INTERSESSIONAL PANEL OF THE UNITED NATIONS COMMISSION ON SCIENCE AND TECHNOLOGY FOR DEVELOPMENT (CSTD)

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Contribution by Poland

to the CSTD 2024-2025 priority theme on "Diversifying economies in a world of accelerated digitalization" and "Technology foresight and technology assessment for sustainable development"

Poland – input to the issues papers to be presented at the CSTD inter-sessional panel meeting which will be held on 21-22 October 2024 in Geneva

THEME 1

1. Has your country put in place mechanisms to strengthen industrial capabilities through partnerships among different stakeholders (e.g., university-industry, or private-public)?

Business development and socio-economic challenges in a knowledge-based economy require partnerships and cross-sectoral cooperation. The innovation and competitiveness of the modern economy increasingly depend on the ability to build partnerships between universities and businesses.

More and more entrepreneurs are using the potential of science to increase profits in their companies. In recent years, there have been many opportunities to establish such cooperation supported by various instruments co-financed from public funds:

a) Relief for R&D

Entrepreneurs undertaking research and development activities may deduct 100% of the expenses incurred for research and development activities (so-called qualified costs) from the tax base. An exception is companies with the status of a research and development centre, which are entitled to deduct 200% in respect of all eligible costs. Eligible costs include: employee costs, materials and raw materials, external services from scientific entities, paid use of scientific and research equipment.

b) IP Box relief (Innovation Box)

The relief consists in preferential taxation of income from intellectual property rights that are subject to legal protection (e.g. patent, copyright in a computer programme) and have been created, developed or improved as part of the R&D activity conducted by the Entrepreneur. If the Entrepreneur generates its own IP (intellectual property rights) then the profits derived from it are taxed at a preferential rate of 5%.

c) Prototype relief

The relief allows an additional 30% of the costs associated with the trial production of a new product and the launch of a new product to be deducted from the tax base.

d) European Funds for the Modern Economy (FENG) 2021-2027

FENG is an EU-funded operational programme with a budget of €7.9 billion, following the two previous programmes Innovative Economy 2007-2013 and Intelligent Development 2014-2020. Government agencies responsible for supporting companies in this area include the Polish Agency for Enterprise Development, the National Centre for Research and Development or the Bank Gospodarstwa Krajowego. The programme is aimed at supporting the development of innovation

and cooperation between business and science in areas with the highest development potential on a national scale, the so-called national smart specialisations. In these areas we have, as a country, a large development potential, which indicates the competitive advantages of Polish enterprises. An example of one of the measures is Joint Research Projects aimed at directing the activity of entrepreneurs and scientific and industrial consortia to implement R&D works on technological solutions. Partners may be private or public entities (e.g. provincial governments). The partners participate in the preparation of the research agenda for the funding of the above-mentioned projects.

Co-financing is granted for the implementation of projects that include industrial research and/or development works. The support for R&D projects may be complemented by co-financing of pre-implementation works, understood as activities preparing for the implementation of the results of R&D works in economic activity.

e) Łukasiewicz Research Network

It is the third largest integrated network of research institutes in Europe. The network combines the potential of 23 research institutes in conducting joint technological projects and 4,500 scientists and engineers from all over Poland generating innovative solutions

Łukasiewicz is a new quality in the relationship between science and business. The organisation, which is open to the needs of entrepreneurs and has a huge potential stemming from the competence of thousands of employees: scientists and engineers, focuses on four key areas for the development of the Polish economy: smart and clean mobility; digital transformation; health; and a green, circular economy. Many products and innovations have been developed so far - cascade lasers, biodegradable packaging for the food industry, bionic beverages or thermal batteries for smart ammunition.

THEME 2

1. **Has your country conducted ForSTI, TA or both? If yes, what were the reasons for undertaking ForSTI and TA?**

MRiT has recently made several studies on global technology trends, including "Assessing the state and forecasting socio-economic development based on technology in the context of National Smart Specialization (2040)", in which the foresight methods were used: scenarios building, trend maps, expert panels.

The purpose of the analysis was to identify technology trends and megatrends, R&D areas, key and critical technologies in which Poland has a competitive advantage and are crucial for innovativeness and security of Polish economy.

2. **What agency (or agencies), if any, is responsible for ForSTI and/or TA?**

There is no specific entity responsible for foresight studies in Poland. Ministry of Economic Development and Technology (MoED) decided to conduct the foresight studies in the field of technology development as a part of monitoring process of smart specialization strategy.

3. Who was responsible for implementing the ForSTI and/or TA undertaken - national government, sub-national levels of government (state/province or other levels), industry, universities, research institutes or civil society?

MoED is responsible for designing and monitoring startegies in the field of smart specialization and technology development. The data and recommendations from the foresight analysis are analysed and used in the future works i.a. identifying potential smart specializations, new key technologies.

4. In which sectors and/or for what policy processes have ForSTI and TA been undertaken, or linked to? What SDGs have they related to?

The foresight analysis weren't undertaken in predefined areas – the aim was to identify the trends and challanges which determine the socio-economic growth, then identify the resources and potential of Polish business and science representatives to address those trends and challanges and in the end conclude in the areas with high growth potential.

Examples of identified main fields and key technological areas in relations to sustainable development goals

Main fields	Key technological area	Sustainable Development Goal
AUTOMATION AND ROBOTIZATION	• Smart agricultural machinery • Medical robots • Systems that automate processes in TSL (transport, forwarding and logistics)	Goal 9 Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation
DIGITIZATION	• Artificial intelligence • Data collection processing and transmission • Internet of Things • Quantum technologies • Immersive and gaming technologies • Geoinformation • Cyber Security	Goal 9 Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation
ENERGY	• Renewable fuels and bioenergy • Nuclear technologies • Hydrogen technologies • Clean coal technologies • Renewable energy sources (RES) • Energy storage and recovery technologies • Resilience and security of energy systems • Energy efficiency for industry • Carbon capture and storage	Goal 7 Ensure access to affordable, reliable, sustainable and modern energy for all Goal 13 Take urgent action to combat climate change and its impacts
RAW MATERIALS, WASTE, ENVIRONMENT	• Environment and climate - sustainable management of natural resources, biodiversity and climate protection • Efficient management of raw materials • Sustainable industry • Closed loop technologies in waste management • Smart environmental management • Remediation of the soil and water environment	Goal 13 Take urgent action to combat climate change and its impacts

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TRANSPORT	• Innovative means of transportation • Innovative drives and power sources and systems • Innovative transport management systems	Goal 11 Make cities and human settlements inclusive, safe, resilient and sustainable

Artificial Intelligence (AI)

What are the specific challenges your economy is facing to develop or adapt frontier technologies and AI?

The Polish economy faces a number of challenges related to the development and adaptation of pioneering technologies. The challenges include: with the need to develop technological infrastructure, qualify specialists in the field of pioneering technologies and implement technologies especially in the small and medium-sized enterprises sector (SME).

It is equally important to adapt legal regulations to the rapid development of technology. In Poland, as a European Union member state, the provisions of the AI Act will apply.The AI Act aims to ensure the safe and ethical use of artificial intelligence technologies, taking into account citizens' rights, and supporting technological innovation. The new regulations include, among others: requirements regarding the transparency of algorithms, labeling of content generated by artificial intelligence and principles of life cycle management of artificial intelligence systems.

The social aspect of introducing new technologies is also important. There is concern that automation and AI may lead to job losses in some sectors. Therefore, it is important that government policies and social support programs help employees adapt to the changing labor market.

Can you provide successful examples of AI and other frontier technologies uptake in your country?

Examples of the use of artificial intelligence supported by the Ministry of Digital Affairs:

PLLum - building an open Polish large language model. The PLLuM project is an initiative that aims to create a Polish language model (LMM). This model is intended to revolutionize interaction with the Polish language in the digital world by providing a more precise language interface embedded in the Polish context. Creating such a model will be a big step towards more personalized and effective AI solutions that will more precisely respond to the needs of the Polish-speaking society. Due to the fact that the model will be open-source, it will allow for full transparency of systems based on it and ensure greater equal access to specialized technology for private individuals and Polish enterprises.

"Telediagnostics in ophthalmological examinations" project implemented by the National Institute of Telecommunications. The aim of the project is to use mobile diagnostics using artificial intelligence in screening tests.

Has your country put in place inclusive policies for innovation and economic diversification specifically tailored to diffusion of digital technologies and AI?

On December 28, 2020, the Council of Ministers adopted the "Policy for the development of artificial intelligence in Poland from 2020" describes the actions that Poland should implement and the goals that it should achieve in the short-term, medium-term (until 2027) and long-term (after 2027), aimed at the development of Polish society, the Polish economy and Polish science in the field of artificial intelligence.