

**Concept note for the
Peer Review of the Polish R&I system
under the Horizon 2020 Policy Support Facility**

implemented under the Framework Service Contract

**SERVICES OF THE POLICY SUPPORT FACILITY (PSF)
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1. Context and background information

To support countries in reforming their research and innovation (R&I) systems, DG Research & Innovation of the European Commission set up a '**Policy Support Facility**' (PSF) under Horizon 2020, aimed at "improving the design, implementation and evaluation of R&I policies".

The PSF provides best practice, leading expertise and guidance to Member States and Associated Countries (on a voluntary basis) through a broad range of services to address their specific needs: (1) **Peer Reviews** of national R&I systems; (2) **Specific support** to countries and (3) **Mutual learning** exercises on specific R&I topics.

On **6 September 2016** the Deputy-Prime Minister and Minister of Science and Higher Education of Poland, Jaroslaw Gowin, addressed a letter to the Commissioner for Science, Research and Innovation in which he requested the support of PSF for an independent Peer Review of the Polish R&I system in 2016 - 2017. Commissioner Moedas replied to this request on 7 October 2016 and agreed to launch preparations still in 2016.

Poland attaches high political relevance to this exercise since it shall provide an important input for the preparation of the new Law on Science and Higher Education that should be finalised by 2018. The law known as "**Law 2.0**" will replace all existing laws (on science, on higher education and on financing science and higher education) which were heavily amended since 2010-2011 but proved unable to contribute in full to the restructuring of the higher education institutions (HEI) and public research organisations (PRO) structure in Poland, that is generally perceived as inefficient.

The proposed timeline for the Peer Review is January- September 2017.

2. Recent developments in Polish R&I policy

The **Commission's analysis of the present situation of the Polish R&I system**, as developed in the context of the European Semester 2016, is provided in Annex1. A snapshot of the **strengths and weaknesses** is presented in the following document: file:///C:/Users/diana/Downloads/PL_Infographic_2016-11-04_Final.pdf.

Poland's research and innovation (R&I) performance has only marginally improved in the last decade and the steadily increasing R&D intensity (from 0,56% in 2007 to 0.94% in 2014) is still below half of the EU average of 2,03 %. Ranking 23rd as "moderate innovator", Poland performs below the EU average in all dimensions of the European Innovation Scoreboard 2016 (EIS 2016), particularly in *Linkages and entrepreneurship* and *Open, excellent and attractive research systems*. Since R&D investments in Poland rely predominantly on the public sector and are mainly supported by the EU Structural Funds, their reduction in the future -as Poland advances in its economic development- might affect the sustainability of the Polish R&I system. The Polish government committed to steadily reach the national R%D intensity target of 1,7% of GDP by 2020.

A summary update on the three key challenges of the Polish R&I system and 2016 policy developments follows:

(1) Raising the innovativeness of the business sector remains a key challenge for Poland. Despite recent increases (from 0.18 % in 2010 to 0.44 % of GDP in 2014), business enterprise expenditure (BERD) remains one of the lowest in the EU even when compared to regional peers such as Czech Republic or Hungary. Still BERD increased less than public funding in support of business R&I (distributed by National Research and Development Centre -

NCBiR). This questions the effectiveness of public R&D support to business R&I activities¹. The EIS 2016 highlights that innovation activities by SMEs have suffered a strong deterioration and the Polish patenting activity remains rather limited (25th position in the EU in relation to patent applications per billion GDP). R&D expenditures of foreign firms are a critical component behind the rise in overall BERD over the last few years², as reflected in the increase of their share in the total expenditures from 17% in 2003 to 50% in 2013. However, no new policy measures have been proposed to attract foreign R&D investments.

- In February 2016 the government adopted the **Responsible Development Plan**, a long-term economic development plan which identifies five major growth barriers for Polish economy: (i) middle income trap; (ii) excessive reliance on external financing; (iii) **low innovative capacity of the economy**; (iv) demography; and (v) weak institutions. The plan intends to tackle the innovation barriers through better regulation, a more friendly business environment (including tax system), advancements in delivering more advanced product and services, better links between business and science, and a new law on innovativeness (amendment to the existing law on tax reliefs in June 2016, and a full new law in 2017).
- This plan is elaborated in a more comprehensive **Strategy for Responsible Development** (pl. *Strategia na rzecz Odpowiedzialnego Rozwoju*) expected to be adopted before the end of 2016 (currently the draft strategy is published for public consultation).
- Multiple measures were introduced recently under the ‘**Smart Growth**’ **Operational Programme** to provide alternative financing to companies wishing to engage in R&D activities. To roll out that strategy, the government announced in 2016 the launch of the “#StartInPoland”³ programme (mainly based on ESIF funding) to support start-ups and eliminate barriers to innovativeness.
- The “**White Paper on Innovation**” published by the government in September 2016 identifies legislative and organisational proposals for the preparation of the two new laws on innovation (foreseen to enter into force in 2017 and 2018, respectively) which would further improve the business environment for innovation. The White Paper also supports the measures presented in the draft **Strategy for Responsible Development**.
- In addition, preparations are ongoing to launch a large **venture capital (VC) programme** by the Witelo Fund (“BRIDGE VC”).
- As from 2016⁴ companies can benefit from new **R&D tax incentives** that allow to deduct, among others, salaries of R&D personnel. It is too early to assess the popularity and uptake of those incentives but the government plans to further increase availability and size of these tax deductions in 2017⁵ and 2018⁶ (introducing, as planned, patent boxes).
- An **Innovation Council** was created in January 2016 as the inter-ministerial body responsible for support to innovation in Poland. This is the first time in Polish history that

¹ For more details see “RIO country report POLAND 2016”, K. Klincewicz, M. Markiewicz, K. Szkuta, EC, JRC, 2016, and the forthcoming background report.

² (draft) Study on “Internationalisation of business expenditures on R&D and analysis of their economic impact (BERD flows), EC, DG RTD, 2016.

³ <https://www.mr.gov.pl/strony/aktualnosci/powolanie-rady-ds-innowacyjnosci-i-start-startinpoland>.

⁴ Ustawa z dnia 25 września 2015 r. o zmianie niektórych ustaw w związku ze wspieraniem innowacyjności <http://isap.sejm.gov.pl/DetailsServlet?id=WDU20150001767>.

⁵ The new provisions on tax incentives will apply as from 1 January 2017, according to the “Small law of innovation”, currently under approval by the Parliament.

⁶ The second set of legal amendments reducing the barriers to innovation, to be developed in 2017, are foreseen to propose more attractive tax incentives (comparable to what is available in e.g. Czech Republic or Hungary) as from 1 January 2018.

R&I policies achieve a most prominent position in the government's agenda, with all three Deputy Prime Ministers being members of the Innovation Council and with an overall political commitment to deliver reforms in this area, which is perceived as one of the pillars for Polish economic growth.

(2) The weak innovativeness of the Polish economy is conditioned by **an ineffective commercialisation of research results and by poor science-business links**, as proven by all related output indicators: counts of joint patent applications and co-publications⁷ are marginal in Poland as are shares of enterprises declaring cooperation with scientific organisations and shares of R&D expenditures of higher education and research institutions funded by business enterprises⁸. On the positive side, Poland is catching up in terms of researchers overall and notably in terms of business enterprise researchers (13,7% compound annual growth in 2007-2014 for researchers employed by business as % of total employment).

- Numerous **R&D funding schemes** (distributed via NCBiR) are available for science-business consortia although their long-term influence in bringing together academia and businesses cannot be assessed yet.
- The **science and higher education reforms from 2010-2011** and a series of **subsequent amendments** that frequently revised the knowledge transfer structure, did not prove effective in raising the level of commercialisation of research outputs.⁹
- Currently three teams, selected from within the Polish academic community, are working on concepts of the new "**Law 2.0**" which should make Higher Education better adapted to market needs.
- The draft Strategy for Responsible Development recognises the importance of science-industry links and the new Law 2,0 (to be prepared by 2019) will aim at better adapting scientific careers and research institutes to needs of the innovative economy. This shall include the creation of the **National Institute of Technology**.

(3) **Raising the quality of the public science base and nurturing its international exposure is a priority identified by the Polish authorities.** The quality of scientific activities in Poland is still far from EU standards: with only 5,0 % of Polish scientific publications among the 10 % most-cited worldwide (2013) Poland ranks 24th in the EU and only two Polish universities were included in the 2015 ARWU World University Ranking of 500 best universities. As there is an empirical correlation between the openness of research and innovation systems and the quality of scientific results¹⁰, the fact that the number of scientific international co-publications ranks Poland 25th in the EU (ahead of only three countries: Romania, Bulgaria, and Latvia) is a worrying trend. The declining trends in the number of the PhD graduates and of non-EU PhD students place Poland respectively at 26th and 27th position in the EU.

- To **cut red tape in higher education a "deregulation act"** (amending the Law on Higher Education and other acts) was drafted and entered into force on 1 October 2016. This is the most important change made by the Ministry of Science and Higher Education in the new academic year. The aim of the new law is to reduce bureaucracy in science and higher education management by introducing deregulation in various areas for universities. The Ministry of Science and Higher Education also intends to

⁷ In 2014 Poland had only 3.66 public-private co-publications per million of population compared to 13.79 in CZ and 33.88 in EU-28.

⁸ Poland scores at 35% of the EU average in relation to public expenditure on R&D financed by business enterprise (national) as % of GDP.

⁹ Recent audits by Supreme Audit Court (NIK) revealed, among others, very limited scope of knowledge transfer activities of public research Institutes: <https://www.nik.gov.pl>.

¹⁰ See "Science, Research and Innovation performance of the EU 2016" (<http://bookshop.europa.eu/fr/science-research-and-innovation-performance-of-the-eu-pbKI0415512/>), European Commission, DG Research and Innovation, 2016.

change the current Polish Accreditation Committee to promote quality and limit bureaucratic burden. Some changes are taking effect this year.

- **Increasing the quality of science and higher education** (certainly a key weakness of the Polish R&I system) is seen by Deputy Prime Minister Gowin as a first step to strengthen the position of Polish universities in Europe and in the world. In February 2016, he launched a competition for the drafts of the new law on higher education, in order to make them better adapted to the labour market needs and ambitions of the Polish scientists. Three teams, selected from among the academic community, will prepare three competing concepts of specific objectives of the new law (by the end of 2016).
- In June 2016 **new rules for evaluation of scientific organisations** were published and further legislative changes will move the evaluation focus from the quantity of publications to the quality of science.
- In September 2016 the Deputy Prime Minister Gowin announced the **Polish Strategy for science and higher education** consisting of three pillars in support of future in-depth reforms of the science and higher education: Constitution for Science (changes in Higher Education system by the Law 2,0, planned reforms of research institutes), Innovations for the economy (focus on science-business links) and Science for You (societal impact of research). A new vision for doctoral studies (including industrial PhDs) is being developed.
- To increase the internationalization of the Polish science, the **Pact for Horizon 2020**, incentivising HEIs and PROs to apply for Horizon 2020 funding, was promoted by the previous government. The current government proposed to establish the **National Agency of Academic Cooperation** that could assume responsibility over unified scholarship programmes and the encouragement of foreign students for studies in Poland.
- In addition, the government is envisaging a **reform of research institutes** so that they become "research facilities for innovative economy", including a **National Institute of Technology** as a network of top research institutes.

3. Purpose, objectives and scope of the Peer Review

As mentioned above, in his letter of **6 September 2016** the Deputy Prime Minister and Minister of Science and Higher Education of Poland outlines a number of key areas in need of in-depth evaluation and recommendations for further structural changes of the national R&I system.

As a response, the aim of the PSF Peer Review shall be to provide **external advice and operational recommendations** to the Polish authorities on possible reforms to undertake in the context of the on-going restructuring of the national R&I system.

As a result of bilateral contact between the Commission and the Polish authorities, the following overall objective and focus areas of the Peer Review were specified:

Overall objective: recommendations on the future development of Poland's science and higher education policy in support of innovation

The specific **focus areas** of the Peer Review are the following:

1. **Structural changes in the science and higher education system** - research university/higher education university/ higher vocational education institution: eligibility criteria for each category and evaluation of different categories' units. Their form of cooperation with academic, economic and societal environment. This includes:

- a) Models of **output evaluation** (public and private sectors).
- b) **Consolidation vs. restructuring/ streamlining of higher education institutes** (e.g. in the context of demographic change). The system of incentives to consolidate vs introduction of the legislation forcing consolidation.
- c) **Career development of researchers** (research and teaching).
- d) **Research universities vs. higher vocational education**, including notably support for youth in the process of choosing their higher education path.
- e) **Role of regional authorities** in shaping of the higher education system in the region.

2. **Links between the higher education sector and the other actors of the innovation system** (research institutes, Academy of Sciences, entrepreneurs) - models and recommendations on the functioning of the reformed sectors. This includes:

- a) **Financing pro-innovation activities in the higher education sector** (grants vs. statutory funding). Methodology for financing specific types of institutions, including ways of contracting tasks in scientific institutions and universities.
- b) **Commercialization of research results** - legal and financial issues (e. g. intellectual property at HEIs and PROs, industrial doctorates; the efficiency of the centers of technology transfer and special purpose vehicles; the effectiveness of commercial financial vehicles such as Alfa Bridge, Bridge VC, commercialization policies in the science and higher education institutions).

3. **Internationalisation of the science and higher education sector** - trends, key areas for improvement.

The results from the Peer Review shall **serve as evidence for the new laws on higher education and public research institutions** to be prepared by 2019 (the so-called "Law 2.0"). The report should contribute to developing a **post- 2020 perspective** for the restructuring of the Polish science and higher education system.

Tentatively the Peer Review should be **finalised by September 2017** (finalisation of the report in June 2017, for editing and proofreading during Summer period) in order to fit into the planned **National Congress of Science** (September 2017). This high-level debate on the future of the Polish Science and Higher Education will sum up a series of meetings with the

scientific community launched on 20 October 2016 in Rzeszow. Therefore it would be useful if experts present their analysis results for public discussion during this event.

The main **expected outcome** of the Peer Review is a **report**¹¹, including a set of concrete operational recommendations, backed up by evidence and analysis. Recommendations should be feasible to implement in the national context, with supporting evidence and learning from practice and analysis of similar approaches and reforms introduced in other countries. The report should contain a solid policy-oriented Executive Summary presenting these recommendations in the European R&I policy context.

4. Working approach and methodology

The standard **methodology for conducting Peer Reviews of national R&I systems** in the context of the Horizon 2020 Policy Support Facility (PSF) **is included in Annex 2**.

This methodology was prepared on the basis of (1) the Commission's expertise with the ERAC and PSF peer reviews to-date and takes into account notably the lessons learnt during the first PSF Peer Review of the Bulgarian R&I system; (2) the contractor's technical tender from May 2015. Since the PSF is in a permanent 'learning by doing' mode, this methodology will continue to evolve over time and will be adopted to the specific Polish needs.

Summary of the methodological approach:

Based on the themes highlighted in section 2, the panel will analyse the Polish R&I system.

The **panel** will analyse and seek full understanding of the Polish R&I system, its R&I policies and its concrete instruments of implementation. The independent experts will use an academic methodology and compare and "de-contextualise" country-specific experiences suggested by peers. Based on the themes highlighted in section 2, they will analyse the Polish R&I system considering a systemic approach with both supply and demand side measures. They will identify alternative structures, practices and instruments in place in European or other countries and assess the validity and relevance of these instruments in Poland. Each expert will focus on themes and questions of his/her specific area of expertise. On this basis, the experts will include also the recommendations of the peer reviewers and the Commission services, putting them into the overall analytical framework of the final report.

The Polish Peer Review will be organised in line with the **three-step methodology** for the division of tasks between different panel members and the working approach described in the methodology (Annex 2):

I. Design and Preparation: As a first step, the host country expresses interest in a Peer Review and confirms its commitment to it, defines the scope of the review (afterwards confirmed/ specified during the self-assessment phase). The panel of independent and peer experts is selected and the collection of relevant existing information and evidence advances through gathering codified information on the reviewed country and mobilising key actors (in the host country). The kick-off meeting of the Peer Review panel, Peer Reviewed country authorities and the Commission services takes place in Brussels to agree on the roadmap of the Peer Review and country visits (timing, meetings, main issues/ questions). The background briefing by the contractor

¹¹The previous reports of the PSF Peer Reviews can be found here : <https://rio.jrc.ec.europa.eu/en/policy-support-facility/peer-reviews>

and the country's self-assessment (taking form of a structured powerpoint presentation) are presented to the experts at this meeting.

II. In-depth analysis and Peer Review sessions: In a second step the Peer Review analysis involves remote analyses of the information (collected in the first step), focusing on the focus areas of the R&I system identified by the host country and face-to-face interactions within the host country (two Peer Review missions). If the panel finds it appropriate, an online questionnaire is set-up to gather opinions, comments and facts from the researchers community/ relevant stakeholders and to mobilise their involvement in the process. The Peer Review missions include interviews with officers and stakeholders from the host country as well as debrief meetings for the panel and representatives of the Commission services, at the end of each day.

III. Reporting phase: The third step consists of elaborating and communicating the findings of the Peer Review. The draft Peer Review report, prepared before the second country visit is discussed with the host country authorities. The final report including analysis and policy recommendations is presented to the Commission and then jointly with the Commission in the host country which is responsible for preparing endorsement in its actual policy-making. Good practice is to organise a press conference and related communication activities to fully disseminate the report among stakeholders and raise awareness of the main R&I policy challenges in the country.

5. CVs of experts and distribution of work

The work will be undertaken by an independent panel of **five high-level independent experts** with expertise in relevant research and innovation fields and **three senior officials** (*peers from Belgium, Austria and Sweden*) working in policy-making at the national level and acting in a personal capacity.

Georg Winckler , chair (Austria). Georg Winckler is an Austrian economist. From 1999 to 2011 he was Rector of the University of Vienna. From 2005 to 2009 he was president of the European University Association (EUA). From 2004 to 2007 he was a member of the European Research Advisory Board (EURAB) and since April 2008 a Member of the Council for the European Research Area Board (ERAB) at the EU Commission. From March 2005 to March 2009 he was president of the European University Association (EUA). Since February 2012, he is chairman of the board and president of the association of the ERSTE Foundation.

Jaana Puukka, rapporteur (Finland) . Jaana Puukka has 20 years of experience in Higher Education and Innovation policy planning, development and evaluation at international, national and institutional level. She spent nearly ten years of her career as an analyst in the OECD Education Directorate where she led higher education system evaluations in over 30 countries. She was the coordinator and the rapporteur of the review in Poland which analysed the performance, quality and relevance of universities, in terms of their contribution to the socio-economic development in Wroclaw's region, and examined the underpinning national higher education and science policies. Currently she is external expert of the ET2020 Working Group on Modernisation of Higher Education (since 2013), a core expert for the University-Business Forum (since 2016), a rapporteur for Horizon 2020 Advisory Group on Spreading Excellence and Widening Participation (since 2014), and a member of the network of independent education experts for EAC (2014-2016).

Jon File, expert (the Netherlands). Director of Development and Consultancy at the Centre for Higher Education Policy Studies (CHEPS) at University of Twente, the Netherlands. He is

an expert in higher education system dynamics, planning and policy, notably in developing and transitional economies. He was the co-project leader of the recently completed study on Structural Reforms in Higher Education in EU and is a senior member of the project on promoting the relevance of higher education, both carried out for DG EAC. He has been an expert member of OECD reviews of the higher education systems of Portugal and the Czech Republic (both in 2006).

Göran Melin, expert (Sweden). Associate Professor at Stockholm University and Assistant Director at Technopolis Group Sweden. He conducted studies and evaluations for ministries/governmental authorities and higher education institutions in Sweden, Denmark, Finland, Czech Republic, Lithuania, Norway and the UK, targeting issues such research funding mechanisms, organisation of higher education institutions, mobility, doctoral training, alliances and mergers between higher education institutions, academic careers and cooperation between universities and the surrounding society. Matters related to participation in the EU Framework Programmes have repeatedly been in focus. In 2011–2012 he supported as expert the Thematic Working Group of Higher Education of DG EAC. He has experience as national expert in a CREST OMC Working Group (“Mutual learning on approaches to improve the excellence of research in universities”, 2009).

Lauritz B. Holm-Nielsen, expert (Denmark). Executive Director of the Sino-Danish Center (SDC). He was the Rector of Aarhus University from 2005-2013, is High Level Advisor to the Senior Management Group at Aarhus University (AU), and is Chairman of the Danish National Nature Fund and the Committee for Research Infrastructure. He is President of EuroScience and member of the Governing Board of Gothenburg University. Lauritz B. Holm-Nielsen was member of the Danish Prime Minister's Growth Forum, Vice-Chairman of the Danish Research Commission and member of several OECD expert review teams and other international review and advisory panels on higher education and research.

Christian Naczinsky, peer expert (Austria), Head of Department EU Research Policy and Coordination, Ministry for Science, Research and Economy since 2002. Former Deputy Director General for Research and Chief co-ordinator of the Austrian EU Council Presidency in the field of research. Currently, among others, Member of the Austrian delegation to CSTP (OECD), Head of the Austrian delegation to ERAC, Sherpa to the Austrian Director General in the Research Policy Group, Chair of the Austrian ERA Reporting Board, Chair of the Austrian Roundtable for Delegates to HORIZON 2020, Chair of the Steering Boards of the Austrian Research Promotion Agency (FFG) for European and International Programmes as well as EU-Performance Monitoring, Secretary of the ERA Council Forum Austria and Co-Chair of the Austrian Working Group on the OECD Review of Austria's STI Eco-system.

Goran Marklund, peer expert (Sweden), Deputy Director General and Head of Operational Development and Analysis at VINNOVA, the Swedish Innovation Agency. In that capacity he is deeply involved in developing VINNOVA's strategy and program designs. Dr Marklund is also highly active in developing the agenda of the OECD TIP, Working Group on Innovation and Technology Policy. He has been Associate Professor in Economic History at Uppsala University with the focus on innovation and economic change. Dr Marklund has also been Science and Technology Attaché at the Swedish Embassy in Washington DC and guest researcher at the Centre for International Technology Policy (CISTP) at George Washington University. He regularly gives advice to the Swedish Government and to the EU on research, innovation and growth policy issues. As a researcher, Dr Marklund has primarily specialized in globalization, innovation and national competitiveness, as well as policy impact studies, with a particular focus on R&D and innovation indicators. In this function he has closely followed OECD's and Eurostat's indicator work and assisted at the meetings of OECD's group of national experts of science and technology indicators, NESTI. Dr Marklund is

currently chairman of the Advisory Board for R&D and Innovation Statistics at Statistics Sweden.

Ward Ziarko, peer expert (Belgium). Since October 2012 Ward Ziarko is a director at the Belgian Science Policy Office (Belspo) where he served from 1986-2000 as a program manager running research programs. In 2000 he became the head of the department on STI-indicators and monitoring research policies. He is a member of the OECD working parties NESTI and CSTP; of the EU working party ERAC and a member of the Eurostat working party on STI indicators. He was previously chairing the ERAC ad-hoc working group on the European Semester and ERA Monitoring. In Belgium he is a member of CFS-STAT and CIS-CFS and co-organised twice the ERAC peer review of Belgium. Previously he participated in the OECD STI policy review of South-Africa and the ERAC peer review of Spain.

The chair will play an active role by chairing the meetings of the expert team (the kick-off meeting, the country visits' meetings and the working meetings of the team), organising the work of the expert group, and providing input for the preparation of the report and quality control of the report (as written by the rapporteur).

The rapporteur will prepare minutes of the meetings and consolidate all written inputs to draft the report. He/she will also actively support the chair in his/her tasks and provide analytical input in relation to his/her competence areas to the preparation of the report.

The experts will provide expertise and input for the analysis of the areas subject to the specific support and share the analytical and drafting tasks (division by topics/chapters). They will contribute to (with written input) and revise both the draft and the final reports.

All independent and peer experts will work together. They will analyse evidence, studies and other documentation provided by the Commission services, the Polish authorities or identified by the experts themselves and they will provide expertise and input for the preparation of the deliverables.

The **peer experts** will use a comparative method to seek full understanding and analyse the host country's R&I system, its R&I policies and its concrete instruments of implementation. Their assessment of possible institutional structures or instruments useful to apply and implement in the host country is complemented, when possible, by concrete case studies or description of instruments and the policy process by which they were put in place in their own country (i.e. 'boxes' in the final report).

The Experts will also be supported by **the PSF Team** comprising the PSF contractor (administrative and analytical support team) and the main **Commission service** involved:

DG Research & Innovation will be represented by Unit A4 – 'Analysis and monitoring of national research policies' with contact point Ms Diana Senczyszyn (+32 229-93376; diana.senczyszyn@ec.europa.eu), who will coordinate the exercise and assure the contacts with the Polish authorities.

PSF Contractor will be represented by Jacek Walendowski (jacek.walendowski@technopolis-group.com) Senior Expert in Technopolis Group, project coordinator of the Polish Peer Review and author of the background report.

The Polish authorities will provide any available data and evidence requested by the Panel (in the translation of the necessary documentation into English they will be supported by the contractor), as well as support to the visits of the panel in Poland (i.e. inviting the representatives of the government institutions and stakeholders; providing meeting facilities and interpretation if necessary). The coordination for the Polish authorities will be assured by Mr Mateusz Gaczynski , Deputy Director, Department of Innovation and Development, Ministry of Science and Higher Education, Poland; e-mail: mateusz.gaczynski@nauka.gov.pl ; tel. +48 22 621 78 83; fax +48 22 628 97 13; mobile: 0048 661 300 871.

Overall responsibility of the PSF Peer Review lies with Ms Teresa Czerwinska, Under-Secretary of State, Ministry of Science and Higher Education.

6. Meetings, reports and deadlines

(all dates are tentative and to be further agreed with the Polish authorities, panel Chair and experts)

Preparatory work:

30 January 2017 (tbc) - kick-off meeting with experts and national authorities (Brussels)

Kick-off meeting:

- Presentation of the outline of the background report (related to the focus areas) will be assured by the Contractor;
- Presentation of the focus areas of the Peer Review and their rationale will be assured by the host country;
- Division of tasks and timetables of the Peer Review will be jointly agreed between the experts, the Commission and the host country;
- Exchange on the first Peer Review mission (stakeholders to meet, roll-out of the session) will be conducted by all involved actors;
- Decision on the possible questionnaire to be sent to relevant stakeholders in view of mobilising their involvement in the process and of gathering the missing background information needed will be taken by the panel of experts.

February 2017: Completion of analytical background report (prepared by Jacek Walendowski representing the PSF contractor) and background documents for the use of the experts:

- Analytical background report for the experts (PSF Contractor)
- Relevant national and international documents, including their translation if necessary (PSF Contractor, Polish authorities)
- (if needed) questionnaire to be sent to relevant stakeholders on the Peer Review focus areas

To note:

- The agenda of the meetings during the first Peer Review mission in Poland will be proposed by the Polish authorities (to follow-up on the previous exchanges with the experts' panel);
- The official invitations for the meetings (including the Chair's invitation) will be sent to the relevant stakeholders by the Polish authorities with the support of the

Contractor and the Commission (case of non-institutional stakeholders);

- The Polish authorities will assure the meetings organisation (e.g. venues) with the support of the Commission (EU delegation premises could be used for meetings with the non-institutional stakeholders);
- The panel of experts will prepare (with the support of the Contractor) a list of issues/questions for the stakeholders taking part in the interviews (to focus their inputs).

March 2017 1st Peer Review mission in Poland, including interviews with institutions and stakeholders. Debriefing meetings of the panel shall conclude each day of interviews. The concluding session to discuss the mission findings will be held the last day.

The experts will send their post-mission written contributions to the Chair and rapporteur according to the agreed timetable.

End April 2017: (optional) meeting of the Panel in Brussels to discuss and finalise:

- a proposal for the structure, main messages and draft recommendations of the Peer Review report, for discussion with the Peer Reviewers and the Commission services; and
- the draft agenda and structure of the second Peer Review mission, including key issues/questions and list of institutions and stakeholders to meet.

April/May 2017: Finalisation of the first draft Peer Review report by the panel of experts. Sending of the first draft report to the host country (as input for the second mission).

End May 2017: 2nd Peer review mission of the panel in Poland -on the basis of the draft report- to interact with the Commission, the Polish authorities and stakeholders.

Debriefing meetings of the panel shall conclude each day of interviews. The concluding session to discuss the mission findings will be held the last day. The experts will send their post-mission written contributions to the Chair and rapporteur according to the agreed timetable.

June 2017: Preparation of the 2nd draft Peer Review report (including contributions from panel members).

End June 2017: (optional) meeting of the Panel in Brussels to discuss and finalise the Peer Review report

Feedback from the Polish authorities and the Commission.

July-August 2017: Finalisation of the Peer Review report, including the feedback from the Commission and the Polish authorities.

By the end of September 2017 Presentation of the final report and recommendations of the Peer Review to the Polish authorities and stakeholders.

Follow-up: It is the country's responsibility to ensure the follow-up to the Peer Review and implementation of the recommendations. Presentation and discussion of the review with the national Parliament would be an asset. The Horizon 2020 Policy Support Facility foresees the possibility of a "post Peer Review" exercise that would allow the Peer Reviewed country to request the peers and/or experts to review the implementation of the recommendations.

7 Tasks during the Peer Review period

a) Preparatory phase

While the **RIO background report 2016** (to be published soon) will provide a general background and overview of the situation of the Polish R&I system to the panel members, the PSF contractor will prepare an analytical background report which will complement it by addressing in more details the elements which are the most relevant with regards to the objectives of the PSF Peer Review. This will include a presentation of the main fact and figures in relation to the overall objective and focus areas of the Peer Review targeting the science and higher education policies.

This will include the following qualitative and quantitative analyses:

- Analysis of statistics related to the science and higher education system in Poland: key data available for all actors of the system, bibliometric analyses of the specialisation of the Polish science base and of its quality by field, international co-publications (by field), public-private co-publications (by field), with some benchmarking vis-à-vis selected Member States , analysis of the patenting by public research organisations.
- Overview of the public research funding system, of the various funding flows and their allocation methods.
- Analyses of statistics on R&D expenditure (crossing sectors of performance and funding sources and analysing the breakdown of BERD by industrial sectors), researchers and S&T human resources capacities. With the help of the Polish authorities (and possibly through them of some of the main stakeholders), it will be important to get a correct understanding of the most important trends.
- Overview of the public science and higher education landscape with references to recent legislations and implementation measures and their relevance in addressing the key bottlenecks.
- Focused and short summaries of the existing public policies, legislations, strategies and/or concrete initiatives/measures related to the science and higher education system in Poland, as well as analyses of the governance aspects (both at political/national administrations level and at the level of the largest public R&I performers). Recent relevant evaluation reports (at policy mix level or more specific) will be summarized.

a. Reporting phase

The experts will:

- Conduct research, meta-analyses and interviews with Polish experts, national authorities and other stakeholders.
- Write a report presenting the results of their analysis of the present situation and formulating proposals for concrete measures and development of specific instruments to further develop and strengthen the Polish science and higher education system according to the selected focus areas.

The contractor will:

- Provide the liaison with panel members to ensure that they undertake the tasks required of them under the terms of reference and according to the set out timetable and methodology.
- Ensure the overall administrative, logistical and organisational support to the project.
- Provide analytical support to the panel, through answering requests made by the panel in the course of its work.
- Carry out the quality review of the reports (background, draft and final) at all stages of their preparation, including the final proofreading, editing and formatting.
- Ensure the following communication activities:
 - Prepare an ‘information note’ about this PSF activity to be distributed to all stakeholders invited to the meetings (What is the PSF? What does the PSF do in Poland? Who are the experts? What is the scope of their work? What are the exact timings and expected outcomes?). This document (A4 format) should be used as annex to all invitations to the PSF meetings and distributed during the meetings.
 - Prepare an article about this activity and its findings (two A4 pages) for the RIO/PSF website (after the approval of the final report by the Commission).
 - Translation of key background documents from Polish to English (up to 300 pages) and of the final report from English to Polish.
 - Support the set-up of a high-level dissemination event and ensure the media monitoring after the high-level dissemination event

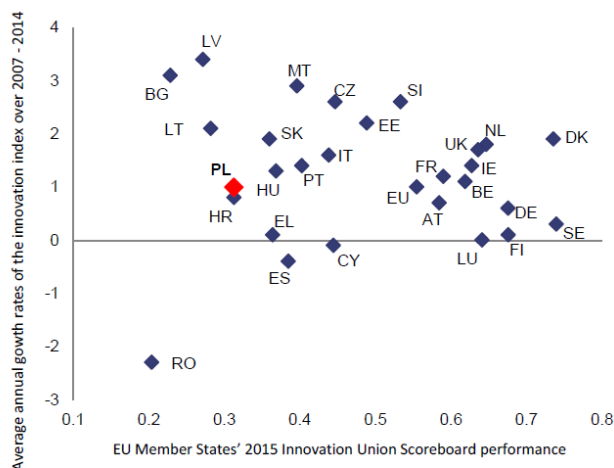
Please see the attached methodology for more specific description of country/experts/contractor and EC roles in the Peer Review process.

Annex 1: European Semester analysis: Research and Innovation chapter from the Country Report 2016

R&D and innovation (from the *European Semester country report Poland 2016*)

Despite the steady increase in R&D spending, progress towards higher innovation output is limited. Gross domestic R&D expenditure (GERD) has been increasing steadily in recent years, but at 0.9 % of GDP in 2014 it is still one of the lowest in Europe and well below the EU average of slightly above 2 %. R&D in Poland still relies predominantly on the public sector supported mainly by EU Structural Funds. However, an important development is the increase in business enterprise expenditure, which in 2014 reached 0.4 % of GDP, up from 0.2 % five years earlier. Despite recent efforts, Poland performs below the EU average on all dimensions of the 2015 Innovation Union Scoreboard (IUS) (Graph 2.3.1). There is a fairly strong deterioration in innovation activities by SMEs, while weak performance in patents and other innovation indicators persists. The quality of scientific activities in Poland is not improving, as evidenced by the low score in the Research Excellence Indicator of the 2015. 4.2 % of Polish scientific publications among the 10 % most-cited worldwide (2010), ranking Poland 24th in the EU (ahead of only four countries: Romania, Bulgaria, Croatia and

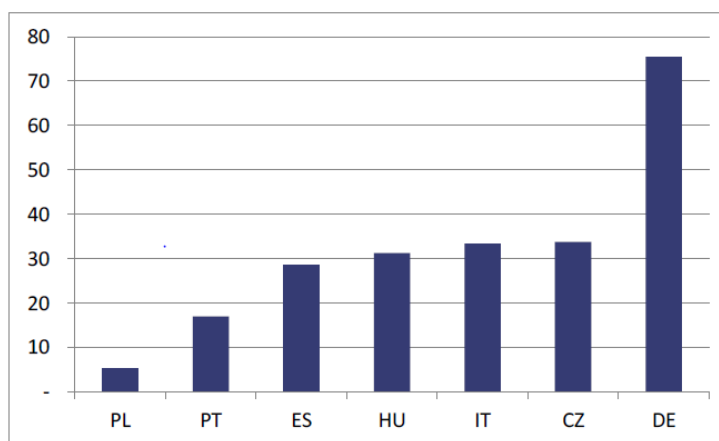
Graph 2.3.1: Poland's ranking in the Innovation Union Scoreboard



Latvia). **Source:** European Commission

Weak linkages between the business sector and academia persist. Only around 10 % of innovative companies cooperate with universities and higher education institutions. In terms of public-private scientific co-publications, which can be used as a measure for the link between business and academia, Poland trails behind regional peers such as the Czech Republic or Hungary (Graph 2.3.2). In order to improve the collaboration between science and industry, a number of policy initiatives were introduced in recent years, but the results still remain to be seen. Apart from the 2014 amendments to higher education laws, affecting the system of intellectual property rights, work is still ongoing to amend industrial property law more broadly. This work aims at simplifying procedures, notably before the Patent Office, including through the use of electronic tools.

Graph 2.3.2: Public-private scientific co-publications per million population, 2012



Source: European Commission

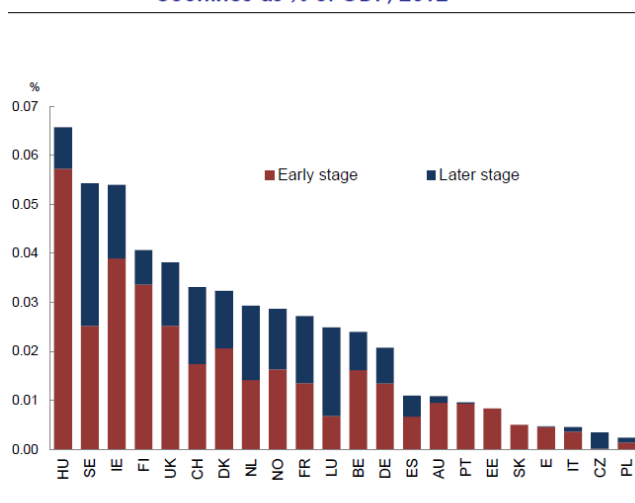
Strengthening the quality and internationalisation of science in Poland is proving challenging. Deficiencies in human resources management result in a lack of mobility and a limited influx of young researchers to both academia and the corporate sector. The average age of academic teachers is increasing and the impact of scientific output in Poland is well below the OECD average¹². Moreover, the quality and organisation of doctoral study programmes is lacking. Doctoral curricula are often overly theoretical, while issues such as

¹² Measured by the normalised impact of scientific production (OECD Science, technology and industry scoreboard 2013 based on Scopus Custom Data)

research methodology are not adequately addressed. A recently approved government document on open access to scientific information lacks some important provisions¹³. With a view to tackling the quality and internationalisation of science, a dedicated ‘Programme for the development of higher education and science 2015-2030’ was proposed in 2015. It aims at improving the quality of public research and higher education through changes in their governance, management and funding. Nevertheless, it neither includes specific financial commitments nor an action plan for implementation.

The sources of financing firms’ R&D activity remain limited. While access to bank loans is easier in Poland than in many other EU countries, the covering of alternative financing is limited, particularly among SMEs. The use of venture capital and private equity instruments to innovative projects is particularly low (Graph 2.3.3). In 2014, these sources of financing amounted to EUR 251 million, or 0.06 % of Polish GDP, well below levels in more advanced EU economies and less than in countries such as the Czech Republic and Hungary¹⁴. The limited availability of venture capital, which plays a more prominent role at a later stage of the innovation cycle, is especially problematic for young firms that intend to commercialise their products and roll them out to the market. Nevertheless, multiple measures have been introduced recently under the European Regional Development Fund’s (ERDF) ‘Smart Growth’ Operational Programme to provide alternative financing to companies wishing to engage in R&D. This includes the ‘4Stock’ instrument aimed at assisting SMEs wishing to raise equity or debt finance in capital markets. Another instrument, ‘Biznest’, is expected to help bring together private investors and entrepreneurs interested in syndicated private investment for start-ups based in Poland¹⁵.

Graph 2.3.3: Venture capital investment in selected OECD countries as % of GDP, 2012



Source: OECD

Recent initiatives set out a comprehensive medium-term agenda for R&D, but their roll-out remains challenging. The Polish research and innovation system has been significantly restructured in recent years. The most important changes include the 2013 Strategy for Innovation and Effectiveness of the Economy 2020 (SIEG) that defines research and innovation policy priorities, and the 2014 Enterprise Development Programme (PRP) that proposes a wide range of measures to improve the support system for innovative activities of enterprises. The strategic framework is strengthened by operating programs under the ERDF. In addition, support to Polish innovative companies is envisaged under the new EU flagship initiative — the European Fund for Strategic Investments (EFSI), within the so-called ‘SME

¹³ E.g. it does not include the requirement of providing open access to Ph.D. dissertations repositories. "Kierunki rozwoju otwartego dostępu do publikacji i wyników badań naukowych w Polsce", Ministry of Science and Higher Education, 2015

¹⁴ 2015 European Private Equity Activity, European Private Equity and Venture Capital Association, May 2015

¹⁵ 2015 SBA Fact Sheet

window'. The EFSI offers guarantees and counter-guarantees, aimed specifically at the high-risk, innovative or research-oriented companies' needs¹⁶. Currently, the key challenge is to implement the strategic policy framework effectively, also taking on board lessons learnt from the previous EU programming period (2007-2013). In particular, multiple dedicated government agencies face the challenge of creating operational synergies in order to better integrate the research and innovation policies that support, among other things, applied research and the commercialisation of innovative ideas. The new government reinforced this framework by creating an Innovation Council in January 2016 to coordinate the innovation policies of the government. It comprises, inter alia, three deputy prime ministers (Development, Culture and National Heritage, and Science and Higher Education). The main policy initiatives of the Council will aim at building on the competitive advantages of the Polish economy and include the introduction of fast-track funding for innovation.

The system of R&D tax incentives has been overhauled to better stimulate innovation. In the past, R&D tax incentives in Poland were not effective in stimulating private R&D due to their design and implementation, but a new law on supporting innovativeness introduces new R&D tax incentives from the beginning of 2016¹⁷. The definition of qualifying R&D costs is now broader and has been extended to internal R&D. The new R&D tax incentives consist of a 30 % deduction in the wages of R&D personnel and 10 % in qualifying R&D costs (20 % for SMEs). However, the effectiveness of new R&D tax incentives will depend on the way they are implemented; much depends on how easy it will be for young and small companies to apply for the new R&D tax solutions. For example, a short carry forward of unused deductions and lack of cash refunds may limit the attractiveness of tax incentives for young innovative companies. The new law also creates tax exemptions for funds on the sale of stocks of qualifying companies in which funds hold at least 10 % of capital. This aims at stimulating equity financing for innovative businesses. The Innovation Council has underlined the need for further changes in R&D tax incentives, including introducing tax breaks stimulating science-to-business collaboration.

¹⁶ The first facilities under the "SME window" are already operational in Poland. For example, in July 2015, the European Investment Fund (EIF) and Bank Gospodarstwa Krajowego (BGK) — the Polish national promotional bank — signed an agreement for EUR 250 million to reach SMEs over the next two years under the COSME Loan Guarantee Facility.

¹⁷ Ustawa z dnia 25 września 2015 r. o zmianie niektórych ustaw w związku ze wspieraniem innowacyjności <http://isap.sejm.gov.pl/DetailsServlet?id=WDU20150001767>.