Testimony of Reed Hundt
CEO of the Coalition for Green Capital

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Subcommittee on Clean Air, Climate, and Nuclear Safety
Hearing on S.283 National Climate Bank Act
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Chairman Markey, Ranking Member Inhofe, and Members of the Committee, it is a pleasure to be here with you today for this important hearing. I am the CEO and co-founder of the Coalition for Green Capital, a 501(c) (3) charitable organization. I am honored to speak in support of S.283, the National Climate Bank Act.

We are here to discuss how to transform totally the way energy is produced and consumed in America: how to change at an accelerated rate from carbon to clean power as the platform for all economic and social activity. Although clean power reaches some corners of everyday life already, heating houses and propelling cars, we need it to form the backbone of modern society for all purposes if we intend to win the battle against climate catastrophe. Because trillions of dollars of new investment are needed to change the power platform, we need private investors to provide most of the capital alongside public investments, to make profits, and to create millions of new well-paid jobs in this massive infrastructure project. Most important, we need the transformation to make everyone better off. Households of all financial means, from low income to the other end of the economic ladder, should be paying less to warm their homes in winter and cool them in summer. People of low-to-moderate income, who historically have borne an unjust share of the economic, social and health costs of the carbon energy platform, should obtain redress through this shift. End users must be delighted by new services enabled by the clean power platform.

Although the great shift is both inevitable and necessary, we need to complete it much faster than market trends alone will do. The reason, of course, is that we have to curtail the greenhouse gas emissions and other pollutants that come from the old carbon platform.

There is another system essential to modern life that is just as critical, complex, pervasive and costly as the nation's power platform. That is the communications and computing platform. It was my privilege as Chairman of the Federal Communications Commission in the 1990s to do my part, with the legal authority given by those of you who were in the House and Senate at that time, to help change that system totally – from analog to digital, from wireline to wireless, from narrowband to broadband, from voice only to data and video. The great change happened in about 15 years, from 1995 to 2010 – just the same amount of time we have to shift from carbon to clean platforming the power sector. We can do it now because we did that then. That's what America, the indispensable country, can do.

Green Banks

The transformation of the power platform must be expedited faster than the pace now set by markets, regulation and innovation, and its benefits must be equitably shared with everyone.

More than one trillion dollars has been invested in green sectors during the last decade, but investment in the more than century old carbon sector has continued apace, leaving the fundamental choice between the past and the future yet to be made. We know what must prevail; among others, Larry Fink, the CEO of BlackRock, the largest investment fund in the world, has explained the right choice: he says environmental sustainability is at the center of his firm's investment strategy. A strong majority of business leaders understand that the shift from carbon to clean power must be accomplished. With some regulatory push and catalytic capital from the public sector, the private sector can provide the great swell of profitable investing that will complete the transition in the short time yet available to keep greenhouse gas emissions lower than globally disastrous levels.

Since its creation in 2010, the Coalition for Green Capital ("CGC") has filled a unique niche in the green finance movement. It has been creating or helping to foster state and local green banks domestically and overseas. Variously independent nonprofit loan funds or quasi-government finance agencies, these green banks are initially funded with public capital but dedicated to crowding-in private capital for building the new clean power platform. These green banks (which are mission-driven loan funds, rather than true depository banks) aim investment at clean energy projects that are critical to achieving environmental and social justice goals, but that because of complexity, unfamiliarity or scale (both too big and too small) the private sector will not fund in a timely manner without some public sector participation.

To date, we have helped create or operate 21 state and local green banks in 15 states and the District of Columbia. CGC operates a domestic network of these green banks, known as the American Green Bank Consortium. Its members have caused investment of seven billion dollars in clean energy solutions, of which three-fourths have come from private investors.

In 22 other states, green banks are proposed in pending legislation or being designed and discussed either in state government or by nonprofit actors. In only 13 states, comprising only one-seventh of American retail electricity consumption, has CGC not yet found actors seeking to start green banks to create jobs, battle climate change, and improve the standard of living in communities adversely affected by environmental damage or the shift from carbon to clean as the platform for economic and social activity.

In addition, CGC has co-organized with the Natural Resources Defense Council a global network of green banks, including members in the United Kingdom, Australia, and Japan among other countries. CGC has also helped create green banks in South Africa and Rwanda.

Green Bank Legislative History: Summary

In 2009 then-Congressman Chris Van Hollen introduced the first version of the Green Bank Act. Congressmen John Dingell and Jay Inslee introduced that bill, renamed the Clean Energy and Deployment Administration, as an amendment to the Waxman-Markey cap and trade bill. It was the only bipartisan measure added to that bill, with 51 votes for and 6 against in the House

Energy and Commerce Committee. The Clean Energy Deployment Administration was also incorporated in the bipartisan energy bill passed out of the Senate Energy and Natural Resources Committee. However, no energy bill reached the Senate floor that year.

Since 2010 CGC and its companion organization, the CGC Action Fund, have been continuously involved in efforts to have Congress create a green bank for the United States. Bills to this end were introduced in the House or Senate in 2014, 2016, and 2017.

In the 116th Congress, Senators Ed Markey and Chris Van Hollen introduced the National Climate Bank Act (S. 2057), co-sponsored by Senators Schatz and Blumenthal as well as then-Senator, now Vice President, Kamala Harris. Representative Debbie Dingell introduced the companion bill in the House (H.R. 5416) that accumulated 10 co-sponsors. The House passed the bill twice, first as part of the Moving Forward Act on July 1, 2020 and then as part of Clean Economy Jobs and Innovation Act on September 24, 2020. Both the House and Senate bills in the 116th Congress provided upfront funds to an independent non-profit that would be based on the green bank model.

In the 117th Congress Senators Markey and Van Hollen introduced the bill before you in the Senate, the National Climate Bank Act of 2021 (S. 283). It would fund an independent nonprofit to operate as the national green bank. This bill was co-sponsored by Senators Blumenthal, Heinrich and Schatz on February 8, 2021, with Senator Stabenow joining as a co-sponsor on February 24, 2021. The bill will deposit $100 billion as capital into the nonprofit corporation, which the House of Representatives chose to call the Clean Energy and Sustainability Accelerator when it passed this legislation last year. The White House, too, has adopted the Accelerator name for the nonprofit, when it was included in the President's American Jobs Plan. S. 283 defines the Accelerator's multi-faceted mission as including mobilizing private investment into seven specific sectors to create jobs, deliver benefits to consumers and reduce greenhouse emissions. Those sectors are renewable power generation; building efficiency and electrification; clean transportation; industrial decarbonization; grid infrastructure; reforestation and sustainable agriculture; and climate-resilient infrastructure. The bill requires that 40% of investment must go to "disadvantaged communities facing climate impacts."

The House counterpart in this session of Congress is The Clean Energy and Sustainability Accelerator Act (H.R. 806), introduced by lead sponsor Rep. Debbie Dingell on February 4, 2021. This bipartisan bill also capitalizes the Accelerator with $100 billion, and currently has 11 co-sponsors. The initial four were Rep. Paul Tonko (D-N.Y.), Rep. Don Young (R-Alaska), Rep. Chellie Pingree (D–Me), and Rep. Brian Fitzpatrick (R-Pa.). The policy is endorsed by organizations and networks like the National Academies of Sciences, Third Way, the Center for Climate and Energy Solutions and the Equitable and Just National Climate Platform.

Since the bills were reintroduced in this session, President Biden included the Accelerator in the American Jobs Plan that was announced on March 31 this year.[1] Last week the White House identified the Accelerator as one of the ways that investment will be made to create new jobs and

[1] White House, "Fact Sheet: The American Jobs Plan," March 31, 2021.

revitalize communities at risk because of the inevitable change from carbon to clean power.[2] Similarly, last week the United Mine Workers of America acknowledged that "change is coming, whether we seek it or not," and then called for targeted efforts enabling affected communities to accommodate the carbon-to-clean transition. Several items urged by the UMWA fall within the authorities conveyed to the Accelerator, including "targeted infrastructure rehabilitation…to coalfield communities."[3]

These recent developments build on a long legislative process of pursuing the creation of this flexible instrument for facilitating the transition in what the UMWA calls a "true" manner.

On April 12, nearly 250 businesses, capital providers, organizations, trade associations, utilities and others wrote a letter of support for the Accelerator to Congress. Signatories include lenders large and small like Amalgamated Bank and City First Bank of DC; trade groups like the Solar Energy Industries Association, Energy Storage Association, Silicon Valley Leadership Group and Black Owners of Solar Services; clean energy businesses like Ameresco and BlocPower; and utilities like Alaska Power & Telephone and Hawaiian Electric Company.

The Accelerator will hit the ground running. We do not have to create a new government agency or institution. After ten years of preparation and execution, the Accelerator is ready to get going. All that is necessary is for Congress to deposit the funds in the Accelerator so it can complete and fund the national network of green banks and begin years of productive investment.

We urge Congress to adopt the National Climate Bank Act and fully fund the Accelerator, for at least four reasons:

- National network of State and Local Green Banks**.** We need to complete the national network of state and local banks and adequately capitalize them. The existing 21 green banks report they have more than $20 billion of ready-to-go projects and programs that they lack the capital to fund.[4] It is reasonable to suppose a completed national network could invest three to four times this amount in short order, with private capital composing the majority of capital, if Congress enacted the National Climate Bank Act.
- Job Creation**.** The Accelerator, combining public and private funds at the national level and through the state and local network, can create jobs – $100 billion of capital will create about 4 million jobs in four years – while at the same time lowering energy costs.[5]
- Investing in Disadvantaged Communities**.** By specific legislative mandate and its charter, the Accelerator will invest at least 40% of its funds in disadvantaged communities including low-and-moderate income communities, communities of color, tribal

[2] White House, "Fact Sheet: Biden Administration Outlines Key Resources to Invest in Coal and Power Plant Community Economic Revitalization," April 23, 2021.
[3] United Mine Workers of America, "Preserving Coal Country: Keeping America's coal miners, families and communities whole in an era of global energy transition."
[4] Examples of identified investment opportunities include: $5.3 billion for building efficiency and upgrades; $626 million for building electrification; $4.8 billion for renewable power and distributed generation; and $3.1 billion for climate-resilient infrastructure. *See* Coalition for Green Capital, "Clean Energy & Sustainability Accelerator:
$21B of Clean & Resilient Infrastructure Projects Ready for Investment," at https://coalitionforgreencapital.com/wp-content/uploads/Accelerator-Investment-Opportunity-20.12.03.pdf.
[5] Vivid Economics, "Supporting a Clean Energy Recovery: Jobs and Emissions Impacts of a $100 Billion Clean energy and Sustainability Accelerator," December 18, 2020, at https://coalitionforgreencapital.com/wp-content/uploads/Accelerator-Impact-Vivid-Economics-11.22.20.pdf

communities, persistent poverty communities, frontline communities, and communities adversely affected by environmental damage or the carbon-to-clean transition. And because the Accelerator is a mission-driven nonprofit organized outside of the federal government, it has unique flexibility to achieve this mission through strategically targeting its investments, not merely the benefits.

- Leveraging Private Capital**.** The Accelerator can crowd-in three to four times as much private sector capital investment for each public dollar invested in building the clean power platform. Expert analysis found that an Accelerator with initial public funding of $100 billion can drive more than $460 billion in total investment in four years, and more than $880 billion in total investment over 10 years.[6] Moreover, the Accelerator's investments do not increase the federal debt or implicate a federal guarantee of any borrowing. Ideally, the President appoints the board initially, in consultation with Congress (using the model of the bipartisan Build Act of 2018), but the board members and management team are not federal officials.

Social Justice

Communities and households located near the source of greenhouse gas emissions and other pollutants – such as refineries, highways, pipelines, and carbon-burning power plants – suffer disproportionately from local air and water pollution, as well as lack of access to clean water, adequate sewage and public health facilities. Not surprisingly, people living there suffer disease, illness, and premature death at rates far higher than in better off neighborhoods. Education results and income levels are lowered by these circumstances. The residents of these adversely affected areas are disproportionately black, indigenous and people of color.

To increase the velocity and the breadth of the move from carbon to clean, the Accelerator will cause investment in vulnerable communities to deliver holistic benefits from clean power solutions: job creation; lower costs for heating, lighting and air conditioning; healthier homes; a safer environment; and a local say in business formation and decision-making. By funding the Accelerator, Congress will enable the benefits of the clean power platform to be delivered to all Americans, while directly redressing the inequities inflicted on low to medium income households by the carbon power platform.

Existing State and Local Green Bank Network and Activities

Today, green banks exist in: California, Connecticut, Colorado, Delaware, the District of Columbia, Florida, Hawaii, Louisiana, Maryland, Michigan, Nevada, New York, North Carolina, Ohio, Pennsylvania, and Rhode Island. These 15 states and the District of Columbia account for 39% of retail sales of electricity nationally. These green banks, all members of the CGC sponsored Consortium, have driven seven billion dollars of total investment in the clean energy platform over just the last 9 years, and 75 percent of those investments are from private sector

[6] Vivid Economics, "Supporting a Clean Energy Recovery: Jobs and Emissions Impacts of a $100 Billion Clean energy and Sustainability Accelerator," December 18, 2020, at https://coalitionforgreencapital.com/wp-content/uploads/Accelerator-Impact-Vivid-Economics-11.22.20.pdf

capital investors. These green banks also have more than $20 billion in ready-to-fund projects and programs.

In addition, state government or elected officials have taken preliminary steps to create green banks in: Alaska, Illinois, Maine, Massachusetts, Minnesota, Missouri, New Jersey, Utah, Vermont, Virginia, and Wisconsin. These 11 states account for 17% of retail electricity sales.

CGC has collaborated with and continues to partner with government officials, local leaders, and market actors to launch green banks in Georgia, Idaho, Indiana, Montana, New Mexico, Oregon, South Carolina, Tennessee, Texas, Washington and West Virginia. These 11 states account for 29% of retail electricity sales.

However, as the Coalition for Green Capital has learned repeatedly over the last decade, none of the actual or proposed green banks have sufficient public capital necessary to achieve a rapid, equitable clean energy transition. Legislation adequately capitalizing the Accelerator would solve that problem.

We know what a national network of green banks would do with the funds because we can see what the existing ones are already doing.

The Connecticut Green Bank lowers energy costs for churches, non-profits, small businesses, and manufacturers, focusing on those located in distressed communities, by helping them obtain capital for clean energy renovations.

The Florida Solar and Energy Loan Fund addresses low-income households often deemed not to be credit-worthy. It helps them strengthen their roofs to withstand increasingly fierce storms and also install solar panels. Occupants save on every cost, pay less for home insurance, and rarely default on loans.

The Hawaii Green Infrastructure Authority partners with the local utility to upgrade homes for low-and-moderate income families, enabling them to obtain solar power and reduce their energy bills.

Michigan Saves helps homeowners retrofit their dwellings to protect against harsh weather conditions. The result is immediate savings on energy bills.

The Delaware Sustainable Energy Utility offers low-cost financing for the installation of solar on small farms.

The New York Green Bank, among many other activities, funds firms to build large ground-mounted solar projects for shared use in whole neighborhoods. These “community solar” projects provide lower electricity costs for subscribers in the neighborhood, including both homeowners and renters.

These green banks partner with private sector investors to finance projects built by private firms, create jobs in the local community, and get paid back with very low default rates.

Activities of Proposed New State Green Banks

The governors, legislatures and other actors proposing green banks in 22 more states have identified specific purposes to these institutions, designed to fit the energy needs of each state. The Accelerator would support these goals, bringing to bear the expertise developed from the last decade of green bank experience and, of course, the funding this Congress would provide.

Alaska Governor Mike Dunleavy recently introduced legislation creating a green bank called the Energy Independence Fund.[7] The Accelerator would co-fund this green bank. Among other things, it would finance building efficiency to lower staggeringly high energy burdens, and it would refinance the debt on eighteen rural renewable energy and hydropower projects. Native corporations and Alaska Power & Telephone support this bill because the investment will result in economic relief to ratepayers in economically distressed communities – including tribal stakeholders - and an inflow of capital so that the State of Alaska can loan money to other projects. In addition, working through and with the Alaskan Energy Independence Fund, the Accelerator would support the supply of renewable power to Native Alaskans and other rural communities that are not connected to the larger utility grid. Clean power solutions in Alaska require local knowledge and specialized techniques, often relying on battery energy storage systems and improved building design to a greater degree than in more southern latitudes. In conjunction with its Alaska partner, the Accelerator would fund local firms to develop solutions that suit local conditions.

In California, where transportation is the principal contributor to greenhouse gas emissions, the Climate Catalyst Fund will convert heavy duty truck fleets to electric technology to reduce particulate emissions and lower costs for fleet operators. A particular focus will be fleets located or largely operating in low-and-moderate income communities.

Bipartisan legislation in Maine proposes to create a state green bank that will convert buildings to using only electricity, instead of fuel oil, for heating purposes. That will save money, abate greenhouse gas emissions and improve healthier indoor air quality. The Accelerator can also provide financing for small family forests to enable longer growth, creating stronger trees that can be used for cross-laminated timber, which in turn can be used for low-carbon building construction.

In North Carolina, the green bank has been a key recommendation in policy and stakeholder-driven initiatives, including the state's Clean Energy Plan.[8] Last year, business and other state leaders formed the nonprofit North Carolina Clean Energy Fund to serve as the state's green bank. If given access to capital, the Fund would provide innovative and inclusive financing to the state, with a focus on serving the 288,000 households in North Carolina that spend a third or more of their income on energy.

In West Virginia there is a beckoning opportunity for a green bank to renovate homes, reclaim and reforest abandoned mining sites, and explore carbon capture technologies. It is estimated that more than $40 billion could be usefully deployed to improve housing in West Virginia alone,

[7] Press Release, "Dunleavy Introduces Alaska Energy Independence Act," Office of Governor Mike Dunleavy, April 9, 2021, at https://gov.alaska.gov/newsroom/2021/04/09/dunleavy-introduces-alaska-energy-independence-act/.

[8] North Carolina Department of Environmental Quality, "North Carolina Clean Energy Plan: Transitioning to a 21st Century Electricity System – Policy & Action Recommendations," October 2019, at 15.

providing much-needed assistance to help low-and-moderate income households manage their energy bills and live in healthier homes. A particular concern in old and un-renovated buildings is their public health costs, including lead poisoning, mold, and air pollution that in various pernicious ways make people sick, cost them money, and limit their chances to get well educated. Asthmatic children are estimated to lose 20 days of schooling per year, and on many of those days parents and other caretakers cannot go to work.

Accelerating Regional Strategic Investments at Scale

In most parts of the United States – with the exceptions of Alaska, Hawaii, and Texas -- the transmission grids span state lines, meaning that consumers in one state depend on power supplied from other states. These interconnected interstate transmission grids are the backbone, or architecture, of the United States power system and the economy that depends on it. To make the transition from carbon to clean power, and to cope with the various problems caused by climate change, we must make these transmission grids much larger and more interconnected than they are today. This transformation is indispensable to the shift from carbon to clean power as the national platform for economic and social activity.

Accelerating this change requires attention to job loss and job creation, economic development in affected communities, pollution reduction, and resiliency improvements. Institutional, financial, and complex regulatory issues must be solved. The Accelerator can act on its own and also coordinate multiple state green banks to address financial and related impediments to transforming the transmission system.

For example, abundant wind resources in the Plains states and offshore areas should provide low-cost electricity to distant geographies that lack ample, steady breezes. However, both wind development and transmission upgrades, including high-voltage direct current long-distance lines, are required. Who will commit to invest in these costly projects: transmission developers, wind project developers, or future customers? The Accelerator can solve this coordination or "chicken-and-egg" problem by making initial investments in coordination with private developers on all sides of the transaction (the complexity of which cannot be overstated). Moreover, because such projects invariably cross state lines, no single state green bank acting alone can play this role. There are more than 20 large-scale transmission projects with estimated costs in excess of $30 billion that are largely permitted that could enable market access for almost 60 GW of new, low-cost wind and solar generation in the middle part of the country.[9] These projects have been stymied to date because of the chicken-and-egg problem.

As another example, many utilities agree that they should not depend on coal-fired power plants for generation, but cannot on their own solve the problems associated with the shift to clean power. Some publicly owned utilities (such as municipal or cooperative utilities) have borrowed to contract with or own these facilities, and are reluctant to make their consumers pay off that debt after the facility is closed. In other instances, a coal-fired power plant cannot be retired unless new renewable generation and perhaps energy storage simultaneously takes its place.

[9] Michael Goggin, Rob Gramlich, and Michael Skelly, "Transmission Projects Ready to Go: Plugging into America's Untapped Renewable Resources," Americans for a Clean Energy Grid, April 2021.

With adequate capital, the Accelerator can address these critical timing and coordination issues in ways that expedite the transition and protect consumers, communities, and utility shareholders. Each of these multi-party situations require unique solutions, but the Accelerator and its network of green banks have the flexibility and, if adequately funded, can negotiate positive outcomes that expand value for all stakeholders. Possible techniques include reducing financing costs, lowering the stranded costs of utilities that are borne by their ratepayers, assisting workers and communities affected by the early retirement of a coal-fired power plant, and providing low-cost debt to help pay for new renewable generation and storage to replace the retired coal-fired generation in a manner than benefits both the utility and its ratepayers.

A last example concerns crises such as the near collapse of the electricity system in Texas freeze of 2021 and the outages that accompanied wildfires, high winds and heat waves in California in 2020. In many if not all states, the existing electric grid must be expanded, made more resilient, and modernized. Regional markets must be broader and deeper, and involve investments in multiple states by market participants and transmission entities. Funds permitting, the Accelerator would be well positioned to take on projects of such large scale.

The Accelerator should also play a role in standardizing and aggregating small scale investments in clean power projects from many states, whether made through state green banks or other public or private sector financing entities. By contributing to standardization and securitization in the vast potential market of small-scale projects, the Accelerator can attract much more private capital to these markets.

This role for the Accelerator – creating a bridge between local clean energy projects and nationally available private capital – is an attribute of all successful changes in the dynamic American economy. We see it in finance for automobiles, housing, appliances, and electronic equipment. Transactions, codes, and regulation may be local, but private capital is national, even global. The Accelerator should be engaged in building that bridge; that is how the necessarily enormous sums of private sector capital will move to local clean energy project development.

In all these use cases, the Accelerator would follow these six principles:

- maximize crowding-in of private sector capital investment;
- lower energy costs;
- maximize emissions reductions per public dollar of public investment;
- stimulate job growth;
- enable communities adversely impacted by the existing carbon platform or the transition to clean power to benefit from improved economic and social conditions; and
- use state and local green banks to the maximum extent possible.

Accelerating Investment in and with Disadvantaged Communities

The Accelerator intends to invest, with and through state and local green banks and the private sector, in communities acutely afflicted by environmental damage, public health problems, and a lack of opportunity to improve their economic and social conditions on the existing carbon

platform. Communities composed of black, indigenous and other people of color disproportionately fall in this category.

Individual home owners in such communities often do not have and cannot borrow the money to improve their dwellings, even when they could immediately save on energy bills or improve health conditions. Renters may not be able to persuade remote owners to adopt renovations. Neighborhoods may not be finding ways to share the benefits of collective action, such as adopting community solar. These are structural impediments to otherwise sensible investments.

Acting primarily through its state and local network and in partnership with local actors, the Accelerator would target at least 40% of its total investments to such communities. Its nonprofit, independent status confers great flexibility in the forms of contracts in which it can enter. These include agreements with community development financial institutions, local banks, credit unions and other trusted local actors to implement useful changes in economic and social conditions. Techniques include upfront financing, start-up grants to small businesses, and development of lending guidelines that improve access to loans while protecting against the defaults that deter commercial lenders from participating in rebuilding communities that must not be overlooked in the carbon-to-clean transition.

In the desired rebuild, the Accelerator and its network aim to take a “whole home” approach. When a home is being weatherized to make it more efficient with lower energy bills, the project can also include mold remediation, lead pipe removal, resilience and other essential upgrades drawing on other pots of funds. More efficient electric appliances and heating systems can replace ones that use fossil fuels. These investments will make houses more economical, more comfortable, safer and healthier. This will also drive targeted job creation, better health and education outcomes, new business creation and new pathways to wealth creation in communities that historically have been cut out of deep, lasting benefits of the nation’s economic development. This whole home approach requires coordination of many private and public sector actors and funding streams, and is the role green banks are designed to fill.

If funded by Congress, the Accelerator will launch a Low-Income Community Electrification Race to the Top Program. It will seek at least 50 communities as volunteers in providing local firms, local enthusiasm, and expedited regulatory processes in return for Accelerator capital. The goal is to discover the go-to-market methods that attract private sector money into rebuilding and electrifying communities of all income levels in every state.

The carbon-to-clean transition will comprise millions of changes in the way Americans live. That is true of any fundamental technological advance. For example, two-thirds of American homes have broadband. In each household a new information system including Wi-Fi, computers, smartphones and other appliances was installed, a telephone line was disconnected or became little used. Hundreds of millions of separate changes adopted in less than 15 years in the aggregate built a new communications platform. The carbon to clean transition also requires a step by step, wire by wire, house by house process. The Accelerator, working through its network, has the special duty of assuring that the change occurs in, and benefits, disadvantaged communities as quickly as or even more quickly than all others.

Technological Change Can – And Needs To – Happen Quickly

No single technological breakthrough will shift the American economy, much less the world's, from carbon to the clean power platform. We are talking here about renovation building by building, community by community. We are talking about changing the way each of nearly 3,000 electric utilities obtain and supply power, in the source of electricity sent along 200,000 miles of high voltage transmission lines.[10] But we have seen exactly this multifaceted, massive and total change before.

From roughly 1993 to 2008 – 15 years – the communications platform of the United States shifted dramatically from analog to digital, from wireline to wireless, from century old firms that changed their business models to new firms based exclusively on the new technologies that enabled information to be generated, shared, and consumed in new ways. A mix of government regulation, deregulation, public money, and vast private sector investment drove this transition.

And so the commercial Internet wrapped around the world. This chart shows the growth of Internet users from 16 million in 1995 to 1.7 billion in 2010.

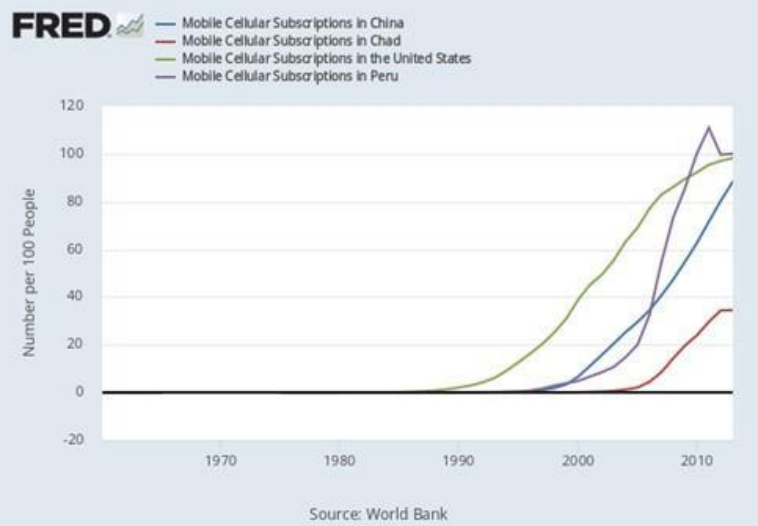
Figure 1: Global Internet users 1995 - 2010[11]

The next chart shows the growth of digital mobile subscribers from near zero in 1993 to 100 cellphone subscriptions for nearly every 100 people by 2010 in the United States, China, and

[10] https://www.eia.gov/todayinenergy/detail.php?id=40913; https://www.scientificamerican.com/article/what-is-the-smart-grid/.
[11] Nurunnabi, Mohammad & Pereira, Ella & Chowdhury, Abdul. (2012). Dream and the Reality: The Adoption of "Digital Concept" in an Emerging Country. 10.4018/978-1-4666-0134-5.ch020.

Peru – to pick three very different countries. And even in a poorer country like Chad the penetration was also huge by 2010.

Figure 2: Mobile Cellular Subscriptions by Country[12]



The chart shows that the United States led the shift from wireline to wireless. The accelerated shift to the new communications platform in the United States caused the 1990s to be the only decade since the 1960s in which every quintile of American society gained in income. American leadership in this transition enabled common technologies to wrap around the world and lift up every country save the very few whose leaders feared change.

To a significant degree, the new information platform changed the way of living for rich and poor alike at approximately the same time. That was by design, with features such as the e-rate that connected the Internet to classrooms and libraries everywhere in the country, as well as many other purposeful measures that addressed affordability. The transition to broadband later was not so widespread. Fixing that is another feature of the American Jobs Plan.

Massive private sector capital investment in the new infrastructure rapidly caused the transformation of the information platform. Investment built transcontinental fiber optic cables, cellular base stations, data centers, and a vast array of other components and systems. From the mid-1990s to 2010, private sector investors put about two trillion dollars into the new communications and computing platform of America. That in turn enabled American companies to lead the world in the new markets that have transformed the way almost everyone now lives. The parallel with the carbon-to-clean transition is nearly exact, and should give us confidence that by combining public, nonprofit and private initiative the United States can realize this change in a way that improves the standard of living for every American, and shows the world how to pursue the same path to world-saving reliance solely on renewable power.

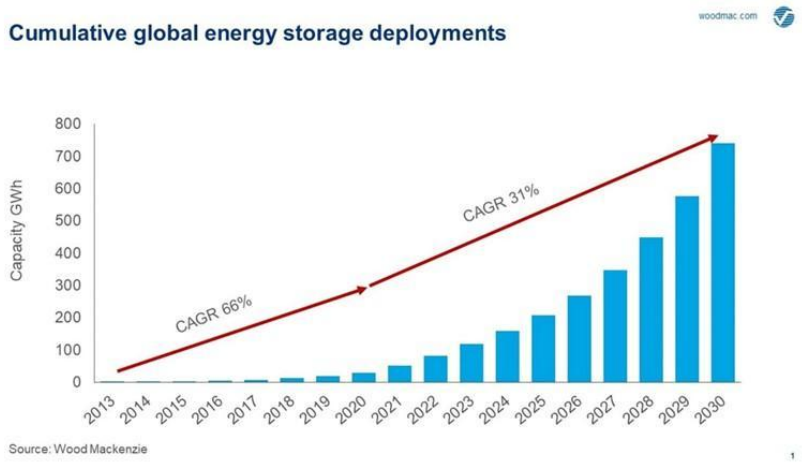
Conclusion

[12] Federal Reserve Economic Data, at https://fred.stlouisfed.org/categories/33527.

Building the clean power platform requires private investment on both sides of the supply-demand equation; change must come to the supply side of generating, transmitting, distributing and storing electric energy and the demand side of consumption. An additional challenge is that the investment has to occur faster than current market trends because of the urgent need to cut greenhouse gas emissions.

An example of an innovation ready to accelerate in deployment is battery storage. The following projection resembles the Internet and cellular growth rates shown above:

Figure 3: Real and Forecast Cumulate Global Energy Storage Deployments[13]



Investment must drive growth in all components of the clean power platform. A Princeton study estimates that in the next ten years about $2.5 trillion of investment in the clean power platform must occur in the United States.[14] The chart below shows where the investment probably must go. This investment will produce savings in energy expenditures over time.

Figure 4: Supply-side Energy Investment Required to Achieve Net-Zero Target by 2050[15]

[13] Wood Mackenzie, "Global energy storage capacity to grow at CAGR of 31% to 2030," September 30, 2020, *see* https://www.woodmac.com/press-releases/global-energy-storage-capacity-to-grow-at-cagr-of-31-to-2030/.
[14] Princeton's Net-Zero America study Annex M: Mobilizing Capital for the Transition.
[15] Princeton's Net-Zero America study Annex M: Mobilizing Capital for the Transition.

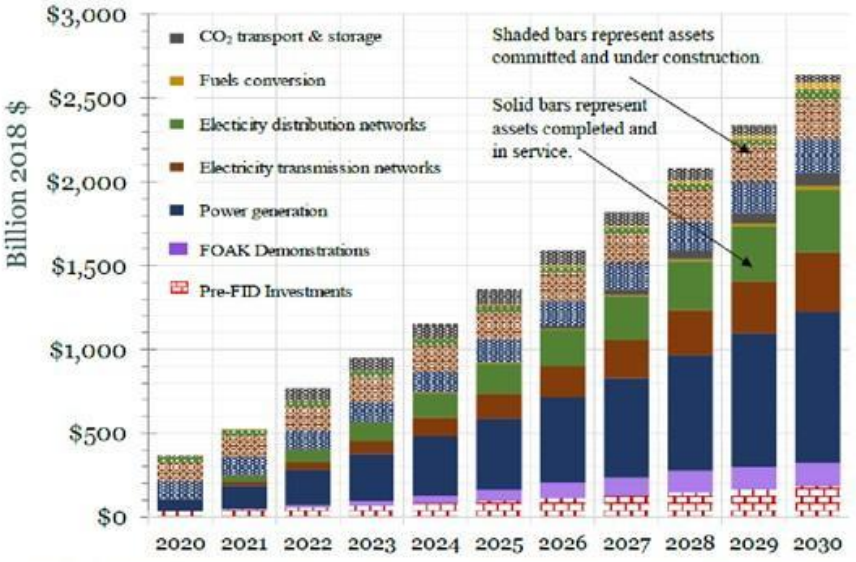


Figure 6 Chart illustrating the mobilization of $2.6 trillion in supply-side investment capital from during the first decade by sector (including Pre-FID at-risk capital). Solid bars indicate capital projects built and in service, while shaded parts of the bars indicate capital that has been committed and is still under construction.

According to the Climate Policy Initiative (CPI), the current annual investment in clean power of $74 billion of investment needs to rise to roughly $250 billion per year.[16] Ninety percent will come from the private sector.

Learning by doing for the last decade, a national green bank with a network of 50 or more state and local green banks knows how to bring in private sector investment at the scale and with the speed necessary to build America anew.

Some have said that the shift from carbon to clean is too costly, too complex, and too ambitious for the United States to undertake. Too many, they say, will suffer; everyone, they say, will be worse off. Besides, they say, nothing like it has ever been done as quickly as the increasingly pressing battle against climate catastrophe requires. None of this nay-saying is right. America is indispensable, because it is uniquely capable of leading and winning the battle against climate change. This Committee, this Senate, this Congress can give the Accelerator the capability to play its part in what can be – what actually must be – an historic accomplishment.

Thank you for the opportunity to be here today, and I am happy to answer any questions that you may have.

[16] Climate Policy Initiative, "The Landscape of Climate Finance in the United States," March 18, 2021.