



International seminar  
Monitoring of S&T and Innovation Development of Ukraine  
30<sup>th</sup> of May, 2024

# **Implementation of the EU standards for monitoring R&D&I activities in Ukraine**

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# Different types of indicators, which could be used for monitoring of S&T and innovation

- Input and output indicators
- "Output "indicators can be divided into two large groups:" technical "and "economic". "Technical" refers primarily to patents and publications. Economic indicators (examples): volume of innovation production, the level of capitalization of investments in R&D (knowledge capital stock) – through the system of national accounts, and others.
- Static and dynamic indicators
- 'Simple' ('basic, initial') and complex indicators

# Key problems for utilization of indicators in monitoring of R&D and Innovation

- difficulties in determining the quantitative characteristics of "new knowledge", which is the main result of scientific, technical and innovative activities;
- the need to take into account the "gaps in time and space" between the appearance of results and their use in different sectors of the economy;
- difficulties in displaying the results of scientific and technical activities using "traditional" economic statistics (for example, within the framework of the system of national accounts-SNA).

# Transition to OECD standards

- Ukraine is actively switching to international standards in the field of Statistics, Science and innovation. In 2023, the OECD approved our versions of Frascati, Oslo and some other manuals in Ukrainian language)
- However, such a transition does not always rely on the relevant statistical base of previous years. The fact is that for a long time specific statistical indicators were used in Ukraine, which practically "disappeared" from the statistics of most countries of the world.



## Key sources of information

- Official statistics of industrial innovations and technology transfers in industry (State Statistical Service, Ukrainian National Office of IP and Innovation, Administrative data from the ministries and state agencies)
- CIS- type surveys (State Statistical Service)
- Surveys of markets for different products (sectors)
- Specialized national surveys at the state and regional levels
- Special reports of international organizations (international patents, publications, EBRD, WB)
- Others (publications in professional journals, exhibitions and others)

# Official statistics of industrial innovations and technology transfers in industry

## Positive features:

- Relatively long time series
- Robust methodology of data collection
- Utilization of international classifications (NACE-type)

## Negative features:

- Focus on industrial sector only
- Specific approach to data sampling (samples are different for different years)
- Problems with access to the data on individual enterprises
- Non-flexible presentation of data

# CIS- type surveys

## Positive features:

- Comparable data with other EU countries
- Comprise all sectors of the economy
- Utilization of the modern statistical instruments (sampling, etc.)

## Negative features:

- Regularity is once per 3 years only
- Time series are short
- Limited volumes of information are published

# Results of CIS-type surveys in Ukraine

- 3 surveys were made in 2008-2018 (some limited results of them are published)
- The shares of innovative companies in the Ukrainian economy were between 18% and 25% in these years, which was worse than the less the 'weak' innovators in the EU demonstrated in the same period
- However, these figures correlate with all major indexes of competitiveness for national economies, which are used for international comparisons.
- 'Paradox': *These figures are usually higher than figures for the industrial sector. Reason: high share of ICT services in the economy*
- 37.5% of indicators of the EU Scoreboard could not be calculated easily.



# Dynamics of changes in human resources in science in Ukraine

- The total number of scientists in Ukraine has more than halved in the last decade (according to domestic statistics) .It decreased to 55.1 thousand in 2020 and to less than 35thous. in 2023
- While the number of doctors of Sciences increased to 7 thousand from 4.1 fifteen years ago.
- The share of young researchers is constantly decreasing
- But: universities have some reserves (2/3 of doctors of sciences and 75% of candidates of sciences are there)

# Individual indicators for monitoring of innovation activities -1

- - the share of expenditures for the implementation of scientific and technical works in the gross domestic product; the share of expenditures by main sectors and sources (according to the current classifications);
- - share of innovative enterprises in the total number of enterprises;
- - the share of exports of goods produced by enterprises of the high - and medium-tech industrial sectors in the total volume of exports of goods;

# Individual indicators for monitoring of innovation activities -2

- - the share of persons, employed in enterprises belonging to the high - and medium-tech industrial sectors in the total number of employees employed in industry;
- - the share of innovative products in the total volume of industrial products.
- - share of investments in intangible assets in the total volume of capital investments;
- - revenues from the sale and use (primarily under license agreements) of intellectual property objects, software, know-how, and other intellectual services;

## Individual indicators for monitoring of innovation activities - 3

- the number of individuals and business entities engaged in innovation activities;
- number of organizations that provide services for commercialization of R&D results (by types of such organizations);
- number of patent applications under the PCT procedure;
- number of new trademarks ;



# Some indicators of the European Innovation Scoreboard 2023 (SUMMARY INNOVATION INDEX 31.0 relative to the average figures for the EU)

| Indicator                                | Changes in 2016-2023 |
|--|----------------------|
| Human resources                          | -0.2                 |
| Doctorate graduates (STEM)               | -8.5                 |
| Population with tertiary education       | No data              |
| Lifelong learning                        | No data              |
| Attractive research systems              | 4.2                  |
| International scientific co-publications | 7.0                  |
| Most cited publications                  | 6.8                  |
| Foreign doctorate students               | -4.6                 |
| Digitalization                           | No data              |

# Conclusion

- Statistics of R&D and innovation has to be improved according to the OECD standards.
- However, there is a need to propose special indexes for innovation development for developing countries, including specific indicators, such as utilization of ISO standards in the economy.
- Monitoring has to be a permanent process with clear procedures and indicators at different levels
- Revisions of the indicators and procedures have to be regular and justified

**Thank you for your attention!**