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Contribution by Turkey

to the CSTD 2019-2020 priority theme on “Harnessing rapid technological change
for inclusive and sustainable development”

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PRIORITY THEME 1: Harnessing rapid technological change for inclusive and sustainable development

1. From the perspective of your country/region, what is the role of the government in creating the ecosystem for innovation on frontier technologies for inclusive and sustainable development? What are the most effective ways to support the improvement of skill levels and better match the supply and demand of skills? What is the role of the government in facilitating a fair relation between workers and employers in the digital economy? What are the current options and lessons learned from policies to protect people affected by rapid changes in labour markets (e.g. greater benefits for those whose jobs are destroyed, retraining, federal job guarantee)? What is the role of redistributive policies to ensure that no one is left behind in a world of rapid technological change?

- From the perspective of your country/region, what is the role of the government in creating the ecosystem for innovation on frontier technologies for inclusive and sustainable development?

In Turkey the government follows the recent developments in technology closely and designs its science, technology and innovation (STI) ecosystem in a way which will take advantage of new improvements and bring value to all society. The 11th Development Plan of Turkey is a result of this vision and the development plan will create a strong society with high standards which creates more value and shares it fairly. Improving the STI ecosystem is an indispensable part of the development plan and importance of frontier technologies is underlined strongly

- What are the most effective ways to support the improvement of skill levels and better match the supply and demand of skills?

To better match the supply and demand of skills it is crucial to bring the supply and demand together. In this view The Scientific and Technological Research Council of Turkey (TÜBİTAK) has launched 2244 – Industry Doctorate Program. This program will supply the qualified human resource with doctorate degree and increase the number of PhD researchers in industry. TÜBİTAK gives employment support for three years after doctorate as well as scholarship during doctorate education. As a result an increase in doctorate degree employment in industry is expected.

- What are the current options and lessons learned from policies to protect people affected by rapid changes in labour markets (e.g. greater benefits for those whose jobs are destroyed, retraining, federal job guarantee)?

Technological change can lead to an increase in efficiency by resulting in producing more with the same amount of input or producing the same amount with less amount of input. From the point of labour input, technological change can result in reduction in employee number. Especially decrease in physical labour can be anticipated. But while some jobs are destroyed by technological change the same change leads to creation of new jobs. The important part is to be able to keep the pace with the technological change and being able to formulate labour market according to new economic environment. There is not a dramatic change in labour markets or increase in unemployment resulting from technological change in Turkey yet. But Turkey takes into account the eventual change in technology and labour markets and try to increase the quality of human capital. With this aim, beside increasing R&D Exp./GDP ratio and improving education quality, Turkey targets to have a youth with a great interest in technology. Two major steps taken for this target are the Science Centres supported

by TÜBİTAK (The Scientific and Technological Research Council of Turkey) and Try It & Do It Workshops supported by the Ministry of Industry and Technology. The science centres which are planned to be built in all cities of Turkey will show visitors (especially young visitors) how fun and useful science can be. In addition, Try It & Do It Workshops are a series of workshops for middle school and high school students who are eager to dive into the world of coding, artificial intelligence and robotics.

- What is the role of redistributive policies to ensure that no one is left behind in a world of rapid technological change?

In “Digital Turkey” Roadmap of Ministry of Science and Technology a comprehensive strategy is introduced which covers the human capital, technological capacity, infrastructure, suppliers, consumers and governance. The strategy aims not to leave anyone behind. Some of the main steps to improve human capital can be listed as:

- Training digital technology users in Continuous Education Centres and thematical technical colleges
- Increasing digital technology developing programs in universities
- Improving digital literacy of teachers at every level
- Supporting doctorate degree in digital technologies
- Supporting to match digital competent human capital with industry
- Improving awareness of digital transformation
- Improving collaboration between digital transformation stakeholders

2. Can you provide examples of STI policies/projects/initiatives intended to promote and give directionality to technological change to make it work for inclusive and sustainable development? Are there policies/projects/initiatives that mitigate the potential negative effects of rapid technological change on inequality? Are there any of these policies/projects/initiatives directed to women, youth, people with special needs or other groups facing specific challenges? How have the policies targeted inequalities? What are the challenges confronted in implementing these policies/projects/initiatives?

The “Digital Turkey” Roadmap of Ministry of Science and Technology and the “Smart Manufacturing Systems Technology Roadmap” will make the economy, society and industry ready for rapid technological change.

The “Digital Turkey” Roadmap comprehensively covers the human capital, technological capacity building, infrastructure, suppliers, consumers and governance. It introduces steps to be taken in all these six aspects which will cause a complete digital transformation. Increasing digital technology developing programs in universities, improving digital literacy of teachers at every level (human capital); establishing research centres in target technologies (building technological capacity); supplying fast internet infrastructure for all the industry (infrastructure); supplying sustainable financial sources to industry (suppliers); digital transformation mentorship support for SMEs (consumers) and designing a good governance structure for digital transformation (governance) are some of the actions to be taken in the roadmap.

The Smart Manufacturing Systems Technology Roadmap has a great importance in preparing the industry, academia, research centres and all the other stakeholders ready for the rapid technological change. The roadmap is based on the technology groups of digitalization, interaction within the scope of smart manufacturing systems and factories of the future with 8 critical technologies and 29 critical products. A comprehensive participatory process with wide-ranging participation included the definition of technology groups, technology based strategic targets, critical technologies, the determination of R&D projects and prioritised

sectoral applications. In this multi-layered roadmap approach, it was possible to associate a critical technology to specific R&D projects and sector applications, which has been an effective way to provide guidance to the new industrial revolution in Turkey.

3. Can you provide examples of innovative initiatives in partnership with (or by) the private sector in/from your country that harnesses frontier technologies for inclusive and sustainable development? What are the innovations in terms of the use of technology? What are the innovations in terms of business models?

As a step to harness technologies for sustainable development the first Model Factory of Turkey was established in 2018 in Ankara with the collaboration of United Nations Development Programme (UNDP), Ministry of Science and Technology and Ankara Chamber of Industry (ASO).

By using the model factory the enterprises will have the opportunity to increase their productivity and competitiveness and benefit from applied learning techniques. In addition employees may acquire permanent capabilities combining theory and practice. The factory including a model of basic production systems will let especially SMEs learn how to improve their production capacity and increase efficiency.

In addition to using technology to increase productivity also having good business and research models is very crucial. The Industry Innovation Networks Mechanism (SAYEM) Programme of TÜBİTAK is a model which brings industry, academia and research centres together. The programme consists of two phases. At the first phase establishment of collaboration and network is expected. Also technological product development and commercialization roadmap is expected with a protocol on intellectual property in the first phase. In the second phase large scale R&D support is given by TÜBİTAK to the consortium for strategic product development. At the end of the second phase having commercialized medium high or high tech strategic products is targeted. Creating sustainable product development based cooperation platforms is another result of the programme.

4. What are the actions that the international community, including the CSTD, can take to contribute to maximize the benefits associated to rapid technological change and mitigate the risk of these technologies widening or creating new inequalities within and across countries? Can you give any success stories in this regard from your country or region?

Turkey believes that CSTD is an important platform where countries have the opportunity to share their valuable experiences. Sharing challenges faced and solutions found to that problems could be good inputs for the countries that has not faced the challenges yet. On the subject of rapid technological change especially challenges and solutions of developed countries could provide good information for other countries. In this manner sharing those experiences in meetings and also in CSTD website as documents could be a good way to reach that valuable information. In addition a volunteer mentorship can be used to share experiences. In this mechanism volunteer mentors with experiences on rapid technological change can give advisory service for demanding countries.