Analysis of Key Priorities in Obama Administration' s Science and Technology Policy Based on OSTP Characteristic Thematic Resources

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Abstract

Continuously updated online resources contain a wealth of information. Statistical analysis is conducted on 36 featured topics from the OSTP website since February 2010 across three dimensions: domain distribution, emergence time, and duration. By domain, in-depth interpretation is performed on the content of 124 important reports under these featured topics to reveal the development priorities and policy orientation of the Obama administration over the past five years, with the aim of providing reference information for China' s future development.

Full Text

Analyzing the Focus of the Obama Administration' s Science and Technology Policy Based on OSTP Featured Topic Resources

Abstract

Continuously updated online resources contain rich information. This paper conducts statistical analysis of 36 featured topics on the OSTP website since February 2010 from three perspectives: domain distribution, appearance time, and retention duration, and provides in-depth interpretation of 124 important reports under these featured topics by domain. The analysis reveals the development priorities and policy guidance of the Obama administration over the past five years, with the aim of providing reference information for China' s future development.

Keywords: Network resources; Featured topics; Science and technology policy; Obama administration; OSTP

With the development of network technology, electronic resources have proliferated, and an increasing number of institutions now publish their latest developments, scientific achievements, and policy information on their websites in a timely manner. These continuously updated online resources contain rich information. Regular monitoring of government agency websites in important countries around the world, collecting and analyzing web resources such as important reports, major news, and significant themes, can reveal the policy orientations and changes in science, technology, and economic policies of these nations.

The U.S. Office of Science and Technology Policy (OSTP) is a crucial institution for formulating, organizing, and prioritizing national science and technology policy, and for stimulating American scientific and technological innovation. It works on important issues including environment, homeland security, international affairs, and science and technology. This department has comprehensive and in-depth understanding of various national domains and plays a significant policy guidance role in promoting American scientific and technological progress, economic growth, human health, and addressing climate and energy challenges. The OSTP website features "featured topics"that highlight the issues the agency focuses on during different periods, which to some extent reflect changes in U.S. economic and technology policies. This paper reveals changes in American science and technology policy through retrospective analysis of featured topics on the OSTP website, providing reference information for the formulation of China' s science and technology policies and the selection of priority development areas.

2 Materials and Methods

The OSTP website currently hosts three featured topics: Open Data (released May 2013), Climate Action Plan (released June 2013), and 2013 White House Science (released October 2013) [1]. For previously released featured topics, we used the retrospective tool Wayback Machine [2] to search and retrieve resources from the OSTP website, saving important reports under each featured topic and the time periods during which each featured topic existed on the OSTP website. Through this retrospective analysis, we obtained 36 featured topics and 124 important reports since February 2010, with specific information shown in Table 1 .

Both the appearance time and retention duration of featured topics on the OSTP website can reflect the government' s work priorities and level of attention to thematic issues at different stages. The distribution of featured topics across different disciplinary domains and their evolution over time can reveal how the government adjusts its development strategies according to national conditions as the economy develops. Our analysis of featured topics proceeds from two angles: first, basic statistical analysis of the domain distribution, research on different featured topics within the same domain, and duration analysis; second, in-depth interpretation of the content of important reports under the 36 featured topics by domain to analyze the orientation and changes in U.S. science and technology policy in recent years. The specific research framework is shown in

Figure 1 [Figure 1: see original paper].

3 Basic Statistical Analysis of Featured Topics

We conducted statistical analysis of featured topics from the perspectives of domain category distribution, temporal evolution across different disciplines, and retention duration on the website to reveal the evolution and changes in policy topics of interest to OSTP from surface-level data, indirectly reflecting the state of U.S. scientific and technological development and government policy guidance.

3.1 Domain Category Distribution of Featured Topics

Different departments and research reports categorize policy topics differently. The U.S. Office of Science and Technology Policy divides its work into five categories: Science, Technology & Innovation, Environment & Energy, and National Security & International Affairs [3]. The President' s Council of Advisors on Science and Technology (PCAST) organizes its work into eight themes: Education Technology, Cybersecurity, Climate Change, Agricultural Preparedness, US Research Enterprise, Drug Innovation, Spectrum, and Advanced Manufacturing [3]. The National Science and Technology Council (NSTC) divides its subordinate agencies into five subcommittee institutions responsible for different domain themes: Environment, Natural Resources and Sustainability; Homeland and National Security; STEM Education; Science; and Technology [4]. In the 2011 U.S. innovation strategy report, Obama proposed increasing investment in clean energy, biotechnology, nanotechnology and advanced manufacturing, space capabilities and applications, health care technology, and educational technologies to promote national economic development [5]. These thematic classifications are formulated according to institutional needs, with some overlap between them, but none can effectively classify featured topics. This paper synthesizes the above classification methods, taking into account the content of OSTP' s 36 featured topics, and divides them into seven domains: Science Technology Innovation Policy, Budget, Space & Ocean, Environment & Health, Key Technologies (including bioInformation and nanotechnology), Energy & Advanced Manufacturing, and STEM Education. Some featured topics involve multiple domains and are therefore assigned to multiple categories. For example, the featured topic "NASA FY2011 Budget" involves both space exploration and NASA' s fiscal year 2011 budget, so it is assigned to both Space & Ocean and Budget categories. The specific content of featured topics in different domains is shown in Table 2 .

Figure 2 [Figure 2: see original paper] shows the proportional distribution of the 36 featured topics across the seven domains. The largest proportion is in the Science and Technology Innovation Policy domain, accounting for over 26%; followed by STEM Education, accounting for nearly 20%; and Energy & Manufacturing accounting for 12%. The distribution proportions across different domains indicate that the Obama administration invested heavily in scientific

and technological innovation and education. A strong education system is fundamental to national development, as educational advancement drives scientific and technological innovation breakthroughs. Energy and manufacturing are also cornerstones of national development. The distribution proportions of featured topics across different domains demonstrate the Obama administration' s substantial investment in foundational areas.

3.2 Temporal and Duration Distribution of Featured Topics Across Domains

We categorized and statistically analyzed the sequence of appearance and changes in attention duration of featured topics according to the seven domain categories to reveal the corresponding plans and strategies formulated by the nation under different policy themes and their specific implementation schemes. Featured topics in different domains continuously change over time. For example, in the Science and Technology Innovation Policy domain, topics evolved from space policy and scientific integrity in 2010, to innovation strategy and student entrepreneurship in 2011, to bioeconomy and big data in 2012, and to public access and open data in 2013, indicating that national policy changes according to social needs. Figure 2 shows the temporal sequence of featured topics across different domains, where numbers on the Y-axis represent the quantity of featured topics in each domain, and the length of each featured topic represents its retention duration on the OSTP website, reflecting the evolution and changes in Obama administration policies. The Science and Technology Innovation Policy domain contains the most featured topics, with the nation continuously updating policy guidance according to scientific and technological development needs. STEM Education has a long retention duration—education being the cornerstone of the nation and an eternal topic—making it a consistent focus of national policy.

Figure 3 [Figure 3: see original paper] shows the duration distribution of featured topics across different domains. The longest durations are in the Science and Technology Innovation Policy domain and STEM Education. The Energy & Manufacturing domain contains few featured topics, but their retention time is not short, mainly focusing on Advanced Manufacturing. Featured topics in the Space & Ocean domain appeared primarily in 2010, while topics such as Bioeconomy, Big Data, Public Access, and Open Data in the Science and Technology Innovation domain appeared mainly in 2012 and 2013, indicating that with the development of network and biotechnology, the Obama administration paid more attention to big data and the bioeconomy. In the Environment & Health domain, agricultural food security and flu vaccines were the focus in 2010, while the Climate Action Plan theme was proposed in 2013, demonstrating that the Obama administration continuously adjusted its science and technology development policies according to national development to promote harmonious social development in the United States.

4 Content Analysis of Featured Topics

The statistical analysis above, including the sequence of appearance, duration distribution, and domain categories of each featured topic, can only reveal changes in policy topics of the Obama administration at different periods from a surface level and show the evolution between different featured topics temporally, but cannot reflect the specific implementation content of these featured topics or the relationships between policy themes. Each featured topic contains different government reports and projects, and in-depth interpretation of these resources can clearly reflect the specific content of different featured topics. Coherent analysis of featured topics within the same domain can reveal the evolution of U.S. policy over time and changes in focus areas. The following sections analyze the specific research content of featured topics by domain to reveal deeper policy changes of the Obama administration over the past five years.

4.1 Science and Technology Innovation Policy

Economic growth and national prosperity depend on national innovation capabilities. To ensure America' s dominant position in the world, the United States must continuously innovate, create more job opportunities, and enhance national competitiveness. Science and technology innovation policy is the most concerned area, accounting for 11 of the 36 featured topics, covering social issues such as big data, open data, public access, and bioeconomy. In February 2011, the National Economic Council, Council of Economic Advisers, and Office of Science and Technology Policy jointly released the "A Strategy for American Innovation" report, which stated that to win the future, the United States must surpass other countries in innovation, education, and technology. In terms of innovation, the report proposed increasing investment in the foundation of innovation, such as strengthening youth education, cultivating a workforce with world-class technical skills, developing advanced information systems, and expanding American leadership in basic research worldwide. In terms of market development, it proposed accelerating research on tax credit policies to support corporate innovation, encouraging the construction of innovation hubs and entrepreneurial ecosystems, and creating a market that is innovative, open, and competitive. In energy technology, the report called for clean energy reform and accelerated development of biotechnology, nanotechnology, and advanced manufacturing to promote breakthroughs in medical technology. Numerous major initiatives were subsequently launched, such as the Wireless Grid Initiative, patent and K-12 education reform projects, and the Startup America initiative [5].

Biological science research is an important driving force for American innovation and economic growth and a crucial foundation for the national economy. In September 2011, President Obama outlined the national blueprint for the bioeconomy, which aims to leverage biological innovation research more broadly to address future challenges in health, food, energy, and environment, while

also meeting employment needs related to biological research. The bioeconomy blueprint depicts the significant potential economic and social value of life sciences. The Obama administration emphasized increasing investment in basic research, promoting the translation of biological inventions from research laboratories to the market, protecting the environment, and improving predictability for disaster events. Scientific integrity is the foundation of government decision-making and public trust. In 2010, President Obama emphasized six principles of scientific integrity in a memorandum, OSTP Director PH John released an implementation report on scientific integrity, and Presidential Science Advisor Holdren interacted with the public through the feature topic "WHERE ARE WE ON SCIENTIFIC INTEGRITY?" to discuss related issues [6]. The foundation of scientific integrity is scientific and technological information, so experts in science and technology must be invited to participate in the policy-making process to ensure the validity of information itself and public trust in government.

With the arrival of the big data era, digital resources are growing rapidly. To improve the ability to extract knowledge and predict the future from large-scale complex digital data, the Obama administration launched the Big Data Research and Development Initiative in March 2012. To ensure successful implementation of this initiative, the National Science Foundation (NSF), National Institutes of Health (NIH), Department of Defense (DoD), Department of Energy (DOE), and U.S. Geological Survey (USGS) jointly announced funding for research and development of big data processing technologies and tools [7]. To further enhance knowledge discovery and innovation capabilities in the big data era, numerous projects have been launched with federal funding, such as NSF' s Core Techniques and Technologies for Advancing Big Data Science & Engineering project, which researches methods for managing, analyzing, visualizing, and extracting useful scientific and technological information from large-scale, diverse, distributed, and heterogeneous datasets; DoD' s XDATA project, which supports open-source software toolkits enabling users to flexibly apply software and workflows corresponding to large-scale data; and the Anomaly Detection at Multiple Scales (ADAMS) project, which addresses anomaly detection and characterization in massive datasets.

Transparent and open government information can strengthen national democracy, improve the efficiency and effectiveness of public services, and promote social harmony and economic growth. Facilitating public access to, retrieval, and use of government information resources can promote entrepreneurship, innovation, and scientific discovery. In recent years, data in fields such as medicine and health, education, energy, public safety, global development, and finance have been made freely available in machine-readable formats on government websites (Data.gov), enabling enterprises and industries to develop more valuable new products and services and creating more job opportunities in the process. The government-created Project Open Data ensures synchronization between high-tech policy and innovation and promotes the continuous advancement of open data policy [8]. To further improve the efficiency and social benefits brought by

government data, more new government data should be publicly presented in machine-readable formats.

4.2 Budget

Budget reflects national investment in various domains, and budget analysis can provide insights into government priorities. In the 2010 U.S. innovation strategy report, President Obama emphasized the importance of next-generation education and described the role of educational technology in improving quality of life, building future enterprises, and promoting employment. The 2011 budget focused on STEM education, emphasizing increased investment in K-12 STEM education and development of new educational technology methods. Additionally, the government stressed the need to increase NASA budget allocations. In April 2010, at the Kennedy Space Center in Florida, Obama announced the overall strategy for human space flight, stating that NASA' s budget would be increased to $6 billion over the next five years. Increased NASA investment would train more astronauts, create more job opportunities, and enable more innovative projects, construction of the International Space Station, and enhanced launch capabilities [9].

Based on U.S. innovation policy, the 2012 government budget continued along the path of sustained economic recovery but required reducing waste to ensure investment promoted economic growth and job creation as much as possible. STEM education remained a priority for investment. In basic research and development, to ensure the nation' s innovation, education, and construction remained world-leading, the 2012 government budget increased by 0.5% compared to 2010. In science and technology, investment in three science agencies crucial for future national competitiveness—NSF, DOE, and NIST laboratories —increased by 12.2% compared to 2010. The concept of a clean energy future was proposed, with government support for clean energy R&D and promotion of collaborative development between enterprises and academia. Additionally, the 2012 budget specifically emphasized accelerating deployment of high-speed wireless networks, encouraging private sector investment, and promptly formulating tax reduction policies [10]. In 2013, the Obama administration continued to insist that science, technology, education, and innovation were key to sustained U.S. economic recovery and future national prosperity. The budget continued to call for further increases in investment in corporate R&D and STEM education, as well as greater investment in American manufacturing, clean energy, medical health, and climate change [11].

In 2014, with U.S. fiscal constraints, the budget focused primarily on revitalizing American manufacturing to promote economic growth, expanding the frontiers of human knowledge, building a clean energy future, improving medical conditions, managing environmental resources, addressing climate change, and strengthening national security. The government continued to increase investment in scientific research, innovation, technology, and education, and maintained investment in the private sector. Compared to 2012, basic and applied

research increased by 7.5%, but investment in different agencies was adjusted: NIH increased by 1.5%, NSF by 8.4%, NASA by 2.6%, while investment in the Department of Defense decreased by 1.7%. Changes in fiscal budget can reveal shifts in government investment priorities, with biomedical and educational innovation receiving increasing attention [12].

4.3 Space and Ocean

In recent years, countries have strengthened space exploration and promoted aerospace technology development, not only for military purposes but also to assist in exploring other planets [13]. In April 2010, at the Kennedy Space Center in Florida, Obama made overall strategic plans for human space flight, increasing investment in the space domain to train more astronauts, build the International Space Station, improve satellite launch capabilities, and transform the Kennedy Space Center into a more modern launch site [9]. In July 2010, the United States released a new aerospace policy reflecting President Obama' s desire to revitalize American leadership in aerospace and ensure a stable space environment so all nations can utilize space peacefully, also indicating increased demand for satellite and aerospace technology. The policy clarified U.S. development goals for the next five years: improving satellite manufacturing, satellite services, space launch capabilities, and developing terrestrial applications; expanding international cooperation, improving space information sharing, and promoting peaceful use of space resources; strengthening safe and responsible operations at space centers; avoiding space object collisions and strengthening space debris mitigation measures; strengthening development of innovative technologies such as robotics and exploration of space beyond the solar system; improving Earth and solar system observation capabilities to monitor global climate change, manage natural resources, and assist disaster relief and recovery; strengthening development of aerospace positioning, navigation, and timing systems; seeking international cooperation opportunities beyond space exploration, space transportation, Earth science and observation, space supervision, and satellite communications; protecting the space environment and developing space collision warning measures; developing and using space nuclear energy systems to safely and effectively enhance space exploration and operational capabilities; utilizing radio spectrum for interference protection; and ensuring American NASA' s dominant position in world aerospace [14].

The ocean contains abundant resources, and in recent years, ocean issues have attracted global attention due to climate change impacts. As early as 2007, the U.S. Joint Subcommittee on Ocean Science and Technology (JSOST) released the Ocean Research Priorities Plan and Implementation Strategy (ORPPIS). In 2009, it solicited public opinions and suggestions on ocean issues through two special topics, "a Dear Colleague Letter"and "Federal Register Notice,"to redraw the ocean research plan. As scientific research focus shifts from observation to prediction, ocean energy management also requires development of tool technologies based on models and field observations. In February 2010, an ocean

science conference held in Portland took developing basic tools as its main 议题, also emphasizing the need to connect field observations with models to develop high-salary prediction tools across multiple spatial and temporal dimensions to improve prediction capabilities while also promoting publicity and education for ocean conservation.

4.4 Environment and Health

In recent years, countries have worked to improve the environment and reduce climate change impacts. In March 2013, the Office of Science and Technology Policy released the U.S. Global Change Research Program (USGCRP), with 13 government agencies responsible for different climate change research directions. Research content includes laboratory experiments, field studies, computer simulations, scientific assessments, and ground detection of the atmosphere, oceans, and space, weather forecasting, crop production, and resource management. The 2013 "Our Changing Planet" annual report proposed specific steps for improving climate change, presenting the public with a clear picture of global climate change. As greenhouse gas emissions cause global warming, diseases, floods, heat waves, and droughts occur frequently, imposing heavy costs on society. In 2009, President Obama committed to reducing U.S. greenhouse gas emissions by 17% by 2020 compared to 2005 levels. In June 2013, he proposed "The President' s Climate Action Plan," emphasizing the establishment of new enterprises, increased use of wind, solar, and geothermal energy, reduced carbon emissions, increased investment in climate change research across departments, strengthened government guidance on clean energy use efficiency, and leveraged American world leadership in environmental governance [15].

Environmental deterioration poses significant threats to human health, requiring continuous government investment in vaccines for influenza or emerging epidemics and shortened vaccine production cycles. The PCAST influenza vaccine report released in August 2010 stated that within the next three years, the nation must effectively improve its capacity to produce influenza or other infectious disease vaccines, proposing increased monitoring of emerging epidemic viruses to rapidly activate vaccine production lines and the use of genetic engineering technology to develop recombinant vaccines [16]. In December 2010, PCAST also released a report on using medical information technology resources to improve Americans' health care. In the big data era, how to quickly and effectively process information is an urgent problem to be solved across all fields. Electronic medical records are a specific application of information technology in the medical field, enabling doctors to view patients' medical conditions and needs anytime while protecting patient privacy and facilitating information sharing among medical institutions [17].

4.5 Key Technologies

Science and technology are the cornerstones of national economic development. Nanotechnology and information technology are high-end technologies that

have developed rapidly in recent years and have attracted significant attention. In March 2010, the PCAST meeting addressed five issues including the National Nanotechnology Initiative, STEM education, and advanced manufacturing. Based on meeting discussions, PCAST released a nanotechnology report in March 2010, stating that U.S. investment in nanotechnology increased by 18% annually from 2003-2008, caught up with Europe in 2005, and surpassed Asia in 2008. The U.S. National Nanotechnology Initiative (NNI) involves 25 agencies, with research groups conducting programs from three aspects: project management, nanotechnology output, and environmental health and safety. However, in recent years, as countries have increased investment in high-salary technologies, American dominance in nanotechnology has been threatened. Although the U.S. still has the highest citation counts from citation metrics, the European Union and China have shown rapid growth in publication volume. While the U.S. still maintains world leadership in the absolute number of nanotechnology patents, it has fallen behind China in the number of nanotechnology application patents.

In information technology, PCAST stated that networking and information technology (NIT) has become an important driving force for scientific and technological progress and economic development, calling on the government to invest more funding in NIT R&D. It noted that high-performance computing (HPC) remains key to national security and economic competitiveness, emphasized the need to strengthen development of large-scale data analysis technology and robotic sensors, and use innovative methods to protect national cybersecurity. Additionally, PCAST members called for increased application of networking and information technology in health care, energy, and transportation cybersecurity. In June 2012, the President signed an executive order to achieve 90% broadband coverage on roads for more convenient and faster network access. Currently, there are over 100 partner institutions forming a new government-civilian partnership called "US Ignite," which uses advanced broadband services to drive the development of new industries [18]. The President' s broadband executive order and US Ignite partnership work together to connect all aspects of social life in the digital age, making enterprises more competitive and students more cognitively capable.

4.6 Energy and Manufacturing

As climate change and environmental pollution intensify, countries have increased research on clean energy. In November 2010, PCAST released an energy report that developed a roadmap for the U.S. energy system for the next 10 to 20 years. For environmental, economic, and national security reasons, developing clean, safe, and economical energy is one of the most important challenges currently facing the United States. The report recommended that the Department of Energy conduct quadrennial energy review reports to guide the proper use of energy R&D funds and launch energy competition programs and education and training programs. It recommended that the administration increase investment

in energy R&D, adopt energy subsidies and incentive mechanisms, and promote energy technology innovation. The report also emphasized strengthening the energy innovation system, using pollution-free water and wind power to reduce dependence on power plants, using solar energy to achieve highly distributed power generation, using nuclear reaction and fuel cycle technologies to reduce resource waste and proliferation, and reducing dependence on petroleum resources [19].

In the 21st century dominated by information technology, the energy domain has undergone new changes. Smart grids play an important role in the clean energy economy, bringing new services and collision-free urban transportation systems. In the President' s 2011 "MODERNIZING OUR GRID" report, he emphasized the goal of achieving 1 million electric vehicles by 2015 and doubling clean energy use by 2035 [20]. To achieve these goals, the Obama administration has increased investment in clean energy technology, grid modernization, and electric vehicle infrastructure construction. Additionally, to promote smart grid technology development, the Obama administration has formulated many related policies, including cooperating with the military to develop new military grid transportation technologies, increasing rural grid construction, and the Department of Energy' s proposal to establish smart grid innovation centers to provide users with convenient energy information query services and incentivize STEM students to innovate in improving household energy efficiency. The administration has strengthened international cooperation to promote smart grid trade in the Asia-Pacific region and required management departments to formulate cybersecurity measures and standards and establish accountability systems to support smart grid construction.

In June 2011, President Obama proposed the Advanced Manufacturing Partnership (AMP) [21], striving to unite enterprises, universities, and the federal government to enhance national competitiveness in emerging technologies (such as information technology, biotechnology, and nanotechnology). To reduce the time for developing and deploying advanced manufacturing basic materials, the Materials Genome Initiative was also launched. In July 2012, the AMP steering committee and PCAST jointly called for increased investment in advanced manufacturing to ensure American long-term leadership, providing 16 recommendations in three areas: stimulating innovation, ensuring talent pipelines, and improving the business environment, and proposing the creation of a national manufacturing innovation research pilot institute. The 2013 fiscal budget also emphasized increasing R&D investment in high-tech manufacturing, creating community colleges to train more innovative talents, and requiring tax law reform to encourage enterprise investment in domestic manufacturing and create a safe and healthy business environment for enterprises.

4.7 STEM Education

Education has always been a key focus of the U.S. government, with investment in STEM Education (Science, Technology, Engineering and Math) increasing

annually as the government strives to promote STEM education development through various measures. In May 2010, OSTP established the "Ask The Science Advisor" feature topic, where Presidential Science Advisor Holdren answered questions such as "Who Do You Credit For Your Scientific Interests," "What Role Does Mentoring Play In Preparing New Scientists,"and "How Can Kids Apply Their Ingenuity To Global Challenges," helping the public better understand issues in STEM education [22]. The K-12 STEM Education Report released by PCAST in September 2010 outlined the government' s specific education plans for the next decade. To create more innovation and extracurricular learning opportunities for students in STEM fields, President Obama held three White House Science Fair conferences between 2010-2013, rewarding outstanding participants in STEM competitions. These young people have diverse specialties, such as application code writing, algae cultivation, video game design, urban planning, robotics, and rockets. At the second White House Science Fair celebration in February 2012, the President announced new initiatives to promote STEM education development, increased investment in STEM education practice for college students, and proposed that the Department of Education and NSF jointly manage educational institutions to improve teaching quality, involve more youth in STEM education, and cultivate them into future innovators [23].

Governments formulate national development policies according to their national conditions, and these policies in turn drive development across all aspects of social life including enterprise and education. Under policy guidance, various institutions develop steadily, bringing more benefits to the nation, creating more job opportunities, and thereby driving further economic development. Analysis of featured topics on the OSTP website over the past five years shows that U.S. funding is concentrated in scientific and technological innovation, space and ocean, environment and health, energy and manufacturing, and education. Key themes emphasized for increased funding include STEM education, advanced manufacturing, bioeconomy, national grid construction, aerospace research, and clean energy, with corresponding implementation plans and programs formulated. In-depth interpretation of reports related to featured topics across different domains clarifies the evolution and changes in U.S. policy over time, showing continuous policy guidance adjustments according to national conditions, transitioning from a sole focus on enterprise output efficiency to attention on environmental health, new energy, and innovative technologies. In education, the focus has gradually shifted from basic education to innovative education. From the fiscal budgets of 2010-2014, funding for aerospace, STEM education, clean energy, and health has increased annually, while investment in national defense security has slightly decreased, indicating that peace is the theme of the world and that scientific and technological innovation and health are priorities for contemporary national development. Dynamic monitoring and analysis of online resources such as important reports and major events released by the U.S. government can provide timely understanding of national science and technology policies and grasp national development trends, offering reference information for China to formulate related policies.

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Note: Figure translations are in progress. See original paper for figures.