PRIORITIZING SMALL UNDERSERVED AND RURAL BUSINESSES IN THE SBIR/STTR PROGRAMS

HEARING

BEFORE THE

SUBCOMMITTEE ON UNDERSERVED, AGRICULTURAL, AND RURAL DEVELOPMENT

OF THE

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HOUSE OF REPRESENTATIVES

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PRIORITIZING SMALL UNDERSERVED AND RURAL BUSINESSES IN THE SBIR/STTR PROGRAMS

WEDNESDAY, JUNE 23, 2021

HOUSE OF REPRESENTATIVES,
COMMITTEE ON SMALL BUSINESS,
SUBCOMMITTEE ON UNDERSERVED, AGRICULTURAL,
AND RURAL BUSINESS DEVELOPMENT,
Washington, DC.

The Subcommittee met, pursuant to call, at 2:40 p.m., in Room 2360, Rayburn House Office Building, Hon. Jared Golden [chairman of the Subcommittee] presiding.

Present: Representatives Golden, Delgado, Williams, Hagedorn, Stauber, and Tenney.

Chairman GOLDEN. Good afternoon. I call this hearing to order.

Without objection, the Chair is authorized to declare a recess at any time.

I apologize to those joining us to testify today for the late start, but we have been voting down on the House floor. I think we should be good now. But I will just quickly note it is possible there could be a series of votes on the floor during this hearing, in which case we will stand in recess while we go vote. But I think we are going to be good. So I appreciate your patience.

Let me first say that standing House and Committee rules and practice continue to apply during hybrid proceedings. All members are reminded that they are expected to adhere to standing rules, including decorum.

House regulations require members to be visible through a video connection throughout the proceeding, so please keep your cameras on. Also remember to remain muted until recognized to minimize background noise. If you have to participate in another proceeding, please exit this one and log back in later.

In the event a member encounters technical issues that prevent them from being recognized for questioning, we will move to the next available member of the same party and later recognize that member at an appropriate time slot provided they have returned to the proceeding.

For those members and staff physically present in the Committee room today, we will continue to follow the most recent guidance. Masks are no longer required in our meeting space for members and staff who are vaccinated. Members and staff who have not been fully vaccinated are asked to wear a mask and to socially dis-

tance. And we sincerely hope we can all do our part to protect each other, but most importantly our staff.

Thank you for joining us for the hearing today.

In a world dominated by technology and innovation, the science, technology, engineering, and math field, otherwise known as STEM, is more vital than ever to our national interest.

STEM helps drive our economy forward. It creates life-improving innovations. And it allows us to keep pace with global technological transformation.

It also provides Americans with good jobs and the opportunity to contribute to our Nation's technological development.

In 2019, over 19 million employees were working in STEM, and job growth in the sector continues to outpace non-STEM jobs. But for many workers the barriers to entry into STEM are steep, and certain groups are chronically underrepresented in the field.

With STEM research and development clustered around major research institutions, often in urban commercial centers, it can be difficult for rural small businesses to fully participate in the innovation economy.

This is borne out by the overwhelmingly rural character of underrepresented States in the SBA's Small Business Innovation Research, or SBIR, and Small Business Technology Transfer, or STTR, programs, including Maine.

Compounded with the capital access challenges facing rural small businesses, this underrepresentation risks stifling rural economic development and also deprives Federal agencies of worthy products and services.

Additionally, Black and Hispanic workers make up just a tiny percentage of STEM workers compared to their percentage of workers across all occupations. Further, women hold less than 20 percent of U.S. tech jobs, and only 5 percent are in leadership positions at technology companies.

From urban population centers to rural areas, like Maine's Second Congressional District, too many entrepreneurs are being kept out of our innovation ecosystem.

As technology continues to develop, STEM jobs will continue to grow in importance. We can't allow certain groups to lag as our economy moves forward. And it is in our interest to ensure the 21st century economy is as diverse and inclusive as possible.

That is why we should elevate the current Federal programs that are driving diversification in the STEM field, including initiatives like SBIR and STTR.

SBIR was created in 1982 to reduce risk of investment in small businesses and encourage entrepreneurs to commercialize Federal R&D innovations.

Ten years later, Congress created the STTR program to drive cooperation between small firms and research institutions.

The Federal Government funds these programs through set-asides of government agencies' extramural research and development funds.

These two programs play a substantial role in supporting innovative small businesses and contribute tens of millions of dollars to small firms annually. Both share the stated goal of fostering inclu-

sion and diversification by encouraging program participation by socially and economically disadvantaged firms.

By working to improve the reach and effectiveness of these programs, Congress can help make the STEM field more accessible and ensure that more Americans benefit from our Nation's technological development.

We will hear today from a diverse range of businesses during today's hearing about the challenges that they face operating in the STEM field and their experiences with the SBIR and STTR programs.

Although statutorily required, participating agencies have struggled to increase participation of rural business owners, women-owned small businesses, socially disadvantaged businesses, and businesses in underrepresented States.

Program statistics show that women-owned small businesses and disadvantaged businesses make up approximately the same share of awards as they did nearly a decade ago.

This lack of progress is concerning, and we must examine efforts within the program for diversification.

We also must evaluate how the SBA research agencies and institutions are spreading program awareness. Small businesses can't take advantage of these programs if they aren't aware of the offerings.

Once aware, many small businesses depend on outside resources to complete the onerous application.

Once they have won an award, small businesses rely on program-specific technical and business assistance providers to maximize the impact of their technology.

I hope that today's hearing gives us the chance to examine how SBA and Federal research agencies can better promote these initiatives and reach entrepreneurs in underserved communities.

The two programs have a proven track record of providing a return on investment in funding groundbreaking technologies that can improve Americans' lives, but high barriers to entry limit the reach and impact of the program.

By increasing diversity in the STEM field, we can create a better future for many Americans and regain our footing as one of the world's most innovative nations.

I will now yield to the Ranking Member, Mr. Hagedorn, for his opening statement.

Mr. HAGEDORN. Chairman, thank you for holding the hearing. It is good to see you today. And I appreciate our shared commitment to rural development and small businesses in the rural communities.

Today, we will discuss two vital programs to our Nation's industrial base, the Small Business Innovation Research, or SBIR, and the Small Business Technology Transfer, or STTR, programs.

These two initiatives play pivotal roles in the development of new technology to enable Federal agencies to meet program and project goals while sparking significant job creation amongst American small businesses.

These programs have positioned thousands of small businesses to create new technologies, commercialize products, and generate high-wage jobs.

We must continue to facilitate success while ensuring that taxpayer dollars are utilized appropriately and efficiently.

Given the success and popularity of the SBIR and STTR programs, I believe our Small Business Committee should move swiftly and pass reauthorizing legislation far before their September 2022 expiration.

I appreciate, Chairman, that you are holding this hearing and you are working closely with members on both the majority and the minority so we can keep moving this issue along.

Without any additional cost to taxpayers, the Federal agencies utilize SBIR and STTR programs to contract with small businesses, to procure unique solutions to improved service to the American people, and solve public sector challenges.

Success stories include development of a new, longer-lasting and lighter Lithium battery to enhance the Air Force's F-22; a new National Cancer Institute treatment that has the potential of saving thousands of lives; and a new piece of technology that enhances safety for astronauts on the International Space Station.

These programs are delivering strong returns on investment. For example, SBIR and STTR economic impact studies from the Department of Defense and the National Cancer Institute have shown economic returns in excess of $15 to $23 for every dollar spent.

That is in addition to improved military strength and capability, significant cost savings, expanded sales of new products and services for our small businesses, life-saving medical techniques and products, and added sales and profits in our economy.

When administered appropriately, the SBIR and STTR are a, quote/unquote, "win" for U.S. taxpayers, Federal agencies, and small businesses.

To state it again, these are successful government programs that deliver real results. I hope we can continue to encourage the acquisition of technology and solutions to meet the Federal Government's needs while ensuring that small companies have equal access to these programs and guarantee that taxpayer dollars are being spent efficiently and effectively.

Thanks again, Mr. Chairman. I yield back.

Chairman GOLDEN. Thank you, Mr. Hagedorn.

I would like to take a quick moment to explain how the hearing will proceed.

Each witness will have 5 minutes to provide a statement, and each Committee member will have 5 minutes for questions. Please ensure that your microphone is on when you begin speaking and that you return to mute when finished.

With that, I would like to introduce our witnesses.

Our first witness is Mr. Joshua Henry, president and founder of GO Lab, Inc., located in Belfast, Maine. GO Lab was founded in 2017 to develop and manufacture wood fiber insulation for the residential and light commercial construction markets.

In 2018, GO Lab won a Phase 1 SBIR award from the EPA to further develop their technology.

In 2022, GO Lab will become the first company to make wood fiber insulation in North America at its new manufacturing facility in Madison, Maine.

Thank you, Dr. Henry, for sharing your story with us today.

Our second witness is Ms. Nancy Min. She is the founder of ecoLong, located in Buffalo, New York. EcoLong is currently working on Phase 2 of their project, advanced peer-to-peer transactive energy platform with predictive optimization awarded by the Department of Energy. Their technology aims to reduce the cost of solar power and increase adoption of distributed energy resources.

Thank you, Ms. Min.

Our third witness is Dr. Angelique Johnson, founder and chief executive officer—you will have to correct me if I am wrong, I am sorry—of MEMStim, LLC, located in Louisville, Kentucky.

Dr. Johnson has used three SBIR grants from the National Institutes of Health to develop her 3D printing methods used to manufacture parts for cochlear implants.

In addition to her work in the lab, she is the CEO/founder of Visionarium, an organization that promotes, trains, and equips underrepresented entrepreneurs.

We greatly appreciate her expertise on today's topic.

The Ranking Member, Mr. Hagedorn, will introduce his witness.

Mr. HAGEDORN. I am honored to introduce our final witness.

Dr. David Green is the chief executive officer of Physical Sciences, Inc., or PSI, headquartered in Andover, Massachusetts. PSI's mission is to translate science into solutions that solve mission-critical needs for their customers.

Andover has been the headquarters and backbone of PSI since 1989. It is the largest and most extensive of the several locations, hosting 68,000 square feet of office and laboratory space.

In addition to their technical capabilities, the site is also home to their accounting, contracts, and technical publications departments, as well as their prototype manufacturing facility.

Dr. Green has participated in the growth of the PSI for 45 years, emphasizing technical excellence in program performance and focusing on aggressive technology maturation to enable its rapid successful transition to fulfill the needs of their government and commercial customers.

Dr. Green, we welcome you today, and we look forward to your testimony.

Chairman GOLDEN. Thank you.

We will now move to our witness testimony.

And, Dr. Henry, you are recognized for 5 minutes.

STATEMENTS OF DR. JOSHUA A. HENRY, PRESIDENT AND FOUNDER, GO LAB, INC., MADISON, ME; MS. NANCY MIN, FOUNDER, ECOLONG, ALBANY, NY, TESTIFYING ON BEHALF OF THE CLEAN ENERGY BUSINESS NETWORK (CEBN); DR. ANGELIQUE JOHNSON, FOUNDER AND CHIEF EXECUTIVE OFFICER, MEMSTIM, LLC, LOUISVILLE, KY; AND DR. DAVID GREEN, CHIEF EXECUTIVE OFFICER, PHYSICAL SCIENCES INC., ANDOVER, MA, TESTIFYING ON BEHALF OF THE NEW ENGLAND INNOVATION ALLIANCE (NEIA)

STATEMENT OF JOSHUA A. HENRY

Mr. HENRY. Thank you, Chairman Golden, Ranking Member Hagedorn, and members of the Subcommittee on Underserved, Agricultural, and Rural Business Development.

Good afternoon. My name is Joshua Henry. I am the president of GO Lab, a Maine-based building materials company.

I am grateful for the opportunity to talk to you today about the Small Business Innovation Research program, the vital support it gave our company at its inception, and some of the ways we believe SBIR can be strengthened.

Next year, at our production facility inside the former paper mill, GO Lab will become the first company to manufacture wood fiber insulation made in America.

Our products, marketed under the brand name TimberHP, will include batt insulation for stud wall cavities, continuous exterior insulation boards, and a blown-in loose fill, designed to work as one comprehensive, above-grade system for the entire building envelope, or as affordable, healthier drop-in replacements for foam, mineral wool, cellulose, and other traditional insulations targeting the residential and commercial construction market.

While SBIR grants are modest monetarily speaking, they are nonetheless critically important to early stage companies. The program gives small businesses and entrepreneurs the freedom to research and develop new technologies, often in partnership with local universities, that are years away from commercialization.

When we founded GO Lab in 2017, insulation made from softwood chips had already been a successful product in European markets for over 20 years. Our SBIR grant allowed us to partner with researchers at the University of Maine's Advanced Structures and Composite Center.

Using the center's advanced machinery and equipment, we were able to determine that we could make a more renewable, cost-competitive, and higher-performing form of wood fiber insulation in America by using alternative binding agents in the insulation manufacturing process.

Too often, these sorts of research and design partnerships with major universities and access to their highly specialized equipment are more easily accessible in urban centers than in remote rural communities, like the one where GO Lab's production facility is based.

Our SBIR grant, though small, helped validate the entire concept at the heart of our business plan. We were able to use this hard, verified data to begin the long process of raising private equity and other financing to move our vision of wood fiber insulation, made in America, towards reality.

And, by the end of the summer, we will have financed this project with over $40 million of private equity and $85 million of private bond equity into the project.

Expanding funding and partnership opportunities under the SBIR program is critical if we hope to empower the kind of entrepreneurship in rural communities that makes it easier for new industries to take hold, hire local people, and thrive.

I would like to end my remarks with two suggestions for improving SBIR based on our experience.

The program, as valuable as it is, could be made even stronger by simplifying the application process. As a former college professor with a Ph.D. in materials chemistry, I have applied for many grants over the years.

Nonetheless, a colleague, also an experienced grant writer, and I found the application process far more bureaucratic and complicated than it needed to be.

To complete our proposal, we ended up needing extensive help from consultants and SBIR specialists hired by the State of Maine. It still took many weeks to complete our application.

Simplifying the application process would be an important step in the right direction.

Additionally, as a business launching in a community qualifying for the New Markets Tax Credit program and within an Opportunity Zone, I strongly believe, as I noted earlier, that more incentives are needed to ensure that a program as valuable as SBIR is able to make more investments in underresourced rural areas where public research and development resources are limited.

I think, potentially, if there could be incentives or bonus points, if you will, for SBIR applications from these areas, that could be an advantage and could serve as a stimulus for more companies from these areas to take advantage of the program.

Thank you for your time, and I would be happy to answer any of the Committee's questions.

Chairman GOLDEN. Thank you very much for the testimony.

We will now recognize Ms. Min for 5 minutes.

STATEMENT OF NANCY MIN

Ms. MIN. Chairman Golden, Ranking Member Hagedorn, and members of the Subcommittee, thank you for the opportunity to testify today on the topic of prioritizing small, underserved, and rural businesses in the SBIR/STTR program. It is an honor to be here.

My name is Nancy Min, and I am the founder and CEO of ecoLong, based in Albany, New York. Our mission is to build interconnected and resilient communities.

This mission is at the heart of everything we do, including developing a blockchain based energy marketplace that provides communities equitable access to clean energy.

We are fortunate beneficiaries of the SBIR/STTR program, having received U.S. Department of Energy SBIR Phase 1 and Phase 2 from the Solar Energy Technologies Office to build out the platform. The DOE SBIR funding provides critical support that is positioning us for growth.

Our path to the SBIR/STTR program wasn't easy. It took a lot of trial and error.

My entrepreneurial interests began in college when I first heard of a new technology called blockchain technology that was the underlying technology to this new thing called Bitcoin. The technology and its application have evolved significantly since then. We now use blockchain technology to decentralize and democratize the energy market.

All small business owners will tell you starting a company is hard. But knowing what is next is harder.

Hearing about and participating in the National Science Foundation Innovation Corp, or NSF I-Corp program, was a pivotal moment for us. The NSF I-Corp program taught me how to articulate

my business idea and forced me to "get out of the building" to validate that our technology was commercially viable.

However, the closest site that the NSF I-Corp program was administered was in New York City. That meant we had to travel 3 hours from Albany to New York City, or 6 hours round trip, to attend classes.

The first time writing a SBIR proposal is daunting. Thankfully, the U.S. Department of Energy has a Phase 0 program that provides a variety of proposal support services for the first-time applicant. All of these programs helped us to get the DOE SBIR awards.

In addition to the financial support of the SBIR, the program managers of the DOE Solar Energy Technologies Office provided integral support at every step of our development and commercialization process.

The support of these communities continues even to this day with the support that we get from business networks, such as the Clean Energy Business Network, or CEBN, that plays a key role in advocating for clean energy research, promoting business partnerships across the Nation, and nurturing small businesses like ecoLong for growth.

Today, my testimony is about the power of communities and its role in accelerating small, underserved, and rural businesses in innovation-driven programs such as the SBIR/STTR program.

The first point I will talk to is improving awareness and accessibility to Federal innovation programs.

The NSF I-Corp program addresses the knowledge gap with transformation of research into business ventures. However, awareness and accessibility of this program is often limited to innovators that are integrated with educational or research institutions or located in urban areas.

Writing a proposal takes a lot of effort. Increasing the visibility and accessibility of the DOE Phase 0 program or research for all applicants is very beneficial for innovative firms, particularly for underserved and rural businesses.

Community-based organizations are vital for innovators to extend their business network. For example, CEBN has been enhancing the accessibility of the SBIR's funding solicitation across their network and beyond.

More support for regional or national support organizations that serve as community hubs on the ground would help small underserved businesses and rural businesses get the support that they need to be competitive in the SBIR/STTR programs.

The second point is promoting open collaboration and open source to reduce the barriers to access technological innovation.

The barriers to small business innovation are not limited to access to entrepreneurship programs. The development of technology innovations often requires extensive technical community support and resources.

A great example is open source technology. Businesses can significantly reduce the expenses and time to develop a product from scratch and focus their efforts on high-impact uniqueness and innovation.

As the Chair of the Linux Foundation Hyperledger Social Impact Special Interest Group, I have seen firsthand small businesses rising from the open source community.

For example, the Department of Energy has encouraged and supported various open source projects, including Pacific Northwest National Laboratory developed VOLTTRON, an open source distributed sensing and control software platform technology that joined the Eclipse Foundation.

Researchers at Brookhaven National Laboratory developed world leading privacy preserving artificial intelligence and will be contributing it to the open source PyTorch community.

At the end of the day, the mission of the SBIR/STTR program is to support scientific excellence and technological innovation to build a strong national economy. This requires innovation on both the technical and business or commercial end.

By improving the awareness and access to Federal entrepreneurship programs, small businesses will have the tools to build successful business ventures. By promoting open collaboration and open source, small underserved and rural businesses across the Nation will have a launch pad to catapult their technological innovation to do their part in building a strong national economy.

Thank you again for the opportunity to testify. I look forward to answering the Committee's questions.

Chairman GOLDEN. Thank you.

The Committee will now recognize Dr. Johnson for 5 minutes.

STATEMENT OF ANGELIQUE JOHNSON

Ms. JOHNSON. Thank you so much.

I want to thank Chairman Golden and Ranking Member Hagedorn for the opportunity to come and talk and testify to the Committee on Small Business and the Subcommittee on Underserved, Agricultural, and Rural Business Development during this hearing, which is titled "Prioritizing Small Underserved and Rural Businesses in the SBIR/STTR Programs."

My name is Dr. Angelique Johnson, as you have already heard, and I testify today not only as CEO and founder of MEMStim, but also as a leader in several STEM organizations, both at the NSF and the NIH, as well as locally in the State.

Some of those organizations include the NSF Council on Engineering Research Visioning Alliance, the Kentucky Statewide EPSCOR Committee, the National Institute of Biomedical Imaging and Bioengineering at the NIH, the NSF NNCI External Advisory Board, and Medtech Color.

I have also given my opinions to several other Federal organizations and actual global international organizations, such as the Eighth District of the Federal Reserve, the Royal Academy of Science International Trust, the International Chamber of Commerce, and the United Nations Assembly on Women and Girls in Science.

And I say all that to say that I represent not only my own opinion, but also the opinions I have heard from countless members of the African-American community in the STEM field and innovation, as well as countless members of women innovators in the field.

While getting my Ph.D. in electrical engineering from the University of Michigan, I founded MEMStim, and MEMStim is a company that is developed to create advanced manufacturing practices for neurostimulator devices for conditions such as hearing loss, heart failure, chronic pain, Parkinson's tremors, and much more.

Now, that is a lot. That is a mouthful. But if we think about the human body, everything we think, say, and do is controlled by nerves and neurons. And when there is any sort of problem in the human body, in many cases it can be tied back to a nervous system issue. And so the technology we are creating is very critical.

But we are not only just creating this technology. We are making it cheaper, more affordable, to lower the healthcare costs in this Nation, and we are innovating the technology so that we can increase the performance.

At MEMStim we use 3D printing, as opposed to hand assembly, to be able to make these devices, which not only will decrease healthcare costs nationwide here in the U.S., but also allow us to increase access to countries globally and export our technology.

Now, today I wanted to talk about my experience a little bit having received SBIRs, and one thing I wanted to make very clear is that my company would not have been able to be as innovative and have done as much great work as we have done without funding from the SBIR program.

However, the reasoning for this is because there is such a lack of funding in venture capital, particularly for African-American females and Black business founders. Less than 1 percent of venture capital goes to those founders, and less than 0.27 percent actually goes to African-American female founders.

Now, the SBIR program is a wonderful example of a program that can come in and fill this gap, but, unfortunately, it also suffers from these less than 1 percent funding going to African-American founders and even seeing worse numbers when you talk about African-American female founders.

So some suggestions that I want to highlight are really these four ones.

A, I think that we need to have an increase of representation on the review committees, and that representation needs to be paid.

I know that there is a lot of recruitment for diverse representation, particularly Black faculty members, researchers, and innovators, but they do have lower wages that they are receiving and much more discriminatory things in terms of seed funding outside of the SBIR program. So pay should be included in that.

I also think that we should create a special fund to help Black businesses acquire consultants and trainers in writing to help to prepare the grants and the applications.

And then, also, I think we should have a special fund, an actual award supplement, that would be a subcontract line of funding to Black businesses that would not only provide an entry into the SBIR program, but also provide monitoring and assistance as they continue to contribute to the innovation economy through the SBIR program.

And the last thing that I will say is I concur with some of what the other speakers said in that we need to expand the reach beyond academia.

It is no mystery that there is very poor representation of African Americans, Hispanic, Latino faculty members in STEM, and that is not due to those populations' account. It is due to, unfortunately, the low rates of achieving tenure and other systemic injustices.

So we need to be looking beyond academia for PIs to submit to SBIR programs and providing training programs to help those individuals submit to it.

Thank you.

Chairman GOLDEN. Thank you.

And we will now recognize Dr. Green for 5 minutes.

STATEMENT OF DAVID GREEN

Mr. GREEN. Good afternoon, Chairman Golden, Ranking Member Hagedorn, members of this Subcommittee and the House Small Business Committee.

Thank you for the opportunity to speak today. It is an honor to testify on behalf of the New England Innovation Alliance, a coalition of small high-technology companies across the New England area.

NEIA members, including Physical Sciences, Inc., have demonstrated the benefits that small businesses can provide the Federal Government and America's economy throughout the program's nearly 40-year history.

As mentioned, studies have shown that the SBIR program generates post-award revenues 15 to 23 times greater than the initial investment. The program more than pays for itself.

I appreciate that this Committee is holding these hearings to ramp up efforts to reauthorize these good programs.

SBIR is a flagship American innovation program that other countries seek to emulate. The formula for its success lies at its core: competitive and merit based.

Innovative small business entrepreneurs from across the country propose concepts addressing national priorities and commercial needs.

There are many more ideas than awards. Selection at each phase is based on the best concepts, best performance, and, above all else, the best science.

This competitive, merit-based process leads to a very high success rate for transition and commercial success. The best science produces the best technology that is essential if the United States is to remain a global leader.

Those best ideas can come from anywhere in the country. Using the publicly available SBIR.gov website, I conducted an analysis into SBIR awards by geographic location.

This analysis confirmed that citizens in each part of our country have priorities and are motivated to improve what matters to them in their daily lives. The analysis found that different parts of our Nation pursue technology innovation in different areas.

To this point, the State of Maine wins over four times the national average per capita in Department of Agriculture SBIR awards and three times the national average in Commerce Department awards. Kansas and Wisconsin far exceed the national average in agriculture awards. Minnesota wins nearly three times the national average in Department of Education awards and well

above the national average per capita in health, agriculture, and awards from NSF. New York exceeds the national average in education awards.

Innovators in those States are motivated to address problems that affect their daily lives. And with insight based on firsthand knowledge, they achieve a high award rate.

Great SBIR ideas and compelling solutions arise from the trained scientific and engineering minds, wherever those researchers reside. The SBIR program does not compel those minds to live in a certain State.

What SBIR can do is give woman- and minority-owned and disadvantaged businesses a fair chance to compete, win, and see their innovation succeed.

The current 3 percent administrative allocation that allows participating agencies to promote outreach and diversity within the program should continue.

A large community of support organizations exists to help with all aspects of creating a winning proposal, from preparation to identifying commercial applications. First-time proposal writers can readily find the support they need to submit their great idea.

The NEIA is an informal group of companies, often competitors, that share best practices to make each company stronger. This mentoring for the common good brings benefit to all. NEIA has helped establish similar alliances in other parts of our country.

We encourage the Committee to consider this model, a network of competitive performers, to improve proposals.

Many NEIA members are employee-owned companies where every employee owns a portion of the company and all employees share in the success: women, minorities, service-disabled veterans, no matter their ethnicity or sexual orientation.

In closing, NEIA respectfully urges the Committee to pass an SBIR/STTR reauthorization bill this year affirming its core principles. The program should be permanently reauthorized in its current form to provide stability. The permanent reauthorization should strengthen the commitment to a competitive, merit-based participation and award structure.

The existing pilot programs, including the use of 3 percent of the funds for administrative costs, permitting outreach to increase participation by underrepresented communities, should be made permanent.

The reauthorization should include a quantitative assessment of the merits of changes in a publicly available report to Congress.

NEIA commends this Subcommittee for holding this hearing. SBIR has proven its value many times over. Please make it permanent.

Thank you again. I look forward to answering your questions.

Chairman GOLDEN. Thank you.

And, with that, we will move to questions, and I will recognize myself first for 5 minutes.

I think I will start—probably no surprise to folks—with our panelist from Maine.

Mr. Henry, I am just curious. Could you remind us of the degree that you hold?

Mr. HENRY. I have a Ph.D. in physical and materials chemistry from Cornell University.

Chairman GOLDEN. And you have also, I think—do I remember correctly, you have been a professor?

Mr. HENRY. Yes. I was a professor in the chemistry department at the University of Maine when we started this company.

Chairman GOLDEN. So I think it is fair to say you have a lot of training and background in things that have helped you with some pretty complex stuff, as well as experience helping other people understand very complex issues that probably most of us here in Congress don't understand ourselves.

And, yet, you found the bureaucratic and complicated application process for the SBIR program that GO Lab competed for and ultimately did win to be pretty tough.

Can you just talk more about that experience? And do you have any specific examples or recommendations about what we could do to ease that process?

Mr. HENRY. Yeah. I mean, I am very curious to hear what the other panelists have to say about their application experience. We have full-time employees of about 15 at this point. When we were doing the SBIR, it was only four or five of us at that point.

But another colleague of mine had about 20 years of experience in government relations and grant writing, and we found the SBIR application to be the hardest of the Federal grants to apply because of the detailed nature of the application.

There are just so many—it varies from agency to agency, but we found across agencies that there were numerous addendums to every part of the application, so much so that the State of Maine basically has full-time consultants working with the Maine Technology Institute, which is an industry advocate and funder of advanced technology companies.

They hire consultants to just help those companies through the SBIR application process, help them with their budget, help them with just submitting the application and making sure every box is checked.

And I think the hard thing for small companies and companies that are struggling with funding is the question—most grant proposals are not successful, as Dr. Green pointed out.

To dedicate that much time to a proposal with the chance of it being knocked out for some small sort of box not checked in the application can be devastating for a company to spend that much time and yield absolutely nothing from it, including no feedback from reviewers. That can be tragic for a small company, and I think it is not necessary.

And I am curious from the people who institute SBIRs why this—I would be curious if I were a Committee member—your Committee members to find out from the people who have instituted SBIR over the years why they find it necessary for all of these various forms and things that need to be committed and that they don't see this as a problem of the program that a State like Maine would need to hire consultants in order to get people through the program.

I also think, being from a rural area, I can tell you that most of the people where we are in the town of Madison have no idea what

SBIR is, let alone the idea that they would reach out to—that they would know that there are consultants there to be able to help them through the process.

Of course I know about it, but I was a professor at the University of Maine. But most business owners in the State of Maine, I am sure, don't have an understanding of SBIR, and certainly couldn't get through the application process, in my mind.

Chairman GOLDEN. Thank you. That is a very helpful start to the conversation. I have a lot more questions for you, but also for the other panelists.

But I am just going to go ahead and cede my 10 seconds remaining here and recognize Mr. Hagedorn next. We will come back later.

Mr. HAGEDORN. Thank you, Chairman.

I appreciate all the witnesses for being here. Very good discussion so far.

Dr. Green, you seem to have some success with these programs and have made some gains for Federal agencies along with your own company.

Can you explain kind of in a nutshell how you are doing so well and how you have utilized this and how it helps the taxpayers and the government?

Mr. GREEN. We, from the outset at the proposal stage, focus on the application and direct the program to achieve what the customer has as his goal. At each step of the way, we define milestones, reducing the greatest risks first, and then move the project forward.

We have had many successes. And, through those successes, we have learned that it is essential to address all aspects of the problem, as well as to decide on the best path to market.

That best path does not necessarily mean that your company develops new skills along each step of the way. As various people have noted, not just in proposal writing, but even when a technology is successful, there are many stages after that—the production, the marketing, the market presence, the distribution. All of these require additional skills.

What we decide is the best path to market. That often involves partnering, and partnering with other small businesses which are already active in that technology field, where we can transfer that technology to them, and they already have in place the know-how and other skills.

That allows our innovators to go back and to solve the next problem for the government.

Mr. HAGEDORN. Sounds like it is not a direct line and you have learned some things over the years and probably had consultants and other help helping you with that, and maybe just building a better mousetrap when it comes to how to do this.

You talked about maintaining the 3 percent allocation and reauthorizing. You feel strongly about that. We should, the Committee should move forward and reauthorize and make this permanent?

Mr. GREEN. Yes. I think that is essential.

First of all, the 3 percent each of the other speakers today has addressed that. And I think it is important, because, as has been noted, there is a barrier, and we need to work to overcome that

barrier. And that can either be done by reducing the paperwork or standardizing it in some manner, or by the additional help that is provided by the agencies and by the private sector.

The benefit of making it permanent is both to the government and to the small businesses. During the reauthorization period in 2008 through 2011, there were 14 continuing resolutions to keep the program alive. During that time, awards were put on hold. Small businesses, who had started with ideas, actually went out of business waiting for decisions to be made.

From the Federal side, it allows there to be a defined program budget that they can then plan and allow technology to be developed through Phases 1, 2, and 3. It also creates good career paths for Federal employees to become deeply knowledgeable and become good advisers in each agency to guide the program to help the small businesses.

Mr. HAGEDORN. Thank you.

Real quickly. Mr. Henry, you were talking about the complicated application process. And my understanding is these aren't really grants, they are awards. And, having worked at the Treasury Department, I kind of have some background in how government agencies have to justify for Congress and others their expenditures and moneys that go out the door. So maybe that is some reason why it is a little more complicated.

But you mentioned that you don't receive feedback if you are on the losing end, if you want to put it that, for one of these awards. Help us understand that a little bit more. And do you think it would be important for agencies to have to follow up?

Mr. HENRY. Well, I want to clarify that if you are on the losing end, if your application is accepted and it goes through the process and it is rejected, then you would receive some feedback, although we have not always received feedback from every agency, which they are supposed to provide but do not always, at least not in our experience.

But if you were to not be able to submit on a technicality and the application was rejected before that process, then that is correct, you would not get any feedback. It would not be—the application simply would not be reviewed.

Mr. HAGEDORN. Okay. Thanks. I think that clears it up.

Chairman, I will yield back.

Chairman GOLDEN. Thank you.

Next, we will recognize Rep Pete Stauber from Minnesota 8.

Mr. STAUBER. Okay. Thank you very much.

Thank you to the witnesses for being here today.

Early in my time in Congress, I became familiar with the Small Business Innovation Research program and the good work it can do for our small businesses.

Lake Assault Boats in Duluth, Minnesota, which builds custom fire and rescue patrol boats, applied for Phase 1 funding from the Air Force's SBIR program. Lake Assault intended to use the funds to undertake a trial to improve improve patrol boat technology, ultimately reducing energy inefficiencies.

As Mr. Green noted in his testimony, it is fascinating to see how the different parts of the Nation are inspired to pursue technology innovation.

With our many lakes in Minnesota, it makes sense that my constituents would look for technology that improves the technology of our patrol boats while keeping our lakes pristine for future generations.

Mr. Green, as we look toward reauthorization, what would you caution Congress from adding or removing from a reauthorization bill that might actually impede or harm the program?

Mr. GREEN. I would argue that we certainly don't want to add more barriers and make it more difficult to submit to the program. The program has already made great strides in moving more quickly, to make decisions quickly, and that allows the small business to have continuity.

So I would urge the Congress to continue to make sure that award decisions are made in a timely manner so that the small business can make business decisions and move forward.

I think what is essential is that the program remain merit based, because there are always many suggested solutions to any problem, but we, as Americans, have to have the best solution so that we can continue to remain the world technology leader. If we settle for less than optimum solutions, that will result in us losing our leadership.

Thank you.

Mr. STAUBER. [Inaudible].

Chairman GOLDEN. Thank you.

We will now recognize Representative Claudia Tenney from New York 22.

Ms. TENNEY. Thank you, Chairman Golden and Ranking Member Hagedorn, for taking the time.

And thank you to the witnesses for being here.

I represent New York's 22nd Congressional District, which stretches from the shores of Lake Ontario to the border of Pennsylvania. We have a diverse collection of cities, rural area and suburban areas. But we are also the home to a lot of innovation heritage, including IBM was founded in my district. The Air Force Research Lab Directorate is part of the former Griffiss Air Force Base. So we do have quite a bit of innovation.

But I wanted to focus, Mr. Green, you said—and I thought your testimony was interesting, just to kind of piggyback on what Mr. Stauber had to say—you indicated that the State of Maine and Kansas and others have twice the grants.

What can we do in New York to revitalize our innovation and be able to have access to some of these tech grants and also innovation transfer grants? How would you create a model that we could get more innovation in New York and more resources to New York that emulates the success of other countries? And how could we make that a permanent issue, then something we could support in reauthorizing this bill?

Mr. GREEN. Well, if I may, I think the government has already put in place—through this 3 percent allocation—factors to provide support. And as I have mentioned, there is a private sector community to provide support.

But because I am speaking today on behalf of the New England Innovation Alliance, I think it is essential for small businesses who are competitors, are peers, to get together and share best practices.

That doesn't have to be just winning an SBIR grant. It can be HR. It can be benefits. It can be hiring. All of these things are challenges that every small business entrepreneur faces.

And so by having this collective, open discussion with your competitors, you end up building a better company and you end up developing a philosophy of how to respond and win grants.

And so we have helped create organizations in Ohio as well as California that follow this model. And I think, beside Federal involvement, private sector and peer involvement is a great way for each company to improve its knowledge base.

Thank you.

Ms. TENNEY. Yeah. Thank you, Mr. Green.

Could I just add a quick anecdote to that? Do you think that the fact that maybe some of our State regulations and the operation of our State business community or the way that States handle innovation and supporting these businesses has an impact?

For example, New York versus Maine, and, as you indicated, Kansas as well has even more grants than we do. Is that something that is a factor in your experience?

Mr. GREEN. If I may clarify, that was more grants per capita.

Ms. TENNEY. Per capita. Okay.

Mr. GREEN. Yes. I mean, you can't expect Wyoming to have as many grants as California. There are a few more people in California.

New York——

Ms. TENNEY. New York is huge.

Mr. GREEN. And New York has a fair amount of people, and they also, as a State, make significant investments. I am aware of NYSERDA and other such State-funded organizations that help create, and stimulate commercial opportunities that complement the SBIR program.

Ms. TENNEY. Thank you.

Mr. GREEN. So I think the State should, in addition, try to complement and benefit the companies within their States, and that will help attract people to those States to address problems in technology areas that are important for the citizens of that State.

Ms. TENNEY. Thank you. I appreciate that.

Just one quick question for Ms. Min.

In your testimony, you pointed out that many of these businesses, especially the Small Business Innovation Research experience, finds that a lot of these businesses have a tough time getting through some of the technical and bureaucratic process.

Would you recommend that we either fund or provide technical resources to businesses that are applying for these grants so that they can use these funds and this assistance more effectively?

Ms. MIN. Thank you, Congresswoman.

Ms. TENNEY. [Inaudible.]

Ms. MIN. Oh, absolutely.

I think an example of a resource that we have taken advantage of is the DOE Phase 0 program, which provides critical proposal support services. And other things that you can select from a kind of a la carte menu is technical support services as you are developing out your proposal.

Ms. TENNEY. Let me ask a quick question.

So we have a huge interest and need in the broadband industry. Would that be somewhere where we could actually get the technical assistance to help with trying to incentivize people to move into that industry and that business? Quickly.

Ms. MIN. Absolutely. Yes. Absolutely.

Ms. TENNEY. Thanks so much. We appreciate it.

I yield back.

Chairman GOLDEN. Thank you.

We will now recognize Representative Roger Williams, the Vice Ranking Member of the Committee.

Mr. WILLIAMS. Successful entrepreneurs will recognize needs in their daily lives and work towards bringing solutions to the marketplace.

Something I think is beneficial about the SBIR program is that it does not take on a one-size-fits-all Federal approach and runs through different Federal agencies. This allows innovators in different States to be able to access the resources to best address their needs in their own communities.

So, Dr. Green, as someone who represents numerous SBIR grantees across the Northeast, is there any agency that administers this program the best? And how can the other agencies adopt these best practices to better help entrepreneurs?

Mr. GREEN. Again, a complex question, and I appreciate it.

I think many of the members of NEIA have interacted with the Department of Defense, and I think they have a program that is very effective because it ties the topics of the SBIR book to agency needs. And, with that, they have a plan that they will award so many Phase 1s, down select more than one Phase 2.

And then, if a project meets the metrics as put forth in the book, the SBIR call, they promise that they will place some core program funds against that topic to see that the technology is inserted into the agency's program.

I commend the National Institutes of Health. They have very deep peer review, very thoughtful pee review councils, as does Department of Energy. Oftentimes we will submit a proposal and get six reviews on a single proposal. So I commend them all for the care they take in trying to make a good selection.

Mr. WILLIAMS. Thank you.

Mr. GREEN. Thank you.

Mr. WILLIAMS. Several of you stressed the need to simplify the SBIR application process. We don't want to see small business being deterred from commercializing their products and advancing American technology because of too much bureaucratic red tape.

So, Dr. Henry, you mention in our testimony that you had to hire outside consultants to help with your application and that it still took weeks to complete. So could you elaborate on what specific changes could be made to streamline the application process without compromising fraud and abuse protections in the SBIR?

Mr. HENRY. Well, I think, just to clarify, as Dr. Min said, that we utilized basically the Phase 0 program as well as consultants that were hired by the State of Maine. We didn't have to hire those. I also pointed out that we had a colleague who was skilled in grant writing and participated in that process.

I was pointing that out just to show the level of depth of experience that we had in order to be successful. And I think that, in my experience, there are a lot of innovative companies here in the State of Maine that don't have the benefit of people with grant-writing experience that would be able to access these programs.

Dr. Green, for example, represents an organization that is successful because they have a number of Ph.D. scientists that are experienced with the grant-writing process. And once you have the experience of getting through it once, it is quite a bit easier than the second and third and fourth time. It is that initial barrier to get over it that I think is a problem.

I can't really speak to the fraud issue. I don't know why the process is so complicated. And looking at other Federal programs—for example, we won a Wood Innovations Grant from the USDA that was for more money than the EPA SBIR that we were funded for, and the entire proposal was all of five pages.

And I do think that that is not always possible for something like SBIR. And I am not advocating simplifying the actual writing of the proposal. The proposal should be extremely detailed, as Dr. Green mentioned. It should lay out all of the aspects that need to be laid out in order to verify the scientific veracity, engineering veracity of the problem they are trying to solve and the market.

But the bureaucratic aspect of it seems to me somewhat unnecessary. There is a lot in there that a layperson or a person who has never approached an SBIR program would not be able to get through or understand.

And I am telling you that based on over a decade of experience of winning grants from the National Science Foundation, from the Department of Energy, from the Department of Transportation. This was an unnecessarily complicated process relative to other programs.

Mr. WILLIAMS. Thank you for that testimony.

I yield my time back.

Chairman GOLDEN. Thank you very much.

Assuming that we don't have Representative Salazar on remote anymore, we are going to move on to a second round. And I am going to recognize myself.

I did want to just quickly, Mr. Green, PSI, it looks like, has gotten about 1,400 SBIR or STTR awards since 1983. I am assuming that is when the company was started, but perhaps not. Maybe that is just the first time.

So you are in Andover, Massachusetts. I think Mass has gotten about 385 awards, I think, last year. But I think in the last 3 years you have got over 100 contracts, 66 million, and 220 employees.

These are good things. So congratulations on that, and I know that the company has been very successful.

But how did you start out? I mean, were you a smaller company then? How do you compare to, let's say, a startup company today when you were just getting started back in the 1980s?

Mr. GREEN. Our company Physical Sciences began in 1973 during the aerospace crunch after we had put man on the Moon. And so we existed for a decade before there was an SBIR program, supporting the government through research and development contracts.

In the early days of SBIR, the discretionary funds that had funded many companies were taken away and used for SBIRs. So initially SBIRs, in addition to serving the dual purpose of commercialization, also continued to support national needs.

I think the reason that our company is successful is that we have many people who are trained, as Dr. Henry has pointed out, trained at writing grants. We have people that are rounded entrepreneurs.

But also, PSI has realized that we are good at the research and development. And so we, as I mentioned earlier, we make a decision that oftentimes it is better not for us to develop the production, the marketing, sales, distribution, market presence, brand, it is better for us to transfer and partner with another company who has an existing technology, but this allows them a next-generation technology.

And that allows the technology to get to the market efficiently because there is a probability that a good idea could die at every step in that process.

It is efficient. It is quicker. And, as a result, it produces a greater return for the SBIR program. And then our serial entrepreneurs can take their expanded skill sets and try and address the next problem.

Chairman GOLDEN. All right. Thank you.

Some people were, I think, a little confused with some of the earlier statistics when we were talking about per capita.

Maine got six awards, I think, most recently. If we could stack that up against 800 in California, 258 in Massachusetts, I think like 150-something in New York, Kentucky, where Ms. Johnson is from, 16.

So per capita sounds impressive, but there are some pretty big gaps there.

I am curious, Dr. Johnson, how would you propose that SBIR/STTR outreach activities could be better designed to reach targeted populations? I think Dr. Henry made the point that people in a place like Madison, Maine, wouldn't even know this program exists unless there is someone there to help lead them to it.

Ms. JOHNSON. Yeah, I think that marketing of the program needs to go beyond the academic campus. I know historically that is where much of the PIs that apply for SBIRs come from. Even presently there is a huge concentration there.

But marketing really needs to go beyond that to be [inaudible]. I mean, that really is where most of the businesses are being generated if you really think about today's, the startup community or the small business community, not actually coming from academic institutions anymore.

So that would be my highest recommendation, that they need to partner with startup ecosystems, provide training events, workshops in those startup ecosystems, as well as small business development centers, and the like.

Chairman GOLDEN. Thank you. I appreciate that.

I have got about 30 seconds left, so I am going to reserve further questions. And at this time, I will yield back and recognize Mr. Hagedorn.

Mr. HAGEDORN. Thank you, Chairman. I appreciate that.

Both Dr. Green and Dr. Johnson, you kind of waded into an area about reauthorization.

And, Dr. Green, you were pretty explicit that in the future, if these programs are going to work properly, that the best science needs to win out, this needs to be a merit-based, totally competitive process.

And, Dr. Johnson, you talked a little bit about how there maybe needs to be more outreach so folks who are new into the process or don't have as much experience are aware of the programs and maybe have some additional expertise provided to them as far as going through the application and that type of thing.

What I would be concerned about as we look at reauthorization is any concept that the actual awards be given based upon preference of identity or race.

Recently, with the Small Business Administration's Administrator, I have spoken with her in one of our hearings and asked about the Restaurant Revitalization Fund. I didn't think that that was quite fair. I thought it was discriminatory that we had a priority list.

And now we have basically everybody who wasn't on the priority list is not getting any money for their restaurants, and they happen to be, in this case, White men.

And then you had the Biden administration put out an executive order saying that SBA needed to change its programs and make them conform with equity standards, whatever that means. I have asked her for an explanation of that, haven't received anything quite yet, although we just sent that letter.

Do you have any comments, Drs. Green and Johnson, as to whether or not this should continue to be a competitive process based upon merit, and also that maybe we still need to do some more in order to help people understand what is out there for them?

Ms. JOHNSON. Yes. So I think absolutely it needs to stay merit based. I am not suggesting anything other than that.

When we think about merit, Dr. Green, I agree with some of his comments and things like that. But we need to understand that these are not research grants. These are Small Business Innovation Research grants.

And so, unfortunately, if you look at the statistics, many of the companies that come out of universities are not the ones creating economic impact in the United States of America.

So when we talk about merit, it is not merit based off of how sexy the innovation idea is, it is merit based off of can you translate that innovation's impact for the United States in terms of innovation, impact in the economy, impact in healthcare, impact in the environment. And then also, can you translate that into a commercial company.

And so, unfortunately, academic institutions have not shown a stellar track record in comparison to other ecosystems, like the startup ecosystem, small development ecosystem.

So I think it needs to be merit based. And my suggestion would not be to change the merit or even the review per se of the grants, but more so provide more assistance on the front end.

For example, if you are looking at the academic institution or even in the startup ecosystem, a lot of times minority business enterprises don't have seed funding to actually do the early stage research necessary.

So I would propose that we add to the Phase 0 programs that we see for grant writing an actual Phase 0 program that provides pre-seed funding so that people can produce minimally viable prototypes for pre-early stage research so they could have a much more competitive Phase 1 application.

So I think it definitely needs to stay merit based, but we need to make sure that the metrics for merit are based off of economic impact and innovation and not just pure basic science research.

Mr. HAGEDORN. Thank you.

I think I understand what you said. I am not sure that I completely agree with the last part of that.

Mr. Green?

Mr. GREEN. May I add?

So I agree with the fact that, of course, it should be merit based, and I also agree that there should be additional assistance.

I believe that the 3 percent administrative funds now really are adequate to address this problem. But what I would suggest is we take a study to decide how they can best be deployed.

I understand that the SBIR road show has toured all the States, and we should assess the benefit of that versus targeting particular entities that could benefit more.

So we agree with reauthorizing the pilot programs, and I think the Phase 0 and the I-Corp are part of those pilot programs. If they are not already permanent, they should be made permanent. And I think that the agency should look how to optimize the benefit of their administrative allowance.

Thank you.

Mr. HAGEDORN. Thank you. I appreciate it.

I yield back.

Chairman GOLDEN. Thank you.

I do want to kind of dig a little bit further into the merit versus economic benefit discussion. I am interested in that.

Mr. Henry, maybe I will give a little bit of time to you on this, but I can also share a little bit of your story.

In my district, Madison, Maine, was a paper mill town; the mill closed just a few short years back. And I think it is fair to say, without those jobs, without that industry, the town was pretty much on a path to being decimated. That look was not good at all.

The decision by GO Lab to not only choose Madison but also move into that old mill space and redevelop it I think almost—it is hard to gauge the impact there in bringing back. I think you are on a path to probably something in the realm of, what, a hundred jobs or more. Of course, this remains to be seen how successful you will be.

But hard to, I think, gauge the benefit just dollar for dollar comparing an SBIR award in a place, let's say, like Massachusetts, versus Madison, Maine, that there has got to be a way to gauge how meaningful that economic benefit is to, let's say, rural Maine, rural America.

And as a result, spurring jobs, creating jobs in disadvantaged communities, I would say it is pretty important from the perspective of taxpayers. Certainly if you are a taxpayer in rural Maine, it has almost definitely got to be the perspective.

But could you, any one of you, talk a little bit about how you might approach some kind of analysis, a way of adding weight in the application process to the award that takes it into the dynamics that I just discussed?

Mr. HENRY. Sure, yeah. I am not an economist, and so there are economists that do studies on the impact of various businesses on their community. I know in the forest products industry, we have an impact factor of something like 16, that is a combination of forest products and manufacturing. That is a huge impact on employment and on a community compared to most other industries.

But I can't really—it is really hard to say definitively anything really valuable to that end.

I feel compelled to comment on Dr. Green's comment that 3 percent is adequate. A lot of facts have been thrown around. A lot of numbers have been thrown around. But what proof do we have that 3 percent is adequate on funding these kind of programs?

I can't see things changing significantly in terms of how we distribute funds for research and development and innovation throughout underrepresented areas, throughout underrepresented communities.

I think, to Representative Hagedorn's point, merit based is really—people will throw that around and want it to be some concrete thing. But my mom was a professor in an Ivy League institution for over 40 years. She graduated more African-American Ph.D.s than any professor in the United States in her tenure, and she graduated four.

So representation is an issue for many communities because those various communities value different things. Rural areas value different things than urban areas. And if the people who are reviewing the applications are primarily from academic institutions, as Dr. Johnson mentioned, they are going to value scientific merit. They are not going to value economic merit.

Our company was rejected for most of our SBIRs because of our scientific merit. They didn't view there to be significant scientific merit. But the impact of our future investment of $150 million on a town like Madison is immeasurably larger than most, the impact that it has on——

Chairman GOLDEN. Quickly, sir. Dr. Henry, if I could—I have only got 30 seconds left there.

But that is a great point, talking about that perspective right there, which is the economic merit versus just purely the scientific, not just—the product that you are bringing is going to benefit, There is going to be an economic merit across the country in regards to lower home heating prices and other things. So I think that is also something that could potentially be worked into a process such as this.

But, Mr. Hagedorn, any other questions on your end?

Mr. HAGEDORN. No.

Chairman GOLDEN. I will just give Dr. Johnson or Dr. Min, Dr. Green, the opportunity to weigh in on this if you want. You don't have to.

And I think with that, we are——

Ms. JOHNSON. I would like to just comment.

I know that we use this term "merit," and we are trying to figure out what to evaluate. I actually serve on one of the review committees for one of the agencies that distribute SBIR and STTR. And I don't want to get lost in this discussion of merit that when it comes to the committees, there is no consideration whatsoever for the applicant coming from a rural area, being Black, White, Hispanic, Latino. There is no—none of that is applied into the review process.

And so I think really what we are talking about is how do we get applicants, a more diverse pool of applicants, doing more diverse innovation of higher quality into the program. And that starts with equipping and enabling more individuals from diverse backgrounds that are currently underserved to be able to do that.

So when we talk merit, yeah, when it gets down to brass tacks, when you act in that review committee, we don't see anything but the application in front of us. But we really need to make sure that everybody is given the opportunity to put the best application in front of us, not just in the way that they write it but also in the content, which is more so what we care about.

Chairman GOLDEN. Thank you.

Anyone else have any other thoughts on this particular issue?

Very good. Well, I want to thank you all for joining us for the hearing today. I certainly appreciate your taking the time and your patience, again, as we started a little bit late. The testimony is very helpful, and I think that the Q&A was productive as well.

As we have heard today, not all small businesses have the chance to succeed in the STEM sector, from rural technology companies to women-run startups. In our metropolitan centers, a broad range of entrepreneurs are at a disadvantage in the field.

SBIR and STTR offer good opportunities for developing technology and growing small firms, but we should work to make them extend to a broader range of business owners.

Today's witnesses provided us with critical insights, very helpful insights into improving these programs and fostering greater diversification.

I look forward to working with members of this Subcommittee to implement these improvements and ensure that these critical programs are reaching as many small businesses as possible.

And with that, I would ask unanimous consent the members have 5 legislative days to submit statements and supporting materials for the record.

Without objection, so ordered.

If there is no further business to come before the Committee, we are adjourned.

Thank you.

[Whereupon, at 3:57 p.m. the Subcommittee adjourned.]

APPENDIX

TIMBERHP
BY GO LAB

Testimony of Joshua Henry
President, GO Lab, Inc.
Before the House Committee on Small Business
Subcommittee on Underserved, Agricultural and Rural Business Development

Prioritizing Small Undeserved and Rural Businesses in the SBIR/STTR Programs
June 23, 2021

Chairman Golden, Ranking Member Hagedorn and members of the Subcommittee on Underserved, Agricultural and Rural Business Development.

Good afternoon.

My name is Dr. Joshua Henry. I'm president of GO Lab, a Maine-based building materials company.

I'm grateful for the opportunity to talk to you today about the Small Business Innovation Research Program, the vital support it gave our company at its inception and some of the ways we believe SBIR can be strengthened.

Next year, at our production facility inside a former paper mill, GO Lab will become the first company to manufacture wood fiber insulation made in America.

Our products, marketed under the brand name TimberHP, will include batt insulation for stud wall cavities, continuous exterior insulation boards and a blown-in loose fill—designed to work as one comprehensive, above-grade system for the entire building envelope or as affordable, healthier, drop-in replacements for foam, mineral wool, cellulose and other traditional insulations targeting the residential and commercial construction market.

While SBIR grants are modest, monetarily speaking, they are nonetheless critically important to early stage companies. The program gives small businesses and entrepreneurs the freedom to research and develop new technologies, often in partnership with local universities, that are years away from commercialization.

When we founded GO Lab, in 2017, insulation made from softwood chips had already been a successful product on the European market for more than 20 years. Our SBIR grant allowed us to work with researchers at the University of Maine to determine that we could make a more renewable, cost competitive and higher performing form of wood fiber insulation in America by using different binding agents in the manufacturing process.

1 Main Street, Madison, ME, 04950 / 207 338 1566 / www.timberhp.com

TIMBERHP
BY GO LAB

This grant, though small, helped validate the entire concept at the heart of our business plan. We were then able to use this hard, verified data to begin the long process of raising private equity and state funding to move our vision of wood fiber insulation, made in America, toward reality.

The SBIR program, as valuable as it is, could be made even stronger by simplifying the application process. We needed extensive help from consultants and SBIR specialists, hired by the state of Maine, to do our application. It still took many weeks to complete.

Additionally, as a business launching in a federally designated opportunity zone, we strongly believe that more incentives are needed to ensure that a program as valuable as SBIR is able to make more investments in under-resourced rural areas, where public research and development resources is limited.

Thank you for your time and I'd be happy to answer the committee's questions.

1 Main Street, Madison, ME, 04950 / 207 338 1566 / www.timberhp.com

Testimony of Nancy Min, Founder and CEO of ecoLong LLC

United States House of Representatives
Committee on Small Business
Subcommittee on Underserved, Agricultural, and Rural Business Development

Hearing on "Prioritizing Small Underserved and Rural Businesses in the SBIR/STTR Programs"

June 23, 2021

Chairman Golden, Ranking Member Hagedorn, and Members of the Subcommittee, thank you for the opportunity to testify today on the topic of prioritizing small underserved and rural businesses in the SBIR/STTR programs. It is an honor to be here this afternoon.

My name is Nancy Min, and I am the Founder and CEO of ecoLong LLC based in Albany, New York. Our mission is to build interconnected and resilient communities. This mission is at the heart of everything we do including developing a blockchain based energy marketplace that provides communities equitable access to clean energy. We are fortunate beneficiaries of the SBIR/STTR program, having received U.S. Department of Energy SBIR Phase I and Phase II from the Solar Energy Technologies Office to build out the platform. The DOE SBIR funding provides critical support that is positioning us for growth.

My path to the SBIR/STTR program wasn't easy. It took a lot of trial and error. For ecoLong to exist today, it required the engagement and support of many communities. My entrepreneurial interests began in college when I first heard about a new technology called blockchain technology that was the underlying technology to this new thing called "Bitcoin". The technology and its application has evolved significantly since then. We now use blockchain technology to decentralize and democratize the energy market.

All small business owners will tell you starting a company is hard but knowing what's next is harder. Hearing about and participating in the National Science Foundation Innovation Corp or NSF I-Corp program was a pivotal moment for me. The NSF I-Corp program taught me how to articulate my business idea and forced me to "get out of the building" to validate that our technology was commercially viable. However, the closest site that the NSF I-Corp program was administered was in New York City at the New York City Regional Innovation Node (NYCRIN). That meant, we had to travel 3 hours from Albany to New York City or 6 hours roundtrip to attend classes.

The first time writing a SBIR/STTR proposal was daunting. Thankfully, the U.S. Department of Energy has a Phase 0 program that provides a variety of proposal support services for the first-time applicant. The Phase 0 program was critical in helping me figure out the proposal development process and creating a budget.

All these programs helped us to get the DOE SBIR awards. In addition to the financial support of the SBIR, the program managers at the Solar Energy Technologies Office provided integral support at every step of our development and commercialization process.

The support of these communities continues even to this day with the support we get from business networks such as the Clean Energy Business Network (CEBN) that plays a key role in advocating for clean energy research, promoting business partnerships across the nation, and nurturing small businesses, like ecoLong, for growth.

Although we were fortunate enough to work with these amazing communities, the journey to uncovering and engaging with them isn't easy, particularly for underserved and rural businesses. Today my testimony is about the power of communities and its role in accelerating small underserved and rural businesses in innovation driven programs such as the SBIR/STTR program.

Improving awareness and accessibility to federal innovation programs

Often the biggest challenge with early-stage technological innovations is to transform a technological concept into a viable business. The National Science Foundation Innovation Corp (NSF I-Corp) program addresses the knowledge gap with transformation of research into business ventures. However, awareness and accessibility of this program is often limited to innovators that are integrated with educational or research institutions or located in urban areas. It may be helpful to increase accessibility to this program for underserved and rural small business.

Writing a proposal takes a lot of effort for small underserved and rural businesses. The U.S. Department of Energy Phase 0 program provides a variety of proposal support services for the first-time applicant with no charge. Increasing the visibility and accessibility of such a program or resource for all applicants is very beneficial for innovative firms, particularly underserved and rural businesses. Additionally, DOE should consider making the Phase 0 available for at least one subsequent round to repeat applicants—particularly businesses who had promising ideas but were unsuccessful in their first applications—in order to help entrepreneurs learn how to navigate the complex application process.

Community based organizations are vital for innovators to extend their business network. These organizations or business networks are a great avenue to enhance the awareness and accessibility of federal innovation programs. The Clean Energy Business Network (CEBN) – the small business voice for the clean energy economy, with a network of more than 5,000 small and midsize business leaders across all 50 states and approximately 350 Congressional districts, has been critical to fostering inclusion and diversification among innovative firms. For example, CEBN, a Power Connector for the Department of Energy's American-Made Challenge has been promoting and enhancing the accessibility of the SBIR funding solicitations across their network and beyond. More support for regional or national support organizations that

serve as community hubs on the ground would help small underserved and rural businesses get the support they need to be competitive in SBIR/STTR programs.

Through CEBN, I have been part of stakeholder conversations on ways to make SBIR/STTR more impactful and accessible to small businesses, which would in turn increase their access to firms from underrepresented demographics. I would like to submit for the record with my testimony a copy of a letter signed by 115 small business and nonprofit leaders outlining these recommendations in detail.

Additionally, a recent report by Third Way highlights that only 7-8 % of SBIR recipients at the DOE are from woman-owned or disadvantaged firms, and highlights some recommendations to improve access.

Promoting open collaboration and open source to reduce barriers to access technological innovation

The barriers to small business innovation are not limited to access to entrepreneurship programs. The development of technology innovations often requires extensive technical community support and resources. This is an area where awareness of and access to technological innovation can support the development of more technology ventures. A great example is open source technology, businesses can significantly reduce the expenses and time to develop a product from scratch and focus their efforts on high impact uniqueness and innovation.

As the Chair of the Linux Foundation Hyperledger's, Social Impact Special Interest Group, an open source community that develops enterprise-grade blockchain technologies, I have seen first-hand small businesses rising from the open-source community. Open source is an opportunity to reduce the barriers for underserved and rural businesses that otherwise may not have the contacts or network to access technological innovation needed to make their businesses a success. For example, the Department of Energy has encouraged and supported various open-source projects:

a. Pacific Northwest National Laboratory (PNNL) developed VOLTTRON™ an open-source distributed sensing and control software platform technology that joined the Eclipse Foundation.
b. Researchers at Brookhaven National Laboratory (BNL) developed world leading privacy preserving Artificial Intelligence and will be contributing it to the open source PyTorch community.

Conclusion

At the end of the day, the mission of the SBIR/STTR programs is to support scientific excellence and technological innovation to build a strong national economy. This requires innovation on both the technical and the business or commercialization end. By improving awareness and access to federal entrepreneurship programs, small businesses will have the tools to build successful business ventures. By promoting open collaboration and open source, small underserved and rural businesses across the nation will have a launchpad to catapult their technological innovation, to do their part in building a strong national economy.

Thank you again for the opportunity to testify, I look forward to answering the committee's questions.

CLEAN ENERGY BUSINESS NETWORK

The Honorable Eddie Bernice Johnson (TX-30)
Chairwoman, House Committee on Science, Space, & Technology

The Honorable Haley Stevens (MI-11)
Chairman, Subcommittee on Research and Technology

The Honorable Nydia Velázquez (NY-7)
Chairwoman, House Committee on Small Business

The Honorable Jason Crow (CO-6)
Chairman, Subcommittee on Innovation, Entrepreneurship & Workforce Development

The Honorable Frank Lucas (OK-3)
Ranking Member, House Committee on Science, Space & Technology

The Honorable Michael Waltz (FL-6)
Ranking Member, Subcommittee on Research and Technology

The Honorable Blaine Luetkemeyer (MO-03)
Ranking Member, House Committee on Small Business

The Honorable Young Kim (CA-39)
Ranking Member, Subcommittee on Innovation, Entrepreneurship & Workforce Development

June 21, 2021

Dear Chairwoman Johnson, Ranking Member Lucas, Chairwoman Stevens, Ranking Member Waltz, Chairwoman Velázquez, Ranking Member Luetkemeyer, Chairman Crow, and Ranking Member Kim:

We are writing as members of the Clean Energy Business Network—the small business voice for the clean energy economy—to convey our recommendations for small business policies to support technology research, development, and commercialization.

Our companies and associations are working across the spectrum of clean energy technologies, including energy efficiency, natural gas, renewable energy, advanced transportation, and storage, among others. Our industries support over 3 million jobs across the country, many of those in manufacturing, and represent the major growth sectors of the U.S. energy economy.

Many of our businesses have benefitted from federal research and development initiatives such as the Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) Programs. We have seen how critical these programs are to promoting breakthroughs in commercialization of cutting-edge technologies. At the same time, we recommend improvements to make these programs even more impactful and available to small businesses across the nation.

Most of the recommendations below can be implemented at no additional cost to the American taxpayer and only require adjusting program direction and implementation. Where new programming or staff are called for in order to manage small business programs more effectively, these improvements can be achieved at minimal cost while increasing mission impact. Additionally, several of the proposals identified below involving extending permanent reauthorization of existing pilot programs that have been reauthorized multiple times on a bipartisan basis by Congress following extensive hearings and stakeholder engagement. These programs have periodically lapsed when these authorizations expired, and should be permanently reauthorized to avoid future disruptions to the SBIR/STTR program.

In the course of the development of these policy recommendations, we have identified changes that could be taken through legislative action as the 117th Congress considers Small Business Administration authorization. Additionally, a number of changes could be accomplished without legislation through administrative action; these are included as an addendum at the end of this letter.

1. **Technical Assistance for Applications, Particularly for Diverse Teams**

   - Recommendation: *Provide technical assistance to teams with limited SBIR experience.*

   - Background: Some federal agencies provide technical assistance to first-time applicants, such as the Department of Energy's "Phase 0" program with its contractor, Dawnbreaker and National Institutes of Health's "Application Assistance Program" with its contractor, Eva Garland Consulting. However, many novice applicants still struggle with the enormously technical applications even after the first time—particularly if the team is unsuccessful in its first attempt and wishes to learn from the experience and submit another application for future consideration. Dedicated agency-specific technical assistance (or vouchers for external assistance) should be available to first-time Phase I applicants, first-time Phase II applicants, and at least one round of re-applicants who were previously unsuccessful. These agency-specific technical assistance programs should also coordinate closely with state and local support centers funded through the Federal and State Technology (FAST) Partnership Program to recruit and support teams from underrepresented populations, regions, and universities. This practice will ensure that the most promising technical ideas are able to compete for awards, regardless of the team's size or prior experience working with the federal government.

2. **Sufficient Follow-on Funding**

   - Recommendation: *Make the Commercialization Readiness Pilot Program for Civilian Agencies and the Commercialization Assistance Pilot Program permanent*

   - Background: The Civilian Agency Commercialization Readiness Pilot Program (CRPP) allows non-DOD agencies to use up to 10% of their SBIR/STTR budget for follow-on awards up to three times greater than a typical Phase II award. The Commercialization Assistance Pilot Program allows agencies to use up to 5% of their SBIR budget for subsequent Phase II awards with a private-sector match. Agencies have responsibly used their authority to make follow-on SBIR/STTR awards to promising companies after the initial Phase II, when there is a clear but lengthy path to commercialization (e.g., completing the drug approval pipeline). Agencies need long-term certainty that these authorities will not lapse or expire.

3. **Entrepreneurial Authority**

   - Recommendation: *Allow Technical and Business Assistance funds to be spent in-house, rather than mandating one or more external vendors.*

   - Background: Through the Technical and Business Assistance Programs, several agencies allow SBIR/STTR awardees to spend a portion of their awards on non-R&D expenses such as

technical and business expertise designed to create a commercialization plan for their technologies. For example, the Department of Energy calls this its "Commercialization Assistance Program." Some agencies provide a designated contractor to support this work. Entrepreneurs should have the discretion to allocate these dollars in the most efficient way, so they should be allowed to choose among the designated contractor, another contractor of their choosing, or in-house employees who possess that technical and business expertise.

4. **Award Flexibility**

   - Recommendation: *Extend direct-to-Phase-II authority to all agencies and make it permanent.*

   - Background: For most agencies, only prior recipients of a Phase I (Feasibility and Proof of Concept) award are eligible to apply for Phase II (Research and Development) award. The Phase Flexibility Pilot Program authorized the National Institutes of Health, Department of Defense, and Department of Education to bypass Phase I and issue Phase II awards if the firm has already met the Phase I standards. Every agency should have the flexibility to make a Phase II award without a prior Phase I award if the small business is ready for it, and this pilot authority should be made permanent. Some businesses may find the smaller dollar amounts provided in Phase I less useful and may prefer to conduct R&D in-house and then proceed with a $1-2 million Phase II grant to further test out and prove the commercial viability of the technology.

5. **Agency Excellence**

   - Recommendation: *Make the Administrative Funding Pilot Program permanent.*

   - Background: Since 2011, agencies have been allowed to use 3% of SBIR/STTR funds for program improvements, yielding a profusion of innovative initiatives to diversify the applicant pool, upgrade data reporting systems, and provide high-impact entrepreneurship training. The Small Business Administration provides performance criteria to measure the effectiveness of these activities and reports to Congress on how funds are used. In order to implement the critical improvements identified in this letter, agencies need long-term certainty that this authority will not lapse, as it has done in the recent past.

In closing, small businesses across all sectors are working to develop new technologies that will transform our lives, in part with support from SBIR/STTR programs. The energy sector offers many shining examples of how the U.S. government has worked in partnership with the private sector to spur innovation. These partnerships have contributed to most transformations in the U.S. energy economy—from new oil extraction methods and hydraulic fracturing, to energy-efficient windows, to dramatic declines in the cost of wind turbines and solar panels.

Small business programs such as SBIR/STTR help small businesses rise and compete to develop promising new technological solutions and bring them to market—resulting in job creation, lower energy bills, increased domestic investment, and healthier communities. We urge you to stand beside these entrepreneurs in bringing the best and brightest ideas to market.

Thank you in advance for consideration of our views. Should you have any questions, please contact CEBN President Lynn Abramson at labramson@cebn.org for further information.

Sincerely,

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ADDENDUM: RECOMMENDATIONS FOR ADMINISTRATIVE ACTION

Agencies offering small business R&D programs should be encouraged to learn from one another and make progress on these key elements of an entrepreneur-friendly SBIR/STTR program. Below are recommendations based on stakeholder input about practices in place at different federal agencies:

1. **Short-Form "Letters of Intent" for First Round of Consideration**

   - Recommendation: *Ensure that agencies create a system for reviewing and greenlighting short-form project descriptions before requiring a more time-intensive full application.*

   - Background: Preparing a high-quality application is a complex and time-intensive task for any small business. Reviewing lengthy applications that are a poor fit is also a waste of federal resources and staff time. Some federal agencies provide a short-form letter of intent—an initial application that is only a few pages long and can be completed without professional assistance. This approach should be used by all agencies to screen submissions for eligibility and fit.

2. **Broad, Goal-Oriented Topics**

   - Recommendation: *Design SBIR/STTR funding announcements based on broad technologies of interest rather than narrow pre-defined research topics.*

   - Background: Some agencies, such as the National Science Foundation, request broadly-defined, goal-oriented proposals, whereas the DOE's typical SBIR/STTR Funding Opportunity Announcement is highly prescriptive in its solicitation topics and may miss highly-impactful, mission-relevant technology solutions proposed by entrepreneurs themselves. This is also a way to reduce barriers for non-traditional applicants. Although comparable in program size, the NSF SBIR/STTR Phase I funding announcement is 20 pages, while the DOE presents nearly 300 pages to describe all its SBIR/STTR topics in a given year.

3. **Dedicated Program Managers**

   - Recommendation: *Develop a team of dedicated SBIR/STTR program managers who possess relevant private-sector experience and the ability to work closely with awardees both before and after awards are made.*

   - Background: SBIR/STTR awards tend to be administered as a small portion of a larger R&D portfolio managed by DOE staff with numerous competing priorities. To cater to the unique needs of small businesses commercializing early-stage technologies, it would be ideal to deploy a team of program managers with relevant private-sector experience who focus exclusively on SBIR/STTR awards, akin to the approach used by the Advanced Research Projects Agency-Energy (ARPA-E) and Defense Advanced Research Projects Agency (DARPA).

4. **Concrete Timelines, Speed, and Flexibility**

   - Recommendation: *Provide a more predictable schedule of awards and encourage the use of prizes and other flexible types of transactions to shorten award times.*

   - Background: SBIR funding solicitations are often subject to budgetary uncertainties caused by delays in Congressional appropriations. Continuing resolutions (aka stop-gap funding bills) and other budgetary uncertainties sometimes delay SBIR solicitations for months—and then agencies must rush to get dollars out the door in a short timeframe. Fast-moving small businesses cannot suddenly drop everything to work on a funding application on short notice, nor wait months or a year to hear about funding decisions. To the extent possible, DOE should shorten selection and award times, and offer multiple—or even continuous—funding opportunities each year. Given the real constraints imposed by uncertainty in appropriations, a possible solution would be for DOE to maintain a quarterly solicitation schedule, make it clear that the total volume of awards and timing of decisions are contingent on available funding, and allow applicants to resubmit proposals without modification should funding constraints limit the ability to make awards. Having dedicated program managers, as described above, would also help increase speed and flexibility.

5. **Matching Funds with Private Investors**

   - Recommendation: *Allow SBIR-funded small businesses to attract venture capital much earlier.*

   - Background: The DOE SBIR program allows small businesses to match DOE dollars with venture capital dollars, which can be a powerful way to "crowd in" private-sector capital and accelerate a company's path to commercialization. Because DOE currently only allows this "Phase IIC" to occur nearly a decade after a company's first Phase I award, however, it is not often used. Public/private matching funds should be available after the small business has completed its first Phase II award.

III. Complementary Measures

6. **Phase III and Other Commercialization Opportunities**

   - Recommendation: *Educate and solicit successful SBIR/STTR awardees to seek and win contracts across the federal government based on DOE's missions and needs, and provide additional forms of commercialization assistance.*

   - Background: Some agencies (e.g., Department of Defense) offer procurement opportunities that can help field-test new technologies. This is often referred to as "Phase III"—which is not an official SBIR level but is generally meant to involve demonstration of near-commercial technologies graduating from Phase II. The process of securing such follow-on commercialization funding is typically not widely advertised or understood—and is relatively rare in agencies focusing on R&D (e.g., NSF and DOE). Unfortunately, most companies graduating from SBIR Phase II still face a significant valley of death to building the first-of-a-kind or Nth-of-a-kind demonstrations. Helping these entrepreneurs prove their technologies is critical to establishing commercially-viable companies, creating jobs and tax revenues, and

producing a taxpayer return on investment. Federal agencies should develop cross-cutting procurement platforms for technologies that may have broad applications across the federal government. Additionally, DOE should explore additional means to support technology commercialization, such as demonstration grants and low-interest loans.

7. Support for Entrepreneurship Programs

- Recommendation: *Allocate funding toward entrepreneurship programs within federal laboratories, universities, and incubators to work collaboratively with companies pursuing tough technical challenges.*

- Background: Over the past five years, innovative entrepreneurship training programs at universities and federal laboratories have generated above-average cohorts of promising SBIR/STTR awardees. Examples include Chain Reaction Innovations at Argonne National Lab, Cyclotron Road at Berkeley Lab, The Engine at MIT, Innovation Crossroads at Oak Ridge National Lab, and numerous incubators and accelerators across the country. DOE should complement its SBIR program by continuing to identify and invest in existing and future programs that build a pipeline of highly-educated entrepreneurs pursuing tough technical challenges.

MEMStim

One pulse over the horizon

June 21, 2021

Dear Chairwoman Nydia Velázquez,

I thank you for the opportunity to share my testimony with The Committee on Small Business Subcommittee on Underserved, Agricultural, and Rural Business Development during this hearing titled, "Prioritizing Small Undeserved and Rural Businesses in the SBIR/STTR Programs."

My name is Dr. Angelique Johnson, and I testify not only in my capacity as CEO/Founder of MEMStim, but also as an expert in entrepreneurship and innovation having addressed audience on behalf of the 8th district of the Federal Reserve Bank; the Royal Academy of Science International Trust; the International Chamber of Commerce; and the United Nations Assembly on Women and Girls in Science. Additionally, I speak as a leader in the following organizations:

- Standing Council, NSF Engineering Research Visioning Alliance
- KY Statewide EPSCOR Committee
- National Institute of Biomedical Imaging and Bioengineering, NIH SBIR
- NSF NNCI External Advisory Board
- Medtech Color

While getting my PhD in Electrical Engineering from the University of Michigan, I founded MEMStim to develop a fully automated, low cost, advanced manufacturing process for implantable nerve stimulators. That is mouthful but let me explain further.

Everything we do and think is controlled by nerves and neurons in our bodies passing along electrical information. Now, sometimes the electrical information is missing or distorted. This can lead to hearing loss, heart failure, chronic pain, paralysis, blindness, Parkinson's tremors and much more. For many of these conditions, pharmaceutical treatments do not exist or are highly addictive (think opioids for chronic pain). Thankfully, neurostimulators were created that can be implanted into the body to restore function via electrical stimulation. Many of you may be familiar with pacemakers, which is one type of neurostimulator, but there are many others, such as cochlear implants for hearing loss and spinal cord stimulators for chronic pain.

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MEMStim

One pulse over the horizon

At MEMStim we are developing the next generation of neurostimulator electrode leads (the wires that deliver the stimulation) with 3D printing. We replace manual assembly with automation to produce components that are ten times cheaper to manufacture and offer the promise of higher performance and lower power consumption.

Our leads are minimally invasive for safer surgeries and more durable than manually assembled alternatives. Imagine receiving a spinal cord stimulator to treat your chronic pain. You don't want the leads implanted in your spine breaking as you bend your back throughout the day. We have created proprietary elastic metals that could prevent breakage and medical device recalls. For decades the performance of neurostimulator leads has been limited to what the human hand can manipulate. This has hampered innovation and resulted in large medical bills. MEMStim seeks to change this through American based manufacturing of medical implants that lower healthcare costs at home and can be exported globally at a price affordable to emerging economies, such as India and China.

As powerful as our work sounds (and is). It would not be possible without the funding of the SBIR/STTR program. We have received Phase I and Phase II grants from multiple agencies, including the National Institute on Deafness and Other Communication Disorders (NIDCD) and the National Institute on Disability, Independent Living, and Rehabilitation Research (NIDILRR). Without this funding we would not have been able to generate our transformative low cost, high performance process.

The truth is, as a medical device startup we would be entirely dependent on funding from Venture Capitalists. However, the reality is that less than 1% of VC funding goes to African American tech founders and black women received only 0.27% of VC funding between 2018 and 2019 (*Still Building*, ProjectDiane 2021 Update). Black founders often must get their startup to a very advanced state on their own before they will be considered by VC's. This is not because their startups are any less valuable; rather, a study from the Kauffman Fellows Research Center shows that diverse founders return 30% more capital to their investors when they get acquired, or through IPO. Some believe this bias is directly related to the demographic of the decision makers who are 93% white male. As stated in a Forbes article, *Check Your Stats: The Lack of Diversity in Venture Capital Is Worse Than It Looks*, "only 1% of the $70 trillion in wealth management industry is controlled by women or minority fund managers".

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The SBIR/STTR program must serve to fill this gap in funding, particularly for underserved founders. However, there are also significant funding gaps existent in the SBIR/STTR program. Only 7.5% of funded grants were awarded to minority business owners according to an annual Brookings survey of entrepreneurs in 2016, even though minority businesses made up 39.4% of the business population surveyed.

I want to offer up some readily executable solutions that I believe could reduce this gap. These solutions come from my experience training and mentoring underserved founders in the SBIR/STTR program. I do this training through my company Vissionaireum, a company for Vissionaires, what I call the "vision rich" (www.vissionaireum.com). I have trained hundreds of entrepreneurs in best tips for acquiring an SBIR/STTR. As well, I draw from my experience as a grant reviewer for the SBIR/STTR program.

Firstly, the program needs to increase the diversity of the review committee. This means the agencies need to actively recruit diverse experts, but it can't stop there. Funding should be allocated to pay reviewers for their time. Due to wage and funding disparities, African American grant reviewers cannot afford to donate several workdays to the SBIR review process. Many reviewers come from academic institutions, but black faculty members have several committees vying for their time. They are often overcommitted and underpaid. For non-underrepresented grant reviewers, the issue of pay may seem like a luxury, but it is necessity to those who don't have the privilege/freedom to go without.

Additionally, I recommend that the program contract with black-owned SBIR consulting companies that have a successful track records of receiving funding. Together they can create a mentor-mentee protégé program for SBIR/STTR grants. Through my company I have helped many black founders navigate the grant process. Having the same lived experience, I can help them navigate the unique challenges faced by underserved companies. Companies like Vissionaireum (www.vissionaireum.com) could mentor so many more if there was funding to cover resources and time. It is a fact that black founders receive less business funding and have less disposable income, typically because of wage disparities. As such, they lack the seed capital to pay for grant consultants who can help them write successful applications.

Lastly, putting together a good application is not just about writing. It is also about having good prior research. Due to poor seed funding, many underserved applicants do not have the resources to conduct good prior research.

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They may be stuck at the concept phase. Although preliminary data isn't explicitly scored, it is expected that companies will be able to make a strong case that they can achieve the Phase I milestones. In part, this is demonstrated through "Phase 0" prior research or prototyping. I recommend the SBIR/STTR program provide Phase 0 funds to underserved entities for the specific purpose of conducting prior research and putting together a good Phase I application. This could be similar to what is done through NSF/NIH ICORPS grant, and eligible specifically to underserved SBIR/STTR applicants.

Again, thank you for this opportunity to share my insights on an invaluable resource for keeping America a leader in innovation and technology.

Sincerely,

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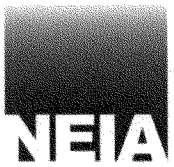

NEW ENGLAND INNOVATION ALLIANCE
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Testimony of

Dr. B. David Green, on behalf of the New England Innovation Alliance

Regarding the House Committee on Small Business Subcommittee on Underserved, Agricultural, and Rural Development Hearing

"Prioritizing Small Undeserved and Rural Businesses in the SBIR/STTR Programs"

June 23, 2021

Good afternoon Chairman Golden, Ranking Member Hagedorn and Members of this Subcommittee and the House Small Business Committee.

Thank you for the opportunity to speak today. It is an honor to testify on behalf of the New England Innovation Alliance, a coalition of small high-technology companies across the New England area. NEIA members – including Physical Sciences, Inc., which I am proud to lead – have experienced firsthand the proven benefits that the SBIR program provide for small businesses as well as the federal government throughout the program's nearly 40-year existence.

Many studies have shown that the SBIR program generates post-award revenues greater than 20 times the initial investment. The resulting taxes from product sales exceed that investment. It is a program that more than pays for itself. I appreciate that this Committee is holding a series of hearings to ramp up efforts to reauthorize the SBIR and STTR

programs, which are set to expire in September of next year. It is time to make these great programs permanent.

SBIR is a flagship American innovation program that other countries seek to emulate. What makes it such a success is that at its fundamental core the program is competitive and merit-based. Innovative small business entrepreneurs, from all across the country, propose concepts addressing national priorities and commercial needs. There are many more ideas than awards. Selection at each phase is based on the best concepts, best performance, and, above all else, the best science.

This competitive, merit-based process leads to a high success rate for transition and commercial success. The best science produces the best technology to fill our nation's needs. That best technology is essential if the United States is to remain a leader, guiding the world to a better future.

The beauty of the SBIR and STTR programs is that the best ideas can come from anywhere in the country. Each state in America is unique and special. I have spent time in every state and treasure the diversity.

Using the publically available SBIR.gov website, I recently conducted an analysis into SBIR awards broken out by geographic location and state distribution. This analysis confirmed a hypothesis that citizens in each part of our country have different perspectives and priorities, but each shares a common belief that America allows them the opportunity to pursue their dream, and live under our good system of government with America as an example for the world.

Citizens are motivated to improve what they hold dear – what matters to them in their daily lives. Our analysis found that different parts of our nation pursue technology innovation in different areas of focus.

To this point: the state of Maine wins over four times the national average per capita in Department of Agriculture SBIR awards, and three times the national average in Commerce Department SBIR awards. Kansas and Wisconsin far exceed the national average in Agriculture SBIR awards. Minnesota wins nearly three times the national average in Department of Education SBIR's and well above the national average in Health, Agriculture, and awards from the National Science Foundation. New York exceeds the national average per capita in Education awards.

I would venture that those areas of focus are important to the people, researchers, and small businesses who are located in those states.

Innovators in those states and regions are focused on things that affect their daily lives and livelihood. They are motivated to seek innovative solutions that address those focus areas and problems. They create solutions based on first-hand knowledge and win awards at a high rate.

We are a nation of problem solvers. We always have been. We were the first nation to establish patents to protect our citizens' innovation. We must continue to fund the very best solutions to address those needs and remain the world's technology leader.

The best ideas and compelling solutions arise from trained scientific and engineering minds in those disciplines that are of interest to them, and that align with federal agency priorities, wherever those researchers reside. The SBIR program does not compel those minds to live in a certain state. What SBIR can do is give woman-owned, minority-owned, and other disadvantaged businesses a fair chance to compete, win, and see their innovation succeed.

The current three percent administrative allocation – which was incorporated during the last reauthorization – allows participating

agencies to promote outreach and diversity within the program. This should continue and be made permanent during the next reauthorization.

In addition, a large community of support organizations exists to help with all aspects of creating a winning proposal – from preparation to identifying commercial applications. First time proposal writers can find the support they need to submit a great idea.

For example, members of the New England Innovation Alliance – an informal group of companies, often competitors – share best practices with a goal to make each company stronger. This mentoring for the common good brings benefit to all. NEIA has played a role in establishing similar alliances in other parts of the country. We encourage the Committee to encourage this model – alliances of competitive performers (mentors) as opposed to guidance from advisors.

Many Alliance members are entirely employee owned (ESOP) – which is a true America ideal. Every employee owns a portion of the company, rather than just one or few individuals regardless of their gender or origin. Every employee is incentivized to make the innovation succeed. Everyone is rewarded – women, minorities, veterans, service-disabled veterans – no matter their ethnicity or sexual orientation. All benefit, not just the few.

In closing, I respectfully urge this Committee to take up and pass an SBIR/STTR reauthorization bill as soon as possible this year.

NEIA strongly believes it is imperative that Congress acts this year – even though the programs are set to expire on September 30, 2022 – in order to avoid the possibility that the SBIR/STTR programs are attached to a series of temporary appropriations extensions as they were from

2008 to 2011. Small business and participating agencies faced tremendous uncertainty during those years – and we are concerned that if these programs are not reauthorized this year, the probability of that uncertainty returning will go up dramatically.

Congress would do better to replicate the most recent success of 2016, when the programs were successfully reauthorized a full year before they were set to expire.

As the Committee ramps up its efforts on SBIR/STTR reauthorization, NEIA urges members to consider the following core principles:

(1) The SBIR/STTR program should be permanently reauthorized in its current configuration to provide stability.

(2) The permanent reauthorization should strengthen the intent that the program remains committed to a competitive, merit-based participation and award structure.

(3) The existing "pilot" components of the program – including the program permitting three percent of SBIR/STTR funds to be used for administrative costs, including for outreach to increase participation by underrepresented communities – should also be made permanent.

(4) The reauthorization should require a quantitative assessment of the merits of experimental changes in a publicly available report to Congress within 5 years of initiating such a modification.

NEIA commends this Subcommittee for holding this hearing on this invaluable government program. The program has grown and evolved over the years since its start. It has proven its value many times over. Please make it permanent.

Thank you again. I look forward to answering your questions.

INVENT TOGETHER

inventtogether.org

Statement of

Holly Fechner
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Invent Together

For the
Subcommittee on Underserved, Agricultural, and Rural Business Development
Committee on Small Business
U.S. House of Representatives

Hearing on
Prioritizing Small Undeserved and Rural Businesses in the SBIR/STTR Programs
June 23, 2021

Invent Together appreciates the opportunity to submit a statement for the record for the House Committee on Small Business Subcommittee Underserved, Agricultural, and Rural Business Development ("the Subcommittee") hearing on "Prioritizing Small Undeserved and Rural Businesses in the SBIR/STTR Programs." One of the goals of the Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) programs is to foster participation in innovation by women and socially or economically disadvantaged individuals.[1] Assessing the programs' progress toward this goal and considering policy changes to continue to advance diversity in innovation are important parts of the Committee's work to reauthorize the programs before they expire in September 2022. We thank the Subcommittee and Committee Chairs for their attention to this important issue, and for the opportunity to offer diversity-related SBIR/STTR policy recommendations.

Invent Together is an initiative supported by organizations, universities, companies, and other stakeholders dedicated to understanding the gender, race, income, and other diversity gaps in invention and patenting and supporting public policies and private efforts to close them. Over the past five years, Invent Together has convened workshops with researchers and practitioners, supported the SUCCESS Act[2] and the IDEA Act[3], and participated in the National Council for Expanding American Innovation (NCEAI).[4] In fall 2020, Invent Together launched a public website—www.inventtogether.org—to provide a new platform and additional tools for educating and informing stakeholders about diversity in invention and patenting and related public policy efforts.

Thanks to brilliant inventors, engineers, entrepreneurs, scientists, and creators, the United States is an innovation powerhouse. When we expand who invents and patents, we create jobs, grow businesses, increase the gross domestic product (GDP), close wage and wealth gaps, and improve our position as a global leader in innovation. We will also benefit from the creation of new and different inventions.

Expanding participation in invention and patenting—and building a strong economy—will require businesses, academia, and government to each do their part to embrace American diversity and ingenuity. Federal investments in research and development—and ensuring such investments are allocated equitably—are an important component of this effort. In this statement, we provide background on the diversity gaps in invention and patenting, describe common barriers to participation in innovation, and make recommendations for improvements to the SBIR and STTR programs to foster greater participation in innovation by women, people of color, and other underrepresented individuals.

PATENT DIVERSITY GAPS

Intellectual property (IP) is critical to the U.S. economy. The United States Patent and Trademark Office (USPTO) has estimated that IP-intensive industries generate over $8 trillion—more than one-third of U.S. GDP—and support 45.5 million jobs—more than one-third of U.S. employment.

Despite the enormous significance of IP to both the economy and to individual inventors, not all Americans share equally in the opportunity to invent and patent. The USPTO and leading researchers have found that women, people of color, and lower-income individuals patent inventions at significantly lower rates than their representation in the population:

- Less than 13 percent of all inventors who hold a U.S. patent are women.[5] Women hold only 5.5 percent of commercialized patents.[6]
- Patenting activity by Black inventors peaked in 1899 and has not recovered.[7] Black and Hispanic college graduates patent at half the rate of White college graduates.[8]
- Children in families in the top one percent of income are ten times more likely to patent as adults than children in the entire bottom half of family income.[9]

These disparities impair economic growth and U.S. leadership in innovation and deny individual members of underrepresented groups the benefits and opportunities that patent ownership creates.

Closing these gaps would have significant benefits for individuals and society as a whole. Increasing participation in invention and patenting by underrepresented groups would quadruple the number of American inventors[10] and increase annual U.S. GDP by almost $1 trillion.[11] Research also shows that inventors with patents consistently earn higher incomes on average than inventors without patents, controlling for occupation, migrant status, and other factors. Patents also help businesses—especially small businesses and startups owned by women and people of color—access capital, attract customers and licensees, and create jobs. For example, startups that obtain a patent employ an average of sixteen more new employees after five years, compared to startups that do not obtain a patent.[12] Startups with patents also have a higher likelihood of obtaining venture capital funding and loan financing, which attract additional investment and help grow businesses and create jobs.

COMMON BARRIERS TO PARTICIPATION

Women, people of color, and other underrepresented groups face numerous barriers to equitable participation in the patenting of inventions, including a lack of exposure to innovation, access to invention education, mentorship opportunities, and capital, as well as entrenched cultural issues, such as discrimination and unconscious bias.

- **Exposure**: Lack of exposure to inventors inhibits invention and patenting. According to a study by Harvard researchers, "Children who grow up in areas with more inventors—and are thereby more exposed to innovation while growing up—are much more likely to become inventors themselves."[13] Indeed, children whose parents are inventors are nine times more likely to become inventors,[14] and "children who grow up in a neighborhood or family with a high innovation rate in a specific technology class are more likely to patent in *exactly the same* class."[15] Children who attend research universities also tend to patent at similar rates, suggesting "that factors that affect children before they enter the labor market, such as childhood environment and exposure to innovation, drive much of the gaps in innovation."[16]

- **Education**:
  - Access to high-quality invention education is critical to help people develop the mindset necessary to become inventors. Invention education "is a term that refers to deliberate efforts to teach people how to approach problem finding and problem solving in ways that reflect the processes and practices employed by accomplished inventors."[17] While STEM education helps students develop technical skills, invention education helps students develop problem-identification and problem-solving skills, as well as an invention mindset.
  - Invention education can also help children uninterested in STEM disciplines see the value of STEM skills.[18] Invention education draws on multiple disciplines, including but not limited to STEM, and students' lived experiences.[19] Many students lack access to invention education because "[f]ederal education standards in K–12 continue to emphasize instruction that maintains disciplinary silos. School finance mechanisms, K–12 accountability standards, and college entrance requirements reinforce the siloed, linear approach to teaching and learning found in today's schools" and make it difficult to implement invention education.[20]
  - Access to STEM education is also important for developing technical skills and interest in patent-intensive fields. In light of evidence that children who are not exposed to STEM before middle school are less likely to pursue STEM careers, STEM education in primary and secondary schools can play an important role in inspiring diverse students to pursue these fields.[21]
  - It is important to note that disparities in STEM education are only part of the reason for the patent gaps. From 1977 to 2010, the percentage of STEM degrees awarded to women increased from 20.2 percent to 33.5 percent.[22] Yet this increase in STEM-educated women has not led to greater equity in patenting. According to the Institute for Women's Policy Research (IWPR), "[W]omen's representation in key patent-intensive STEM fields (such as engineering) may play an even larger role than women's representation in STEM overall."[23] Thus, even as women earn a higher share of STEM-related degrees, it is critical to continue encouraging members of underrepresented groups to pursue careers in patent-intensive fields.

- **Social Networks and Mentorship**: Social networks and mentorship play significant roles in encouraging patenting. Social networks are key to helping inventors "evaluat[e] whether it would be worthwhile to pursue a patent" in the first place since an inventor is likely to first seek advice from his or her own peers.[24] Moreover, the relative "exclusion from STEM fields" of women, people of color, and other underrepresented groups has led to limited available mentorship opportunities and networks.[25] Because inventors tend to seek mentors who share similar backgrounds, and there are fewer women and people of color in positions to act as mentors for inventors, it is harder for underrepresented inventors to find inventors to mentor them.[26]

- **Capital**: According to estimates, female founders receive only 1 percent of all venture capital (VC) funding, and Black founders receive less than 2 percent.[27] This massive

funding gap penalizes women inventors and inventors of color, who are less likely to receive venture backing for their ideas than their White, male counterparts. Funding—including federal funding—helps inventors research and develop their ideas, and eventually bring them to market. Patents are also important assets for attracting private investment capital in potential businesses. Disparities in patent rates, therefore, lead to disparities in investment rates, and vice versa.

- **Workplace Culture**: Discrimination against women, people of color, and other underrepresented groups in the workplace, cultural inertia in academia and industry, and unconscious bias from gender and racial stereotypes all contribute to the patent gaps.

SBIR/STTR POLICY RECOMMENDATIONS

One of the ways the federal government helps to expand participation in innovation is by funding research and development with the potential for commercialization. The SBIR and STTR programs enable small businesses to explore the potential of their inventions. This opportunity is critical for small business owners, particularly women and people of color, without equitable access to other investment capital. Congress recognized this when it established the programs, and as Congress prepares to reauthorize the programs, it should consider new policies to continue to advance the SBIR/STTR program goals. To ensure innovation funding is allocated equitably and projects are commercialized, we recommend the following:

- ***Expand Outreach to Underrepresented Populations***
  - Congress should require that the SBA and all SBIR/STTR participating agencies develop outreach and education programs focused on expanding the participation of underrepresented populations.
  - Building on the success of the SBIR Road Tour and Regional SBIR Weeks, these programs should include a regular "road tour" of SBIR/STTR program managers to minority-serving institutions, such as Historically Black Colleges and Universities, and other organizations that serve underrepresented entrepreneurs.
  - SBA and SBIR/STTR participating agencies should recognize diverse awardees in success stories and other public communications.

- ***Provide Greater Assistance for First-time and Underrepresented Applicants***
  - First-time and underrepresented SBIR/STTR program applicants at all participating agencies should receive "Phase 0" assistance similar to the support offered by the Department of Energy.
  - SBA could administer this assistance to support agencies with smaller budgets and fewer program personnel.

- ***Engineer Bias Out of the Application Process***
  - For a more equitable application review, participating agencies should increase the diversity of application reviewer pools and conduct blind reviews of technical merit sections of applications when feasible.
  - The National Academy of Science should study the SBIR/STTR program application and appeals processes, including the demographics of SBIR/STTR program applicants and awardees, to identify potential biases or barriers to participation and ways to mitigate them.

- ***Pass the RAMP for Innovators Act***
  - SBIR/STTR awardees should receive assistance with commercializing their projects. Congress should pass, and the President should sign, the bipartisan, bicameral Research Advancing to Market Production (RAMP) for Innovators Act.[28] The RAMP for Innovators Act would require each participating agency to designate a Technology Commercialization Official to help awardees commercialize their projects and to conduct an annual commercialization impact assessment. It would also improve the flexibility of technical and business assistance, which may be used for IP protection, and require the SBA and USPTO to enter into an interagency agreement to help awardees with IP protection.

* * *

Thank you for the opportunity to submit this statement. Invent Together looks forward to continuing to work with the Subcommittee to improve diversity and inclusion in the SBIR and STTR programs.

[1] *See About*, SBIR/STTR, https://www.sbir.gov/about.
[2] *See* P.L. 115-273, the Study of Underrepresented Classes Chasing Engineering and Science Success (SUCCESS) Act, which required the USPTO to study and report on the available data on the number of patents applied for and obtained by women, minorities, and veterans, and to provide legislative recommendations for how to increase the participation of women, minorities, and veterans in patenting and entrepreneurship activities.
[3] *See* the Inventor Diversity for Economic Advancement (IDEA) Act, S. 632/H.R. 1723, 117th Cong. (2021), which would direct the USPTO to collect inventors' demographic data on a voluntary basis and make this information available in the aggregate for research.
[4] The USPTO announced within the SUCCESS Act report that they would create a council for innovation inclusiveness. In September 2020, the USPTO launched the NCEAI, comprised of representatives from industry, academia, and government, to help the USPTO develop a comprehensive national strategy to build a more diverse and inclusive innovation ecosystem by encouraging greater participation in invention and patenting by underrepresented groups. The NCEAI has also solicited input from stakeholders and plans to release the national strategy in the summer of 2021. *See National Council for Expanding American Innovation*, USPTO, https://www.uspto.gov/initiatives/expanding-innovation/national-council-expanding-american-innovation (last visited Jun. 22, 2021).
[5] USPTO, PROGRESS AND POTENTIAL: 2020 UPDATE ON U.S. WOMEN INVENTOR-PATENTEES 2 (2020), https://www.uspto.gov/sites/default/files/documents/OCE-DH-Progress-Potential-2020.pdf.
[6] Jennifer Hunt et al., *Why Don't Women Patent* 1 (Nat'l Bureau of Econ. Research, Working Paper No. 17888, 2012), https://www.nber.org/papers/w17888.
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[10] *See* Alex Bell et al., *Who Becomes an Inventor in America?*, at 34.
[11] *See* Lisa D. Cook, *Economic and Social Implications of Racial Disparities* (Jun. 8, 2020), https://bcf.princeton.edu/wp-content/uploads/2020/11/Combined-Slides-10.pdf.
[12] Joan Farre-Mensa et al., *What is a Patent Worth? Evidence from the U.S. Patent "Lottery"* 3 (Nat'l Bureau of Econ. Research, Working Paper No. 23268, 2018), https://www.nber.org/system/files/working_papers/w23268/w23268.pdf.
[13] ALEX BELL, COMMENTS BEFORE THE USPTO, SUCCESS ACT HEARINGS 7 (2019).
[14] *See* Alex Bell et al., *Who Becomes an Inventor in America?*, at 17–18.
[15] *Id.* at 1.
[16] ALEX BELL, COMMENTS BEFORE THE USPTO, SUCCESS ACT HEARINGS, at 8.
[17] STEPHANIE COUCH ET AL., RESEARCHING INVENTION EDUCATION: A WHITE PAPER ("RESEARCHING INVENTION EDUCATION") 1 (2019).
[18] *3 Questions: Stephanie Couch on Invention and Inspiring Young People to Pursue STEM Education*, MIT NEWS, https://news.mit.edu/2016/stephanie-couch-inspiring-young-people-to-pursue-stem-education-0601 (last visited Apr. 20, 2021).
[19] *See* STEPHANIE COUCH ET AL., RESEARCHING INVENTION EDUCATION, at 2.
[20] *See id.* at 57.
[21] *See* Talia Milgrom-Elcott, *STEM Starts Earlier Than You Think*, FORBES (Jul. 24, 2018), https://www.forbes.com/sites/taliamilgromelcott/2018/07/24/stem-starts-earlier-than-you-think/#1fbc0938348b.
[22] IWPR, EQUITY IN INNOVATION, at 8.
[23] *Id.* at 8.

[24] *Id.* at 22.
[25] *See id.* at 23.
[26] *See id.* at 22.
[27] *See, e.g.*, Emma Hinchliffe, *Female Founders' Share of Venture Capital Funding Shrank to 2.2% in 2020*, FORTUNE (Feb. 8, 2021), https://fortune.com/2021/02/08/female-founders-venture-capital-funding-2020/; James Norman, *A VC's Guide to Investing in Black Founders*, HARV. BUS. REV. (Jun. 19, 2020), https://hbr.org/2020/06/a-vcs-guide-to-investing-in-black-founders.
[28] S. 2127/H.R. 3839, 116th Cong. (2019); *see also* H.R. 652, 117th Cong. (2021).