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OFFICE OF SCIENCE AND TECHNOLOGY POLICY

NATIONAL ECONOMIC COUNCIL

Strategy for American Innovation

ACTION: Notice of Request for Information.

SUMMARY: The Office of Science and Technology Policy and the National Economic Council request public comments to provide input into an upcoming update of the *Strategy for American Innovation*, which helps to guide the Administration's efforts to promote lasting economic growth and competitiveness through policies that support transformative American innovation in products, processes, and services and spur new fundamental discoveries that in the long run lead to growing economic prosperity and rising living standards. These efforts include policies to promote critical components of the American innovation ecosystem, including scientific research and development (R&D), technical workforce, entrepreneurship, technology commercialization, advanced manufacturing, and others. The strategy also provides an important framework to channel these Federal investments in innovation capacity towards innovative activity for specific national priorities. The public input provided through this notice will inform the deliberations of the National Economic Council and the Office of Science and Technology Policy, which are together responsible for publishing an updated *Strategy for American Innovation*.

DATE(S): Responses must be received by September 23, 2014 to be considered.

ADDRESSES: You may submit comments by any of the following methods (email is preferred):

- E-mail: innovationstrategy@ostp.gov. Include [*Strategy for American Innovation*] in the subject line of the message.
- Fax: (202) 456-6040, Attn: Dan Correa.
- Mail: Attn: Dan Correa, Office of Science and Technology Policy, Eisenhower Executive Office Building, 1650 Pennsylvania Ave, NW, Washington, DC 20504. If submitting responses by mail, please allow sufficient time for mail processing and screening.

Details: Response to this RFI is voluntary. Please do not include in your comments information of a confidential nature, such as sensitive personal information or proprietary information. Please be aware that your comments may be posted online. Responses to this notice are not offers and cannot be accepted by the Federal Government to form a binding contract or issue a grant. Information obtained as a result of this notice may be used by the Federal Government for program planning on a non-attribution basis. The United States Government will not pay for response preparation, or for the use of any information contained in the response.

FOR FURTHER INFORMATION CONTACT:

Dan Correa, (202) 456-4444, innovationstrategy@ostp.gov, OSTP.

SUPPLEMENTARY INFORMATION:

This Request for Information (RFI) offers interested individuals and organizations the opportunity to provide input into the development of an updated *Strategy for American Innovation* by identifying promising policy opportunities to promote innovation and its economic

benefits in the United States (U.S.). The public input provided through this notice will inform the deliberations of the National Economic Council and the Office of Science and Technology Policy, which are together responsible for publishing an updated *Strategy for American Innovation*.

Public input into the strategy update process is particularly valuable given the document's critical role in guiding the development of new policy initiatives that can help unleash the transformative innovation that leads to long-term economic growth. For example, the 2009 *Strategy for American Innovation* first identified an opportunity for Federal agencies to use incentive prizes to promote innovation, which was an important step in the eventual inclusion of agency prize authority in the America COMPETES Reauthorization Act of 2010, significantly increasing the Federal Government's ability to catalyze innovation across a wide range of national priorities.

Background

President Obama released the *Strategy for American Innovation* in September 2009 and updated it in February 2011 (<http://www.whitehouse.gov/innovation/strategy>).

The 2011 *Strategy for American Innovation* articulates the importance of innovation as a driver of U.S. economic growth and prosperity, the central importance of the private sector as the engine of innovation, and the critical role of government in supporting our innovation system.

It organizes the Administration's policy initiatives into three parts:

(1) Invest in the Building Blocks of American Innovation

Spurring the innovations that will drive America's future economic growth and competitiveness requires critical investments in the basic foundations of the innovation process,

including education, fundamental research, and both the digital and physical infrastructure on which our dynamic economy relies.

(2) Promote Market-Based Innovation

American businesses are the engine of innovation, and the Administration seeks to promote an environment that allows U.S. companies to drive future economic growth and continue to lead on the global stage. This requires that government establish and maintain the right framework conditions to support market-based innovation through the Research and Experimentation Tax Credit, effective intellectual property policy, and policies to promote innovation-based entrepreneurship as well as innovative, open, and competitive markets.

(3) Catalyze Breakthroughs for National Priorities

The 2011 strategy identifies several areas of national importance where public investments can catalyze advances, bring about key breakthroughs, and establish U.S. leadership faster than might be possible otherwise. The portfolio of national priority areas outlined in the 2011 strategy includes clean energy, biotechnology, nanotechnology, advanced manufacturing, educational and health information technologies, and space technologies.

Questions

To gather valuable insight into promising opportunities to boost our innovation capacity in order to drive economic growth and competitiveness, the Office of Science and Technology Policy (OSTP) and the National Economic Council (NEC) seek public comment on a wide range of innovation policy topics.

Instructions. In formulating responses to any of the below questions, respondents should consider the following:

- The questions below are grouped into the following categories:

- *Overarching Questions*
- *Innovation Trends*
- *Science, Technology, and R&D Priorities*
- *Skilled Workforce Development*
- *Manufacturing and Entrepreneurship*
- *Regional Innovation Ecosystems*
- *Intellectual Property/Antitrust*
- *Novel Government Tools for Promoting Innovation*
- *National Priorities*
- Respondents are free to address any or all of the following questions, as well as provide additional relevant information not in response to any specific question. Please note the number corresponding to the question(s) addressed in the response.
- Specific, actionable proposals for policy mechanisms, models, or initiatives are more useful than general observations and recommendations. For example, a response that describes the importance of increasing technology transfer activities is helpful but not as useful as one that identifies specific model(s) to accomplish this goal and offers accompanying details (e.g., the specific problem it addresses and how it does so, the parties who would be responsible for administering the model, actions the Administration might take, the likely benefits and costs, the rationale and evidence to support the proposal, etc.).
- There is a 5,000 word limit for responses. Accordingly, responses longer than 5,000 words will not be considered. There is no minimum length requirement, and a 500 word

response can be as valuable as a 5,000 word response if it contains detailed and well-founded information.

OSTP and NEC seek public comment on the following:

Overarching Questions

(1) What specific policies or initiatives should the Administration consider prioritizing in the next version of the *Strategy for American Innovation*?

For any proposal, respondents may wish to consider describing specific goals, the actions the Administration might take to achieve those goals, the benefits and costs associated with the proposal, whether the proposal is cross-government, inter-agency, or agency-specific, the rationale and evidence to support it, and the roles of other stakeholders, such as companies, universities, non-profits, philanthropists, state and local governments, professional societies, etc.

(2) What are the biggest challenges to, and opportunities for, innovation in the United States that will generate long-term economic growth, increased productivity, sustained leadership in knowledge-intensive sectors, job creation, entrepreneurship, and rising standards of living for more Americans?

(3) What specific actions can the Federal Government take to build and sustain U.S. strengths including its entrepreneurial culture, flexible labor markets, world-class research universities, strong regional innovation ecosystems, and large share of global venture capital investment?

(4) How can the Federal Government augment its overall capacity for analysis of both the forces that determine the competitiveness of specific sectors and the impact of Federal policies – including, but not limited to, science, technology, and innovation policies – on sector-specific productivity and competitiveness? What are the most important outstanding questions about

innovation policy and process and how might government promote systematic research and program evaluation in those areas?

Many policies can affect the ability of research-intensive companies to innovate and compete in the marketplace, but the impact of future policy choices on innovation is often not well understood in advance. For example, telecommunications spectrum policies that facilitate innovative business models may enable significant productivity growth in the mobile communications sector. Improved Federal capacity for analysis of such impacts would help inform policy development to support innovation.

(5) What innovation practices and policies have other countries adopted that deserve further consideration in the United States? What innovation practices and policies have been adopted at the state or local level that should be piloted by the Federal Government?

Innovation Trends

(6) How has the nature of the innovation process itself changed in recent years and what new models for science and technology investment and innovation policy, if any, do these changes require?

For example, many cite the growing importance of open innovation, combinatorial innovation, and user innovation; the convergence of biology, the physical sciences, and engineering; and the emergence of human-centered design.

(7) What emerging areas of scientific and technological innovation merit greater Federal investment, and how can that investment be structured for maximum impact?

(8) What are important needs or opportunities for institutional innovation and what steps can the Federal Government take to support these innovations?

Economists have identified institutional innovation as critical to long-term economic growth. Examples of particularly important institutional innovations include the British invention of patents and copyrights in the 17th century, the work of the agricultural extension service in the U.S. in the 19th century, and the development of the peer review system for supporting basic research in the 20th century.

Science, Technology, and R&D Priorities

(9) What additional opportunities exist to develop high-impact platform technologies that reduce the time and cost associated with the “design, build, test” cycle for important classes of materials, products, and systems?

A number of the Administration’s current research initiatives are aimed at developing platform technologies for this purpose, such as:

- The Defense Advanced Research Projects Agency (DARPA)/National Institute of Health (NIH)/ Food and Drug Administration (FDA) “tissue chip” project to transform the way researchers evaluate the safety and efficacy of drug candidates;
- The Materials Genome Initiative, which is investing in a “materials innovation infrastructure” to reduce the time and cost required to discover and make advanced materials by at least 50 percent;
- Federal investments in new tools to reduce the time and cost needed to engineer biological systems;
- The DARPA “Adaptive Vehicle Make” program, which supported the development of technologies such as model-based design to shorten development timelines for defense systems by a factor of five or more.

(10) Where are there gaps in the Federal Government's science, technology, and innovation portfolios with respect to important national challenges, and what are the appropriate investment and R&D models through which these gaps might be addressed?

Agencies lacking a traditional focus on research and development nonetheless pursue critical missions that could benefit from innovation. Given these agencies' more modest capacity to support research and development and other avenues to innovation, there is potentially underinvestment in science, technology and innovation to address key national problems such as education, workforce development, and poverty alleviation.

(11) Given recent evidence of the irreproducibility of a surprising number of published scientific findings, how can the Federal Government leverage its role as a significant funder of scientific research to most effectively address the problem?

Skilled Workforce Development

(12) What novel mechanisms or models might facilitate matching skilled STEM workers with employers and helping individuals identify what additional skills they may need to transition successfully to new roles?

In a dynamic economy, STEM workers seeking employment in a different industry often find it difficult to identify employers with matching needs. Likewise, employers devote significant resources to finding technically skilled individuals to meet their needs, sometimes with little success, even though a large pool of technically skilled workers may exist.

(13) What emerging areas of skills are needed in order to keep pace with emerging innovations or technologies? What are successful models for training workers with these skills to keep up with emerging innovations?

For example, pharmaceutical researchers report that more workers are needed with capabilities in gene sequencing and bioengineering to keep pace with new innovations in biomanufacturing. Similarly, innovations in advanced materials from lightweight metals to advanced composites have spurred a need for welders with the ability to create high-precision welds on complex materials.

(14) What mechanisms or programs can effectively increase the supply of workers with technical training, from industry-recognized credentials and postsecondary certificates to two- and four-year degrees?

Manufacturing and Entrepreneurship

(15) What new or existing investment models should be explored to support entrepreneurship in new geographies, as well as in technologies and sectors that are capital-intensive, relatively high-risk, and require sustained investment over long periods of time?

Angel and venture investment has tended to concentrate in a few regions and sectors, particularly sectors that are capital efficient and can provide “exits” for investors within 5-7 years. As a result, innovative technologies that do not meet these criteria may be better suited to different investment models.

(16) For new technologies and products, how might “proof of manufacturability” be gauged sooner, and what entities would most appropriately provide the necessary resources and facilities? What sectors represent the most promising opportunities for the application of such models?

Assessing the feasibility of producing at scale remains a critical hurdle for manufacturing startups attempting to commercialize new or unproven technologies, but it is a challenge that firms do not face until relatively late in their evolution, after a great deal of early investment has

already been committed. More effectively addressing this challenge at an early stage could yield more efficient allocation of investment capital, and greater commercialization of important innovative technologies and products.

(17) What tools, business model innovations, financial innovations, or other developments hold promise for reducing the cost of starting and scaling a business in capital intensive sectors like the life sciences, advanced materials, and clean energy? What can the Federal Government do to accelerate these trends?

Over the past two decades, the cost of starting and scaling an IT-based company has plummeted due to a combination of cheap, scalable cloud computing, open source software, and other similar trends. Extending these or similar developments to more capital intensive sectors, where costs remain a significant barrier, would yield significant benefits.

(18) What investments, strategies, or technological advancements, across both the public and private sectors, are needed to rebuild the U.S. “industrial commons” and ensure the latest technologies can be produced here?

After a decade of significant offshoring, the United States has lost important manufacturing capabilities and the connections between manufacturers, know-how, national supply chains, educational institutions, local workforce and financial institutions that provide the foundation and resources for new technologies to be manufactured in the U.S. As the manufacturing sector recovers and strengthens, rebuilding these industrial commons will be important for capturing domestically both the production of new technologies and next generation manufacturing capabilities.

Regional Innovation Ecosystems

(19) What partnerships or novel models for collaboration between the Federal Government and regions should the Administration consider in order to promote innovation and the development of regional innovation ecosystems?

(20) How should the Federal government promote the development of metropolitan “innovation districts,” where large research institutions, companies, start-ups, and business accelerators congregate to facilitate the knowledge flows that sustain innovation?

Intellectual Property/Antitrust

(21) What new challenges and opportunities for intellectual property and competition policy are posed by the increasing diversity of models of innovation (including, e.g., through the growing use of open innovation, combinatorial innovation, user innovation, internet-enabled innovation, and big data-driven innovation)?

Novel Government Tools for Promoting Innovation

(22) What are specific areas where a greater capacity for experimentation in law, policy, and regulation at the Federal level is likely to have large benefits? Are there useful models of experimental platforms in the public or private sectors that the Federal Government can adopt? How might the Federal Government encourage state and local experimentation?

New technologies and business models often evolve more rapidly than law, policy, and regulation at the Federal, state and local level. One approach to dealing with this challenge is to increase the capacity of governments at all levels to support experimentation. For example, the FCC recently reformed its experimental licensing rules to help researchers and manufacturers bring new products to market more rapidly. Analogous opportunities may exist in other areas.

(23) Beyond current Federal efforts to promote open data and open application programming interfaces (APIs), what other opportunities exist to open up access to Federal

assets (such as data, tools, equipment, facilities, and intellectual property from Federally-funded research) in order to spark private sector innovation?

For example, the Internet economy has created new opportunities for innovative business models relying on Federal data. Through open data and open APIs, the Federal Government can invite competition among firms to provide valuable services directly to end users by incorporating these Federal assets. For example, a travel booking provider might directly incorporate public campsite reservation functionality into its website through open Federal APIs. Likewise, a researcher looking to access billions of dollars of Federal testing equipment can access equipment availability and usage information through machine-readable data on Data.gov.

National Priorities

(24) Which new areas should be identified as “national priorities,” either because they address important challenges confronting U.S. security or living standards, or they present an opportunity for public investments to catalyze advances, bring about key breakthroughs and establish U.S. leadership faster than what might be possible otherwise?

(25) What Federal policies or initiatives could unleash additional corporate and philanthropic investment for critical national priorities, such as energy innovation?

In a number of areas, overall investment may be too low to sustain our global leadership in innovation or to confront critical challenges to our national wellbeing. For example, overall investment in clean energy innovation remains significantly below the level that economists and climate experts conclude are required to facilitate the transition to a low-carbon economy. Other national priorities may suffer from similar underinvestment, such as in learning technologies or in smart infrastructure technologies. Responsible for the majority of U.S. research and

development (R&D) funding, private entities will be essential to achieving the overall levels of investment required to meet such challenges.

Respondents are also free to provide additional information they think is relevant to the goal of promoting innovation in the United States, and feedback on the framework and components of the 2011 *Strategy for American Innovation*.

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