

Localised Science, Technology and Innovation (STI) for SDGs Roadmap in Ukraine: defining the governance and policy frameworks

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Abstract

Ukraine joined the UN Global Pilot Programme on STI for SDGs Roadmaps in March 2021, supported by the Joint Research Centre (JRC) of the European Commission, as well as the United Nations Industrial Development Organization. This policy brief provides an overview of Ukraine's preliminary steps in the design of the STI for SDGs roadmap, with a focus on the analysis of policy frameworks and institutional set-up. The work aimed at positioning the roadmap in the existing legal and policy framework and at identifying the most appropriate governance structure. Recommendations on the methodology and on the next steps are shared in this document.

The STI for SDGs roadmap design follows the Guidebook for the Preparation of STI for SDGs roadmaps and is based on the most recent advancements in the Smart Specialisation for Sustainable Development Goals methodology.

Background

Considering the key role of science, technology and innovation (STI) in achieving the Sustainable Development Goals (SDGs) and the importance of international cooperation and exchange for sustainable development and recovery from the COVID-19 pandemic, Ukraine joined the UN Global Pilot Programme on STI for SDGs Roadmaps in March 2021¹. Since then Ukraine has been working on the Roadmap development, using the smart specialization approach that proposes a localised, evidence-informed and participative priority-setting process for research and innovation investments. This work has been supported by the Joint Research Centre of the European Commission, as well as the United Nations Industrial Development Organization's experience on green industrial transformation.

The process for the design of the STI for SDGs roadmap in Ukraine is based on the development of the National Smart Specialisation Strategy for SDGs and takes into account the successful experience of the implementation of the JRC Smart Specialisation methodology in Ukrainian regions. The national level strategy will set up the key priorities for future action but also provide the necessary coordination and means of implementation for the subnational strategies with their respective roadmaps and action plans.

The methodological basis for adapting the smart specialisation approach to the context of sustainable development in Ukraine is the "Guidebook for the

Preparation of Science, Technology and Innovation (STI) for SDGs Roadmap" (the Guidebook) (UN-IATT and EC/JRC, 2021) and the following publications:

- [Overview of the existing STI for SDGs roadmapping methodologies - Background paper](#)
- [Progress Report of the Global Pilot Programme on STI for SDGs Roadmaps](#)
- [Addressing sustainability challenges and Sustainable Development Goals via Smart Specialisation. Towards a theoretical and conceptual framework](#)
- [Smart Specialisation, Sustainable Development Goals and Environmental Commons](#)
- [Pilot methodology for mapping Sustainable Development Goals in the context of Smart Specialisation Strategies](#)

The aim of this policy brief is to share Ukraine's preliminary steps in the design of the STI for SDGs roadmap, particularly as concerns the analysis of policy frameworks and institutional set-up. This policy brief shows a practical implementation of the Guidebook in the Ukrainian context in alignment with the JRC Smart Specialisation for SDGs methodology. The key stages and components of the initial phase of the Roadmap development - Strategic policy framework establishment, institutional set-up, governance, as well as mapping of economic, innovative and scientific potential in the sustainable development context are

¹ Links to the launching events:
<https://sdgs.un.org/events/working-meeting-global-pilot-programme-sti-sdgs-roadmaps-32806> ;

<https://s3platform.jrc.ec.europa.eu/en/web/guest/w/working-meeting-global-pilot-programme-on-sti-for-sdgs-roadmaps->

analysed. This policy brief is aimed at policymakers and STI policy practitioners interested in the development of the STI for SDGs Roadmap, as described in the Guidebook.

Approach and methods

The analysis of the Ukrainian strategic policy framework, as well as on institutional set-up, governance of the project and mapping of economic, innovative and scientific potential in the sustainable development context was performed to provide guidance on the placement of the STI for SDGs Roadmap into the Ukrainian context. The data were obtained through expert interviews and fieldwork with the stakeholders working on the STI for SDGs Roadmaps in Ukraine.

Strategic policy framework

Ukraine is working on the coordination and monitoring of Sustainable Development Goals at the national level, with national targets for achieving the SDGs (Ministry of Economic Development and Trade of Ukraine, 2017: 122). An SDG-driven national level policy making and monitoring is based on 86 national targets and 183 indicators. Results of the 2020 SDGs national monitoring should be considered as a basis of selecting the priority areas for the STI for SDGs Roadmap of Ukraine². Following that, the Roadmap mobilising Science, technology and innovation for SDGs, will also be developed at the national level, as this is where most support programmes, instruments and mandates are concentrated. Ukraine decided to develop the STI for SDGs Roadmap in the form of the National Smart Specialisation Strategy for SDGs that will also include key subnational level priorities.

Following the rationale for the Roadmaps of the Guidebook (STAIIFS and JRC, 2021: 13), an analysis was carried out to determine the place of the Roadmap in the National Policy Framework of Ukraine. Three interrelated policy frameworks are intended to provide the national context of the roadmap - National Development Plan National, STI Plan, National SDGs Plan (Fig. 1).

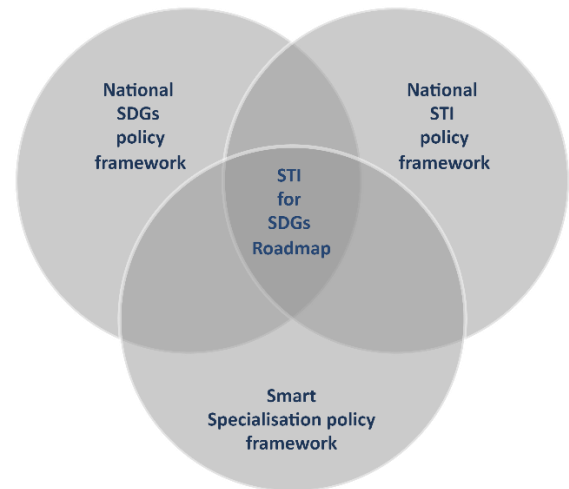
Figure 1. STI for SDGs Roadmaps in the intersection of three types of national plans



Source: STAIIFS and JRC, 2021: 13

The national challenge in the implementation of this approach was the absence of the official National development plan in Ukraine. Taking into account that Ukraine is working on the Roadmap using the smart specialisation approach, it was proposed to expand the methodology by adding a national smart specialisation framework. Therefore, to define a place for the STI for SDGs Roadmap in Ukrainian strategic framework, the SDGs, STI and Smart Specialisation policies and policymaking bodies were analyzed.

Figure 2. STI for SDGs in the strategic policy framework of Ukraine



A complex reform on both science and innovation components of the STI policy framework was launched in 2017. It was based on the shift from the supply side to demand-side innovation policy, including the development of the key strategic documents, establishment of the new funding and coordination

² The SDGs 2020 Monitoring Report: Ukraine <https://ukraine.un.org/en/151095-sdgs-2020-monitoring-report>

mechanisms, improvement of the national IPR protection system. The key state strategic documents related to STI policy are the Strategy for developing the sphere of innovative activity until 2030 (the Innovation Strategy 2030), the Economic strategy until 2030, as well as STI components in sectoral strategies, such as the Strategy for developing the defence-industrial complex until 2027, the Ecological strategy until 2030, the Energy strategy until 2050 and a draft Strategy for Industry 4.0. As the legislative bases for the Ukrainian participation in the Global Pilot Program for STI for SDGs Roadmaps, the Innovation Strategy 2030's Action Plan foresees the development of an STI for SDG's roadmap in Ukraine.

The Smart Specialisation policy framework is formalized through the Methodological guidelines for determining the priorities of smart specialization of regions, which was adopted by the Ministry of Economy in 2019 and follows the Smart Specialisation Framework for EU Enlargement and Neighbourhood Region. At the regional level smart specialisation is regulated by the decree of the Cabinet of Ministers of Ukraine from 2019 "On approval of the Procedure for developing regional development strategies and action plans for their implementation, as well as monitoring and evaluating the effectiveness of these regional strategies and action plans", which determines that the strategic goal of the regional strategy should be determined on the basis of smart specialisation.

As for the SDGs policy, the key strategic document in Ukraine is the Baseline National Report "Sustainable Development Goals: Ukraine", adopted and published by the Ministry of Economic Development and Trade of

Ukraine in 2017, which also includes national indicators for each of the SDGs. In addition, the Ministry assessed the level of incorporation of SDG targets and activities into the current strategic (policy) documents in 2019.

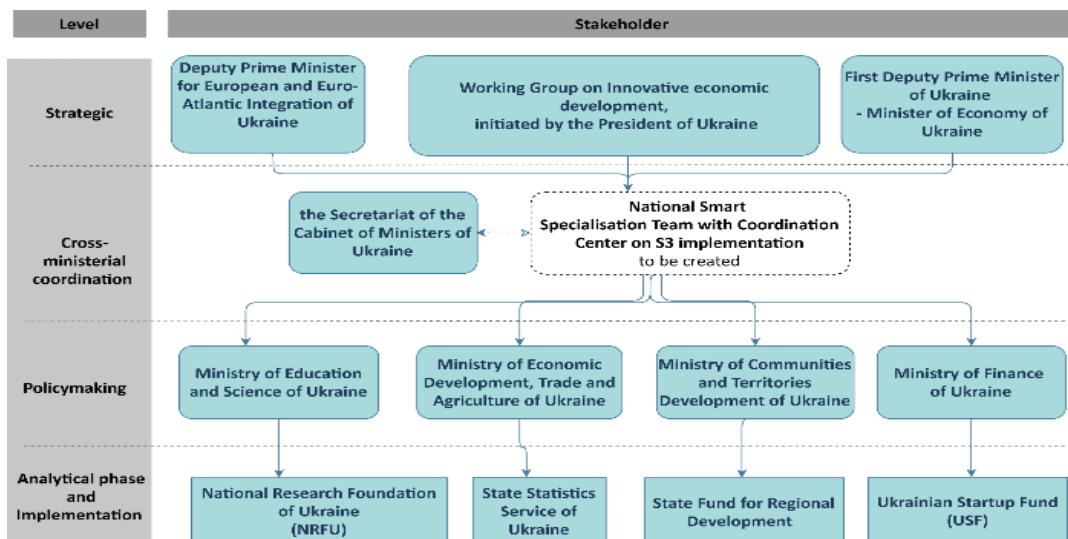
The development and implementation of STI for SDGs Roadmap is proposed to be placed at the intersection of the above-mentioned policies (Fig. 2).

Effective governance and implementation of the framework described above, requires correct institutional setup for the Roadmap's development. Given the recommendations of Chapter 2.1 of the Guidebook, the work on a roadmap should be done at the national level, by central agencies or ministries responsible for STI plans and development plans, or having the mandate to work on SDG plans. In the Ukrainian case, the Ministry of Education and Science, responsible for the STI policy, took commitment to lead the Roadmap development.

Further analysis of the Ukrainian context has shown that the Roadmap's placement on the intersection of the STI, SDGs and Smart specialisation policies requires the involvement of the broad range of public stakeholders and their proper coordination. This challenge stems from the fact that the policies that are involved in the work on the Roadmap lay under the responsibility of different Ministries and leaders.

Based on the approach given in Figure 2.1 of the "Intersection of Development, STI and SDG Plans and key actors" of the Guidebook (ibid., 2021: 23), a map of the institutional setup of the main governmental agencies and bodies involved in the work on the Roadmap was developed (Fig. 3).

Figure 3. Institutional setup of the STI for SDGs Roadmap in Ukraine



To ensure effective interaction on both development and implementation stages, it was proposed to carry out the institutional placement of the project at four levels - strategic, coordination, policymaking and implementation. As for the leadership on the strategic level, the Guidebook recommends that high-level leadership is envisaged, for example by the Presidential Administration or other target high-level body (ibid.: 22). Taking into account the multi-stakeholder specificity of the Ukrainian framework, the 3 main leaders on the strategic level should be involved, namely the First Deputy Prime Minister of Ukraine, responsible for the strategic planning and smart specialisation; the Deputy Prime Minister for European and Euro-Atlantic Integration, responsible for the SDGs; and the Working Group on Innovative economic development under the President of Ukraine, supporting the strategic STI policymaking. Having multiple leaders at the strategic level creates both advantages and risks in terms of governance. It provides a certain degree of flexibility, but at the same time, it creates the threat of a duplication of responsibilities. This potential risk should be mitigated in further work on the implementation of the Roadmap. The National Smart Specialisation Team established in a form of the Coordination Center on the smart specialisation implementation is seen as the main cross-ministerial body.

Figure 4. Areas of focus of SDGs in Ukraine



Source: Ministry of Economic Development and Trade of Ukraine, 2017

Despite the fact that the Roadmap's development is designed at the national level, it is crucial to create a mechanism for identifying possible synergies with the regional smart specialisation strategies that Ukraine is developing since 2017, in a new sustainable development context. For this purpose, Ukraine has been developing a coherent Multi-Level Smart Specialisation policy framework that will allow effective multi-level governance based on synergies between the National STI for SDGs Roadmap and regional Smart Specialisation Strategies in the country.

Furthermore, as indicated in the Guidebook (ibid.: 22), a significant aspect of the development of the Roadmap, regardless of which public body is engaged in its coordination and development, is that this process requires the additional integration of a wide range of private and public stakeholders from the public sector, academia, business, civil society and development organizations.

Considering that Ukraine is working on developing the Roadmap using a smart specialisation approach, the Guidebook's recommendation would be reflected in the Entrepreneurial Discovery Process (EDP)³, which provides a framework for stakeholders' engagement mobilising private and public sector, academia and civic society (Marinelli, 2017: 4). As EDP is a continuous process, it allows stakeholders' engagement on both the Roadmap's design, implementation and monitoring phases (ibid.: 7).

Until the Russian military aggression, Ukraine was working on the mapping of its economic, innovative and scientific potential in the sustainable development context. Once the activities will be resumed, the mapping will be finalised taking into account the new scenario and ensuring a comprehensive integration of the sustainable development targets and country's priorities on both the mapping and the EDP stage.

Mapping of economic innovative and scientific potential in the sustainable development context

As was pointed out above, the mapping of Ukrainian economic, innovative and scientific potential in the sustainable development context is an initial and integral part of the Roadmap development, that reflects Step 1 "Define objectives and scope" and Step 2 "Assess

³ In Smart Specialisation methodology, the Entrepreneurial Discovery Process is the stakeholders' dialogue phase during which

investments are prioritized based on an inclusive and evidence-based discussion with different actors

current situation" of the Guidebook (STAIFS and JRC, 2021: 32).

As Ukraine has decided to develop STI for SDGs Roadmap as a stand-alone document, the analysis of its possible connection and overlaps with other planning and implementation documents on STI, SDGs and Smart Specialisation was performed. Benchmarks and targets for Ukraine to achieve the Sustainable Development Goals (SDGs) are given in the "Sustainable Development Goals: Ukraine' national report", including the corresponding "Sustainable Development Goals: Ukraine - target and indicators" chapter (Ministry of Economic Development and Trade of Ukraine, 2017: 122). Starting from the analysis of Ukraine's development challenges connected with the support of lifelong education, promoting gender equality, decreasing child mortality, reducing the spread of HIV/AIDS and tuberculosis and ensuring environmental sustainability, the report describes the national SDGs system, including 86 national development targets and 183 indicators. Targets and indicators focus on four areas: equitable social development, sustainable economic growth and employment, effective governance, and environmental balance and the development of resilience (Fig.4).

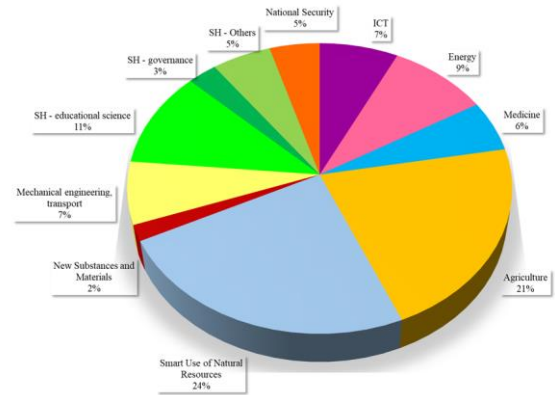
As for the priority areas of scientific, technological and innovative activities, the assessment of the situation showed that at the time of the start of the work on the Roadmap, priority areas were going through a process of transformation and renewal led by the Ministry of Education and Science (MES). This work allowed to map the Ukrainian economic, innovative and scientific potential in the sustainable development context based on the results of the foresight research on priority areas, carried out by the Institute of Economics and Forecasting of NASU at the request of the MES. Foresight research was carried out in seven thematic areas: social sciences, energy, environmental management, information and communication technologies (ICT), life sciences, industry and national security.

The methodology used by the Institute is based on the EU approach to the selection of research priorities under the Horizon-Europe programme for research and innovation, as well as the national SDGs targets and indicators. It was carried out in five stages, which include conducting two surveys of experts-scientists and experts-practitioners by questionnaires and forming a database of proposals, as well as three stages of evaluation of proposals submitted by experts with more than 1000 experts participating in the survey.

Spheres of activities and structure of the Foresight research's survey participants are indicated on the

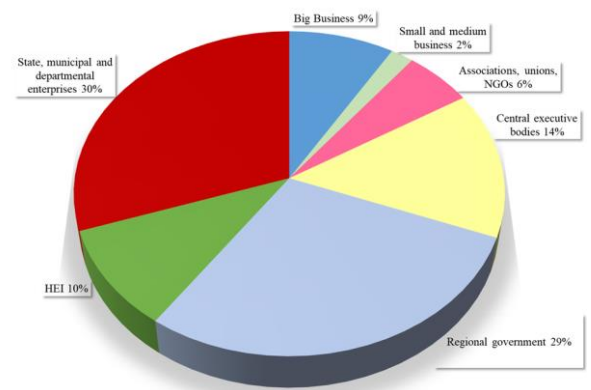
Figures 6 and 5 respectively. Beyond the questionnaires, this would be complemented with the analysis of STI potential using STI indicators. In addition, environmental indicators will be included into the study.

Figure 5. Spheres of activities indicated by the Foresight research's survey participants



Source: MES of Ukraine

Figure 6. Structure of the Foresight research's survey participants



Source: MES of Ukraine

analyse the situation in Ukraine regarding the SDGs and selected targets, the first stage of the foresight included a grouping of proposals and establishing connections of the scientific community's opinions and vision on the priority areas of scientific and technological research for each of the 17 SDGs. The vision of the scientific and business community was determined by a questionnaire to map the proposed areas of research and innovation with the corresponding national targets for the SDGs.

JRC has also undertaken a mapping of the economic, innovation, scientific and technological potential of the

Eastern Partnership countries, including Ukraine (Fuster, E., Matusiak, M., Reimeris, R., 2022). The study provides a set of domains of economic and innovation (E&I) specialisation, as well as scientific and technological (S&T) specialisations. The analysis has highlighted for Ukraine economic and innovation specialisation in food products, wood and products of wood and cork, basic metals and fabricated metal products, machinery equipment, manufacture of motor

vehicles, wholesale and retail trade; and scientific and technological specialisation in Health and wellbeing, Energy, Biotechnology, Transportation, Mechanical engineering and Nanotechnology and materials. As a final step, the study provides clusters of economic activities by matching economic and innovation domains and their corresponding scientific and technological domains, as follows (Fig. 6):

Table 1. Concordance between Economic and Innovation analysis and Scientific and Technological Analysis

Ukraine		
Concordance between E&I analysis and S&T analysis		
Economic cluster	E&I domains (NACE sectors)	S&T domains
Food Processing and Manufacturing	10 Manufacture of food products	• Agrifood
Wood Products	16 Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials	
Metalworking Technology	25 Manufacture of fabricated metal products, except machinery and equipment	• Nanotechnology and materials
Information Technology and Analytical Instruments	26 Manufacture of computer, electronic and optical products	• Electric and electronic technologies • Energy • Fundamental physics and mathematics • ICT and computer science • Optics and photonics
Production Technology and Heavy Machinery	28 Manufacture of machinery and equipment n.e.c.	• Agrifood • Energy • Fundamental physics and mathematics • Environmental sciences and industries • Mechanical engineering and heavy machinery
Automotive	29 Manufacture of motor vehicles, trailers and semi-trailers	• Transportation
Wholesale trade	46 Wholesale trade, except of motor vehicles and motorcycles	

Source: Fuster, E., Matusiak, M., Reimeris, R. (ed.), 2022

However, to follow consistently the approach given in the Guidebook, it is recommended to additionally assess the SDGs gaps within the mapping framework, and additionally, evaluate their influence on emerging development trends at the national level in the Ukrainian context.

Conclusion and policy recommendations

The development and implementation of the STI for SDGs Roadmap could effectively contribute to the comprehensive and sustainable recovery of Ukraine. The development of the Roadmap will require an

integrated approach and well-coordinated work of policymakers at different levels, as well as the application of the Guidebook’s recommendations to the realities of Ukraine with the due adjustments that will be required depending on the situation in the country. Taking into account this, the analysis above should be considered as a comprehensive and complex preparatory basis for the development and the implementation of the STI for SDGs Roadmap in the future.

Such work should be aligned with possible policy measures for a fast post-war economic and social recovery of Ukraine, as well as with the updated smart specialization priorities and strategies of the regions. Science, technology and innovation will play a key role for the fastest sustainable recovery from the war's damages for the most affected regions of Ukraine. The STI for SDGs roadmap will have to take into account urgent post-war issues such as the formation of new value chains, including the relocation of many companies and enterprises, and the reintegration of the human capital within the country as well as those who were displaced abroad.

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