Meeting 21st-Century Challenges with Science, Technology and Innovation: A Roadmap for Policymaking

What are the most important unanswered questions concerning the design of policies for science, technology and innovation? This publication seeks to address this question through a synthesis of the work of the OECD's Committee for Scientific and Technological Policy (CSTP). Taking stock of the policy lessons learned through CSTP's work, and drawing on a broader literature review, this report aims to identify the themes where additional information and analysis could be most useful to policy makers. The efficiency and effectiveness of policy for science, technology and innovation (STI) is important for many reasons. STI is key to long-term economic growth and higher standards of living. The protracted nature of the global crisis, sluggish macro-economic conditions in many OECD economies, weak labour markets and escalating public debt have all added urgency to the pursuit of growth. Over the longer term, population ageing, combined with natural resource constraints, mean that the future of growth in OECD economies will increasingly depend on productivity-raising innovation. Climate change, loss of topsoil, disease threats and the consequences of population ageing are some of the major complex challenges facing the globe. Breakthroughs in STI are needed to address such challenges in cost-effective ways. Synthetic biology, for instance, could allow petroleum-based products to be manufactured from sugar-based microbes, cleaning production processes at the same time. Nanotechnology could enable the use of hydrogen fuel cells in cars. Digital technologies could monitor outbreaks of disease that threaten to become pandemics. And while no cure is as yet available, new research has identified molecules in blood that predict with 95% accuracy whether people will develop mild cognitive impairment or full-blown Alzheimer's disease. Good policy for STI is also critical because much essential scientific and technical knowledge is lacking. Furthermore, innovation is insufficient in some crucial fields, such as energy generation. And well-conceived policy is needed to respond to complex economic and institutional dynamics associated with new technologies (for instance, in many occupations technology will increasingly displace workers, while education systems may struggle to respond to the speed and scale of technological change). Almost all major themes in policy for STI have been examined by CSTP in recent years. Broad trends have been explored, such as the shift towards open science, as have the characteristics of individual policy instruments, such as R&D tax credits; traditional policy concerns have been analysed, such as how to commercialise public research, alongside newer themes, such as technology transitions; technology-neutral subjects have been addressed, such as demand-side innovation policy, as have technology-specific themes, such as nanotechnology, and work has been carried out which is relevant to developed and developing economies, such as how to foster international collaboration in science.

Knowledge Type: Thematic report [1]
Other Tag: global challenges [2]
government procurement [3]
green innovation [4]
biotechnology [5]
open innovation [6]
open science [7]
peer review [8]
policy ideas [9]
procurement [10]
research and development funding [11]
research policies [12]
scientific articles [13]
service innovation [14]

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Links
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