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DRIVING JOB GROWTH: SMALL BUSINESS INNOVATION AND RESEARCH

FIELD HEARING

BEFORE THE

COMMITTEE ON SMALL BUSINESS AND ENTREPRENEURSHIP UNITED STATES SENATE

ONE HUNDRED THIRTEENTH CONGRESS

SECOND SESSION

APRIL 24, 2014

Printed for the Committee on Small Business and Entrepreneurship

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DRIVING JOB GROWTH: SMALL BUSINESS INNOVATION AND RESEARCH

THURSDAY, APRIL 24, 2014

UNITED STATES SENATE,
COMMITTEE ON SMALL BUSINESS
AND ENTREPRENEURSHIP,
Seattle, WA.

The Committee met, pursuant to notice, at 9:30 a.m., in the Microsoft Lakefront Pavilion, Museum of History and Industry (MOHAI), Hon. Maria Cantwell, Chairman of the Committee, presiding.

Present: Senator Cantwell (presiding).

OPENING STATEMENT OF HON. MARIA CANTWELL, CHAIRWOMAN, AND A U.S. SENATOR FROM WASHINGTON

Chairwoman CANTWELL. Good morning. This is the Small Business and Entrepreneurship Committee hearing entitled Driving Job Growth: Small Business Innovation and Research. We have a very distinguished panel of witnesses here today, and I thank all of them for being here.

I am very pleased that Administrator Maria Contreras-Sweet, the new Administrator of the Small Business Administration, is here to join us to participate in this hearing about how innovation and job creation is happening in Washington State.

This hearing, for me, is part of a two-week listening tour around Washington State, including a field hearing that we had last week in Vancouver, Washington, on access to capital; a contracting and innovation discussion in Pasco that was led by the Department of Energy on how to get small businesses to be a larger part of the small business contracting program; and tomorrow I will be with the ranking member of the committee, Senator Risch, in Spokane and Idaho to talk about the STEP program, a program administered by the Small Business Administration on small business exports.

After this hearing, Administrator Sweet and I are going to the Oso-Darrington-Arlington SR–530 corridor to talk about disaster assistance. And I want everyone in the Puget Sound area in Washington State to know that upon her confirmation, the very first thing the administrator said to me is, "I want to go to the Oso-Darrington area and make sure we're doing everything we can as a nation to help that community."

So I thank you for that and your willingness to be here in Puget Sound.

When she said she would come and do that, we also thought of all the many things that we could ask her to do while she is here. But nothing could be more important following the Oso-Darrington visit than to talk about the innovation economy and how much the perspective of entrepreneurs here can help us shape the direction of our country.

Everyone knows that Seattle is the hub of innovation, and there's no place like right here at MOHAI to look at that innovation. We're here today to talk about how small business integrates the key tools to help innovate, in particular, the SBIR program, the Small Business Innovation Research Program, that requires that federal agencies with large external research and development budgets set aside a percentage of that funding specifically for small business.

That funding is used by these innovators to confront and address the challenges facing our nation, anything from medical diagnostic tools to advanced polymers for energy research. And this program, in 2012, amounted to over $2 billion in investment in small businesses across the United States.

The Small Business Technology Transfer Program is similar. It also focuses on stimulating partnerships between businesses and nonprofit institutions. So I'm sure we'll hear a little bit about that today. But when we think about these programs here in the Pacific Northwest, you know that we have been successful.

Beginning with a modest SBIR investment through the Health and Human Services Department in the early 1990s to explore commercial potential for an electronic toothbrush, Optiva created what we all know now as Sonicare. The original six employees grew to more than 600, and when it was sold in the year 2000 to Philips, annual sales were $175 million. So we can say that the SBIR program was a big success.

Small business and innovation ideas have led to many other successes here in the Northwest. Today, we're going to hear from two of those companies. One is Aculight, which used an SBIR defense investment to develop technology to avoid heat-seeking missiles and commercialized it and grew a firm of six employees to more than 100. And we're also going to hear from Stasys, a medical device company using SBIR, and UniEnergy Technologies, which wants to use SBIR to help facilitate their growth.

So these opportunities are what has helped us here, along with the University of Washington and their Center for Commercialization. So we're glad they're here to give us a global perspective on that, as well as Intellectual Ventures to give us a larger perspective on what we need to do to further stimulate the innovation economy.

Obviously, we have some challenges we have to face. Today, the Government Accountability Office will discuss a recent report which sheds light on the fact that eight out of the 11 federal agencies participating in the program didn't consistently comply with the obligations for small business research. In fact, the agency found that overall use of the program fell $80 million short of the small business investment goal between 2006 and 2011.

So I know that the administrator and I agree that there's more to be done here to make sure that we are getting research dollars

out to help small businesses create new jobs. That will be part of our discussion today.

I know that we have many things to be thankful for. We're also going to hear from businesses who are in the process, or should I say want to make sure that the SBIR program works for them as well, particularly in the area of energy, which is an access to capital issue for many new job creation activities here in the Puget Sound area on clean energy products and services. So we certainly take to heart what the Government Accountability Office says about making sure all agencies, including the Department of Energy, meet their goals in small business research.

So with that, I'm going to turn it over to Administrator Contreras-Sweet. She's already had bestowed upon her the advent of bringing this great sunshine with her.

So we're very glad you're here, and thank you for coming to the Pacific Northwest.

[The prepared statement of Chairwoman Cantwell follows:]

Statement for Sen. Maria Cantwell

In 2009 MicroGREEN won a Small Business Innovation Research grant from the National Science Foundation totaling $650,000. The focus of the grant was to fund research to develop new manufacturing techniques and applications to commercialize using our novel microcellular material with recycled plastics. The goals were fully met and further enhanced our ability to innovate in the coffee cup market.

The SBIR grant helped reinforce the decision of many of our early investors, giving them confidence in the MicroGREEN vision, as well as attracting new investors that saw the potential of our transformational technology. The SBIR grant was a foundational element, helping us conduct research into commercializing InCycle™ products and providing more jobs in our local community, Arlington, WA.

Our current product, the InCycle cup, is a unique, lightweight hot cup made from recycled plastic beverage containers. The information gained in the research undertaken with the help of SBIR helped lead us down the quickest path to commercial success, and was instrumental in helping us choose the inks and processing that would not hinder InCycle cup's recyclability.

In the past year we have created more than 100 living wage manufacturing jobs in Arlington, WA. Our employees feel they are a part of something larger than simply earning a living, by helping create disruptive innovation that is better for the planet. This is illustrated through our being named by *Seattle Business Magazine* as one of the "Best Places to Work in Washington". This award is just one of the notable awards MicroGREEN has recently won including the DuPont Award for Packaging Innovation, the Foodservice Packaging Institute's award for performance improvement and another for sustainability, the Green Washington Award, and we are a finalist for the Edison Green Award which will be awarded next week. All of this recognition parallels our massive growth in demand. We currently supply some of the world's largest airlines, with significant customers waiting in the wings. As we grow to meet this demand we intend to hire another 100 employees in the upcoming months.

We are proud to make InCycle cups in Washington, working to create an innovative and updated recycling infrastructure that is accepting of new materials. We believe that by employing creativity, innovation and sound entrepreneurship practices, we can be a part of the resurgence of American manufacturing. By creating demand, and thinking through the entire life cycle of our products as we create them, we can act as a model for other job creation engines as we enhance our domestic recycling infrastructure.

STATEMENT OF MARIA CONTRERAS-SWEET, ADMINISTRATOR, U.S. SMALL BUSINESS ADMINISTRATION, WASHINGTON, DC

Ms. CONTRERAS-SWEET. Thank you so much. Thank you, Chairman Cantwell, for convening this hearing and for your outstanding leadership in the United States Senate, not only for America's innovators but for the great state of Washington and our entire country, indeed. When we think and remember and respect the fact that one in two of our people work for a small business and two out of three new jobs are created by small businesses, we're delighted that you are now at the helm of the United States Senate Committee on Small Business. Congratulations once again.

And thank you to the good folks at MOHAI. What a beautiful site and how appropriate to have this hearing.

I'm just pleased to be here in the state of Washington. You have been a laboratory for how to create high-tech, high-paying jobs of the future. From software to aviation to manufacturing, this beautiful evergreen state is showing the world, indeed, what the 21st century economic leadership looks like.

At the SBA, I look forward to working with you to help create more success stories like these here in Seattle. But nationwide, across every field of innovation, the Small Business Innovation Research Program, along with the STTR programs, have awarded 145,000 grants totaling more than $35 billion to America's small businesses. In 2012, these programs put over $2.5 billion directly into the hands of small businesses.

SBIR and STTR are true gems, and nowhere is that more evident than here in the great state of Washington. We are pleased to report that over the last decade, more than 1,100 small businesses have received 1,800 grants totaling $629 million. Since the programs' inception, Washington's small businesses have received a total of more than $1 billion under these two programs alone to spur innovation.

Additionally, the University of Washington, Washington State University, and Gonzaga University have all participated. Since 1998, small businesses working with these schools, these universities, have received more than 250 STTR grants totaling $70 million. These programs have created many success stories throughout the state.

The SBIR, for example, helped Hummingbird Scientific in Lacey become a global leader in the design of electron microscopes. Their achievements have helped scientists do amazing work in fields like 3–D mechanical design, complex circuitry, and software development. They have gone from a four-person team to employing 25 professionals at their facility in Lacey.

Just up the road, SBIR supported Micronics in Redmond. This company patented new technology that lets health professionals perform medical tests on the spot and get results in minutes versus having to go to a lab and wait hours. And when we're talking about medical situations, life-altering situations, we know that minutes mean life.

Madam Chairwoman, these are just two of the successes made possible by one of the federal government's most powerful and effective programs. I want to take a moment to thank you again for your leadership in passing a six-year reauthorization of the SBIR

and STTR programs in 2011. This long-term reauthorization provided certainty and stability for the small business community and included a number of improvements to the programs.

Our work to foster innovation through SBIR and STTR is an important part of SBA's core mission to ensure that entrepreneurs have access to capital, to counseling, and contracting opportunities. And, of course, while we don't wish this on anybody, and we lament the grim situation that we're confronted with here in Oso, we also, as you know, provide disaster assistance in times of emergency.

I'm also focused on exploring new opportunities to expand our exports, because we know that where there is global demand for cutting edge products and opportunities that are made here in Seattle's high-tech corridor, we want to make sure that you're able to sell them abroad.

I look forward to this opportunity to listen to you all today. I share your strong commitment to innovation, and through SBIR, I think we can work more closely together. I look forward to working with you to help our high-tech entrepreneurs create excellent jobs, high-paying jobs, economic growth, and a better world for all Americans, including you.

Thank you so much.

[The prepared statement of Ms. Contreras-Sweet follows:]

U.S SMALL BUSINESS ADMINISTRATION
WASHINGTON, D.C. 20416

TESTIMONY of

MARIA CONTRERAS-SWEET
Administrator, U.S. Small Business Administration

BEFORE THE

Senate Committee on Small Business and Entrepreneurship
April 9, 2014

Chairwoman Cantwell, Ranking Member Risch and distinguished Members of this Committee, I'm delighted to have this opportunity to testify before you in my new capacity as SBA Administrator.

I want to thank Members of this Committee for all your guidance and support during my confirmation process. I have been struck by the passion and high level of policy engagement you and your staffs have displayed on critical issues affecting America's small businesses. I'm truly looking forward to working with you in the months ahead.

As you know, until last week, I was a small business owner whose small business was lending capital to other small businesses. I do believe this background gives me a keen understanding of the challenges faced by both entrepreneurs and the banks who lend to them.

It is my strong belief that supporting small business is the ultimate bipartisan issue, and I'm energized by this chance to work together to assist the entrepreneurs who often risk everything to create good jobs and a stronger economy in America.

Chairwoman Cantwell, I'd like to open by offering my thoughts and prayers to the families in Oso and Darrington. I want you to know that my first meeting on my first day at the SBA was with my disaster relief team to discuss our response to this tragedy.

Our team has been on the ground since last week coordinating closely with FEMA. The presidential disaster declaration means we are able to make all of our tools available, including business loans, economic injury loans and home loans. All of us at the SBA are committed to doing everything in our power to be a resource for those affected by this terrible natural disaster.

Disaster assistance continues to be a priority in our Fiscal Year 2015 budget. Last year, we assisted more than 46,000 businesses and individuals through $2.8 billion in disaster loans. Once again, we're requesting full funding for disaster loan assistance as we continue to make process reforms to help ensure that homeowners, renters, and businesses have access to rapid SBA assistance when they need us the most.

For FY15, the SBA is requesting an appropriation of $710 million, plus an additional $155 million for our disaster assistance program. This funding level will allow the SBA to fulfill our core mission of helping

America's small businesses access capital, contracts, counseling and disaster aid.

It would enable us to support loans totaling $36.5 billion over the next year and help us facilitate access to $80 billion in federal contracts for small businesses, which are too often shortchanged in our procurement processes.

Additionally, it would allow us to work with our resource partners to counsel and train more than one million small business owners, so they can grow their companies and create more middle class jobs. To that end, we're seeking full funding for our Small Business Development Centers, our Women's Business Centers, our Veteran's Business Outreach Centers and our national network of SCORE chapters and volunteer mentors.

We've dramatically reduced our subsidy for the 504 loan program down to $45 million, and for the second year in a row, the SBA is requesting no credit subsidy for the 7(a) loan program. Overall, our FY15 request represents a $64 million reduction because of the subsidy decrease. This is due to an improving economy as well as the agency's diligence in ensuring that we are backing good loans to responsible borrowers.

Our borrowers report that these two lending programs – 7(a) and 504 – together have supported more than 650,000 jobs.

We're requesting $4 billion in authority for our Small Business Investment Company Program. This streamlined program is operating as a model public-private partnership, with its fourth straight record-breaking year in FY2013. Our request would help our most successful SBIC fund managers grow this program from within and ensure more high-growth businesses have access to the capital they need.

We're also requesting authority to extend 504 Refinance lending. 504 Refi supported $5.5 billion in lending over two years when it was originally authorized, but it expired at the end of FY12. This is a zero subsidy request, meaning we project no taxpayer cost to extend this very successful program.

Our budget also ensures that our transitioning military veterans come home to new opportunities to grow the American economy as entrepreneurs. I am committed to this cause. In fact, on my very first day at the SBA this week, I met with a group of these heroes who've started their own businesses.

Each year, more than 250,000 service members transition out of the armed forces. Our Boots to Business program allows them to continue to serve their country as job creators. We're requesting $7 million to meet the Department of Defense's request to train transitioning service members at more than 200 installations worldwide. We're also making it easier for veterans to access capital by reducing or eliminating their fees on certain SBA loans.

We're prioritizing Entrepreneurial Education, so successful small businesses can become medium and large businesses that create more jobs. This initiative builds on the success of our Emerging Leaders program to teach the fundamentals of business, how to get into a supply chain, and how to compete for contracts. To date, two out of three companies that have been through this program have increased their revenue; three out of four have hired new employees; and nearly half have secured government contracts. We're requesting $15 million to expand a program with proven results.

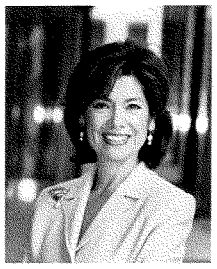
As someone whose family came to this country from Mexico at age 5 with few resources but an abundance of hope, I believe the SBA must redouble its efforts to ensure our customers represent the diversity of this great nation. That means getting more small-dollar loans out the door that can lift up entire underserved communities. So once again, the SBA is setting fees to zero for 7(a) loans under $150,000.

Being a former lender, I also understand the transformative power of technology to simplify the lending process. We've already made great strides in this area in our disaster loan assistance. This budget will utilize technology to help us reform the process for working with our lenders. Our new SBA One program will roll out later this year. It will create a streamlined, online lending application that will make it much easier for banks to offer our products, make more SBA loans —particularly smaller loans — to Main Street businesses.

Finally, the SBA continues to focus on rooting out waste, fraud, and abuse in our contracting and lending programs. Since 2008, SBA has suspended and debarred more companies and individuals for abusing SBA programs than in the previous 10 years combined. Under my leadership, we will have a zero-tolerance policy for these types of abuses. I am personally committed to ensuring that federal dollars go to deserving small businesses that play by the rules.

Once again, thank you for this opportunity to testify. I look forward to working closely with members of this committee and your staffs to ensure that the SBA carries out our critical mission of helping small businesses grow their payrolls, their profits and, in turn, the American economy. I am happy to take your questions.

Biography of Maria Contreras-Sweet



Maria Contreras-Sweet became the 24th Administrator of the U.S. Small Business Administration and a member of President Obama's Cabinet on April 7, 2014.

Contreras-Sweet is a successful entrepreneur, business executive, and state cabinet official. Throughout her career in the public and private sector, she has been a champion of diversity, access to capital and equal opportunity for all Americans.

Prior to her arrival in Washington, Contreras-Sweet founded ProAmérica Bank, the first Latino-formed commercial bank in California in more than 35 years. As the bank's executive chairwoman, she focused on providing access to capital and counseling to small- and mid-size businesses in Los Angeles. She previously started Fortius Holdings, LLC, a venture capital firm that invested in small businesses.

Contreras-Sweet was the first Latina to hold a state cabinet post in California. As Secretary of Business, Transportation and Housing Agency, she managed 13 departments, including Caltrans, the California Highway Patrol, the Department of Motor Vehicles and the Department of Financial Institutions. She managed a $14 billion budget and a workforce of more than 42,000 employees during her five-year tenure. She led in the creation of the state's Department of Managed Health Care and its Office of Patient Advocate and in the implementation of a $2.1 billion housing bond that stimulated the state's economy. During California's energy crisis, she chaired the finance committee of the state's electrical power grid, CA-ISO, helping to stabilize the state's volatile energy market.

Contreras-Sweet entered the private sector as the director of public affairs for Westinghouse's 7-Up / RC Bottling Company. She rose to vice president and later became an equity partner in the company.

Contreras-Sweet was a founding director of The California Endowment, a multi-billion dollar philanthropic health foundation. She was appointed by the United States Senate to serve on the Federal Glass Ceiling Commission, created to help break down barriers between women and the executive suite. In 1989, Contreras-Sweet founded Hispanas Organized for Political Equality (HOPE), a nonprofit, nonpartisan advocacy organization dedicated to encouraging Latinas to engage more fully in the democratic process.

Born in Guadalajara, Mexico, Contreras-Sweet is a first-generation immigrant who came to America at age 5 with her mother and five siblings. She is married to Ray Sweet, and they have three children and a granddaughter.

Chairwoman CANTWELL. Well, thank you, Administrator.

We will start with our witnesses, and we're going to just go right down the line. So if you'll introduce yourself along with your testimony, we appreciate it, and we'll do questions with all of you at the end of everyone's testimony.

STATEMENT OF ROB AFZAL, LOCKHEED MARTIN ACULIGHT, BOTHELL, WA

Dr. AFZAL. Thank you, Administrator Contreras-Sweet and Senator Cantwell, for inviting me down.

Chairwoman CANTWELL. You might pull that a little closer.

Dr. AFZAL. Is that better?

Chairwoman CANTWELL. Yes.

Dr. AFZAL. My name is Robert Afzal, and I'm a senior technical fellow at Lockheed Martin Aculight Corporation and formerly the Vice President of Research and Development at Aculight Corporation in Bothell, Washington.

In 1994, Aculight Corporation was founded by five scientists after being laid off from another company following the fall of the Berlin Wall and the end of the Strategic Defense Initiative Program, or at least its reduction in funding. Not wanting to leave the beautiful Pacific Northwest, they started a company to focus on research and development on lasers for aerospace and defense but with an eye towards one day commercializing their laser technology.

They started off by doing studies and analysis and slowly but surely their business grew as they continued to secure contracts from the United States government and from the prime aerospace corporations. As they hired more scientists, engineers, and technicians, they secured more contracts and were able to establish development laboratories to build hardware and prototypes to validate their ideas.

Their core business was creating and generating new ideas in lasers and electro-optics to be demonstrated in experiments and prototypes to serve the United States government and prime contractors. They were able to focus their core laser technology to the applications for infrared counter measures, which is the defeat of heat-seeking missiles; 3–D airborne lidar mapping to generate high resolution maps for geospatial information systems; and for directed energy lasers for our next generation weapons capability. These are still core applications that we are working today.

The SBIR program played a crucial role in the development of Aculight and the development of the technology in two tangible ways. First was the SBIR call for topics. This was a way for the United States government departments to communicate their needs so that small, innovative businesses could bring their ideas forward and establish relevancy.

This method helps ensure the innovative ideas brought forward are related to the national need. Second and most importantly, it provided the funding to develop the ideas further, and in the cases of Phase II and Phase III, funding to demonstrate the ideas in tangible proof of concept demonstrations.

Although the SBIR Program did not provide sufficient funds to fully develop a product for production, it did enable the product to

be developed to a point where the risk of product development was significantly reduced for further investment paths such as equity capital or partnerships with larger corporations. That said, at Aculight, there were two examples of how SBIR programs led directly to products that were developed and sold to the market.

First, leveraging an Air Force SBIR for pulse fiber lasers for target identification, Aculight was able to develop and sell a similar laser for the airborne laser mapping market. These lasers are sold throughout the world and are helping generate foundational data for geospatial information systems used today. Second, leveraging an SBIR from the Missile Defense Agency, Aculight developed a product which is still being sold to universities and research labs worldwide for groundbreaking scientific research in the area of spectroscopy, including some of the Nobel Prize winning labs.

As successful as those examples are, as Aculight continued to mature its concepts and technology, its targeting for acquisition by Lockheed Martin is an even larger measure of its success. In September of 2008, Lockheed Martin acquired Aculight, and now the innovative small company has the strength and resources to bring those ideas and technology to bear to address our pressing national needs.

We have continued to develop and advance those core technologies, but now have the opportunity to bring them to support our warfighters. At that time, Aculight was 85 people and has now grown to over 120 locally, and we are continuing to hire.

Lockheed Martin has brought in many tens of millions of dollars in contracts that are feeding the economy for jobs in Washington State, but also supporting work at other Lockheed facilities throughout the country. Now, as a prime, we are looking back into the SBIR program and looking at those new small innovative businesses developing the next generation of solutions that we can one day utilize.

The SBIR program helped enable our growth. It provided a playing field where small innovative companies could respond to national needs and where the marketplace of ideas can bear them out. It provides an additional funding pathway that's not tied to equity investment and, more importantly, has the patience to advance technology with a somewhat longer time scale.

Thank you very much.

[The prepared statement of Dr. Afzal follows:]

Driving Job Growth: Small Business Innovation and Research

U.S. Senate Committee on Small Business & Entrepreneurship

Field Hearing
Museum of History and Industry (MOHAI)
Microsoft Lakefront Pavilion
860 Terry Avenue North
Seattle, WA 98109

April 24, 2014

Testimony of
Robert Afzal

Lockheed Martin Aculight

Hello. My name is Robert Afzal and I am a Senior Technical Fellow at Lockheed Martin Aculight Corporation and formerly the Vice President of Research &Development at Aculight Corporation in Bothell, WA.

In 1994 Aculight Corp. was founded by 5 scientists after being laid off from another company following the Fall of the Berlin Wall and the end of the SDI Program. Not wanting to leave the beautiful Pacific Northwest they started a company to focus on Research and Development on Lasers for Aerospace and Defense but with an eye to one day commercializing laser technology. They started off by doing studies and analysis and slowly but surely their business grew as they continued to secure contracts from the US Government and from the Primes. As they hired more scientists, engineers and technicians, they secured more contracts and were able to establish development laboratories to build hardware and prototypes to validate their ideas.

Their core business was creating and generating new ideas in lasers and electro-optics to be demonstrated in experiments and prototypes to serve the US Government and prime contractors. They were able to focus their core laser technology to the applications for Infrared Counter measures (defeat of heat seeking missiles) 3-D airborne lidar mapping for generating high resolution maps for geospatial information systems and for Directed Energy Lasers for next generation weapons capability. These are still core applications we are working today.

The SBIR Program played a crucial role in the development of Aculight and the development of the technology in two tangible ways. First was the SBIR call for topics. This was a way for the US Government departments to communicate their needs so small innovative businesses could bring their ideas forward and established relevancy. This method helps ensure the innovative ideas brought forward, are related to a national need. Second and most importantly, it provided the funding to develop the ideas further and in the cases of Phase II and Phase III funding demonstrate the ideas in tangible proof of concept demonstrations. Although the SBIR Program did not provide sufficient fund to fully develop a product for production it did enable the product to be developed to a point where the

risk of product development was significantly reduced for further investment paths such as equity capital or from a large corporation funding. That said, at Aculight there we 2 examples of how SBIR Programs lead to Products that were developed and sold to the market. First, leveraging an Air Force SBIR for a pulse fiber lasers for target identification, Aculight was able to develop and sell a similar laser for the airborne laser mapping market. These lasers are sold throughout the world and are helping generate foundational data for Geospatial Information systems. Second, leveraging an SBIR from the Missile Defense Agency, Aculight developed a product which is still being sold to Universities and Research Labs world-wide for ground breaking scientific research in the area of spectroscopy including to Nobel Prize winning Research labs.

As successful as those examples are, as Aculight continued to mature its concepts and technology, its targeting for acquisition by Lockheed Martin is an even larger measure of its success. In September of 2008 Lockheed Martin acquired Aculight and now the innovative small company has the strength and resources to bring those ideas and technology to bear to address our pressing National needs. We have continued to develop and advance those core technologies, but now have the opportunity to bring them to support our warfighters. At that time, Aculight was 85 people and has now grown to over 120 and we continuing to hire. Lockheed Martin Aculight has brought in ten's of millions of dollars in contracts that are feeding the economy for jobs in Washington State, but also supporting work at other Lockheed facilities throughout the Country. Now as a Prime, we are looking back into the SBIR Program and looking at those new small innovative businesses developing the next generation of solutions that we can utilize.

The SBIR Program helped enable our growth. It provided a playing field where small innovative companies could respond to National needs and where the market place of ideas can bear them out. It provides an additional funding pathway that's not tied to equity investment and more importantly some patience in advancing technology with a longer development timeline.

Thank you.

Chairwoman CANTWELL. Thank you very much.

Mr. Barry.

STATEMENT OF ROBERT BARRY, CO-FOUNDER AND CEO, STASYS MEDICAL CORPORATION, KIRKLAND, WA

Mr. BARRY. Thank you for the opportunity to discuss SBIR and how it has helped companies like Stasys Medical. My name is Robert Barry. I'm the Co-Founder and CEO of Stasys Medical Corporation. I am also an entrepreneur in residence at the University of Washington. I have 25-plus years of medical device experience. I've worked for large companies like Pfizer and Boston Scientific, and I've also started three medical device companies here in the Seattle area.

I do have experience with SBIR grants, as well as private capital and seed funding, angel funding, and venture capital funding, most recently founding Stasys Medical Corporation, which was a spinout from the University of Washington, with two other co-founders, Dr. Nathan White, who is a trauma physician at Harborview here in Seattle, and Dr. Nate Sniadecki, who is a professor of mechanical engineering at the University of Washington.

The company was started on a clinical need, and that clinical need was brought to us by Dr. Nathan White, who works in the emergency room at Harborview and was frustrated by the fact that as patients showed up who were bleeding, it was difficult to determine if they had clot dysfunction, and, if so, why. There are tests that determine clot dysfunction, but those tests are lab-based tests, and they take quite a while, up to a half an hour to obtain. We all know that in trauma, 30 minutes is too long.

In working with Professor Nate Sniadecki at the University of Washington, Nate White was able to basically develop technology, microfluidic and micropost technology, that enabled measuring clot dysfunction within minutes. We are currently working on that technology. I would like to say that in the very beginning, as this technology was being developed, the Center for Commercialization, along with Coulter Foundation and the Life Sciences Discovery Fund, helped to support the initial development of the base technology.

Once that was done, we then formed a company, and that's when I became involved. Looking at the business opportunity, as I did due diligence on whether or not this was a viable commercial entity, there were several things that really struck me about this particular opportunity. It's a 510(k), which, if you're familiar with 510(k), means that the regulatory path is rather short. The reimbursement is in place with the current lab-based tests. So the time to get to revenue is also fairly short.

And, finally, the technology did not require a tremendous amount of capital, and yet there is the opportunity for several hundred million dollars per year of revenue. So it's a good business opportunity, and I think a high-growth potential for the Seattle community.

We have received an SBIR grant, Phase I NSF grant, for $150,000. We received that in January of 2014. We are currently applying for a Phase II grant for approximately $1 million and are hoping to obtain that. We think that the SBIR grant is crucial for us, and I say that having been in this industry for a long time and

having seen the decline in private capital wanting to invest in early medical device companies.

In fact, in the last five years, there's been over a 50 percent reduction in private capital for early medical device companies. That is why I feel that now, more than ever, the SBIR grants can help to fill that gap, to de-risk companies and help them develop to the point where then they can obtain the private capital in the Series A round, which then helps to really launch the project and the company quickly forward to become a provider of valuable jobs for the region.

Thank you.

[The prepared statement of Mr. Barry follows:]

TO: SENATE COMMITTEE ON SMALL BUSINESS AND ENTREPRENEURSHIP
FROM: Robert Barry, Co-Founder and CEO Stasys Medical Corp. Seattle, Washington
RE: Field Hearing - Driving job growth: Small Business Innovation and Growth 04-24-14

I. Introduction to Stasys Medical Corp and CEO Robert Barry

II. Stasys SBIR grant and how this is helping the company develop the product

III. Why the Stasys Medical device is important and has strong commercial appeal

IV. Why SBIR is important to Stasys and other companies

I would like to thank Senator Cantwell and her staff for the opportunity to discuss the importance of SBIR grants to small business growth in the Seattle region.

I. Introduction to Stasys Medical Corp.
Stasys Medical Corp. is a University of Washington Center for Commercialization spin-out. The company was incorporated in 2012 and is developing a device to solve the need to quickly measure and correct blood clotting dysfunction and stop bleeding after major trauma.

Stasys Medical Corp co-founders are Nathan White. MD, Emergency Physician at Harborview, a regional trauma center. Nathan Sniadecki, PhD, Professor of mechanical engineering at the University of Washington, and Robert Barry, Entrepreneur in Residence (EIR) at the University of Washington.

As an Emergency Physician at a major trauma center, Dr Nathan White deals first hand with the consequences of not having a timely measure for clot dysfunction. Nathan brought this need to Dr Sniadecki, an expert in the field of microfluidics and micropost technologies, to see if Dr Sniadecki's technology might be useful in rapidly measuring clot dysfunction. As anticipated, it was. From there, the project was brought to the UW Center for Commercialization where support for initial feasibility development, intellectual property protection, and project oversight were provided. As an EIR at UW, Robert Barry took interest in the project and after due diligence decided that this idea had many attributes that made it a viable commercial endeavor. Among a handful of attributes were: The device can have a meaningful impact on society with the possibility to save lives and reduce healthcare costs. It is a 510(k) device meaning its clearance by the FDA is based on predicate lab based devices, and this results in a short path to market. Also, reimbursement is already established and the market opportunity is in the hundreds of millions of dollars per year range. Certainly Stasys Medical Corp holds the promise of creating professional, impactful, high value jobs in the Seattle region in the coming years.

Robert Barry – Co Founder and CEO Stasys Medical Corp
Robert has over 25 years of multifaceted experience in the medical device industry. He started his career as an engineer and progressed through project management to executive management to founding and leading start-up medical device companies as CEO. Prior to co-founding Stasys Medical Corp. he founded Uptake Medical Corp. based on his technology for treating lung diseases. Robert lead Uptake Medical as CEO through seed funding and Series A funding from tier I Venture Capital firms. To date Uptake Medical has raised over $70 million dollars and is in the late stages of validation and early stages of commercialization. Robert also co-founded CoAptus Medical Corp and was instrumental in securing an agreement with Boston Scientific Corp. Robert built the product development department and team for Spiration Inc. as Director of Product Development (Spiration Inc. was acquired by Olympus in 2010). In addition to being an EIR at UW, is a screening member for the WINGS angel investment organization. Robert's experience includes working for Boston Scientific, Pfizer, Universal Medical Instruments, and Bausch & Lomb. He holds a Bachelor's degree in Engineering from Rochester Institute of Technology and has over 25 issued patents in the fields of cardiology, radiology, pulmonology and thoracic surgery.

Stasys Medical's SBIR grant and how this is helping the company develop the product
Stasys received a NSF SBIR phase I grant in Jan 2014. The goal of SBIR grants is to encourage small businesses to engage in R&D efforts that have the potential for commercialization, unlike many other academic focused government grants. Winning this competitive awards-based program is important to Stasys Medical as it allows early development of our commercial device outside an academic lab that would not be possible otherwise. Stasys Medical anticipates, and is counting on, an NSF phase II grant to further develop the product and de-risk the company as it drives towards series A funding in 2015.

III. Why the Stasys Medical device is important and has strong commercial appeal
Today, EMTs ,ER physicians, and surgeons often have to make decisions on treatment of bleeding for major trauma patients without valuable information that could save their lives. This occurs because the lab tests, which help the physician identify who has clot dysfunction and why, take too long to get. The resulting late recognition and treatment decreases survival. The early information gap regarding clot dysfunction also leads to sub-optimal blood transfusion strategies and unwarranted complications for patients. Finally, the guesswork that clinicians must rely on currently when treating bleeding trauma patients drives up costs to the patient, hospital, and healthcare system.

Since the Stasys device is intended to be hand-held and portable, it can be deployed in the field allowing for early pre-hospital treatment for hemorrhaging. This could help civilians as well as the men and women of our armed forces.

IV. Why SBIR is important to Stasys Medical Corp and other companies

Now more than any time in recent history, SBIRs play a vital role in the early funding of start-up companies. It is well documented that early investment in medical device companies from private capital is down. In fact, initial private capital financing including angel, seed, and Series A, has dropped by greater than 50% over the past 5 years. The drop in funding has been felt in two ways: a decrease in the average size of initial funding and number of companies being funded. Thirdly, the progress (or de-risking) required to obtain private capital has increased dramatically over the past five years. These three factors combined all point to a gap that must be filled in order to continue to build high growth potential small companies. Excellent programs like the center for commercialization at UW in conjunction with SBIR grants are critical to the future growth and economic health of the Seattle region.

Sincerely,

Robert Barry
EIR - UW Center for Commercialization
Co Founder and CEO
Stasys Medical Corp
425 591 7943

Chairwoman CANTWELL. Thank you very much.

Linden, welcome and thank you for your work at the university.

STATEMENT OF LINDEN RHOADS, VICE PROVOST, CENTER FOR COMMERCIALIZATION, UNIVERSITY OF WASHINGTON, SEATTLE, WA

Ms. RHOADS. Thank you. My name is Linden Rhoads, and I would like to thank Senator Cantwell and Ms. Contreras-Sweet for the opportunity to present today on behalf of the University of Washington.

I spent two decades as a technology entrepreneur and am now a Vice Provost at UW and lead the university's Center for Commercialization, known as C4C. I'm here to express gratitude for how the SBIR program is working to help one of America's leading public research universities really fulfill the promise of seeing our researchers' discoveries reach patients and society.

Over the past five years, C4C staff have helped UW startups win $20.5 million in SBIR–STTR grants, and we have another $10 million of proposals filed and pending. These grants provide a critical bridge to private investment for our university life science, materials, and technology startups.

C4C is more than tech transfer for the University of Washington. Five years ago, the university reorganized Tech Transfer into C4C to provide the greater assistance and functions, mentorship, talent recruitment, and, above all, of course, funding necessary if UW was really to emphasize spinout of startup companies around our innovations rather than rely on license to larger existing companies, which isn't always an available option, even if we wished that it were.

We have built an extensive ecosystem for innovation entrepreneurship around the UW, recruiting, by way of example, veteran entrepreneurs such as—to be entrepreneurs in residence such as Bob Barry, who just gave testimony. But talent is really not enough. So as part of our gap funding initiatives, I think we're unique as a university perhaps in providing a full time grant writer to help UW startup teams apply for SBIR and STTR grants.

In interrogating researchers who we thought should be eligible for this kind of support, we found that they didn't understand SBIR grants nearly as well as we might expect, despite the fact that their primary career is based on winning research grants. The process and focus of these proposals is different enough from those for basic research grants that C4C is able to provide real assistance to our researchers in pursuing these funding opportunities. And, as I said, over the last five years, we've provided direct assistance to our startups in winning over $20 million in SBIR and STTR, with great results.

The University of Washington is currently ranked number one in the nation for licenses executed annually. That's to startups and existing companies together. We were number one for the number of distinct innovations under license, so we don't only have one lucky technology that's being licensed hundreds of times. Probably, though, most importantly for our regional economy and our faculty, who care deeply about the opportunity to start companies around

their work, last year, we were suddenly among the top five universities in the United States for launching startups.

We launched 17 technology startups last year, and that was more than double UW's 10-year run rate of seven, on average. We are on track to launch another 17 this fiscal year which ends in just a few months—so a really big change with the support of SBIR.

C4C supported startups are qualitatively improved from the past. On average, they have larger target markets, customer validation, more experienced management, and they're more worthy of funding. But the reality is that they are still often painfully early in stage, and SBIR and STTR awards are often the only capital that makes it possible for university founders and outside talent to take that pivotal step, to decide to take the risk, and to convince their families to allow them, and alongside them take the risk of committing themselves to the risky endeavor of starting up a company, suffering the opportunity cost of dedicating themselves to the success of a new company.

I think the key aspects to UW's success in spinning out companies are, first and foremost, a world class research base; our expert commercialization staff, which includes this life science PhD grant writer; deep engagement of our business community, as well as our researchers and students; and gap funding.

A persistent challenge to technology startups in our region is this dearth of early-stage funding that I'm sure you hear about early and often. In Washington, the angel and venture communities mirror our industry, and they're strongest in software, in retail, and in e-commerce. There are sector specialized angel groups for clean tech and medical device that are increasingly active. But it is just so much harder to raise money in life sciences or material science, despite the fact that we have a proliferation of innovations in those areas at UW.

For startups in the life sciences, there is a painfully predictable valley of death between the point to which NIH will fund and the proof of concept that we all know investors require to risk their capital. For startups in a nascent sector, such as clean tech, where it's often unclear whether technology is proven to perform technically and scientifically and better for the environment, can compete on price in the marketplace. There's no carbon tax yet. In sectors where there is this much uncertainty, investors have a hard time understanding which investments won't be strategic philanthropy. Young companies really need SBIR grants to give them the time to make that necessary showing of venture worthiness.

I think the funding gap actually has many dimensions, and our startups and their investors try to formulate an overall funding plan. UW C4C has somewhat of a variety of funding entities and strategies to address the gap. Bob Barry mentioned a number of foundations that we actually work together with to provide a combined funding initiative, where we all grant in concert so that instead of spreading out money in such a dispersed way that no startups actually get over the line, we are making our bets collectively on the best opportunities.

However, while we have a significant budget at UW to provide up to $50,000 in commercialization grants and support while the project is inside the university, we took the extraordinary step of

a big effort that resulted in a venture fund, university affiliated, committed to—the W Fund, which I run for UW—committed to investing exclusively in innovation-based startups spinning out of the research institutions in Washington State.

I thought it was worth mentioning that even where a university has taken the step of raising its own affiliated venture fund, at least half of the W Fund investments—and I think more—went to SBIR recipients. So we were investing alongside companies that had the benefit of SBIR support.

SBIR provides what I call but-for non-diluted capital to our technology startups. Often, this SBIR award is the only capital that really enabled us to launch the company that led us to 17 companies last year. An SBIR or STTR award helps technology startup companies go on to raise private risk capital.

I've seen that angel investors see an advantage, not only in believing that there'll be a leverage effect on their own investment, because the money will take that company much further alongside federal money, and the runway for that company to make progress is that much more significant, but also they believe in the technical validation that an SBIR or STTR award provides.

Finally, it's occurred to me that to produce even more impact from investments in the SBIR and STTR programs, I'd love for us to think about a way where the federal government could give preference to those companies that don't plan to remain an R and D operation, but can demonstrate that they are actively pursuing private investment to fund growth and to reach patients in the marketplace. We have numerous examples of UW spinouts which I see as having fulfilled the promise of SBIR in that they leveraged your critical federal support to hire talent, but then went on to succeed in garnering risk capital and traction with development partners and customers.

Thank you.

[The prepared statement of Ms. Rhoads follows:]

Driving Job Growth: Small Business Innovation and Research

U.S. Senate Committee on Small Business & Entrepreneurship
Field Hearing
24 April 2014

Testimony of
Linden Rhoads
Center for Commercialization
University of Washington

Introductions

My name is Linden Rhoads, and I would like to thank Senator Cantwell and Ms. Contreras Sweet for the opportunity to present on behalf of the University of Washington today. I am Vice Provost of Commercialization and lead the university's Center for Commercialization, known as "C4C".

Over the past 5 years, we have helped UW start-ups win $20.5M in SBIR / STTR grants, with another $10M of proposals still pending. These grants provide an important bridge to private investment for young technology start-ups.

C4C is more than "tech transfer" for the University of Washington. Five years ago, we reorganized TechTransfer into C4C to address all aspects of the commercialization opportunity. We have built an extensive ecosystem for technology entrepreneurship around the UW.

The University of Washington is #1 in the nation for licenses executed annually, #1 for innovations under license, #2 in total active licenses, and now Top-5 in launching start-ups.

We launched 17 technology start-ups last year, doubling UW's previous performance, and we are launching another 17 this year.

These start-ups are healthier – stronger leadership, better resourced, more focused, more *fundable*. Gap funding, including SBIR and STTR awards, are essential resources.

The key aspects to our success are:

- First and foremost, a world-class research base;
- expert staff;
- deep engagement of the business community, of researchers, and of students;
- and gap funding.

Gap funding – general need

A persistent challenge to technology start-ups in this region is to find early stage funding. In Washington State, the angel and venture communities are strongest in IT, in retail, and in e-commerce. There is some angel money in clean tech. It is much harder to raise money in life sciences or material science.

For start-ups in the life sciences, there is just a very predictable valley of death between what NIH will fund and the proof-of-concept that investors need. For start-ups in a nascent sector such as clean tech, it's unclear whether technologies that are useful and better for the environment can compete on price in the marketplace, until there is a carbon tax for example. In sectors where there is so much uncertainty, investors have have a hard time understanding which investments aren't strategic philanthropy.

The funding gap actually has many stages within it, and our start-ups and their investors need to see the overall funding plan, both upstream and downstream. We have been bringing together a variety of funding mechanisms to address all stages of the gap, from earliest exploratory funds while the project is still inside the UW, to the W Fund, a $20M angel fund committed to investing in technology start-ups spinning out of the research institutions in Washington State.

As part of our gap funding initiatives, we provide a grant writer to help UW start-up teams apply for SBIR and STTR funding. The process and focus of these proposals is different enough from R01 research proposals, that we are able to provide real assistance to the researchers in pursuing these funding opportunities. Over the last five years, we have provided direct assistance to our start-ups in winning $20.5M in SBIR and STTR awards.

SBIR / STTR and the gap

These grants provide non-dilutive capital to our technology start-ups. Often an SBIR award is the earliest capital that enables the technical team to launch the company.

An SBIR or STTR award helps technology start-up companies to raise private investment. Angel investors see an advantage not just in the leveraged funding, but also in the technical validation that an SBIR or STTR award provides.

To produce even more impact from its investments in the SBIR and STTR programs, the federal government could give preference to those companies that are pursuing private investment. We have numerous examples of UW spin-outs which fulfilled the promise of SBIR, by leveraging those grants to hire talent, bring on risk capital, and gain traction with development partners and customers.

Chairwoman CANTWELL. Thank you very much.

Adriane, welcome.

I'm sorry about the microphones here, so thank you for everybody sharing.

STATEMENT OF ADRIANE BROWN, PRESIDENT AND COO, INTELLECTUAL VENTURES, BELLEVUE, WA

Ms. BROWN. My name is Adriane Brown. On behalf of Intellectual Ventures, I would like to thank Senator Cantwell and the Senate Committee on Small Business and Entrepreneurship for the opportunity to speak today on the subjects of innovation, job growth, the invention economy in the Pacific Northwest, and how government can best support innovation. I'd also like to welcome Administrator Contreras-Sweet to our region and thank her for her leadership. Your combined commitment to fostering our region's iconic and dynamic high-tech economy is extraordinarily important.

I'd like to briefly introduce Intellectual Ventures and our work to the committee and make three points about the invention economy based on our experience. Intellectual Ventures is an invention capital company and is the global leader in the business of invention. We believe ideas are valuable, and we're not alone. According to the U.S. Commerce Department, IP-intensive industries currently contribute more than $5 trillion per year or nearly 35 percent of the U.S. GDP.

Our mission is to energize and streamline the invention economy in a manner which allows us to generate a return on our invested capital, and which should also allow others to be motivated to invest their capital into the invention economy in expectation of earning a return as well.

My first point: We recognize the value of feeding the invention economy and encourage the committee to support a variety of business models that fuel the marketplace of invention. Intellectual Ventures manages more than $6 billion in committed capital and has paid more than $720 million to startups and small businesses, as well as more than half a billion dollars to individual inventors since 2000, and we will continue to do so.

One of the questions we are asked frequently is why invention matters. The old proverb often ascribed to Plato says "necessity is the mother of invention." The constant need to make faster, smaller, cheaper, better versions of nearly everything requires constant innovation, which leads to a continuous cycle of invention.

Most people don't realize that smartphones contain, on average, 25,000 to 30,000 patents and innovations. That's a mountain of technology and intellectual property to either protect or access from many sources. It's critical for there to be a marketplace that represents and rewards innovation and intellectual property rights accordingly.

Inventors want to be paid for their work, companies of all sizes want to be able to make a return on their invention investments, and universities, like our own University of Washington, one of the world's foremost research institutions that you've just heard about, want to further their research and development programs. I urge this committee and the SBA to do everything possible to keep the invention economy vibrant by supporting startups and small busi-

nesses that thrive because of investments in patents and intellectual property and benefit from grant programs like the SBA's SBIR grants.

My second point: Intellectual Ventures is also creating companies, jobs, and public good through innovation. Two examples with local impact are Kymeta and TerraPower. Kymeta, a 2012 spinout from Intellectual Ventures, currently employs more than 100 people in Redmond, Washington, and is focused on commercializing a new, innovative, metamaterials-based antenna for satellite communications. TerraPower, a nuclear energy company based on early IV inventions, employs more than 80 people in Bellevue, Washington. And, finally, our Passive Vaccine Storage Device, which is on display here in MOHAI, is one of our Global Good inventions that enables medical professionals to reach remote health posts and treat people, especially children, throughout the developing world. I urge this committee and the SBA to make it possible for companies to continue to create jobs and public good through invention.

My last point: Our startup initiative allows us to bring our network of more than 4,000 inventors to bear on ideas and growth opportunities for small businesses, joint ventures, and spinouts based on our customers' interests and our portfolio of technologies. We also support the SURF Incubator, a local Pacific Northwest initiative that fuels local innovation. Our work together has allowed us to develop a rich pipeline of opportunities that we are exploring.

The future of innovation remains bright, and we continue to invest in research and development efforts on multiple fronts. We encourage the committee and the SBA to continue to support policies and programs which allow for investment and partnership in startups and incubator programs like those I have highlighted here in the Pacific Northwest.

So, in summary, Intellectual Ventures is committed to the invention economy, and it is our hope that this committee and the SBA, as well as Congress overall, will continue to support a strong invention economy. So thank you, Chairwoman Cantwell and Administrator Contreras-Sweet and all of the members of the committee here today.

[The prepared statement of Ms. Brown follows:]

Driving Job Growth: Small Business Innovation and Research
U.S. Senate Committee on Small Business & Entrepreneurship
Field Hearing
Museum of History and Industry (MOHAI)
Seattle, WA
April 24, 2014

Testimony of Adriane Brown
Intellectual Ventures

My name is Adriane Brown. On behalf of Intellectual Ventures, I would like to thank Senator Cantwell and the Senate Committee on Small Business and Entrepreneurship for the opportunity to speak today on the subjects of innovation, job growth, the invention economy in the Pacific Northwest, and how government can best support innovation. I'd also like to welcome Administrator Contreras-Sweet to Seattle and thank her for her leadership. Your combined commitment to fostering our region's iconic and dynamic hi-tech economy is extraordinarily important.

The Museum of History and Industry is such a fitting place for our gathering today. We are surrounded by invention at every turn, and cannot help but be inspired by the innovations on display. I'd like to briefly introduce Intellectual Ventures and our work to the committee and make three points about the invention economy based upon our experience.

Intellectual Ventures is an invention capital company and is the global leader in the business of invention. We believe ideas are valuable. And we're not alone. According to the U.S. Commerce Department, IP-intensive industries currently contribute more than $5 trillion per year or 34.8 percent of the U.S. GDP.

Our mission is to energize and streamline the invention economy in a manner which allows us to generate a return on our invested capital, and which should also allow others to be motivated to invest their capital into the invention economy in expectation of earning a return as well. We manage and grow our invention portfolios by partnering with leading inventors, collaborating with pioneering companies, and investing both expertise and capital in the process of invention.

Point one: We recognize the value of feeding the invention economy and encourage the Committee to support a variety of business models that fuel the marketplace of invention. Intellectual Ventures manages more than $6 billion in committed capital and has paid more than $720 million to startups and

small businesses as well as more than half a billion to individual inventors since 2000, and we will continue to do so.

We have more than 40,000 intellectual property assets spanning more than 50 technology areas. We have 4,000 active inventors in our international inventor network. We partner with more than 400 institutions and universities to support innovation. Our 700 team members include more than 140 engineers, scientists and staff at our lab which are working on a variety of projects including disease modeling, malaria diagnostics, and milk science.

One of the questions we are asked frequently is why invention matters. The old proverb, often ascribed to Plato, says "necessity is the mother of invention." That is quite a fitting way to answer this question. The constant need to make faster, smaller, cheaper, better versions of nearly everything requires constant innovation which leads to a continuous cycle of invention.

Let's consider the ubiquitous smartphone. Most people don't know that in addition to all your emails, phone numbers, texts and photos – plus Twitter, Facebook and Instagram accounts – your smartphone contains on average 25,000-30,000 patents and innovations. That's a mountain of technology and intellectual property to either protect or access. We believe a liquid marketplace benefits the invention process associated with building the next evolution of the smartphone, as one example, which seems to be in high demand every 12-18 months. It's critical for there to be a marketplace that represents and rewards innovation and intellectual property rights accordingly.

In the past 13years, we have infused more than $2.3 billion into the economy by purchasing patents for the purpose of providing access and creating a new market for invention. This infusion means jobs, tax revenue, and most importantly, more capital for innovation.

The fact is we all need an invention market where patents can be bought and sold for fair market value. Inventors want to be paid for their work, companies of all sizes want to be able to make a return on their invention investments, and universities like our own University of Washington – one of the world's foremost research institutions – want to further their research and development programs. Universities are often the best incubators for new and exciting startups. Without this market, who will have the incentive to reinvest in invention, and in turn push ahead our collective economic growth?

I urge this Committee and the SBA to do everything possible to keep the invention economy vibrant by supporting startups and small businesses that thrive because of investments in patents and intellectual property, and benefit from grant programs like the SBA's Small Business Innovation Research grants.

Point 2: In addition to leading the marketplace for monetizing invention, Intellectual Ventures is also creating companies, jobs and public good through innovation. Two examples with local impact are Kymeta and TerraPower.

We are very proud of Kymeta, headquartered in Redmond, a 2012 spin-out from Intellectual Ventures which currently employs more than 100 people here in Washington State, and is focused on commercializing a new, innovative metamaterials-based antenna for satellite communications.

An early Intellectual Ventures focus on big problems resulted in numerous inventions which supported the launch of another spin-out, TerraPower, a nuclear energy technology company based in Bellevue, which employs more than 80 people in the state of Washington.

Finally, our Vaccine Cold Chain Device, which is on display here in MOHAI, is one of our Global Good inventions helping to protect vaccines requiring cold storage. This enables medical professionals to reach remote health posts and treat people throughout the developing world. Our invention will help reduce the roughly 1.5 million childhood deaths annually from vaccine-preventable diseases like tuberculosis.

I urge this Committee and the SBA to make it possible for companies to continue to create jobs and public good through invention.

Point 3: We also remain committed to finding big innovations through two additional programs we create or support. We urge the Committee and the SBA to support strong patent protection for small businesses as a strong patent system encourages investment and commitment to invention.

Our Startup Initiative allows us to bring our network of more than 4,000 inventors to bear on ideas and growth opportunities for small businesses, joint ventures, and spin-outs based on our customers' interests and our portfolio of technologies. We expect big things from this initiative. We also support the SURF Incubator, a local Pacific Northwest initiative that fuels local innovation. Our work together has allowed us to develop a rich pipeline of opportunities we are exploring together.

Innovation, invention, patent rights, and the health of the invention economy remain critical issues for Intellectual Ventures and for the American economy. We have research to support this.

Last year, Intellectual Ventures commissioned market research based on interviews with more than 200 CEO, CFO and CTOs from companies with revenues of $100 million or less, in a wide range of industries, to better understand their current views on patents and the growing intellectual property industry. Our market research shows that 70 percent of the C-suite respondents believe patents are good for innovation.

Let me share a few other interesting data points:

- **87%** of the C-suite surveyed believes that patent rights should be respected.
- **78%** of the C-suite respondents believe people should pay a license fee to use technology that is patented.
- **68%** of the C-suite surveyed had a positive overall perception of patents.

Despite the overall stated importance of patent rights, our research showed that many business leaders remain largely uninformed about patents, licensing, and other intellectual property strategies.

The future of innovation remains bright and we continue to invest in research and development efforts on multiple fronts. We encourage this Committee and the SBA to continue to support policies and programs which allow for investment and partnership in startups and incubator programs like those we have highlighted here in the Pacific Northwest.

We recommend this Committee and the SBA continue to create opportunities, like this hearing today, to offer a platform for all the participants in the innovation ecosystem to have a voice, to share our experiences, and to offer our recommendations for moving forward.

Summary: In summary, Intellectual Ventures is committed to the invention economy. We have made significant investments in building a marketplace for invention and will continue to support the small businesses that are helping drive our economy forward. It is our hope that this Committee and the SBA, as well as Congress as a whole, will continue to support these efforts and those of the others at this hearing today.

I am grateful for the opportunity provided by Chairwoman Cantwell and Administrator Contreras-Sweet and all the members of the Committee appearing today, and we hope that our testimony has shed some light on the continued importance of Congressional support for a healthy invention economy.

Thank you.

Chairwoman CANTWELL. Thank you.

John.

STATEMENT OF JOHN NEUMANN, ACTING DIRECTOR, U.S. GOVERNMENT ACCOUNTABILITY OFFICE, WASHINGTON, DC; ACCOMPANIED BY HILARY M. BENEDICT, ASSISTANT DIRECTOR, U.S. GOVERNMENT ACCOUNTABILITY OFFICE, WASHINGTON, DC

Mr. NEUMANN. Chairwoman Cantwell and Madam Administrator, my name is John Neumann, and I'm an Acting Director with the U.S. Government Accountability Office leading our portfolio of audits related to the science and technology area. I am pleased to be here today with my colleague, Ms. Hilary Benedict, to discuss our recent work on federal small business research programs.

As you know, the Small Business Innovation Research Program, SBIR, and the Small Business Technology Transfer Program, STTR, were established to use small businesses to meet federal research and development needs. Since their inception, federal agencies have awarded about 150,000 contracts and grants totaling nearly $40 billion to small businesses to develop and commercialize innovative technologies.

As you mentioned, currently, 11 federal agencies participate in SBIR and five participate in STTR based on their annual budget for research and development conducted outside of the government, including at private companies and universities. This morning, I would like to briefly highlight two key points from our September 2013 report on these programs.

First, when we reviewed data from fiscal years 2006 to 2011 from the agencies that participated in these programs, we found that most did not consistently comply with spending requirements. Specifically, eight of the 11 agencies that participated in SBIR and four of the five that participated in STTR did not comply with spending requirements for all of the six years we looked at. Some of the agencies cited difficulties in spending the required amounts each year, particularly when their appropriations were late, which, in turn, delayed their contract awards to small businesses, among other reasons.

Second, in our 2013 report, we also found that participating agencies had not consistently complied with certain annual reporting requirements. For example, the majority of the agencies did not itemize each program that they excluded from their calculations for their extramural research and development budgets as required by SBA policy directives.

This made it difficult for SBA to determine whether agencies were accurately calculating their spending requirements. SBA did not always know which research and development programs the agencies excluded and why they were excluded.

I also want to note that we made several recommendations to SBA to address our findings, including recommending that it provide guidance to participating agencies to improve their compliance with spending and reporting requirements, as well as to increase transparency in SBA's reports to Congress. We understand that SBA is in the process of addressing these recommendations.

Chairwoman Cantwell and Madam Administrator, this concludes my prepared statement. But my colleague and I are pleased to respond to any questions you have about our work.

[The prepared statement of Mr. Neumann and Ms. Benedict follows:]

United States Government Accountability Office

GAO

Testimony
Before the Committee on Small Business and Entrepreneurship, U.S. Senate

For Release on Delivery
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Thursday, April 24, 2014

SMALL BUSINESS RESEARCH PROGRAMS

Agencies Did Not Consistently Comply with Spending and Reporting Requirements

Statement of John Neumann, Acting Director,
Natural Resources and Environment

GAO-14-567T

GAO Highlights

Highlights of GAO-14-567T, a testimony before the Committee on Small Business and Entrepreneurship, U.S. Senate

Why GAO Did This Study

Federal agencies have awarded more than 156,000 contracts and grants, totaling nearly $40 billion through the SBIR and STTR programs to small businesses to develop and commercialize innovative technologies. The Small Business Act mandates that agencies, with extramural R&D budgets that meet the thresholds for participation, must spend a percentage of these annual budgets on the two programs. The agencies are to report to SBA and SBA is to report to Congress.

This testimony is based on a report GAO issued in September 2013 and addresses for fiscal years 2006 through 2011, (1) the extent to which participating agencies complied with program spending requirements, (2) the extent to which participating agencies and SBA complied with certain reporting requirements, (3) the potential effects of basing the spending requirements for the SBIR and STTR programs on agencies' total R&D budgets instead of their extramural R&D budgets, and (4) what is known about the amounts participating agencies spent for administering the programs. For that report, GAO reviewed agency calculations of spending requirements and required reports, and interviewed SBA and participating agency officials.

What GAO Recommends

GAO is not making any new recommendations, but made several to SBA in GAO's 2013 report on this topic. SBA agreed with those recommendations and is taking steps to implement them.

View GAO-14-567T. For more information, contact John Neumann at (202) 512-3841 or neumannj@gao.gov.

April 24, 2014

SMALL BUSINESS RESEARCH PROGRAMS

Agencies Did Not Consistently Comply with Spending and Reporting Requirements

What GAO Found

Using data agencies had reported to the Small Business Administration (SBA), GAO found in its 2013 report that 8 of the 11 agencies participating in the Small Business Innovation Research (SBIR) program and 4 of the 5 agencies participating in the Small Business Technology Transfer (STTR) program did not consistently comply with spending requirements for fiscal years 2006 to 2011. SBA, which oversees the programs, provided guidance in policy directives for agencies on calculating these requirements, but the directives did not provide guidance on calculating the requirements when appropriations are late and spending is delayed. Some SBIR and STTR program managers told GAO that it can be difficult to spend the required amount because delays in receiving final appropriations can delay agencies' awarding of contracts. As GAO found in its 2013 report, when appropriations were received late in the year agencies used differing methodologies to calculate their spending requirements, which made it difficult to determine whether agencies' calculations were correct. GAO found that, without further SBA guidance, agencies would likely continue calculating spending requirements in differing ways.

GAO also found in 2013 that the participating agencies and SBA had not consistently complied with certain program reporting requirements. For example, participating agencies did not itemize each program excluded from the calculation of their extramural research or research and development (R&D) budgets and explain why the program was excluded, as required. (Extramural R&D is generally conducted by nonfederal employees outside of federal facilities.) Also, SBA's annual reports to Congress that were available at the time of GAO's review contained limited analysis of the agencies' methodologies, often not including information on particular agencies. By providing more analysis of the agencies' reports, as GAO recommended in its 2013 report, SBA can provide information to Congress on the extent to which agencies were reporting what is required.

In 2013, GAO found that the potential effects of basing each participating agency's spending requirement on its total R&D budget instead of its extramural R&D budget would increase the amount of the spending requirement—for some agencies more than others, depending on how the change was implemented. Also, if the thresholds of the spending requirements for participation in the programs did not change, changing the base to an agency's total R&D budget would increase the number of agencies required to participate.

In addition, GAO found in 2013 that the agencies' cost of administering the programs could not be determined because the agencies had not consistently tracked costs as they were not required to do so by the authorizing legislation of the programs. Estimates agencies provided to GAO indicated that the greatest amounts of administrative costs in fiscal year 2011 were for salaries and expenses, contract processing, outreach programs, technical assistance programs, support contracts, and other purposes. With the start of a pilot program allowing agencies to use up to 3 percent of SBIR program funds for administrative costs in fiscal year 2013, SBA planned to require participating agencies to track and report administrative costs paid from program funds.

Chairwoman Cantwell, Ranking Member Risch, and Members of the Committee:

I am pleased to be here today to discuss federal agencies' compliance with spending and reporting requirements for the Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) programs, as well as other aspects of the programs. Since the early 1980s, federal agencies have awarded more than 156,000 contracts and grants, totaling nearly $40 billion, to small businesses to develop and commercialize innovative technologies. Federal agencies with a budget of $100 million or more for extramural research or research and development (R&D) are required to establish and operate an SBIR program, while federal agencies with budgets of $1 billion or more for extramural R&D are required to establish and operate an STTR program.[1] Currently, 11 agencies participate in the SBIR program and 5 of these agencies also participate in the STTR program, as shown in table 1.

Table 1: Agencies Participating in the Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) Programs

Agency	Program	
	SBIR	STTR
Department of Agriculture (USDA)	X	
Department of Commerce	X	
Department of Defense (DOD)	X	X
Department of Education	X	
Department of Energy (DOE)	X	X
Department of Health and Human Services (HHS)	X	X
Department of Homeland Security (DHS)	X	
Department of Transportation (DOT)	X	
Environmental Protection Agency (EPA)	X	
National Aeronautics and Space Administration (NASA)	X	X
National Science Foundation (NSF)	X	X

Source: Small Business Administration.

[1]Agencies' R&D programs generally include funding for two types of R&D: intramural and extramural. Intramural R&D is conducted by employees of a federal agency in or through government-owned, government-operated facilities. Extramural R&D is generally conducted by nonfederal employees outside of federal facilities. Agencies are required to calculate their extramural R&D budgets by subtracting amounts obligated for intramural R&D from total obligations for R&D.

The Small Business Administration's (SBA) Office of Investment and Innovation is responsible for overseeing and coordinating the participating agencies' efforts for the SBIR and STTR programs by setting overarching policy and issuing policy directives, collecting program data, reviewing agency progress, and reporting annually to Congress, among other responsibilities. Each participating agency must manage its SBIR and STTR programs in accordance with program laws, regulations, and policy directives issued by SBA.[2] Each participating agency has considerable flexibility to design and manage the specifics of these programs, such as determining research topics, selecting award recipients, and administering funding agreements.

The Small Business Act, which authorizes the programs, establishes the minimum percentage of an agency's extramural R&D budget that must be spent on the programs annually.[3] Participating agencies were required to spend at least 2.5 percent of their extramural R&D budgets on the SBIR program in fiscal years 1997 through 2011 and at least 0.3 percent of these budgets on the STTR program in fiscal years 2004 through 2011. The 2011 reauthorization of the programs increased these minimum percentages to 2.6 percent and 0.35 percent, respectively, for the SBIR and STTR programs in fiscal year 2012, with additional increases in future years.[4] SBA's SBIR and STTR policy directives require participating agencies to submit data to SBA each year on the amount of their extramural R&D budgets and the amount obligated for awards, among other information. The Small Business Act also establishes certain reporting requirements for participating agencies and SBA. Among other things, agencies are to report to SBA on their methodologies for calculating their extramural R&D budgets within 4 months of the enactment of their annual appropriations. Furthermore, SBA is to annually report to Congress on all participating agencies' SBIR and STTR programs.

[2]As part of its oversight and coordination role, SBA issued SBIR and STTR policy directives in September 2002 and December 2005, respectively, and updated them in August 2012, January 2014, and February 2014.

[3]We refer to the amounts resulting from applying these mandated percentages to extramural R&D budgets as "spending requirements."

[4]National Defense Authorization Act for Fiscal Year 2012, Pub. L. No. 112-81, § 5102, 125 Stat. 1298,1824.

In 2013, we reported on the participating agencies' compliance with spending and reporting requirements for the programs, as well as other aspects of the programs, for fiscal years 2006 through 2011.[5] We are currently examining these issues for fiscal year 2012, and we plan to report on our findings in June 2014. My testimony today focuses on our 2013 report and addresses, for fiscal years 2006 through 2011, (1) the extent to which participating agencies complied with program spending requirements, (2) the extent to which participating agencies and SBA complied with certain reporting requirements, (3) the potential effects of basing the spending requirements for the SBIR and STTR programs on agencies' total R&D budgets instead of their extramural R&D budgets, and (4) what is known about the amounts participating agencies spent for administering the programs.

To determine the extent to which participating agencies complied with the programs' spending requirements for our 2013 report, we compared spending requirements for fiscal years 2006 to 2011 with the amounts agencies reported spending in each annual report to SBA.[6] To determine the extent to which participating agencies and SBA complied with certain reporting requirements for calculating their extramural research budgets, we compared the agencies' methodology and annual reports to SBA and SBA's annual report to Congress for fiscal years 2006 to 2011, to the extent available, with requirements in the Small Business Act and the policy directives for the programs. To determine the potential effects of basing spending requirements for the SBIR and STTR programs on an agency's total R&D budget, we calculated potential spending requirements for each agency using data on total R&D budget authority

[5]GAO, *Small Business Research Programs: Actions Needed to Improve Compliance with Spending and Reporting Requirements*, GAO-13-421 (Washington, D.C.: Sept. 9, 2013).

[6]We used the agencies' obligations data to represent spending for the programs in part because obligations data were readily available from each of the agencies for program purposes, and obligations provided a reasonable measure of the spending for the programs in each year. We determined that an agency met its spending requirement if the agency's reported spending for these programs was equal to or greater than the reported spending requirement.

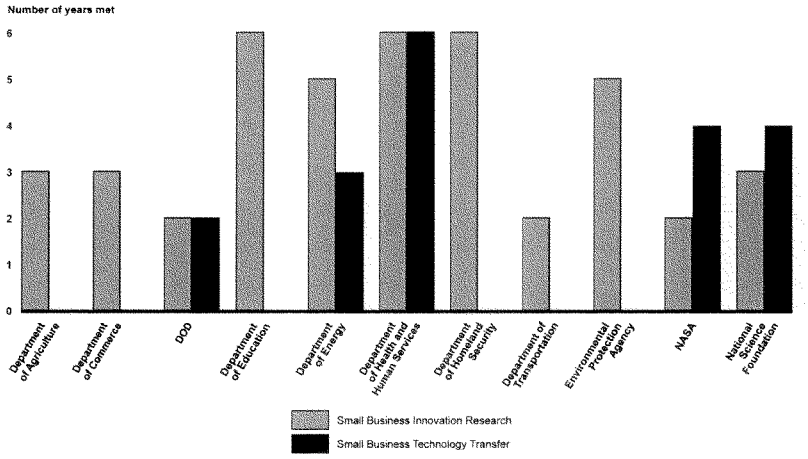
from the President's budget.[7] We compared these potential spending requirements with the spending requirements under the current law to determine the potential effects of changing the methodology. To determine what is known about the amounts participating agencies spent for administering the programs, we collected existing administrative cost data directly from agencies and interviewed program and financial officials at each agency. We determined that the administrative cost data were too incomplete and from such varied sources that an assessment of the available data's reliability was not possible and we could not use the data in our report. More detail on our scope and methodology is included in that issued product. The work on which this testimony is based was conducted from April 2012 to August 2013 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Data Indicated Most Agencies Did Not Consistently Comply with Spending Requirements

In 2013, we found that most agencies did not comply with spending requirements for the SBIR or STTR programs in all 6 years, based on data the agencies submitted to SBA for fiscal years 2006 to 2011. Specifically, 8 of the 11 agencies did not consistently meet annual spending requirements for SBIR. Data from 3 of the agencies—DHS, Education, and HHS—indicated that they met their spending requirements for all 6 years. For STTR, 4 of 5 agencies did not consistently meet annual spending requirements. Data from 1 agency—HHS—indicated that it met its STTR spending requirements for all 6 years. Figure 1 shows the number of years that each agency complied with spending requirements for fiscal years 2006 through 2011. Additional data on each agency's spending on the programs is included in our 2013 report.

[7]In calculating these potential spending requirements, we assumed that agencies would be required to spend 2.5 percent of their total R&D budget for the SBIR program and 0.3 percent for the STTR program. Additionally, we assumed that an agency with total annual R&D funding of $100 million would be required to participate in the SBIR program, while an agency with total annual R&D funding of $1 billion would be required to participate in both the SBIR and STTR programs.

Figure 1: Number of Years Agencies Met Spending Requirements for the Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) Programs for Fiscal Years 2006 to 2011



Sources: GAO analysis of agency annual report data submitted to SBA.

SBIR and STTR program managers identified reasons why spending the required amount in a given fiscal year could be difficult, which we described in our 2013 report. For example, in that report, we found that delays in receiving final appropriations can delay agencies' awarding of contracts for SBIR or STTR projects. Some program managers said that they tend to wait to award some grants and contracts until receiving their final appropriations in case the agency's extramural R&D budget—and, therefore, its SBIR or STTR spending requirement—differs significantly from the expected amount. Because the award process can be lengthy, a delay can push the awards and spending into the following fiscal year.

As we found in our 2013 report, when appropriations were received late in the year, agencies used differing methodologies to calculate their spending requirements, making it difficult to determine whether agencies'

calculations were correct. Although SBA provided guidance in policy directives on calculating their spending requirements, we found that the policy directives did not provide guidance to agencies on how to calculate such spending requirements when agency appropriations are delayed. We found that, without such guidance, that agencies would likely continue to calculate spending requirements in differing ways. In our 2013 report, we recommended that SBA provide additional guidance on how agencies should calculate spending requirements when agency appropriations are received late in the fiscal year. SBA has since begun taking steps to address this recommendation.

Agencies and SBA Did Not Consistently Comply with Certain Reporting Requirements

We also found in 2013 that agencies participating in the SBIR and STTR programs did not consistently comply with requirements in the Small Business Act to annually report a description of their methodologies for calculating their extramural R&D budgets to SBA and that SBA did not consistently comply with the act's requirements for annually reporting to Congress.

With the exception of NASA in certain years, agencies did not submit their methodology reports to SBA within the time frame required by the Small Business Act for fiscal years 2006 through 2011 for the SBIR and STTR programs. As noted earlier, the act requires that agencies report to SBA their methodologies for calculating their extramural budgets within 4 months after the date of enactment of their respective appropriations acts.[8] However, most participating agencies documented their methodologies for calculating their extramural R&D budgets for these fiscal years and submitted them to SBA after the close of the fiscal year with their annual reports. SBA officials said that they did not hold the agencies to the act's deadline for submitting methodology reports, in part because delays in receiving annual appropriations pushed the required reporting date until late in the fiscal year and it was more convenient for agencies to submit their methodology reports with their annual reports. By not having the methodology reports earlier in the year as specified by law, however, SBA did not have an opportunity to analyze these methodologies and provide the agencies with timely feedback to assist agencies in accurately calculating their spending requirements. By not providing such feedback, SBA was forgoing the opportunity to assist

[8] 15 U.S.C. § 638(i)(2)(A).

agencies in correctly calculating their program spending requirements and to help ensure that they spent the mandated amounts.

More significantly, we found in 2013 that the majority of the agencies did not include an itemization of each R&D program excluded from the calculation of the agency's extramural budget and a brief explanation of why it was excluded, as required. We found that it was difficult for SBA to comprehensively analyze the methodologies and determine whether agencies were accurately calculating their spending requirements without having more consistent information from agencies. We also found that agencies could have benefited from guidance on the format of methodology reports, and that without such guidance, participating agencies might continue to provide SBA with broad, incomplete, or inconsistent information about their methodologies and spending requirements. We recommended that SBA provide additional guidance to agencies on the format that they are to include in their methodology reports. We also recommended that SBA provide timely annual feedback to each agency following submission of its methodology report on whether its method for calculating the extramural R&D budget complies with program requirements, including an itemization of and an explanation for all exclusions from the basis for the calculations. SBA is in the process of taking steps to address these recommendations.

We also found in 2013 that SBA had not consistently complied with the requirement to report its analysis of the agencies' methodologies in its annual report to Congress,[9] as required by the Small Business Act.[10] Over the 6 years covered in our review, SBA reported to Congress for 3 of those; fiscal years 2006, 2007, and 2008.[11] We found that these reports contained limited analyses of the agencies' methodologies, and some of the analyses were inaccurate. For example, SBA's analysis was limited to a table attached to the annual report to Congress that often did not include information on particular agencies. In our 2013 report, we

[9]The act directs that the SBA Administrator report not less than annually to the Committee on Small Business and Entrepreneurship of the Senate and to the Committee on Science and Technology and the Committee on Small Business of the House of Representatives.

[10]15 U.S.C. § 638(i)(2)(B).

[11]SBA issued its report on the programs for fiscal years 2009 through 2011 in December 2013, after we issued our 2013 report. See *SBA: The Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) Program Annual Report Fiscal Years 2009-2011* (Washington, D.C.: December 2013).

found that, without more comprehensive analysis and accurate information on participating agencies in SBA's annual report, Congress did not have information on the extent to which agencies are reporting what is required by law. In that report, we recommended that SBA provide Congress with a timely annual report that includes a comprehensive analysis of the methodology each agency used for calculating the SBIR and STTR spending requirements, providing a clear basis for SBA's conclusions about whether these calculations meet program requirements. SBA is in the process of taking steps to address this recommendation.

Changing the Calculation Methodology Could Increase Spending Requirements and Participation

In 2013, we also found that changing the methodology to calculate the SBIR and STTR spending requirements based on each agency's total R&D budget instead of each agency's extramural R&D budget would increase the amount of each agency's spending requirement for the programs, some much more than others, depending on how the change was implemented. Also, such a change would increase the number of agencies that would be required to participate in the programs if the threshold for participating in the programs remained the same. For example, two additional agencies—the Departments of Veterans Affairs (VA) and the Interior—would have been required to participate in SBIR in fiscal year 2011 if total R&D budgets had been the criteria because these agencies reported total R&D budgets in excess of $100 million.[12] For STTR, three additional agencies—Commerce, USDA, and VA—would also have been required to participate in the program for fiscal year 2011 if total R&D budgets had been the criteria because these agencies reported total R&D budgets in excess of $1 billion.[13]

Some agencies told us in 2013 that changing the methodology to calculate the SBIR and STTR spending requirements could have effects on their R&D programs and create challenges. For example, changing the base would increase SBIR and STTR budgets and could result in reductions in certain types of intramural R&D, with corresponding reductions in full-time equivalent staffing of these programs. In addition,

[12]Federal agencies with a budget of $100 million or more for extramural R&D are required to establish and operate an SBIR program

[13]Federal agencies with budgets of $1 billion or more for extramural R&D are required to establish and operate an STTR program.

some agency officials said there would potentially be changes in the content of the agency's extramural R&D effort because of changes in the types of businesses that receive grants and contracts.

Administrative Costs Could Not Be Determined Because the Agencies Did Not Identify or Track All Costs

We found in 2013 that the participating agencies' cost of administering the SBIR and STTR programs could not be determined because the agencies neither collected that information nor had the systems to do so. Neither the authorizing legislation for the programs nor SBA policy directives require agencies to track and estimate all administrative costs, and neither the law nor the policy directives define these administrative costs. Estimates agencies provided for our report indicated that the greatest amounts of administrative costs in fiscal year 2011 were for salaries and expenses, contract processing, outreach programs, technical assistance programs, support contracts, and other purposes. With the implementation in 2013 of a pilot program allowing agencies under certain conditions to use up to 3 percent of SBIR program funds for certain administrative costs, SBA expected to require agencies in the pilot program to track and report the spending of that 3 percent but not all of their administrative costs.

Chairwoman Cantwell, Ranking Member Risch, and Members of the Committee, this completes my prepared statement. I would be pleased to respond to any questions that you may have at this time.

GAO Contact and Staff Acknowledgments

If you or your staff have any questions about this testimony, please contact me at (202) 512-3841 or neumannj@gao.gov. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this statement. GAO staff who made key contributions to this testimony are Hilary Benedict, Assistant Director; Antoinette Capaccio; Cindy Gilbert; Rebecca Makar; Cynthia Norris; and Daniel Semick.

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Bio for John Neumann

John Neumann is an Acting Director in GAO's Natural Resources and Environment team, where he leads a diverse portfolio of issues related to Food Safety, Agriculture and Science, including several ongoing reviews related to the federal government's management of research and development programs. Over the course of his career with GAO, John has led teams to produce a wide range of reports on topics such as export enforcement, counterfeit parts in the defense supply chain, and the Department of Defense's reliance on rare earth materials from China. John holds a Juris Doctor from Georgetown University Law Center and a Masters in Business Administration from American University.

Bio for Hilary Benedict

Hilary Benedict is an Assistant Director in GAO's Natural Resources and Environment team, working on a wide variety of energy and science and technology issues, including GAO's recent reviews of the Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) programs. Over the course of her career, Hilary has worked on a wide variety of issues, including alternative financing of energy and infrastructure projects and reviewing the Department of Defense's Base Realignment and Closure (BRAC) program. Hilary received a Master of Public Administration with an emphasis in Public Policy Analysis from the University of Wisconsin-Madison and a Bachelor's degree in Political Science and Psychology from Cornell College (Iowa).

Chairwoman CANTWELL. Thank you.
Mr. Weed.

STATEMENT OF RUSS WEED, UE TECHNOLOGIES, MUKILTEO, WA

Mr. WEED. Thank you, Senator Cantwell, Administrator Contreras-Sweet, and your staffs and MOHAI for the opportunity to speak today on the importance of small business innovation and research, including the SBIR program, driving job growth through commercialization.

My name is Russ Weed. I'm the VP of Business Development for UniEnergy Technologies based in Mukilteo, Washington, and also its general counsel. UniEnergy Technologies, or UET for short, manufactures and delivers large-scale energy storage systems for utility and grid, micro-grid, commercial and industrial, and other applications. The core technology is an advanced vanadium, element number 23, flow battery, with its technology origins at the Pacific Northwest National Laboratory here in Washington State, with funding from the Office of Electricity at the U.S. DOE.

Because of the critical problems solved by the technology developed at PNNL, and with the support of a multinational private equity group, the PNNL energy storage program leader, who is here today, and his chief scientist came out from the lab and formed UET in March 2012. UET agreed upon a license agreement with PNNL and, fortunately, with full funding, put in place a world-class engineering, manufacturing, and business team which has designed and delivered a commercial product now available for sale in just two years.

I've brought for you an impromptu picture taken yesterday of one of our Uni.Systems—it's on the front corner of your table there—which at the end of this year will be installed at a distribution substation for a Washington State utility. As I said, this was an impromptu photo with the short amount of time. This is a utility class system, storing a large amount of energy, up to a maximum of 1.8 megawatt hours, with a peak power of 600 kilowatts.

With further research and development, including supported by SBIR and other SBA programs, as I will further comment on, we plan for our system's performance measures to grow further in scale. Our constant objective is to increase the cost-benefit effectiveness of energy storage, called the holy grail for the grid for some years, before the concept of a smart grid arrived on the scene. It is imperative for the integration of renewably-generated energy, implementation of the smart grid, and our clean energy future that our utility and other large-scale energy systems have the ability to buffer energy supply and demand, from millisecond bursts to hours-long, even day-long shifts, in other words, to have utility-class energy storage.

UET has a 67,000 square foot engineering and manufacturing facility in Mukilteo, about 30 minutes north of here next to Boeing's Paine Field. We are scaling up to produce 100 megawatts of advanced vanadium flow batteries annually.

As you can see from the second photo I brought, again taken impromptu yesterday, presently we are 40 people, scaling up to about 100 people by the end of 2015. This includes scientists, engineers,

technicians, and business people. We are a capital equipment manufacturing company, as you can see—these are big systems—with our biggest employment need now being technicians, mechanical, electrical, and other skilled technicians.

Thus, we are working closely with local community colleges that either have or will have programs producing the technicians we need. UET is very glad and proud to be growing skilled manufacturing jobs in Washington State with family wages and health care.

Of course, UET is only one company in the clean tech cluster growing here in the evergreen state. It is important for us to acknowledge UET has gotten to this point and will only go further with the critical help of our partners in ecosystem. That includes the DOE, PNNL, the Washington Clean Technology Alliance, whose president is here today, the Washington State Department of Commerce, Avista Utilities, Snohomish Public Utility District, Energy Northwest, Puget Sound Energy, and the Trade Development Alliance.

While UET is a manufacturer of large-scale energy storage systems for commercial use, we are a product company. We were not, at the beginning of the company, a research company. Nonetheless, we aim to keep and hopefully extend our technology lead by continuing to press ahead with our R and D efforts. The UET R and D team has eight PhDs who are pushing night and day, literally, on innovation related to energy storage systems, stacks, which are large-scale electrodes in flow batteries, electrolyte for flow batteries, and controls, among other areas.

Two research projects we have in mind for SBIR funding are the cost-benefit effective combination of energy storage and solar generation, and the full automation of manufacturing of stacks which could enable on-shoring of production in the United States. With real megawatt-sized projects soon in Washington State, UET will have the "iron in the ground" to show we would use SBIR and other SBA funds for a sound business purpose, to reference Linden's comments on the challenge of clean tech companies making this showing, and we are very pleased that we will be able to do so.

Then we will need to work through some of the Small Business eligibility requirements, such as the size standards of 1,000 employees for primary battery manufacturing, but 500 employees for storage battery manufacturing. We look forward to that process and would very much appreciate your help as we do so.

Thank you again for the opportunity to speak today on behalf of UET, and please let me invite you, Senator Cantwell, Administrator Contreras-Sweet, and your staffs, to visit UET's facility just a bit north of here.

[The prepared statement of Mr. Weed follows:]

Written Statement of Russ Weed of UniEnergy Technologies
Small Business & Entrepreneurship Committee Field Hearing
April 24, 2014

Thank you, Senator Cantwell, Administrator Contreras-Sweet, and your staffs for the opportunity to speak today on the importance of small business innovation and research, including the SBIR program, driving job growth through commercialization.

My name is Russ Weed, VP of Business Development for UniEnergy Technologies and also its general counsel. UniEnergy Technologies, or UET, manufactures and delivers large-scale energy storage systems for utility and grid, micro-grid, commercial and industrial, and other applications. The core technology is an advanced vanadium flow battery, with its technology origins at the Pacific Northwest National Laboratory here in Washington State, with funding from the Office of Electricity at the US Department of Energy. Because of the critical problems solved by the technology developed at PNNL, and with the support of a multi-national private equity group, the PNNL energy storage program leader and his chief scientist came out from the lab and formed UET in March 2012. UET agreed upon a technology license with PNNL and fortunately with full funding, put in place a world-class engineering, manufacturing, and business team which has designed and delivered a commercial product now available for sale, in just two years. I've brought for you a picture of one of our Uni.Systems, which at the end of this year will be installed at a distribution substation for a Washington State utility. This is a utility-class system, storing a large amount of energy – up to a maximum of 1.8 megawatt-hours - with peak power of 600 kilowatts.

With further research and development, including supported by SBIR and other SBA programs as I will further comment on, we plan for our system's performance measures to grow further in scale. Our constant objective is to increase the cost-benefit effectiveness of energy storage – called the "Holy Grail" for the grid for some years, before the concept of a Smart Grid arrived on the scene. It is imperative for the integration of renewably-generated energy, implementation of the smart grid, and our clean energy future, that our utility and other large-scale energy systems have the ability to buffer energy supply and demand, from millisecond bursts to hours-long, even day-long shifts. In other words, to have utility-class energy storage.

UET has a 67,000 square foot engineering and manufacturing facility in Mukilteo, Washington, about 30 minutes north of here next to Boeing's Paine Field. We are scaling up to produce 100MW of advanced vanadium flow batteries annually. Presently we are forty people, scaling up to about 100 people by the end of 2015. This includes scientists, engineers, technicians, and business people. We are a capital equipment manufacturing company as you can see, with our biggest employment need now being

mechanical, electrical, and other skilled technicians. Thus we are working closely with local community colleges that either have or will have programs producing the technicians we need. UET is very glad and proud to be growing skilled manufacturing jobs in Washington State with family wages and health care.

Of course UET is only one company in the cleantech cluster growing here in the Evergreen State. It is important for us to acknowledge UET has gotten to this point, and only will go further, with the critical help of our "partners in ecosystem" including the DOE, PNNL, the Washington Clean Technology Alliance, the Washington State Department of Commerce, Avista Utilities, Snohomish Public Utility District, Energy Northwest, Puget Sound Energy, and the Trade Development Alliance.

While UET is a manufacturer of large-scale energy storage systems for commercial use, we aim to keep and hopefully extend our technology lead by continuing to press ahead with our R&D efforts. The UET R & D team has 8 PhD's who are pushing night and day on innovation related to energy storage systems, "stacks" (which are large-scale electrodes in flow batteries), electrolyte for flow batteries, and controls, among other areas. Two research projects we have in mind for SBIR funding are the cost-benefit effective combination of energy storage and solar generation, and the full automation of manufacturing of "stacks" which could enable on-shoring of production in the United States. With real megawatt-sized projects soon in Washington State, UET will have the "iron in the ground" to show we would use SBIR and other SBA funds for a "sound business purpose." Then we will need to work through some of the Small Business eligibility requirements, such as the size standards of 1,000 employees for "primary battery manufacturing," but 500 employees for "storage battery manufacturing." We look forward to that process and would very much appreciate your help as we do so. Thank you again for the opportunity to speak today on behalf of UniEnergy Technologies.

Russ Weed
VP Business Development & General Counsel

Russ Weed is a seasoned business executive and corporate lawyer with a track record of accomplishment at UniEnergy Technologies\, GE, Labtec, and AV-rated Seattle and Portland law firms. Russ leads UET's business development and strategic activities in North America, Europe, and globally. In that role, he is responsible for strategic alliances with channel, product, and other partners; optimizing product management; negotiations and contracting; mergers and acquisitions; fundraising efforts; and media activities. Russ is general counsel for UET as well.

With 12 years of experience as the VP Business Development and company counsel at technology and industrial companies, as well as 10 years as a corporate attorney at law firms. Russ has led and teamed in the strategizing, preparation, negotiation, closing, and execution of a wide range of deals and business matters, including mergers and acquisitions, licensing, corporate financing, formations and fundings, intellectual property, and commercial contracts. With broad international experience, particularly in Asia and Europe, Russ also has expertise in government relations, employment, compliance, trade regulation, and risk management. He has managed corporate teams and cross-functional processes. Russ is personally committed to identify and accomplish the strategic and legal objectives of the business and its people, and to make large-scale clean energy a reality.

Chairwoman CANTWELL. Well, thank you all very much for your ability to paint a picture of the opportunity and challenges that we face and for your specific recommendations on SBIR and small business programs. You know, I'm struck by some of the very specific things that each of you have said.

I don't know, Administrator, if you wanted to start with the questioning.

Ms. CONTRERAS-SWEET. I have a couple of questions, but please, go ahead.

Chairwoman CANTWELL. Thank you.

Adriane, you talked about 35 percent of our GDP based on innovation. And Linden specifically pointed out that this was about negating the risk that the rest of the market—that SBIR is basically taking the risk out of the first phase of the investment that Level A funding isn't willing to do.

So my question is how do we categorize the right amount of investment by our country in SBIR? Because I would say, looking at what you guys are presenting today, and Linden, what you just talked about with your incredible success at the University of Washington, we should be doing more. And who's to say that that 35 percent couldn't be 40 percent if we made the right level of investment?

Ms. RHOADS. You know, it occurs to me that there's a common platitude among venture capitalists that's pretty self-serving to existing venture capitalists, that they often say that for a good idea, there's always capital, and you're going to find it. And I guess I can say that from my chair at the University of Washington, we see venture worthy—you know, good ideas that are very close to proof of concept or have rudimentary proof of concept that we think would be successful in the marketplace not find that early stage funding and die on the vine all the time, or not find it in time and lose all momentum, because the recent PhDs can't wait around and have to take that academic job or that job in industry, sometimes even to stay in the country.

So, I mean, if we're asking is there more unfulfilled potential, are there additional opportunities that if they only had seen even a few hundred thousand dollars in early stage funding might have become successful companies bringing innovation to our country, I think the answer is yes. So I think we're underserved today.

Chairwoman CANTWELL. Is there any way to quantify that?

Ms. BROWN. I don't know that we can quantify it, but when I look at the variety of sources that a startup might have access to, particularly when they have been investing in inventions that support their business, sometimes we have found that they've invented some things that they didn't need along the way. And a company like Intellectual Ventures or others might be able to fulfill some value for those inventions which helps.

But there's nothing like the kind of support that SBIR can give where—what did you say that it was?

Ms. RHOADS. But for.

Ms. BROWN. The more that we can increase this and find ways to step it, the more we'll see an increase in economic outcomes.

Chairwoman CANTWELL. Well, I think to your point, Rob mentioned the LIDAR technology. I can guarantee you when we get to

Oso, you're going to see a LIDAR map of the challenges that we face in rebuilding there because of the potential for mudslides in the future. And that LIDAR mapping, as you said, was not what he was exactly going for to begin with, but ended up with that technology as well. So there is something to be said for that.

Robert, you mentioned taking risk out of the equation. How would you judge the level of investment for SBIR, given—you know, what we're trying to do in the future is lower health care costs and keep pace with the level of invention that we can do in the medical area.

Mr. BARRY. As I mentioned, there has been quite a drop in the early investment of private capital. On the late end of private capital for medical devices and biotech, the investment has been okay. It's maintained. But those companies are much closer to—there's much less risk on the investment because it's usually developed, there's usually revenue, and they're closer to an exit.

So if you take the early companies, you have to be willing to look at an investment over a longer period of time, say, on average, 10 years. And many of the venture capital funds today are just not geared for those longer-term investments. They're looking for the shorter-term investments to get—to prop up their funds so that they can raise more funds. That's been part of the issue with the inability or the unwillingness of venture capital funds, especially to fund the early companies.

So I think, as I said, now more than ever, the SBIR grants to get a company ready for Series A are very important. And what I mean by that is it's basically trying to take out as much risk to the investor as efficiently as you can prior to them coming in. So the less risk, the more things that you've ticked off in terms of does it work, can it be built, is there a market, the more likely those investors are to come in.

Chairwoman CANTWELL. Administrator.

Ms. CONTRERAS-SWEET. Thank you. I thank you again for your good stories. They're so important to us. You know, with competing priorities and interests and limiting resources, it's important for us to show the why of what you're doing. And so to the extent that you can track longitudinally—and I really appreciate that each of you talked about your job creation. So I think it's important for you to continue to track that longitudinally so we can make a case for these resources. So thank you, number one, for that.

Number two, what I wanted to say is that I would hope that along the way, wealth should not be a prerequisite to creating innovation. So I've always concerned myself, having had just a little stint in investments—I've concerned myself that, you know, the question was always, "Well, how much skin in the game do you have? How do we make sure that you're invested if I'm going to invest in you?"

So I think that this program helps to address some of those issues. So I'd want to know about how that works in that regard, because I want to make sure that all people can be innovators, and if they don't have skin in the game, if they don't have the initial anchor investment, they can still spur activity in innovation. So I'm concerned about that.

Third, what I'd like to know—and I'm just sort of throwing these out, generally speaking. What I'd like to learn from you if any of you could address this third question, which is: How did you learn about our programs? Because I want to know if we're getting the information out to the vast audiences that we should be reaching to make sure that we're allowing everybody to invent, to innovate. And if they're not in a university, how do we get out to them?

So I'd be interested, just generally, in those three areas of commentary, because I want to make sure that I can come back and learn about how we can continue to promote SBIR. Again, the notion was not that we wanted to put a cap. It was supposed to be a floor. If universities and other agencies can actually promote more, then we want them to allow small businesses to spur.

We know that small businesses, as I said at the top of my comments, are the innovators of job creation. And so I would hope that to the extent that you all can partner with us—you know, I'm a sales person at heart, and if I don't call for the sale, you know, you don't make the sale. So I really think it's important for all of us to collaborate and to agree that we're going to help promote programs like this so that they're funded, that all people can access the programs, and that they're getting the right return on investment.

So if you could just—you know, each of you sort of addressed job creation. But if you could help me address those questions, I'd really appreciate it.

Dr. AFZAL. Maybe I can address job creation almost from a—looking back from a large corporation, now that I look at things from that perspective. Decades ago, the large corporations in America had very extensive, deep research labs that did fundamental research—Bell Labs, for example, IBM, et cetera. Much of that has gone away, not completely, but what's opened up is a marketplace for the new ideas, and it's really in the small businesses. They can take the risk. They can generate new ideas, and as they blossom, then they can be brought to market, either by acquisition by a large corporation to be brought into their space, or they get venture funding and grow their company. Either way, that is the validation of the ideas. It brings the products forward, and then, ultimately, that leads to jobs.

So it's critical that we now have kind of a new paradigm in how R and D research, new product development, invention is being done, and it's not just stove-piped within corporations that then only feed themselves.

Chairwoman CANTWELL. So research is flat, too.

Dr. AFZAL. Yes. That's unfortunate.

Chairwoman CANTWELL. Well, no, I don't mean flat as in a budget perspective.

Dr. AFZAL. Oh, I see.

Chairwoman CANTWELL. I mean if everything is becoming more, you know—horizontal research, you're saying, has become or needs to become, because it's not as hierarchical as it used to be, given the investments.

Dr. AFZAL. Absolutely. Yes.

Mr. BARRY. Maybe a way to talk about this is the last company that I started, Uptake Medical. We raised $70 million from venture

capitalists. The company was started here in Seattle. This was before I was aware of things like SBIR. I went out and raised angel money, a million and a half dollars, which was great, and we were able to get the company started on that.

However, as you come to learn, you lose ownership. So another important point about SBIRs is that they're non-dilutive, and that's an important aspect when you talk about whether the company that you start will remain in Seattle. In this case, I'll be selfish here. We're in Seattle. Will it remain in Seattle?

There will be forces that will want to move the company closer to the venture capitalists who have the ownership. The only way to resist that is for the co-founders of the company to maintain ownership. So I think that's another really important aspect of the SBIR program, and it helps to keep jobs in this region.

As I mentioned, in the last company, yes, we've maintained the technical group here in Seattle, which is only a handful of people. There are 25 people that are employed with very good jobs, high-paying jobs, in California, unfortunately, rather than in Washington.

Ms. RHOADS. Well, I remember what didn't work. I mean, there used to be an economic development agency with some state funding. TASK was going out and promoting SBIR. And I explored that before deciding to dedicate a full time position to popularizing and assisting with SBIR application in our office. I think very few universities have a large enough research enterprise or commercialization budget to use as their strategy. We're fortunate in that regard.

And what they were doing was going around and giving seminars. I have to tell you that post-seminar, even if you made your way to one of them, it remains a daunting and obscure universe to think about how to go about applying for these grants. And it's challenging for the university world. I mean, SBIR is invaluable, as I said, but still imperfect, because the grants are small compared to many basic research grants.

So if we're trying to prevail upon a principal investigator to take some of the time that they might be using to try to win a research grant from the NIH to keep their very large research organization going, and if the percentage opportunity of winning them is lower, they don't often see the merits to trying.

And, also, there's confusion over whether there will need to be a full time person available to be inside the company or the new co if the award is won and how that will be structured and how equity will be divided. And without a lot of coaching, sometimes there's fear around whether a team might lose control of their invention.

I see SBIR as invaluable because we're working very hard to recruit the talent necessary to pair with our great innovations if we're going to see a successful spinout. And, often, even if we find talent that has had success in the past, they do need to be paid something, and these companies aren't at a point where they can raise any private money now.

And we also have this phenomenon we call the great PhD diaspora, which is that suddenly someone has won their PhD, and there's another six months or a year it's going to take to really get that technology, which they spent three years working on alongside

their research faculty, to a point at which it could attract risk capital. But they need a job now, maybe even to have a visa so they can stay in the country now.

If they leave, sometimes all momentum will be lost, because there isn't anyone else in that research group within the university who would be the right person to be part of a four or five-person early stage team, as the person really familiar with the technology, and maybe investors won't see the principal investigator, the faculty member, deciding to be willing to be a chief scientific advisor for when—and the university is quite reassuring enough, I think, often for good reason.

So if we don't have some mechanism to keep the Robert Barrys, you know, foregoing all of the more secure and immediately remunerative opportunities that they might take on, or these recent PhDs working on this project, the opportunity is gone. And the shame of that to me is always that we're going to see maybe millions of dollars in federal funding that led to something that could have potentially been very useful to society wasted, if you want to look at it that way.

So at any rate, I think there's, you know, changes that could be made to make it clearer how you staff an SBIR funded company in a way that is congruent with being part of a university spinout, and also maybe grants like goals and even maybe to Maria's point about the amount of funding, the greater likelihood of winning one, that would be encouraging.

Chairwoman CANTWELL. Thank you.

Ms. BROWN. I'll come at this maybe from a different perspective. Last year, Intellectual Ventures launched a study, a commissioned study, to ask smaller companies, CFOs, chief technology officers, and CEOs what were their perceptions about intellectual property and invention. And it was really pleasing that we got over 200 respondents, and it was clear that patents are very important to them. They understand that they need to have patents and intellectual property in some of their business models in order to succeed.

We've had a number of people with really bright concepts and a real nugget of an idea, but didn't feel like they had enough to really be able to launch a company. We've been able to work with companies like Coffee Flour, which launched last month, a partnership between an entrepreneur and Intellectual Ventures, where we provided some capital, but also some support that would provide, you know, product definition and prototyping and testing to really help it launch.

So I see that if an entrepreneur has that idea and can work with others to really get the IP that's necessary to give them the foundation, they have more options to drive the kind of investments that they need. And when you have that IP, when you have the clarity of how broad this market can be, I think it becomes a real attractant for those who would like to make investments, or the ability to then go to the Small Business Administration and say, "Here is how we expect to drive this market, how we want to develop the product, how we want to get it to customers and commercialize it."

So I think the use of IP in addition to the concepts and the innovations that are coming forward from the business really can use

SBIR dollars to help drive the supporting growth. So I would really encourage that we continue to do this to try to raise the numbers so that we can see the economic impacts that come from this.

Ms. CONTRERAS-SWEET. Right. You know, I don't know how many of you had an opportunity to read the Wall Street article that addressed that certain segments of our population are not accessing capital in the same way as others. And so I'm particularly concerned to make sure that we're leveling the playing field for all of our good innovators, particularly focused on the African American community.

So I'm trying to understand how we, as the SBA, as your federal government, can make certain that we are promoting the program in all circles and all opportunities. So I was trying to get at that a little bit as well.

Ms. BROWN. Well, I think as you look at entrepreneurs and where perhaps there hasn't been that level playing field, that access, finding where that community gets its information—you know, there are organizations that have deep ties, and I think leveraging communications in that area would help spur what it takes to get this idea developed and built, and they can get that support, and then learning how to do the grant writing, learning what it takes to actually apply, so that you can be eligible to get these dollars. There are absolutely ways that that can happen, and I think it's a great opportunity for growth as well for those that are underserved.

Mr. WEED. So on your three questions in terms of job creation, skin in the game, and learning of the SBIR program, you know, I mentioned we're 40 people now. We're scaling up to be 100 people. But that's just to make 100 megawatts of systems a year. California now has a procurement program for 1.325 gigawatts of systems.

So from our factory that we are scaling up, we could produce from that for 13 years and meet the procurement needs of California. In other words, it's a huge market.

Ms. CONTRERAS-SWEET. May I just say before you get to the second point, the senator knows that when I was going through my confirmation hearing, I acknowledged the role—as a Californian, I can say to you that I acknowledge the role that the state of Washington played in helping us get through our energy crisis. Few people were there for us, but the state of Washington allowed us the access to some of your energy, and so you sort of literally kept the lights on for us.

So, indeed, as a Californian, I am very grateful to the state of Washington for being there in a time of need. Thank you.

Mr. WEED. I would mention that one of our utilities here is looking at using energy storage as further providing a broader support in the energy markets for California. And, hopefully, you won't mind that our plan is, of course, to get iron in the ground in Washington State and then to invade California.

[Laughter.]

Because it's a very large market. There are other states that are important, of course. New York is important. Texas is important. And we are aiming to help make Washington State to be in that same list of the important energy storage markets.

The skin in the game part—of course, we're a private company, so I should be a little demure. I will say that the private equity fund that has invested in us has been quite generous, has the ownership positions of management and of employees through a stock option plan. Frankly, it's not something you always see in the United States. This private equity firm comes out of Australia and China.

And I would say the United States, in terms of—and you've heard some discussion on this already in terms of the approach of VCs and so forth. We need more long-term thinking. That's actually a term that we hear from our private equity funder very frequently. That's a very frequent phrase, long-term thinking.

In terms of learning of the SBIR program, of course, we knew about it. But in terms of really forming our intent to go after it, that actually came out of some discussions with the head of the DOE's Advanced Manufacturing Program, Mark Johnson, as we discussed what the different possible uses of funds were and how we could fit the different programs together under the different eligibility requirements.

Ms. CONTRERAS-SWEET. Thank you.

Chairwoman CANTWELL. Well, I'd like to turn to the GAO on this issue, obviously, of your report, which is very concerning, because as we talk about how to increase SBIR use, all you have to do is say, "Okay, make these agencies who have so many dollars available—make them meet their requirements."

One of the things that you talked about, Mr. Neumann, was the fact that some of these agencies said—I mean, you mentioned six years running that they hadn't met this mark. So it isn't just the downturn of 2008 that caused it. Or you mentioned that, oh, well, they didn't get appropriations bills done in time. Well, the Department of Health is meeting this standard, and they're one of our biggest federal agencies. So the fact that they are actually meeting their set-aside—I would think that they have as complicated challenges on a budget as anybody.

And the Department of Energy, which Mr. Weed—who's to say that he wouldn't have been funded already if, in fact, DOE had met its requirements? So what do we need to do to get these agencies to live up to this requirement?

Mr. NEUMANN. That's a good point. Although we didn't focus on best practices in our 2013 report, during the course of that work, we did note that the Department of Health and Human Services intentionally set aside and spent more money. So that's, in part, why they met the spending requirement in every year that we looked at. But there is some good news in——

Chairwoman CANTWELL. Because they went above the——

Mr. NEUMANN. Yes. They intentionally set aside more than the required amount in their planning for it. So in the end, they ended up going above or at least meeting the requirement without a problem in each of the six years we looked at.

But there is some good news. If you look at 2011 with some of the other agencies, it did get a little better for 10 out of the 11 that participate in SBIR. Only the National Science Foundation didn't meet spending requirements for that year. So I think there's some movement in the right direction. And I think coupled with SBA's

continued oversight of the agencies and as SBA implements some of the recommendations we made in that report, I think we will start to see improvement.

Chairwoman CANTWELL. Do we need to go back and ask about best practices? Do we need to qualify best practices for an official record, or do you think we can do that informally?

Mr. NEUMANN. I'll let my colleague mention the ongoing work and whether or not we're getting at any of that.

Ms. BENEDICT. Sure. In our ongoing work, we are looking currently at the 2012 spending for SBIR and STTR. We did not ask about best practices this year, but we certainly could incorporate it into our methodology, if that's something that would be useful to the committee.

Chairwoman CANTWELL. Well, I think it's interesting to think about why a federal agency like the Department of Health and Human Services meets that standard. And, of course, the University of Washington is probably number one in the country as far as public institutions with NIH research. So it all works well.

But I always remind people—what is it—$300 million, something like that, of research between UW and WSU. Maybe it's increased since I got my numbers. But just on the other side of the mountains, we have PNNL that gets, you know, three or four times—at least, definitely, it gets, you know, in the $800 million to $900 million range. And yet where is the advent of that technology spinout?

So it's just—you know, there's something that's working on the health side, and it's working on many fronts. And there's something that's definitely not working on the energy side, and it's definitely not working on many fronts. So it says to me that, you know, either focus over time, and maybe—I don't know, Mr. Barry, if you have comments on that, or if you think—you know, like there's a threshold period here for SBIR funding within certain sectors, and until you reach that credibility, you have a challenge.

But it's clear with certain sectors of these research areas that we're not making the goals on any front. It's not happening from the top down, and it's not happening from the bottom up.

Ms. CONTRERAS-SWEET. I'll also say, Senator, that I think it's important that now the SBA has been elevated to the cabinet level, and that I'd be sitting at the table with some of my cabinet colleagues, that it's also about leadership. So, certainly, I would, you know, sort of put on myself the opportunity to make sure that I am promoting it among my cabinet peers and raising this as an important opportunity for us to spur job creation and economic activity. So that would be number one.

And number two, as I said, to the extent that we are promoting the program, that there's also a demand in the marketplace so that people are approaching the departments, the agencies with these requests. And I think that both ends will help spur more compliance.

Chairwoman CANTWELL. That's good. I appreciate that. I like you sitting at the cabinet level reminding all of these cabinet officials that they're not meeting their research standards for working with the SBA.

Mr. NEUMANN. And let me add that the SBA has a very powerful tool for encouraging agency compliance, and that's the annual report to Congress. So to the extent that you provide some robust analysis in that report, I think it'll shed some light on which agencies are doing well and which ones are not doing as well. I think that's a very powerful tool.

Ms. CONTRERAS-SWEET. And reminding them that we're coming up on this report, and I think that's right. The score cards are really important. Thank you.

Chairwoman CANTWELL. Well, we're about at time. I don't know if anybody has any further comments they want to give for the record. I will point out at this moment that this is an official hearing, and so we do leave the record open for two weeks for all our colleagues to comment on this. And then this gets published as recommendations, and we take this as part of our official capacity to improve these programs. So we very much appreciate all the witnesses here today.

And I don't know—do you have any further questions?

Ms. CONTRERAS-SWEET. Well, I think it's really important, you know, in promoting something, to celebrate the successes. And so I really want to thank this great state, the senator, and each of you who have presented your stories, because to the extent that we can celebrate your successes, success begets success.

I'm delighted with the ideas, the diversity of thought here, the diversity of opportunities that have been generated from this program. As I mentioned, the idea of storing energy is just fascinating to me, and I'm really interested in that technology. So maybe on the next trip out, we'll come out and visit you. That's okay. I mean, California needs more energy, so we're happy to have you come on down.

But I really want to challenge us—you know, I want to make sure that the Native American community is able to access these programs, and rural communities and urban centers alike, and that women are able to access this program. America is such a wonderful, beautiful place of diversity of thought, of ideas, of opportunity.

So to the extent that you can help me think of ways to promote this program to make sure that more of our programs are available, particularly this one, but also—you know, again, as I said, I'm calling for the sale. I want to make sure that folks understand that not only is SBA here for access to capital, but that we do counseling, and we do contracting, so that those of you who are now finally launching your companies and are able to grow, that you think about the federal government as a partner, as a client.

You know, so many of us have an uncle, and now I want to make sure that Uncle Sam is also available to you, to be able to diversify your portfolio so that you have private sector opportunities but also public sector opportunities. So think of those ways that we can help you get the word out throughout the state in all corners to make sure that everybody is able to reach this. That would be a great gift that you would bestow upon us.

Thank you, Senator.

Chairwoman CANTWELL. Well, thank you. And I want to mention that, as I said, the record is left open, but we have—I know tomorrow, I'm going to be with Senator Risch, who is the ranking mem-

ber, and he'll be very interested in DOE meeting its research standards that are being set, because there's a lot of research being done in the state of Idaho.

And we have with us people from Senator Risch's Small Business Committee staff. We have Mr. Holderness, who is the staff director back there; and Ms. Kristen Granchelli, professional staff for the SBIR program. So we have people from the Small Business Committee staff that will stay here after we have to depart. So please feel free to talk to them.

Also, Calvin Goings, our regional Small Business Administrator—Calvin, just wave—is here. He's the Region 10 Administrator for the Small Business Administration, and he obviously is familiar with this program and many other programs. And we have many other staff here for people if you want to continue to talk to them afterwards, they'd be more than happy to have your input and comments, either as official or unofficial parts of the record.

This has been very helpful. As I said, we wanted to have this hearing because the administrator was so generous to give her time to come to the Northwest. We think we represent a very unique perspective on how much job growth can happen with innovation. We hope that we can take today's feedback and look at ways to increase the SBIR.

As I mentioned earlier, I believe that we need to make something in America besides exotic financial instruments, and, clearly, the innovation here is an example of that. And if we can get the right amount of capital into the marketplace to do that, to me, I feel like that is a lot less risky than what happened with the implosion of our marketplace.

I feel like we have an administrator who knows the capital markets well and will be a great asset to the administration. So we're so happy that she was able to take this innovation hearing in and to digest some of your input. So we'll look forward to working with her.

Ms. CONTRERAS-SWEET. Just in closing, I want to thank you for mentioning that. I have to tell you that after I left office in California—I was California's Secretary of Transportation and regulator of businesses and promoter of housing—but the point is that I felt that the common denominator to prosperity for America was through financing. We need to be able to finance our innovation, to finance our housing strategies, our transportation systems. So I learned very quickly that it was really essential that we focus on access to capital.

So in that regard, after I left office, I decided to just start a financial institution to do just that. I started with private equity and then learned that, you know, not everybody wants to give up—as you said, they don't want to be diluted. They don't want to lose their equity position, and it's a very expensive way to get capital.

So then I studied what financial institutions were doing, the depository institutions, and decided that maybe that was the way to go. And in financing that, Senator, it was quite interesting, because, again, it's like how do you finance a financial institution. So I did what anybody would do. I went to friends and family, and that's the way that it worked for us. I just went to friends and family and emboldened them with the idea of doing this work.

So I'm interested in understanding crowd sourcing and the other mechanisms, so that when our traditional financial institutions don't come through, what is the proper role of government in oversight, in seeding opportunities, in creating models, pilots that might be contemplated in the future. So this is the great state that innovates in so many ways, and so I was delighted to make this my first road trip in all of two weeks of service already.

The senator was very good to ask me to defend my budget on day two. But we got through, and she's just been an ardent champion for all of you, and as I said at the top of my comments, for the country. So I'm delighted to be a part of this hearing. I'm delighted to get to know you all, to hear your stories, and I look forward to you communicating with us. We've got to deepen this relationship. This should not be a one-time visit. I want this to be an ongoing relationship.

And I was delighted that Calvin was able to be here with us representing us here in the district. Our district office is also represented here. And we have nice representation here in terms of the disaster relief team. So know that SBA stands ready to help you in your time of need as well as in your time of creative thinking. God bless you. God speed. Thank you.

Chairwoman CANTWELL. Thank you. And on that note, we're adjourned.

[Whereupon, at 10:50 a.m., the hearing was adjourned.]

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