

# DAY ONE PROJECT

## Creating a National DeepTech Capital Fund

Leslie Jump  
Mack Kolarich  
Ellen Brooks Shehata

January 2021

The Day One Project offers a platform for ideas that represent a broad range of perspectives across S&T disciplines. The views and opinions expressed in this proposal are those of the authors and do not reflect the views and opinions of the Day One Project or its S&T Leadership Council.

## Summary

The Biden-Harris Administration should establish a National DeepTech Capital Fund (NDTC Fund) to bridge capital gaps and enable more DeepTech entrepreneurs to bring promising and beneficial technologies to market.

Greater investment in DeepTech is critical in order to return the United States to the forefront of advanced science and technology research and development (R&D).<sup>1</sup> “DeepTech” refers to companies and innovators building science-based, or R&D-based, products and services including hardware and advanced materials, robotics, manufacturing, and biotech. U.S. government investment in technology has declined by two-thirds in the past decades.<sup>2</sup> Private capital typically eschews investment in advanced technologies, due to a combination of the additional expertise needed for and risks inherent to advanced-technology investment.<sup>3</sup> Silicon Valley’s early days were cushioned by government risk capital at a time when the private sector could not see the value of investing in R&D. But relying entirely on Silicon Valley to drive investment in innovation has led the U.S. to a point where it risks being replaced by other innovation centers such as China. A National DeepTech Capital Fund would encourage and enable investment in companies building solutions to society’s greatest challenges, while ensuring that the United States remains at the center of global innovation.

## Challenge and Opportunity

We are living in chaotic times. The United States, and the world as a whole, urgently needs COVID-19 detection, prevention, and cures, as well as ways to help the world weather the economic impacts of the COVID-19 crisis. Add the impending threat of climate change—which demands an immediate transition to carbon-free energy, industry, transportation, and infrastructure—and we have all the more reason to invest in strategies to fuel increased science-based innovation for the near and long term.

The need is especially pressing in the United States. For the past several decades, the predominant focus of private investment in innovation has been on software and “technology-enabled” startups, instead of on companies working at the leading edge of fields such as hardware and advanced materials, robotics, and manufacturing—that is, DeepTech. In the meantime, other global superpowers have made significant advancements in key science-based technologies. As a result, our nation’s scientific preeminence and international competitiveness is under threat.

---

<sup>1</sup> Rozansky, R.; (2019). *Becoming America’s Seed Fund: Why NSF’s SBIR Program Should Be a Model for the Rest of Government*. Information Technology & Innovation Foundation (ITIF).

<sup>2</sup> Manyika, J.; McRaven, W.H.; Segal, A. (2019). *Innovation and National Security: Keeping Our Edge*. Council on Foreign Relations, Independent Task Force Report No. 77. [https://www.cfr.org/report/keeping-our-edge/pdf/TFR\\_Innovation\\_Strategy.pdf](https://www.cfr.org/report/keeping-our-edge/pdf/TFR_Innovation_Strategy.pdf).

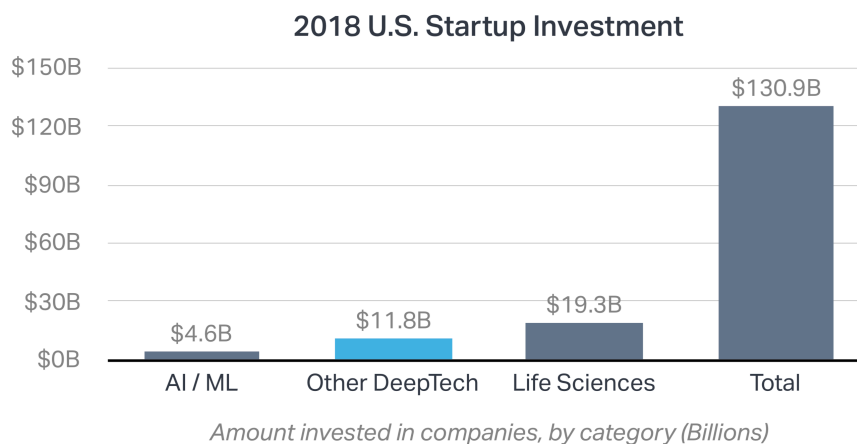
<sup>3</sup> Different. (2020). *DeepTech Investing Report 2020*. <https://differentfunds.com/deeptech-investing/>.

“DeepTech” refers to companies and innovators building science-based or R&D-based products and services. These technologies often have transformational potential if successful. They could trigger transformative shifts in the way businesses operate, how our national security is protected, or how an entire field of discovery thinks. It’s impossible to overstate the importance of DeepTech. The United States needs DeepTech products and services to address the Biden-Harris Administration’s top priorities: from the COVID-19 pandemic, to climate change, to the nation’s economic recovery.



**Figure 1:** Technologies commonly considered to be part of “DeepTech”.

Unfortunately, significant funding gaps in DeepTech investment inhibit the ability of scientific entrepreneurs to shepherd their companies from proof-of-concept to commercialization.<sup>4</sup> The lack of readily available capital for commercialization leads to the phenomenon of scientists cycling through ‘research mills’ vs. building DeepTech companies. When scientific entrepreneurs fail to raise startup funding, they return to the only money they’re able to access: research grants. The incentives to win successive grants outweigh the incentives to bring a company to market.



**Figure 2:** DeepTech investment represents a small fraction of total venture investment in the U.S.

<sup>4</sup> Different. (2020). DeepTech Investing Report 2020. <https://differentfunds.com/deeptech-investing/>.

The most urgent capital gap DeepTech entrepreneurs face is in the phase between government grants and initial private capital investments (e.g., Seed through Series A; fundraising rounds of ~\$1M–\$20M respectively). The NDTC Fund would specifically address this funding gap. The Fund would catalyze private capital investment by providing the government financing needed to reduce risk, allowing for a blended finance approach to early stage DeepTech investing. The NDTC Fund would invest in promising DeepTech companies as well as the emerging DeepTech venture capital firms who back them. It would foster a more robust capital market and help mission-critical technologies overcome key funding hurdles.

The federal Small Business Administration (SBA)'s programs intended to address this gap often miss the mark. The Small Business Innovation Research (SBIR) program's resources are not always optimized for startups, and often prioritize research and development over commercialization. SBIR program grants also tend to be designed without the needs of the marketplace in mind, and don't effectively align with private-sector incentives. This mismatch is illustrated by the fact that 20% of awardees account for more than 72% of grants issued by SBIR—these repeat awardees are commonly known as 'research mills,' capturing critical funding dollars much needed by startups with high-growth potential.<sup>5</sup> SBA's other small business funding mechanism, the Small Business Investment Company (SBIC) program, has low adoption rates and an uneven performance track record.<sup>6</sup>

The Biden Administration should support scientific entrepreneurs by creating a National DeepTech Capital (NDTC) Fund specifically designed to address the persistent gaps in DeepTech funding. By providing the government financing needed to reduce risk, the fund would catalyze private investment and enable a blended-finance approach to early-stage DeepTech investing. This in turn will drive a more robust capital market and help technologies critical to national priorities overcome key funding hurdles.

The NDTC Fund would focus on moving DeepTech companies from the Seed phase through the Series A phase. Fund management would have the flexibility to invest in later and earlier funding stages for certain technologies and companies as appropriate. Importantly, the NDTC Fund would invest in promising DeepTech companies as well as the emerging DeepTech venture capital firms that back them. Many emerging DeepTech venture firms, while led by talented investors, struggle to raise sufficient capital to make meaningful investments. By providing anchor funding to these DeepTech venture firms, the NDTC Fund will help foster a diverse funding ecosystem for advanced technology companies. Growth of this ecosystem will attract follow-on funding from the private sector.

---

<sup>5</sup> Different analysis of SBA's publicly available SBIR data. <https://www.sbir.gov/sbirsearch/award/all>.

<sup>6</sup> U.S. Small Business Administration. (2018). Small Business Investment Companies (SBIC); Early Stage Initiative. 13 CFR Part 107. <https://www.govinfo.gov/content/pkg/FR-2018-06-11/pdf/2018-12030.pdf>.

## Plan of Action

The Biden-Harris Administration should work with Congress to allocate \$1 billion of government funds into a designated pool of capital for DeepTech investing, to be called the National DeepTech Capital (NDTC) Fund. The NDTC Fund would provide (1) anchor investments in emerging venture capital (VC) firms backing Seed through Series A DeepTech companies, as well as (2) follow-on direct investments in some of the most promising companies in the portfolios of DeepTech VC firms.

The fund would have a six-year investment period and the capital allocated would be divided into three tranches: the DeepTech VC Multi-Fund, the DeepTech Co-Investment Fund, and the DeepTech Continuity Fund. Similar to other successful development-finance vehicles, the NDTC Fund would encourage private actors—including philanthropic and commercial investors—to invest alongside the government.

The NDTC Fund would be managed by a nonprofit, nonpartisan entity created for this purpose, and would draw talent from the public and private sectors. Oversight would be provided by an Advisory Board made up of experts from government as well as the private sector. Since technology frontiers evolve over time, the NDTC fund would be empowered to invest in a broad slate of technologies. However, investment priorities at any given time would be aligned with key priorities of the Administration. The table below illustrates areas that the NDTC fund might focus on under the incoming Biden-Harris Administration.

| Biden-Harris Administration Priorities | NDTC Fund Investment Themes                                                                                      | Notes                                                                                                                                                                                                                                                                                                                                                |
|----------------------------------------|------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| COVID-19 Pandemic                      | Diagnostics, Synthetic Biology, Bioinformatics                                                                   | Technologies, therapeutics and devices that enable diagnosis, prevention, and treatment of COVID-19 and related diseases and conditions.                                                                                                                                                                                                             |
| Economic Recovery                      | Future of Work, EdTech, AgTech, Materials Science and Advanced Manufacturing, Robotics, Internet of Things (IoT) | Technologies that advance innovation in key sectors and provide opportunities for millions of new jobs.                                                                                                                                                                                                                                              |
| Climate Change and the Environment     | Clean Energy, Climate                                                                                            | CleanTech, including renewables, is needed to implement massive infrastructure upgrades: from high-speed rails to increased building efficiency. Other technologies like carbon capture, utilization, and storage (CCUS) require widespread adoption by industry to reach the Biden-Harris Administration's goal of carbon-free electricity by 2035. |

|                                           |                                                                 |                                                                                                                                                                                         |
|-------------------------------------------|-----------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Racial Equity and Criminal-Justice Reform | Artificial Intelligence (AI) and Machine Learning (ML), FinTech | Combatting structural racism in America will require a technology-enabled strategy. DeepTech can provide solutions to systemic issues such as racial profiling and financial inclusion. |
|-------------------------------------------|-----------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### **Tranche I: DeepTech VC Multi-Fund**

The first tranche of funding for the NDTC Fund would be a \$300 million DeepTech VC Multi-Fund, a multi-fund program to invest in early-stage DeepTech VC funds. This tranche would seek to anchor 20 to 30 DeepTech VC funds with a \$10–20 million investment per fund. By anchoring the funds that invest in young DeepTech companies, the VC Multi-Fund would fuel the growth and development of America’s DeepTech capital ecosystem. The VC Multi-Fund would support a wide variety of VC managers within DeepTech, while using diversification to mitigate single-fund and single-sector risk. The VC Multi-Fund also offers a way to apply investment screens to align with Administration priorities (e.g., climate, disease prevention, etc.) and to increase VC manager diversity.<sup>7</sup>

### **Tranche II: DeepTech Co-Investment Fund**

The second tranche of funding would be a \$300 million DeepTech Direct Co-Investment Fund to invest directly in 60–90 top performers among the portfolio of companies represented in the DeepTech VC Multi-Fund. The approximate size of each investment per company would be \$2–5 million. The Co-Investment Fund would be split into equity and credit (first plant finance) vehicles, offering a blended-finance approach for private capital to co-invest alongside either strategy. Some startups struggle to secure lending to test experimental tech in a built physical environment (such as a small power plant) while others struggle to access equity financing in general. Pairing equity and credit strategies would enable the Co-Investment Fund to bring the right kind of capital to the right companies. The Co-Investment Fund would be broadly diversified within DeepTech early- and growth-stage companies while again focusing on solutions that support the Biden Administration’s national priorities. The Co-Investment Fund would help ensure that America’s most promising DeepTech companies are able to continue to grow without needing to seek capital from foreign investors.

### **Tranche III: DeepTech Continuity Fund**

The third tranche of funding would be a \$400 million DeepTech Continuity Fund, a multi-fund program to invest in a minimum of 10 follow-on DeepTech funds as a pooled capital product. The focus would be on top-performing managers with the greatest potential to scale, with the goal of significantly increasing the amount of growth capital available in the market. The

---

<sup>7</sup> Of the 4,250+ decision-making partners at U.S. venture firms, less than 3% are Black, and these diverse management teams make up only 18% of firms. Moreover, Black VCs manage just 1% of capital and Black entrepreneurs receive just 3% of venture investment. This is significant not only for its lack of representation, but because diverse teams are twice as likely to invest in diverse founders. [Source: Different. (2020). Black Funding Matters: Time for LPs to Really Diversify—Through Diversity. June 8.] <https://differentfunds.com/diversity/black-lives-matter-vc-lps/>.

Continuity Fund would also expand the national roster of growth-stage DeepTech funds, an area that is significantly undercapitalized today.<sup>8</sup>

### NDTC Fund Management

The NDTC Fund would be managed by a dedicated nonprofit, nonpartisan organization led by experienced DeepTech investors, entrepreneurs, and ecosystem builders. The management organization would be directed in partnership with a lead federal agency such as the SBA or the National Science Foundation (NSF) and in collaboration with the White House Office of Science and Technology Policy.

The NDTC Fund would appoint a Board of Trustees, in accordance with industry best practices for Limited Partner Advisory Committees (LPACs).<sup>9</sup> The Board would be composed of representatives from the lead federal agency as well as private-capital funders (institutional investors, family offices, foundations, etc.). The Board will provide governance oversight to the NDTC Fund, advising the General Partner (GP) fund manager on issues related to conflicts of interest, valuation methodology, governing documents, and other matters.

The NDTC Fund could receive expert guidance via several avenues. The NDTC Fund would recruit a diverse Advisory Board composed of scientific founders, investors, and policymakers. The NDTC Fund would also seek input from existing government programs such as SBIR, the Advanced Research Projects Agency—Energy (ARPA-E), and the Defense Advanced Research Projects Agency (DARPA) as well as all relevant federal agencies. Finally, the NDTC Fund would secure a coalition of private investors to supply ad hoc advisory support as well as private capital to invest alongside the NDTC Fund.

On the demand side, it would be critical for the NDTC Fund to work with leading DeepTech accelerators, SBIR, and relevant federal agencies to select a pipeline of companies for investment through existing networks of grantees and scientific entrepreneurs. The NDTC Fund would also partner with organizations such as the National Science Fellows, DeepTech accelerators, and corporate investors to identify and review promising technologies and companies. Once funds for the NDTC Fund are appropriated by Congress, investment could begin immediately.

The NDTC Fund would build in mentorship and educational programming for grantees, including technical support from relevant government agencies and labs as well as private-sector VC and corporate investment teams. The NDTC Fund would offer access to shared services (administration, legal, financial, etc.) along with shared frameworks for data collection and evaluation. The fund would be evergreen, with profits supporting subsequent investments. A comparable government program is In-Q-Tel, a nonprofit taxpayer-funded corporation created by the CIA on the advice of a private-sector panel. In-Q-Tel acts as an entrepreneurial and

---

<sup>8</sup> There are approximately a dozen growth-stage DeepTech firms, as compared to nearly 10 times that in the broader technology market.

<sup>9</sup> Institutional Limited Partners Association. (2019). ILPA Principles 3.0: Fostering Transparency, Governance and Alignment of Interests for General and Limited Partners.

innovative venture firm facilitating the delivery of new technology to the intelligence community. While establishment of In-Q-Tel was met with initial skepticism, the model has delivered significant results in the 21 years since its creation.<sup>10</sup>

## Funding Proposal

The NDTC Fund could be funded in two ways. The first option is to use congressional action. The NDTC Fund could be allocated under the Endless Frontiers Act, America LEADS, or similar legislation to ensure that the fund is both well-resourced and long lasting. There is strong bipartisan support for increasing federal funding for DeepTech, given the rise of China as a major international competitor in DeepTech, and the national security implications of falling behind in advanced technology. Given the makeup of the 2021 Congress, there is strong reason to believe that bipartisan agreement could be reached on the advancement of DeepTech investment domestically.

An alternative option would be to leverage allocations for venture capital investing within SBA's Small Business Investment Company (SBIC) program, given the program's mandate to support startup financing and venture capital. SBIC currently has \$1 billion in debentures available for lending to startups. These unsecured loans could potentially provide de-risking capital if paired with private investment.

## Conclusion

There are significant capital gaps at key stages of the DeepTech company lifecycle. Given the risk profile of early-stage DeepTech companies and their potential to yield innovations with significant public benefit, it is in the Federal Government's best interest to support early-stage DeepTech companies to reach commercialization.

The NDTC Fund would catalyze a dramatic increase in science-based innovation, with an approach that serves as a force multiplier to draw more investment into promising DeepTech VC funds and companies. By taking a holistic investment approach, leveraging public-private partnerships, and working in tandem with the DeepTech ecosystem, the NDTC Fund would serve as a catalyst for greater DeepTech innovation and, eventually, commercialization. The fund would also help the Biden-Harris Administration meet its challenging top priorities.

By establishing a National DeepTech Capital Fund, the Biden-Harris Administration would signal a return to an emphasis on investment in advanced technology and innovation in the United States, strengthening national security, ensuring that the inventions of the future would be created on American soil, and positioning the United States to build back better.

---

<sup>10</sup> Gallo, M.E.; Hogue, H.B.; Sargent Jr., J.F. (2019). Agency-Related Nonprofit Research Foundations and Corporations. Congressional Research Service, R46109. <https://crsreports.congress.gov/product/pdf/R/R46109>.



## Frequently Asked Questions

### 1. Doesn't the private sector already invest in DeepTech?

There is a pervasive capital gap for DeepTech entrepreneurs in the venture capital (VC) market. DeepTech investing is a fraction (less than one-third, and less than one-tenth when controlling for life sciences) of total VC investments. This is because VC investors tend to over-focus on software-enabled technology investments (versus hardware technology investments) since the former is easier to understand. Investing in DeepTech often requires foundational knowledge of biology, chemistry, physics, and/or other science, technology, engineering, and math (STEM) disciplines. Moreover, 88% of all DeepTech investment is concentrated in life sciences and artificial intelligence (AI), leaving only a small amount of venture funding for all of the other critical technologies that fall under DeepTech. The Federal Government can and should help bridge these societally important capital gaps.

### 2. Are there similar models to the NDTC Fund in other areas that have been successful?

This proposal takes inspiration from the world of development finance. Two examples from that world that could serve as templates for the NDTC Fund are the Inter-American Development Bank (IDB) for Latin America and the European Investment Bank for Europe.

The IDB does not make direct equity investments itself, but the Multilateral Investment Fund (MIF) and the IDB Invest, both members of the IDB Group, do invest in private businesses. The MIF invests in equity funds that provide assistance to small businesses in Latin America and the Caribbean. MIF investments are development tools evaluated not just for financial results, but also for development characteristics. Examples of such characteristics include innovation, demonstration effect, job creation, technology transfer, promotion of foreign direct investment, entrepreneurial development, fostering the culture of equity ownership, savings mobilization, and contribution to the development and deepening of capital markets. The MIF is largely credited with providing the foundation of the VC industry across Latin America.

The European Investment Bank (EIB) is a publicly-owned international financial institution whose shareholders are the EU member states. As a multilateral finance institution, the EIB is one of the largest providers of climate finance, and also provides loans, guarantees, equity investments, and advisory services. Its Climate Bank Roadmap provides a framework to lead the global energy transition through lending and investment.<sup>11</sup> Similar to the IDB's MIF, the EIB's Horizon 2020 program invests in technologies and sectors of strategic importance to the European Union.

Finally, the governance structure proposed for the NDTC Fund is similar to the governance structure of In-Q-Tel (IQT), the "venture capital fund" of the CIA. IQT was established to support

---

<sup>11</sup> European Investment Bank Group. (2020). EIB Group Climate Bank Roadmap 2021–2025. [https://www.eib.org/attachments/strategies/eib\\_group\\_climate\\_bank\\_roadmap\\_en.pdf](https://www.eib.org/attachments/strategies/eib_group_climate_bank_roadmap_en.pdf).

the innovation needs of the intelligence community and has become a preeminent investor in this field. While structured as a nonprofit corporation, IQT operates much like any other venture firm.<sup>12</sup>

We are aware that other such government-venture programs have not been successful (e.g., Red Planet Ventures at NASA). Therefore, we recommend that an audit of such past efforts as well as existing DeepTech grants across government agencies (SBIR, DARPA and ARPA-E) be undertaken as a part of structuring the NDTC.

### **3. What federal agency is a good candidate to be the lead agency for the NDTC Fund?**

Federal agencies operating at the intersection of scientific invention and the capital markets would be qualified to lead oversight of the NDTC Fund. These agencies include the Small Business Administration, the National Science Foundation, and the Department of Commerce.

### **4. How would the NDTC Fund's investment allocation be determined?**

Fund managers would make investment decisions using a data-driven due-diligence approach developed by leveraging existing research, such as Different Funds' 2020 DeepTech Investing Report.<sup>13</sup> Key Performance Indicators (KPIs) and milestones would be developed with input from the NDTC Fund Board of Trustees, the NDTC Fund Advisory Board, and relevant third-party experts (e.g., asset managers, venture capitalists, foundations, pension funds, endowments, etc.).

---

<sup>12</sup> Wikipedia. (2021). In-Q-Tel: Governance. [https://www.eib.org/attachments/thematic/eib\\_group\\_climate\\_bank\\_roadmap\\_en.pdf](https://www.eib.org/attachments/thematic/eib_group_climate_bank_roadmap_en.pdf).

<sup>13</sup> Different. (2020). DeepTech Investing Report 2020. <https://differentfunds.com/deeptech-investing/>.

# DAY ONE PROJECT

## About the Authors



**Leslie Jump** has over 30 years' experience building, advising, and investing in new companies, in the United States and across the globe. She is the Founder and CEO of Different, the first platform designed and built for investing in venture funds. Prior to that, she was a Partner in Sawari Ventures, LLC, a Cairo-based early-stage venture capital firm investing in entrepreneurs across the Middle East/North Africa. She continues as an advisor to Flat6Labs, Sawari Ventures' dedicated startup accelerator for seed-stage investments. Leslie has served on the Board of UP Global, a network of entrepreneurs and startup community leaders, and Ubongo, a leading children's edutainment company reaching over 440 million children in Africa. She is an alumna of St. John's College (Annapolis, MD/Santa Fe, NM), and is Vice Chair of its Board of Visitors and Governors.



**Mack Kolarich** is a serial entrepreneur and startup community leader, and the Cofounder and Chief Product Officer of Different. He spearheads Different's product design and development as well as its fund due diligence team. He leverages his deep expertise and networks in 50+ global startup ecosystems to help source and assess funds for Different. In addition to his work at Different, Mack cofounded Startup Angels with Leslie Jump after meeting her at an entrepreneurs' summit in Rio de Janeiro. Together, they have taught investor workshops in 30+ markets around the world. Previously, Mack cofounded SceneSquid (a software-as-a-service (SaaS) marketing tool), Startup Jackpot, and GetSpontaneous. As a global and corporate facilitator with Startup Weekend, Mack has run entrepreneur programs across the globe and helped pioneer Startup Weekend's corporate innovation program—working with organizations like Booz Allen Hamilton, Coca Cola and the World Bank. In a prior life, Mack worked with the U.S. International Trade Administration and as a backcountry ranger for the National Park Service. He loves mountaineering, quality outdoor gear, and good design. He has a B.A. in Political Science and Political Economy from Carleton College.

# DAY ONE PROJECT



**Ellen Brooks Shehata** is the Director of Investor Relations at Different. She has a decade of expertise working in the Middle East in finance, investment advisory, fundraising, and policy. She was most recently a Vice President in JPMorgan’s Private Banking division. She holds a B.A. in Art History from the University of California, Los Angeles and a master’s degree from Columbia University’s School of International and Public Affairs: International Finance, Middle Eastern Studies. She is President of the Board of ArteEast and Co-founder of NY Policy Perspectives. She holds the Series 7 and 63 securities licenses.



## About the Day One Project

The **Day One Project** is dedicated to democratizing the policymaking process by working with new and expert voices across the science and technology community, helping to develop actionable policies that can improve the lives of all Americans. For more about the Day One Project, visit [dayoneproject.org](https://dayoneproject.org).