Testimony of Jack Allen

Chief Executive Officer and Chairman, Proterra Inc

Before the U.S. House of Representatives Committee on Transportation and Infrastructure

Hearing on "The Business Case for Climate Solutions"

March 17, 2021

Chairman DeFazio, Ranking Member Graves, and Members of the Committee, thank you for the opportunity to testify at today's hearing on "The Business Case for Climate Solutions."

My name is Jack Allen, and I am the CEO of Proterra.

I am honored to appear before you today to discuss the opportunity for American industry to drive the next wave of innovation and economic growth and provide solutions to reduce greenhouse gas emissions through electric vehicle technology.

Proterra is a leader in the design and manufacture of battery systems and electric drivetrains for commercial vehicles, charging infrastructure solutions for commercial vehicle fleets, and

zero-emission, battery-electric transit buses. Our mission is to advance electric vehicle technology to deliver the world's best performing commercial vehicles.

Proterra is an American company and an American technology leader. Our products are designed, engineered, and manufactured at our factories in the United States. We employ over 600 people across the nation, with most of those employees located at our bus production plant in Greenville, South Carolina, our battery and bus production plant in City of Industry, California, and our battery production and powertrain testing lab in Burlingame, California.

Our sole focus is battery-electric vehicles. We are not hampered by investments in legacy technologies. While the internal combustion engine has had a good run, the future is electric. Market demand for electric vehicles is rising because battery electric vehicles can meet the demands of customers at a lower cost of ownership than diesel vehicles. At the same time, electric vehicles impose fewer costs on our communities and advance our climate goals.

Mr. Chairman, I want to thank you and this Committee for driving federal surface transportation policies and funding levels that will position America to compete and lead the future of transportation globally. The investments and overarching focus on reducing emissions throughout H.R. 2 are the bold steps that climate change and the opportunity for jobs and new industries demand.

Federal policy supporting the development of alternative fuel technologies and investments in zero emission vehicles has been critical to U.S. competitiveness in these new industries and to

advancing U.S. technology leadership. In turn, those policy signals have been followed by significant private investment in companies such as Proterra that have created new jobs. These jobs are full time, high paying, skilled jobs in manufacturing, engineering, and related support functions. While the Bureau of Labor Statistics stopped measuring employment in industries that produce goods or provide services that benefit the environment in 2013, in 2011 more than 3.4 million Americans were employed in the green sector, including over 500,000 in manufacturing jobs.[1] In March 2020, The Institute for Applied Economics at the Los Angeles County Economic Development Corporation reported that the electric vehicle industry in California alone has provided over $9.6 billion in labor income and thousands of well-paying jobs. California's EV industry provided over 275,600 jobs with average annual wages of $91,300 in 2018 alone.[2]

Expanding the electric vehicle industry and investing in supporting infrastructure, and commercial electric vehicles, will continue to create new job opportunities. Such efforts will ensure that American companies become global leaders in research, development and manufacturing of zero emission vehicles.

Proterra is one of those leaders.

[1] U.S. Bureau of Labor Statistics, https://www.bls.gov/green/home.htm , last accessed on March 13, 2021.
[2] https://laedc.org/2020/03/01/laedc-ev-industry-report/, last accessed on March 13, 2021.

We delivered our first battery electric bus to Foothill Transit in San Gabriel Valley over ten years ago. Since then, we have delivered over 550 battery electric transit buses throughout North America. We've sold more than a thousand electric transit buses; however, battery electric buses still only represent approximately 1% of the overall transit bus market.

Through deploying those transit buses, we have learned what it takes to design and manufacture a commercial, heavy-duty, all-electric vehicle. We have just launched our fifth-generation battery electric bus, the ZX5, in 2020, and our battery technology has been proven through over 17 million miles of revenue service. There is much to be done to transition the U.S. transportation system to zero emission fleets, and American companies, like Proterra, can meet this opportunity.

We have developed intellectual property and hold over 70 patents on our innovative solutions. In addition, we have taken our expertise in transit vehicles and built a business providing electric powertrain systems to other commercial OEMs. Our battery systems -- also designed and manufactured in the United States – will power other transit buses, coach buses, school buses, delivery trucks, low-floor shuttles, and construction equipment in the United States, and other countries.

Critical to transportation electrification is charging infrastructure. In fact, recent news headlines are pressing this point to policymakers as well as the public. To date, Proterra has deployed an industry-leading 54 megawatts of charging systems for our customers through 45

projects in North America. Proterra is a full-service provider of charging solutions including the software to manage fleet charging and the expertise to plan large-scale, cost-effective charging solutions for vehicle fleets. We recently completed our largest charging installation for the City of Edmonton, Canada, with 40 Proterra electric buses and a first-of-its-kind overhead charging solution for a bus depot in North America.[3] Our new charging hardware manufacturer, Power Electronics, is investing in a manufacturing facility in Arizona to support Proterra's Energy business.

Proterra's business supports hundreds of suppliers, including US small businesses and disadvantaged business enterprises, women-owned businesses, and veteran-owned companies. Over 75 percent of the components in Proterra vehicles are sourced from American companies in more than 30 states including Illinois, Minnesota, North Carolina, Ohio, Pennsylvania, Tennessee, and Texas.

The road to building the future of zero emission transportation in the U.S. begins with public transit. I would like to thank the Members of this Committee for your leadership in advancing the American Rescue Plan and previous COVID-19 emergency relief legislation which have provided necessary funding to public transit agencies in both urban and rural areas of the nation that provided a lifeline during the pandemic. In 2019, Americans took 9.9 billion trips on public transportation. Public transportation brings Americans to work. Over 71% of public

[3] https://www.thefourth-revolution.com/buses/edmonton-transit-agency-becomes-first-in-north-america-to-deploy-overhead-in-depot-charging-for-electric-buses/

transit riders are employed.[4] During the Covid-19 pandemic, our essential workers depended on public transportation and your actions helped transit agencies meet that need.

Congress also took the historic step in the FAST Act to fund the Federal Transit Administration's Low and No Program from the Highway Trust Fund. Stable funding from the authorization act buttressed by supplemental funding through the annual appropriations process for the past 4 fiscal years has provided approximately $500 million in investments for this program which has supported over 200 separate awards to help communities electrify. As a result of this modest federal investment, more than 2700 zero emission buses are running in revenue service or soon will be deployed.[5] Just as importantly, the program has demonstrated a federal commitment to electric vehicle deployment and the growing level of funding has sent a signal of support for accelerating electric vehicle adoption for public transportation.

Driven by technological and cost advancements, electrifying transportation increasingly offers a winning formula to cities, states, companies, and other fleet operators.

Over the past decade, battery costs have declined substantially. According to Bloomberg New Energy Finance, since 2010, lithium-ion battery pack prices have fallen 89 percent.[6] At Proterra, we have lowered our battery pack cost by 86 percent since 2017.

[4] https://www.apta.com/news-publications/public-transportation-facts/, last accessed on March 14, 2021.
[5] https://calstart.org/wp-content/uploads/2021/01/Zeroing_In_on_ZEBs_FINALREPORT_1262021.pdf
[6] https://about.bnef.com/blog/battery-pack-prices-cited-below-100-kwh-for-the-first-time-in-2020-while-market-average-sits-at-137-kwh/

Over our five generations of bus development, we have routinely increased range and drive performance. Our newest model of electric bus, the 40-foot Proterra ZX5, can be equipped with 675 kilowatt hours of energy storage on board to deliver up to 329 miles of drive range, which represents the most energy storage and longest drive range of any 40-foot electric bus available in the market today.

Going electric does not mean compromising on vehicle performance. A Proterra electric transit bus can accelerate 1.5 times faster than a standard diesel bus, with nearly twice the horsepower, giving it the ability to tackle steep hills with grades up to 27 percent.

Battery-electric transit buses offer a low total cost of ownership and less volatile fuel costs when compared to internal combustion engine vehicles. Proterra's drivetrain and propulsion system enables fuel economies of up to 25 MPGe, a substantial improvement over conventional combustion engines fueled by CNG or diesel. Further because electric buses have fewer parts, require no oil changes or emissions tests, and place less wear on braking systems, operating and maintenance expenses are substantially lower compared to diesel and CNG alternatives.

Simply put, transitioning to zero-emission, electric vehicles is no longer just the right thing to do for public health reasons and to address climate change, it is the smart thing to do for businesses.

That's why private business along with cities, states, schools, airports, and others are advancing bold initiatives to switch entirely to zero-emission vehicle fleets.

Last summer, for example, 15 states and Washington D.C. signaled their intent to transition to 100% zero-emission trucks and buses by 2050.[7] California has continued its embrace of electric vehicles through meaningful standards advanced last year to transition commercial trucks like delivery vans, school buses and other large vehicles to zero-emission technology by 2035.[8]

Major automakers including GM and Ford along with truck manufacturers like Daimler are driving significant investment into accelerating their conversion to electric vehicles.[9]

Also, leading delivery and e-commerce companies including FedEx, UPS, and Amazon are on a path to electrifying their fleets in the coming years.[10]

Now, as demand for transportation electrification accelerates, electric vehicle technology is an opportunity for the United States to be at the leading edge of the innovations that will create good American jobs, modernize our nation's infrastructure, and help build a more just and resilient economy.

Last summer, this Committee spearheaded HR2: The Moving Forward Act which provided for bold investments in our future and decisive action to create US leadership globally in zero emission transportation. The competition in these markets is formidable. In China, there are 450,000 EV buses on the road and China has made massive investments in EV technology.

[7] https://ww2.arb.ca.gov/news/15-states-and-district-columbia-join-forces-accelerate-bus-and-truck-electrification
[8] https://www.gov.ca.gov/2020/09/23/governor-newsom-announces-california-will-phase-out-gasoline-powered-cars-drastically-reduce-demand-for-fossil-fuel-in-californias-fight-against-climate-change/
[9] https://www.nytimes.com/2021/01/28/business/gm-zero-emission-vehicles.html
[10] https://www.nytimes.com/2020/08/27/business/electric-delivery-vehicles-ups-fedex-amazon.html

We believe the technologies we need to meet the global demand for zero-emission transportation, can and must be built right here in the United States. We've experienced this first-hand at Proterra.

In December 2020, Proterra marked the opening of a new battery production line in Los Angeles County. This facility will expand our production capacity to manufacture our industry-leading battery technology systems that power our fleet of transit buses as well as commercial vehicles, such as school buses and delivery vans. With the opening of our new battery production line, we are hiring over 30 employees in Los Angeles County—providing much needed jobs during the pandemic—and these new jobs will include more than two dozen union represented positions.

The new battery production facility is also the first to be co-located within a vehicle manufacturing plant—showcasing our ability to bring state-of-the-art battery production directly to vehicle manufacturers.

Successfully building an advanced manufacturing workforce requires investing in training and development. That's why, along with the United Steelworkers Local 675, our community partners, and Los Angeles County, we launched a first of its kind training program for job applicants interested in electric vehicle manufacturing and celebrated the first graduating class in January.

This training program was developed to advance diversity, equity, inclusion in the EV manufacturing sector by targeting historically underrepresented groups with barriers to

employment, including women, people of color, aging foster youth, veterans, and the formerly incarcerated.

As the transportation industry transitions from fossil fuels, we, along with our partners at USW Local 675, are modeling how American manufacturing companies and workers can come together to create the manufacturing jobs of the 21st century.

The benefits of electric vehicle technology extend far beyond how we move people and deliver goods throughout our communities, too. Proterra has designed our battery systems to serve the development of multiple industries and applications.

The recent widespread power outages in Texas have demonstrated the need for grid resilience, and electric vehicles can play an important role. We can create a more resilient energy *and* transportation system that works for everyone including cities and states operating electric vehicle fleets as well as the utilities and regulators that manage the grid.

Electrifying school bus fleets provides an excellent opportunity. In 2018, Proterra and our partner Thomas Built Buses unveiled a Proterra powered electric school bus. The all-electric Saf-T-Liner C2 Jouley is powered by Proterra's electric vehicle technology and built on the Thomas Built Buses school bus platform – all manufactured here in the United States, in California and North Carolina respectively.

The Jouley electric school bus is capable of supplying power back to the electricity grid using bidirectional charging and vehicle-to-grid technology. This means we can send stored power back to the electricity grid at times when it's needed most or even to provide back-up power to

critical facilities like schools during a power outage, as the electric utility DTE Energy will be testing with their recent acceptance of six electric school buses to serve students in Michigan.[11]

Just last month, the Montgomery County, Maryland Board of Education approved a project with Highland Electric Transportation, to convert its school bus fleet to all-electric, starting with 326 school buses over the next four years. This project represents the largest single procurement of electric school buses in North America. In addition to delivering health and climate benefits by reducing diesel pollution, these Proterra Powered electric school buses will lend their batteries to deliver stored power to the local electricity markets, helping the community integrate renewable energy and support grid resiliency.[12]

Utilities are focused on ensuring the right-sized charging infrastructure is in place to meet the needs for electric vehicles. These initial deployments show promise and policymakers should support additional opportunities to explore how charging infrastructure projects can lighten demand and deliver power back to the electricity grid.

Accelerating the switch to clean transportation will require partnership and coordination, and we are excited to work with electric utilities across the country, including PG&E, which is represented on this panel, to advance creative solutions to meet our energy demands.

Beyond transportation, there are further business opportunities for U.S. innovation and job creation.

[11] https://www.michigan.gov/mienvironment/0,9349,7-385-93394-551135--,00.html
[12] https://www.proterra.com/press-release/montgomery-county-approves-largest-electric-school-bus-order/

Proterra batteries come with up to 12 year warranties, depending on the application. When Proterra batteries have met their useful life in a vehicle, these batteries still retain a significant amount of energy that can be used in second-life applications such as stationary energy storage. In fact, our batteries are designed with second life applications in mind.

When batteries are no longer suited for those applications, there is an entire industry to be built in the U.S. to recycle components for reuse. Proterra battery packs are designed for easy separation of components for recycling purposes, allowing for 100% of aluminum used in the battery pack to be recycled. We also work with top-tier recycling companies such as Redwood Materials in Carson City, Nevada that specialize in extracting and repurposing materials inside lithium-ion automotive batteries.

This regenerative cycle of use and reuse can support the creation of new jobs, help the United States maintain a competitive economic advantage by spurring new domestic industries, and strengthen our national security by reducing reliance on foreign industries for minerals and mining for critical raw materials.

The United States is positioned to lead the world in this emerging market for clean energy and clean mobility. This opportunity for U.S. leadership and manufacturing expansion is worthy of strong support of the federal government. The federal government has played a meaningful role in the early adoption of electric vehicle technology, and we strongly urge you to continue to do so at a scale and with a sense of urgency that the climate crisis demands. Through meaningful measures to expand support for this emerging industry through policies that

promote manufacturing, a domestic supply chain, and workforce training, we can bring the next wave of innovation directly to communities across the United States.

For your consideration, Proterra recommends the following measures to accelerate the adoption of zero emission vehicles:

- Increase funding for zero emission buses and related infrastructure. The Low or No Emission Vehicle Program (Low No) has been responsible for funding thousands of electric transit buses, and we urge you to reauthorize the program and apply significantly greater resources to it to meet growing demand. The INVEST in America Act, which later became the Moving America Forward Act, included bold investments that dedicate significant resources for zero emission buses through the "zero-emission bus grants" program as well "Bus facility and fleet expansion competitive grants" program. As the Congress and this Committee begin the surface transportation reauthorization process again, we support reforming the Low No Program as a zero emission bus grant program and endorse funding at the levels called for in the HR 2 or Congresswoman Brownley's Green Bus Act.

- Incentivize domestic manufacturing and supply chain. We urge Congress to modify the eligibility of the existing Advanced Technology Vehicle Manufacturing (ATVM) loan program to include heavy duty vehicle and suppliers to heavy duty original equipment manufacturers (OEMs). Access to low cost capital through this program would allow

companies to invest in state-of-the-art manufacturing and build the supply chain for domestic components that will allow us to compete against aggressive foreign competition. It will also entice foreign battery cell manufacturers that are the market leaders to open manufacturing facilities in the United States and to import considerable intellectual property and create new American jobs.

- Support deployment of electric vehicles for other public fleets. We recommend that Congress establish grant programs that are modeled on previous successful efforts like the Low or No Emission Vehicle Program that would support the electrification for other heavy duty vehicle fleets such as school buses and municipal fleets.

- Electrification of Federal Vehicles. Proterra applauds the Administration's goal to electrify the federal fleet of vehicles, which boost electric vehicle manufacturing domestically. While opportunities for light duty vehicles garner much of the attention, we believe that deploying zero emission buses at national parks, military facilities, and other federal installations would bring immediate environmental and public health benefits while also reducing operating costs for these agencies over time.

Through these policies, the federal government can send a strong signal to the industry and supply chains that the United States is committed to electrification and will drive greater

private investment into the market, thereby creating even more American jobs in this rapidly growing market.

Thank you for the opportunity to testify before you today. I look forward to answering any questions that you may have.