H2020 Policy Support Facility Peer Review of the Hungarian Research and Innovation (R&I) system

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European Commission

HORIZON 2020

Presentation of the Peer Review Report: Overview and Key Policy Messages

Professor Mark Ferguson, *Chair PSF Peer Review Panel,*
Director General of Science Foundation Ireland and Chief Scientific Adviser to the Government of Ireland

The Peer Review Panel

National Peers

Erja Heikkinen (Thematic expert for human resources for R&I - Ministry of Education and Culture, Finland)

Andrea Höglinger (Austrian Research Promotion Agency, Austria)

Urban Krajcar (Ministry of Education, Science and Sport, Slovenia)

Benoît Legaît (Ministry of Economy, France)

Independent Experts

Mark Ferguson (Chair – Director General Science Foundation Ireland and Chief Scientific Adviser to the Government of Ireland)

Krzysztof Klincewicz (Rapporteur and thematic expert for innovation in the business sector - University of Warsaw, Poland)

Jakob Edler (Thematic expert for R&I governance, funding and policy-making - University of Manchester, United Kingdom)

Marjan Oudeman (Thematic expert for science-industry cooperation - Utrecht University, Netherlands)

H2020 Policy Support Facility (PSF)

- PSF Peer Review aims to help national authorities improve and strengthen the quality of their national Research and Innovation systems.
- Hungarian authorities requested a Pre-Peer Review and a Peer Review.
- Strong support from the Hungarian Authorities particularly the Hungarian National Research Development and Innovation Office (NRDIO).

Four Focus Areas of the Peer Review

- Selected by the Hungarian Authorities following the Pre-Peer Review report.
  1. Research and Innovation governance and policy making.
  2. Availability of human resources for Research and Innovation.
  3. Framework conditions for innovation in the business sector.
  4. Science – Industry cooperation, technology transfer and entrepreneurship.

Methodology

- Peer Review panel – 4 national peers and 4 independent experts.
  - Analysis of documents, policies, data
  - 2 field visits to Budapest (24-26 Feb 2016 and 18-20 April 2016)
  - In-depth, unsupervised interviews and discussions with representatives of more than 50 organisations.
    - R&I performers public & private (beneficiaries of public R&I funding & those not receiving funding)
    - Intermediary organisations in the R&I system
    - Public Administration Bodies
    - Industry
    - Entrepreneurs
  - Wide range of organisations from different: regions of the country, industries, scientific disciplines, sizes & track records.

Seven Policy Messages

1. Hungary has a **vast science and innovation potential that can bring about a structural shift upwards in its economy**. While important progress has been made in strengthening Hungary's national science and innovation performance, the country has now a golden opportunity to build on the emerging collective feeling of a "new beginning" for its R&I system. It should better exploit its intellectual capital, the proven excellence in its science base and the presence of highly innovative international enterprises. However, success in making it happen will require a dedicated *will to reform* accompanied by sustained *increases in public funding* for R&D performers.

2. Hungary must **decide "what it wants" from its R&I system and "by when"**. It needs an R&I vision shared across government departments, understood by society and derived from a continuous dialogue with stakeholders. Hungary's R&I strengths should be an integral part of the country's economic agenda given their clear role as growth enablers. The R&I vision should be translated into a set of clear priorities for R&I policy and funding which would strategically focus resources on key areas of Hungarian strength.

3. The development of this shared vision will require **a structured involvement of stakeholders in overseeing the operations of the National Research, Development and Innovation Office (NRDIO)**, as well as further improvements of the Office's internal procedures to better accommodate inputs from stakeholders and advisory bodies. This shall contribute to increased transparency and responsibility. A formal platform for stakeholder involvement shall ensure due representation of key non-governmental and governmental stakeholders in the design and implementation of NRDIO's R&I actions. Moreover, Hungary's R&I programmes and instruments will benefit in quality and impact through their systematic, independent evaluation using international standards.

4. To **increase the quality and efficiency of its public R&I system**, Hungary's progressive and steady increase in its public R&D investment intensity should be combined with: improved processes for *evaluation and funding of R&I projects and proposals* in line with international peer review standards; an increasing *concentration of public R&I funding according to performance;* and *stronger collaboration by all actors in the system* to reduce fragmentation and maximise impact. The long-term consolidation of the Hungarian public R&I system will allow to build the necessary critical mass and attractiveness to reinforce public-private cooperation in R&I as well as the international reputation and attractiveness of Hungarian science and innovation.

5. **Hungary has talent!** The conditions and career prospects of researchers should become more attractive, notably those for young researchers. Universities should offer training that equips graduates with transferable skills. Open, merit-based recruitment and performance-based promotion practices are an unavoidable must.

6. **Innovate everywhere!** Hungary should **broaden its innovation base**, which is currently highly concentrated in a limited number of companies. It should support innovation in businesses of *all types and sizes* and throughout the innovation cycle. This requires putting in place **framework conditions that stimulate innovation, promote a risk taking culture and foster innovation demand** in order to create a true national innovation eco-system.

7. Stronger and more impactful **cooperation between the public R&I system and innovative businesses** is key for economic impact.

Follow up & Implementation

- Responsibility of Hungary.
- Possible PSF Post-Peer Review in 2019 to assess implementation.

Thanks

- All Hungarian stakeholders
- Especially team at National Research, Development and Innovation Office.
- EC DG RTD Officials especially Ms Annamaria Nemeth.

Focus Area 1:

R&I governance, funding and policy making in Hungary

Jakob Edler, *Professor of Innovation Policy and Strategy and Executive Director of the Manchester Institute of Innovation Research at the University of Manchester*

Basic Governance

- Past:
  - major shifts and uncertainties.
  - perceived lack of transparency and rigour
- NRDIO seen as potential break with past
  - one stop shop, vertical and horizontal integration
  - accountable to PRIME MINISTERS office only
  - Strong position:
    - huge opportunities
    - …and risks
  - needed:
    - Participation, external advice, supervisory board
    - Coordination with other policies
    - Strong, demonstrable evidence base and rigour

Funding of public and private R&D

Recommendation 1:

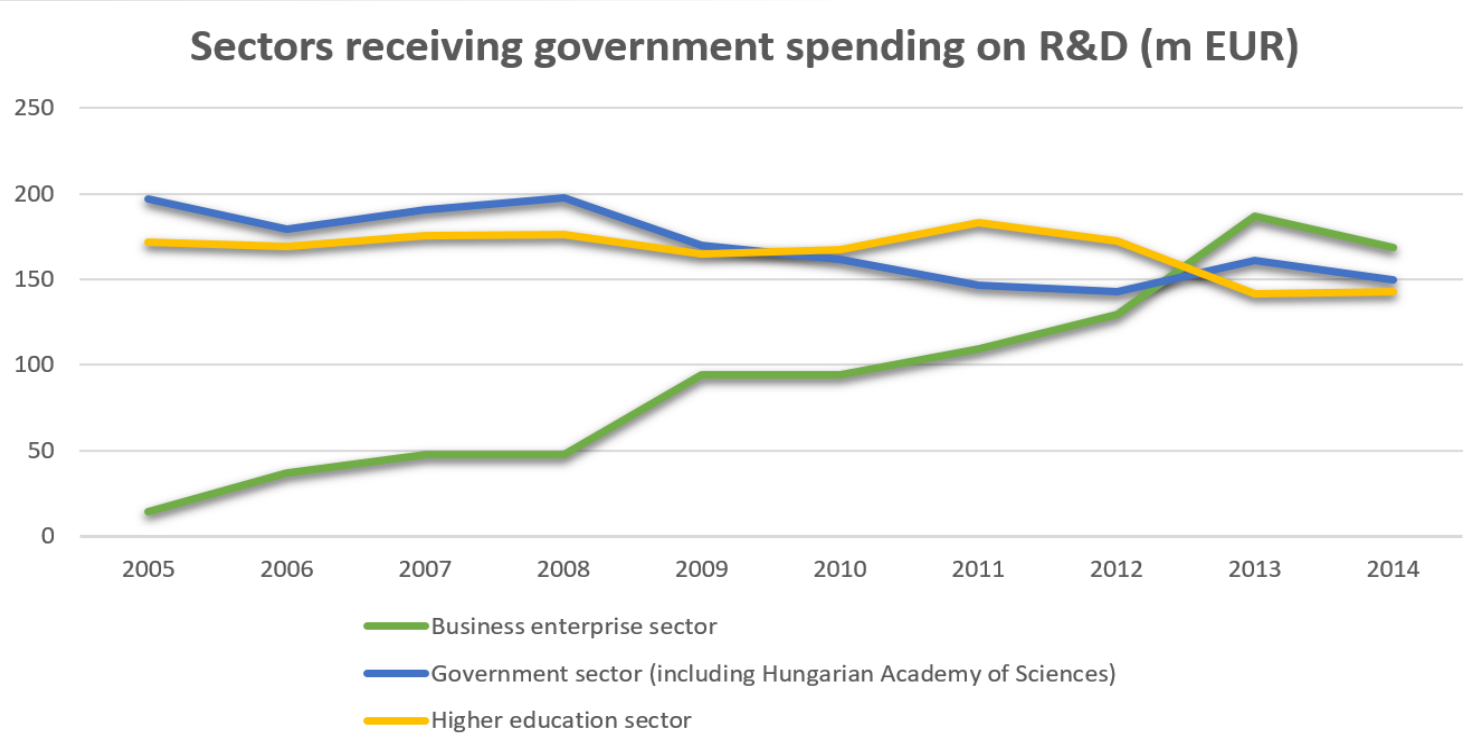
- Hungary must progressively and steadily **increase its support towards public R&D performers** in order to reach by 2020 a public R&D intensity higher than 0.5% of GDP (from the current level of 0.38%).
- To **raise the country's share of innovative companies** and **broaden** the support for innovation **across the economy**, public funding for business R&D should **support more indigenous companies and non-science based innovations**, as well as **stimulate knowledge transfer**.

Recommendation 11:

- Hungary must **increase** the share of public research and innovation funding awarded by **competitive, performance-based programmes** at both the individual and institutional level (see examples UK / Poland).
- Funds, including overheads, **must be used solely** for research and innovation purposes.

Funding of public and private R&D – Background

- Weak public funding for public R&D: (5th form last in EU)



- Low attractiveness of higher education sector
- Low capacity to do public research

Funding of public and private R&D – Background

- Strong on business: 2nd highest share of public spending / GDP for firms, but
- Performance mixed
  - Encouraging signs (e.g. employm. in fast growing firms)
  - Innovation position still **moderate**
  - Innovation index **growth rate** comparatively poor
  - Innovativeness **across all firms** (esp. SMEs) very **low**
  - **Non science driven innovation** main feature to be supported

Prioritisation

Recommendation 2:

- Hungary must decide **what it wants** from its research and innovation system in the short, medium and long term.
- It should **forge closer links between this resulting vision**, the goals in existing and future R&I strategies, and the political priorities of the government.

Recommendation 3:

- develop a **compact and up-to-date set of R&I priorities** to guide the national R&I funding programmes.
- target **economic and societal challenges** and benefit from synergies with **relevant sectoral policies** in areas such as transport, health, energy or environment.
- clearly and adequately reflected in Hungary's R&I programmes and percolate through programme implementation and funding streams.
- **facilitated by appropriate Key Performance Indicators** to measure the success of the strategy and its implementing programmes.

Prioritisation: Background

- Different priority catalogues
  - R&I Strategy: horizontal priorities pus 83 “objectives”
  - Smart Specialisation: 3 main dimensions plus 6 national priorities
  - Industrial Development Strategy: different strategic pillars again

- Unconnected with each other and to overall strategy
- While first thematic calls launched
- **No** systematic priority setting **process**

Prioritisation Process

Recommendation 4:

In deciding priority goals and in designing new R&I programmes, in reviewing their progress and in refining or developing existing programmes,

- **consult with a wide group of relevant stakeholders**, including companies (large, small, national/international), universities, the Academy of Sciences, entrepreneurs, civil servants in other areas and the public at large.
- Be informed by an **appropriate foresight exercise** and get conducted at **regular intervals**, e.g. every five years. Stakeholders should be **involved** in ensuring Hungarian **research integrity and transparency** in the allocation of public R&I funding and in project selection procedures

Recommendation 5:

- Develop a **formal platform** for stakeholder involvement to **establish a participatory process** of nurturing synergies, dialogue and advice on R&I and to ensure stakeholder ownership and oversight of NRDIO activities.
- **Can take the form of a supervisory board** of NRDIO including broad representation of stakeholders of the Hungarian R&I system (see above)

Policy Mix supporting R&I Strategy

Recommendation 9:

- R&I instrument mix for policies and programmes **across** the government departments and agencies should be **aligned** with the overall R&I objectives.
- Policy coherence and synergy between the R&I actions **of the various government** departments to ensure efficiency in the policy delivery of the objectives;
- due coverage of **cross-cutting issues** key for the science base of the country (e.g. development of skilled human capital; balance across regions and between direct and indirect R&I support)

Background

- Variety of different types of instrument
- mix implicit
- does not seem to be linked to strategy and priorities

Policy Mix supporting R&I Strategy

Recommendation 8:

- Further develop and implement **pre-commercial public procurement** and **public procurement of innovation** to stimulate and reward research, development and innovation.
- This evolution shall be accompanied by **necessary institutional changes**.

Background :

- Demand linked to challenges, can support priority led strategy
- Huge institutional challenges, rigorous commitment needed

Evidence based policy and programming

Recommendation 6:

- Panel supports the move towards **increased evidence-based** policy-making, including through the use of foresight and through the systematic evaluation of R&I policies, programmes and support measures.
- Evaluations of the outputs and outcomes of programmes and projects to be **managed in a clear and transparent way** and to be delivered in a timely and efficient fashion, giving due **publicity** to them and eliminating undue bureaucracy

Recommendation 7:

- All priority R&I programmes should be rigorously evaluated
  - at appropriate times using **international reviews** and standards.
  - against their objectives and funding.
- lead to incremental improvements of a core set of programmes that should remain stable over time to assure system predictability

Evidence based policy and programming Background

- Some good examples of evaluation, but:

- International comparative analyses show poor evaluation culture, limited number of reports, limited availability
- Poor embedding of evaluation in programme development (while management is efficient)
- Demands for improved evaluation in selection procedures (ESF 2014)
- Transparency missing, lack of learning opportunities

- Build up of evaluation culture: example of Austrian Platform

Internationalisation

Recommendation 10:

- Boost the internationalisation of its R&I system.
- **Expand use of international expertise** and best international practice in design and implementation of R&I programmes (including evaluation) (example Finland)
- **Learn** from leading international programmes and transpose best practice nationally when feasible and with the necessary tuning.
- **Leverage** the potential of the Horizon 2020 National Contact Points network and the network of Hungarian **scientific attachés abroad** to increase Hungarian participation in European initiatives.
- **Continue** the **good practice** of supporting researchers and entrepreneurs that are awarded the "**Seal of Excellence**" by Horizon 2020 (proposals positively evaluated within the programme, but not funded due to lack of budget)

Background: Picture mixed

- High level of co-publications
- EU participation below EU average, with some positive developments (e.g. ERC)
- ERA Roadmap being developed (needed!) for synergies EU and national
- Teaming with neighbouring countries small scale, not visible

Focus Area 2:

Availability of human resources for R&I

Erja Heikkinen, *Director of Science Policy, Ministry of Education and Culture, Finland*

Increase impact by strenghtening the competence base

- 12. Increase the responsibility and accountability of public research and innovation performers (universities and the Hungarian Academy of Sciences) to support their commitment towards the national R&I policy goals. This move should be accompanied by the better availability of public funding for R&D for researchers at both universities and the Hungarian Academy of Sciences, who should face equal opportunities to carry out ambitious R&I projects and get rewarded for their scientific excellence and research performance. However, this increased responsibility and accountability should come hand in hand with significantly increased performance-based funding for these institutions. The monitoring, evaluation and publication by the government of the performance of individual institutions against Key Performance Indicators should become a reality. Successful institutions should be allowed to expand or merge and unsuccessful institutions should be allowed to close or be absorbed by other organisations.

- 13. Cooperation between universities, and between universities and institutes of the Hungarian Academy of Sciences, should be actively encouraged using grant programmes, joint appointments of researchers and professors, shared administration and "accommodation" of projects and activities as well as distributed campuses.

Make careers in research attractive

- 16. Ensure that the salary levels of researchers are competitive and comparable across the system. Introduce performance-based salary incentives for researchers working in the public sector (universities and the Hungarian Academy of Sciences).

- 17. Increase the attractiveness of research careers in Hungarian academia. Universities and institutes of the Hungarian Academy of Sciences should ensure open, transparent and merit-based recruitment as well as performance-based promotion practices. Doctoral students should benefit from improved career conditions and from innovative doctoral training that equips them with transferable skills. Scholarships should be allocated competitively. Doctoral students should be granted sufficient time for research and for interaction with their academic supervisors.

Science, technology and innovation activities empower the society – and a researcher

- 18. When measuring the scientific performance of researchers, notably in view of appointments and career development, universities and the Hungarian Academy of Sciences should not just give credit to criteria focussed on scientific publications. Exposure to science-business cooperation in the broadest sense should also be addressed, e.g. relevant expertise in the commercialisation of research results and patenting, membership of industry advisory boards, or exposure to cooperation with business or entrepreneurial activities. In addition, scientists should be given due recognition for their work including via prizes, media campaigns and dissemination events, as well as financial and non-financial rewards for outstanding performers.

Nurture future by supporting the young talented researchers

- 19. Talented Hungarian researchers, and notably the young generation, should be supported in carrying out internationally-oriented careers in Hungary as well as in returning to the national R&I system from the diaspora. Programmes should also cater for the attraction of foreign talent. Best international practice in promoting healthy brain circulation should be explored.

Focus Area 3:

Framework conditions for innovation in the business sector

Krzysztof Klincewicz, *Rapporteur of the PSF Peer Review Panel, Professor of Management and Rector's Deputy for Intellectual Property Management, University of Warsaw, Poland*

Recommendation 25:

- Incentivise quality business R&D projects with innovation and commercial impact.
- In line with the smart specialisation strategy, **review the design of support measures** to fund business R&D so that these cover priority areas with clear eligibility criteria and selection modalities.
- **Promote openness, impartiality, confidentiality, increased flexibility for project implementation, and shorter times-to-grant.**
- Reduce the bureaucratic burden for applicants and beneficiaries.
- The systematic use of international peer review for project evaluation of business grants should also be fostered by all agencies and ministries that distribute R&I funding.
- Funding tools should get redesigned so as to cover the whole innovation cycle, avoiding gaps in funding for innovative businesses, notably fast-growing ones.

Background for recommendation 25 (1):

- Identified challenges related to evaluation of project applications
- Long lead times between the submission of project application and the funding decisions
- Need to focus on innovativeness and commercial impact instead of the quality of written applications
- Need to better use international peer reviewers and experts experienced in commercialisation of innovations

Background for recommendation 25 (2):

- Incorrect assumption that funding automatically induces desired changes in R&I policies
- Need to use better output measures of success related to products, patents, implementations
- Limited thematic focus of R&I funding schemes despite the existence of Smart Specialisation Strategy
- Need for more flexibility in the implementation of high-risk, innovative projects
- Funding should better address the scale-up of technology development

Recommendation 27:

- **Review and evaluate the existing tax allowances** and the generous R&D tax incentives to foster their uptake by fast-growing innovative businesses.
- Examine the appropriateness of tax incentives for different industries and firms (start-ups, scale-ups, companies with intensive R&I but few sales in Hungary, exporting companies and traditional businesses).
- Draw conclusions to **simplify existing rules** and **reduce the administrative burden** for the users.

Background for recommendation 27:

- R&D tax incentives used by a relatively small number of taxpayers
- Attractiveness of tax incentives limited despite substantial foregone tax revenues
- Eligibility rules not always clear, heavy administrative burden and uncertainty
- Lack of independent, systematic evaluation of the instruments – but substantial value of granted incentives

Recommendation 26:

- Ensure that the funds collected through the **innovation levy are redistributed solely for R&I purposes** and **get appropriately topped-up by government funding.**
- The innovation levy should not become the exclusive source of funding for business R&D activities.

Recommendation 23:

- The limited funding available from the EU Structural Funds for **Central Hungary** is likely to negatively affect the R&I strengths of the region, which accounts for a disproportionate share of high-tech industry and skilled human capital in Hungary. **The innovation levy and the state budget can be used to preserve the R&I potential of the region.**

- **Recommendation 24**: Not all innovation in Hungary is science-based. The input and the involvement in R&I of engineers, users (customers), entrepreneurs, service-based industries and service providers, e.g. health service, should be further encouraged via dedicated support measures. R&I programmes should also promote multi-disciplinarity.
- **Recommendation 28**: Revisit Hungarian bankruptcy laws in order to permit a culture of 'good failure' for Hungarian innovative entrepreneurs.

- **Recommendation 29**: Hungary must develop its innovation eco-system with the support of appropriate physical infrastructure. The creation and development of common laboratories between universities and industry, innovation spaces, incubators, accelerators, and science parks should be promoted. Entrepreneurial education and training should be available both in schools and universities. The provision of "soft service" support (e.g. advice, training, guidance, information) to entrepreneurs and to companies across all industries, types and sizes is an asset. The successes of entrepreneurs should be rewarded through prizes, media campaigns and public exposure.

- **Recommendation 30**: Support measures for innovative start-up companies (direct funding for business R&I activities, tax incentives, strategic advice, training, physical accommodation) should be boosted, addressing both the start-up and scale-up stages in the development of innovative firms.
- **Recommendation 31**: Exploit international best practice in the design of new financial instruments and in their evaluation, in order to maximise their potential to match the public funding to the private capital investment, engage the VC community and stimulate the commercialisation of innovations.

Focus Area 4:

Science-industry cooperation, technology transfer and entrepreneurship

Marjan Oudeman, *President of the Executive Board of Utrecht University in the Netherlands*

Recommendation 32:

- Cooperation between universities, institutes of the Hungarian Academy of Sciences and industry, including at the level of individual entrepreneurs, should be further promoted through targeted means.
- These can include:
  - dedicated grant programmes to foster the **mobility of researchers to industry and vice versa** as well as **closer-to-market research**;
  - the provision of appropriate physical infrastructures (e.g. **shared** laboratories, incubators, accelerators, science parks, innovation clusters);
  - the introduction of transparent and adequate incentives for **inter-sectoral mobility** including adequate appointment and **promotion criteria in the public sector to recognise the value of business exposure** for researchers;
  - the involvement of private sector representatives in the **governance** of public sector R&I performers;
  - and the promotion of **knowledge transfer programmes** at institutional and system level.

Background for recommendation 32 (1):

- traditional divide between research, education and innovation
- lack of role models of academic entrepreneurs
- insufficient focus of higher education curricula on innovativeness and creativity
- limited academic patenting and small scale of University technology transfer operations
- Hungarian Academy of Sciences focused on fundamental research

Background for recommendation 32 (2):

- design of support measures should go beyond grants for R&D projects and look for multiple ways of stimulating the cooperation
- schemes supporting science-industry cooperation were fragmented, with short-term orientation and lack of continuity
- the Panel was unable to comment on the new relevant support measures, but recommends their evaluation and stakeholder dialogue

Recommendation 33:

- The design of support measures intended to stimulate science-industry cooperation should **take into account the lessons learned** from past experiences and from existing policy actions, including the results of the **independent evaluations** of programmes and the **views of stakeholders** (beneficiaries and non-users of these support measures).
- Hungary should equally **learn from successful European schemes** supporting science-industry cooperation.
- National support schemes for science-business cooperation should undergo **regular impact evaluations** in order to promote their further **incremental improvement.**

The report is published at the websites:

European Commission, Research and Innovation Observatory – Horizon 2020 Policy Support Facility: **https://rio.jrc.ec.europa.eu/en/country-analysis/Hungary**

National Research, Development and Innovation Office Hungary: **http://nkfih.gov.hu/**

Thank you!

H2020 Policy Support Facility