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Bridging the Gap: Policy Options for Sustainable Innovation

Editor’s Note: In 2021 Pujiang Innovation Forum – The Policy Forum, with the theme of “Bridging the Gap: Policy Options for Sustainable Innovation”, well-known experts and scholars at home and abroad had discussions on issues such as the “gaps” in the global development, how to improve the sustainable policy reform in China, how to address the inharmony and inconsistency in development. This bulletin is a summary based on the reports from the participating guests¹ of the Policy Forum, and is intended for reference.

¹ Participating guests include: WANG Yuan, Former Vice President of Chinese Academy of Science and Technology for Development; XIE Min, Director-General of Department of Policy, Regulation and Innovation System, MOST; HU Zhijian, President of Chinese Academy of Science and Technology for Development; MING Ju, Vice President of Chongqing University; CHEN Qiang, Special-Term Professor of Tongji University, Executive Director of Shanghai Research Center for Industrial Innovation Ecosystem; Darrell West, Vice President and Senior Research Fellow of Governance Studies at Brookings Institution; Ed Steinmueller, Professor of University of Sussex.

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Science and technology play a fundamental role to transform the nature and create wealth. However, with the rapid advancement of science and technology, the level of development reveals disparity among different countries, regions and groups of people due to the different utilization level of science and technology strength. In addition, in the process of transforming the nature and creating wealth through science and technology, the inharmony and inconsistency in development goals have become increasingly obvious. The participating guests agreed unanimously that **all the above-mentioned “gaps” related to science and technology eventually have to be eliminated with the power of science and technology as well as innovation.** In the face of stern challenges in terms of sustainable development, **science and technology innovation policies need to be designed with “bridging the gap” kept in mind to turn the development of human society into a harmonious and consistent mode.**

I. The Status of and Challenges in the Development of Innovation Policies

On one hand, innovation policies have experienced multiple stages of development, and a relatively complete innovation policy system has been established. According to **HU Zhijian, President of**

Chinese Academy of Science and Technology for Development, the evolution of innovation policies includes three stages: the first stage (innovation policy 1.0) concerns the R&D linear model, which believes that knowledge can flow downstream after basic research done well; the second stage (innovation policy 2.0) concerns the innovation system model, emphasizing the connection and interaction among different elements; the third stage (innovation policy 3.0) concerns system expansion, covering the complex system of the whole society. In the opinion of **Ed Steinmueller, Professor of University of Sussex**, the evolution of innovation policies has also formed three frameworks: the innovation policy framework after World War II believed that it is necessary to make public investment in the development of science and technology, and find solutions to social needs and problems. However, its performance was not satisfactory. In the short and medium term, there is only a very weak correlation between the investment in science and technology and human development. The framework in the 1980s not only focused on the development of new technologies, but also combined the technologies horizontally and vertically, to promote the flow of information between people and advanced technologies. At present, the latest innovation policy framework requires recognition of the uncertain impact of inclusiveness and diversification in policies on the future. As pointed out by **XIE Min, Director-General of Department of Policy, Regulation and Innovation System, MOST**, since the reform and opening up, we have kept on optimizing policies for all kinds of innovation entities and all links in the innovation chain, around the

development strategies and the reform tasks of science and technology systems in different periods, and then realized the legalization of science and technology governance step by step through policies. Centering on the elements, subjects, industries, regions, environment, system and mechanism of the national innovation system, a science and technology innovation policy system with comprehensive coverage, complete categories and various tools has been formed, and the basic framework has been established.

On the other hand, the changes in the innovation environment have brought new challenges to innovation policies. In the opinion of **CHEN Qiang, Special-Term Professor of Tongji University and Executive Director of Shanghai Research Center for Industrial Innovation Ecosystem**, we are currently at the forefront of scientific and technological revolution and industrial transformation, and have not made many significant breakthroughs yet. Therefore, these breakthroughs in basic cutting-edge and key and core technology fields require a wider range of cooperation, including interdisciplinary, cross-industrial, cross-regional and cross-border cooperation. In the opinion of **Darrell West**, Vice President and Senior Research Fellow of Governance Studies at Brookings Institution, artificial intelligence represents the most important scientific and technological change of the modern society which has a widespread influence on investment, infrastructure construction, green building, emerging energy, climate monitoring, and other aspects concerning sustainable development. However, artificial

intelligence also encounters some difficulties, mainly including the issues concerning its fairness, transparency, decision making authority, accountability, and safety. As pointed out by **HU Zhijian**, new-generation information technologies represented by mobile Internet, big data, artificial intelligence, and supercomputer have become a crucial engine for economic and social changes. With “intelligence, green and health” as the mainstream, new technologies are advancing rapidly, and the deep combination of digital technologies and real economy is also rapidly changing the economic structure. Digitalization has brought about new social risks, and social public governance is facing challenges. According to **Ed Steinmueller**, human beings are now facing a series of existential threats, including climate change, the impact on biodiversity and sea level caused by greenhouse gas emissions, and the widening gap in income and wealth, which give rise to a lot of waste and resource exhaustion. All of these threaten the existence of our civilization, and oblige us to make changes.

II . The Bright Prospects of Innovation Policies in the Face of the “Gaps”

Firstly, alter the understanding and deeply comprehend the “gaps”. According to **Ed Steinmueller**, while people regard economic development as the sole competitiveness, and pay all their attention to the growth of GDP, social demand is ignored. Although the two aspects have overlapping parts, economic development is not exactly equal to social

demand. From the perspective of **MING Ju, Vice President of Chongqing University**, science and technology innovation is not the cause of economic development; on the contrary, it is the latter that brings about inventions and science and technology innovation. Nowadays, with the accelerated iteration of science and technology and the constant emergence of major scientific and technological achievements, the competition in innovation strategies and policies has become the primary means of international competition. Therefore, higher requirements for innovation policy making are laid down to build up a community with a shared future for mankind, and science and technology policies have the responsibility to bridge the gaps. As pointed out by **CHEN Qiang**, China has clarified the ambitious goal of becoming a global sci-tech power. However, a goal would be insufficient if not paired with a practical path towards it, and a strategy would not be realized without tactics. We need to further bridge the gap between the overall effectiveness of the science and technology governance system and our goal as well as the grand blueprint.

Secondly, pinpoint the problems and actively address the challenge from the “gaps”. In the opinion of **XIE Min**, we still have some problems such as inadequate functional transformation, slow planning for the construction of national innovation system under the new pattern, poor policy implementation, inadequate inclusive policies, and inadequate cooperation among departments during the reform of science and technology system. According to **HU Zhijian**, with the strategic goal

of achieving peak carbon dioxide emissions and carbon neutrality, industrial civilization should be transformed into non-industrial civilization. Over the past 200 years of industrialization, a series of industrial civilizations have been formed, which determine a high-carbon political and social system. As pointed out by **Darrell West**, according to a survey, speaking of artificial intelligence, most people worry about the disclosure of personal information, the threats towards human beings and employment reduction. Policies and regulations should be adopted to ensure that artificial intelligence can meet the public interest and promote the sustainable development of the environment as well as human beings. As expressed by **CHEN Qiang**, some groups of people in the social system are severely maladjusted under the impact of the “gaps”. There are more than 190 million people over the age of 65 in China, whose inadaptability to technological development may be more obvious and intense than other groups. In addition, the imbalance among different regions is intensifying, including the serious wealth inequality, the capability gap in aggregating innovation elements and the gap in the richness of innovation activities.

Thirdly, implement reform positively and constantly bridge the “gaps”. In the opinion of **XIE Min**, from the perspective of streamlining administration and delegating power, improving regulation, and upgrading services, and the four focuses, we should focus on “strategy, planning, policy, and service” in the early stage of government management. At the General Assembly of the Members of the Chinese

Academy of Sciences and the Chinese Academy of Engineering, General Secretary XI Jinping proposed to concentrate on “strategy, reform, planning, and service”, and promote the functional transformation in the management of science and technology. According to **Darrell West**, we need to make good use of technologies, and ensure that the enterprises are in line with human values and sustainable environment through policy supervision. The government may cooperate with enterprises, the academia, experts and professors from universities, and sociologists, using technology to help human beings and the world become better, and the whole environment and the earth become more sustainable. As pointed out by **HU Zhijian**, we should accelerate the development of key common technologies, promote the diffusion of green technology innovation to remove the technology restrictions; push systematic layout and comprehensive green low-carbon transformation to unlock the system; use innovative policy tools, and achieve coordination and diversified governance to break the institutional confinement. From the perspective of **MING Ju**, we should give play to different subjects. To this end, we should reshape the institutional foundation of policy coordination with the help of international organizations on the macro level, enhance the subject efficiency of policy reform by individual countries on the medium level, and give play to the educational function of universities to support policy reform on the micro level, so as to promote the transformation from “flat” policies to “stereoscopic” policies. As expressed by **CHEN Qiang**, science and technology governance should be resilient to ensure the high-quality development of economy and society, should be flexible

for the deep participation in global science and technology governance,
and should also be dynamic, viscous and elastic.

Summarized by LUO Xianfeng