PRESENT AND FUTURE
OF THE HUNGARIAN RI ECOSYSTEM

Research Infrastructure Monitoring Workshop

István SZABÓ PhD, Vice President of NKFIH

Budapest - 27 May, 2019
Tasks of National Research, Development and Innovation Office

- strategic planning of **calls for proposals**, coordinated **management** of the application procedure, programme **evaluation** and **monitoring** system;

- managing the **National Research, Development and Innovation Fund** and being responsible for the strategic planning of research development and innovation calls financed from EU funds;

- governmental coordination of RDI issues and **representation of Hungary in international organizations** (in cooperation with the MIT);

- establishment of **innovation services** and collaboration **platforms**, maintenance of **databases**, preparation of **strategic analyses**.
HUNGARIAN RDI SYSTEM IN BRIEF
Performance of EU Member States’ innovation systems

European Innovation Scoreboard 2018
(Columns show Member States’ performance in 2017)

compared to the EU’s 2016 innovation performance%

Source: European Innovation Scoreboard 2018
Share of innovative businesses

The share of innovative businesses in Hungary

INNOVATIVE BUSINESSES BY SIZE CLASS

Source: KSH / Data source: Hungarian Central Statistical Office
**Firm innovation**

**Barriers to innovation at innovative businesses**

- 26.8% Too high innovation costs
- 24.1% Difficulties in obtaining government grants or subsidies for innovation
- 22% Lack of skilled employees within the enterprise
- 20.9% Lack of internal finance for innovation
- 15.4% Too much competition in the market of the enterprise
- 11.2% Uncertain market demand for ideas of enterprise for innovations
- 10.7% Lack of credit or private equity
- 5.3% Lack of collaboration partners

**Non-innovators**

- 14% Considered innovating, but barriers to innovation too large
- 86% No compelling reason to innovate

**86% of non-innovative businesses stated that they had no compelling reason to innovate.**

**Most innovative businesses mentioned financial factors as the barriers to innovation, but the shortage of skilled employees is also a problem.**

Source: KSH / Data source: Hungarian Central Statistical Office
GERD by sectors of performance and sources of funds

**Source:** RESEARCH, DEVELOPMENT AND INNOVATION IN HUNGARY, by NRDIO
Cooperation among the RDI sectors

Share of product and/or process innovative firms cooperating with universities, government, public or private research institutes

EU-28: 15,0%
HU: 13,6%

Source: ERA Progress report 2018
(Computed by Science-Metrix using Eurostat data)
Regional differences in R&D

- Significant spatial concentration
- Budapest as a primate city
- Regional university/industry poles
- Goal: smart specialisation, regional networking based on local capacities

Source: KSH / Data source: Hungarian Central Statistical Office
Universities Cooperation for "Third Generation University"

Knowledge

1. Education
   - Curriculum Development & Delivery
   - Student Mobility
   - Dual studies programme
   - LLL

2. Research
   - Shared facilities
   - Governance
   - Consulting
   - Professional mobility
   - Joint R&D
   - Academic entrepreneurship
   - Commercialisation of R&D
   - Student entrepreneurship

Low

New

High

Practical application of knowledge
Mintacím szerkesztése

Higher Education and Industry Cooperation Centres

Gazdaságfejlesztési és Innovációs Operatív Program

Nemzeti Kutatási, Fejlesztési és Innovációs Alap

GINOP

NKFI Alap

BUDAPEST

GYŐR

MISKOLC

GÖDÖLLŐ

DEBRECEN

KECSKEMÉT

Kaposvár

5,9 Mrd Ft Autóipar

6,4 Mrd Ft Autóipar

2,6 Mrd Ft Agrárinformatika

1,5 Mrd Ft Agrárinformatika

5 Mrd Ft Anyagtechnológia

4,2 Mrd Ft Növénytermesztés Állattannyésztés Klimaváltozás

2,6 Mrd Ft Egészségipar

4 Mrd Ft Gyógyszeripar

6 Mrd Ft Egészségipar

6 Mrd Ft Egészségipar

5 Mrd Ft Egészségipar

6 Mrd Ft Anyagtechnológia

4 Mrd Ft Anyagtechnológia

5 Mrd Ft Anyagtechnológia

1,5 Mrd Ft Anyagtechnológia

NÖVÉNYTERMESZTÉS

ÁLLATTANYÉSZTÉS

KLIMAVÁLTOZÁS

ANYAGTECHNOLÓGIA

AGRÁRINFORMATIKA

AUTÓIPAR

EGÉSZSÉGPÁR

GYÓGYSZERIPAR

Egészségipar

4 Mrd Ft

Gyógyszeripar

5 Mrd Ft

Növénytermesztés

Állattannyésztés

Klimaváltozás

Autóipar

2,6 Mrd Ft

Gödöllő

Miskolc

Kaposvár

Debrecen

Budapest

Győr

Kecskemét

Debrecen

Gödöllő

Miskolc

Kaposvár

Budapest

Győr

Kecskemét

Debrecen

GINOP

NKFI Alap

NATIONAL RESEARCH, DEVELOPMENT AND INNOVATION OFFICE HUNGARY
The centres develop an infrastructure background for industrial development projects based on current market needs, in collaboration with the excellent research institutions of the discipline(s) concerned.

The centres develop the domestic research infrastructure in the form of cooperation between industry and higher education. The developed RDI capacity generates new competitive products and services.

35 billion HUF was allocated in 2016 for establishing RD centres.

The support program enables the establishment of centres based on corporate RD needs and the use of university RD capacities.
New National RDI Strategy 2021 – 2030
HIGH VALUE ADDING, KNOWLEDGE-BASED, BALANCED, SUSTAINABLE ECONOMY AND SOCIETY
Mission

RDI policy:

• Contributes to the fulfillment of the vision to great social challenges through the establishment of a stable and supportive environment
• Promotes a deeper international, first and foremost European embeddedness
• Promotes public sector innovation
• Supports excellence-based research and development, along with horizontal, non-technological innovation and attitude-shaping
The target system of the RDI Strategy

HORIZONTAL OBJECTIVES

- KNOWLEDGE GENERATION
- COOPERATION AND KNOWLEDGE TRANSFER
- KNOWLEDGE EXPLOITATION AND BUSINESS INNOVATION
Specific objectives of the RDI Strategy: Knowledge production

- Securing the critical mass of young researchers in the long run
- Practice-oriented higher education and RDI programmes, following the local needs
- Introduction of doctoral programmes better responding to market needs, e.g. industrial PhD scheme
- Knowledge co-creation activities of higher education institutions and public research institutions involving non-state RDI actors
- Development and more efficient exploitation of human capacities and research infrastructures of public research institutions
- Promotion of business RDI
- Enhancement of knowledge-based services
Specific objectives of the RDI Strategy: Cooperation and knowledge transfer

- Promotion of active knowledge transfer between the stakeholders of the innovation ecosystem
- Support of open innovation and open access
- Establishment of research career models enabling to move between the academic and business sectors
- Encouragement of international researcher mobility
- Facilitation of access to RDI infrastructure
- Reinforcement of RDI cooperations between firms
- Motivation of international RDI cooperations
Specific objectives of the RDI Strategy: knowledge exploitation and business innovation

- Management and exploitation of intellectual property
- Development of the startup ecosystem and fostering the founding of spin-offs
- Strengthening the innovativity of companies
- Promotion of technological and non-technological (organisational, marketing) innovation
- Investment in next generation innovation infrastructure
- Support of the third mission activities of higher education institutions
Horizontal objectives of the RDI Strategy

- Motivation for innovation, openness, creative thinking and value creation
- Providing an up-to-date regulatory and business environment supporting RDI activities
- Reinforcement of territorial, social and economic cohesion along with the measures of the RDI policy
- Establishment of a stable and motivating financial support system
- Promotion of mission-oriented innovation
- Achievement of gender equality within the stakeholders of the RDI system
## Planned financial framework

<table>
<thead>
<tr>
<th>Call</th>
<th>Planned framework</th>
<th>Support per project</th>
<th>Approximate number of beneficiaries</th>
<th>Type of beneficiary</th>
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</thead>
<tbody>
<tr>
<td>SME START Innovation</td>
<td>HUF 10 Bn</td>
<td>HUF 10-20 M</td>
<td>650-700</td>
<td>SMEs</td>
</tr>
<tr>
<td>Market-led RDI</td>
<td>HUF 45 Bn</td>
<td>HUF 50-700 M</td>
<td>160-200</td>
<td>SMEs, large companies, universities/research and knowledge transfer organisations</td>
</tr>
<tr>
<td>Open Innovation</td>
<td>HUF 1,5 Bn</td>
<td>HUF 10-150 M</td>
<td>15-20</td>
<td>large companies &amp; SMEs</td>
</tr>
<tr>
<td>University-industry cooperation</td>
<td>HUF 20 Bn</td>
<td>HUF 1 - 6 M</td>
<td>4-8</td>
<td>large companies, research and knowledge transfer organisations, SMEs</td>
</tr>
<tr>
<td>Intellectual property rights</td>
<td>HUF 0,05 Bn</td>
<td>HUF 0,1-7,1 M</td>
<td>20-40</td>
<td>SMEs, large companies, research and knowledge transfer organisations, state bodies, nonprofit organisations, natural persons</td>
</tr>
</tbody>
</table>
Cooperation with international RIs

NATIONAL RESEARCH INFRASTRUCTURE ROADMAP
Participation in International Cooperation

Memberships fees of International Research Infrastructures
Contribution payed by the National Research, Development and Innovation Office

SUM: ~3,3 Mrd Ft/year (~10 M€/2018)
## Hungary’s Memberships in International Research Infrastructures

<table>
<thead>
<tr>
<th>Physical Sciences and Engineering</th>
<th>Health and Food</th>
<th>Social &amp; Cultural Innovation</th>
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</thead>
<tbody>
<tr>
<td>CERIC-ERIC</td>
<td>ECRIN-ERIC</td>
<td>CESSDA-ERIC</td>
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<tr>
<td>Central European Research</td>
<td>European Clinical Research Infrastructure</td>
<td>Consortium of European Social Science Data Archives</td>
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<tr>
<td>Infrastructure Consortium</td>
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<tr>
<td>CERN</td>
<td>ELIXIR</td>
<td>CLARIN-ERIC</td>
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<tr>
<td>The European Organization for</td>
<td>A distributed infrastructure for life-science information</td>
<td>Common Language Resources and Technology</td>
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<tr>
<td>Nuclear Research</td>
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<tr>
<td>CERN HL-LHC (ALICE, CMS)</td>
<td>EMBL</td>
<td>ESS-ERIC</td>
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<tr>
<td>High-Luminosity Large Hadron</td>
<td>European Molecular Biology Laboratory</td>
<td>European Social Survey</td>
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<td>Collider (CERN)</td>
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<tr>
<td>ELI-ERIC</td>
<td>ERINHA</td>
<td>SHARE-ERIC</td>
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<tr>
<td>Extreme Light Infrastructure</td>
<td>European Research Infrastructure on Highly Pathogenic Agents</td>
<td>Survey of Health, Ageing and Retirement in Europe</td>
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<td>ESA</td>
<td>EuBi ERIC</td>
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<tr>
<td>European Space Agency</td>
<td>European Research Infrastructure for Imaging Technologies in Biological and Medical Sciences</td>
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<td>ESRF UPDATES</td>
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<tr>
<td>European Synchrotron Radiation</td>
<td>ICGBE</td>
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<tr>
<td>Facility (ESRF), Phase II</td>
<td>International Centre for Genetic Engineering and Biotechnology</td>
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<tr>
<td>Extremely Brilliant Source</td>
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<td>ESS-ERIC</td>
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<td>European Spallation Source</td>
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<td>European XFEL</td>
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<td>European X-Ray Free-Electron</td>
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<td>Laser Facility</td>
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<td>ITER/EUROfusion</td>
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<td>International Thermonuclear</td>
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<td>Experimental Reactor</td>
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<td>GÉANT</td>
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<td>Pan-European data network for</td>
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<td>research and education</td>
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<td>community</td>
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<td>PRACE</td>
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<td>Partnership for Advanced</td>
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<td>Computing in Europe</td>
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Source: RESEARCH, DEVELOPMENT AND INNOVATION IN HUNGARY, by NRDIO
### ERICS in the EU from 2011

**HU participation in ERICs (10)**

**Other related HU memberships:**
- CERIC-ERIC (non ESFRI)
- CERN
- ELIXIR
- EMBL
- ERINHA
- ESA
- ESRF UPGRdades
- GEANT
- ICGEB
- ITER/EUROfusion
- PRACE
- XFEL

<table>
<thead>
<tr>
<th>Year</th>
<th>SHARE</th>
<th>CLARIN</th>
<th>EATRIS</th>
<th>EURO ARGO</th>
<th>ESS Neutron</th>
<th>EMSO</th>
<th>LIFE WATCH</th>
<th>EMBRC</th>
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</tbody>
</table>

*Source: EC DG RTD Directorate B, B.4 – Research infrastructure, Feb 9, 2018*
Support of research infrastructures (RI) in Hungary

Expenditures:

1. **International RI membership fees**: ~10 M€/2018  
   (3.3 billion HUF/2018)

2. **RI development projects** financed by
   - Cohesion Policy Instruments (SF)
   - National Research, Development and Innovation Fund (NRDI Fund)

Knowledge Transfer

- National support for European Research Council (ERC) programme entries…
- Support of research teams with internationally prominent achievements…
- “Frontline” – Research Excellence Programme
- Postdoctoral excellence programme
- Excellence of Strategic R&D centres - Central Hungary

Research Infrastructures

- Excellence of Strategic R&D centres
- Research infrastructure development of Higher Education and Industry Cooperation Centres

Discovery research and Postdoctoral Programmes

- Postdoctoral excellence programme
- “Frontline” – Research Excellence Programme
- Support of research teams with internationally prominent achievements…

International RDI Cooperation

- National support for European Research Council (ERC) programme entries…

Calls to promote excellence from the NRDI Fund (2015-2017)
RI upgrades from the Structural Funds

Spent on new infrastructure projects (without ELI)

Research Infrastructure development projects from GINOP/VEKOP
## Distribution of H2020 RI Grants per scientific field

<table>
<thead>
<tr>
<th>Scientific Domain</th>
<th>Number of Grants</th>
<th>EU Contribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social sciences and Humanities</td>
<td>13</td>
<td>68,302,468,48</td>
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<tr>
<td>Life sciences</td>
<td>25</td>
<td>163,936,185,81</td>
</tr>
<tr>
<td>Environmental Sciences</td>
<td>22</td>
<td>142,463,359,87</td>
</tr>
<tr>
<td>Material sciences and Analytical Facilities</td>
<td>12</td>
<td>91,889,049,13</td>
</tr>
<tr>
<td>Physical Sciences and Astronomy</td>
<td>21</td>
<td>127,308,787,38</td>
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<tr>
<td>Energy and Engineering</td>
<td>7</td>
<td>46,731,007,65</td>
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<tr>
<td>Information Communication Technologies</td>
<td>4</td>
<td>26,153,874,00</td>
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<tr>
<td>Horizontal policy and inco support measures</td>
<td>10</td>
<td>16,032,529,25</td>
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<tr>
<td><strong>Total RTD grants</strong></td>
<td><strong>114</strong></td>
<td><strong>682,817,261,57</strong></td>
</tr>
</tbody>
</table>

Source: European Commission, DG RTD, March 2017
HU participation in H2020

- Food security, sustainable agriculture and forestry, marine and maritime and inland water research and the bioeconomy: 51 participations, 14.75 M €
- Smart, green and integrated transport: 74 participations, 13.10 M €
- Health, demographic change and wellbeing: 41 participations, 2.88 M €
- Secure, clean and efficient energy: 52 participations, 10.60 M €
- Climate action, environment, resource efficiency and raw materials: 49 participations, 9.44 M €
- Europe in a changing world - inclusive, innovative and reflective Societies: 13 participations, 6.68 M €
- Secure societies - Protecting freedom and security of Europe and its citizens: 89 participations, 2.88 M €

- European Research Council (ERC): 27 participations, 2.88 M €
- Marie-Skłodowska-Curie Actions: 89 participations, 12.07 M €
- Research Infrastructures: 47 participations, 7.54 M €
- Future and Emerging Technologies (FET): 14 participations, 5.63 M €

- Leadership in enabling and industrial technologies (LEIT): 68 participations, 32.19 M €
- Innovation in SMEs: 31 participations, 0.95 M €
- Industrial Leadership - Cross-theme: 10.07 M €

- Teaming of excellent research institutions and low performing RDI regions: 18 participations, 2.142 M €
- Twinning of research institutions: 1 participations, 1.03 M €
- Transnational networks of National Contact Points: 2 participations, 2.57 M €
ESFRI’s role in the EU RI Ecosystem

THE FIFTH ESFRI ROADMAP AND STRATEGY REPORT

2006
2008
2010
2016

ROADMAP 2018

STRATEGY REPORT ON RESEARCH INFRASTRUCTURES

NATIONAL RESEARCH, DEVELOPMENT AND INNOVATION OFFICE
HUNGARY
<table>
<thead>
<tr>
<th>Country</th>
<th>Projects + Landmarks</th>
<th>Projects</th>
<th>Landmarks</th>
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<tr>
<td>EU-28</td>
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<td>37%</td>
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<td>60%</td>
<td>54%</td>
<td>64%</td>
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<td>Cluster 2</td>
<td>36%</td>
<td>24%</td>
<td>42%</td>
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<td>Cluster 3</td>
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<td>Cluster 4</td>
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<td>Cluster 1</td>
<td>FR 78%</td>
<td>67%</td>
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<td>IT 71%</td>
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<td>EL 47%</td>
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<td>FI 44%</td>
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<td>SK 22%</td>
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</table>

Source: ERA Progress report 2018
Status of National RI Roadmaps in 2017 November

Source: InRoad consultation, November 2017
**Status of National RI Roadmaps in 2018**

**Hungary has published the national roadmap in June 2018**

<table>
<thead>
<tr>
<th>Status</th>
<th>Country</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under preparation</td>
<td>Belgium, Cyprus, Hungary</td>
</tr>
<tr>
<td>No roadmap available</td>
<td>Iceland, Latvia, Luxembourg, Malta, Slovak Republic, Turkey</td>
</tr>
</tbody>
</table>

*Source: http://www.esfri.eu/national-roadmaps, 2018 May*
Development of the National RI Roadmap

2008
Launch of the National Research Infrastructure Survey and Roadmap (NEKIFUT) project

2011
Harmonization with the National Smart Specialisation Strategy (S3)

2013
Survey on joining to international research infrastructures (scientific excellence, training of future researchers, sustainability, in-kind contribution)

2014
Setting up of RI groups, joining to several international RIs based on the recommendation of the NKIB (since the end of 2016)

2015
Defining the main chapters of the Roadmap: national RIs, international RIs; RI definition, classification of RIs based on the 6 ESFRI scientific fields

2016
Selection of funded EDIOP/CCHOP (GINOP/VEKOP) etc. projects to be presented, discussion of monitoring criteria

2017
Publication of the National Research Infrastructure Roadmap

2018 March
The Roadmap is accepted by the NKIB

Source: National Research Infrastructure Roadmap, by NRDIO
Hungary’s membership in European RIs

Source: National Research Infrastructure Roadmap, by NRDIO
The Goal, Role & Function of the National Roadmap

- map the major domestic RIs in Hungary
- present the excellence of domestic research communities
- provide guidance for domestic research communities on professional opportunities & requirements
- set realistic goals and formulate recommendations for domestic R&D
- ensure the professional background in strategic issues & decisions connecting to RIs
- facilitate communication with a wider audience.

The national roadmap provides a comprehensive insight for different target groups into the trends of capacities & actual situations with regard to prominent RIs, and create a professional background material for devising future RI development goals.
Definition & Types of RIs in the Hungarian Roadmap

**Definition**

- The set of thematically compatible *equipment*, *laboratories*, *databanks*, *information systems*, as well as associated *human resources* (beyond research resources incl. operation, maintenance & management capacities), expertise, complemented by *services* supporting research activities that form a single unit. These are necessary for conducting high-quality and internationally competitive research activities.

**Types of RIs in Hungary by their physical appearance:**

- **large-scale RIs**
  - physically operating partly in Hungary (e.g. the ELI-ALPS, a distributed RI)

- **physically operating outside of Hungary with Hungarian users’ access**
  - in a single establishment, distributed and/or virtual RI (e.g. the HL-LHC, European XFEL, ESS-ERIC, etc.)

- **physically operating in Hungary**
  - single sited or as parts of a network
  - are not unique
  - provide access to domestic and/or foreign researchers

Source: Eurostat
Forming of RI groups

The Hungarian Roadmap presents **groups of RIs** (not single RIs) according to the ESFRI thematic areas.

**Reasons:**

- Hungary-based RIs are **mainly non-unique** (similar RIs can be found in Europe).
- The groups of RIs can provide an **essential professional background for Hungary** to become an integral part of the international research community, enabling them to connect to large-scale unique RIs at a European level.
- Forming groups (networks) of RIs **can foster co-operation among Hungary-based RIs**, enhancing the professional efficiency and international prestige and competitiveness of Hungarian research groups in a given area.
Methodology of creating the RI groups for the Roadmap

1. Surveying and integration of infrastructure data
   - Source of data:
     - Hungarian ESFRI memberships
     - RIs developed from domestic and EU funds (GINOP/VEKOP etc.)
     - List of SRIs (NEKI-FUT database)

2. Selection of infrastructures to be included in the Roadmap
   - Selection criteria:
     - Open access and capacity
     - International connection
     - Uniqueness and scientific excellence
     - National strategic relevance
     - Upgrading options

3. Selection of RI groups and classification of the individual RIs into them
   - Grouping principles:
     - Presentation of scientific diversity with the whole spectrum of national infrastructures
     - Correspondence with ESFRI thematic fields
     - Sustainability
     - Professional aspects represented by the NKIB members
     - Selection of coordinator institutions

Landscape of domestic RIs
   - With thematic introduction of international (EU) connections

Next steps
   - Monitoring and evaluation of RI groups (paying special attention to the sustainability criteria)
   - Foster the implementation of strategic goals through RI groups (e.g. networking, increased use of capacity, international cooperation, memberships etc.)

Source: National Research Infrastructure Roadmap, by NRDIO
NATIONAL RESEARCH INFRASTRUCTURE ROADMAP

23 International RI memberships (16 ESFRI, 10 ERIC)

26 infrastructure groups

16 recently funded RI development projects
<table>
<thead>
<tr>
<th>RI short name</th>
<th>Involved institutions</th>
</tr>
</thead>
</table>
| **ECRIN ERIC** | **University of Debrecen**  
University of Pécs  
Semmelweis University  
University of Szeged  
National Institute of Clinical Neurosciences  
Medicine for Children Research Network  
RCNS Brain Imaging Centre, HAS  
Svábhegyi Children’s Clinic  
AdWare Research Ltd.  
Pharmahungary Ltd. |
| **ELIXIR** | **Research Centre for Natural Sciences, HAS**  
University of Debrecen  
Biological Research Centre, HAS  
National Agricultural Research and Innovation Center  
University of Pécs Szentágothai Research Centre |
<table>
<thead>
<tr>
<th>RI short name</th>
<th>Involved institutions</th>
</tr>
</thead>
</table>
| EMBL          | **Biological Research Centre, HAS**  
University of Debrecen  
Research Centre for Natural Sciences, HAS |
| Eu-Bi ERIC    | **University of Debrecen**  
Biological Research Centre, HAS  
Semmelweis University  
University of Pécs  
Femtonics Ltd. |
## RI Groups - Physical Sciences & Engineering (1)

<table>
<thead>
<tr>
<th>RI short name</th>
<th>Involved institutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>CERN</td>
<td><strong>Wigner Research Center for Physics, HAS</strong>&lt;br&gt;Eötvös Lóránd University</td>
</tr>
<tr>
<td>ESRF</td>
<td>University of Debrecen&lt;br&gt;Eötvös Lóránd University&lt;br&gt;<strong>Wigner Research Center for Physics, HAS</strong>&lt;br&gt;Institute for Nuclear Research, HAS&lt;br&gt;Centre for Energy Research, HAS&lt;br&gt;Research Centre for Natural Sciences, HAS</td>
</tr>
<tr>
<td>ESS</td>
<td><strong>Wigner Research Center for Physics, HAS</strong>&lt;br&gt;Institute for Nuclear Research, HAS&lt;br&gt;Centre for Energy Research, HAS&lt;br&gt;Evopro Ltd.</td>
</tr>
<tr>
<td>RI short name</td>
<td>Involved institutions</td>
</tr>
<tr>
<td>--------------</td>
<td>-----------------------</td>
</tr>
</tbody>
</table>
| XFEL         | Wigner Research Center for Physics, HAS  
               University of Pécs  
               University of Szeged  
               Biological Research Centre, HAS |
| CERIC ERIC   | Centre for Energy Research, HAS |
| ITER         | Wigner Research Center for Physics, HAS  
               Budapest University of Technology and Economics |
<table>
<thead>
<tr>
<th>RI short name</th>
<th>Involved institutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>CESSDA ERIC</td>
<td>Tarki Social Research Institute</td>
</tr>
</tbody>
</table>
| CLARIN ERIC   | Research Institute for Linguistics, HAS  
|               | University of Szeged  
|               | Budapest University of Technology and Economics  
|               | University of Debrecen  
|               | Pázmány Péter Catholic University  
|               | Institute for Computer Science and Control, HAS  
|               | Morphologic Ltd. |
| European Social Survey (ESS) | Centre for Social Sciences, HAS |
| SHARE ERIC    | Centre for Economic and Regional Studies, HAS  
|               | Tarki Social Research Institute |
Monitoring & Evaluation

Reasoning
- on-going inventory needed
- follow-up of changes, long term goals
- running coasts and financing
- monitor the national needs and international trends
- benefits of international RI memberships

Dimensions
1. ELI
2. international memberships
3. national RIs

Policy indicators
- international memberships (e.g. co-operation, knowledge building)
- national RIs (e.g. sustainability, social & economic impact, innov. pot.)

No detailed set of monitoring indicators given
Monitoring and evaluation of RI memberships

No detailed description of the monitoring system and indicators are given in the National Roadmap! BUT…

Focusing on the international memberships!

International RI membership fees: ~10 M€/2018 (3,3 billion HUF/2018)

Reason for revising the memberships (in every 3-5 years)

- monitor the effectiveness, utilization, measure scientific output
- allow to join existing international RIs as new users
- allow to join newly forming international RIs
- to align with national R&D strategies
- integration into the life of domestic research communities
Important aspects for the monitoring memberships in international RIs

• the number and name of institutions and organizations represented by the researchers using the RI;

• the number of Hungarian researchers/PhD students using the RI;

• the number of new publications resulting from the use of the RI;

• the number of ongoing international research collaborations implemented in the framework of the RI;

• international research cooperation or projects established with new actors in the research sector using the RI.
Possible ways to enhance the use of RIs (1)

• Enhance the **role of intermediaries** (e.g. ILOs) to facilitate knowledge and technology transfer and commercial application of RI services

• Support **large scale initiatives and pilots involving RI**, academy and industry through a co-innovation process;

• **Public-private partnership vouchers** to support enterprise involvement in RI

• Stimulate **joint innovative procurement mechanisms**

• Foster the use of RI for **pre-normative research**

• Increase RI engagement with **industry, SMEs and start-ups**, by fostering their direct and early-involvement in RI
Possible ways to enhance the use of RIs (2)

- Develop a set of Key Performance Indicators (**KPIs**), based on Excellence principles
- Require users to systematically acknowledge the contribution of the RI **when publishing** and disseminating their results
- Encourage short to medium term **mobility schemes**
- Increase the visibility of RI services by developing a **service catalogue**
- **Broaden stakeholders' engagement** by developing criteria in defining environmental, social, cultural and political impact
- Support the development and uptake of an internationally accepted model and criteria describing the **socio-economic impact** of RI
- Stimulate a dedicated **budget** for European RI development at national level
Monitoring of socio-economic impacts (1)

• **Economic impacts**
  additional jobs for scientists, technicians and administrative staff working within RI, multiplier effect on local economy, increased community services, housing, tourism etc.

• **Societal impacts**
  innovative products and services able to improve living conditions, contribute to solving societal challenges (e.g. through medical instruments, active aging assistance, environmental benefits such as the lowering of CO2 emission, etc.)
Monitoring of socio-economic impacts (2)

• **Scientific impacts**
  scientific productivity and reputation, increased number of international articles published, patents granted, PhD dissertation completed

  Trained through research not trained for research!

• **Human resource impacts**
  attract talent and impact on training and skills development, exchange programmes (also between RI and industry), training of young students (summer schools), knowledge transfer

• **Innovation impacts**
  joint research collaborations between RI and industry potentially leading to different forms of innovation, such as spin-offs, licences or joint ventures
THANK YOU FOR YOUR ATTENTION!

[Links to websites]