

SENATE COMMITTEE ON COMMERCE, SCIENCE, AND TRANSPORTATION
*“Nomination of Dr. Arati Prabhakar, of California, to be Director of the Office of Science and
Technology Policy”*

10:00 AM, June 20, 2022

Questions for the Record from Chair Cantwell to Dr. Arati Prabhakar

Weather and Climate Forecasting. If confirmed, you will oversee the Interagency Council for Advancing Meteorological Services (“ICAMS”), established to ensure that the United States leads the world in weather and climate forecasting.

The work of ICAMS and NOAA is critical for our Nation’s ability to prepare, respond, and adapt to the increasing extreme weather events and our changing climate.

Question 1. The European weather forecast model is superior to the American forecast model. The European model provides more accurate three- to seven-day forecasts and can better predict the location of hurricane landfall compared to the American model. In your role, will you commit to accelerating the work of this Council to improve the United States’ leadership standing?

Answer: Yes. ICAMS is well positioned to accelerate scientific and technological advancements in weather forecast modeling because it brings the broad federal meteorological enterprise together.

Question 2. Increases in extreme weather events cause hundreds of deaths, cost billions of dollars annually, and threaten food, water, energy, and economic well-being. So far this year there have been nine separate billion-dollar weather and climate disasters in the Nation. Do you agree that advancing the Nation’s preparedness for extreme weather events and climate events is a science priority and will you prioritize ICAM’s work to improve the timing and accuracy of weather forecasting?

Answer: Yes. If confirmed, my roles as OSTP Director and as the Assistant to the President for Science and Technology would allow multiple avenues for prioritizing solutions that address the climate crisis and its increasingly devastating impacts. With respect to ICAMS, one of its primary strengths is coordination across federal meteorological science and service providers and users, which can significantly advance the development of new tools and capabilities that enable communities to prepare for extreme weather events.

Question 3. We invested \$80 million in the Biden-Harris Infrastructure Law to help boost supercomputing technologies for fire-weather models, but we have a long way to go. The United Kingdom’s recent billion-dollar investment gives them the most powerful weather and climate supercomputer technology in the world. If confirmed, will you work with the Committee to

elevate the need and procure the supercomputing infrastructure, including high-performance computers, cloud computing capabilities, and the workforce, needed to support and advance our weather and climate forecasting capabilities?

Answer: Enhancing our weather and climate forecasting capabilities is essential to Americans' safety. If confirmed, I look forward to engaging with the Committee on the technological infrastructure and workforce investments that will be needed for this important challenge.

OSTP Workplace. A December 2021 White House investigation revealed complaints from fourteen OSTP employees that the former Director bullied and demeaned his subordinates in violation of OSTP's Safe and Respectful Workplace policy. In April, this Committee submitted a bipartisan letter to the Administration urging it to move quickly to nominate a new OSTP Director to continue the Office's important work and address workplace issues. The Committee's letter cited reports of a toxic work environment and allegations that employees who raised concerns with senior leadership faced retaliation.

Question. What will you do to restore trust among OSTP staff and ensure that OSTP leads by example in maintaining a safe and professional work environment?

Answer: I was extremely concerned about the allegations and behavior cited in press reports about the investigation and in your bipartisan letter. Based on my interactions with OSTP to date, it is clear that the organization has since made important progress in setting a foundation for a respectful workplace environment. As I stated at the hearing, people will be my first priority, if I'm confirmed. I plan to come into the role ready to do two things. One is to listen to the people in the organization to learn about the history and the current environment and assess what work is now needed to move forward. The other is to state my own expectations for a high standard of mutual respect and to exhibit that level of respect in my interactions with all parties. OSTP's success depends on its excellent staff being able to work effectively with each other and many others in a safe and professional environment, and I am committed to doing everything I can to nurture that environment.

Questions for the Record from Senator Blumenthal to Dr. Arati Prabhakar

Combatting Sexual Harassment. There is a long history of a persistent and pervasive culture of discrimination and sexual harassment in the STEM workforce. Earlier this Congress, I introduced S.1379, the Combatting Sexual Harassment in Science Act, which would direct the National Science Foundation to award grants to examine the causes of and reduce the incidence and negative consequences of sexual harassment. The bill would also direct OSTP to establish a working group to assess current practices and develop, maintain, and implement policy guidelines for sexual harassment prevention and reduction efforts at federal science agencies. This bill was included in the “CHIPS plus” package currently under consideration on the Senate floor.

Question. If confirmed, do you commit to expeditiously standing up the OSTP working group?

Answer: Yes. Sexual harassment is unacceptable in the STEM community, as it is everywhere.

A.I. Bill of Rights. Last October, the Office of Science and Technology Policy (OSTP) announced an initiative to develop an A.I. Bill of Rights. It is important that we protect consumer rights, civil rights, and civil liberties as A.I. and other data-driven technologies increasingly intersect and shape the lives of Americans.

Question 1. Do you support OSTP’s work on creating an A.I. Bill of Rights?

Answer: Yes. Artificial intelligence is a powerful technological capability, and it is up to us as a society to make sure we use it in ways that reflect and reinforce American values. AI and automated systems must be designed, built, and used in ways that uphold our core values and protect the civil rights of all Americans.

Question 2. If confirmed, do you commit to moving forward with this work?

Answer: Yes.

Questions for the Record from Hon. Sinema to Dr. Prabhakar

Competition Bill Implementation. Congress will soon pass the competition bill, previously known as the U.S. Innovation and Competition Act. In addition to vital funding for our domestic semiconductor industry, the legislation provides significant investments in the National Science Foundation (NSF) and a variety of initiatives that fall under the purview of the Office of Science and Technology Policy (OSTP) through the ten key technology focus areas (KTFAs) noted in the legislation. Programs relevant to KTFAs in artificial intelligence, quantum science, cybersecurity, biotechnology, and distributed ledger technologies include the NSF's Technology Directorate and the Department of Commerce's Regional Innovation Hubs, among others.

Question. If confirmed, how will you work at OSTP to implement the competition legislation, once it is signed into law?

Answer: This pending legislation is a tremendous opportunity to boost American competitiveness, and its effective implementation will be critical. If confirmed, I will lead OSTP in implementing the bipartisan innovation legislation as enacted. I understand that the legislation has multiple coordination and implementation tasks for OSTP, and if confirmed, I will ensure OSTP executes these authorities and policies in collaboration with other White House offices, with federal agencies, with stakeholder communities, with Congress, and with the science, technology, and innovation communities.

Diversity in STEM Education and Fields. Despite gains in recent years, women and minority groups remain underrepresented in STEM fields. Figures from 2021 state that underrepresented minority groups make up a little over 33 percent of the STEM workforce. Though women comprised 50 percent of the STEM workforce in 2019, their participation varies across industries, with women overrepresented in health-related fields while being underrepresented in the computer science and engineering fields. Though many factors play a role, bolstering diversity among instructors and students in STEM courses will likely encourage more individuals to pursue STEM careers.

Question 1. How can OSTP promote diversity in STEM education in K-12 schools, in addition to institutions of higher education?

Answer: OSTP can promote diversity in STEM education in K-12 schools by working to ensure that all schools, including those that have been historically under-resourced, are able to bring the excitement of STEM to life for students in ways that connect personally. That means educators and teachers must have the resources they need to provide a quality STEM education, including state-of-the-art learning, training, and instructional materials, as well as connections to the broader STEM ecosystem.

Question 2. From your own experience, are there additional actions Congress should consider taking to support diversity in the STEM workforce?

Answer: In addition to the critical investments and actions in the bipartisan innovation legislation, Congress can bolster U.S. STEM capabilities by appropriating substantial investments in R&D, STEM education, and the STEM workforce, as the President has proposed in his Fiscal Year 2023 Budget. Agencies are making important progress in improving diversity and access to funding opportunities. The bipartisan legislation that this Committee has championed would provide significant additional measures. If confirmed, I look forward to helping the agencies that implement these new efforts make them as impactful as possible.

Workplace Culture at OSTP. As you know, the White House found that your predecessor at OSTP engaged in inappropriate workplace conduct, especially in his treatment of subordinate staff. I expect all presidential nominees to believe in the mission of their agency and to have the proper qualifications to serve in their role, which includes fostering a productive, safe, and collaborative environment.

Question. How will you work to create a positive work environment at OSTP?

Answer: Nurturing a positive work environment is very important to me; I see it as the lynchpin of a successful organization. I was extremely concerned about the allegations and behavior cited in press reports earlier in this year. As I stated at the hearing, people will be my first priority, if I'm confirmed to lead OSTP. I plan to come into the role ready to do two things. One is to listen to the people in the organization to learn about the history and the current environment and assess what work is now needed to move forward. The other is to state my own expectations for a high standard of mutual respect and to exhibit that level of respect in my interactions with all parties. Delivering on OSTP's important mission depends on its excellent staff being able to work effectively with each other and many others in a safe and professional environment, and I am committed to doing everything I can to nurture that environment.

Questions for the Record from Senator John Hickenlooper to Dr. Arati Prabhakar

Climate Science: Dr. Prabhakar, your experience running science organizations such as NIST, DARPA, and others in the private sector can provide leadership at OSTP that will be vital to providing the best scientific research possible to address critical issues climate change, economic competitiveness, and national security.

During your nomination hearing you were asked about actions taken by the U.S. to reduce greenhouse gas emissions since 2005 and to opine on the United States' shift from coal to natural gas.

Question 1. Can you describe in full the role that coal-to-gas substitution has played in reducing emissions since 2005, including any relevant uncertainties around fugitive methane?

Answer: With communities in every part of the U.S. experiencing the devastations of a changing climate, it is clear that we must drastically reduce greenhouse gas emissions very quickly. The electricity sector has made the most progress, with natural gas playing the biggest role in electricity decarbonization to date. Combusting natural gas does result in CO₂ emissions but far less than combusting coal, though as noted below this advantage is to some extent offset by leakage in the supply chain. The U.S. Energy Information Administration estimates that the shift from coal to natural gas for electricity generation resulted in a cumulative savings of CO₂ emissions of about 3 billion metric tons during 2006-2019 in the U.S. Despite this progress, it is sobering to realize that cumulative gross U.S. greenhouse gas emissions were 96 billion metric tons over those years, showing how much further we still have to go.

In addition to CO₂ from fossil fuel combustion at power plants, methane that leaks into the atmosphere from natural gas production and distribution also contributes to climate change. We continue to learn how to measure these leaks to get a better handle on their impact and where actions to contain the leaks would have the biggest benefit. This “fugitive methane” erodes some of the climate benefits from fuel switching from coal to natural gas.

Question 2. Relatedly, can you discuss any fundamental limitations of an emissions-reduction strategy based primarily on switching from one fossil fuel to another?

Answer: Getting to net-zero emissions for electricity generation requires maximizing carbon-free generation, using carbon capture and sequestration for any remaining fossil-powered generation, minimizing fugitive methane, and removing carbon dioxide from the atmosphere. The Bipartisan Infrastructure Law makes important investments in innovation and demonstration across all of these important technologies.

Question 3. And finally, how will OSTP, under your leadership if confirmed, use accurate scientific and technical data to inform the development of strategies to support the United States' transition to clean energy for all sectors of our economy?

Answer: Accurate and up-to-date scientific and technical data are essential to support evidence-based analysis, decisions, and actions to enable clean, affordable, and equitable energy. If confirmed, I will build on OSTP's work in this area.

Questions for the Record from Senator Raphael Warnock to Dr. Arati Prabhakar

Investing in U.S. R&D. From the landing of the first man on the moon to recent breakthroughs in science and technology, the U.S. has been a global pioneer in cutting edge STEM research and development (R&D). As you know, Congress is negotiating a bipartisan bill that would help maintain this competitive edge by making historic investments to improve research capacity at colleges and universities, establishing regional technology hubs, boosting domestic research and production of semiconductors, and more. However, as this legislation stalls, other nations are beginning to invest more into these fields, which could jeopardize U.S. STEM leadership and have disastrous consequences for the economy and national security.

Question 1. How important is it that Congress pass this competition bill and make these critical investments in U.S. R&D? What are the risks in failing to pass this legislation?

Answer: I agree with the President’s view that it is critical for Congress to pass this bipartisan innovation legislation. It can play a very significant role in strengthening our economic and national security, advancing U.S. science and technology, and creating good-paying jobs for U.S. workers in communities across the country. Geopolitical competition in both military and economic spheres means we can no longer take American leadership for granted—because leadership translates directly to the safety and prosperity of all Americans. That is what is at stake.

Question 2. In the absence of a competition bill to invest in U.S. R&D, what actions should Congress take to ensure the U.S. remains a global leader in STEM?

Answer: In addition to the critical investments and actions in the bipartisan innovation legislation, Congress can bolster the U.S.’s STEM abilities by appropriating substantial investments in R&D, STEM education, and the STEM workforce, as the President has proposed in his Fiscal Year 2023 Budget.

Question 3. What actions would you take as OSTP Director to promote U.S. leadership in STEM R&D? How would you work with Congress, federal agencies, colleges and universities, and the science and technology industries to achieve this goal?

Answer: The second part of this question is the starting point to address the first part. My experience working in and with a myriad of agencies, universities, and companies has brought home the fact that major progress happens only when many organizations in both public and private sectors play their important roles. As I remarked at the hearing, OSTP is at the heart of making sure that U.S. science and technology leadership endures in our complex times. That is because it sees and can work with all the actors in this innovation ecosystem. If confirmed, I would support and continue OSTP’s long history of working with the broad science and technology community to address the greatest challenges that our nation faces. I would also advise the President on science and technology policy matters, and I would look forward to working closely with you and your colleagues in Congress on our shared goal of science and technology that creates a better future for all Americans.

Diversity in STEM. From Lewis Latimer, who helped invent the lightbulb, to Dorothy Vaughan, who contributed to computations for space flight, Americans from all backgrounds have been crucial to U.S. achievements in STEM. NSF, NASA, and other federal agencies related to STEM R&D administer programs that build on this diversity to provide greater opportunities for women and communities of color that have historically been overlooked and under-credited. However, women and minorities remain underrepresented in our nation’s STEM community, despite evidence that greater diversity can lead to greater innovation and scientific discovery.

Question 1. How would diversifying America’s STEM researchers and practitioners help to improve the efforts of NSF, NASA, and other agencies to maintain global leadership in STEM fields?

Answer: Broad and diverse participation in STEM is critical for two reasons. The first is that STEM careers can be among the more rewarding, both in terms of providing good-paying jobs and in terms of the satisfaction that many of us in STEM derive from making this contribution to our world. Every child in America must have the opportunity to discover if a STEM career is their calling and to pursue one if that is the case. The second reason is that the challenges and aspirations of our times—such as boosting health outcomes, mitigating and adapting to climate change, improving equity and access to opportunity for all, bolstering our global competitiveness, and reinvigorating trust in the Information Age—demand more talents, backgrounds, and experiences than we currently have at the drafting table.

Question 2. Do federal agencies have the resources and support they need to cultivate greater diversity in America’s STEM community? If not, what actions should Congress take to address this issue?

Answer: Agencies are making important progress in improving diversity and access to funding opportunities. The bipartisan legislation that this Committee has championed would provide significant additional measures. If confirmed, I look forward to helping the agencies that implement these new efforts make them as impactful as possible.

Question 3. As OSTP director, will you commit to making it a priority to promote diversity, equity, and inclusion for women and minorities within your office, federal agencies that are related to STEM R&D, and the broader STEM community?

Answer: Yes.

Regional Innovation. America’s STEM talent can be found in all corners of our nation, and it is critical that our nation’s scientific leadership encourages research, education, and technology development across the country. I’m proud that Georgia is home to many institutions that are critical to our nation’s scientific development, from research powerhouses like Georgia Tech to HBCUs like Morehouse and Spelman who punch above their weight when it comes to training Black scientists and engineers to institutions that are the cornerstone of our regional economy and workforce, like Savannah State University, Valdosta State University, and many others.

Question. If confirmed, will you come visit some of these outstanding Georgia institutions to demonstrate your commitment to STEM development across the country?

Answer: I couldn't agree more that America has STEM talent all across our country, including in the institutions in Georgia. If confirmed, I would welcome the opportunity to accompany you on a visit to Georgia institutions.

Question for the Record from Senator Ben Ray Luján to Dr. Arati Prabhakar

Topic. OSTP advises the President on and assists the Office of Management and Budget (OMB) in the development of the Federal research and development (R&D) budget. In the President's Budget Request, I applaud the Administration's focus on ensuring our competitiveness in key technology areas, such as bioscience, AI, and quantum information sciences. Unfortunately, however, the Administration's requests have generally shortchanged the Department of Energy's Office of Science, despite its leadership in these key areas of the R&D ecosystem.

Question: How do you plan to strengthen our entire federal research ecosystem, including the Office of Science and the Department of Energy National Laboratories, to ensure that we are making smart investments on the frontiers of science and technology?

Answer: My experience working in and with a myriad of agencies, universities, labs and companies has brought home the fact that major progress happens only when many organizations in both public and private sectors play their important roles. As I remarked at the hearing, OSTP is at the heart of making sure that U.S. science and technology leadership endures in our complex times. That is because it sees and can work with all the actors in this innovation ecosystem. If confirmed, I would support and continue OSTP's long history of working with the broad science and technology community to address the greatest challenges that our nation faces.

Our national labs are a major part of the U.S. innovation system. It was my privilege to lead one when I was director at NIST. And my experience with the DoE labs goes all the way back to when I was an undergraduate and had the chance to visit some of those facilities and then work at one of them. If confirmed, I would look forward to opportunities to reduce barriers and create new linkages to boost the effectiveness of all parts of our R&D ecosystem, including our national labs.