S. HRG. 119–94

SMALL BUSINESSES POWERING THE CLEAN ENERGY ECONOMY

FIELD HEARING

BEFORE THE

COMMITTEE ON SMALL BUSINESS AND ENTREPRENEURSHIP

OF THE

UNITED STATES SENATE

ONE HUNDRED NINETEENTH CONGRESS

FIRST SESSION

MAY 9, 2025

Printed for the use of the Committee on Small Business and Entrepreneurship

Available via the World Wide Web: http://www.govinfo.gov

U.S. GOVERNMENT PUBLISHING OFFICE

60–612 WASHINGTON : 2025

COMMITTEE ON SMALL BUSINESS AND ENTREPRENEURSHIP

ONE HUNDRED NINETEENTH CONGRESS

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FIELD HEARING:
SMALL BUSINESSES POWERING THE CLEAN ENERGY ECONOMY

FRIDAY, MAY 9, 2025

U.S. SENATE,
COMMITTEE ON SMALL BUSINESS
AND ENTREPRENEURSHIP,
Washington, DC.

The committee met, pursuant to notice, at 10:00 a.m., at Benjamin Franklin Cummings Institute of Technology, 41 Berkeley Street, Boston, MA, Hon. Edward J. Markey, Ranking Member of the Committee, presiding.

Present: Senator Markey.

STATEMENT OF SENATOR MARKEY

Senator MARKEY. Good morning, everyone. The Senate Committee on Small Business and Entrepreneurship will come to order.

As we come to the end of the National Small Business Week, we are here today to talk about an issue that is very important to all of us here in Massachusetts—the clean energy economy. This is one of the fastest growing industries in the United States. Nearly 3.5 million Americans work in clean energy, and the sector is adding jobs three times faster than the overall U.S. workforce, and Massachusetts is leading the way.

Here in the commonwealth, the clean energy economy supports more than 200,000 jobs, an 80 percent increase since 2010. We also lead the nation in climate tech start-ups per capita, with 49 start-ups per 1 million residents. That is what makes us not just the Bay State but the Brain State. We are moving to the future, technologically.

Today we are at Franklin Cummings Tech, a school on the front lines of making economic and climate justice a reality. In 2013, Senator Warren and I, in the Senate, working with Congresswoman Pressley in the House, secured $800,000 in funding to help launch the school's Center for Energy Efficiency and the Trades. I am proud to have helped get such an innovative program off of the ground.

Small businesses play an important role in the clean energy economy, but uncertainty and chaos could affect our path to a just, livable future for everyone. Our clean energy transition isn't just about mitigating the devastating impacts of the climate crisis. It is about building an economy with accessible, good-paying jobs, and it is about centering justice.

A major part of building this future is supporting the small businesses in the industry. We all know small businesses are the backbone of the American economy, and that is no different here. They account for a significant portion of clean energy jobs in the United States. In fact, 75 percent of energy efficiency businesses are small businesses, employing 20 or fewer workers.

The Inflation Reduction Act, the largest climate bill in history, is a down payment for a livable future, and is helping small businesses in the clean energy economy thrive. The IRA supports jobs and small businesses with tax credits to improve energy efficiency in homes, in businesses, produce clean energy, and install solar and wind and battery technology. And these credits are intentionally designed to favor projects to pay prevailing wages and invest in apprenticeship programs.

In other words, IRA investments mean that a local restaurant can lower its electricity bill by installing rooftop solar, or the corner store, down the street, can buy electric delivery vehicles and install charging stations, allowing shoppers to charge up while they grab groceries for the week.

In addition, the $20 billion in funding from the Greenhouse Gas Reduction Fund, the single largest investment in the Inflation Reduction Act, and based on my National Climate Bank legislation, is projected to generate a combined $250 billion in public and private sector funding over the first 10 years of the Climate Bank, much of which would support jobs and small businesses. That is not me touting my Climate Bank. That is McKinsey doing an analysis of how much private sector funding would be unleashed by the Climate Bank in the first 10 years.

But the Trump administration has frozen the money, creating uncertainty, and putting small businesses depending on all of this funding at risk. We must continue investing in American jobs and small businesses by preserving the IRA's tax credits. This means investing in clean and efficient energy technologies, safeguard Small Business Administration lending options, and supporting small business importers and exporters.

Likewise, the Small Business Administration, or SBA, can support low-cost financing of energy-efficient and renewable technologies. Low-cost energy loans from the SBA have been used by hotels on Cape Cod to install solar panels to lower costs, to help hotels survive the winter season.

The SBA also provides grants to innovative climate tech companies through the Small Business Innovation Research and Small Business Technology Transfer programs, and has helped clean energy ensure that those small businesses expand to foreign markets, with grants through the State Trade Expansion Program, also known as STEP.

President Trump's budget, released last week, proposed cutting STEP entirely, cutting the State Trade Expansion Program. Even as he is talking about tariffs, he wants to eliminate the program which would provide that extra help for state trade expansion. He also wants to eliminate many other key Federal programs that small businesses rely upon.

The Trump administration is denying small businesses the support and the capital they need to keep pushing American innova-

tion forward. The clean energy economy is the key to a healthy climate future for everyone, and supporting small businesses should never be a partisan issue.

In Massachusetts, we know the importance of investing in entrepreneurs. We have built an ecosystem of innovation, where start-ups and small businesses are creating the technologies that are transforming our world. We need clean energy entrepreneurs to develop, install, and maintain the technology and infrastructure that are the foundation of our clean energy economy. The future of our environment and economy depends upon these continued investments in small businesses, and I look forward to discussing them in today's field hearing.

So we have an incredible panel of experts who are joining us this morning, and I am going to give each one of them their proper introduction, and one by one you are going to hear some of the smartest people in America explain why this is a key part of our economy, both here and across the nation.

First up is Dr. Emily Reichert, the Chief Executive Officer of the Massachusetts Clean Energy Center. For more than a decade, Emily has been an essential part of what makes Massachusetts a climate and clean energy leader. With technical and business expertise, Emily led Greentown Labs to become the largest climate tech start-up incubator in North America, attracting billions in investments and creating thousands of jobs. As CEO of MassCEC, Emily is working to develop the clean energy workforce and drive equitable growth across Massachusetts.

So Dr. Reichert, thank you so much for being with us. Whenever you feel ready, please begin.

STATEMENT OF EMILY REICHERT, Ph.D., CEO, MASSACHUSETTS CLEAN ENERGY CENTER, BOSTON, MA

Ms. REICHERT. Good morning, Senator Markey. Thank you for gathering us here today to discuss the clean energy economy in Massachusetts, and specifically the economic impact of clean energy small businesses and clean energy workers.

I want to first thank Franklin Cummings Tech and President Aisha Francis for hosting us. At MassCEC we are fortunate to have Dr. Francis as a valued member of our board of directors.

My name is Emily Reichert and I have the honor of serving as the CEO of the Massachusetts Clean Energy Center, also known as MassCEC. MassCEC is a quasi-state economic development agency dedicated to accelerating the growth of the clean energy and climate tech sector across Massachusetts. We do this to spur job creation, deliver statewide environmental benefits, and secure long-term economic growth for our residents.

I appreciate the opportunity to share findings that we have gathered as part of MassCEC's annual Clean Energy Industry Survey. MassCEC is required by law to submit an annual report detailing the state's clean energy industry to the Massachusetts legislature. While we are still finalizing the report, I would like to share a few highlights with you today. The headline is: the Massachusetts clean energy economy is strong.

The clean energy industry has become a major part of the Massachusetts economy and has seen continued growth in jobs, busi-

nesses, and economic impact. There are over 7,500 clean energy businesses in Massachusetts, and 58 percent of clean energy businesses in Massachusetts are small businesses, with 10 or fewer workers.

The Massachusetts clean energy industry has doubled since 2010, adding nearly 60,000 jobs. In total, Massachusetts is home to over 115,000 clean energy workers. That is 115,000 Massachusetts residents who rely on work in clean energy businesses, many of them small businesses, to support themselves and their families.

But the impact of the industry is much greater than 115,000 jobs alone, because the Massachusetts clean energy industry supports another 43,500 indirect jobs, and nearly 70,000 induced jobs. Indirect jobs are those outside the clean energy sector that provide critical supply chain goods and services for the sector, and induced jobs are those that result from increased spending in the economy, thanks to the clean energy industry.

In total, the clean energy industry powers 233,427 direct, indirect, and induced jobs, according to our recent report.

As well, the industry has been responsible for generating a significant amount of tax dollars, including $5.9 in Federal taxes, and $2.9 billion in state and local taxes invested back in the economy here. In 2023, the clean energy sector contributed $15.9 billion, or about 2 percent, to the commonwealth's gross state product.

However, the numbers in this year's annual industry report only reflect clean energy jobs. Massachusetts has a booming climate tech sector, as well. We are number one in the U.S. for climate tech startups per capita, with many young companies emerging from our local universities and growing into successful climate tech manufacturing businesses. Recent examples who are also grantees of MassCEC's programs include Aeroshield Materials, in Waltham, Massachusetts, which is developing advanced insulation materials to improve energy efficiency in buildings; AM Batteries, in Billerica, Massachusetts, which is pioneering cleaner, more efficient ways to make batteries for electric vehicles and other energy storage applications; and Clean Crop Technologies in Holyoke, Massachusetts, which is using innovative technology to keep food fresher or longer and cut waste across the food supply chain.

Another exciting highlight of the report is that the Massachusetts clean energy industry is a statewide industry. Seventy-four percent of clean energy businesses are outside of the greater Boston area. These workers and small businesses are improving the quality of life for countless residents across Massachusetts. They are making lives more affordable and more comfortable. They are helping drivers switch to cleaner electric vehicles. They are helping homeowners and businesses make their homes and commercial buildings healthier and more efficient. They are reducing pollution and building a future with cleaner air and water. And they are helping us accelerate the transition to clean energy sources that are more reliable and more secure.

The continued growth of the clean energy industry is already vital to the well-being of many Massachusetts families. But we know we have more work to do to grow jobs and ensure everyone can take part in the benefits of clean energy. Women and minority workers continue to be underrepresented in the industry, and that

is why equitable workforce development is one of our top priorities at MassCEC.

Massachusetts needs roughly 28,000 additional workers to meet our 2030 climate goals, but 37 percent of clean energy employers reported that they found it very difficult to hire qualified workers. That is why yesterday I traveled to Essex North Shore Technical and Agricultural High School in Danvers, Massachusetts, to announce $7.3 million in workforce development grants to 25 incredible organizations across the commonwealth, including community colleges, unions, and technical high schools. These grants will support local organizations working to build training pipelines, raise awareness, and expand access to clean energy jobs.

On a global scale, the clean energy transition is unstoppable. But the competition is fierce and other countries are moving forward.

The progress we have made over the past 15 years here in Massachusetts is incredible, and we have much to be proud of. This work wouldn't be possible without people coming together across higher education, government, labor, industry, and the nonprofit sector.

Massachusetts is a climate leader and a hub for innovation, and will continue to grow the clean energy industry and accelerate climate tech solutions. But without reliable Federal investments, our entrepreneurs and small businesses will suffer, and when small businesses suffer, so do workers, consumers, and entire communities. This is the time when we should strengthen our support for clean energy small businesses and workers, as well as the researchers and innovators who drive ground-breaking climate solutions.

I appreciate the opportunity to speak about positive economic impact of the clean energy small businesses and the workers who power this growing industry in Massachusetts. Senator Markey, thank you again for inviting MassCEC to testify today. I look forward to your questions.

[The prepared statement of Ms. Reichert follows:]

Emily Reichert's Remarks

Senator Markey's Clean Energy Small Business Field Hearing

May 9, 2025

You will speak for about 5 minutes.

Introduction:

- Good morning, Senator Markey. Thank you for gathering us here today to discuss the clean energy economy in Massachusetts, and specifically the economic impact of clean energy small businesses and clean energy workers.

- I want to thank Franklin Cummings Tech and President Aisha Francis for hosting us. At MassCEC, we are fortunate to have Dr. Francis as a valued member of our Board.

- My name is Emily Reichert, and I have the honor of serving as the CEO of the Massachusetts Clean Energy Center, also known as MassCEC.

- MassCEC is a quasi-state economic development agency dedicated to accelerating the growth of the clean energy and climatetech sector across Massachusetts.

- We do this to spur job creation, deliver statewide environmental benefits, and secure long-term economic growth for our residents.

MA Clean Energy Industry:

- I appreciate the opportunity to share the findings we have gathered as part of MassCEC's Annual Clean Energy Industry survey.

- MassCEC is required by law to submit to the Massachusetts Legislature an annual report detailing the state's clean energy industry.

- While we are still finalizing the report, I'd like to share some highlights with you today.

- The headline is: the Massachusetts Clean Energy economy is strong.

- The clean energy industry has become a major part of the Massachusetts economy and has seen continued growth in jobs, businesses, and economic impact.

- **There are over 7,500 clean energy businesses in Massachusetts.**

- The Massachusetts clean energy industry has doubled since 2010, adding nearly 60,000 jobs.

- In total, Massachusetts is home to over 115,000 clean energy workers.

- That's 115,000 people who rely on work in the clean energy industry to pay their bills and care for themselves and their families.

- But the impact of the clean energy industry is much greater than these 115,000 jobs alone.

- The Massachusetts clean energy industry impacts another 43,500 indirect jobs and nearly 75,000 induced jobs.

- Indirect jobs are those outside of the clean energy sector that provide critical supply chain goods and services.

- Induced jobs are those that result from increased spending in the economy thanks to the clean energy industry.

- In total, the clean energy industry powers 233,427 direct, indirect, and induced jobs.

- The industry has been responsible for generating a significant amount of tax dollars, including a total of $5.9 billion in federal taxes and $2.9 billion in state and local taxes.

- In 2023, the clean energy industry contributed $15.9 billion, or about 2%, to the Commonwealth's Gross State Product (GSP).

- The numbers in this year's report only reflect *clean energy* jobs.

- Massachusetts has a booming *climatetech* sector as well. We are #1 in US climatetech startups per capita, with many young companies emerging from our local universities and growing into successful climatetech manufacturing businesses.

- Recent examples, who are also grantees of MassCEC's programs include:
    - **Aeroshield Materials** in Waltham, MA, which is developing advanced insulation materials to improve energy efficiency in buildings.
    - **AM Batteries** in Billerica, MA, which is pioneering cleaner, more efficient ways to make batteries for electric vehicles and energy storage.
    - **Clean Crop Technologies** in Holyoke, MA, which is using innovative technology to keep food fresher for longer and cut waste across the food supply chain.

- Another exciting highlight is that the Massachusetts clean energy industry is a **statewide** industry.

- 74% of clean energy businesses are located outside of Greater Boston.

- **58% of clean energy businesses are small businesses with 10 or fewer workers.**

- When looking at clean energy jobs by sector or subsector, many clean energy jobs, 66% to be exact, are in the Energy Efficiency, Demand Management, and Clean Heating and Cooling.

- The state has experienced growth in other subsectors, too.

- Massachusetts has seen a 22% increase in clean transportation jobs since 2023. And the state was ranked #1 nationally for the highest rate of growth in electric vehicle jobs in 2024.

- Along with EVs, other subsectors that experienced the greatest increase in jobs between 2023 and 2024 include solar; advanced and recycled building materials; and clean, high efficiency, and ENERGY STAR heating and cooling.

- These workers and small businesses are improving the quality of life for countless residents across Massachusetts.

- They're making life more affordable and more comfortable.

- They're helping drivers switch to electric vehicles.

- They're helping homeowners and business owners make their homes and commercial buildings healthier and more efficient.

- They're reducing pollution and building a future with cleaner air and water.

- And they're helping us accelerate the transition to clean energy sources that are more reliable and more secure.

- The continued growth of the clean energy industry is vital to the well - being of the Massachusetts economy.
- But we have more work to do to grow jobs and ensure everyone can take part in the economic benefits of clean energy.

- Women and minority workers continue to be underrepresented in the industry.

- Equitable workforce development is one of our top priorities, and Massachusetts needs roughly 28,000 additional workers to meet our 2030 climate goals, but 37% of employers still reported that they found it very difficult to hire qualified workers.

- That's why yesterday, MassCEC traveled to Essex North Shore Technical and Agricultural High School in Danvers, Massachusetts to announce $7.3 million in workforce development grants to 25 incredible organizations including community colleges, unions, and technical high schools.

- These grants will support local organizations working to build training pipelines, raise awareness, and expand access to climate jobs.

Closing:

- On a global scale, the clean energy transition is unstoppable. Competition is increasing and other countries are moving forward.

- The progress we've made here in Massachusetts over the past 15 years is incredible and we have much to be proud of

- This work wouldn't be possible without people coming together from across higher education, government, labor, industry, and the nonprofit sector.

- Massachusetts, as a climate leader and a hub for innovation, will continue to do what it can to grow the clean energy industry and accelerate climatetech solutions.

- But without reliable federal investments, our entrepreneurs and small businesses will suffer.

- And when small businesses suffer, so do workers, consumers, and entire communities.

- This is the time when we should strengthen our support for clean energy small businesses and workers, as well as the researchers and innovators who drive groundbreaking climate solutions.

- I appreciate the opportunity to speak about the positive economic impact of clean energy small businesses and the workers who power this growing industry.

- Senator Markey, thank you again. I look forward to your questions.

Senator MARKEY. Thank you so much, Doctor. And you are right. This is a global revolution. Last year, for the first time in history, there was more funding invested into solar than in oil, for the first time in history. So this is no longer some small piece of the whole clean energy or energy economy, in general. It is just growing exponentially. So thank you so much, Doctor.

Next we have Nick d'Arbeloff, President of the Board for the Solar Energy Business Association of New England, or SEBANE. SEBANE is a collection of solar energy companies in New England, including residential and commercial developers, installers, and consultants, and manufacturers. Nick is also Head of Market Development at ReVision Energy, a mission-driven, employee-owned solar company with locations in North Andover and Wakefield.

We thank you, Nick, for coming, and I welcome you to make an opening statement.

STATEMENT OF NICK D'ARBELOFF, PRESIDENT, SOLAR ENERGY BUSINESS ASSOCIATION OF NEW ENGLAND (SEBANE), RANDOLPH, MA

Mr. D'ARBELOFF. Thank you. Ranking Member Markey and members of the Senate Committee on Small Business and Entrepreneurship, thank you for this opportunity to testify today. As you note, I am Nick d'Arbeloff. I serve as President of SEBANE, the Solar Energy Business Association of New England.

Before I begin I would like to express my thanks to you, Senator Markey, for all that you do and all that you have done to support clean energy in Massachusetts and nationwide. Your tireless efforts to advance legislation that helps clean energy businesses gain a foothold and grow has been critical to the success of the Massachusetts clean energy economy.

Back in 2008, when I served as the founding President of the England Clean Energy Council, now the Alliance for Climate Transition, I remember well the support you offered our young organization. I am deeply grateful for your dedication to the clean energy cause.

SEBANE's mission is to protect and promote the New England solar industry through informed policy intervention, coalition building, and stakeholder education. Our members include residential installers, commercial developers, systems integrators, solar component manufacturers, and service providers. The vast majority of our members are small businesses, and all of them have been significantly impacted by the erratic changes in policy over the last few months.

SEBANE members work diligently each day to deploy clean energy resources throughout our region. Domestic energy production is vital to achieving energy independence, and much of our progress has been greatly accelerated by the Section 48 and 25D investment tax credits. These clean energy tax benefits have a long-standing history of bipartisan support, and their extension under the IRA offer the regulatory certainty that our member businesses depend on to plan, hire, and invest. Repealing these provisions, especially when paired with the volatility caused by proposed tariffs, would deal a significant blow, financial blow, to project viability and thus to our member businesses, jeopardizing thousands

of jobs and millions of dollars in private investment that power our regional economy.

Many of our small business member companies, including some that have been operating for more than 20 years, have expressed serious concerns about the potential rollback of the Inflation Reduction Act. Several have indicated that they will be forced to significantly reduce their workforce or close their doors entirely if these changes move forward. Investors are increasingly hesitant to finance projects due to uncertainties around tax credits, grants, and tariffs, all of which are now being factored into both the cost of capital and asset valuations.

As a result, projects are being halted mid-development. Installers are raising their prices significantly, some by more than 20 percent. Several members have warned that the imposition of tariffs could effectively shut down the battery storage sector altogether.

While SEBANE has worked successfully with the Healey administration and previous administrations to advance policies, to reduce barriers, and open new markets for solar, the combined impact of IRA rollbacks and tariffs would be devastating for many of our small business members. Moreover, SEBANE itself, operating as a nonprofit funded entirely through member dues and educational event revenue, may not withstand the financial strain that such cuts would impose across our membership base.

Tariffs are not new to the solar industry. We saw tariffs introduced in 2012, when it was believed that the Chinese were dumping panels in the U.S. below their cost to manufacture. In 2018, several new tariffs were added. These were then extended in 2022. Multiple administrations have levied solar tariffs, kept them in place, and/or extended them. At this moment in time, what is most concerning is both the scale and unpredictability of the tariffs being implemented.

Any business, small or large, seeks to understand and account for all the variables that may adversely impact its operations. If a business knows that a component is going to cost more in the years ahead, they can plan for it. What makes planning more challenging is a situation where it is difficult, if not impossible, to understand or even estimate what that component will cost. This is the very situation that solar companies find themselves in today.

The Biden administration placed an emphasis on the domestic manufacturing of solar components. The policy was well designed and well implemented. As a result, major panel manufacturers began building assembly plants here in the United States. Hanwha opened plans in Dalton and Cartersville, Georgia; Silfab opened plants in Burlington, Washington, and Fort Mill, South Carolina; JA in Phoenix, Arizona; Jinko in Jacksonville, Florida. It is important to note that the policy leaned on carrots rather than sticks. If a project used components with high domestic content, it was eligible for higher tax credits. This incentive drove the market and ultimately drove manufacturers to invest in U.S. operations.

Currently, these manufacturing plants are not building solar panels from the ground up. They are still primarily assembly plants. They receive subcomponents from around the globe, and the finished product is assembled in the U.S. This represents a huge step forward in increasing the domestic content of panels installed

in the U.S., but it is worth nothing that a panel with every single subcomponent made in the United States is mostly aspirational. It is not realistic given today's global supply chains. The previous policy took this into account.

The tariffs being implemented in 2025 are all sticks and no carrots. In fact, many of the financial incentives that the industry has started to leverage have been swept off the table. It is possible the courts may bring some of these incentive and grant monies back. It is also possible they will not. Most concerning, it is possible that Congress will reduce tax credits in the coming months, something SEBANE members very strongly oppose.

With all subcomponents now facing a range of different punitive tariffs, the industry has gone from the possibility of bonus incentives, with prices remaining relatively stable, to a situation where there are now no bonus incentives and prices are starting to fluctuate wildly. This rapidly changing landscape creates substantial instability.

The solar industry, both in Massachusetts and across the nation, is quite accustomed to policy-driven ups and downs. After all, that is why it is so commonly referred to by insiders as the "the solar coaster." We have weathered many storms, and it is my expectation that the industry will weather this storm, as well. And it is critical that we do so, since solar remains one of the most powerful tools available for combatting climate change. Solar not only increase our nation's energy independence and enhances grid resiliency, it also offers a reliable, affordable source of electricity that moves us away from the dangers of fossil fuels.

Senator Markey, as you know well, the battle to prevent climate catastrophe is not going particularly well. That said, giving up the fight is simply not an option. To the greatest extent possible, SEBANE's members, along with solar companies across the country, will continue doing what we do, both as small businesses seeking to grow and prosper and as a group of dedicated professionals helping civilization avoid the very worst impacts of climate change.

Thank you for the opportunity to speak with you today.

[The prepared statement of Mr. d'Arbeloff follows:]

SENATE COMMITTEE ON SMALL BUSINESS AND ENTREPRENEURSHIP

Field Hearing:

Small Businesses Powering the Clean Energy Economy

Benjamin Franklin Cummings Institute of Technology
41 Berkeley Street, Boston, MA 02116

Friday, May 9, 2025

Testimony of:

Nick d'Arbeloff
President, Solar Energy Business Association of New England (SEBANE)
Randolph, MA

Ranking Member Markey and Members of the Senate Committee on Small Business and Entrepreneurship, thank you for this opportunity to testify today. My name is Nick d'Arbeloff, and I serve as President of SEBANE, the Solar Energy Business Association of New England.

Before I begin, I would like to express my thanks to you, Senator Markey, for all that you do and all that you have done to support clean energy in Massachusetts and nationwide. Your tireless efforts to advance legislation that helps clean energy businesses gain a foothold and grow has been critical to the success of the Massachusetts clean energy economy. Back in 2008, when I served as the founding president of the New England Clean Energy Council (now the Alliance for Climate Transition, or ACT), I remember well the support you offered our fledgling organization. I am deeply grateful for your dedication to the clean energy cause.

The mission of the Solar Energy Business Association of New England is to protect and promote the New England solar industry through informed policy intervention, coalition building, and stakeholder education. Our members include residential installers; commercial developers; systems integrators; solar component manufacturers; and service providers. The vast majority of our members are small businesses, and all of them have been significantly impacted by the erratic changes in policy over the last few months.

SEBANE members work diligently each day to deploy clean energy resources throughout our region. Domestic energy production is vital to achieving energy independence, and much of our progress has been driven by the incentives provided under the IRA—particularly the 48E and 25D investment tax credits. These clean energy tax credits have a long-standing history of bipartisan support, and their extension under the IRA offered the

regulatory certainty that businesses like ours depend on to plan, hire, and invest. Repealing these provisions—especially when paired with the volatility caused by proposed tariffs—would deal a significant financial blow to project viability and thus to our businesses, jeopardizing thousands of jobs and millions of dollars in private investment that power our regional economy.

Many of our small business member companies—including some that have been operating for more than 20 years—have expressed serious concerns about the potential rollback of the Inflation Reduction Act. Several have indicated they will be forced to significantly reduce their workforce or close their doors entirely if these changes move forward. Investors are increasingly hesitant to finance projects due to uncertainties surrounding tax credits, grants, and tariffs, all of which are now being factored into both the cost of capital and asset valuations. As a result, projects are being halted mid-development. Installers are raising their prices significantly—some by more than 20%—just to stay afloat. Several members have warned that the imposition of tariffs could effectively shut down the battery storage sector altogether.

While SEBANE has worked successfully with the Healey administration to advance policies that reduce barriers and open new markets for solar, the combined impact of IRA rollbacks and tariffs would be devastating for many of our small business members. Moreover, SEBANE itself—operating as a nonprofit funded entirely through member dues and educational event revenue—may not withstand the financial strain that such cuts would impose across our membership base.

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The Biden administration placed an emphasis on the domestic manufacturing of solar components. The policy was implemented in a logical fashion; as a result, major manufacturers began building assembly plants here in the United States. Hanwha opened plants in Dalton and Cartersville, Georgia; Silfab opened plants in Burlington, Washington

and Fort Mill, South Carolina; JA in Phoenix, Arizona; Jinko in Jacksonville, Florida. It is important to note that the policy leaned on carrots, rather than sticks: if a solar project used components with high domestic content, it was eligible for higher tax credits. This incentive drove the market and ultimately drove manufacturers to invest in US operations.

Currently, these manufacturing plants are not building solar panels from the ground up. They are still primarily assembly plants; they receive sub-components from around the globe, and the finished product is assembled in the US. This represents a huge step forward in increasing the domestic content of panels installed in the United States—but it's worth noting that a panel with every single sub-component made in the US is mostly aspirational; it is not realistic given today's global supply chains. The previous policy took this into account.

The tariffs being implemented in 2025 are all sticks and no carrots. In fact, many of the financial incentives that the industry had started to leverage have been swept off the table. It is possible the courts may bring some of these incentives and grant monies back; it is also very possible that they will not. It is also possible that Congress will reduce tax credits in the coming months—something SEBANE members strongly oppose. With all sub-components now facing a range of different punitive tariffs, the industry has gone from the possibility of bonus incentives with prices remaining relatively stable to a situation where there are now no bonus incentives and prices are starting to fluctuate wildly. This rapidly changing landscape creates significant instability.

The solar industry, both in Massachusetts and across the nation, is quite accustomed to policy-driven ups and downs; after all – that is why it is so commonly referred to by insiders as "the solar coaster." We have weathered many storms, and it is my expectation that the industry will weather this storm as well. And it is critical that we do so, since solar remains one of the most powerful tools available for combatting climate change. Solar not only increases our nation's energy independence and enhances grid resiliency, it also offers a reliable, affordable source of electricity that moves us away from the dangers of fossil fuels.

Senator Markey, as you well know, the battle to prevent climate catastrophe is not going particularly well. That said, giving up the fight is not an option. SEBANE's members, along with solar companies across the country, will continue doing what we do, both as small businesses seeking to grow and prosper, and as a group of dedicated professionals intent on helping civilization avoid the very worst impacts of climate change.

Thank you for your time today.

Senator MARKEY. Thank you, Nick, so much, and thank you for career-long dedication to these issues.

Next we are going to hear from Dr. Aisha Francis, President of Benjamin Franklin Cummings Institute. In 2021, Dr. Francis became the school's first female President. As President, Dr. Francis has been an advocate for clean technology, overseeing the school's efforts to gear programs to its training students in fields such as green building practices, renewable energy, and electric vehicle technology.

President Francis, thank you for hosting us here at Franklin Cummings Tech. It looks absolutely beautiful, and I know that, as you told me earlier, there are 1,100 students who are benefitting from all of your great teaching here at the school. Thank you for hosting us, and we are looking forward to your opening statement.

STATEMENT OF AISHA FRANCIS, PH.D., PRESIDENT AND CEO, BENJAMIN FRANKLIN CUMMINGS INSTITUTE OF TECHNOLOGY, BOSTON, MA

Ms. FRANCIS. Thank you so much, Senator Markey. Good morning, Chair Ernst, Ranking Member Markey, and distinguished members of the Committee, and thank you so much for being in our home. We are happy to have you here, and for the opportunity to give testimony this morning.

I want to speak with you about Franking Cummings Tech and how we look at bringing economic opportunity to our students and graduates in the communities we serve through supporting small businesses and the economy by supplying them with the talent that is needed for them to grow, particularly for clean energy companies and other companies that might not consider themselves clean energy companies but rely on talent that is educated in the clean energy sector, which we do.

Benjamin Franklin Cummings Institute of Technology is directly connected to our namesake, Benjamin Franklin, who left 1,000 pounds to the City of Boston for the purpose of teaching people a trade and making sure they could go into apprenticeship and becoming contributing members of society. And all these decades and centuries later, we are proud to continue that legacy and to make a very clear connection between that legacy and sustainability.

From the student application process all the way through job placement, Franklin Cummings Tech makes sure that we empower learnings to achieve their career goals and attain economic advancement through flexible, hands-on technical and trade education. We are a two-year college, and we believe in making education affordable.

And who are our students and what are our outcomes? We have an 84 percent job placement rate. Our alum report a median income of almost $60,000 one year after graduation, which is important considering that their annual household income at time of graduation is less than $35,000. And 46 percent of our students are first-generation college students, almost all of whom receive financial assistance.

We also believe in early college programming and making sure high school is even more valuable to students by making it possible

to receive an entire year of college-level credit while students are in high school.

So throughout history we have also frequently adapted our curriculum to meet the needs of industry and match the pace of technological advances and changes. This prepares graduates and citizens for in-demand jobs, which is important to keep economies humming.

Things change. We know that. Soon after this particular building was opened in 1908, there was a line of people waiting around the block to take classes that taught them how to repair the Model T Ford. Today, we have people lining up to learn about hybrid and electric vehicle technology. So sometimes things change, and in other ways they stay the same. One thing we are very fortunate about is that in 2023, we received investment from community-directed spending—thank you, Senator Markey—for our Center for Energy Efficiency and the Trades. The center was established a few years ago to encapsulate and better organize sustainability programming that had already been happening across our campus in multiple majors. It is an example of how important it is to thoughtfully prepare for what is coming and make sure that good-paying, in-demand jobs that align with the skills that are available in local marketplaces happen at the college level.

We believe it is important to serve as an intermediary between the workplace and the talent pool. It is important role that colleges play. It is an important role for society. Our Center for Energy Efficiency and the Trades does this by giving companies who are looking for clean tech talent one place where they can search and partner for the talent they need to grow their businesses.

Affordable, high-quality programs that align with sustainability, that are offered through certificate, associate degree education is an important aspect of the small business ecosystem, and I am going to spend some time explaining how.

We expertly train untapped talent, mostly people who are first-generation college students, immigrants, children of immigrants, and others who have chosen to go into clean tech careers or careers in sustainability. And the demand for that work has been outstripping supply. These areas include renewable energy technology, hybrid and electric vehicle technology, HVAC and refrigeration including heat pump installation and technology, smart building technology, electric power generation, and more. Programs offered through our center create pathways to home ownership, help graduates contribute to the 60-odd Massachusetts towns and cities that are represented by the students we serve in this college.

Good jobs create shared prosperity. The clean energy sector creates shared prosperity for students and our families by preparing them to become part of the skilled workforce and by helping to make sure that the small businesses, and really all businesses, thrive by having the talent they need to grow.

In addition, we relaunched and invested in business management degree program that teaches students how to run and market their own businesses. Why did we do this? Because more than 50 percent of our students share that they have aspirations to become small business owners, and we want to make sure that they have the

skills to fulfill their dreams and have the talent that they need to do that.

Our Center for Energy Efficiency and the Trades received a tremendous boost when Senator Markey and Senator Warren facilitated $800,000 in community-directed spending. A little money goes a long way in helping to propel the flywheel. These funds brought critical resources and infrastructure to this program so that we were able to respond to exploding demand for talent. We hired an additional HVAC faculty member because there is a waitlist for that program. That program has actually doubled in size in a few years, and now, thanks to investment, can accommodate up to 125 students. It is critical that we have places that train the talent that companies need in technologies such as heat pump installation, other forms of smart building technology.

Community-directed spending and public investment also allowed us to expand career navigation services by hiring a career navigator, to build connections between students and the hundreds of companies that are ardently seeking employees who are trained in green tech skills. Through professional career navigation we guide our students into secure jobs.

We deployed infrastructure improvement in the form of software platforms that helped us better track our students' progress and retention, and allowed those of them who are in co-ops and apprenticeships to securely take exams while they are off-campus. We want our students to be able to keep their commitments to college and keep their work schedules at the same time, and now we have better technology modes to allow them to do that.

The most essential elements of having adequate clean energy programming are to make sure we have community-based partnerships that facilitate better knowledge and awareness that the programs are available, and we have been able to achieve those aims through partnerships with organizations such as Castle Square Tenants Association, just across the street, unions such as IBEW, and other community-based organizations such as Jewish Vocational Services. All of those organizations have members, residents, and program participant who are taking classes and participating in our programming. This is very much an ecosystem, and we would like very much to see it remain strong.

We have been able to strengthen our curriculum and respond to the needs for local talent by making sure we have hands-on, project-based learning, making sure we work together to enhance student engagement and skill acquisition, while providing small businesses and larger companies with the skilled employees they need.

To our minds, energy efficiency and clean technology is not an outlier in fields such as construction, building management, automotive technology, and manufacturing. Rather, it is an established imperative today. It just makes business sense.

We have excellent small business partners who partner with us to develop curriculum and train our students. Some of these include construction firms such as Delbrook/JKS of Quincy, building automation company, American Energy Management, based in Westborough, Cummings Properties of Woburn, and facility man-

agement company, UG2 of Boston, and 128 Plumbing in Wakefield, to name a few.

It is projected that Massachusetts will continue to need to grow its local clean energy workforce. And as you heard my colleagues share, it is also true that many companies are still saying it is too difficult for them to find the skilled workforce they need to do the work that they have. At Franklin Cummings Tech and our partners we are working to bridge this gap and meet this demand, and we take pride in the fact that because of the work that we do and the industries that we are serving, enrollment has increased by 40 percent in 4 years. We know we can do our part to keep this flywheel going and make sure we grow the workforce and place our graduates on a pathway to working at small businesses for the betterment of economic advancement and to support clean energy and sustainability.

Funding from public sources, like what we received through community-directed spending for the clean energy programs we offer is direly necessary. We hope and very much want this programming and support to continue, both here and in our peer institutions, and we will continue to produce significant return on investment for individuals, small businesses, and the economy.

Thank you very much.

[The prepared statement of Ms. Francis follows:]

Testimony of Dr. Aisha Francis, President & CEO, Benjamin Franklin Cummings Institute of Technology

Submitted to U.S. Senate Committee on Small Business & Entrepreneurship on May 7, 2025

Good afternoon, Chair Ernst, Ranking Member Markey, and distinguished members of the Committee. Thank you for the opportunity to speak with you and share the achievements and progress of our Center for Energy Efficiency and the Trades and how Franklin Cummings Tech is bringing economic opportunity to our graduates and supporting small businesses and our economy through this program.

Benjamin Franklin Cummings Institute of Technology is directly connected to our namesake, Benjamin Franklin, who left 1,000 pounds to the City of Boston for the purpose of teaching people a trade so they could be self-sufficient, prosper, and become contributing members of society. We are proud to continue that legacy today.

From the application process through job placement, Franklin Cummings Tech empowers students to achieve their career goals and attain economic advancement through affordable, flexible, and hands-on technical and trade education.

Our alums have an 84% job placement rate and a median income of about $57,000 within 1 year of graduation. 46% of our students are first-generation college students, and 98% receive financial assistance. We have a growing early college education program in which students can graduate from high school and be well on their way to completing college-level programs.

Throughout its history, Franklin Cummings Tech has adapted its curriculum to meet the current needs in industry, technology, and the economy, which prepares our graduates for in-demand jobs. Soon after this college opened in 1908, there was a line of people around the block wanting to sign up for classes on servicing Model Ts. Today, students are eager to learn the latest on electric cars.

The Center for Energy Efficiency and the Trades (CEET) is a perfect example of how Franklin Cummings Tech prepares graduates for well-paying, in-demand jobs by aligning the skills we teach with the immediate needs of the job market and society's needs. The CEET does this by bringing a focus on sustainability and renewable energy across the college's technical programs.

The affordable, high-quality programs offered through the Center for Energy Efficiency and the Trades (CEET) expertly train untapped and diverse talent for well-paying roles in sustainability areas where hiring demand far outstrips supply, including solar and wind energy technology; electric and autonomous vehicle technology; heat pump technology; green building technology; electric power generation technology; and much more.

Programs offered through this Center provide a pathway to economic security for our students and their families, and they provide the diverse, skilled workforce that small businesses and all businesses need right now. Our new Business Management program teaches students how to run and market their own business, which is part of our desire to see our graduates become small business owners.

The CEET program received a tremendous boost when Senator Markey and Senator Warren facilitated the $800,000 grant to Franklin Cummings Tech through the Department of Labor.

This grant brought greater resources and structure to the CEET program by allowing us to fund and hire an executive director and an assistant executive director to ensure the Center had the guidance it needed for success. We were also able to hire an additional HVAC&R faculty member, which is crucial to growing instruction in areas like heat pumps and smart building technology. The grant also allowed us to hire a career navigator to build connections between our students and companies looking for employees trained in green tech skills and to guide our students in securing a job after college.

The grant provided infrastructure for the CEET in the form of software platforms that help us to track our students' progress and retention, allowing our students to take exams off campus to meet their work schedules.

The college also used the grant funding for marketing and recruitment efforts to create a stronger pipeline of prospective students into our existing and new energy-efficient programs in automotive technology, construction, and clean energy technologies.

The most essential parts of the CEET helped by the grant are research, partnership development, and demand analysis to ensure that we align the training we provide to with the immediate green-tech and energy efficiency skills in the highest demand. We have been able to strengthen our curriculum development and introduce more hands-on project-based learning to target the skill gaps identified by local employers. This enhances student engagement and skill acquisition while providing small businesses and larger companies with the skilled employees they need. Further, we have developed strategic partnerships with NASRCC, IBEW, and Jewish Vocational Services to align our program development with employment needs in clean energy and the trades.

Clean energy, energy efficiency, and green-tech are no longer outliers in construction, building management, automotive, and manufacturing; they are established disciplines and drivers of our economy, creating opportunity for small businesses, entrepreneurs, and the students we serve.

Today, the CEET has excellent small-business partners who help us develop curriculum, train our students, and hire them. These include:

- Construction firm Dellbrook/ JKS of Quincy
- The building automation company, American Energy Management of Westborough
- Facility management company UG2 of Boston
- 128 Plumbing of Wakefield
- And Cummings Properties of Woburn

It is projected that Massachusetts will need to grow the clean energy workforce by nearly 40%. In comparison, almost 90% of companies responding to a Mass Clean Energy Center survey say they have difficulty finding skilled labor. Franklin Cummings Tech and our partners are working to meet this demand, grow this workforce, and place our graduates on the pathway to economic advancement.

Funding like the grant we received for the CEET, and continued funding for these types of workforce-building programs here and at our peer institutions, will continue to produce a significant return on the investment for individuals, small businesses, and our economy.

Thank you.

Senator MARKEY. Thank you so much, Doctor. And last but, I think kind of our capstone here, about what is possible, is Josh Aviv, who is the Founder and CEO of Somerville-based SparkCharge. I met Josh 7 or 8 years ago over at Greentown, when Emily was running Greentown, and he was just in a little alley in a booth at the time. And he was all concept, and, of course, concept is 20 percent. Execution is 80 percent.

So he has gone from the concept to the execution quite brilliantly, which is really where young people are in clean tech right now. He founded SparkCharge from his dorm room at Syracuse University, moved over to Somerville, raised over $50 million—$50 million—from investment, including $1 million from his appearance on Shark Tank. And he is here today to share his experience in running a successful small business in the clean energy sector, now not just Somerville but now nationwide.

So welcome, Josh. We are just so proud of everything you have done.

STATEMENT OF JOSHUA AVIV, FOUNDER AND CEO, SPARKCHARGE, SOMERVILLE, MA

Mr. AVIV. Thank you so much. I deeply appreciate it. Good morning to everyone. It is a pleasure to be here. Senator Markey, esteemed Committee members, and fellow participants, my name is Josh Aviv. I am the CEO of SparkCharge, a Massachusetts-based small business committed to building the future of electric vehicle charging.

At SparkCharge we provide mobile, flexible charging to electric vehicle and electric vehicle fleet, reducing the infrastructure and downtime from 2 to 3 years to as little as 3 to 7 days, meaning that we allow electrification to grow in an advanced and accelerated way, without the need for costly infrastructure hurdles.

Today I am honored to discuss how Federal policies profoundly impact not only our ability but the ability of countless other small businesses in Massachusetts and across the nation to innovate, grow, and lead in the clean energy economy.

First, I would like to start by talking about the impacts of tariffs. They significantly affect businesses by increasing the cost of essential components by up to 30 percent. We have seen this firsthand where battery components, electrical components have now skyrocketed in price, meaning that it becomes almost impossible for us to go out and offer affordable EV charging to certain areas in the EV ecosystem.

Most of which, when we think about it, batteries and electronic equipment remain dependent on global supply chains. For small businesses, these increased costs result in reduced competitiveness, slower innovation, and financial strain, as we scale operations and strive to offer affordable, clean energy solutions.

For EV companies and clean energy companies here in the United States, we must remain competitive on a global stage. We cannot just simply remain competitive here in the United States. There are companies and small businesses around the world that are trying to compete with us for the American dollar. And when we fail to do that, we often lose market share, and that reduces the amount of employees we can hire, the growth that we can bring,

not only to the commonwealth but businesses in areas across the United States.

When we think about the Inflation Reduction Act, it has been transformative for the clean energy sector and companies like ours. Its incentives have spurred crucial investment, job creation, and technological innovation in clean energy. Should these incentives be removed, we would see disruption in ongoing projects, decreased future investment, and a loss of critical momentum in our journey towards electrification and sustainability. The elimination of the IRA-supported incentives would increase the cost of capital significantly, diminishing our global competitive position.

We have made so many advancements here in the United States with small businesses coming up with innovative technology that we want to deploy, that only help our ecosystem and bring more jobs, and to take two steps back after we have taken a step forward would truly be heartbreaking.

Moreover, when we think about investment in clean energy companies we have amazing programs like MassCEC and Greentown Labs. But when we also think about it, there are other funding sources such as venture capital that also help companies grow and develop and scale. Within the clean energy sector, venture capital was instrumental in helping us finance research, develop and scale operations, and expand our market research. A reduction in available venture capital funding due to changing Federal policies and economic uncertainty would severely limit growth, stalling promising new technologies, and threatening jobs and economic progress here in the state of Massachusetts, where venture capital has always been a part of helping companies grow and scale to a global presence.

Manufacturing domestically here in the United States remains a critical priority for us at SparkCharge. From day one, we said we would never manufacture outside of the United States, and we have been able to keep that promise. And other small businesses here in the United States also have the yearning to manufacture here in the United States. Local manufacturing capabilities reduce supply chain vulnerabilities, generate quality employment opportunities, and expedite the innovation cycle. Federal support through incentives and infrastructure investments strengthens our ability to produce competitively priced produces domestically, enhancing business resilience and national economic security.

Additionally, the clean vehicle tax credits under current Federal policies significantly stimulate demand for electric vehicles, directly benefiting SparkCharge and the broader EV ecosystem. Increased adoption rates of EVs naturally lead to heightened demand for EV charging infrastructure solutions and also open up the opportunity for blue-collar jobs to advance and grow.

When EV technology took off and charging stations were being rolled out across the United States, there was a huge demand for electricians across the United States. This demand for electricians were able to provide jobs in countless communities around the United States to offer good, high-paying jobs, to advance clean technology at a rate that we had never before seen here in the United States. If we lose that momentum, all of those advanced jobs, all of those jobs for electricians, trade workers that went into

electrifying this country and moving this country forward could be in jeopardy.

Lastly, tax credits like Research and Development Tax Credits, tailored specifically for small businesses, are vital, leveling the playing field by enabling innovative startups and small companies like ours to invest robustly in research, workforce development, and growth. Eliminating these credits could disproportionately burden small businesses, increase operational costs, and weaken our competitive standing relative to larger, established corporations.

In conclusion, continued Federal support through fair tariffs, sustained incentives from the IRA, a robust environment for venture capital, strengthened domestic manufacturing capabilities, stable clean vehicle tax credits, and targeted small business tax credits are indispensable to SparkCharge and similar innovative companies. Such supportive policies ensure small businesses remain competitive, innovative, and integral in driving America's clean energy future.

Thank you for providing me this opportunity to testify today. SparkCharge remains steadfast in our commitment to collaborate with policymakers to reinforce the clean energy economy, promote innovation, and foster sustainable, equitable growth for our communities.

[The prepared statement of Mr. Aviv follows:]

Good morning, Senator Markey, esteemed committee members, and fellow participants.

My name is Josh Aviv, and I am the CEO of SparkCharge, a Massachusetts-based small business committed to building the future of electric vehicle (EV) charging. At SparkCharge, we provide mobile and flexible EV charging solutions called Charging As A Service that empower fleets and communities to adopt clean transportation without infrastructure hurdles.

Today, I am honored to discuss how federal policies profoundly impact our ability, and that of countless other small businesses in Massachusetts and across the nation, to innovate, grow, and lead in the clean energy economy.

First, tariffs significantly affect businesses like SparkCharge by increasing the cost of essential components by +30%, such as batteries and electronic equipment, most of which remain dependent on global supply chains. For small businesses, these increased costs result in reduced competitiveness, slower innovation, and financial strain as we scale operations and strive to offer affordable clean energy solutions.

The Inflation Reduction Act (IRA) has been transformative for the clean energy sector and companies like ours. Its incentives have spurred crucial investment, job creation, and technological innovation in clean energy. Should these incentives be removed, we would see disruption to ongoing projects, decreased future investments, and a loss of critical momentum in our journey toward electrification and sustainability. Specifically for SparkCharge, the elimination of IRA-supported incentives would increase the cost of capital significantly, diminishing our global competitive position.

Moreover, the role of venture capital is indispensable in fueling innovation and growth within the clean energy sector. Venture capital was instrumental in helping us finance research, develop, scale our operations, and expand our market reach. A reduction in available venture capital funding due to changing federal policies and economic uncertainty would severely limit growth, stall promising new technologies, and threaten jobs and economic progress in Massachusetts.

Manufacturing domestically in the USA remains a critical priority for SparkCharge and other small businesses. Local manufacturing capabilities reduce supply chain vulnerabilities, generate quality employment opportunities, and expedite innovation cycles. Federal support through incentives and infrastructure investment strengthens our ability to produce competitively priced products domestically, enhancing business resilience and national economic security.

Additionally, the clean vehicle tax credits under current federal policies significantly stimulate demand for electric vehicles, directly benefiting SparkCharge and the broader EV ecosystem. Increased adoption rates of EVs naturally lead to heightened demand for charging infrastructure solutions. Removing or reducing these credits would dramatically slow EV adoption, negatively impacting market opportunities for small businesses in the EV charging sector and impeding our nation's clean transportation transition.

Lastly, tax credits like Research and Development (R&D) Tax Credit, tailored specifically for small businesses, are vital, leveling the playing field by enabling innovative startups and small companies like ours to invest robustly in research, workforce development, and growth. Eliminating these credits would disproportionately burden small businesses, increase operational costs, and weaken our competitive standing relative to larger, established corporations.

In conclusion, continued federal support through fair tariffs, sustained incentives from the IRA, a robust environment for venture capital, strengthened domestic manufacturing capabilities, stable clean vehicle tax credits, and targeted small business tax credits are indispensable to SparkCharge and similar innovative companies. Such supportive policies ensure small businesses remain competitive, innovative, and integral in driving America's clean energy future.

Thank you for providing me this opportunity to testify today. SparkCharge remains steadfast in our commitment to collaborate with policymakers to reinforce the clean energy economy, promote innovation, and foster sustainable, equitable growth for our communities.

Senator MARKEY. Thank you. As everyone can see, this is just such an incredible all-star panel which has gathered here to talk about the clean energy future and the threats to it.

So Josh, President Trump, when he introduced his tariffs on 180 countries around the world, including an island that only had penguins on it, it didn't seem as though it was well thought out in terms of what the impact was going to be, especially on small businesses in our country. So how many employees do you have now?

Mr. AVIV. We are approaching close to 40 employees across the United States.

Senator MARKEY. Tell me what you are doing in L.A., in California.

Mr. AVIV. In L.A. we are charging electric vehicles for large corporations like Uber, allowing them to continue to electrify. We have operations where we service some of the largest fleets, everyone from food to agriculture, OEMs, ride share, last-mile delivery. We power electric vehicles at scale.

Senator MARKEY. At scale. And how many states are you in now?

Mr. AVIV. We currently have operations across all 50 states, our availability of operations across all 60 states here in the United States.

Senator MARKEY. And so you would continue to need more highly trained people, to provide these services?

Mr. AVIV. Yes, sir.

Senator MARKEY. So again, what is the impact the tariffs are having on you right now?

Mr. AVIV. Absolutely. So the impact that tariffs are having on us is we are starting to slow down investment in battery. We are starting to slow down investment in, call it, more technological advances. And then we are also starting to look at are these fleets now going to slow down their investment in electric vehicles.

So we have had to slightly start to pull back on hiring, as well. We originally planned to grow to 50, 60-plus people this year. We have now started to hear basically from fleets, "Well, look, we have got to understand the impact of the tariffs. There is a lot of uncertainty in the market."

And so if those fleets scale back and they don't push forward to electrification, then that inhibits our ability to grow and hire, as well. So we have started to scale back our hiring.

We have also started to see a lot of venture capital money really stay on the sidelines, is what I would say. We have heard from investors, "Well, depending on how this goes, depending on how the tariffs go, depending on how policy goes, that's how we are going to deploy capital to new, innovative companies like yours. But we really just want to sit back and wait and see how this plays out, because we are just unsure."

So there are millions of dollars that are being basically sidelined because of the uncertainty, not only around the tariffs but really uncertainty around where are we moving forward as a country.

Senator MARKEY. And Mr. d'Arbeloff, are you seeing the same thing in your industry?

Mr. D'ARBELOFF. Well, we absolutely are. I think that most solar companies are not eligible for venture capital. The intellectual property component of our businesses is such that hit is not a great

match. As such, cash flow is king to every solar company, and when a solar company is forced to use that precious cash flow to make long-term procurements to hedge against the instability we see ahead, it really constrains the business. It really ties their hands behind their back in terms of what can and can't be done, and frankly, can put the business at risk.

Senator MARKEY. So you are seeing the same thing that Josh is seeing.

Mr. D'ARBELOFF. Absolutely.

Senator MARKEY. And so those are two good examples. But Dr. Reichert is able to see the whole state. That is her job. So what is happening here in this sector, Doctor, in terms of the impact tariffs are having?

Ms. REICHERT. Well, I will just add to what Josh referenced a moment ago. In terms of the young companies that we work with across Massachusetts, we had recently tried to understand better what impacts they are facing in this short, 100-day period where so much has changed over and over again.

What we learned was that change is causing so much uncertainty in all the ways that Josh just mentioned. Should we hire? Should we not hire? Should we expand, or should we hold back on that expansion? How do we think about inventory, or not have inventory?

The uncertainty is the big thing that comes through the survey results, over and over again, and that spills out into the economy. When you are talking about clean energy jobs in Massachusetts, we have 115,000 jobs, but we also have induced and indirect jobs that depend on this industry. So whenever you think about, well, the supply chain for clean energy, that instability trickles down to less hiring, less contracts, and it has a much broader impact than on the industry alone.

Senator MARKEY. Yeah. With much fanfare, yesterday the President announced that he had reached an agreement with Great Britain on a trade deal, but it looks like it is less an agreement than a framework to reach an agreement. And that, again, is something would only have been the first of all the agreements that he has to reach, although he hasn't reached an agreement, in reality, on all of the key details.

So again, all of that just leaves an incredible cloud of uncertainty, especially over the smaller companies. The big companies, they might be able to ride it out for 6 months, ride it out for a year, be able to make some adjustments. But for smaller companies it becomes less "liberation day," which President Trump used as a way to describe all of his tariffs, than an "extermination day," a "liquidation day" for so many smaller businesses who move week to week, month to month. And they have to figure it out on an ongoing basis. They don't have that kind of margin for survival over a longer period of time.

So again, coming back to you, Mr. d'Arbeloff, how many companies do you represent?

Mr. D'ARBELOFF. We have about 80 members in SEBANE.

Senator MARKEY. And how many, do you think, are becoming more vulnerable because of these tariffs, or even the threats of the removal of the tax break?

Mr. D'ARBELOFF. I would estimate 55 of our member companies are actually solar companies, and I do not think there is a single one of them that is not negatively impacted by what we are seeing. It is a very, very difficult situation. As I noted, solar is called the "solar coaster" for a reason. There are lots of ups and downs, and we figure it out. There are plenty of businesses in the solar industry that have failed over the years, but there have also been quite a few who have prevailed and figured out how to ride these waves. That said, what we are seeing today is really unprecedented in terms of unpredictability. And so I would say that the threat is very, very real and quite frightening.

Senator MARKEY. In 2009, when Congressman Henry Waxman and I passed our legislation, the Waxman-Markey Bill, that passed the House of Representatives and would have reduced greenhouse gasses by 80 percent by the year 2050, the total installed capacity of solar in the United States, from the beginning of time until 2009, was 2,000 megawatts. That is all we had. Last year, there was 40,000 new megawatts of solar installed in the United States of America.

So this has just moved dramatically with all of the incentives, all of the states that have moved, all of the cities that have moved, and the Federal incentives that have been placed on the books.

So it is clearly a vertical story that, of course, the natural gas industry is frightened of because it can, in fact, substitute for natural gas-generated electricity. So now they have gone beyond saying, well, solar is important, but only as a small, small portion, to a point where, in 2024, almost all of the new installed electrical capacity in the United States just came from solar and wind and new battery storage technologies, including another company, Form Energy, which came out of Greentown, as well, which is showing that you can have battery storage at a utility scale. And they are in Weirton, West Virginia, now, with more than 400 employees there, coming out of Somerville. Like Josh's story, going national.

So all of this is absolutely an indication of how we have created a job creation machine, and it is working, but it is a threat. It is a threat to the oil industry, the more that all-electric vehicles are on the road. We put 70 percent of the oil, which we consume in America, goes into gasoline tanks, and the more that vehicles don't have gasoline tanks will lower the need for new oil. And the same thing is true for the natural gas industry in terms of electrical generation. The more that solar and wind are deploying, there is less natural gas, less number of pipelines which we are going to need.

So it is becoming, obviously, the storyline, and to the extent to which Donald Trump said to the natural gas and oil industry, if you raise me $1 billion, just in April of last year, I will kill the clean energy industry. So that is where we are, and it is not anything other than a policy decision that they are making. But it is on behalf of the fossil fuel industry. It is on behalf of the legacy industry.

And then it is coupled with a tariff policy which isn't aimed at anything that is rationally explainable because it doesn't just affect the clean energy industry, it is affecting small businesses across the entirety of the nation. There are 34 million small businesses in the United States. We have 734,000 small businesses in Massachu-

setts. We have 7 million people, so there is one small business for every 10 people in the state of Massachusetts, and the number is true for every single state in the union. It is 330 million people and 33 million small businesses. So it is a 10-to-1 ratio. And 30 percent of all trade in our nation is done by small businesses, and they represent 97 percent of all business that do trade with other countries.

So this then becomes something that goes right to the heart of small business in Massachusetts or across the country, the ability to be able to plan. Again, they are not a big business. If a small restaurant chain here in Massachusetts, trading with maybe 15 different countries, for different foods or products which they need in their business, and they can't be sure what they are going to be having to pay in a tariff, or the supplier in the other country is absolutely uncertain as to whether or not they have a reliable partner in the United States, it casts a shadow over it, their small businesses.

So I would like to just come back to Dr. Francis for a second, because you are providing the new workers that Josh or Nick's trade association can use.

Ms. FRANCIS. Correct.

Senator MARKEY. And you mentioned earlier that you are partnered with IBEW 103, the electricians' union. Could you explain that partnership and the enthusiasm for young students, you know, minority students, young women, to get into this field?

Ms. FRANCIS. Absolutely. So with the partnership that we have with that particular union, members who are well established can receive credit for the training center education that they have received at the union and apply that credit towards an associate degree here in college. So these kinds of partnerships, these alternative pathways to receiving the credentials that folks are looking for, that are required to get into the field and take these jobs, is really an important way to really bring untapped talent into the clean tech space. And it is important for small businesses, as well, because a lot of times the large companies have people beating down the doors to work at their companies, and it might not necessary be the same came for small businesses. So it is important that we are also responding to the talent needs for small businesses, as well. But union partnerships are a really important part of the ecosystem, and we are happy to be working with them.

Senator MARKEY. Yeah, and the Federal investments, they spur new projects. They create new hubs.

Ms. FRANCIS. Absolutely.

Senator MARKEY. But many of them are union jobs, as well. Many of the clean technology tax credits in the Inflation Reduction Act are worth more when developers pay workers a prevailing wage and use registered apprentices, and that is not an accident. It is on purpose. These job standards will result in better projects, better policies, better communities. Could you expand on that, in terms of apprenticeship programs that your students are able to graduate into?

Ms. FRANCIS. Yes. We have delivered work-based learning, which essentially means that we want to make sure that students aren't only learning in their classrooms and theoretically, but that they have something that they apply that to. So projects with compa-

nies, like working with [unclear] are important, and so are co-ops, so are apprenticeships.

So we have been part of pioneering something called the apprenticeship degrees, which is a method whereby the traditional apprenticeship has been adapted with investment from the state, and the State Office of Labor and Workforce Development really helps us to navigate a way in which you can pair and partner an apprenticeship with a college degree. And it is wonderful. It opens up all kinds of avenues for people to get paid while they are in college. As I shared, many of our students are very resource constrained and people want to bring forward the opportunity to work and go to school. And it is helpful for companies, too, so that they have the talent pool that they need earlier and sooner, so there is less pressure on people thinking that they have to do either a job or college. You can do both at the same time.

So we have really taken the apprenticeship from the days of Ben Franklin and modernized it. So the apprenticeship degree is something that we invest in heavily here.

Senator MARKEY. Thank you. And I think you mentioned earlier that the student, as they graduate, starts at $60,000 a year.

Ms. FRANCIS. That is the average, yes.

Senator MARKEY. That is the average, $60,000 a year.

Dr. Reichert, could you talk about wages in the clean energy sector of Massachusetts, in general, just so people can understand how big of an opportunity this is. Kids figure out why they should study this subject because their buddies are telling them, this could really be a big payoff, if you get this background, made by your own personal commitment to learning about a new industry. So what is the status for people who work in this sector?

Ms. REICHERT. Sure. Well, many clean energy occupations currently earn hourly wages that are higher than average hourly wages in Massachusetts, and they come with real benefits, long-term stability, and the opportunity to build a meaningful career.

So for perspective, the statewide median hourly wage is about $29, and in the clean energy sector we are seeing wages that far exceed that benchmark. So for example, construction workers in clean energy earn a median wage of $64 an hour. Electrical engineers earn $60 an hour. Even roles like electricians and HVAC technicians, which are core to decarbonizing our buildings, earn $39 and $35 per hours, respectively, which is both well above the statewide median as well as the national median.

Even workers who are just starting out often earn wages above the state average. And I think Dr. Francis can tell you stories that oftentimes it is hard to keep these students long enough through their training because they get snapped up like that. There is real demand for these workers, and there will continue to be as we march towards our climate goals.

Senator MARKEY. Which is, I think, great news for young people. And again, I just want to come back to Dr. Francis a little bit, because you talked about a partnership that you have with high schools, to get them college credits while they are in school. I think, is it Madison High School?

Ms. FRANCIS. We have that partnership with Madison Park, Dearborn STEM Academy, Cambridge Rindge and Latin. We actu-

ally have 16 or 17 high schools, students from 16 or 17 high schools taking advantage of our early college program.

Senator MARKEY. So what you do is you help to introduce young people, as juniors or seniors in high school, into these areas.

Ms. FRANCIS. Yes, because the sooner we get them, the better.

Senator MARKEY. So they then can kind of see the future earlier. It is kind of like parents taking their kids on college weekends, to go see which school they might apply to.

Ms. FRANCIS. Yes.

Senator MARKEY. But what you do is you go right to the high schools.

Ms. FRANCIS. Demystifying——

Senator MARKEY. And you say, "Here it is. This is the future. And if you start to study a little bit harder, work on this, come to our school, go to another school that has these particular skill sets, it can be an incredible future." Do you mention how much people can make when you talk to the juniors and seniors in high school?

Ms. FRANCIS. It is one of the highlights of the talks that we do in community, and it is important because people need ways to sustain themselves in their communities. This is why we are doing this work, and this is how we can incentivize folks to make an investment, a post-secondary education investment in their education beyond high school. Because the truth is that it does still matter to have some training beyond high school, for the time that it takes to deal with voltage and electricity, and these are complicated fields. And while we can push as much of that training as we can into high school, it does still require post-secondary training.

Senator MARKEY. Right. And again, the workforce is there, ready to go.

Ms. FRANCIS. The workforce is there.

Senator MARKEY. It is getting the training, and now we have to make sure that the companies are there——

Ms. FRANCIS. That is right.

Senator MARKEY [continuing]. To be able to hire them. We have to make sure that the policies reflect that.

So I want to come back again to Josh and to Nick to talk about tax policy. We just talked about tariffs. Now let's talk about the tax policies, and which of these tax policies are central to ensuring that we see the continued investment in growth in the clean energy sector.

So if you could, Josh, focus upon that area and tell us why it is so vital.

Mr. AVIV. Absolutely. When we think about the Inflation Reduction Act, for us this is a vital policy. When we think about the growth of EVs and clean tech and clean tech investments here in the United States that spur job growth across the United States, this is something that has proven to not only be successful but helpful to not only just companies here in Massachusetts but companies across the United States that are looking to further clean tech advancements, further grow the clean tech economy.

And if that is removed, then we are really taking a serious step backwards. We are taking a serious step backwards in job growth. We are taking a serious step backwards in innovation. We are taking a serious step backwards in investment. And we are really giv-

ing up that advancement to outside companies, outside countries that want to take advantage of that.

I firmly believe that the U.S. dollar is still the most powerful dollar in the world, and U.S. companies are innovating and creating innovative solutions to go after and solve problems for U.S.-based and worldwide-based consumers. So if we lose these tax credit, if we lose these policies, then we are really giving up the competitive advantage, and we are losing an opportunity that I think we will never see again.

Senator MARKEY. Never see again. Mr. d'Arbeloff.

Mr. D'ARBELOFF. Well, I think one thing I would note is that the ITC, the Investment Tax Credit, which has for a long time been 30 percent of system price—in other words, the investor or the owner of the system is allowed to take a 30 percent tax credit off their tax burden in the year in which the system goes live—is absolutely vital to driving the industry.

By the way, it is also worth noting that this perhaps wouldn't be necessary or anywhere near as important if fossil fuels were to be charged for the externalities that they generate. In other words, the damage that they do to the environment is not a burden that they bear. They are allowed to pollute for free. And were that not the case, were there a carbon tax, were Waxman-Markey have come to pass, we would be in a very different situation here, wherein something like the ITC would not be quite as critical.

But we are where we are, and the ITC drives down payback for solar systems in a way that is just fundamental for the investment community, and for homeowners. So for really anyone who purchases a solar system or invests in a solar system, it is what gives a level of predictability to the investment that allows all parties to engage in the transaction and make it happen.

I think that if this were badly threatened, I hate to throw around big words, but it would be an existential threat to the way that the industry operates. And as you noted, solar and clean energy is now exceeding fossil fuels in terms of new energy resources per year. I think that if the ITC were to be pulled back in any significant fashion, we would——

Senator MARKEY. For the audience, ITC is——

Mr. D'ARBELOFF. The Investment Tax Credit.

Senator MARKEY. And how is the Investment Tax Credit applied to a small business.

Mr. D'ARBELOFF. Great question. So if you are a small business and you put solar on the roof of your facility, then you are allowed to, using a one-page, actually I think it is a two-page, IRS form, you input the price of the solar system that you purchased. It then calculates 30 percent of that system purchase price, and you are allowed to deduct that from your overall tax burden. It is not a tax deduction. You are actually taking a credit on the taxes you owe for that year. So it is hugely valuable to the way in which solar transactions go down, and were it removed it would be hugely problematic.

The same is true for homeowners, by the way, where a homeowner can do the exact same thing. It is a different IRS form. It is a different section of the tax code, but same exact process.

Senator MARKEY. Now the interesting thing, of course, is that the oil, gas, and coal industry have had a tax break for 100 years. So it is not as though, as they try to call this socialistic, it is not as though they haven't been the biggest beneficiary of socialism, for 100 years, with their tax breaks. And then we try to put tax breaks on the books for the competitors, and all of a sudden they are outraged that you could have such a system in our great country, while not taking the tax breaks for the oil industry or the gas industry off the books, simultaneously.

So can you explain that and how troubling that is?

Mr. D'ARBELOFF. Yes. That is true. The tax breaks offered to the fossil fuel industry are substantive and dwarf what the solar industry might receive, although they are not truly visible by the consumer. They are extraction tax credits, which allow for them to engage in R&D activities at a substantially reduced rate than what it would cost them directly were such tax breaks not available to them.

So it is sort of a behind-the-scenes, behind-closed-doors tax credit that no one really understands other than the fossil fuel companies themselves.

Senator MARKEY. Yeah. And again, let's go back to 2009, once again. It is not that long ago, 15 years ago, when Waxman-Markey was passing in the House of Representatives. And then, according to some estimates, the largest amount of money ever spent to defeat any piece of legislation in congressional history was spent to kill Waxman-Markey in the Senate. There were only 2,000 all-electric vehicles in the United States, total. There were only 2,000 megawatts of solar in the United States.

Now, coming back to Josh, in the first quarter of this year, January, February, and March of this year, there were 380,000 new all-electric vehicles and plug-in hybrids sold. Electricity, plug it in. That is like a million and a half vehicles that would be sold this year, not 2,000 total in 2009, but an explosive increase.

So that is a big story. But the tax breaks help, right, to make sure that all of that can—and in the same way Nick explained how the tax breaks work, could you also explain how the tax breaks work to incentivize people to install those charging stations?

Mr. AVIV. Absolutely. So there are tax incentives not only on installing EV charging stations but also on owning and buying an electric vehicle. And when we think about the growth of electric vehicle adoption here in the United States in the first quarter of this year, a lot of that was driven by growth outside of what you would say were mostly popular EV states. Back in 2009, those 2,000 vehicles were most likely populated in California, right. Now, here, 2025, that growth has expanded across the United States, outside of California, and even in more rural areas. We are starting to see adoption happening in Texas. We are starting to see adoption happening in Ohio, in Michigan. And that is due to a lot of the tax credits that are available to owning an electric vehicle and install an EV charging station.

So we are seeing this massive growth that, to date, you bring up a really good point. We grew EV charging in '21, but I think the bigger headline here is that electric vehicle growth in America, since its inception, has never taken a decrease. It has always

grown, year over year over year. So a lot of times people will come out and say, "Well, is electric vehicle adoption growing? Is it slowing?" Year over year, we have never sold less electric vehicles here in the United States.

So these tax credits, these benefits, help spur that growth, not only on the EV side and the charging station side, but think about the person that comes out and installs that charging station. So the trickle-down effect is that now, as more EVs grow across the United States, they are opening up more job growth for people to actually earn a living off this clean energy economy.

Senator MARKEY. Thank you, Josh. Yeah, and it is not any longer just Tesla. I think there are 78 models that can be purchased from other companies. So back then, you know, 15 years ago, it was just a very small number of vehicles that were being produced. But now it is Ford, it is General Motors, it is companies around the globe that want to build here. Yeah, Josh.

Mr. AVIV. Absolutely. And if you think about it, as well, there are more OEMs. General Motors is doing an amazing job coming——

Senator MARKEY. OEM?

Mr. AVIV. Original manufacturer.

Senator MARKEY. Meaning General Motors and Ford.

Mr. AVIV. General Motors and Ford. Yes, sir. They are coming out with new EVs, and they are getting better and better at price points where people can afford them. And if we think about how we are going to go out and scale electric vehicle adoption, there has got to be affordable models out there. And when we think about Tesla, who started producing electric vehicles, General Motors, who now, I think, is almost on par, if not they are about to pass Tesla, in electric vehicles sold. That means that the American consumer now wants electric vehicles. It is no longer the cool thing. It is now starting to become the economical way to travel.

So we expect to see more electric vehicle growth. And then when we think about the adoption of fleets, as well—so fleets now adopting electric vehicles in the thousands—you are going to start to see more electric vehicles on the road. And we need these policies in place to continue to spur that growth and continue to bring along that economic development and job growth.

Senator MARKEY. Yeah. And that is just so important. There is kind of an inexorable increase and consumer satisfaction. And we have come a long way when Donald Trump is running a car show on the lawn of the White House, to help out his buddy, Elon, to sell more vehicles. And Trump is going, "I might buy one of these all-electric vehicles." So he might be actually, ironically, expanding the market rather than contracting it.

Yeah, Dr. Reichert.

Ms. REICHERT. Can I just add, in terms of impacts here in Massachusetts, we have seen a 22 percent increase in clean transportation jobs, which encompasses EVs, since 2023. And the state was actually ranked nationally number one for the highest rate of growth in electric jobs in 2024. So this is having real impacts here at home, and obviously the type of tax credits that have been discussed here and those potentially not being available is going to cause impacts on real people's lives, real jobs, right here in Massachusetts.

Senator MARKEY. And again, the way I view this is that President Trump is imposing tariffs without any clear plan, and putting a cloud over businesses, but especially small businesses. He is planning on cutting, by upwards of 40 percent, the budget for the National Institutes of Health, which is what we would call Kendall Square, finding the cure for Alzheimer's and diabetes and cancer and all the diseases which run through the genetics of people in our country but all around the planet. And we are the leader. We are clearly the leader in clean energy technology, as well. And meanwhile, China is moving very rapidly in biotech. They are investing massively in biotech.

I think, Josh, I just saw last month where there is a Chinese company that announced that they now have a battery which can be charged in 5 minutes for a vehicle. So do we want to pull out of the race with China and just giftwrap biotech and clean tech to the Chinese economy, or do we want to compete? Do we want to use our young people, you know, the Greentown, the engine, all of our university brainpower, to compete technologically.

So what is the risk, Josh, of this retreat?

Mr. AVIV. Absolutely. And I love that example, because everyone got excited when they showed that they could charge a car in 5 minutes. And the reality is that the technology that enabled that to happen was actually developed here in the United States, and it was actually demoed 5 years ago. It was nothing new. It was just a Chinese OEM that said, "Oh look, we can do it."

But believe it or not, the Combined Charging Standards, CCS, actually supports up to 1,000 kilowatts of energy that can go into a car, so that is your 5-minute charge. It is investment that is needed to roll out that infrastructure, that we developed here in the United States, that we were able to prove out 5 years ago.

So, anyway, when we think about the advancement, and when we think about other countries catching up to the United States, the United States is still in the lead in most categories, but other countries are like right behind us. And if we give up that lead, if we stop investing in clean tech, if we don't roll out the technology that we developed, innovated, and created here in the United States, if we don't roll that out, if we don't support that innovation, then we will be surpassed. And that is just a crime against humanity, to be able to develop the technology here, innovate it.

You know, when we think about a lot of the solar technology, as well, a lot of that was developed here in the United States, as well. We innovated on that, we patented on that, and then we stopped investing in it. And then other countries said, "Look, that is a really great patent. That's really great technology. Let's innovate it and move it forward."

So when you have this technology that has been created here, when you have U.S. government money that has been invested in that technology to bring it to market, and then we pull back, really we are just hurting ourselves. We are hurting the businesses, because we are not pushing that technology forward. We are not taking advantage. We are not reaping the benefit of the technology that we created and that we developed here in the United States.

So when we think about China and we think about the advances that they are making, really we have to continue to invest in clean

energy. We have to continue to invest in the clean energy economy. We have to continue to invest in innovation so that we maintain that lead and not give up our position.

Senator MARKEY. I agree with you, 100 percent. When there is a rival coming for you, when that rival has a plan, and that rival is energized, you have to have a plan. You have to respond. And that is why it is so important that the Boston Celtics have a plan tonight against the New York Knicks. They have got to come back. They have got to have a plan. And we need the same thing in biotech. We need the same thing in clean tech. That is the future. Not just for Massachusetts. It is the future for our country. We are only 5 percent of the world's population. We have to decide what we are going to make. We have to decide what we are going to produce.

Yes, Dr. Francis.

Ms. FRANCIS. Senator, I just wanted to follow up on that by putting a finer point on what these jobs are. So for instance, in electric vehicle technology it does require different approaches to repair. So we have created a program that responds to that need, because there is a shortage of technicians who actually know how to deal with the electricity and the voltage.

So these are the kinds of things that we are talking about. So when you cut off the investment, you are also cutting off jobs for people, not only in Massachusetts but in local communities, because local repair people do that work. This is not work that is outsourced. This is work that is happening on the ground. So there is an entire infrastructure of roles that we are going to snuff out, and I just think people should know about that.

Senator MARKEY. Yeah. And my father graduated from the vocational program at Lawrence High School, and he became, ultimately, vice president of an electrical union in South Boston, UE. He was the vice president. And one of the earliest things I can hear from my father, as the oldest in the family, was "Eddie, whatever you do, don't put your finger in the socket." So I was learning about electricity very young, from my father, who focused on it. And he could do anything with electricity.

And electricity is making a big comeback. We might have to double the capacity over the next generation. So there is a whole new generation, like my father, as they were starting this whole revolution, that once again will get reintroduced. But the technology is different. It requires even more sophistication. It is computer related, in many ways. You have to have wireless devices with you while you are trying to figure out how to do the installation, and it requires training.

And that is where young people want to go. They are smart. They want to move to the future. And between the tariffs and the potential removal of tax breaks, the future has a cloud over it in the areas where young people want to move to most ambitiously. So it is a pretty grave threat right now, which is why I am fighting so hard down in Washington.

Nick, did you want to add something right there, that I see you moving in on?

Mr. D'ARBELOFF. No, I think we have passed the point. But I do think that we are on the verge of really solving some of the basic

problems that were associated with renewable technology. Early on, stones could be thrown at renewable by claiming it was intermittent, and that it couldn't power our industry and civilization because if the wind wasn't blowing and the sun wasn't shining.

But energy storage, as witnessed by Josh's company and many others, has grown and evolved by leaps and bounds, and we now can provide renewable baseload power to industry, to homes, and so forth. Baseload power is defined as constant, something that can be relied upon and depended upon, day in and day out. And the fact that we have now arrived at this incredibly critical milestone, only to head down what I can only say is a rabbit hole, is very, very unfortunate.

Senator MARKEY. And again, that is why I am going to be working very hard to explain to my colleagues in Washington. For example, it is West Virginia where Form Energy is building their manufacturing capacity. That is the future. Those are workers who can move into a brand-new industry, not just a job but a career, you know, manufacturing.

And by the way, Form Energy, also a Greentown firm, you keep hearing about lithium-ion and do we have enough lithium-ion here in the United States. Well, what they did, brilliantly, over at Form Energy, was they figured out how to use iron and oxygen, in other words, two of the most common elements, to be able to produce this incredible, utility-scale battery technology, which is being manufactured in West Virginia.

So 80 percent of all of the jobs created in the climate bill are in red states. They are the ones manufacturing the batteries. They are the ones manufacturing the solar panels. They are the ones manufacturing these new vehicles, disproportionately.

And you have installation jobs, though, and there are way more jobs in installation than there are in even the manufacture. And that is where we are. We innovate, we come up with those innovation jobs. That is Greentown. And there are a lot of jobs that we get from the innovation. There are many more jobs that are being created out of the bill down in the red states and the purple states. And, on top of that, once they manufacture it we can then hire electricians. We can hire roofers to go up and do the work. And we need to train a whole new generation of young people to go into doing that. That is the whole system. It is inventors and investors. It is professors and producers. We provide part of it; other states provide part of it. And when you put it all together it is called future economy.

And again, I am going to keep coming back to the same thing is true for biotech. It is absolutely essential to job creation in the future, but also solving the problems of the diseases that have afflicted humankind forever, or climate change, which is a cumulative problem over generations, that also needs a technological solution. But it is going to require jobs to be created in order to solve those problems.

So what I would like to do with this incredible panel—has this been a great panel? Can we give them applause for the incredible job that they have done?

[Applause.]

Senator MARKEY. So what I would like to do is give each one of you 1 minute to tell everyone who is watching across the country what it is you want them to remember from this hearing. What is most important for them to keep in their minds over these next several months, as we are talking about tariffs, talking about changes in tax policy, and what the implications can be.

And maybe we will go in reverse order of the opening statement, and if you wouldn't mind, Josh, we will begin with you.

Mr. AVIV. Absolutely. So just want to say thank you to everyone for coming out, and thank you, Mr. Markey, for allowing us to present here today.

I will keep mine short and sweet. Investment in clean tech, investment in the clean energy economy is an investment in job growth. It is an investment in the economy. It is an investment in economic growth, not only here in Massachusetts but across the United States. And so I think as we continue the conversation around electric vehicles, as we continue the conversation around clean tech, as we continue the conversation around biotech, when we think about those industries and we think about those particular topics, at the end of the day an investment in those areas is an investment in jobs. It is an investment in growing our economy. And if you like jobs, if you want to grow jobs here in the commonwealth, we should continue to invest in those areas.

At SparkCharge we are proud that we are here. We are based in Somerville, Massachusetts. We plan on staying in Somerville, Massachusetts. We plan on continuing to grow here in the state of Massachusetts, and continue to help with innovative ways to grow the electric vehicle industry at a faster pace across the United States.

Thank you so much for listening to what we have to say, and we are excited to work with everybody as we continue to push this industry forward.

Senator MARKEY. Thank you. Dr. Francis.

Ms. FRANCIS. Yes. Thank you again for the opportunity to share why post-secondary education matters. I would hope that the people who are listening can understand that investment in training and education beyond high school remains important and that policy impacts people. I hope that people resist the urge to think that none of this matters and to be overwhelmed by the pace of change, and to really think about the fact that a mission like ours, which is to deliver transformative technical and trade education that leads to economic advancement requires a thriving economy in order to work, and that small businesses are where 80 percent of our students find their jobs.

So anything that threatens small business, any policies that threaten education sector really threatens people. So that would be my last message. Thank you for the opportunity.

Senator MARKEY. And thank you, Doctor, and again, my father, he could do things easily that I couldn't even imagine to do, as a boy or even today. It is a skill set.

Ms. FRANCIS. It is.

Senator MARKEY. It is a gift. People have this technological ability go to in and see a problem, and to solve it, and that is what

you are doing every day here, giving young people the ability to go and do that, and then get a high-paid job.

Ms. FRANCIS. Absolutely.

Senator MARKEY. So we thank you for that. Mr. d'Arbeloff.

Mr. D'ARBELOFF. Thank you, Senator. I am going to be ambitious and a little wonky with my final minutes.

Unfortunately, we are in an age of extreme whether due to climate change, and I think the solar small businesses that are members of our organization are a critical component of helping us literally weather the storms ahead. I think that the notion of having solar on your house or small business, in conjunction with storage, allows you to obtain a level of resiliency which is really, really important.

I would also say that lots of folks have accused the solar industry of being subsidized, to the disadvantage of other rate payers who don't go solar. And I want to point out that solar plays a critical role in actually lowering rates for all rate payers. The way it works—and this is wonky—at what is called ISO New England, that manages our grid, if a number of different generators all bid in their source of energy, the last generator in, the highest rate sets the price for all generators. If you can knock out the peaker plants, if you can knock out——

Senator MARKEY. If you can knock out——

Mr. D'ARBELOFF. If we are all generators, and Senator, by some strange turn of fate you are a natural gas peaker plant, charging——

Senator MARKEY. What do you mean by peaker? What do you mean by peaker?

Mr. D'ARBELOFF. Peaker plant says when the grid is peaking, when the grid is at or near capacity——

Senator MARKEY. You mean, when it is a 100-degree day out.

Mr. D'ARBELOFF. Exactly.

Senator MARKEY. Okay, yeah.

Mr. D'ARBELOFF. And the grid needs more generators, there are power plants that are designed to run for 20 hours a year and get paid very handsomely for it. If you can say, hey, peaker plant——

Senator MARKEY. Meaning that it is only going to be 100 degrees for 20 days a year, but you have got to pay the highest single price just to keep it going, and it happens all year long. So what happens under our new regime?

Mr. D'ARBELOFF. If there is a large installed base of solar, and that installed base of solar grows and grows and grows, and what it means is Senator Markey's natural gas peaker plant is no longer necessary, we can bid him goodbye. His 25 cent per kilowatt energy is no longer necessary——

Senator MARKEY. And how many——

Mr. D'ARBELOFF [continuing]. In at 16 cents.

Senator MARKEY. 16 cents.

Mr. D'ARBELOFF. And we just saved 9 cents per kilowatt hour for every rate payer in the region. And that is just a small example and the type of wonky stuff that never gets publicized, and it is critical to how clean energy is really going to be a wonderful influence and a critical cog in how we manage our civilization, moving forward.

Senator MARKEY. Thank you. Dr. Reichert.

Ms. REICHERT. Well, thank you for inviting me and my colleagues here to testify. I think this has been a very important conversation, and thank you for giving me the chance to take it home.

I want to say to the audience that this is really about communities. This is about people. This is about jobs and livelihoods. It is about the uncertainty that exists now at the Federal policy level, creating uncertainty in the lives of students who are going to need a job and not sure if their training matches up with what jobs are going to be available. It is uncertainty in the future of small businesses who might have made investments that now are in question. And it is uncertainty in everyone who has bills to pay, if you are a clean energy worker and you don't know that your job is going to continue. These are real impacts on real people's lives.

You know, you talked about installation jobs in other parts of the country, and that is absolutely true. But there are clean energy installation, maintenance, and construction jobs. That is actually one of the top three sets of jobs that exists in the Massachusetts clean energy sector, as well.

Senator MARKEY. Can you say that again?

Ms. REICHERT. One of the top three parts of the clean energy jobs in Massachusetts are installation, maintenance, and construction jobs.

So these are local jobs. These are jobs that are paying the bills for real people who are living here, working here every day, and depending on the future of clean energy in Massachusetts and the entire country.

Senator MARKEY. Thank you. So I think Dr. Reichert has put her finger on it. You can't outsource a job where someone has to get up on the roof and do that work. You can't outsource a job where someone has to figure out how to install the charging station in somebody's garage or somebody's business. That has to happen right here, with American workers, trained here at Franklin Cummings. Yes, we have to do that right here. The Chinese can't do it for us. It requires American workers to do it.

But we need the technologies to be installed. We need the workers to have a place to go to be hired, and we have people here who want to hire them. They are ready to go. They are ready to employ a whole new generation of workers.

And so I think what we heard today was that President Trump's tariff policies are a real threat to especially the small businesses in the clean energy sector, but to the clean energy sector, in general. No question about it.

A repeal of tax incentives would also be an incredible threat to this burgeoning industry, creating jobs on a massive basis. The numbers, since 2022, when the IRA, the largest climate bill in history, passed, is that it has already created 400,000 new jobs in America and $400 billion worth of private sector investment. That is just in 2 1/2 years. So it is working.

But it is even more than that, even more than the tariffs. It is even more than the attempt to repeal the tax breaks, which again, is counterintuitive if you are in the red states, where 80 percent of the new jobs have been created. That really doesn't make any economic sense that you have a future, and as Dr. Reichert said at

the beginning, for an industry that is going to continue. But we will just get a smaller percentage of it as each year goes by.

But it is more than that. It is also a direct attack upon that sector which is already working, which is the offshore wind industry. So right off our coastline we have the same winds that moved the Pilgrims towards our shores, that were used by the whaling industry to create the first energy industry, whale oil. But now that same wind can produce electricity that we plug into, Barnstable, or Fall River, or Salem, and fuel our homes and fuel our industries right now.

Donald Trump has announced that he is going to try to end the entire offshore wind industry. And why would he do something like that when Vineyard Wind is within months of opening up 800 megawatts of electricity to come right into the Massachusetts economy, essentially replacing the Pilgrim Nuclear Power Plant. And it is pretty clear because otherwise we would have to have more natural gas, natural gas that would be coming in from fossil fuel states, when we would be able to use our own indigenous power.

So Donald Trump not only is now talking about the tariffs and the removal of the tax breaks, but also a direct attack through his Department of Interior and Energy on an industry which was going to produce 3,000, or 4,000, or 5,000, or 6,000 new megawatts of electricity which would just come in from offshore.

And it is all for the benefit of the incumbent industries, because they are afraid of the new industries that can replace them. And especially for places like New England, where God didn't bless us with any oil or gas or coal. But now we can use our own indigenous energy resources, and that is a threat to the natural gas industry, in the same way that Josh's technology is a threat to the oil industry, and putting gasoline into the tanks of the vehicles which we drive forever. We wouldn't have to do that.

So this is an important defining moment in our country's history, whether it be biotech or clean tech. We have a clear vision for where the next generation of young people, young people who are leading us, want to go, want to take us, the industries where they want to work.

I can't thank our witnesses enough. And I am also going to be releasing today a report that I have asked my great staff to put together, and the title of the report is, "Pulling the Plug: How Trump's Attacks on Clean Energy Could Turn Out the Lights for Small Business." And I am going to be releasing this report today, as the Ranking Member of the Small Business Committee, and it will go on here in some detail about what the impacts will be of the Trump policies.

So again, with that I can't thank our incredible panel enough for your expert testimony today, and we thank anyone who is here for their participation.

The record will be open for 2 weeks for anyone who would like to submit any comments or questions to the panel. We thank all of you for participating, and with that this hearing is adjourned. Thank you all so much.

[Whereupon, at 11:49 a.m., the hearing was adjourned.]

Statement for Record of Chair Joni. K. Erst
U.S. Senate Committee on Small Business & Entrepreneurship
"Small Businesses Powering the Clean Energy Economy"

Thank you, Ranking Member Markey, for bringing attention to the role small businesses play in unleashing America's energy dominance. Small businesses in Iowa and across the United States also rely on access to affordable and reliable energy to keep their lights on and operations going.

I have long supported an all-of-the-above energy strategy to ensure the United States independently produces the energy it needs to power the economy and safeguard its national security. This means that we must utilize the massive energy reserves at our disposal including homegrown biofuels, traditional fossil fuels, natural gas, nuclear, wind, or any other energy source.

Local stakeholders need to be able to weigh all available energy options and choose what best fits their situation to deliver reliable and affordable power. In Iowa, for example, over 58 percent of the state's baseload power comes from wind energy. Landowners, local governments, utilities, and energy companies have all come together to utilize a unique blend of energy sources, which is why energy costs for Iowans are nearly 30 percent less than the national average![1]

My home state of Iowa is also the unequivocal leader in biofuels, leading the nation in both ethanol and biodiesel production. Our farmers are part of the solution towards domestic energy dominance—growing crops that are used for both food *and* fuel. The continued innovation and expansion of biofuels makes us less reliant on foreign oil, reduces air pollution, supports rural economic development, and delivers real savings at the pump for American families. I am proud to partner with the President to strengthen this market and provide our producers with the certainty needed to thrive—such as allowing E15 sales in the summer months and helping our mom-and-pop fuel retailers offer higher blends of biofuel at the pump.[2]

Small businesses across the state of Iowa benefit from and contribute to Iowa's energy economy. Small manufacturers make components of wind turbines, engineers help design next-generation turbines, electricians and technicians help install and maintain new projects, and small businesses in unrelated industries rely on access to affordable electricity. This system supports thousands of jobs for Iowans, and the same plan is being replicated across the country with solar generation increasing in Arizona and natural gas production increasing in places like Pennsylvania and Louisiana.

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[1] U.S. ENERGY INFORMATION ADMINISTRATION, TABLE 5.6.A, AVERAGE PRICE OF ELECTRICITY TO ULTIMATE CUSTOMERS BY END-USE SECTOR, (Feb. 2025), *available at* https://www.eia.gov/electricity/monthly/epm_table_grapher.php?t=epmt_5_6_a.

[2] Press Release, EPA, *Ahead of the Summer Driving Season, EPA Allows for Nationwide Year-Round E-15,* (Apr. 28, 2025), *available at* https://www.epa.gov/newsreleases/ahead-summer-driving-season-epa-allows-nationwide-year-round-e15#:~:text=Home-,Ahead%20of%20the%20Summer%20Driving%20Season%2C%20EPA,for%20Nationwide%20Year%2DRound%20E15&text=WASHINGTON%20%E2%80%93%20The%20U.S.%20Environmental%20Protection,during%20the%20summer%20driving%20season; see also Press Release, USDA, *USDA Delivers in Rural Energy Commitments, Strengthens U.S. Energy Security and Increases American-Grown Fuels,* (Mar. 31, 2025), *available at* https://www.usda.gov/about-usda/news/press-releases/2025/03/31/usda-delivers-rural-energy-commitments-strengthens-us-energy-security-and-increases-american-grown.

Arbitrary restrictions and regulations on energy producers can lead to untenable situations where Russian[3] or Algerian[4] natural gas must be imported into Massachusetts because local regulations blocked the pipelines[5] that would have given small businesses access to American natural gas. American natural gas pipelines deliver a product that is refined domestically and produced in a cleaner manner than foreign alternatives. American energy purchases support American jobs and small businesses, instead of Russian and Algerian exporters.

It is our job here at this Committee, and in Congress, to foster an environment where energy is inexpensive and abundant, ensuring the United States remains energy dominant. Congress and the federal government should not be picking winners and losers in the energy sector as the last administration did when it imposed burdensome regulations on small businesses and energy producers. I look forward to working with my colleagues on this Committee to support the small businesses who ensure that every American knows when they flip a light switch, it is powered by American energy.

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[3] Saqib Rahim, *How Russian gas ended up on U.S. shores*, E&E News, (Mar. 21, 2018), *available at* https://www.eenews.net/articles/how-russian-gas-ended-up-on-u-s-shores/.

[4] Ariel Cohen, *Renewables Meet Reality: Fuel Oil Still A Problem In New England*, Forbes, (Jan. 9, 2025), *available at* https://www.forbes.com/sites/arielcohen/2025/01/09/renewables-meet-reality-fuel-oil-still-a-problem-in-new-england/.

[5] Robert Bryce, *Out of Gas: New York's Blocked Pipelines Will Hurt Northeast Consumers*, Manhattan Institute, (June 25, 2019), *available at* https://manhattan.institute/article/out-of-gas-new-yorks-blocked-pipelines-will-hurt-northeast-consumers.