



Greentown Labs

House Committee on Science, Space, and Technology

Subcommittee on Energy

Testimony on “From Lab to Market: Accelerating our Progress Toward Economic Recovery and a Clean Energy Future”

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Thank you Chairwoman Bernice Johnson, Chairwoman Lizzie Fletcher, Ranking Member Randy Weber, and members of the subcommittee for giving me the opportunity to testify on the role the U.S. Department of Energy’s (DOE’s) technology transfer activities can play in accelerating economic recovery from the current COVID-19 pandemic and commercializing clean technologies for a cleaner, more resilient future. My name is Dr. Emily Reichert and I am CEO of Greentown Labs, the largest climatetech incubator in North America, currently home to more than 100 climatetech and cleantech companies.

About Greentown Labs

I would first like to provide you with some background on Greentown Labs (also referred to as “Greentown”). Our headquarters in Somerville, Massachusetts, spans a 100,000-square-foot campus, comprising prototyping labs, a wet lab, and office and community spaces to enable a vibrant community of entrepreneurs solving climate and environmental challenges. The mission of Greentown Labs is to provide these startups with the community, resources, and connections their companies need to thrive.

In its role as an incubator, Greentown Labs provides a place for startups to actualize their prototypes, connect with their first customers, and begin pilot testing. Before joining incubators, startups often begin their initial technology development during their founders' time at university. Companies that are accepted into Greentown Labs have often raised a small amount of money and have gone through business plan competitions and accelerator programs, where they have learned basics of entrepreneurship and refined their fundraising pitch. As a next step *after* the business plan competition and accelerator program phases, incubators provide curated prototyping resources, programming, and connections that help startups develop, test, and deploy their solutions successfully at scale.

At Greentown Labs, startups are immersed into a community of entrepreneurs and are able to take advantage of a curated suite of programming and events. At our 100,000-square-foot campus in Somerville, Massachusetts, we offer roughly 40,000 square feet of flexible, affordable prototyping and wet lab space, along with a shared machine shop and electronics lab, to allow startups to take their technology from initial R&D to rapid prototyping while preparing for manufacturing and commercial development. Greentown provides its members access to a strong network of investors, corporate partners, and manufacturers that play a critical role in supporting our entrepreneurs and helping their companies to scale.

Greentown Labs recently announced our intention to expand—for the first time outside of Massachusetts—to Houston, Texas. Greentown Labs Houston will be the first climatetech-focused incubator in the city. Houston does not have a convening incubator for the cleantech community like Greentown Labs, and this gap in the market was one key factor that attracted us to explore expansion there. The incubator will open in Spring 2021 to provide 40,000 square feet of office, prototyping lab, and community space alongside programming for Houston-area startups. We believe opening our second location in Houston, Texas, is the best way to broaden our impact and help to accelerate the energy transition through climatetech entrepreneurship, in partnership with the world-leading energy organizations headquartered there.

Houston has long been known as the energy capital of the world and we believe Texas is well-positioned to lead the global energy transition. Texas produces about one-fourth of the country's wind power, and its wind energy industry employs more than 25,000 people. Houston has the largest concentration of renewable companies anywhere in the U.S., with more than 130 solar and wind companies based in the Houston area. The City of Houston municipality is already powered by 92 percent renewable energy, and is on track to being the first major U.S. city to be powered by 100 percent clean energy. Through the

deployment of innovative, new clean technologies, some of which may emerge from Greentown Labs, Houston can reach its goal of carbon neutrality by 2050.

Both Greentown Labs and the City of Houston believe building the cleantech innovation ecosystem can be a critical part of the state's economic recovery from COVID-19, and we hope to be a catalyst for further progress on the energy transition. With the opening of Greentown Houston, we aim to build a bridge between Massachusetts and Texas to have the best and brightest engineering and business minds in energy working together on the development and deployment of innovative technology to drive the global energy transition.

Greentown's History and Impact

Greentown Labs was founded in 2011 by four startups that needed space to get dirty and build their cleantech solutions. These companies joined forces in a small space in east Cambridge, Massachusetts and quickly attracted more startups with a shared commitment to cleantech innovation and collaboration among peer entrepreneurs. What started with four startups simply needing to share the cost of rent has grown into a community of more than 100 early-stage climate and cleantech companies tackling challenges within the very largest greenhouse gas emitting sectors: Electricity, Buildings, Transportation, Agriculture, and Manufacturing.

Since our founding, Greentown Labs has supported more than 280 startups, with a survival rate of 86 percent. As of Q4 2019, these startups have collectively:

- Created more than 6,500 jobs,
- Raised more than \$850 million in capital,
- Generated nearly \$550 million in revenue,
- Filed for over 400 patents,
- Demonstrated a value add of \$850 million in gross regional product in 2019, and
- Generated at least \$1.6 billion in regional economic impact.¹

Greentown's Business Model: Strong Private Sector Support

Today, Greentown Labs is a public benefit corporation with a staff of 34, including 23 full time employees in Boston and two employees in Houston. In 2019, Greentown Labs' operating budget was just over \$8 million. Of that, more than two-thirds of our revenue came from our startups' membership fees and one-third came from corporate partnerships, which help us keep membership fees low for startups. Our expansion to Houston, Texas is

¹ Reported impacts found via quarterly surveys and IMPLAN software.

funded 100 percent by corporate partners to date. Greentown Labs' corporate partners include world-leading energy companies, many of whom have significant operations in Texas, including Shell, Chevron, BHP, ENGIE, NRG, EDF, Enel, Veolia, DSM, Mitsubishi Chemical Holdings, and Schneider Electric.

Greentown Labs wouldn't be where it is today without the support of forward-thinking corporate partners committed to energy innovation and climate action. These partnerships help us meet our operating expenses and have resulted in dozens of investments, pilots, customer agreements, and partnerships with our startups. In addition, corporations often provide valuable in-kind resources, such as legal services or discounted software, industry perspectives, and market insight for our members.

Since its inception, Greentown Labs has relied mostly on private funding, with public sector funding making up less than 4 percent of our budget in 2019. In 2015, Greentown Labs received its first federal funding in the form of a \$50,000 award from the U.S. Small Business Administration (SBA) Growth Accelerator Fund Competition. In 2019, we were honored to receive an award from the U.S. DOE/NREL and be named as a Power Connector for the American-Made Solar Prize, as well as to receive funding from the Massachusetts Clean Energy Center (MassCEC) IncubateMass grant program at the state level.

Funded by the DOE Solar Energy Technologies Office, the American-Made Solar Prize is a multi-stage prize competition that is designed to energize the U.S. solar manufacturing and energy innovation ecosystem. As a Power Connector, we leveraged our network of resources and expertise to support solar entrepreneurs in the competition. The MassCEC IncubateMass program provides funding to Massachusetts incubators with the goal of growing the clean energy innovation ecosystem and commercializing cleantech startups through incubator support.

The Role of the U.S. DOE in Cleantech Startup Support

The U.S. DOE plays a critical role in catalyzing clean energy innovation, improving the competitiveness of cleantech research and development, and generating follow on investment for early stage clean technologies. Greentown Labs has had firsthand experience of the value add and funding gap filled by DOE-led grants and competitions. Many of Greentown Labs' members have benefited from the Advanced Research Projects Agency-Energy (ARPA-E), Small Business Innovation Research (SBIR), and Small Business Technology Transfer (STTR) programs that are administered by the DOE, in addition to those from the National Science Foundation (NSF) and other federal agencies. These

programs provide essential support to early-stage cleantech companies through non-dilutive funding, mentorship, connections, and commercialization support.

SBIR/STTR Programs

This crucial support begins at the university, where DOE funding encourages students to engage in clean energy technology development to solve big challenges. After receiving support from the DOE over the last five years at the University of Texas at Austin, TexPower recently received a DOE SBIR Phase I grant for commercialization efforts of its battery technology innovation. A prospective member for Greentown Houston, TexPower aims to commercialize cobalt-free, high-capacity, drop-in cathode materials for lithium-based batteries commonly used for electric vehicles (EVs). As the U.S. manufacturing base for these metals is limited, most EV manufacturers must rely on East Asia to fill the gap. TexPower's technology will reduce reliance on these materials, ultimately enabling EVs to become more competitive in cost and performance against petroleum-driven combustion engines. Their DOE Phase I SBIR grant will enable them to start scaling their technology from the laboratory to industrial fabrication.

ARPA-E

ARPA-E is another federal program that fills a critical gap for early-stage ventures by funding game-changing energy technologies that are too early for private investment. Houston-based Syzygy Plasmonics is creating a hydrogen fuel cell technology that produces a cheaper source of energy that releases fewer carbon emissions. Syzygy was a recipient of a 2019 ARPA-E award, which helped the company develop reactor technology to process carbon emissions and create hydrogen. These programs enabled Syzygy to scale productivity of its technology by more than 10,000 times and improve its energy efficiency by 100 times. Furthermore, ARPA-E prizes better prepare startups to scale their operations and to generate follow-on investment, with Syzygy raising \$5.8 million in private funding for the company to grow its team and scale into its own lab space in Houston.

H2 Refuel H-Prize

Greentown Labs member company Ivys Energy Solutions is a prime example of how startups benefit from DOE programs. Building on its founders' decades of experience in the hydrogen fuel cell industry, Ivys is developing innovative hydrogen refueling infrastructure to enable the successful near-term rollout of electric vehicles. In 2017, Ivys and its partners McPhy Energy North America (Massachusetts) and PDC Machines (Pennsylvania) won the DOE's \$1 million H2 Refuel H-Prize Competition. The goal of the competition was to develop

a safe, affordable, readily deployable hydrogen refueling appliance for electric vehicles. This million-dollar prize enabled Ivys to develop its novel SimpleFuel station, which it is currently piloting at Greentown Labs in Massachusetts, at a Toyota hydrogen car manufacturing plant in Japan, and at other sites around the globe.

American-Made Solar Prize

Greentown Labs was proud to serve as a Power Connector in the American-Made Solar Prize, partnering with the DOE and the National Renewable Energy Laboratory (NREL) to drive solar innovation. Through this program, we provided participants access to our strong national and local network of manufacturers, startups, and strategic partners in the solar industry. To help amplify the DOE and NREL's efforts to revitalize the U.S. solar manufacturing industry, Greentown Labs hosted the 2019 American-Made Solar Prize Set! Demo Day.

VesprSolar, one of our newer members, learned about Greentown Labs through the competition after receiving mentorship and advice on a commercialization approach from our team. VesprSolar is a solar hardware startup that is defining a new industry standard for PV module attachment. The VesprSolar V-Clip is a new multi-functional, low-cost PV module fastener that will drive significant savings in utility-scale installation and maintenance costs. VesprSolar's V-Clip is a Round 2 Semi-finalist of the 2019 American-Made Solar Prize, recognized as a top 20 solar innovation, and is now competing in the final stage.

COVID-19 Impacts on Cleantech Startups and Cleantech Incubators

Since March 2020, COVID-19 has posed unprecedented challenges for both cleantech startups and for the incubators that provide them support and services. In the earliest days of the pandemic, many investors warned startups of the economic challenges ahead, advising them to cut their costs by 30 percent in order to extend their runway. COVID-19 has delayed new investment and the hiring of new employees as startups seek to conserve cash for unanticipated, longer runways before funding can be secured. As fears rose around cleantech investment prospects coming to a standstill, cleantech startups with limited runways or that were actively fundraising were disproportionately affected. Furthermore, available programs such as the CARES Act Paycheck Protection Program and other loan programs that benefited many sectors of the economy were not a good fit for startup companies due to issues with affiliation, among others.

COVID-19 has also made it more challenging for startups to achieve technical and business milestones. As customer projects came to a halt—some indefinitely—revenue-funded

companies that were counting on those orders seemed to struggle more than venture-capital-backed companies. Additionally, the economic slowdown resulted in disrupted supply chains and stalled pilot projects that would have been crucial for startups proving their technology in the field. Following the shutdown of building operations in the wake of COVID-19 outbreaks, startups heavily reliant on lab access experienced detrimental impacts on progress against their technical milestones and grant deliverables.

From the incubator perspective, in order to adhere to state and local guidance, Greentown Labs' operations had to cease for nearly three months, resulting in a significant loss of revenue that has been detrimental to Greentown Labs' financial health and long-term ability to provide critical services to entrepreneurs. Although we received a much-needed forgivable loan through the CARES Act Paycheck Protection Program, we have already had to reduce headcount. As noted above, over two-thirds of Greentown's revenue is derived from membership fees startups pay to access lab and office space.

As well, in the past few months, Greentown has had to rapidly learn how to run a virtual incubator, focusing specifically on providing unique virtual programming and connection to experts for our members during this challenging time. Today, we are operating at about 25 percent of our original occupancy while continuing to develop and deliver virtual programming resources. With both continued uncertainty about the nation's economy as a whole and its impacts on private investment in startups, and the continuing impact of necessary COVID-19-related restrictions on our operations, we face a challenging path forward without additional support.

Catalyzing a National Recovery Driven by Clean Energy

As we shift our focus from responding to the virus to recovery from the virus, we have a significant opportunity to align efforts to build our economy back better than before. Support of cleantech innovation and building resilient systems can and should be part of our economic recovery. In Houston, the city's energy expertise and strong engineering talent base can be re-utilized to address climate change through cleantech innovation. Already strong in Texas, this sector provides massive economic potential for sustainable and equitable growth.

As we've seen since the last recession, clean energy can be a huge driver for workforce development and economic opportunity. The Massachusetts example, following the 2007-2009 recession, provides an important case study. Overall, the Massachusetts clean energy sector has added more than 52,000 jobs since 2010—a growth rate of 86 percent over that time. As of 2019, over 111,800 clean energy workers could be found in every

Massachusetts county, and the state's cleantech industry contributes \$14 billion to the Massachusetts Gross State Product. And of those workers, 61 percent are employed by small businesses, which is the size of most Greentown Labs companies.

With this experience in mind, Greentown Labs is thrilled to provide its enthusiastic support of the proposed "Energizing Technology Transfer Act"² and the "Increasing and Mobilizing Partnerships to Achieve Commercialization of Technologies (IMPACT) for Energy Act" (H.R. 3575).³ Both Acts introduce programming and support that will be crucial for COVID-19 recovery in the cleantech industry. Several program elements critical to the recovery of cleantech incubators and startups in the wake of COVID-19 are highlighted below.

National Clean Energy Incubator Program

In 2014, the DOE's National Incubator Initiative for Clean Energy (NIICE) grant program provided support for individual incubators and launched the Incubator Network made up of cleantech incubators and accelerators across the nation, including Greentown Labs. The goal of the Network was to enhance collaboration, encourage sharing of best practices, and help standardize incubator performance metrics. Through the Incubator Network, Greentown Labs has developed strong and lasting partnerships with incubators and accelerators across the country located in Hawaii, California, Texas, Michigan, Illinois, and New York. It is exciting to imagine the possibilities for collaboration and growth benefiting cleantech startups throughout the country that will be spurred by the National Clean Energy Incubator Program as proposed in the "Energizing Technology Transfer Act" legislation before the committee.

In particular, the National Clean Energy Incubator Program described in the proposed legislation will be crucial for filling a much-needed gap in cleantech incubator operations support. Even in normal times, one of the biggest challenges faced by incubators is funding operational costs. We are pleased to see language specifically highlighting this as an allowable expense. Funding of this type, especially in the wake of COVID-19, will go a long way in meeting this challenge and in helping incubators and the startups they support recover.

This Program additionally would also allow Greentown Labs and other incubators to engage and invest in diversity, equity, and inclusion efforts. Participation of underrepresented groups—including women and minorities—have been a long-standing issue in the cleantech

² This proposed bill will be introduced during the 2nd session in the 116th Congress (2019 - 2020).

³ Increasing and Mobilizing Partnerships to Achieve Commercialization of Technologies (IMPACT) for Energy Act, H.R. 3575, 116th Cong., 1st Sess. (2019 - 2020).

industry, and incubators have often lacked necessary resources to engage in meaningful outreach and develop programming to support these groups. Funding from the National Clean Energy Incubator Program could enable support and engagement of traditionally underrepresented groups to be more core to the operations of an incubator. In the Houston area alone, we've identified a dozen organizations focused on supporting traditionally underrepresented entrepreneurs that we would like to work with as we build our operations there. Such programming will help ensure an equitable clean energy recovery, ensuring that *all* of the human capital and talent the U.S. has to offer is applied to the challenge of climate change.

Clean Energy Technology University Prize Competition

Furthermore, we applaud the expansion of support for the I-Corp program and the Clean Energy Technology University Prize Competition put forward in the proposed "Energizing Technology Transfer Act" legislation, which we see as incredibly important to strengthening the bridge between academia and launching an entrepreneurial venture. Both MIT's many startup programs and Rice University's Rice Alliance for Technology and Entrepreneurship have been nationally recognized for their role in spurring cleantech entrepreneurship and commercialization. University competitions, such as the MIT Clean Energy Prize and the Rice University Business Plan Competition, help curate the best talent and technological innovations from university labs to be transferred successfully to the marketplace.

These programs are essential for encouraging entrepreneurship, generating student excitement about clean energy, and driving technology toward commercialization. The majority of Greentown Labs' members have participated in such programs, many going on to win first place. Greentown Labs member Infinite Cooling won the top Cleantech University Prize at the 2017 MIT Clean Energy Prize (\$100K), after winning top prizes in numerous other competitions and accelerators and in the DOE National Cleantech Competition.⁴ Infinite Cooling also emerged as the top company in the 2018 Rice Business Plan Competition, hosted by the Rice Alliance, winning a total of \$400K in prizes. Infinite Cooling's innovative technology can reduce power plant water consumption and costs by capturing and reusing steam escaping from cooling towers.

In the wake of COVID-19, with large corporations hiring less due to a slowing economy, it is likely that many enterprising students at Rice University, MIT, and other universities across the nation will choose to build new companies that seek to address our major energy and

⁴ Other Greentown members who have won the MIT Clean Energy Prize include Aeroshield (2019), Medley Thermal (2019), Infinite Cooling (2016), Heila Technologies (2016), Sistine Solar (2013), and Cool Chip (2011).

environmental challenges. Support for the Clean Energy Technology University Prize Competition will provide the educational experience, mentoring, visibility, and path to funding these young entrepreneurs will need to launch businesses that create jobs and grow our economy back stronger than ever. These programs will play a crucial role in catalyzing cleantech innovation and driving the COVID-19 recovery.

IMPACT for Energy Act

Finally, we strongly support the “IMPACT for Energy Act,” which would provide necessary funding for critical gaps in the early stages of cleantech startup development and in the commercialization of innovative technologies. In particular, the establishment of an Impact Investment Fund would help fill critical current private sector funding gaps in the path to market for early-stage clean technologies.

As well, the importance of engaging the private sector and investment community in addressing climate change through innovation cannot be understated. At Greentown Labs, we believe corporate partnerships are paramount to scaling clean technology, and they provide critical, direct support for our innovation programming. Through our work with 50+ corporate partners, our organization has direct experience in engaging the private sector in these efforts, resulting in investments, commercial pilots, joint development agreements, and licensing agreements for our incubated startups. We are glad to see the vision for a specific purpose-built entity to engage the private sector in climate-focused innovation become a reality through the creation of a DOE Foundation.

Conclusion

Based on the experiences of Greentown Labs, and our partners around the country, it is clear that legislation to support the development of clean energy innovation companies is critical to the nation’s recovery following COVID-19 and to meet the urgency of climate change. As this committee continues to review the impacts of technology transfer activities at the Department of Energy and their potential contributions to economic recovery from the current COVID-19 pandemic, I hope you will keep the experience of Greentown Labs in mind. The DOE is in a perfect position to administer programs that will accelerate cleantech commercialization and drive job growth for an equitable, clean-energy-fueled recovery. Thank you again for inviting me here today and for the opportunity to speak on such an important issue.



Emily Reichert, Ph.D.

Chief Executive Officer
Greentown Labs

Dr. Emily Reichert serves as Chief Executive Officer of Greentown Labs, the largest climatetech incubator in North America. As the organization's first employee, Emily spearheaded the rapid growth of Greentown Labs, incubating hundreds of climate-focused startups that have created thousands of jobs and attracted partners from around the world. Today, Greentown Labs has grown to 35 employees managing a community of nearly 100 startups and 100,000+ sq. ft. of space, headquartered in Somerville, Massachusetts with a second location currently in development in Houston, Texas.

Emily started her career at Arthur D. Little as a Ph.D. scientist and progressed into R&D, business development and general management roles. Prior to Greentown Labs, she was the Director of Business Operations at the Warner Babcock Institute for Green Chemistry where she helped grow the angel-funded startup into a sustainable contract R&D business with a mission to minimize environmental impact of chemical products.

Emily has been appointed to leadership positions on innovation, economic development, entrepreneurship, and clean technology commercialization at the city, state, and federal level including the City of Somerville's Chamber of Commerce, the Massachusetts Governor's Economic Development Planning Council, the Massachusetts Advanced Manufacturing Collaborative, and the U.S. Secretary of Commerce's National Advisory Council on Innovation and Entrepreneurship.

She holds a Ph.D. in Physical Chemistry from the University of Wisconsin-Madison and earned her MBA from MIT Sloan School of Management.