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Strategies to Accelerate and Expand Access to the U.S. Innovation Economy

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In 2020, VentureWell **outlined a vision** for how the incoming presidential administration could strengthen the nation's innovation ecosystem, encouraging the development and commercialization of science and technology (S&T) based ventures. This vision entailed closing critical gaps from lab to market, with an emphasis on building a broadly inclusive pipeline of entrepreneurial talent while simultaneously providing key support in venture development.

During the intervening years, we have seen extraordinary progress, in good part due to ambitious legislation. Today, we propose innovative ways that the federal government can successfully build on this progress and make the most of new programs. With targeted policy interventions, we can efficiently and effectively support the U.S. innovation economy through the translation of breakthrough scientific research from the lab to the market. The action steps we propose are predicated on three core principles: **inclusion**, **relevance**, and **sustainability**. Accelerating our innovation economy and expanding access to it can make our nation more globally competitive, increase economic development, address climate change, and improve health outcomes. A strong innovation economy benefits everyone.

Challenge

Our Day One 2020 memo began by pitching the importance of innovation and entrepreneurship: "Advances in scientific and technological innovations—and, critically, the ability to efficiently transform breakthroughs into scalable businesses—have contributed enormously to American economic leadership over the past century." Now, it is widely recognized that innovation and entrepreneurship are key to both global economic leadership and addressing the challenges of changing climate. The question is no longer whether we must innovate but rather how effectively we can stimulate and expand a national innovation economy.

Since 2020, the global and U.S. economies have gone through massive change and uncertainty. **The Global Innovation Index (GII)** 2023 described the challenges involved in its yearly analysis of monitoring global innovation trends amid uncertainty brought on by a sluggish economic recovery from the COVID-19 pandemic, elevated interest rates, and geopolitical tensions. Innovation indicators like scientific publications, research and development (R&D), venture capital (VC) investments, and the number of patents rose to historic levels, but the value of VC investment declined by close to 40%. As a counterweight to this extensive uncertainty, the GII 2023 described the future of S&T innovation and progress as "the promise of Digital Age and Deep Science innovation waves and technological progress."

In the face of the pressures of global competitiveness, societal needs, and climate change, the clear way forward is to continue to innovate based on scientific and technical advancements. Meeting the challenges of our moment in history requires a comprehensive and multifaceted effort led by the federal government with many public and private partners.

Grow global competitiveness

Around the world, countries are realizing that investing in innovation is the most efficient way to transform their economies. In 2022, the U.S. had the largest R&D budget internationally, with spending growing by 5.6%, but China's investment in R&D grew by 9.8%. For the U.S. to remain a global economic leader, we must continue to invest in innovation infrastructure, including the basic research and science, technology, engineering, and math (STEM) education that underpins our leadership, while we grow our investments in translational innovation. This includes reframing how existing resources are used as well as allocating new spending. It will require a systems change orientation and long-term commitments.

Increase economic development

Supporting and growing an innovation economy is one of our best tools for economic development. From place-based innovation programs to investment in emerging research institutions (ERIs) and Minority-Serving Institutions (MSIs) to training S&T innovators to become entrepreneurs in **I-Corps™**, these initiatives stimulate local economies, create high-quality jobs, and reinvigorate regions of the country left behind for too long.

Address climate change

In 2023, for the first time, global warming exceeded 1.5°C above pre-industrial temperatures for an entire year. As of early December, 2024 is on track to be the warmest year on record. Nationally and internationally, we are experiencing the effects of climate change; climate mitigation, adaptation, and resilience solutions are urgently needed and will bring outsized economic and social impact.

Improve U.S. health outcomes

The COVID-19 pandemic was devastating, particularly impacting underserved and underrepresented populations, but it spurred unprecedented medical innovation and commercialization of new diagnostics, vaccines, and treatments. We must build on this momentum by applying what we've learned about rapid innovation to continue to improve U.S. health outcomes and to ensure that our nation's health care needs across regions and demographics are addressed.

Make innovation more inclusive

Representational disparities persist across racial/ethnic and gender lines in both **access to and participation in** innovation and entrepreneurship. This is a massive loss for our innovation economy. The business case for broader inclusion and diversity is growing even stronger, with compelling data tracking the relationship between **leadership diversity and company performance**. Inclusive innovation is more effective innovation: a multitude of perspectives and lived experiences are required to fully understand complex problems and create truly useful solutions. To reap the full benefits of innovation and entrepreneurship, we must increase access and pathways for all.

Opportunity

With the new presidential administration in 2025, the federal government has a renewed opportunity to prioritize policies that will generate and activate a wave of powerful, inclusive innovation and entrepreneurship. Implementing such policies and funding the initiatives that result is crucial if we as a nation are to successfully address urgent problems such as the climate crisis and escalating health disparities.

VentureWell's proposal for federal action steps, outlined in this memo, is grounded in our vantage point as a national nonprofit with almost three decades of experience supporting inclusive, science- and technology-based invention, innovation, and entrepreneurship. Our particular expertise is in providing the entrepreneurship infrastructure—pathways and pipeline development, education programs, capital, mentorship, networks, ecosystem development, and other resources—to support innovators and startup ventures as they develop concepts for technological solutions, prototype and test them, research consumer needs, and ultimately bring their products to the marketplace. Much of VentureWell's work is done in conjunction with federal agencies, including, among others, the National Science Foundation (NSF), the National Institutes of Health (NIH), the Advanced Research Projects Agency for Health (ARPA-H), and the Department of Energy (DoE). We are closely involved with signature federal programs such as the I-Corps™ program (both NSF and NIH), the NIH Rapid Acceleration of Diagnostics initiative, the ARPA-H Investor Catalyst Hub, and the NSF Industry-University Cooperative Research Partnerships program. This extensive work has given us a deep understanding of both the interventions needed to stimulate inclusive innovation and the federal government's current initiatives aimed at this goal. Our expertise gives us unique insight into how to apply effective interventions—both through new legislative initiatives and by honing existing programs to maximize their impact.

Our proposed action steps are predicated on three core principles: inclusion, relevance, and sustainability.

Inclusion

One of this nation's greatest and most unique strengths is our heterogeneity. We must leverage our diversity to meet the complexity of the substantial social and economic challenges that we face today. The multiplicity of our people, communities, identities, geographies, and lived experiences gives the U.S. an edge in the global innovation economy: When we bring all of these perspectives to the table, we better understand the challenges that we face, and we are better equipped to innovate to meet them. If we are to harness the fullness of our nation's capacity for imagination, ingenuity, and creative problem-solving, entrepreneurship pathways must be inclusive, equitable, and accessible to all. Moreover, all innovators must learn to embrace complexity, think expansively and critically, and welcome perspectives beyond their own frame of reference. Collaboration and mutually beneficial partnerships are at the heart of inclusive innovation.

Relevance

Innovators and entrepreneurs have the greatest likelihood of success—and the greatest potential for impact—when their work is purpose-driven, nimble, responsive to consumer needs, and adaptable to different applications and settings. Research suggests that "**breakthrough innovation**" occurs when different actors bring complementary and independent skills to co-create interesting solutions to existing problems. Place-based innovation is one strategy to make certain that technology development is grounded in regional concerns and aspirations, leading to better outcomes for all concerned.

Sustainability

Multiple layers of sustainability should be integrated into the innovation and entrepreneurship landscape. First and most salient is supporting the development of innovative technologies that respond to the climate crisis and bolster national resilience. Second is encouraging innovators to incorporate sustainable materials and processes in all stages of research and development so that products benefit the planet and risks to the environment are mitigated through the manufacturing process, whether or not climate change is the focus of the technology. Third, it is vital to prioritize helping ventures develop sustainable business models that will result in long-term viability in the marketplace. Fourth, working with innovators to incorporate the potential impact of climate change into their business planning and projections ensures they are equipped to adapt to changing needs. All of these layers contribute to sustaining America's social well-being and economic prosperity, ensuring that technological breakthroughs are accessible to all.

Proposed Action

Recommendation 1. Supply and prepare talent.

Continuing to grow the nation's pipeline of S&T innovators and entrepreneurs is essential. Specifically, creating accessible entrepreneurial pathways in STEM will ensure equitable participation. Incentivizing individuals to become innovators-entrepreneurs, especially those from underrepresented groups, will strengthen national competitiveness by leveraging new, untapped potential across innovation ecosystems.

Expand the I-Corps™ model

By bringing together experienced industry mentors, commercial experts, research talent, and promising technologies, I-Corps™ teaches scientific innovators how to evaluate whether their innovation can be commercialized and how to take the first practical steps of bringing their product to market. **Ten new I-Corps™ Hubs, launched in 2022**, have expanded the network of engaged universities and collaborators, an important step toward growing an inclusive innovation ecosystem across the U.S.

Interest in I-Corps™ far outpaces current capacity, and increasing access will create more expansive pathways for underrepresented entrepreneurs. New federal initiatives to support place-based innovation and to grow investment at ERIs and MSIs will be more successful if they also include lab-to-market training programs such as I-Corps™. Federal entities should institute policies and programs that increase awareness about and access to sequenced venture support opportunities for S&T innovators. These opportunities should include intentional "de-risking" strategies through training, advising, and mentoring.

Specifically, we recommend expanding I-Corps™ capacity so that all interested participants can be accommodated. We should also strive to increase access to I-Corps™ so that programs reach diverse students and researchers. This is essential given the U.S. culture of entrepreneurship that remains insufficiently inclusive of women, people of color, and those from low-income backgrounds, as well as international students and researchers, who often face barriers such as visa issues or a lack of institutional support needed to remain in the U.S. to develop their innovations. Finally, we should expand the scope of what I-Corps™ offers, so that programs provide follow-on support, funding, and access to mentor and investor networks even beyond the conclusion of initial entrepreneurial training.

I-Corps™ has already expanded beyond the National Science Foundation (NSF) to I-Corps™ at National Institutes of Health (NIH), to empower biomedical entrepreneurs, and **Energy I-Corps™, established by the Department of Energy (DOE)** to accelerate the deployment of energy technologies. We see the opportunity to grow I-Corps™ further by building on this existing infrastructure and creating cohorts funded by additional science agencies so that more basic research is translated into commercially viable businesses.

Close opportunity gaps by supporting emerging research institutions (ERIs) and Minority-Serving Institutions (MSIs)

ERIs and MSIs provide pathways to S&T innovation and entrepreneurship, especially for individuals from underrepresented groups. In particular, a VentureWell-commissioned report identified that "MSIs are centers of research that address the unique challenges and opportunities faced by BIPOC communities. The research that takes place at MSIs offers solutions that benefit a broad and diverse audience; it contributes to a deeper understanding of societal issues and drives innovation that addresses these issues."

The recent codification of ERIs in the 2022 CHIPS and Science Act pulls this category into focus. Defining this group, which comprises thousands of higher education institutions, was the first step in addressing the inequitable distribution of federal research funding. That imbalance has perpetuated regional disparities and impacted students from underrepresented groups, low-income students, and rural students in particular. Further investment in ERIs will result in more STEM-trained students, who can become innovators and entrepreneurs with training and engagement. Additional support that could be provided to ERIs includes increased research

funding, access to capital/investment, capacity building (faculty development, student support services), industry partnerships, access to networks, data collection/benchmarking, and implementing effective translation policies, incentives, and curricula.

Supporting these institutions—many of which are located in underserved rural or urban communities that experience underinvestment—provides an anchor for sustained talent development and economic growth.

Recommendation 2. Support place-based innovation.

Place-based innovation not only spurs innovation but also builds resilience in vulnerable communities, enhancing both U.S. economic and national security. Communities that are underserved and underinvested in present vulnerabilities that hostile actors outside of the U.S. can exploit. Place-based innovation builds resilience: innovation creates high-quality jobs and brings energy and hope to communities that have been left behind, leveraging the unique strengths, ecosystems, assets, and needs of specific regions to drive economic growth and address local challenges.

Evaluate and learn from transformative new investments

There have been historic levels of government investment in place-based innovation, funding the **NSF's Regional Innovation Engines awards** and two U.S. Department of Commerce Economic Development Administration (EDA) programs: the Build Back Better Regional Challenge and Regional Technology and Innovation Hubs awards. The next steps are to refine, improve, and evaluate these initiatives as we move forward.

Unify the evaluation framework, paired with local solutions

Currently, evaluating the effectiveness and outcomes of place-based initiatives is challenging, as benchmarks and metrics can vary by region. We propose a unified framework paired with solutions locally identified by and tailored to the specific needs of the regional innovation ecosystem. A functioning ecosystem cannot be simply overlaid upon a community but must be built by and for that community. The success of these initiatives requires active evaluation and incorporation of these learnings into effective solutions, as well as deep strategic collaboration at the local level, with support and time built into processes.

Recommendation 3. Increase access to financing and capital.

Funding is the lifeblood of innovation. S&T innovation requires more investment and more time to bring to market than other types of ventures, and early-stage investments in S&T startups are often perceived as risky by those who seek a financial return. Bringing large quantities of early-stage S&T innovations to the point in the commercialization process where substantial private capital takes an interest requires nondilutive and patient government support. The return on investment that the federal government seeks is measured in companies successfully launched, jobs created, and useful technologies brought to market.

Disparities in access to capital by companies owned by women and underrepresented minority founders are well documented. The federal government has an interest in funding innovators and entrepreneurs from many backgrounds: they bring deep and varied knowledge and a multitude of perspectives to their innovations and to their ventures. This results in improved solutions and better products at a cheaper price for consumers. Increasing access to financing and capital is essential to our national economic well-being and to our efforts to build climate resilience.

Expand SBIR/STTR access and commercial impact

The SBIR and STTR programs spur innovation, bolster U.S. economic competitiveness, and strengthen the small business sector, but barriers persist. In a recent third-party assessment of the SBIR/STTR program at NIH, the second largest administrator of SBIR/STTR funds, the committee found outreach from the SBIR/STTR programs to underserved groups is not coordinated, and there has been little improvement in the share of applications from or awards to these groups in the past 20 years. Further, **NIH follows the same processes** used for awarding R01 research grants, using the same review criteria and typically the same reviewers, omitting important commercialization considerations.

To expand access and increase the commercialization potential of the SBIR/STTR program, funding agencies should foster partnerships with a broader group of organizations, conduct targeted outreach to potential applicants, offer additional application assistance to potential applicants, work with partners to develop mentorship and entrepreneur training programs, and increase the percentage of private-sector reviewers with entrepreneurial experience. Successful example programs of SBIR/STTR support programs include the **NSF Beat-The-Odds Boot Camp**, **Michigan's Emerging Technologies Fund**, and the **SBIR/STTR Innovation Summit**.

Provide entrepreneurship education and training

Initiatives like NSF Engines, Tech Hubs, Build-Back-Better Regional Challenge, the **Minority Business Development Agency (MBDA) Capital Challenge**, and the **Small Business Administration (SBA) Growth Accelerator Fund** expansion will all achieve more substantial results with supplemental training for participants in how to develop and launch a technology-based business. As an example of the potential impact, more than 2,500 teams have participated in I-Corps™ since the program's inception in 2012. More than half of these teams, nearly 1,400, have launched startups that have cumulatively raised $3.16 billion in subsequent funding, creating over 11,000 jobs. VentureWell has learned how to optimally provide such training over the past decade and we believe that now is an opportune moment to widely apply similarly effective approaches.

Launch a local investment education initiative

Angel investors are typically providing the first private funding available to S&T innovators and entrepreneurs. These very early-stage funders give innovators access to needed capital, networks, and advice to get their ventures off the ground. We recommend that the federal government **expand the definition of an accredited investor** and **incentivize regionally focused initiatives** to educate policymakers and other regional stakeholders about best practices to foster more diverse and inclusive angel investment networks. With the right approach and support, there is the potential to engage thousands more high-net-worth individuals in early-stage investing, contributing their expertise and networks as well as their wealth.

Encourage investment in climate solutions

Extreme climate-change-attributed weather events such as floods, hurricanes, drought, wildfire, and heat waves cost the global economy an average of **$143 billion annually**. S&T innovations have the potential to help address the impacts of climate change at every level:

- *Mitigation*. Promising new ideas and technologies can slow or even prevent further climate change by reducing or removing greenhouse gasses.
- *Adaptation*. We can adapt processes and systems to better respond to adverse events, reducing the impacts of climate change.
- *Resilience*. By anticipating, preparing for, and responding to hazardous events, trends, or disturbances caused by climate change, we can continue to thrive on our changing planet.

Given the global scope of the problem and the shared resources of affected communities, the federal government can be a leader in prioritizing, collaborating, and investing in solutions to direct and encourage S&T innovation for climate solutions. There is no question whether climate adaptation technologies will be needed, but we must ensure that these solutions are technologies that create economic opportunity in the U.S. We encourage the expansion and regular appropriations of funding for successful climate programs across federal agencies, including the DoE Office of Technology Transitions' Energy Program for Innovation Clusters, the National Oceanic and Atmospheric Administration's (NOAA) Ocean-Based Climate Resilience Accelerators program, and the U.S. Department of Agriculture's Climate Hubs.

Recommendation 4. Shift to a systems change orientation.

To truly stimulate a national innovation economy, we need long-term commitments in policy, practice, and regulations. Leadership and coordination from the executive branch of the federal government are essential to continue the positive actions already begun by the Biden-Harris Administration.

These initiatives include:

- **Scientific integrity and evidence-based policy-making memo**
- **Catalyzing Clean Energy Industry Executive Order**
- **Implementation of the Infrastructure Investment and Jobs Act**
- **Advancing Biotechnology and Biomanufacturing Innovation for a Sustainable, Safe, and Secure American Bioeconomy**
- **Implementation of the CHIPS Act of 2022**
- **Advancing Women's Health Research and Innovation**

Policy

Signature initiatives like the CHIPS and Science Act, Infrastructure Investment and Jobs Act, and the National Quantum Initiative Act are already threatened by looming appropriations shortfalls. We need to fully fund existing legislation, with a focus on innovative and translational R&D. According to a **report** by PricewaterhouseCoopers, if the U.S. increased federal R&D spending to 1% of GDP by 2030, the nation could support 3.4 million jobs and add $301 billion in labor income, $478 billion in economic value, and $81 billion in tax revenue. Beyond funding, we propose supporting innovative policies to bolster U.S. innovation capacity at the local and national levels. This includes providing R&D tax credits to spur research collaboration between industry and universities and labs, providing federal matching funds for state and regional technology transfer and commercialization efforts, and revising the tax code to support innovation by research-intensive, pre-revenue companies.

Practice

The University and Small Business Patent Procedures Act of 1980, commonly known as the **Bayh-Dole Act**, allows recipients of federal research funding to retain rights to inventions conceived or developed with that funding. The academic tech transfer system created by the Bayh-Dole Act (codified as amended at 35 U.S.C. §§ 200-212) **generated** nearly $1.3 trillion in economic output, supported over 4.2 million jobs, and launched over 11,000 startups. We should preserve the Bayh-Dole Act as a means to promote commercialization and prohibit the consideration of specific factors, such as price, in **march-in determinations**.

In addition to the continual practice and implementation of successful laws such as Bayh-Dole, we must repurpose resources to support innovation and the high-value jobs that result from S&T innovation. We believe the new administration should allocate a share of federal funding to promote technology transfer and commercialization and better incentivize commercialization activities at federal labs and research institutes. This could include new programs such as mentoring programs for researcher entrepreneurs and student entrepreneurship training programs. Incentives include evaluating the economic impact of lab-developed technology by measuring commercialization outcomes in the annual Performance Evaluation and Management Plans of federal labs, establishing stronger university entrepreneurship reporting requirements to track and reward universities that create new businesses and startups, and incentivizing universities to focus more on commercialization activities as part of promotion and tenure of faculty.

Regulations

A common cause of lab-to-market failure is the inability to secure regulatory approval, particularly for novel technologies in nascent industries. **Regulation** can limit potentially innovative paths, increase innovation costs, and create a compliance burden on businesses that stifle innovation. **Regulation can also spur innovation** by enabling the management of risk. In 1976 the Cambridge (Massachusetts) City Council became the first jurisdiction to regulate recombinant DNA, issuing the first genetic engineering license and creating the first biotech company. Now Boston/Cambridge is the world's largest biotech hub: home to over 1,000 biotech companies, 21% of all VC biotech investments, and 15% of the U.S. drug development pipeline.

To advance innovation, we propose two specific regulatory actions:

- *Climate*. We recommend the Environmental Protection Agency (EPA) adopt market-based strategies to help fight climate change by monitoring and regulating CO2 emissions, putting an explicit price on carbon emissions, and incentivizing businesses to find cost-effective and innovative ways to reduce those emissions.
- *Health*. We recommend strengthening regulatory collaboration between the Food and Drug Administration (FDA) and the Centers for Medicare & Medicaid Services (CMS) to establish a more efficient and timely reimbursement process for novel FDA-authorized medical devices and diagnostics. This includes **refining the Medicare Coverage of Innovative Technologies rule** and fully implementing the new **Transitional Coverage for Emerging Technologies** pathway to expedite the review, coverage determination, and reimbursement of novel medical technologies.

Conclusion

To maintain its global leadership role, the United States must invest in the individuals, institutions, and ecosystems critical to a thriving, inclusive innovation economy. This includes mobilizing access, inclusion, and talent through novel entrepreneurship training programs; investing, incentivizing, and building the capacity of our research institutions; and enabling innovation pathways by increasing access to capital, networks, and resources.

Fortunately, there are several important pieces of legislation recommitting the U.S. leadership to bold S&T goals, although much of the necessary resources are yet to be committed to those efforts. As a society, we benefit when federally supported innovation efforts tackle big problems that are beyond the scope of single ventures; notably, the many challenges arising from climate change. A stronger, more inclusive innovation economy benefits the users of S&T-based innovations, individual innovators, and the nation as a whole.

When we intentionally create pathways to innovation and entrepreneurship for underrepresented individuals, we build on our strengths. In the United States, our strength has always been our people, who bring problem-solving abilities from a multitude of perspectives and settings. We must unleash their entrepreneurial power and become, even more, a country of innovators.


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