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Contribution by UNIDO

to the CSTD 2024-2025 priority theme on "Technology foresight and technology assessment for sustainable development"

PRIORITY THEME 2: Technology foresight and technology assessment for sustainable development

United Nations Commission on Science and Technology for Development (CSTD)

To whom it may concern

The 27th CSTD annual session selected "Technology foresight and technology assessment for sustainable development", as one of the priority themes for its 28th session (2024-2025) period).

Along with unprecedented opportunities, rapid technological developments present multifaceted challenges and risks, socio-economic disruptions and environmental impacts, among others. STI foresight (ForSTI)[1] and technology assessment (TA)[2] are useful tools for identifying and understanding key emerging trends and the risks and opportunities from the creation and adoption of new technologies, improving the quality of decision-making by making it better informed, more evidence-based and inclusive, promoting inclusive discussion, and identifying strategic priorities for future STI policy at the national level, and thereby enable more effective adaptation to technological and other systemically important future changes. STI foresight is a systematic process aimed at envisaging the future and strategically making decisions on STI policy and the use policy actions in the present to arrive at a preferred future.

Technology assessment is an interdisciplinary process for assessing opportunities and risks of new technologies, informing policymakers, inducing public dialogues and debates, and helping frame supportive policies and instruments. Therefore, they are policy tools that are particularly relevant to ensuring that policymakers can identify STI policy actions and implement more inclusive policy processes that move towards leaving no one behind, which is closely aligned with the theme under consideration for ECOSOC 2025 ("Advancing sustainable and inclusive solutions for leaving no one behind").

The annual resolutions negotiated at the CSTD have consistently underscored the importance of technology foresight and TA exercises and have encouraged all stakeholders to conduct inclusive national, regional and international and foresight exercises on existing, new and emerging technologies to help to evaluate their development potential and mitigate possible negative effects and risks. By integrating these processes into strategic planning and innovation policymaking, countries could navigate better the complexities of technological changes while maximizing its benefits for national development.

Under this theme, the Commission will consider issues such as the methodology for conducting ForSTI and TA, good practices and challenges in conducting these exercises, and the effective integration of the results from these exercises into the design and implementation of STI policies that will drive progress towards achieving the SDGs. The Commission will also consider how international cooperation and the CSTD could play a role in this regard.

The CSTD secretariat is in the process of drafting an issues paper on the theme to be presented at the CSTD inter-sessional panel meeting to be held on 21 and 22 October 2024 in Geneva. In this context, we would like to solicit inputs from your organization on this theme. We would be grateful if you could kindly answer the following questions based on your organization's work. To facilitate your answering, we have made the questions be as specific as possible.

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[1] Technology foresight is a term that can be usefully broadened to STI foresight to recognize that STI is broader than technology alone, and foresight for national policy related to technology can include STI more broadly defined. This remains narrower than "strategic foresight", which can be applied to many areas of policy and diverse uses, and "futures", which can include many future-oriented studies of a diverse nature.

[2] TA is not the same as technology needs assessment (TNA), which aims to identify technology needs for addressing climate change rather than the impacts of adopting a technology new to the country.

1. Has your organization conducted ForSTI, TA or both for developing countries? If yes, what were the reasons for undertaking ForSTI and TA? And what have been some important ForSTI and TA examples undertaken by your organization?

In 2023-24 UNIDO conducted exploratory foresight exercise on the future of Circular Economy (CE) in Ukraine. The reason for undertaking that exercise was to have, common understanding and engagement of all possible stakeholders on the issue of CE and to create a participatory process to inform the forthcoming national strategy on CE. The exercise included scoping, building of visions and identifying potential scenarios for specific Key Product Value Chains of Ukraine in three time horizons; up to 5, 10 and 15 years into the future. The work was reported to the Government and presented at the World Circular Economy Forum in Brussels in April 2024. The summary report of the exercise is available at https://www.eu4environment.org/app/uploads/2024/07/Towards-the-Circular-Economy-Ukraine_ENG_online.pdf and UNIDO web page on green recovery of Ukraine.

2. If your organization have not conducted ForSTI or TA in the past, what were the reasons for this? Would your organization be interested in undertaking either ForSTI or TA for developing countries in the near future?

UNIDO conducted technology foresight (TF) activities, including capacity building and actual multi-country foresight exercises, to inform decision-making on specific STI topics. More information about the TF activities is available here. It is being planned to revitalize TF activities further promoting the TF application to specific topics and cross-organizational themes.

3. Who was your counterpart in the beneficiary countries 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?

UNIDO key counterparts are national governments as the topics of TF application included STI, industrial sectors' as well as value chains. In the cases of multi-country foresights, several national governments were involved. As a matter of principle to ensure participatory engagement into TF exercises, industry, universities and research institutes were engaged for specific exercises. Civil society organizations are considered important contributors to the TF exercises of UNIDO.

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 key sectors included fisheries, medicinal plants, food VCs and automotive industries among others. The STI strategy development and action plans were the main policy processes for TF application. All SDGs are relevant to the TF exercises, although the organization's mandate prioritizes the goals 1, 7, 8, 9, 12, 13 and 17.

5. What specific methods (tools) and methodologies have been used for ForSTI and/or TA?

The whole spectrum of TF methods outlined in the UNIDO TF Manual was considered for specific exercises. In particular, the Ukraine TF included scoping, visions-building, scenarios, (online) surveys and facilitated panel discussions among the key methodologies.

6. What challenges has your organization experienced in undertaking ForSTI and TA exercises? Does your beneficiary country have any specific capacity needs to strengthen the conduct and use of ForSTI and TA?

The main chalenge was engagement of national stakeholders to actively contribute to different parts of the TF. Each method requires engagement strategy and reward/recognition system for stakeholders, as well as ownership creation to ensure interest in further contribution to the exercise throughout the duration of the foresight project.

UNIDO training program Central and Eastern Europe and Newly Independent States (CEE/NIS) on TF was developed to address the capacity needs of countries. As it has stopped regular training sessions some time ago, it is known that the self-sustaining capacities in some countries are still operational (in the format of TF centers or groups at universities or specialized centers), but it is clear that further support and capacity building is necessary on specific methods of TF as well as overall awareness on the benefits of TF application.

7. Has your organization conducted combined ForSTI and TA in a single exercise at any time? What were the benefits and challenges of combining ForSTI and TA? Do you see this as a useful and feasible approach?

UNIDO Technology Foresight methodology combines ForSTI and TA by definition, thus, having both approaches in addressing specific industrial sector was ensured in majority of sectoral TF studies of UNIDO. The STI foresight in Vietnam and recent exploratory foresight in Ukraine did not have TA element due to topic and nature of the exercises.

8. What role(s) can international cooperation, and the CSTD, play in promoting ForSTI and TA?

International Cooperation could facilitate promotion of TF as an instrument for strategic decision-making and informed participatory process for building common understanding (not consensus) on specific issues. This could be coupled with capacity building and awareness raising campaigns, as well as documenting and demonstration of best practices in application of specific methods and actual implementation and/or support to implementation of specific TF studies. The latter could be promoted and discussed at international fora on TF application.

9. Based on your organization's experiences, how have ForSTI and TA improved STI decision making and the prioritization, design and implementation of STI policies?

TF ensured engagement of wider spectrum of stakeholders, which were not considered for STI decision making/policies at first place. As a process-oriented methodology, it created ownership of and understanding among the key contributors, which allowed better informed decision-making, engagement and actual implementation of STI policies. Documenting the different stages of TF allowed overview of several time horizons for decisions, which could have been used in further STI shaping exercises. Among others, TF has also contributed to identification of potential wild cards and uncertainties which should also be considered in the decision-making process.

Please indicate contact person(s) responsible for projects/policies and international collaboration in this context in case we need clarification on the inputs.

Please, contact Tatiana Chernyavskaya at t.chernyavskaya@unido.org

We look forward to receiving your valuable inputs.

Sincere regards,

CSTD secretariat

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Technology assessment is an interdisciplinary process for assessing opportunities and risks of new technologies, informing policymakers, inducing public dialogues and debates, and helping frame supportive policies and instruments. Therefore, they are policy tools that are particularly relevant to ensuring that policymakers can identify STI policy actions and implement more inclusive policy processes that move towards leaving no one behind, which is closely aligned with the theme under consideration for ECOSOC 2025 ("Advancing sustainable and inclusive solutions for leaving no one behind").

The annual resolutions negotiated at the CSTD have consistently underscored the importance of technology foresight and TA exercises and have encouraged all stakeholders to conduct inclusive national, regional and international and foresight exercises on existing, new and emerging technologies to help to evaluate their development potential and mitigate possible negative effects and risks. By integrating these processes into strategic planning and innovation policymaking, countries could navigate better the complexities of technological changes while maximizing its benefits for national development.

Under this theme, the Commission will consider issues such as the methodology for conducting ForSTI and TA, good practices and challenges in conducting these exercises, and the effective integration of the results from these exercises into the design and implementation of STI policies that will drive progress towards achieving the SDGs. The Commission will also consider how international cooperation and the CSTD could play a role in this regard.

The CSTD secretariat is in the process of drafting an issues paper on the theme to be presented at the CSTD inter-sessional panel meeting to be held on 21 and 22 October 2024 in Geneva. In this context, we would like to solicit inputs from your organization on this theme. We would be grateful if you could kindly answer the following questions based on your organization's work. To facilitate your answering, we have made the questions be as specific as possible.

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1. Has your organization conducted ForSTI, TA or both for developing countries? If yes, what were the reasons for undertaking ForSTI and TA? And what have been some important ForSTI and TA examples undertaken by your organization?

ForSTI and TA were undertaken by UNIDO (TCS/CEG/CRE) for Egypt as part of the support provided to the Egyptian Ministries of Industry and Environment in the development of national strategies on green industries and circular bioeconomy, respectively.

2. If your organization have not conducted ForSTI or TA in the past, what were the reasons for this? Would your organization be interested in undertaking either ForSTI or TA for developing countries in the near future?

3. Who was your counterpart in the beneficiary countries 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?

The leading counterpart were Ministries of Industries and Environment. The ForSTI and TA were developed in consultation with other concerned Ministries at national level, as well as industry. The ensuing national strategies are structured in a way that their implementation should involve all relevant stakeholders at national and sub-national level, from public and private sector, research and education, and civil society, following a whole-of-society approach.

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?

Green industries development as part of a broader national strategy on industrial development (with Ministry of Industry and in partnership with World Bank and GIZ), and circular bio-economy (with Ministry of Environment).

5. What specific methods (tools) and methodologies have been used for ForSTI and/or TA?

Primary and secondary research was undertaken to analyze current manufacturing capabilities, skills availability, technology and market readiness, estimate market growth and investment potential, impacts on trade balance.

6. What challenges has your organization experienced in undertaking ForSTI and TA exercises? Does your beneficiary country have any specific capacity needs to strengthen the conduct and use of ForSTI and TA?

Limited availability of data at national level and coordination among concerned entities for design, implementation and monitoring. Capacities to conduct and use ForSTI and TA need to be strengthened in regard to the above.

7. Has your organization conducted combined ForSTI and TA in a single exercise at any time? What were the benefits and challenges of combining ForSTI and TA? Do you see this as a useful and feasible approach?

8. What role(s) can international cooperation, and the CSTD, play in promoting ForSTI and TA?

Based on the above-mentioned experiences, international cooperation has an important role to play to support developing countries in identifying emerging technologies and investments to promote and build their capacities on the relevant know-how. International cooperation can also play an important role in facilitating coordination among various stakeholders in a given country for the design and implementation of ForSTI/TA. Worth also mentioning that leveraging the respective expertise of UN agencies and International Financial Institutions can result in more comprehensive and effective ForSTI/TA.

9. Based on your organization's experiences, how have ForSTI and TA improved STI decision making and the prioritization, design and implementation of STI policies?

ForSTI and TA have proved essential in identifying priority technologies and investment opportunities that the beneficiary country should focus on through the design of dedicated market development efforts at policy/regulatory, investment/finance, research and education, enterprise and skills level.

Please indicate contact person(s) responsible for projects/policies and international collaboration in this context in case we need clarification on the inputs.

We look forward to receiving your valuable inputs.

Sincere regards,

CSTD secretariat