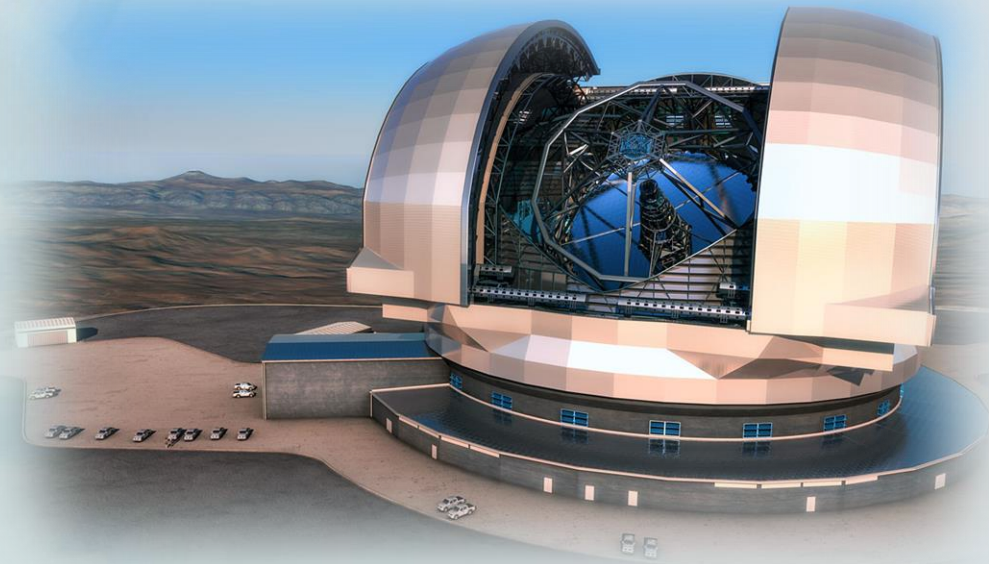




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- **Membership in international R&D organisations**

- **CERN** (European Organisation for Nuclear Research)
- **EMBC** (European Molecular Biology Conference)
- **EMBL** (European Molecular Biology Laboratory)
- **ESA** (European Space Agency)
- **ESO** (European Southern Observatory)
- **JINR** (Joint Institute of Nuclear Research)





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4. Evaluation of large research infrastructures 2017

- Expert basis for policy-decision making process on **funding of already supported large research infrastructures in 2020-2022**, both by the state budget expenditures (operational costs) and European Structural and Investment Funds (investment costs)
- Expert basis for policy-decision making process on **funding of new large research infrastructures' projects in 2019-2022**, both by the state budget expenditures (operational costs) and European Structural and Investment Funds (investment costs)
- Expert basis for policy-decision making process on supporting the pan-European research infrastructures with the Czech participation applying for the **2018 ESFRI Roadmap update**
- Expert basis for the **2019 update of Roadmap** of Large Infrastructures for Research, Technology Development and Innovation of the Czech Republic for the years 2016-2022





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- **Large research infrastructures evaluation procedure**
 - Methodology was prepared and international evaluation committee appointed in close cooperation with **Large Research Infrastructures Council** (advisory board to Minister of Education, Youth and Sports)
 - Methodology was inspired by rigorous ESFRI evaluation standards and based on **international peer-review** assessment principles
 - International evaluation committee was composed of a **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 in Prague, coordination video-conference meeting of Scientific Boards' Chairs with the Chair, external inputs delivered by another 3 reviewers, interview with large research infrastructures → **comprehensive assessment**



● Large research infrastructures evaluation criteria

- Organisation and management structure
- Knowledge and technology expertise provided
- Technology and human resources development plans
- Cooperation at national / international level with public / private sector
- Importance / contribution for development of respective R&D area
- Compliance with needs of user community and scientific trends
- Open access policy / arrangements and capacity use
- Scientific results achieved by users
- Feasibility / SWOT analysis
- Benchmarking
- Communication / marketing
- Costs and budget
- Performance indicators
- Milestones



- **Large research infrastructures evaluation outcomes**

- Division of (1) already financed large research infrastructures and (2) new large research infrastructures' projects in **6 performance based groups according to the overall evaluation scale**, thus indicating the science-based priority for public funding in direct proportion to quality-differentiated outcomes of the evaluation

- **5 – Excellent quality**

- **4 – High quality**

- **3 – Good quality**

- **2 – Low quality**

- **1 – Very low quality**

- **0 – Does not comply with criteria of a large research infrastructure**

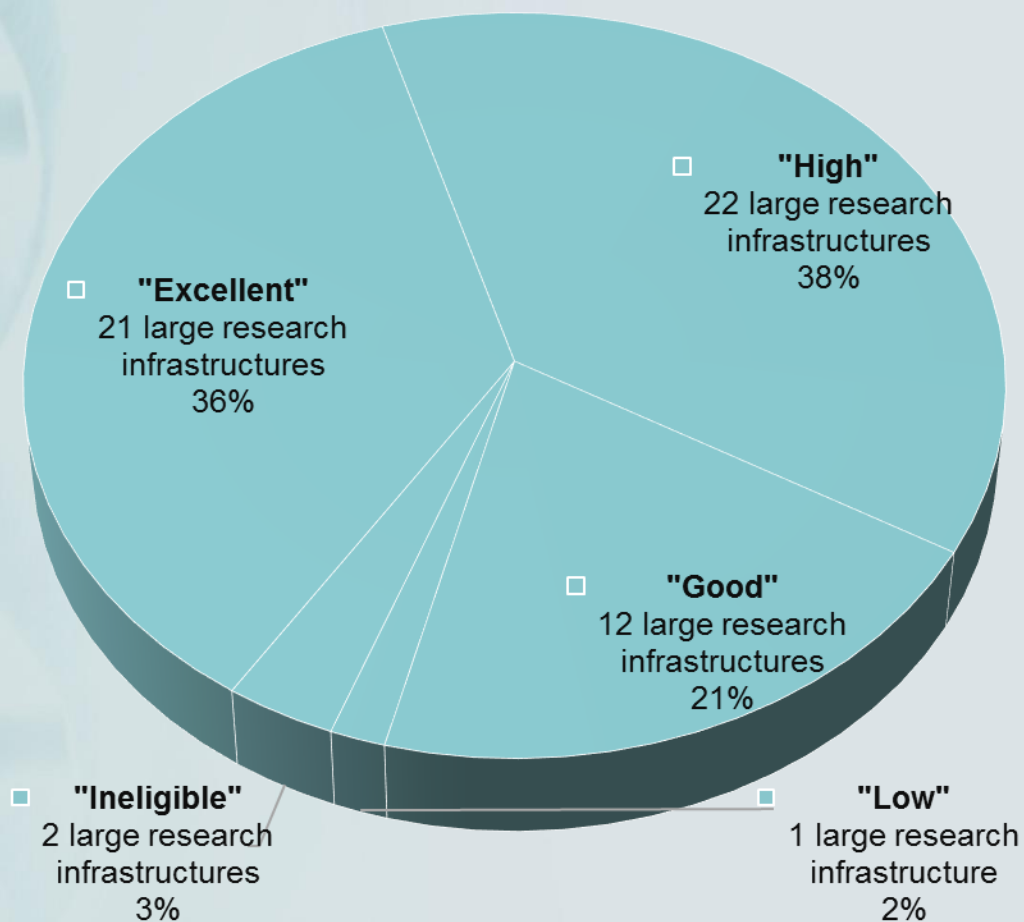


Interim evaluation of large research infrastructures



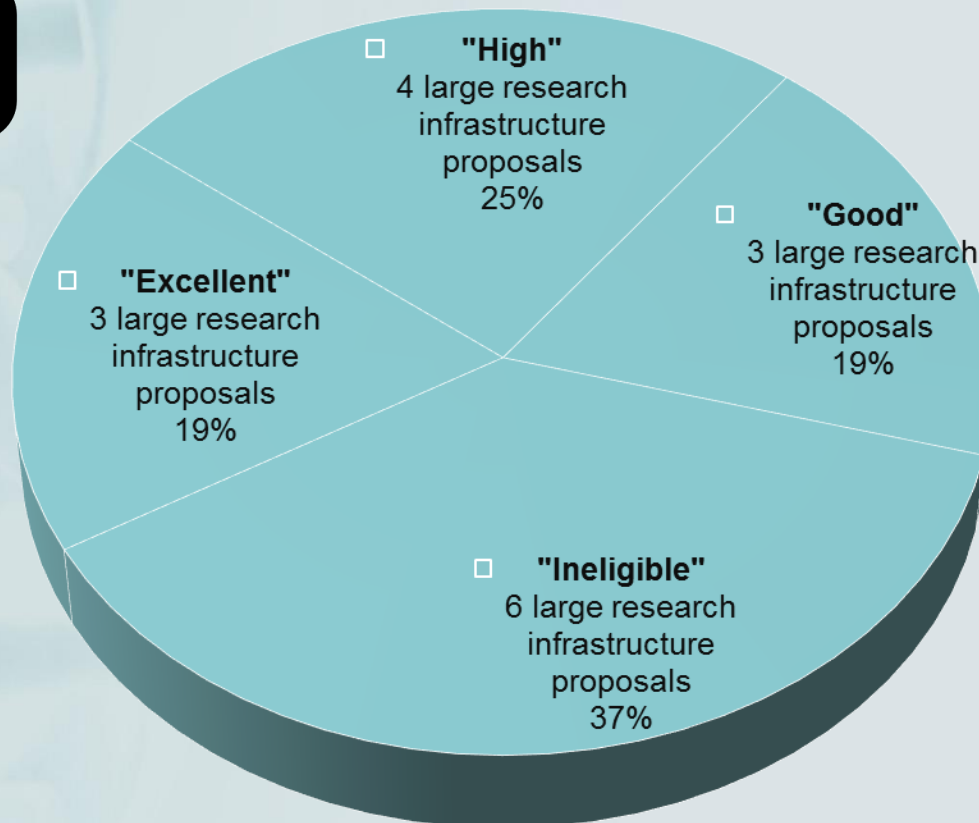
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- **58 large research infrastructures** approved by the Government of the Czech Republic for public funding in the years 2016-2019 → **interim evaluated**



Ex-ante evaluation of large research infrastructures

- **17 new proposals submitted** for the 1st stage of evaluation
- 11 new proposals advanced to the 2nd stage (2 advised to merge)
- **10 new proposals passed** through the evaluation



5. Large research infrastructures funding until 2022

- **Large research infrastructures 2017 evaluation procedure**
 - Completed in 7/2017, consensus reports distributed in 8/2017
 - Research, Development and Innovation Council informed in 10/2017
 - Government of the Czech Republic informed in 11/2017
- **Political decision on funding to be adopted by the end of 2018**
 - Research, Development and Innovation Council statement in 10/2018
 - Follow-up interdepartmental consultation process in 11/2018
 - Approval by the Government of the Czech Republic in 12/2018





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● Large research infrastructures funding proposal

- The multiannual financial framework for covering the **operational costs** by using the state budget expenditures in the years 2020-2022 was set by Research, Development and Innovation Council at the level of **1 890 million CZK (≈ 75 million EUR) per year**
- The multiannual financial framework for covering the **investment costs** by using the European Structural and Investment Funds in the years 2020-2022 was set by the Ministry of Education, Youth and Sports at the level of **3 billion CZK (≈ 120 million EUR) totally**
- Complementary and synergy use of the state budget expenditures of the Czech Republic and European Structural and Investment Funds



- **Large research infrastructures funding proposal**
 - **Interim evaluated large research infrastructures 2020-2022**
 - Excellent quality → 21 facilities
 - High quality → 22 facilities
 - Good quality → 2 facilities (due to ERIC memberships)
 - **Ex-ante evaluated large research infrastructures 2019-2022**
 - Excellent quality → 3 facilities
 - High quality → 4 facilities
 - **Merging of large research infrastructures**
 - CESNET + IT4I + CERIT-SC → e-INFRA CZ
 - LINDAT/CLARIN + DARIAH-CZ → LINDAT/CLARIAH-CZ
 - CEITEC Nano + LNSM → CzechNanoLab

**48 large research infrastructures
to be financially supported from the
public funds of the Czech Republic**





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● Follow-up

- 2019 update of **Roadmap** of Large Infrastructures for Research, Technology Development and Innovation of the Czech Republic for the years 2016-2022 and approval by the Government of the Czech Republic
- Launch of the “**Research Infrastructures II**“ calls in the Operational Programme Research, Development and Education (investment costs funding in 2020-2022)
- Preparation of the large research infrastructures funding instrument for the **period 2023+** when extensive use of the European Structural and Investment Funds may terminate





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● Follow-up

- The large research infrastructures' landscape of the Czech Republic consists of high number of facilities, which comply with all necessary quality criteria, but due to their individual approach make the system still rather **fragmented**, thus not enabling to use the full potential of their expertise by means of synergy and complementary approach
- Further **concentration** of large research infrastructures capacities, which technology and knowledge expertise within respective R&D field is complementary (but the facilities themselves are operated on individual basis), **is needed**





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● Follow-up

- Creation of wider large research infrastructures' **consortia** in the Czech Republic (without the need to merge on institutional basis)
- Combination of the **top-down** and **bottom-up approach** in line with the recommendations provided by international evaluation committee of large research infrastructures during the 2017 assessment process





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Thank you for your attention!

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