

# CAS Studies of S&T Development Trends to 2020

CAS always places high importance on strategic studies for S&T development. In early 2012, CAS President BAI Chunli called for studies on solutions to the following questions: What are the pressing difficulties China will face during the 12<sup>th</sup> and even 13<sup>th</sup> Five-Year Plan periods, and how can S&T address them? What possible S&T events will have an important bearing on China in the near future? As a national S&T team, what role can CAS play in the events? To address the issues, CAS has organized more than 200 experts from a research team on Roadmaps for S&T Development in 18 Priority Areas<sup>①</sup> to conduct research into S&T development trends toward 2020.

As a result of almost a year of intensive study and analysis of the challenges and opportunities brought about by a new S&T revolution, experts have identified key S&T issues in China to be addressed over the next five to 10 years and to put forward policy recommendations for the national government. In addition to a report giving an overall account of the studies, the team also produced reports on 10 S&T fields: energy; resources; materials and manufacturing; information; agriculture; population and health; eco-environment; space; ocean; and frontiers of major basic research and interdisciplinary studies. These research achievements resulted in the publication of the book, *Vision 2020: The Emerging Trends in Science & Technology and Strategic Option of China*. It has three parts: a general report, sub-reports and monographic reports. The general report foresees and depicts scenarios for S&T advancement in major areas over the next five to 10 years, with forecasts on 22 possible major S&T events around the world, 19 possible major S&T breakthroughs in China and several priorities with strategic importance that should be promoted. The sub-reports focus on the development trends and features

of 10 priority areas, extending and enriching the ideas and judgments in the general report. The monographic reports expound on the relationship between S&T revolution and modernization from the historical and future points of view, summarizing and crystallizing strategies of S&T development toward 2020 in major countries, and providing references for S&T strategic options selection in China.

As the studies of S&T development trends to 2020 involve many different fields and experts, and it is very difficult to understand and forecast S&T frontiers, an overall design and systematic structures have been formed:

1. A general research team to examine the framework and key issues for the studies. Under the leadership of Prof. BAI Chunli, the group is headed by PAN Jiaofeng and involves ZHANG Baichun, ZHANG Feng, ZHANG Zhiqiang, ZHAO Lanxiang and HUO Guoqing. Responsible for the research and writing of the general report, the group dealt with its main points such as report structure, identification of possible major S&T events in the world and China, and judgment criteria. The CAS Bureau of Planning and Strategy (CBPS), as the executive body of the studies, coordinated the research and consultation.

2. Clarification of essential requirements for the research report. Mainly relying on the research team of Roadmaps for S&T Development in 18 Priority Areas, this research into development trends of major S&T areas toward 2020 is based on annual studies. Studies in different fields are required to set appropriate priorities rather than give equal attention to every aspect, with an emphasis on forward-looking and strategic perspectives. The timeframe for the research is mainly the national 12<sup>th</sup> and 13<sup>th</sup> Five-Year Plan periods (2011–2020). Each report in different areas contains the following three parts: new development

<sup>①</sup> In the second half of 2007, CAS organized more than 300 high-caliber experts to conduct studies of science and technology in China, including a roadmap to 2050, focusing on the following 18 areas: energy; mineral resources; oil and gas; water resources; advanced materials; nanoscience; advanced manufacturing; information; agriculture; population and health; eco-environment; space; ocean; biomass resources; big science facilities; regional development; cross-disciplinary and frontier research; and national and public security. After two years of intensive research, a series of reports on strategic studies, *Innovation 2050: S&T and China's Future*, was completed in 2009, having a significant impact in China and abroad, and receiving high praise from the national government.

trends and features of S&T development in a field over the next five to 10 years; major S&T demands in the field from the initiative to build China into an innovative country; and S&T strategic priorities toward 2020.

3. Each research group drafts a sub-report in consultation with the general research group. In line with the requirements of CBPS, research groups drafted sub-reports after numerous workshops to identify possible major S&T breakthroughs in their fields over the next five to 10 years and to present policy suggestions for the government. After the completion of the framework drafts of the general report, the general research group held in-depth discussions with research groups in different fields, and devoted their efforts to the writing and revision of sub-reports.

4. Wide-ranging consultation with experts. In September 2012, CBPS convened a symposium on S&T Development Trends Toward 2020 in Beijing. More than 30 academicians and other experts from fields including energy, materials, information, population and health, space,

earth science, and interdisciplinary frontiers, were invited to make recommendations on the possible major S&T breakthroughs over the next five to 10 years and policy suggestions. Afterwards, the research report was revised and improved on the basis of extensive consultation.

It is very challenging to precisely forecast future development, especially major S&T events in the next five to 10 years. The research and this report are the fruit of many expert consultations. Herewith, our sincere gratitude goes to all the experts engaged in the writing, consultation and discussion of the report.

As strategic research involves many different fields with difficulties in assessment, and due to the limited knowledge, the report may have deficiencies. Therefore, we welcome valuable advice from a much wider community of experts and scholars from around the world.

(Editorial Committee and Writing Group for *Vision 2020: Emerging Trends in Science & Technology and Strategic Option of China*)