

Accelerating Investment in Clean Energy & Climate Infrastructure to Create Jobs & Drive an Equitable & Just Transition:

Policy Analysis of the Clean Energy and Sustainability Accelerator



About the Authors

The Coalition for Green Capital (CGC) is a non-profit with a mission to halt climate change by accelerating investment in clean energy and climate infrastructure. CGC achieves this by advocating for, creating and implementing green bank finance institutions. Green banks are a proven finance model that use public and philanthropic funds to mobilize private investment in renewable energy, energy efficiency and other decarbonization technologies. For over a decade, CGC has led the green bank movement, working at the federal, state and local level in the U.S. and in countries around the world. By increasing investment and accelerating the construction of clean power, CGC is helping deliver a cleaner, better future.

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Overview

The United States is at an inflection point.

The nation is coping with an active public health crisis that, at the time of publication, has claimed over 240,000 American lives and caused the most severe economic downturn since the Great Depression. As of mid-October 2020, 20 million Americans were collecting unemployment benefits, and labor force participation is down to its lowest level in nearly 50 years. It is now clear that COVID-related shutdowns have created lasting changes in consumer habits and business behavior, which have led to permanent structural changes in the labor force. Millions of the jobs that were eliminated temporarily will soon disappear permanently. Full employment recovery requires creating new jobs.

The public health and economic crises are further exacerbated by the ongoing crisis of systemic racial injustice that has plagued the country since its founding. 2020 has seen some of the largest mass mobilizations in U.S. history and persistent instances of social unrest. Communities of color, working families and historically disinvested communities are demanding radical changes to the economic and social structure of American society.

In the background of this trio of crises looms the now-realized climate catastrophe, an existential threat to the livability of broad swathes of the country. There is broad scientific consensus that the U.S. must transition to a carbon-free economy within the next two decades or experience extraordinary environmental, social and economic costs. However, private capital is not flowing into clean energy and climate infrastructure at anywhere near the required scale or pace necessary to facilitate such a transition. Further, public spending, already strained by the pandemic and resulting economic fallout, is unlikely to quickly fill the gap. Instead the limited public funds must be used to leverage private dollars into the required investments.

Fortunately, the jobs, equity and climate investment crises can be addressed with the same policy intervention – creation of the Clean Energy and Sustainability

Accelerator (the “Accelerator”). The enabling legislation for an Accelerator will capitalize an independent, non-partisan, nonprofit financial institution with a one-time federal appropriation. The Accelerator will use this seed funding in partnership with private capital to increase and expedite our country’s annual investments in clean energy, create millions of new jobs and advance climate equity and justice.

The Accelerator will deliver jobs. An independent economic analysis determined that an Accelerator that is capitalized with \$35 billion will create 5.4 million jobs over five years. These jobs will be in small businesses – nearly two thirds of the entire clean energy workforce are employed by small businesses with fewer than 19 employees. Further, these jobs will offer employment opportunities in all corners of America and for all skillsets. Clean energy and climate infrastructure jobs are in manufacturing, construction, and equipment installation, but also in management, sales, and administration.

The Accelerator will deliver justice. The Accelerator will invest no less than 40% of its portfolio in climate impacted communities – the frontline, fence-line, low-income, rural, distressed, Black and brown communities that have historically been excluded from clean energy investment. Further the Accelerator will catalyze local control of climate investment, seeding dozens of new green banks in communities on the frontlines of the fight against climate change. The Accelerator’s investments will enable communities that are being left behind in the climate transition to access pollution free communities, cleaner air, electrified homes, thriving local businesses and improved health and wellbeing.

The Accelerator will deliver investment. Our nation’s total annual investment continues to fall far short of the amount required to transition to a 100% clean electric grid (\$225B of annual investment), let alone a fully decarbonized economy. The Accelerator will work with the private sector to address these investment shortfalls by leveraging its initial capitalization to catalyze billions of dollars of total investment. It will accomplish this by

utilizing credit enhancements, co- and subordinated-investments, and warehousing tools that de-risk and demonstrate nontraditional segments of clean energy investment.

The Accelerator will put communities in control of climate investment. The Accelerator model has already been successfully demonstrated by state and local green banks across the country. These institutions have leveraged, on average, \$3 of private co-investment for each green bank dollar invested, causing more than \$5 billion of total investment in clean energy and climate infrastructure. The Accelerator will leverage this existing distribution network to rapidly deploy capital into projects. The Accelerator and its network of state and local green banks will invest across seven sectors key to combatting climate

change: renewable-power projects, building efficiency and electrification, clean transportation, industrial decarbonization, improved grid infrastructure, sustainable agriculture, and resilience efforts.

The papers that follow detail the markets in which the Accelerator will participate, the tools that it will use, and how it will leverage capital and support marginalized communities in the name of social and environmental justice. This collective body of work demonstrates that not only are the objectives of the Accelerator achievable, but that we also know precisely how to achieve them on a short time frame. The groundwork has been laid – now we just need the political will to deliver the funding and institutional mechanism necessary to realize the jobs, equity and climate benefits in this moment of extreme crisis.





Why America Needs an Accelerator

The Problem We Must Solve

Our Decarbonization Pathway

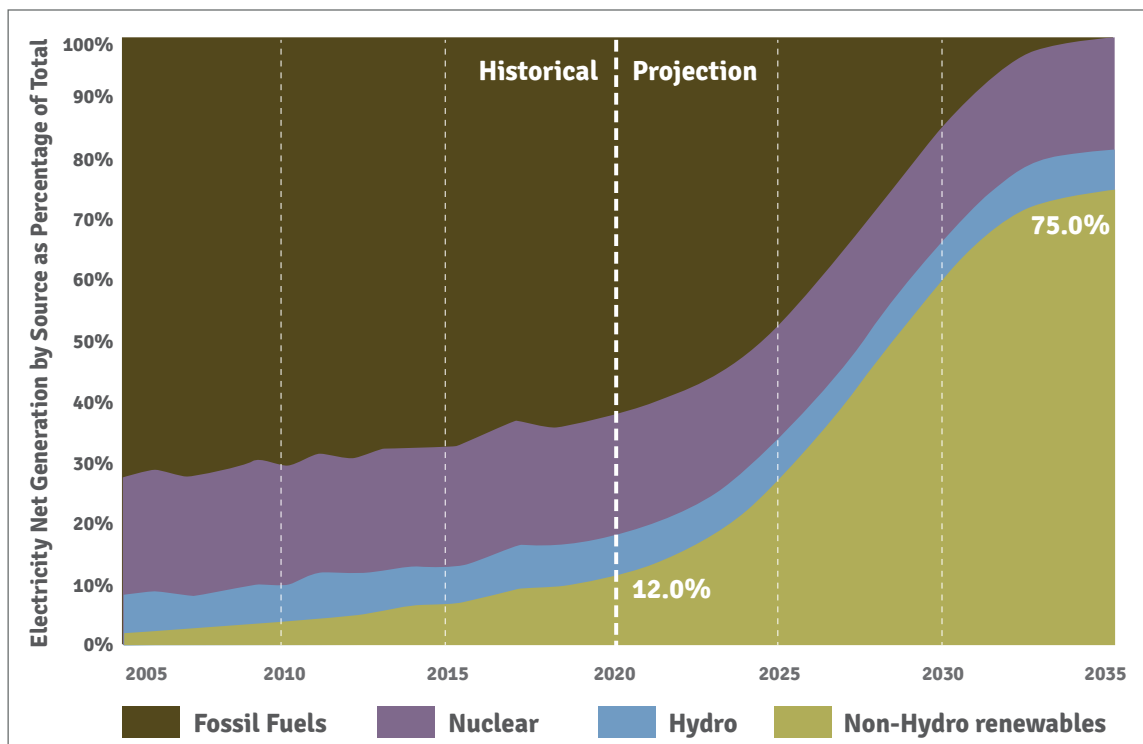
In 2019, 80% of the energy consumed in the United States came from fossil fuels, with only 20% from sources that do not emit greenhouse gases like carbon-dioxide.¹ To decarbonize the U.S., the market share of non-emitting energy sources must grow from 20% to 100%. This means generating 100% of power from non-emitting sources, eliminating all travel that is powered by gasoline, and eliminating the use of natural gas for heating in buildings and industry.

Today, in the U.S., non-hydro renewable power sources (primarily wind and solar power) account for approximately 12% of electricity market share. Fifteen years ago, these sources accounted for only 2%, meaning those technologies gained 10% more market share during that time. Most climate scientists and policymakers now believe the entire U.S. power grid needs to be decarbonized by

2035. This will primarily rely on a mix of wind and solar power, combined with existing hydro and nuclear power generation (plus ample battery storage to maintain reliable power delivery). Assuming no new nuclear or hydro resources are added to the grid, this means that non-hydro renewable power will have to grow from 12% market share to approximately 75% market share in the next 15 years. This gain of 63% share in the next 15 years versus the 10% share gain in the prior 15 years means growth of more than 6x the prior rate.

This kind of rapid adoption means renewable power market penetration will need to follow the “s-curves” that are found for other technologies like internet and smart phone adoption. And if clean power penetration is on an s-curve, then 2021 will need to be the inflection point where the curve shifts from being mostly horizontal to mostly vertical. An illustrative chart is shown below.

Figure 1. Electricity Market Share by Source: 2005–2035 S-Curve Projection With Goal of 100% Non-Emitting Power by 2035



1 [“U.S. energy fact explained.”](#) U.S. Energy Information Administration, Accessed October 2020

And this challenge is even greater than it first appears because simultaneously building energy use, transportation and industrial energy use all have to be electrified, with that power, in turn, delivered by renewable sources. So non-hydro renewables will have to deliver 75% of the power in America, where demand for power over that time period may have grown by 25% or more. (Total electrification is expected to result in a 4x growth in total power demand.) Approximately 75 million homes use natural gas for heating and cooking, and six million use fuel oil for heating. Each one of those buildings must be converted to electric or geothermal based heat. Today, far less than 1% of the vehicle miles travelled today are powered by electricity. Which means nearly 100% of the market for vehicle miles travelled has to be converted from internal combustion engine to electric motor.

The Investment Need

The transformation described above will require trillions of dollars of investment capital. The net result of the conversion from carbon to clean will actually lower energy costs for American households and businesses. The job of building, installing, selling and manufacturing all the requisite technology and projects will transform the U.S. economy and create millions of jobs. The capital investment needed is at a staggering scale and must be deployed at a rate far beyond what markets are delivering today.

Recent estimates show that the investment required to build a fully electric power grid is \$4 trillion.² This includes both the generating capacity and the necessary grid infrastructure upgrades, including storage, to manage the intermittent resources of wind and solar. In addition, the cost of electrifying buildings (commercial and residential) is also several trillion dollars, based on bottom-up analysis of Rewiring America.³ So even leaving out the investment necessary to fully decarbonize transportation and industry, this tells us that over a 20 year time period, the annual investment needed approaches \$300 billion.

In 2019, new investment in clean energy in the United States totaled only \$71.9 billion. In order to achieve

decarbonization on the necessary time frame, annual investment must increase more than 4x immediately, and be maintained at that level for the next 20 years. There is no reason to expect the private market to solve this problem and fill this gap on its own, and waiting for such a solution is too high a risk to take when it comes to saving the planet from climate change.

A Just and Equitable Transition

Finally, we already know from historical precedent that private investment and market forces on their own will absolutely not lead to a just and equitable clean energy transition. Low-income communities, frontline communities and communities of color have not only been severely left behind in clean energy adoption, but they have historically taken on the disproportionate burden of health and economic impacts of fossil fuel pollution. Environmental justice and equity must be central to the clean energy transition, and that means intentional, targeted investment and solutions delivered first to underserved communities, not last.

This often means addressing the hardest decarbonization challenges first, and not simply aiming for the “lowest-hanging fruit.” Project developers and those in the business of selling clean energy projects prioritize their activity, at least in part, based on expected customer acquisition costs. An installer of rooftop solar presumes it is cheaper to acquire a wealthy customer than a poor one, if for no other reason than the wealthy customer is more likely to have a tax burden that would benefit from the federal investment tax credit. This is just one example of how market forces combined with existing policies lead to low-income and communities of color being left out of the clean energy transition.

In addition to merely deploying clean energy solutions that benefit underserved communities, the job creation and wealth accumulation that has come from the clean energy transition to date has also been realized inequitably. This all adds up to a clear need for intentional investment, products and go-to-market tactics, and business

2 “The Price of Fully Renewable US Grid: \$4.5 Trillion.” GreenTech Media, June 28, 2019

3 “Rewiring America.” Saul Griffith with Sam Calisch & Laura Fraser

creation all strategically designed and prioritized for underserved communities. Again, private market forces on their own (and even tax and regulatory policy on top of that) have proven incapable of solving these problems.

Lastly, this transition can be disruptive to communities across the country that have historically relied on fossil fuel-driven activities to generate economic activity and provide jobs. Maintaining the fossil fuel economy simply to sustain jobs is not a viable option. So instead solutions must be offered to workers and communities in the form of job training, economic development, and investment to maintain standards of living. This, too, requires mission-oriented, strategic, targeted investment.

The Barriers to Scaling U.S. Climate Investment

The Accelerator is a mission-driven, outcomes-based organization. It is not a passive provider of capital. Rather, it is specifically designed to address a myriad of business problems that halt the rapid market penetration of clean energy technologies and climate solutions across multiple sectors. Those barriers are sector-specific and just as often relate to project demand as they do to capital supply. This memo describes a number of barriers that slow more rapid market penetration of clean energy solutions.

Perceived Project Risk

There are a number of perceived project risks that might prevent a private lender from extending capital to a project that is economical, sound and socially beneficial. This is rarely associated with uncertainty or risk associated with the technology at issue, though it sometimes can be. If a technology has been deployed commercially a small number of times, or there is limited track record on performance, this lack of data alone can disqualify a project.

A more common disqualifying project risk is if the developer of a project has a limited track record of executing and successfully building projects. This is a problem across the clean energy sector, as markets are still relatively nascent, the developer industry is still immature,

The Solution is the Accelerator

The required scale of the transformation, amount and pace of investment, and the strategic and equitable nature of that investment all point to the need for an Accelerator. A highly capitalized institution is needed that has the tools, flexibility and mission-orientation to meet these requirements, and to do so specifically in ways that mobilize private capital. Public funds on their own can solve some but not nearly all of the investment challenges faced on the pathway to decarbonization. An Accelerator is the institutional framework America needs to drive private investment and meet the challenge.

and it is heavily populated by small businesses across the country. Those small businesses, because they may not have a large balance sheet themselves, or have only completed a small number of projects, may not qualify for project finance.

Finally, there are a number of project revenue risks and uncertainties that a private capital provider may be unwilling to take on, even if the underlying economics are attractive. For example, a project may generate valuable renewable energy credits for years into the future, and those credits can be sold to create revenue which can then be used to pay back a lender. But the exact price at which those credits can be sold ten or 15 years from now is hard to discern. That uncertainty can undermine an entire project from moving forward.

Perceived Credit Risk

Projects serving low-income and frontline communities may struggle to secure financing because of the perceived credit risk of the underlying customers. Even for a project where the savings generated by the clean energy project exceed the amount of loan repayment, private lenders rarely underwrite a project solely based on the project cash flows. Rather, they look at traditional metrics like FICO credit score or debt-to-income levels. Many low- or

moderate-income households may not qualify under those traditional metrics, even if they have a high ability to repay based on the project cash flows, or based on high utility bill repayment history. The lack of track record and data lead to this perception and fear of credit risk.

Marginal Project Economics

There is only demand for a clean energy project if it can produce financial benefits for the end customer. A solar or wind project that sells electricity to a customer at a price that is above what they currently pay will, all else equal, not be built. This is true even if the project is sound and financeable in every other respect. The price at which the power must be sold to customers is directly related to the cost and terms of financing that are used to build the project. Financing provided at longer terms or at lower rates will in turn result in cheaper electricity that can produce savings for a customer. Therefore, pulling various financial levers to lower the overall cost of financing for the total project can meaningfully expand markets.

Inefficiencies of Scale for Small Projects

A great number of projects across clean energy, transportation, building and other sectors are small, distributed and non-standardized in their form. These projects are generally unattractive to large private capital providers because the scale of the projects makes them uneconomical to finance. The cost of evaluating and underwriting a project is largely the same, whether it is big or small. Capital providers can often generate a higher return with larger projects; projects below a certain size cannot get financing. Aggregation techniques can overcome these scale challenges.

First-of-kind Transactions

Projects that employ proven technologies and have credit worthy counterparties may not be financed simply because the transaction structure itself is novel. Private capital providers are hesitant to be the first to try a new investment structure. This is because the extra upfront work can be costly and also because of the uncertainty about whether or not such a structure will work. Most

notable are questions about which risks will be borne by which parties, and how to ensure there are not unmitigated transaction risks. Proven and repeated transaction structures are simpler and less risky to execute.

Lack of Technical Capacity at Local Level

There may be a significant opportunity in certain communities to build public-benefit microgrids that ensure continued safety and security for a community during a heavy storm. But a significant amount of technical know-how is required within the community to cause that microgrid to be financed and built. This includes technical, engineering, procurement, and financing knowledge, that many communities do not have readily at hand. As a result, projects like these rarely are built, even if they are cost effective, financeable and deliver significant benefits to communities. This lack of technical ability prevents all kinds of community-level projects from moving forward, including clean energy and resilience projects.

Collective Action Problems

Collective action problems require coordination among multiple actors, but for whom, on an individual basis, the pursuit of suboptimal outcomes is in the individual actor's favor. For example, a concentration of new wind power projects may collectively exceed the existing interconnection capacity of a transmission system. Each individual project is incentivized to be the first to interconnect in order to avoid paying for costly grid upgrades. The result of this individualized action is the total overall cost of upgrades is greater, with that cost borne by ratepayers. The optimal outcome would be for the group of wind projects to coordinate and build an optimized interconnection upgrade to serve the whole group of projects, producing lower costs for ratepayers. Such collective action will not be taken if profit-seeking actors are left to decide, calling for a mission-driven coordinator.

Low Incentive to Serve LMI and Communities of Color

Low-to-moderate income communities and communities of color are chronically underserved by clean energy

and climate infrastructure developers and installers. An installer of residential efficiency projects, for example, may be selling those installation services without any financing solution, relying on the homeowner to pay cash out of pocket. That installer may then presume that households in certain communities won't have sufficient cash on hand to pay for the installation, and so the service is never offered. Alternatively, the installer may have a financing solution that allows for purchase with no upfront payment. However, that installer may presume that certain households lack the creditworthiness to qualify for financing. So again, the service is not offered in those communities. This has resulted in a disproportionately low market penetration for clean energy solutions in low-to-moderate income and communities of color. Accordingly, capital must be intentionally directed to these communities.

Sales or Installation Workforce is Too Small

There are over 100 million households in the U.S. More than half use natural gas for heating and/or cooking, and petroleum is the most common energy source after that. Electrifying over 50 million households to replace that fossil fuel-based energy with electricity within the time frames required by climate change will require an army of workers that simply does not exist. Millions will need to be trained in sales, marketing, installation, monitoring and financing to actually achieve 100% market penetration. The same can be said of many other discrete clean energy sectors. And without the businesses and the labor force dedicated to penetrating these markets, the capital and industry maturation will be slow to develop. Proactive efforts to create those businesses and simultaneously deliver capital and generate demand is required.

Lack of Standardization to Access Public Capital Markets

The most efficient way for clean energy and climate-related projects to access long-term, affordable and abundant capital is from public capital markets. However, a typical, individual clean energy project is unable access capital from capital markets for a number of reasons. This includes project size, lack of risk diversification and

others. The common method for overcoming such barriers is to aggregate, many smaller projects to reach the sufficient scale to attract capital, and then "securitize" that group of projects as one tradable debt-based asset. However, such securitization is infeasible unless the underlying project and financing structures are highly standardized. Standardization is also critical in order to address climate change quickly. Individual, distinct and bespoke transactions are time-consuming, complicated and expensive to execute. Therefore, standardization is critical in several respects to address climate change.

Low Consumer Awareness

There is nothing to finance unless there is demand for the product that needs financing. Demand for distributed clean energy solutions is incredibly low primarily due to low awareness and understanding of the opportunity to use cheap, cleaner and better energy solutions. Perception that clean energy is expensive or is complicated to adopt has kept demand far below the size of the true addressable market. Intense and broad-based marketing efforts are critical to overcoming this barrier.

Project Life and Debt Tenor Mismatch

Clean energy and climate-related projects often have a very long project life, typically generating returns and producing benefits over many decades. For example, an offshore wind project's life may be 30 years. Replanting forests may have an even longer life. That means the project's revenue generation is spread out over many years, as well. The tenor of the debt taken out to finance the construction of those projects, though, does not always match the project lifespan. For example, a 30-year wind project may only be able to secure debt for ten or 15 years. This mismatch erodes the underlying economics and returns for the developer, shrinking the size of economically viable projects that a developer may pursue. For consumer-focused distributed projects like energy efficiency, the consequence of this mismatch is that the shorter loan term means each loan repayment is larger. These payments may exceed the amount of savings produced by the project in any given month. Therefore, the shorter loan period means the project is not "cash flow positive"

on a month-by-month basis until the loan is fully repaid. Longer loan terms that match the project life would reverse this barrier and make the same project cash flow positive from day one.

Stranded Asset Value for Fossil Fuel Investments

The construction of a coal or natural gas-fired power plant requires a massive upfront investment, and the owners recoup that investment and earn a return over an incredibly long period of time, measured in decades. This return is typically guaranteed by the regulator of the market through rate recovery from ratepayers. Therefore, the plant owner has no incentive to shut down that power plant, even if the power it produces cannot economically compete in the market, because the plant still has value as a rate-based asset. Walking away from the plant or shutting down will “strand” that asset when it should still be producing returns to repay investors. This problem of stranded asset values for fossil fuel investments is a primary barrier to a more rapid shutdown of coal plants, for example. Without regulatory or financial solutions, this stranded asset barrier will keep coal plants operating far into the future, long after they are economically non-competitive.



Outcomes of the Accelerator



The Accelerator Will Create Five Million Jobs

An [independent economic analysis](#) of the Accelerator found that a \$35 billion investment in the Accelerator would create 5.4 million jobs over five years. Other key findings of the analysis are included below.

- An Accelerator could kick-start a step change in green investment by crowding in private investment and generating millions of new jobs.
- The Accelerator could translate an initial \$35 billion capitalization almost \$500 billion dollars of public and private investment across key green sectors within its first five years through direct financing and private co-investment in projects. Over two decades, the Accelerator could drive almost \$2 trillion worth of investment.

- Looking at a realistic investment portfolio for the Accelerator across six climate mitigation sectors, the Accelerator could support the creation of 5.4 million new job-years in its first five years of operation. As initial investments are repaid and then reinvested by the Accelerator, job creation would continue at approximately the same rate.
- Clean investments generate more jobs than fossil fuel investments, for the same level of spending. In particular, the Accelerator's clean transport and renewable energy sectors have huge job creation potential, providing more than 60% of new jobs created.

The full analysis can be viewed at coalitionforgreencapital.com.



The Accelerator Supports Climate Equity and Justice

SUMMARY

The National Climate Bank Act of 2019 was introduced in the U.S. Senate in July 2019 and in the House of Representatives in December 2019. In 2020, a version of the bill called the Clean Energy and Sustainability Accelerator passed the House with \$20 billion of funding as part of both the Moving Forward Act and the Clean Economy Jobs and Innovation Act. These pieces of legislation capitalize an independent nonpartisan non-profit institution, an “Accelerator,” to finance climate solutions at scale and bring clean energy investment to American communities. This institution will invest its funds in ways that leverage private investment and generate the most impact out of each public dollar.

This analysis seeks to further explore the Accelerator’s ability to work as a force for environmental justice. It discusses the importance of environmental justice and the importance of the green bank model of public investment to meet environmental justice needs. Further, it will explore how an Accelerator can amplify the benefits already demonstrated by the green bank model at the state and local level, while also opening up entirely new pathways to provide opportunity and justice for environmental justice communities.

STRATEGIC AREAS OF INVESTMENT

The Accelerator’s establishing legislation directs it to, among others, do the following:

- Enable communities of color, front-line communities, fence-line communities, low-income communities, historically disinvested communities and rural communities to benefit from and afford projects and investments that reduce emissions;
- Provide support for workers and communities impacted by the transition to a low-carbon economy;

- Form new state and local green banks with start-up funding and technical assistance, and provide lending capital to new and existing state and local green banks; and
- Use capital to accelerate the retirements of fossil-fueled generation, and otherwise work to purchase greenhouse gas reductions at low cost.

The Accelerator’s investment strategy is designed to rapidly and fully transition from fossil fuels to clean energy in order to address climate change. Among the bank’s core principles is that addressing climate change requires a just transition that prioritizes climate impacted communities. This principle is operationalized through various requirements in the Accelerator’s enabling legislation including:

- the Accelerator will make a significant portion of its investments in climate-impacted communities;
- the Accelerator will prioritize investment activities that result in the deployment of projects to serve climate impacted communities;
- the Accelerator will ensure that the projects it finances create good paying jobs; and
- the Accelerator’s board of directors will have expertise in environmental justice and matters related to the energy and environmental needs of climate impacted communities.

If fully capitalized with \$35 billion contemplated in the National Climate Bank Act of 2019, the Accelerator is projected to create over 5.4 million jobs and \$500 billion of climate investment over five years.

THE IMPORTANCE OF ENVIRONMENTAL JUSTICE

The U.S. Environmental Protection Agency defines environmental justice as the “fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws,

regulations, and policies.”⁴ Promoting environmental justice within the context of an Accelerator will require the Accelerator to deliver a clean energy transition that benefits communities that have been disproportionately harmed by the effects of fossil fuel extraction and use, and excluded from the economic benefits of the clean energy transition to date. These communities are disproportionately low-income communities and communities of color and are often referred to as “environmental justice communities.” Environmental Justice communities have been subject to a host of environmental injustices.

- Environmental justice communities disproportionately bear **negative public health outcomes** due to fossil fuels, transportation emissions, and other forms of pollution. Studies have connected asthma, low birth weights, and lead poisoning to air pollution and toxic chemicals, which disproportionately affect those in low-income neighborhoods.⁵
- Environmental justice communities face **increased exposure to the harms** of climate change. In urban areas, environmental justice communities are more likely to be impacted by the effects of extreme heat waves, and less likely to have reliable or affordable ways to cool down. When they face extreme weather impacts in the form of fire or flooding, environmental justice communities are less likely to be able to afford to start a new life elsewhere. The Fourth National Climate Assessment found that low-income communities in urban and rural areas face disproportionate harms.⁶
- The clean energy transition brings economic benefits in the form of lower energy costs and jobs; however, environmental justice communities have too often been **excluded from realizing these benefits**. Wealthy homeowners that make investments in energy efficiency or home solar receive public subsidies that enable them to enjoy lower energy bills and increased comfort. However, many members of environmental justice communities are renters. Others that are

homeowners are unable to afford the up-front cost of improvements, or to secure traditional financing to achieve the same cost and comfort benefits.

- When large federal investments are made in energy and infrastructure, the needs of environmental justice communities generally aren’t taken into account, and **the voices of these communities have often been excluded from planning processes**. Conventional stakeholder meetings for energy and infrastructure-related decisions are typically technical and arcane, unavailable in languages other than English, and are held at places and times that present obstacles for anyone with inflexible work schedules.
- Programs that mandate emissions reductions or clean energy installations **often disregard where those changes occur**. Such programs are designed for economic efficiency, to allow emissions reductions to be achieved first where the cost of doing so is lowest. However, this approach can leave polluting facilities in environmental justice communities running for years even as the region as a whole reduces its average annual emissions.
- Environmental justice communities **pay a disproportionate share of their income towards energy bills**, including electricity and heating.⁷ To the extent that policies to address climate change increase the prices of energy, these households are disproportionately affected.

Any climate policy that aims to enable a just transition will need to take these historic injustices into account. Environmentally just policy should strive to reduce the burden of energy costs on these households. That includes increasing access to money-saving improvements like energy efficiency and clean energy, but also keeping energy prices affordable for households whether or not they invest in such improvements. Investments in new clean energy infrastructure should prioritize reducing pollutants in climate impacted communities, provide

4 “[Environmental Justice](#).” United States Environmental Protection Agency, Accessed October 2020

5 “[Trump’s EPA Concludes Environmental Racism is Real](#).” *The Atlantic*, February 28, 2018

6 “[Climate change in the US will hurt poor people the most, according to bombshell federal report](#).” CNBC, November 26, 2018

7 “[Lifting the High Energy Burden in America’s Largest Cities: How Energy Efficiency Can Improve Low-Income and Underserved Communities](#).” American Council for an Energy-Efficient Economy, April, 2016.

good-quality jobs, and bring economic activity to local communities.

HOW THE GREEN BANK MODEL SUPPORTS ENVIRONMENTAL JUSTICE

Green banks already exist at the state and local level across the country, and have built a decade-long track record mobilizing investment into clean energy. They have already driven over \$5.4 billion of investment into clean energy projects that would otherwise not have been built.⁸ They have done so while lowering energy costs for consumers in their states. And, they have undertaken targeted efforts to address environmental justice communities which have historically been excluded from the benefits of clean energy investment.

Reducing energy costs for communities

Green banks are finance institutions designed to lower energy costs by blending public and private capital. For example, a green bank may provide a portion of the total investment that a solar energy project needs, and do so at a lower interest rate than would be offered by a private lender. Private investors may provide the rest of the necessary capital at their normal return requirements. The price of the energy output sold from a given project is based on all the costs that go into the project, including capital costs. For the project to move forward on an economic basis, the end result of all this must be the sale of energy that is competitive or cheaper than the current price of grid power in the region. By blending public and private capital, the green bank is able to lower the overall cost of the project and deliver clean electricity that is competitive and cheaper for the end user.

Connecticut Green Bank: Solar for All

An example drawn from the Connecticut Green Bank showcases the savings that solar energy, combined with energy efficiency, can provide to individual families.

Susan Young, a Black homeowner in Bridgeport, CT, was paying over \$500 per month in utility bills. To lower her utility bills, she signed up for a ground-breaking new solar and efficiency financing program launched by the Connecticut Green Bank. With no down payment or upfront cost, the green bank and its developer partner lowered the energy needs of Susan's home with energy efficiency, and then installed solar panels on her roof. Now after the installation, she pays \$120 per month on the financing, and her utility bill is now just \$28. With the combined remaining utility bill and financing charge, Susan comes out well ahead compared to what she was paying before.⁹

This financing solution is made possible through a credit-enhancing junior loan made by the green bank, as well as by using alternative underwriting criteria. Rather than evaluate a borrower's eligibility based on traditional banking metrics like credit score or debt-to-income ratio, the only consideration was whether or not the homeowner had consistently paid his/her utility bills for the last 12 months.

The example is part of the Solar for All program, established in 2014 after the Connecticut Green Bank (the first green bank in the U.S.) found a racial and income disparity in solar adoption rates in the state. Since the program launched in partnership with PosiGen, solar penetration in Connecticut's low-income communities has increased 188% and over 800 low-income verified households have signed up to go solar.¹⁰ As a testament to its success, this early demonstration has led to the creation of a larger \$90 million facility with a private investor allowing Posigen to expand the product into new states.¹¹

INCREASING ACCESS TO CLEAN ENERGY THROUGH TARGETED PROGRAMS

State and local green banks have pioneered tools to provide low-income communities, renters, and other

8 "Green Banks in the United States: 2018 Annual Industry Report," American Green Bank Consortium, May 2019.

9 "Malloy Touts Solar Energy Savings." CTPost, July 21, 2015

10 "Connecticut Green Bank Receives 2018 State Leadership in Clean Energy Award for Connecticut "Solar for All" Program." Connecticut Green Bank, May 16, 2018

11 "Financial Partnership Secures Growth of Nation's Leading Low-Income Residential Solar Provider," Connecticut Green Bank, January 23, 2019.

underserved communities with access to energy efficiency and clean energy improvements.

There are now three green banks which focus exclusively on low- and moderate-income customers: the Florida Solar and Energy Loan Fund (SELF), Inclusive Prosperity Capital (IPC) in Connecticut, and the Climate Access Fund (CAF) in Maryland. Many other green banks have specific programs dedicated to low-income or otherwise underserved pools of customers.

These programs are a growing part of state and local green banks' portfolios of projects. The green bank model inherently focuses on markets that are underserved by commercial investors, where the adoption of clean energy is limited by a lack of capital. Low- and moderate-income markets are a clear example where this is the case. Green bank leaders are also increasingly focused on the historically unequal access to clean energy programs and savings, and on the need to take active steps to remedy the disparity.

An Accelerator would provide capital and technical assistance which would enable these efforts to expand into communities across the country, including into states and regions which do not currently have existing green banks.

Maryland Climate Access Fund: Low-to-Moderate Income Community Solar

Maryland's Community Solar Pilot Program, established by the General Assembly in 2015, allows any Maryland resident to sign up for solar power whether they own their home or not. Program users can sign up for power that is generated elsewhere in the same utility service territory and get credit on their electricity bill for that power.

The program includes a provision that at least 30% of its solar capacity be reserved for projects that serve low- and moderate- income (LMI) customers. However, over time, the state found that this provision alone was not sufficient to drive LMI adoption of community solar. Traditional

developers and their investors hesitated to enter the low-income community solar market, in part due to concerns that low-income customers may not pay their bills.¹²

The Baltimore-based Climate Access Fund (CAF), a non-profit green bank, was launched in 2017 to address this gap between the community solar regulation and the way the solar market has traditionally worked. CAF locates urban rooftops for solar developers, and offers attractive financing in the form of below-market debt with flexible terms (using loan capital raised through philanthropic program-related investments) and guarantees to cover potential revenue losses in the event of low-income subscriber non-payment (provided by the State of Maryland).

In exchange for these services, solar developers must agree to an initial 20% discount on low-income subscribers' electricity bills, with no credit limitations or lengthy contract requirements. The developers and the customers both stand to benefit from this arrangement. CAF expects to close on its first project in the coming months, and has a pipeline of additional potential projects in the queue.¹³

ENABLING COMMUNITIES TO ADAPT TO THE IMPACTS OF CLIMATE CHANGE

State and local green banks have also created lending programs that help frontline communities adapt to the effects of climate change. Generally speaking, mitigation activities, such as deploying clean electricity generating resources, are easier to finance because of the expected future cash flows that arise from these technologies. Adaptation activities, however, do not benefit from the same intrinsic cash flow generating characteristics as mitigation activities such as wind and solar generation. Generally, adaptation projects provide less quantifiable financial benefits than mitigation, meaning that lenders are more hesitant to make loans to these types of projects. This hesitancy can be devastating for front-line communities that are already experiencing the impacts of climate change in the form of increased flooding and stronger storms.

12 ["Social Equity Through Clean Energy,"](#) Lynn Heller, August 12, 2019

13 ["Social Equity Through Clean Energy,"](#) Lynn Heller, August 12, 2019

Florida Solar and Energy Loan Fund: Climate Resilience Lending

Green banks have begun to apply themselves to the task of identifying quantifiable cash flows or savings associated with adaptation projects and have already had some success. In Florida, the Florida Solar & Energy Loan Fund (SELF) a certified Community Development Financial Institution (CDFI) and green bank, has created a program that takes advantage of the insurance premium savings enjoyed by homeowners that harden their roofs against the threat of hurricanes, and uses those anticipated savings to help secure a loan provided by SELF to finance the upfront cost of the entire project.

SELF also makes financing available specifically for home adaptations, aging-in-place, and assistive technologies.¹⁴ These can also be combined with conventional clean energy and energy efficiency options available through Florida SELF. A release from Florida SELF highlights the case of St. Petersburg homeowner Sylvia Thompson, who secured an affordable loan from SELF for a new high-efficiency air conditioner: “Her child with cerebral palsy and epilepsy is prone to seizures during hot summer months. Having a functional air conditioner not only lowered her electric bills, but it greatly improved living conditions. Sylvia described the SELF program as a ‘blessing.’”¹⁵

CAPITALIZING ENVIRONMENTAL JUSTICE OWNED COMMUNITY BUSINESSES

The clean energy transition will stimulate a massive transfer of wealth to the businesses, large and small, that manufacture, design and install clean energy technologies. Unfortunately, the same inequities that exist in the broader economy have been replicated in the clean energy transition. Businesses owned or operated by members of environmental justice communities are often unable to access the capital necessary to survive and thrive. State and local green banks can serve as crucial source of capital

for the locally owned contracting and construction businesses that do the work of the clean energy transition.

Inclusive Prosperity Capital: Providing credit to local businesses

Inclusive Prosperity Capital (IPC) is a national not-for-profit specialty finance organization and green bank focusing on the intersection of community development, clean energy finance, and climate impact. IPC spun out of the Connecticut Green Bank in 2018 to increase investment in underserved markets nationally, including low- and moderate-income communities, by accessing new mission-driven capital sources and forging partnerships with mission aligned lenders, community-based organizations and others. IPC’s first investment outside of Connecticut was a \$5 million credit facility for BlocPower, a Black-owned Brooklyn-based energy services company that is transitioning fossil fuel burning buildings in New York State, to clean electric heating and cooling systems.

FACILITATING COMMUNITY INPUT IN A JUST TRANSITION

One of the obstacles faced by environmental justice communities arise from their exclusion from decision-making processes. Conventional stakeholder meetings for energy and infrastructure-related decisions are typically technical and arcane, unavailable in languages other than English, and are held at places and times that present obstacles for anyone with inflexible work schedules. As state and local institutions, that depend on income from communities they serve, green banks are designed to be responsive to community input.

Connecticut Green Bank: Responding to inequity in solar deployment

The Connecticut Green Bank, for example became aware of a disparity in its solar lending programs. In response, the green bank set out to correct this disparity by increasing participation from environmental justice communities. As of 2019, CTGB has achieved “parity” in its solar lending

14 [“New HALO Loans Help Seniors, the Disabled With Crucial Home Renovations,”](#) November 2, 2018

15 [“New HALO Loans Help Seniors, the Disabled With Crucial Home Renovations,”](#) November 2, 2018

operations, meaning that the households and businesses that have received solar loans from the Connecticut Green Bank are representative of the demographics of the state itself. The organization has achieved “beyond parity” with solar lending to communities of color. This focus on parity has allowed the benefits of going solar to be enjoyed by people and businesses of all walks of life, not just those that may have more access to information about the existence of these programs.

AN ACCELERATOR INCREASES ENVIRONMENTAL JUSTICE INVESTMENT

An Accelerator will build on the work of state and local green banks and be a powerful tool for environmental justice in its own right, by a) supporting the expansion of the environmental justice programs currently underway in state and local green banks b) creating local financing entities that enable local control of climate investment and c) undertaking large and complex environmental justice related investment projects.

Supporting expansion of state and local environmental justice programs

The Accelerator will expand the environmental justice work currently underway at state and local green banks across the country. As is discussed at length above, state and local green banks across the country are facilitating the transactions necessary to enable clean energy and climate infrastructure investment in environmental justice communities. The Accelerator will further this work by providing additional flexible capital that can be used to broaden the scope and scale of environmental justice focused financing programs. The Accelerator will also provide technical assistance that enables state and local green banks to develop new financing programs that facilitate investment in environmental justice communities. Like state and local green banks, the Accelerator would focus its technical assistance and capital on projects involving technologies that are on the edge of widespread deployment in environmental justice communities.

Providing resources necessary for local control of climate investment

The Accelerator will also provide the resources necessary to stand up new green banks in environmental justice communities. Historically, green banks in the U.S. have been formed by state governments, local governments and non-profit and community organizations. There are currently 15 green banks operating nationally and across 13 states. State and local green banks can be formed and operated by community stakeholders and accordingly, are an ideal vehicle for community control and direction of clean energy and climate infrastructure investments.

A key function of the Accelerator will be to provide technical assistance to enable the formation and launch of new green banks in environmental justice communities. Technical assistance is a key ingredient for the success of any green bank and will be especially important for green banks launching in environmental justice communities with a limited history of clean energy and climate infrastructure investment. The Accelerator’s technical assistance offerings will include market evaluation, product design and implementation, organizational formation, hiring, business plan creation, and launch support.

The Accelerator will also provide seed capital to enable new green banks to launch their operations and initial financing products. Access to start-up operating capital is key to the success of new green banks, as it often takes several years for a new green bank to generate revenues sufficient to cover its operating costs. This timeline may be longer in communities where project sizes are smaller or expected returns from financing are low. The Accelerator will provide operating capital, sized to the operating needs of the applicable green bank, to enable the green bank to immediately begin financing clean energy and infrastructure projects.

UNDERTAKING LARGE AND COMPLEX ENVIRONMENTAL JUSTICE PROJECTS

The Accelerator will also invest in large and complex clean energy and climate infrastructure investment projects that are currently outside the scope and scale

of most state and local green banks. These projects have the potential to bring significant economic activity to the communities and regions in which they are located, and to ameliorate long-standing environmental harms caused by fossil-fuel infrastructure.

A wide array of local stakeholders stand to benefit, including:

- Americans who suffer from the health effects of fossil-fuel based generation;
- Businesses that construct or install clean energy;
- Contractors that perform energy efficiency audits, upgrades, or other construction;
- Communities charting a new path in a post-fossil fuel economy; and
- Energy-intensive businesses constrained by the availability or price of power.

Though the Accelerator would invest at an even larger scale, a few examples from existing green banks point to the potential benefits, including the jobs that can be created by clean energy investment at scale.

New York Green Bank: Economic boost to Western New York

Since 2014, New York Green Bank (NYGB) has helped nine New York-based companies expand their operations within the state, and seven non-New York-based companies grow their existing footprint within the state.¹⁶

Specific projects have generated additional jobs and economic benefits for communities. For example, in 2019 NYGB committed \$68.75 million in financing to support the acquisition of 612.0 MW of installed wind power by Carlyle Power Partners. The transaction will allow that generation to remain operational for longer than previously planned. During these years of extended operation, the projects are expected to generate almost three million

MWh of clean energy and avoid over 1.5M metric tons of GHG emissions.¹⁷

In addition to the environmental benefits, this transaction will retain more than 40 clean energy jobs in the North Country and Western NY, and enable continued lease payments made to landowners and property taxes contributed to local communities. The NYGB also expects that the transaction will build market confidence and enable further large-scale renewable investments of this type.

Connecticut Green Bank: Creating jobs

The Connecticut Green Bank's 2018 Impact report found that the green bank has supported the creation of more than 16,500 direct, indirect, and induced job-years.¹⁸ A research study from Connecticut Green Bank and Navigant Consulting further estimated the jobs created by each million-dollar investment in clean energy mobilized by the green bank. It found that the number of jobs created ranges from five job-years for storage tech installers to 18 job-years for residential energy efficiency installers.¹⁹

The Accelerator will also undertake large scale projects that enable communities to recover from the effects of fossil fuel infrastructure.

Supporting revitalization efforts of fence-line communities

The Accelerator will serve as a new source of capital for the revitalization of fence-line communities. Low-income communities and communities of color are more likely to live in fence-line communities that are in close proximity to polluting fossil fuel infrastructure. These communities have long fought for regulatory interventions to mitigate the harms caused by fossil fuel infrastructure, and are increasingly forcing the decommissioning of this infrastructure. However, once the polluting facilities are closed, capital is required to rebuild, repair and renew damaged community infrastructure. Currently, communities depend on scarce philanthropy and

16 [“Governor Cuomo Announces Major Milestone Reached by NY Green Bank with \\$2.7 Million in Profits,”](#) NY Green Bank, June 22, 2017

17 [NY Green Bank Annual Review 2018-19 and Annual Business Plan 2019-20](#)

18 [Green Bank Impact Report FY 12- CY 18,](#) Connecticut Green Bank

19 [Evaluation Framework Societal Perspective,](#) Connecticut Green Bank

governmental grants to undertake these rebuilding efforts. The Accelerator will be capable of providing the low/no-cost patient capital that communities need to undertake revitalization projects like community renewable generation facility construction and green retrofits of housing and commercial spaces.

Facilitating a just transition for frontline communities

The Accelerator will be a tool to support a just transition for communities harmed by the transition away from fossil fuel infrastructure. Many low-income, communities of color, Native and indigenous communities are being devastated by the closure of fossil fuel infrastructure, like coal mines, that were previously the primary source of employment and tax revenue in their communities. Responding to this reality requires a cohesive national response led by the communities experiencing this crisis. However, the Accelerator can play a role as a capital provider as these communities develop their post-fossil fuel future. The Accelerator will provide financing that supports the creation and capitalization of new businesses in clean energy and climate infrastructure, one of the fastest growing segments of the economy. The Accelerator will also be a capital provider for communities looking to reclaim former fossil fuel infrastructure sites, mitigating public health and environmental risks.

CONCLUSION

A focus on environmental justice must be a part of any comprehensive climate plan. The Accelerator has the potential to be a powerful force for environmental justice. Further direct outreach and collaboration with environmental justice communities is needed to understand the investment needs and opportunities that the Accelerator should prioritize.

The example set by existing green banks has shown that this model can successfully reach and benefit low-income communities, helping residents to access previously unavailable improvements that can immediately save money and reduce pollution. The support of the Accelerator will help to capitalize these programs and expand them to new areas. It will maintain or reduce energy costs for consumers, while transitioning to clean energy and improving local air quality. It will provide other economic benefits, including jobs and business activity in disadvantaged communities. With creative policy-making and investment design, it can provide quality-of-life improvements, including in the transportation sector. In the larger picture, this mobilization of investment into clean energy will mitigate the harms of climate change, which disproportionately impact environmental justice communities across the country. These features all make the Accelerator an important implementation tool for environmental justice.

The Accelerator Will Drive More Than \$1 Trillion of Investment

The National Climate Bank Act of 2019 calls for \$35 billion of federal funding to serve as the initial deposit, or capitalization, in the Accelerator. This initial funding, however, is only the base off which the Accelerator will mobilize multiples of private co-investment into clean energy and climate-related projects. Depending on the final capitalization funding provided by Congress, using common and well-practiced banking and leverage techniques, the Accelerator will be able to drive over \$1 trillion of total investment over its 30-year lifespan.

The multiplication of the Accelerator's investment plays a critical role in achieving climate goals currently under discussion at both federal, state and local levels. Many Congressional leaders have advocated a target of 100% renewable energy by 2035, and states and cities are increasingly also exploring aggressive renewable energy and carbon reduction targets. This ambition is appropriate given the urgency of the climate crisis, but it will require an infusion of capital well above business-as-usual trends. Recent estimates show that a 100% clean electricity grid in the United States could require \$4.5 trillion

of investment.²⁰ This suggests that any proposed federal climate investment policies must be catalytic and drive hundreds of billions, if not trillions of dollars to have a meaningful impact. The Accelerator is not a silver bullet designed to achieve all of this investment on its own. It will work in concert with other complementary climate policies, and the private sector has shown an appetite to finance tens of billions of dollars of clean energy projects.

This memo explores the financial model of the Accelerator, and reviews comparable institutions for perspective on the amplification of impact that the Accelerator could achieve using similar techniques.

In borrowing against its capital and leveraging its balance sheet, the Accelerator follows a similar model to commercial banks and development banks. By drawing in private investment at the project level, the model would be most similar to existing green banks within the U.S. and around the world. The Accelerator would be similar to all of these institutions in that would recycle its capital, lending the same dollars repeatedly as loans are paid back and the funds re-used.

STRUCTURE AND GOVERNANCE OF THE ACCELERATOR

The Accelerator is a private non-profit corporation formed at the direction of the federal government. Like any non-profit corporation, it is incorporated in a specific domestic jurisdiction (in this case the District of Columbia), and have a charitable purpose. It is governed by a Board of seven Directors, the exact composition of which is described in legislation. The Accelerator is chartered for 30 years.

The Accelerator is empowered to work with a diverse range of technologies and markets. This includes:

- Renewable power generation
- Building efficiency and electrification
- Clean transportation

- Industrial decarbonization
- Grid infrastructure
- Sustainable agriculture and forestry
- Climate-resilience infrastructure

In each case, the Accelerator will work to make projects and markets that were previously unattractive to private capital into viable investment opportunities, whether through acting as junior debt, providing a partial guarantee, or using other mechanisms for mitigating risk.

KEY FINANCIAL TECHNIQUES

Balance Sheet Leverage

Nearly all commercial and development banks borrow money from capital markets to increase their lending capacity, and the Accelerator is designed to be able to do so as well. Over the course of its 30-year charter, it can build up the track record and risk profile necessary to borrow funds, and then lend out those borrowed dollars rather than relying purely on its federal capital.

In estimating the amount of balance sheet leverage that the Accelerator would be able to achieve, we review the comparable institutions discussed in more detail later in the paper, including commercial banks and global development banks.

Balance sheet leverage is affected by a number of factors. These include the strength and quality of the existing balance sheet,²¹ the entity's ability to generate cash flow to serve debt, the rate at which an institution would be able to borrow, and the rate at which it desires to lend. Any institution needs to lend capital at a higher rate than it paid to borrow it, so the ability to borrow at low costs and lend at higher costs is relevant to the ability to grow its balance sheet leverage. The largest commercial banks have balance sheet leverage ratios of 10:1. Other institutions like development banks typically have lower balance sheet leverage ratios.

²⁰ "Deep Decarbonization Requires Deep Pockets." Wood Mackenzie. June 2019.

²¹ This is typically based on the amount of equity, or paid-in capital, on the balance sheet compared to the amount of existing assets or debt. It also depends on the quality (i.e. risk/return profile) of the existing assets.

Project Level Leverage

Green banks around the world have developed numerous techniques to leverage, or draw in private co-investment at the project level. These techniques allow each green bank balance sheet dollar to go farther. This means the green bank uses a limited amount of its own capital to bring private capital off the sidelines into a project, enabling the project to move forward.

For example, private investors may be avoiding a project that appears too risky for the expected return. If a green bank provides the junior 20% of the project debt, then the risk taken on by the private lender is partially limited. That could be the deciding factor for private investors to come forward with the remaining 80% of project debt. In this example, a single green bank dollar is able to cause \$4 of private co-investment, for \$5 of total investment, in addition to the project's equity investment.

The amount of private capital that can be leveraged at the project level is affected by factors including the types of projects that an institution invests in, the amount of risk that the institution is willing to take on, and the amount of return the institution needs to generate to covering operating costs. For example, a green bank may need to put only 10% of the capital into a project in a more mature market in order to attract the remaining private capital, but may need to put 50% of the capital into a project in a less mature market. This in turn affects the overall project-level leverage ratio of the green bank.

Green banks around the world have varying project-level leverage ratios at the institutional level ranging from 2:1 to 10:1. Through 2019, on average green banks in the U.S. leverage three private dollars per green bank dollar deployed.²²

Capital Recycling

Capital recycling also has a significant effect on an institution's total investment impact. Recycling means that dollars deployed by an institution come back and are able to be lent again, multiple times.

Institutions can recycle capital through several mechanisms. The first is principal and interest repayment on the loans it makes to projects. If a loan is made with a ten-year term and it is fully amortized in a straight-line fashion, then the institution will have its loan principal repaid, with interest, in equal installments over ten years. The funds repaid in year one could be recycled into a new loan immediately, and all the capital will have been returned by the end of the ten-year term.

The second mechanism for recycling capital is refinancing. A project with a ten-year loan may decide after only three years that it wants to refinance the debt on the project and is able to secure a new loan from a private lender.

The proceeds of that refinancing are used to pay off the original loan, enabling re-use of the capital by the original institution.

The third mechanism is asset sales. As an institution makes loans, it will hold those loans as assets on its balance sheet. In some cases, when the loans reach a certain maturity, or a group of loans can be bundled together, an institution can sell them as a group to private market participants. This allows the institution to make its capital back more quickly, rather than waiting for the loan to be repaid over time.

A final mechanism is securitization. Under this structure an institution bundles a group of loans on its balance sheet. But rather than selling the group of loans as a whole to a private actor, the institution "securitizes" the repayments off of those loans and sells bonds against it. The repayments from the specified loans are pledged as cash to repay the bond holders, and the issuing institution is able to recoup the total value of those future repayments upfront through the bond sale.

Overall, rates of capital recycling are affected by the length of the loans being made, and the degree to which the institution relies on techniques like asset sales that enable faster turnarounds. Loans for energy projects tend to have long terms, which is why recycling is typically

22 [Green Banks in the United States: 2020 US Green Bank Annual Industry Report](#), June 2020.

accelerated by selling the loan or refinancing rather than holding to maturity.

COMPARABLE INSTITUTIONS

Commercial Banks

In some ways the Accelerator will operate like a commercial bank, using a similar set of financial tools. One tool used by commercial banks is balance sheet leverage, the practice of borrowing against their capital to greatly increase the amount they are able to lend. The largest commercial banks are considered very safe entities to lend to, and can borrow money at very low rates. When they lend that same capital out to individual borrowers, they charge a higher rate and are able to make a profit.

The practice enables the commercial bank to lend more money to customers than they initially started with. The largest commercial banks can borrow and lend ten dollars for each dollar they hold directly on their balance sheet; this is referred to as a “balance sheet leverage ratio.”

The Accelerator will also differ in several key ways from commercial banks. The Accelerator will be a non-profit, seeking to maximize GHG emissions reductions, create jobs and address environmental justice, rather than seeking to maximize profit.

This has implications for the amount that the Accelerator will borrow, in that it would be more motivated than a commercial bank to lend at low costs, and thus may be incentivized to borrow less than a commercial bank in order to keep its own costs low.

As a new institution, the Accelerator will also not have the same track record as an established commercial bank right from the start, and it may take time for bond holders to become comfortable lending to the Accelerator. Borrowing will become easier over time as the Accelerator builds up a longer track record and a pipeline of profitable projects for investment.

Table 1: Balance Sheet Leverage of Five Largest U.S. Commercial Banks²³

| Commercial Banks | Total Assets (millions) | Total Equity (millions) | Balance Sheet Leverage (Assets/Equity) |
|------------------|-------------------------|-------------------------|--|
| JP Morgan Chase | \$2,622,532 | \$256,515 | 10 |
| Bank of America | \$2,354,507 | \$265,325 | 9 |
| Citigroup | \$1,917,383 | \$197,074 | 10 |
| Wells Fargo | \$1,895,883 | \$197,066 | 10 |
| Goldman Sachs | \$931,796 | \$90,185 | 10 |

Development Banks

Development banks are financial institutions that primarily exist outside the U.S. The Accelerator shares similarities with these entities, in that they likewise are purpose-built, mission-driven finance institutions. Development banks are formed by one or more countries

investing public funds to provide the initial capitalization to the institution.

Development banks typically receive their initial capital from seed investor countries in the form of “paid-in capital.” As a development bank’s initial round of capital is lent out to projects, the development bank builds a

²³ Data collected from most recent financial statements of each respective institution.

track record of performance and a balance sheet of return-generating assets. Over time, this allows the development bank to go out to capital markets and borrow money from private investors at low rates, building up balance sheet leverage in a manner similar to a commercial bank.

Development banks typically have lower balance sheet leverage ratios than commercial banks. These institutions work diligently to maintain very high credit ratings in order to access the bond market. As a result, they want to maintain strong balance sheets with lower leverage than typical commercial banks. The Accelerator's considerations around balance sheet leverage would be similar to those of development banks.

Table 2 shows four development banks' balance sheet leverage calculated in two ways: both with and without the banks' callable capital. Callable capital is money that world governments have promised to make available to the development banks if needed, but have not transferred to the development banks. The availability of callable capital can help an institution to borrow more money at lower rates, although not to the same extent as having the same amount of funds directly on hand. The Accelerator would not have a line of callable capital, because it will be fully capitalized upfront through Congressional appropriation. As such, its potential balance sheet leverage ratio may be in between these two numbers as demonstrated by the development banks.

Table 2: Example Development Bank Balance Sheet Leverage²⁴

| Development Banks | Total Assets (millions)* | Total Equity (millions) | Balance Sheet Leverage (Assets/Equity) | Callable Capital (millions) | Balance Sheet Leverage (Assets/(Equity + Callable Capital)) |
|---------------------------------|--------------------------|-------------------------|--|-----------------------------|---|
| Asian Development Bank | 191,860 | 50,984 | 3.8 | 140,550 | 1.0 |
| European Investment Bank | 555,793 | 71,325 | 7.8 | 221,585 | 1.9 |
| Inter-American Development Bank | 129,459 | 32,929 | 3.9 | 164,901 | 0.7 |
| World Bank (IBRD only) | 403,056 | 43,518 | 9.3 | 258,274 | 1.3 |

* All figures in USD, except EIB, which is in EUR.

Importantly, development banks are able to multiply their impact in an additional way through the recycling of capital. As they make loans to projects and those loans are repaid with interest, development banks are able to lend the same capital a second or third time. Loan terms can vary greatly depending on the details of the deal. One IMF working paper surveyed thousands of loans from development banks to projects in developing countries and reported a mean loan maturity of about seven years,²⁵ although development banks can also make loans that are

decades long.²⁶ Depending on the duration of the loans and the age of the institution, recycling can multiply an institution's impact many times over.

Table 3 provides a way to illustrate the impact of balance sheet leverage and capital recycling. The table compares the total capital paid in to the development banks over their cumulative history, compared to the amount the institutions have invested in a single year (2018). As a rough approximation, these institutions are able to invest

²⁴ Data collected from most recent financial statements of each respective institution.

²⁵ "Borrowing Costs and the Role of Multilateral Development Banks: Evidence from Cross-Border Syndicated Bank Lending." IMF. December 2018

²⁶ "Multilateral Development Banks: A short guide." ODI. December 2015.

an amount in a given year that's at least as great as their total paid-in capital.

Over time, the result is a track record of investment much greater than the paid-in capital base. If the Accelerator is capitalized with \$35 billion and is able to invest equivalent to its paid-in capital each year for 30 years, its cumulative investment would come to \$975 billion. All the project-level leverage that the Accelerator achieves will further increase this amount.

Also note that multi-lateral development banks like the World Bank do not have the full faith and credit backing

of the countries that formed the bank. The debt issued by the World Bank that allows it to increase its lending capacity is not guaranteed by any government. It is supported purely by the creditworthiness of the development bank itself (which is inclusive of both its paid-in and uncalled capital), and the returns generated by the underlying loans provided to its borrowers. The Accelerator is similarly not be backed by the full faith and credit of the U.S. government, and it would not have callable capital beyond its initial capitalization.

Table 3: Example Development Bank Total Investment Impact per Paid-in Capital

| Development Banks | Cumulative Paid-In Capital (billions)* | 2018 Loan Disbursements (billions) | Total Annual Lending per Dollar of Paid-in Capital |
|---------------------------------|--|------------------------------------|--|
| Asian Development Bank | 7.415 | 13.7 | 1.85 |
| European Investment Bank | 71.325 | 451.121 | 6.32 |
| Inter-American Development Bank | 11.851 | 11.304 | 0.95 |
| World Bank (IBRD only) | 16.5 | 18.761 | 1.14 |

* All figures in USD, except EIB, which is in EUR.

Existing Green Banks in the U.S. and abroad

The Accelerator would be the first national green bank in the U.S., but there is already a growing ecosystem of U.S. green banks at the state and local level. The most common structure for these green banks is similar to that of the proposed Accelerator, in that the associated government provides capital to enable financing activity.

Unlike commercial banks or development banks, green bank institutions do not yet exist at the scale or maturity to leverage funds directly on their balance sheet by borrowing from capital markets. However, they do achieve project-level leverage in many ways, crowding-in private

capital on a project-by-project basis. On average, green banks in the U.S. have mobilized \$3 in private project investment for every dollar directly invested, driving more than \$5 billion in total investment.²⁷

State and local green banks also recycle capital. The New York Green Bank ("NYGB") has a particularly sophisticated approach to evaluating and measuring what they call their private capital Mobilization Ratio:

Central to achieving NYGB's objectives is its ability to efficiently recycle funds. Unlike a pool of public funds that is dispensed once to qualifying projects as non-refundable grants or subsidies, funds entrusted

27 [Green Banks in the United States: 2020 US Green Bank Annual Industry Report](#). June 2020.

to NYGB are disbursed under commercial arrangements generating investment income and requiring repayment in accordance with agreed terms for each product and counterparty. This means that as each dollar from NYGB cycles through successive investments, benefits will compound. The effective rate of accumulation of these benefits is directly tied to the weighted average holding periods of the financial products that NYGB provides to its clients. Further, as the commercial markets expand into and increasingly accommodate sustainable infrastructure finance needs previously supported by NYGB, the multiplier effect on NYGB's activities and investments will continue through market follow-on activity.²⁸

Early business plan development documents for the NYGB suggested possible capital recycling of 3x–4x over a 20-year period.²⁹ Including both capital recycling and project-level leverage the NYGB expects to achieve a cumulative “Mobilization Ratio” of 8:1 by the time it marks a decade of operation in 2025.³⁰

National-scale green banks outside the U.S. also provide instructive examples, with the two most relevant being the United Kingdom Green Investment Bank (GIB)³¹ and the Australian Clean Energy Finance Corporation.

The UK GIB was capitalized with a total of 3.8 billion pounds and has invested primarily in waste-to-energy, energy efficiency and offshore wind, bringing new first-time investors into the burgeoning offshore wind sector in the UK. Within three years from launch, it had catalyzed total investment of over ten billion pounds, partnering with almost 100 co-investors and achieving total leverage ratio of 3:1³² based on project-level leverage and capital recycling.

The Australian Clean Energy Finance Corporation (CEFC), Australia's national green bank, was initially capitalized with AU\$10 billion from the federal government, and

invests in clean energy projects across the country. In its five years of investing, CEFC has supported projects with a total value of around AU\$19 billion. CEFC has directly invested in more than 110 individual transactions and financed more than 5,500 smaller-scale clean energy projects through its partners, achieving total leverage ratio of over 2:1 based on project-level leverage and capital recycling. In 2018, CEFC's average loan had a duration of ten years, providing context on its rate of capital recycling.³³

THE ACCELERATOR'S INVESTMENT IMPACT

Based on comparisons with these institutions, the Accelerator could drive trillions of total climate-related investment. The exact amount of the Accelerator's total investment will depend on a number of factors, the most significant of which are the capitalization it ultimately receives from Congress and the precise breakdown of investments by project type. Allocations to particular technologies or project types are not specified in the Accelerator's legislation, which is appropriate as it allows the Board and its expert committees to determine the most effective investment pathway. Different projects can achieve widely varying impacts in terms of project-level leverage as well as other environmental and economic impacts. The Board will need to take all of these factors and considerations into account in assembling a diverse portfolio of projects.

As a result, this report does not attempt to make assumptions about the breakdown of the Accelerator's investments. Instead, it draws broad comparisons to relevant institutions to estimate the potential total investment impact across the Accelerator's entire time horizon and portfolio.

One of the main categories of comparable institution is development banks, which have achieved balance sheet leverage ratios from almost 4:1 to above 9:1. This

28 [NY Green Bank Annual Review 2018-19 and Annual Business Plan 2019-20](#), Case 13-M-0412; June 19, 2019, footnote 17.

29 “[New York State Green Bank Business Plan Development](#).” Booz&Co. Final Report, Sept. 2013.

30 [NY Green Bank Annual Review 2018-19 and Annual Business Plan 2019-20](#).

31 The UK GIB was sold by the UK government to Macquarie on X date, and renamed the Green Investment Group in its now-private form. Data cited here refers to activity of the UK GIB while it was still a publicly owned Green Bank.

32 “[UK Green Investment Bank helps mobilise £10bn of capital into UK green infrastructure](#).” Green Investment Group. Nov. 2015.

33 “[Publications: Quarterly Reports](#).” CEFC. Accessed Aug. 2019.

technique, combined with capital recycling, has enabled them to disburse investments in a given year at least equal to their cumulative paid-in capital. On top of this, they achieve modest project-level leverage ratios of about 1:1, although they do not optimize for this metric.

Unlike development banks, the Accelerator would not be able to take advantage of callable capital, so a lower balance sheet leverage ratio on the order of 3:1 could be more comparable, along with three rounds of capital recycling during its 30-year life. The Accelerator can also be expected to achieve a higher project level leverage ratio more similar to other green banks, which have achieved an average in the US of three private dollars for each public dollar.

Taken together, these three multiplying mechanisms indicate that, over its lifespan, the Accelerator could increase its investment capacity and drive private co-investment that results in total investment more than 30 times greater than its initial investment. The World Bank, for example, over its 70-year history has a cumulative loan portfolio that is 250 times greater than its own capital (both paid and callable). So a 30x multiplier for the Accelerator over 30 years may actually be conservative.

This estimate does not account for the Accelerator's broader potential to cause market transformation. If the Accelerator is successful, it will open new markets for investment that will ultimately grow and receive financing without any Accelerator participation. These effects are difficult to measure and are therefore left out of this analysis, but there is some precedent set by other green banks.

Addressing the climate crisis will require transforming the energy sector and the nation's infrastructure on precisely this large scale. The Accelerator's operations are based on established precedents, both in terms of its ability to mobilize private capital, and its ability to reduce greenhouse gases by delivering clean energy at a competitive price that reduces consumer costs. While the Accelerator's actual total impact will be subject to a range of factors, the Accelerator is fully endowed with all of the authorities required to achieve trillions in impact, giving it the potential to be one of the most powerful tools available to the US government to transform the energy sector, boost the nation's economy, and meet climate change targets.



The Accelerator Will Leverage More Private Investment

The National Climate Bank Act, which recently passed the House with \$20 billion of funding as part of both the Moving Forward Act and the Clean Economy Jobs and Innovation Act, would create a national Clean Energy and Sustainability Accelerator, taking the green bank techniques already used in many states to the federal level.

Green banks are mission-driven institutions that use innovative financing to accelerate the transition to clean energy and fight climate change. They use limited public funds to mobilize private investment in renewable energy, energy efficiency and other decarbonization technologies. Green banks at the state and local level in the U.S. have driven \$4 billion of investment, mobilizing three private dollars for every public dollar deployed. Around the world, green banks have driven over \$50 billion to address climate change.

Green banks can accelerate clean energy market growth while making energy cheaper and cleaner for consumers, driving job creation, and preserving taxpayer dollars. Green banks deploy public capital efficiently through financing to maximize private investment, and lower the cost of clean energy to spark consumer demand. Green banks facilitate market development by working with contractors, developers, lenders and investors, offering the information and capital consumers and businesses need to confidently purchase clean energy. By connecting capital supply and customer demand, green banks grow markets.

“CROWDING-IN” PRIVATE CAPITAL

Green banks leverage public dollars with private co-investment. Green banks use a range of financial techniques and structures to achieve this leverage (described below), but across products, green banks can draw in multiple private dollars of investment per public dollar. For example, a loan loss reserve credit enhancement may enable \$10 of private lending per \$1 of public investment put in reserve. Through green bank structures, public dollars go farther, getting more “bang for the buck” on

public investment. And because public dollars are lent and repaid, the same public dollar can be recycled and used to draw in more private dollars again in the future.

Green banks generally use a common set of techniques and structures to offer public financing and leverage private investment in clean energy. These methods form the basis of many specific green bank activities and applications, and are adaptable to fit multiple markets segments and technologies. Green banks also spur demand and develop markets to lower barriers to market penetration.

The following techniques form the three fundamental categories of green bank financing activity. All green banks are using some derivation of these fundamental categories.

Credit Enhancement

A credit enhancement is a tool offered by a green bank with the goal of increasing private lending activity and/or improving the terms of private financing. Green banks accomplish this through multiple means, but loan loss reserves and loan guarantees are most common. This technique is suitable for a market where private lenders are interested in entering the market but are hesitant due to perceived risks. Or, a credit enhancement can be used when private lending is available, but at terms and rates that reduce the viability and market potential for clean energy projects. These kinds of investments can achieve high leverage ratios, stimulating many dollars of private investment per public dollar spent.

Co-Investment

Co-investment involves direct green bank investment or lending to a clean energy project alongside a private capital provider. Unlike credit enhancements, where public dollars are not actually invested in the project itself, co-investment can take multiple forms and structures of actual project investment. A green bank may provide senior debt, subordinated debt, or less frequently equity in a project, which is then paired with multiple potential forms of private investment. For instance, a green Bank

and private bank may each make a 50% debt investment in a project. Or, a private investor may offer 80% of the debt needed for a project, and the green bank makes a 20% subordinated debt investment. This structure both fills financing gaps and acts as a credit enhancement for the senior debt. The leverage achieved on these co-investments depends on the precise product structure, and by its nature requires the presence of a private lender willing to at least make some level of investment in a project.

Warehousing/Securitization

In the event no private lender is willing to make a loan, even with a credit enhancement, it may be suitable for a green bank to underwrite 100% of a loan itself. This situation often arises if the individual projects are too small, too disparate in location or technology, and are individually difficult to underwrite for credit risk. This is a significant barrier to private investment in certain markets like distributed generation and energy efficiency,

because project sizes don't meet minimum investment thresholds for large investors, even though the project economics themselves are attractive. This makes the projects relatively expensive to underwrite for a bank and – on an individual basis – not worth the trouble. However, if a pool of these kinds of loans were bundled together to diversify risk and achieve scale, the projects then become far more attractive to private investment. A green bank can accomplish this by financing loans directly and warehousing them until scale is reached. At this point the green bank can sell the loans to private investors. This can be done either through a private placement of the whole loans, a private securitization, or a public securitization. If the green bank is able to sell its entire stake in the portfolio of loans, then 100% of public dollars are replaced with private capital, effectively achieving infinite leverage. This technique is critical to allowing small clean energy projects to access the affordable capital that can be found in publicly traded debt markets that are tapped through securitization.



The Accelerator Will Lower the Cost of the Clean Energy Transition

The task of addressing climate change and the process of transitioning from carbon to clean is often described as a “cost” that society must bear. For example, estimates show that \$4.5 trillion is needed to build a fully renewable power grid. But to characterize this as a cost is incorrect. This is an upfront investment, which is then repaid through electricity bills. This is no different than how, for decades, upfront investment was needed to pay for the construction of coal-fired power plants, with the investment repaid with the purchase of the resulting electricity.

Those electricity bills are the actual cost borne by individuals and businesses. So, the right question as to whether or not the clean energy transition will have any cost on society really comes down to whether or not, for example, electricity bills go up compared to where they are today. If power bills go up for an average family in Indiana, then this is a real cost. Or if the monthly operating expense of running a manufacturing facility goes up because the monthly energy costs are higher as a result of using clean power instead of burning fossil fuels, then this is a real cost.

These are costs that can and must be avoided. Utility bills, business operating expenses, the cost of using a vehicle for transportation and other energy-related on-going costs all must stay the same or go down through this transition. And this can and will be achieved by the Accelerator. This paper describes how the Accelerator achieves that objective.

The Accelerator has a specific mandate to protect consumers and ensure that all of its activities result in costs staying the same or going down. And beyond this mandate, the concept of maintaining or lowering costs is core to the green bank model, as the green bank by definition is operating in a market. And there is no market for power that is more expensive than the power it is replacing. So the Accelerator will use its financing tools in ways that specifically ensure that the power produced by a renewable energy project, for example, is always cheaper or the same price as the fossil fuel-based power it is replacing.

Geography is important to this analysis because significant variation exists across the United States. The emissions intensity of energy production is much higher in some states than others. Retail power costs also vary widely across states, with low prices in many of the most emissions-intensive states. States vary in terms of their resource availability (in other words, their amount of wind or sun). Their regulatory environments also vary greatly and can support or discourage different energy technologies.

Based on differing conditions, the Accelerator is empowered to use a range of investment strategies. Flexible, long-term and/or low-cost capital can be used to co-finance electricity generation projects alongside the private sector. This keeps offtake prices low, allows private investors to earn their necessary returns, and opens up whole new markets where renewable energy lags today.

THE COST OF ELECTRICITY

Electricity is delivered to customers from the grid at a certain price per kilowatt hour (cents/kwh) or dollars per megawatt hour (\$/mwh). A range of factors can influence project economics either favorably or unfavorably in different locations and markets. Some of the most salient include:

- **Input costs.** This includes fuel costs (often zero for clean energy generation), operations and maintenance costs, the cost of the clean technology itself, the cost to the developer for creating and building the project, and the cost of permitting, siting, and interconnection.
- **Policy landscape.** States vary in terms of the policy frameworks supporting renewable energy. Tax credits, renewable portfolio standards, and other incentives effectively lower the price of renewable energy, while carbon prices effectively raise the price of competing fossil-fueled power. The existence of these policies can make development of renewable energy projects more economically feasible.

- **Resource availability.** Some locations are sunnier or windier than others. A project in an ideal location will be able to generate power more consistently (also known as a higher capacity factor). The upfront investment for the wind turbine is fixed, so more wind and higher capacity factor means a project can generate more revenue and ultimately more return for the same fixed investment.
- **Cost of financing.** This is the element impacted by green banks' involvement. The up-front capital to develop a project comes at a cost that varies based on

local lenders, investors, and market conditions. Green banks use low-cost capital and financial tools to bring these costs down.

The upfront cost of constructing power generation (either clean or dirty) is large and is usually financed with third-party capital. For clean power, the cost of financing can be especially important in determining the project's overall price per MWh. An NREL analysis found a 17% reduction in the per-MWh levelized cost of energy when comparing a plausible lower-cost financing scenario to a high-cost financing scenario.³⁴

Table 4. LCOE Comparison of a Higher Cost and Lower Cost Financing Scenario

| SAM Financial Model Inputs | Higher-Cost Financing Scenario | Lower-Cost Financing Scenario |
|--|--------------------------------|-------------------------------|
| Sponsor Equity IRR | 12% | 10% |
| Tax Equity IRR | 8% | 7% |
| Debt Interest Rate | 5% | 4.5% |
| Loan Term (years) | 15 | 18 |
| Debt Percentage | 35% | 40% |
| Resulting Nominal LCOE (\$/MWh) | \$51 | \$42 |

From NREL report: Wind Energy Finance in the United States

Reports from Lazard similarly find that renewable energy is particularly sensitive to the cost of capital, “whose costs reflect essentially the return on, and of, the capital investment required to build them.”³⁵

Financing typically includes a mix of equity investment and loans. Investors have targets for the return they aim to receive, and will only make their capital available if they expect to meet those targets based on the features of the project. Similarly, a lender only makes a loan if the project's expected future cash flows are sufficient to repay

the loan at a desired interest rate. For a power generation project, the cash flow used to pay back investors and lenders primarily comes from the payments the electricity customer (e.g. utility, corporation, homeowner) makes to buy the electricity generated by the project.

Recent research in Nature Sustainability shows the direct link between cost of capital and the speed of the clean energy transition. “While the costs of [renewable energy] have substantially declined in the past, here we show that rising interest rates (IRs) can reverse the trend of

³⁴ [National Renewable Energy Laboratory](#)

³⁵ “Lazard’s Levelized Cost of Energy Analysis – Version 12.0.” Lazard, November 2018

decreasing RE costs ... IRs recovering to pre-financial crisis levels in five years could add 11% and 25% to the levelized cost of electricity for solar photovoltaics and onshore wind, respectively, with financing costs accounting for about one-third of total levelized cost of electricity.”³⁶

The core economic framework of electricity project finance creates a tension between the customer and the capital providers. In order for a project to be attractive and viable for third-party investment, the price of the electricity sold by the project must be high enough to meet the investors’ and lenders’ return requirements. But, in order to attract a customer to buy the power from the generation source, the price of that power must be lower than the price currently supplied by the local grid.

Rapid clean electricity market expansion requires this calculus to balance for both sides. The balance will vary in different locations, dependent upon the existing energy mix, grid price, and policy incentives. But the underlying economic forces will be similar throughout the country. The price of clean electricity delivered in every corner of America must be low enough to out-compete fossil-fuel based electricity, while at the same time delivering sufficient returns to private capital.

WHY COST MATTERS

Many existing climate change policy proposals include a range of mechanisms to send market signals in support of the clean energy transition. These may include carbon pricing mechanisms such as carbon taxes or cap-and-trade systems, as well as regulatory mandates like clean energy standards or tougher pollution rules on fossil fuel sources. These policies alter the economic conditions that underlie decisions about energy investment.

However, without a plan for public investment, appropriately aggressive policy scenarios could come with a high consumer cost. These cost impacts are delivered through two pathways: the cost of power itself, and the cost of

fossil-fueled assets left stranded by the transition to renewables.

To illustrate potential price impacts, consider a simplistic scenario where regulatory authority is used to mandate 100% clean energy across the country, without providing for public investment. The market would deliver the renewable power as required, but the cost of that power could vary greatly based on local conditions. In some areas, clean energy will be able to be integrated at or near the existing grid price. In areas with less favorable condition for clean energy, the market would need to raise the price of power in order for the new projects to be economically feasible.

The differing uptake of clean energy across states today provides an indicator of the disparities that currently exist in terms of favorable vs. unfavorable conditions or clean energy. The end users in the states facing the greatest cost impacts have a legitimate claim that the whole country should bear the burden of the shift from carbon to clean, and that it is unfair for them to bear a greater share of the cost burden.

The second pathway for potential cost increases concerns the treatment of retiring fossil-fueled power plants. Research shows that many of these facilities are on track to be retired before they reach the end of their expected useful life. These facilities are referred to as “stranded assets” because they fail to recoup the full value that investors expected when they built the facility. Coal plants are most at risk, but new research shows that even existing natural gas plants operating today will face the risk of being “stranded” by the 2030s.³⁷ When these facilities are shut down, in many cases the stranded asset costs are imposed on ratepayers, in addition to any cleanup costs associated with the retirement. These factors add to the potential ratepayer cost impact of the clean energy transition.

History and polling both provide cautionary signals when it comes to Americans’ beliefs about the costs of climate action, and their willingness to shoulder them. The 2009

36 Schmidt et al., “Adverse effects of rising interest rates on sustainable energy transitions,” *Nature Sustainability* 2, pages 879–885 (2019).

37 “Renewables, storage poised to undercut natural gas prices, increase stranded assets: RMI.” *Utility Dive*, September 11, 2019

Waxman-Markey cap-and-trade bill was largely killed by Senators representing states that were concerned that their constituents would carry the cost burden of the transition. More recently, voters in Washington state rejected a carbon fee in a referendum last year.³⁸ Oregon Republicans literally fled the capital to ensure a similar measure was blocked.³⁹ And recent polling shows that 85% of Americans believe that addressing climate change will require some kind of personal sacrifice, though only a quarter of Americans are willing to pay \$10 per month to solve the crisis.⁴⁰

Environmental justice groups have also raised concerns about energy cost impacts arising from climate action. Low-income customers dedicate a disproportionate share of their income to paying energy bills, and would bear the burden of cost increases more heavily than other customers.

Action on climate change is time-sensitive; the economy of the United States must move aggressively towards full decarbonization if we are to avoid the worst impacts. Recognition of these potential costs is not an argument against the need for a rapid clean energy transition. However, these trends point to a need to take costs seriously and to use the power of public investment to mitigate or avoid consumer energy cost increases.

THE CRITICAL ROLE OF ACCELERATOR FINANCING

The Accelerator is designed to use finance, supported by public dollars, to accelerate the shift from carbon to clean without causing cost burdens to fall disproportionately on any segment of the population. The Accelerator thus plays a critical complementary role to the regulatory and market-based policies that could otherwise cause price increases.

The Accelerator uses proven green bank financing tools that allow the equilibrium to be struck between consumers who demand equal or lower electricity prices, and

investors operating based on return requirements. Public financing through an Accelerator create wins for all parties:

- **Customers:** Electricity customers enjoy clean electricity at a price lower than they previously paid for grid power.
- **Investors:** Markets and projects that were previously unable to meet return requirements become viable and profitable investments.
- **Taxpayers:** Public capital used by the Accelerator is repaid, recycled and preserved, rather than delivered as a one-time expenditure as would take place with a cash subsidy or tax break. Taxpayers get the most impact out of each dollar.

An illustrative example of a wind-power project shows the impact that Accelerator financing can have on project economics, the resulting price of power, and the ability of the Accelerator to open up markets for private capital.

For an example wind project, under normal market conditions and assumptions around private financing, the price or resulting wind-power without any Accelerator intervention would be \$42/Mwh. That price is based on a typical capital structure of sponsor equity that must achieve an after-tax IRR of 6.5%; private debt offered at ten years, 5% interest rate, and 1.4x debt servicer coverage ratio; and a power purchase agreement with a 10-year term. The price of \$42/Mwh may be competitive in some markets, but not in others. If the wholesale price of grid power is the same or lower than that, then the project will not be built, and there will be no investment.

But the Accelerator can make this project viable and provide lower-cost wind power for customers. Specifically, the Accelerator can provide long-term, low-cost subordinated debt that sits junior to the commercial bank. This debt allows the project sponsor to borrow more money over all at a lower cost, thus reducing the overall cost of debt to the project. And because the debt is junior and is

38 [“Washington State Voters Reject Carbon-Fee Initiative.”](#) *Seattle Times*, November 7, 2018

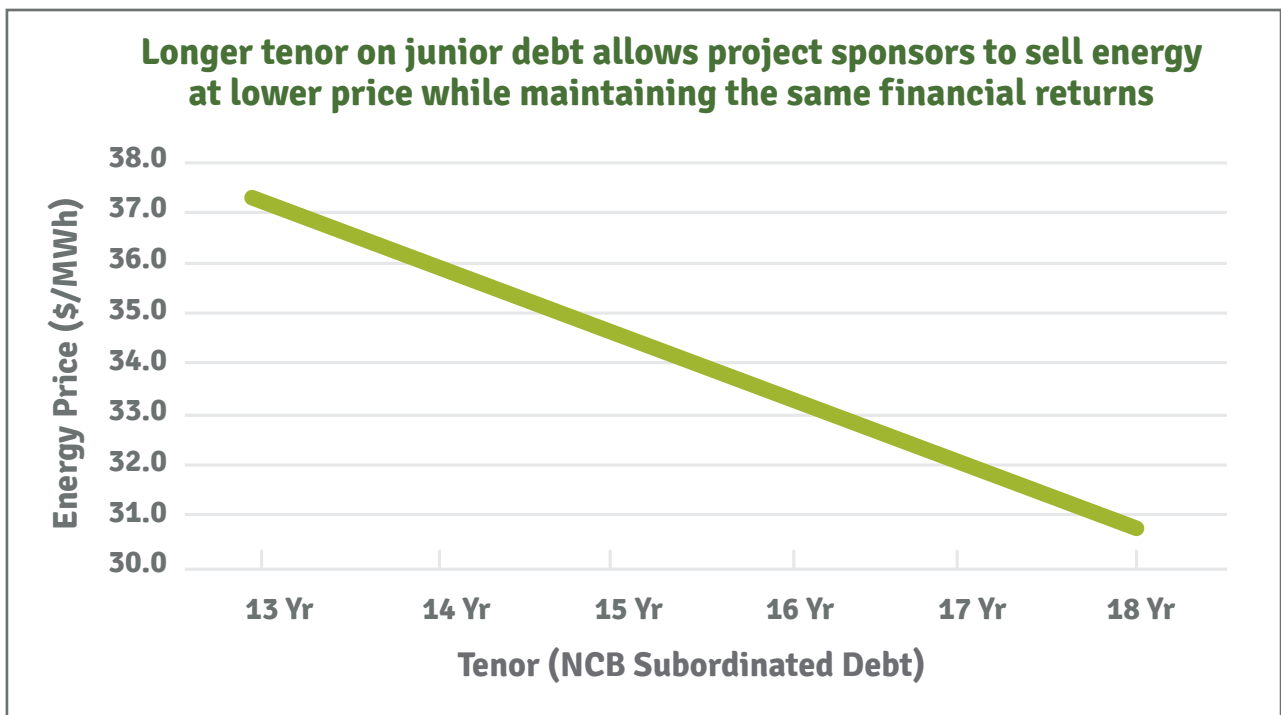
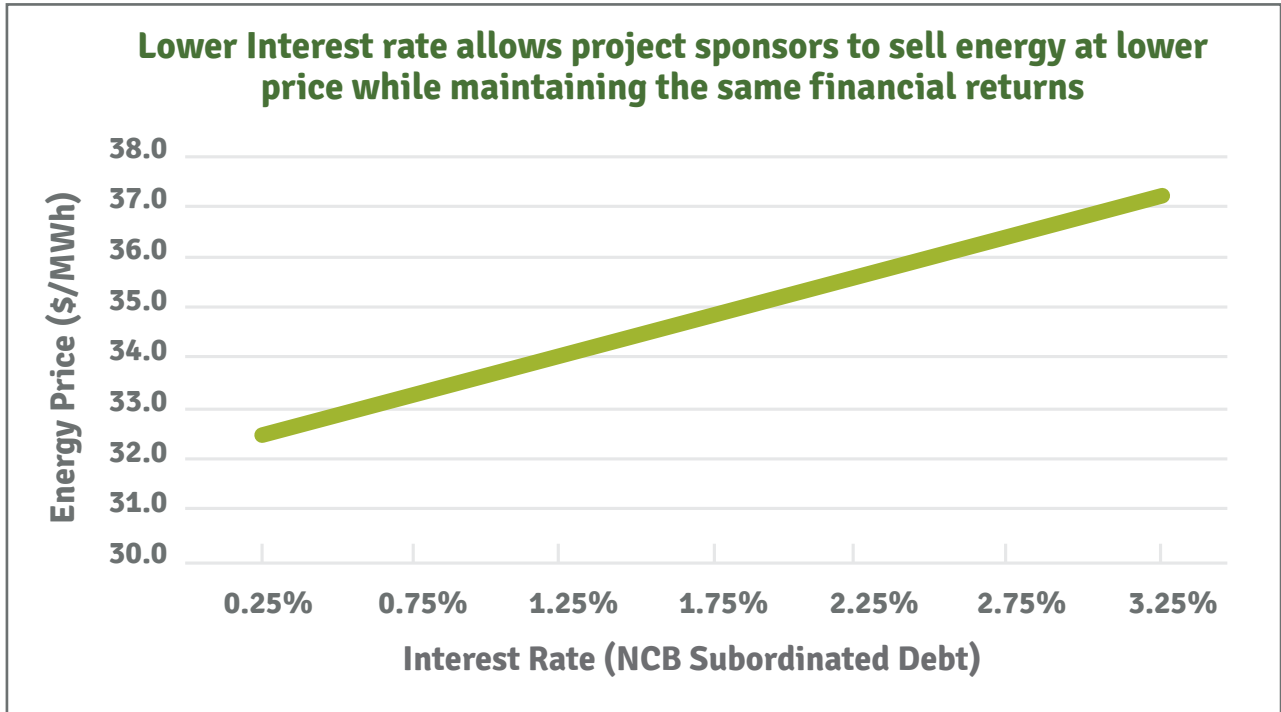
39 [“Oregon Climate Walkout Left Republicans in Hiding, Statehouse in Disarray.”](#) *New York Times*, June 28, 2019

40 [“Americans Increasingly See Climate Change as a Crisis, Poll Shows.”](#) *Washington Post*, September 13, 2019

subordinate to the commercial loan, it will not crowd out private capital. Depending on the exact term and rate of

the subordinated debt provided, the price of power from the wind project can be lowered by as much as 25%.

Figure 2.



Source: EIA, State Energy Data System and EIA calculations made for this analysis

This example shows precisely how the Accelerator can lower the cost of the clean energy transition by using financing mechanisms. And as a result, not only do consumers enjoy cleaner and cheaper power, but private investors are able to deploy more capital, financing a project that otherwise would not be built because its price wasn't competitive. In addition, taxpayers win because the funds are used for financing, rather than grants, so it can be repaid and used again for future transactions.

CONCLUSION

Financing costs play a significant role in determining the economic viability of a clean energy project. Using public funds to provide low-cost financing, the Accelerator is designed to remove financial barriers and accelerate the uptake of clean energy.

The Accelerator's investment model inherently keeps costs down for consumers, by mobilizing capital into projects that are competitive on price. The representative case study modeled here shows that it is possible for the Accelerator to increase clean energy adoption while maintaining or reducing energy prices in every region of the country.

Social equity concerns, political considerations, and historical lessons all point to the importance of cost in designing effective climate policy. Federal climate policy plans will likely include a range of mechanisms intended to send market signals in support of clean energy adoption. Taken alone, these mechanisms could result in energy price increases, but an Accelerator provides way to use public funds to bring about a clean energy transition that is both faster and cheaper.

The Accelerator Will Support State & Local Green Banks

Summary

The National Climate Bank Act of 2019 was introduced in the U.S. Senate in July 2019 and in the House of Representatives in December 2019. In 2020, a version of the bill called the Clean Energy and Sustainability Accelerator passed the House with \$20 billion of funding as part of both the Moving Forward Act and the Clean Economy Jobs and Innovation Act. These pieces of legislation capitalize an independent nonpartisan non-profit institution, an "Accelerator," to finance climate solutions at scale and bring clean energy investment to American communities. This institution is designed to be capitalized with federal funds, and charged with raising and investing capital in partnership with the private sector in order to maximize greenhouse gas (GHG) emissions reductions.

The Accelerator will directly finance a range of clean energy and greenhouse gas (GHG) emissions reduction projects. It will also support the growth and investment activity of state and local green banks across the United States to address more local project investment needs. This memo describes the way the Accelerator and sub-national green banks will work together, how capital will flow, and

why national and sub-national "layers" of green banks both provide distinct value.

THE ROLE OF NATIONAL AND SUB-NATIONAL GREEN BANKS

A wide range of technologies and project types will be eligible to receive financing from the Accelerator. This includes everything from large offshore wind projects to the construction of networks of electric vehicle charging stations.

Energy markets, and electricity markets in particular, are regulated at the state level. That means prices, restrictions, policies, subsidies, utility structure, emissions goals and more are set within each state and can vary widely across them. The clean energy market participants in each state also tend to be localized. Contractors, project developers and other participants build their base of business in large part based on the market conditions set by each state. Table 5 provides examples to illustrate the diversity of these conditions.

These diverse conditions mean that there is a natural division between activity best served by the Accelerator

and state and local green banks. The Accelerator will be able to directly finance activities that are large in scale, have high complexity and are likely to impact multiple states. High voltage transmission lines built to carry clean electricity from the Dakotas to load centers such as Chicago are a perfect example of this activity. Other project types, like community solar, or commercial or residential energy efficiency are better served by state and local green banks, where financing can be tailored to local conditions.

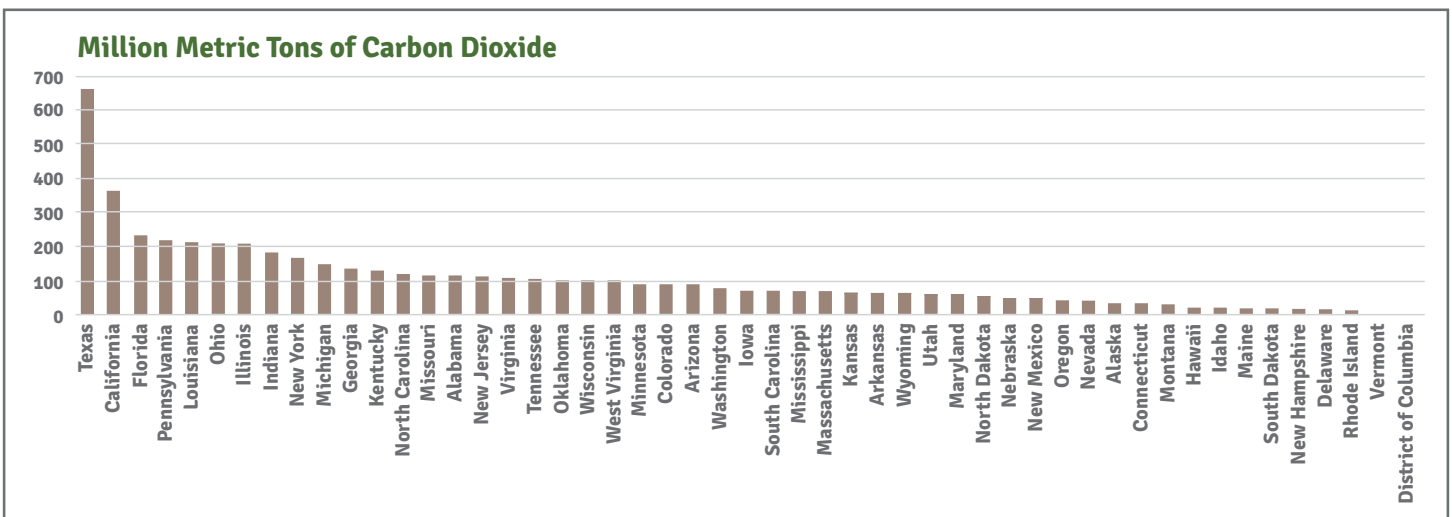
In the case of projects better served by state and local green banks, the Accelerator will help in two ways. It will provide the start-up funding and technical assistance needed to create sub-national green banks where they don't already exist. And the Accelerator will provide the low-cost capital base to new and existing green banks so they may finance the projects in their geography that require local expertise.

Table 5: Selected Energy Facts by State

| State | Residential Electricity Price (cents/kwh)* | Total In-State Electricity Generation Capacity (GW)** | Leading Electricity Source*** | % of Power from Renewable**** |
|-------------|--|---|-------------------------------|-------------------------------|
| California | 18.89 | 76.4 | Natural Gas | 34% |
| Connecticut | 23.35 | 8.9 | Nuclear | 4% |
| Hawaii | 33.43 | 2.7 | Petroleum | 25% |
| Indiana | 13.06 | 25.7 | Coal | 16% |
| Alabama | 12.90 | 29.7 | Natural Gas | 10% |
| Wyoming | 11.57 | 8.6 | Coal | 10% |

* "Electric Power Monthly: Table 5.6.A: Average Price of Electricity to Ultimate Customers By End-Use Sector." EIA. May 2019.
 ** "State Electricity Profiles." EIA. 2017 net summer nameplate capacity. Release Date Jan. 8, 2019.
 *** "Detailed State Data." EIA. As measured in megawatthours of net generation. Release Date Oct. 12, 2018.
 **** "State Profile Analysis." EIA. Updated June 2019. "California On Track with 2020 Renewable Goal." California Energy Commission. Includes hydro. Nov. 2018.

Figure 3: Energy-Related Carbon Emissions by State



CREATING SUB-NATIONAL GREEN BANKS

The enabling legislation for the Accelerator specifically calls for the formation of a Green Bank Start-Up Division within the Accelerator. This will be staffed by a specialized team of green bank formation experts who will work with state and local governments who want a green bank but don't yet have one. The support team will be able to provide two key forms of support: technical assistance to guide the formation and launch process, and start-up funding. These new green banks can be created at the regional, state or local level.

Technical assistance has proven to be a key ingredient in successful green bank formation, and those locations that want a green bank will be able to receive that assistance at no cost from the Accelerator. This removes a significant barrier to growth in the green bank ecosystem. This technical assistance would likely include market evaluation, product design and implementation, organizational formation, hiring and business plan creation, and launch support to ensure a green bank can be formed quickly, while still suited to local conditions.

The other form of support provided by the Start-Up Division will be funding that the new green bank can use to start its operations. The amount will be scaled to meet the needs of the market and the specific business plan of the green bank. A realistic model would be to offer three years of operating funds, with the expectation that the green bank will be able to reach financial self-sustainability within three years. At that point, the revenue generated by the sub-national green bank in the form of interest payments and fees on its loans or other products should meet or exceed its operating revenues.

The bill itself does not contain specific guidelines and processes for the Start-Up Division, meaning that staff will need to develop these internally to determine eligibility and guide applicants in seeking funding and technical assistance, with the final criteria subject to approval by the Accelerator's Board of Directors. As guiding principles for decisions on funding for start-up projects, the Board should consider the project's potential for achieving emissions reductions and its overall size and scale. The Board

should also look holistically at the green bank landscape; for instance, rather than supporting green bank formation in two adjacent counties in the same state, the Accelerator could prioritize the creation of a single state-wide or regional green bank.

The sub-national green banks that receive support from the Accelerator should operate under the same objective function as the Accelerator: to reduce greenhouse gases and accelerate the clean energy transition by mobilizing investment into clean energy projects. Using this investment model, green banks deliver clean energy at prices competitive with grid power. At the same time, they can also deliver a host of other economic benefits including job creation, economic development, and serving low-to-moderate income households.

FUNDING ACTIVITIES OF SUB-NATIONAL GREEN BANKS

The Accelerator will directly provide capital to each qualifying sub-national green bank, including existing green banks as well as new ones formed by the Accelerator's Start-Up Division. The legislation defines a green bank as:

“A dedicated public or nonprofit specialized finance entity that (1) is designed to drive private capital into market gaps for low and zero-emission goods and services; (2) uses finance tools to mitigate climate change; (3) does not take deposits; (4) is funded by government, public, private and charitable contributions; and (5) invests alone or in conjunction with other investors.”

The precise mechanism for moving funds from the Accelerator to sub-national green banks is not specified in the Accelerator's authorizing legislation, nor is the level of funding.

Potential Funding Mechanisms

The relevant parameters to consider for Accelerator funding mechanisms to sub-national green banks are form, repayment and cost.

FORMS OF FUNDING

The primary forms that could be considered are a grant, a loan and a guarantee. A grant would be the direct transfer of funds from the Accelerator to a sub-national green bank with no need to repay at any time with any interest. This would be the most beneficial approach for the sub-national green bank and would in effect replicate the capitalization approach used by states like Connecticut and New York to form their green banks. In both of those cases, state funds are transferred to the green bank with no requirement to repay the state. However, this is the most expensive for the Accelerator, as none of that capital would flow back to the federal entity. This might be acceptable so long as the sub-national green banks use the capital themselves for financing, which is then recycled at the state and local level.

The Accelerator could also provide a loan to regional, state and local green banks, where a lump sum is disbursed up front and principal and interest payments occurring over time. Different options for loan repayment structures are explored in the “Repayment” paragraph below.

A loan guarantee is another potential mechanism for the Accelerator to support capitalization of sub-national green banks. Under this approach, the Accelerator would stand behind the balance sheets of state and local green banks, thus allowing them to directly borrow funds from a commercial bank or another capital provider. One potential advantage to this approach is that it would allow those commercial banks to become comfortable lending to green banks and in turn supporting the financing of clean energy. This could lead to further lending without guarantee support in the future. However, this approach is not necessarily capital-efficient, because the Accelerator will have to reserve the capital it uses for the guarantees, while the capital that then flows to the sub-national green banks may not be at terms as favorable as what could be directly provided by the Accelerator. There are also complex

questions around how long the guarantee should last and what would trigger payment against the guarantee.

REPAYMENT

Some loan repayment structures would be more viable than others. A short-term loan with mortgage-style amortization (equal repayment installments across the term) wouldn't be terribly useful, because the sub-national green bank itself will need to lend out the capital at a longer term to support projects. Similarly, a straight-line amortization, where principal repayments are constant and interest payments gradually decrease over time, would likely be a less-welcome, front-loaded amortization style.

A balloon-style loan from the Accelerator (where interest payments are due at a regular cadence and full principal repayment is due at the end of the term of the loan) might create a better match with the underlying loan portfolio of the sub-national green bank. It is likely the case that any loan would need to be structured with deferred repayments, where there is no requirement to start paying back the principal or interest on the loan until several years of operation by the sub-national green bank. A start-up green bank requires time to build its operations, build a pipeline of projects, close deals and then receive the loan repayments that are needed to repay the larger loan from the Accelerator. No matter the term, payments from sub-national green banks to the federal entity realistically shouldn't start until five years into operation.

COST OF FUNDING

Finally, the cost of the financing provided is a critical parameter. A grant has no cost, without even principal repayment. A loan with an interest rate of zero requires principal repayment but no interest above that. And an interest rate greater than zero will require the sub-national green bank to pay the Accelerator back above and beyond the original amount of the loan extended.

If the Accelerator itself does not need to repay the US Treasury a specified rate of return, it could lend the capital at any rate it chooses.⁴¹ If the Green Bank Start-Up Division must operate on a self-sustaining basis, where revenue covers operating expenses, then the loans to sub-national green bank will likely have a non-negligible interest rate. This is because the Division would have to cover both its operating expenses and expected losses on the underlying loans to the sub-national green banks. But if the sub-national green banks receive capital with a meaningful cost, they in turn will have to lend capital into projects at a rate even higher to make enough margin to cover their own costs. This quickly leads to the conclusion that the cost of funds from the Accelerator to the sub-national green bank must be minimal for the entire network to function effectively.

Based on these considerations and the profile of the underlying types of projects the sub-national green banks are likely to finance, an optimal approach will be a very long-term and low-cost or no-cost loan. Given the Accelerator's 30-year charter, a 30-year 1% or 0% loan with deferred repayment structure would provide the most benefit to the sub-national green banks and catalyze the greatest total investment, while still preserving the Accelerator's principal.

Potential Funding Allocations

The enabling legislation for the Accelerator does not specify any method or formula for distributing funds to state and local green banks. There is almost an endless number of approaches the Accelerator could use, but the main questions to consider are:

- The size of a green bank's target market.
- The price of energy in that market.
- The carbon intensity of the existing energy mix in that market.

The market size indicates how much investment is needed. Variables that can be used to gauge market size include

population, total energy consumption per capita, and total energy expenditure per capita.

Energy prices matter because they indicate how price competitive clean energy can be against the existing fossil fuel-based energy. This in turn indicates how much green bank capital will need to be used in a typical transaction. If the price of electricity in a target market is incredibly high, that means renewable power is better positioned to compete on price. This would directionally mean that less green bank capital would be required to move a typical renewable energy project forward. Price competitiveness alone does not lead to demand or investment, but a green bank may be able to take a smaller risk mitigation position in a transaction where the competitive price is higher. Conversely, in a market where grid power is cheap, a green bank may need to take a more significant part of a transaction to meaningfully impact the project economics.

The last key consideration is the emissions intensity of the market. In markets where the existing energy mix is highly carbon-intensive, each megawatt of additional clean energy will generate the greatest emissions reductions. In markets where the existing energy mix is already more clean, each additional megawatt of clean energy or "negawatt" of energy efficiency will produce diminishing returns in terms of emissions reductions. This does not mean that relatively clean energy markets should not receive additional investment: a fully decarbonized energy system will require clean energy everywhere. Emissions intensity is a factor that can be taken into account in determining the investment required to achieve emissions reductions as rapidly as possible.

Collectively, these factors imply that in order to decarbonize the nation's energy use as rapidly as possible, the Accelerator should tilt its allocation of capital towards sub-national green banks that serve large, more carbon-intensive markets where the price of existing energy is low. However, ultimately the Accelerator's investments should reach every energy market in the country.

⁴¹ If the Accelerator issues bonds against its balance sheet, then those bonds will carry some positive cost greater than zero. If this capital was used to fund sub-national green banks, that loan would have to also carry that cost of capital, on top of any additional costs associated with potential losses and operating expenses. That suggests that funds used to capitalize state and local green banks would likely need to be partitioned and not used as part of the asset base against which the Accelerator issues any bonds.

CONCLUSION

Supporting and capitalizing state and local green banks will be an important part of the Accelerator's role. These institutions fill a necessary role in understanding local regulations, market conditions, and market participants. They are especially well-suited for mobilizing investment into distributed renewables, community solar, and commercial and residential energy efficiency. They are also better positioned to serve frontline communities, as they understand the needs and opportunities for strengthening communities through climate investment.

The Accelerator's enabling legislation specifies only that the Accelerator will be empowered to fund state and local institutions, and that it will contain a start-up division to help establish new state and local green banks. But, based on the relevant considerations in play, it is possible to infer a likely strategy for the Accelerator.

In funding these state and local institutions, the Accelerator could employ a mixture of grants, loans, and guarantees. There are considerations around each of these options, but the most feasible and likely approach may be a very long-term low-cost or no-cost loan.

In determining how to allocate available funds between state and local institutions, the Accelerator should consider the target market's size, energy price, and carbon intensity. To maximize greenhouse gas reductions, the Accelerator may tilt towards allocating more capital to sub-national green banks that serve large, carbon-intensive markets where the price of existing energy is low.

Using these techniques, the Accelerator will be a powerful tool to mobilize clean energy investment, boost state and local economies, and forestall the impacts of the climate crisis by reducing the emission of greenhouse gases.

The Accelerator Will Invest Across Sectors

The National Climate Bank Act of 2019 was introduced in the U.S. Senate in July 2019 and in the House of Representatives in December 2019. In 2020, a version of the bill called the Clean Energy and Sustainability Accelerator passed the House with \$20 billion of funding as part of both the Moving Forward Act and the Clean Economy Jobs and Innovation Act. These pieces of legislation capitalize an independent nonpartisan non-profit institution, an "Accelerator," to finance climate solutions at scale and bring clean energy investment to American communities. This institution would be capitalized with federal funds and charged with raising and deploying capital in partnership with the private sector in order to maximize greenhouse gas (GHG) emissions reductions.

The bill establishes divisions within the Accelerator with distinct purposes, and it gives the Accelerator broad authority to support projects in many sectors.

While the bill names a set of eligible project types, it does not specify the extent to which the Accelerator must

invest in particular sectors or project types, nor does it preclude the re-evaluation of its investments over time. The bill also does not specify return requirements or other required metrics for its portfolio. Rather, it establishes a Board of Directors, a set of key priorities, and relevant mechanisms for oversight. This gives the institution the flexibility to conduct new analysis to guide its investments, and to adapt to changing conditions over the course of its 30-year charter. At the same time, its foundational priorities will remain constant.

The overarching priority of the Accelerator is to maximize greenhouse gas reductions per public dollar, while reducing energy costs to consumers. Among projects that cost-effectively reduce greenhouse gases, the Accelerator is empowered to prioritize projects that provide economic benefits to underserved communities, rural communities, and communities of color.

Within the scope of these priorities and provisions, the Accelerator's work can be understood in terms of a few major categories:

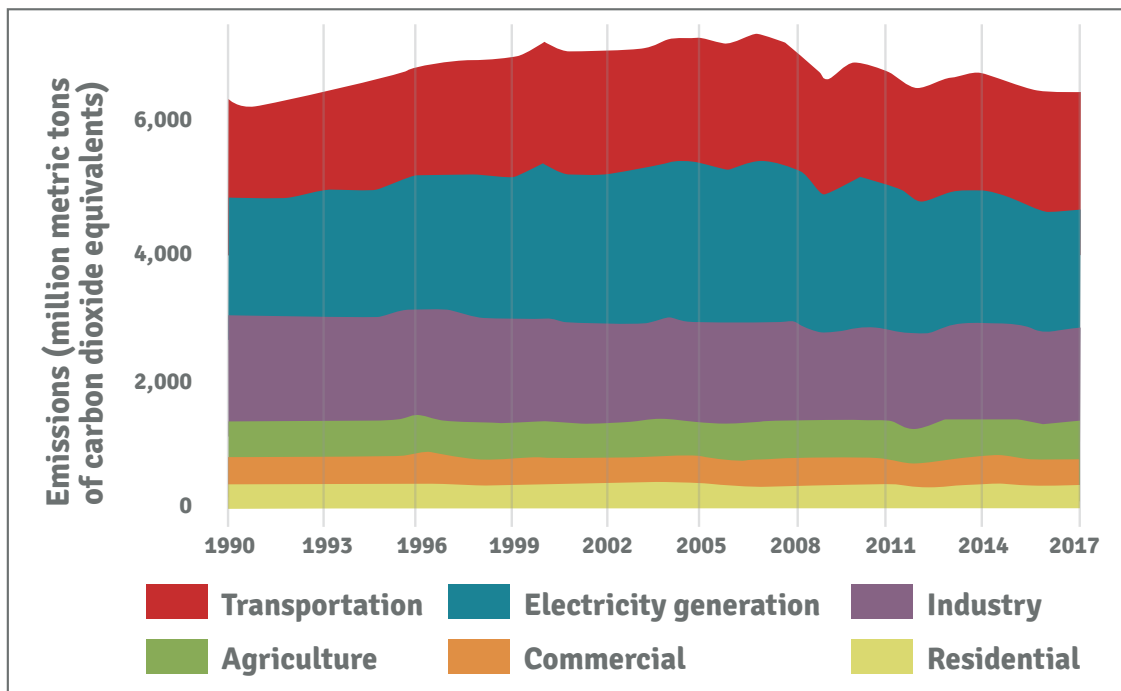
- Financing projects that reduce greenhouse gases.** This is a large category that encompasses investments in solar, wind, efficiency, storage, transmission, transportation, agriculture, and more. This will include direct and indirect financing through state and local green bank partners.
- Purchasing additional greenhouse gas reductions at lowest cost.** The Cash for Carbon program falls under this umbrella, whereby the Accelerator is authorized to incentivize the retirement of coal facilities and purchase coal reserves. Retired fossil-fuel power would be replaced by cheaper renewable power, lowering consumer costs. Certain forestry and afforestation projects could also fall into this category, depending on the types of projects selected.
- Investing in communities to ensure a just transition.** As part of the Cash for Carbon program, the Accelerator is authorized to directly invest in the communities where fossil fuel-based power plants and facilities are closed. More broadly, the Accelerator is

also empowered to prioritize projects that benefit rural communities, low- and moderate-income communities, and communities of color. This will help ensure sustained economic growth, new job training and healthy communities running on clean energy.

Each of these categories cuts across economic sectors, which is consistent with research underscoring the fact that deep decarbonization will require many sectors to “do their share” in reducing economy-wide emissions in the U.S.⁴² For example, decarbonization of the power sector must be accompanied by fuel-switching to convert fossil-fueled activities like transportation and heating to electric technologies.

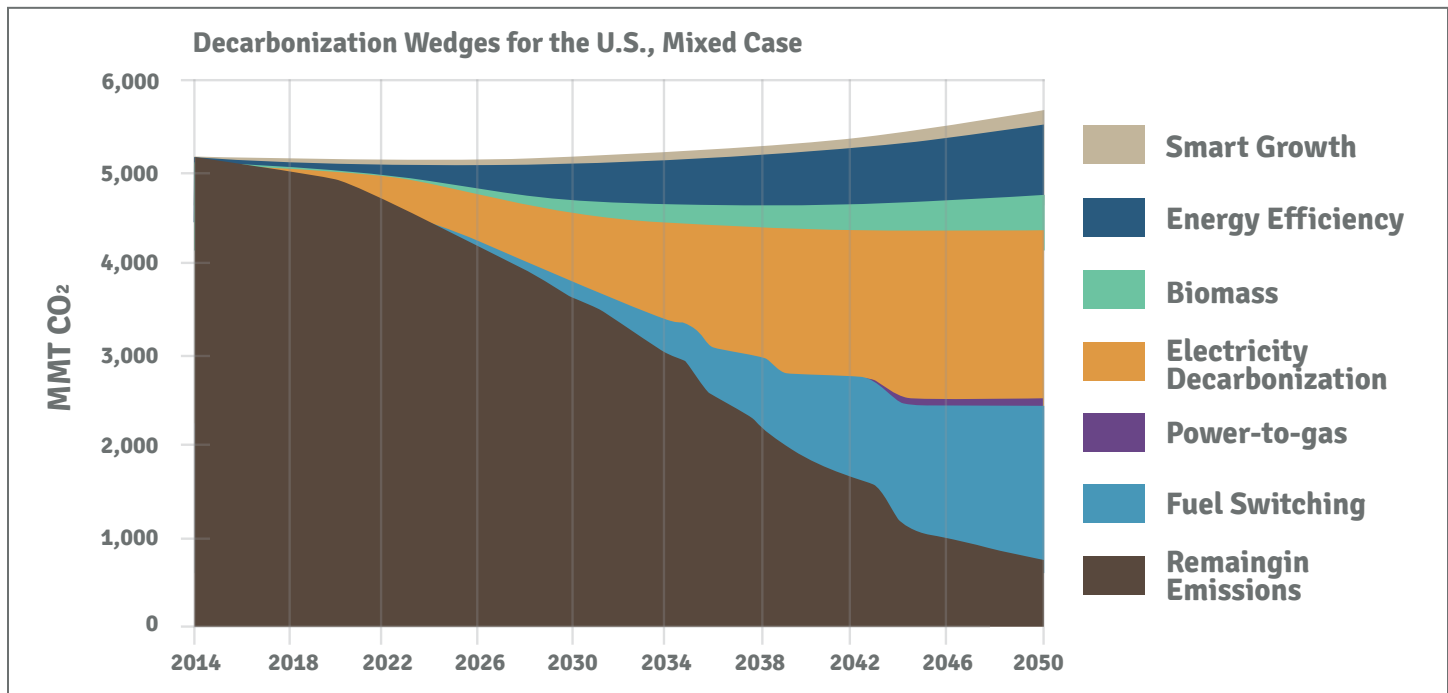
Quantifying the Accelerator’s direct contribution to decarbonization in each of these categories is outside the scope of this paper, and could be a topic for future research. As an initial exploration, this paper seeks to examine the sectors in which the Accelerator may invest and the types of projects which it could finance. Taken together, the Accelerator’s investments could have significant impact towards economy-wide decarbonization.

Figure 4: US GHG Emissions By Sector⁴³



42 [Clean Energy Finance Corporation \(Abolition\) Bill 2013](#), Parliament of Australia

43 [“10 Billion Climate Fund in Investor Sights,”](#) *Sidney Morning Herald*, August 22, 2019

Figure 5: Pathways to Deep Decarbonization⁴⁴

FINANCING PROJECTS ACROSS SECTORS TO MITIGATE CLIMATE IMPACTS

The Accelerator will provide capital for projects across seven authorized sectors of investment. This capital will be provided either directly or indirectly through a network of state and local green bank partners.

Renewable Energy Generation

The Accelerator will be authorized to finance a wide array of utility-scale renewable energy generation technologies, including solar PV, wind, geothermal and others. Emissions from the U.S. power sector declined 28% from 2005 to 2017, thanks in a large part to increases in

renewable energy generation and improvements in energy efficiency.⁴⁵ However electric power generation still accounts for 28% of U.S. GHG emissions as of 2017.^{46 47}

New capacity needs are already increasingly filled by clean energy, with EIA reporting that wind and solar make up 64% of planned capacity additions in 2019. At the same time, new natural gas is still being constructed despite increasing indications of stranded asset risks to these facilities.⁴⁸ Moving forward, more aggressive measures will be needed to complete the decarbonization of the power sector. Not only will renewables need to meet new demand, but they must become competitive with existing fossil-fueled generation in order to help accelerate the retirement of these facilities.

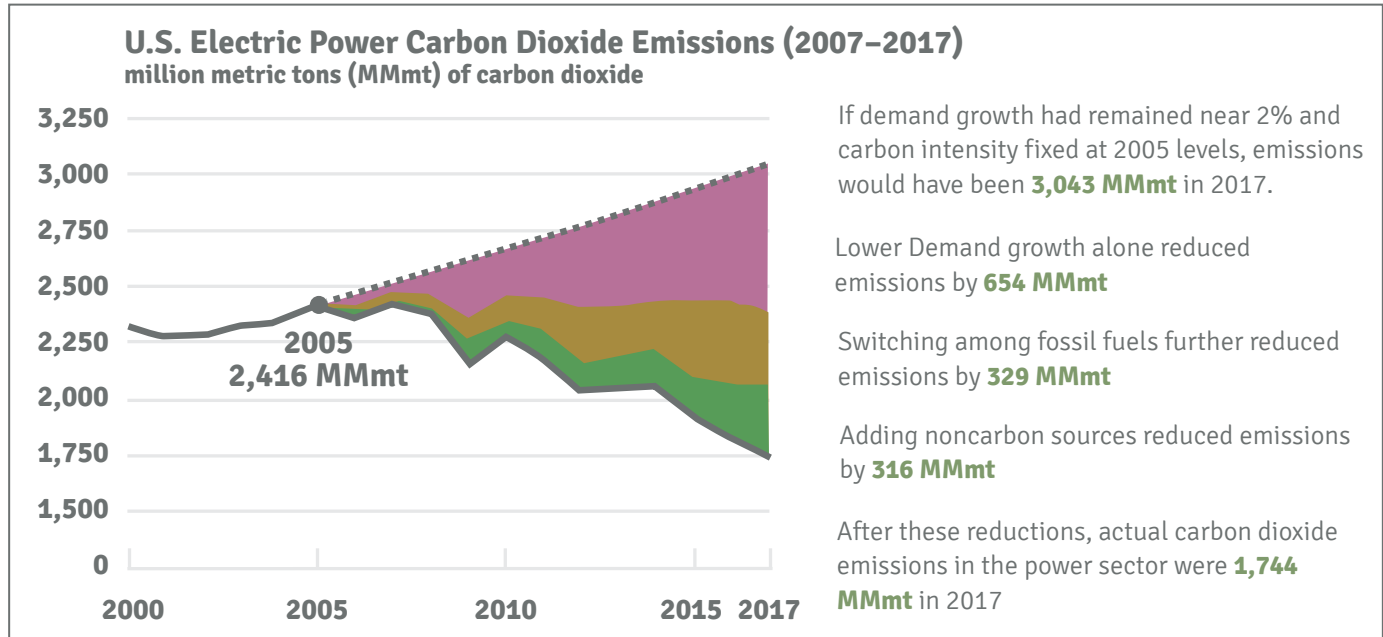
⁴⁴ "Orwellian": Coalition Accused of Planning to Open Green Bank to Fossil Fuel Investments," *The Guardian*, August 27, 2020

⁴⁵ "Billions in Clean Energy Loans Go Unused as Coronavirus Ravages Economy," *New York Times*, April 30, 2020

⁴⁶ "Inventory of U.S. Greenhouse Gas Emissions and Sinks." EPA. Updated April 2019. Accessed Sept. 2019.

⁴⁷ "Carbon dioxide emissions from the US power sector have declined 28% since 2005." EIA Today in Energy. Oct. 29, 2018.

⁴⁸ "The Growing Market for Clean Energy Portfolios." RMI. Sept. 2019.

Figure 6: U.S. Power Generation CO₂ Emissions⁴⁹

Low-cost financing from the Accelerator can help increase the competitiveness of renewable energy resources in a wider range of markets sectors and geographic areas. Studies have shown that capital costs can have a significant impact on the delivered cost of electricity from clean energy projects, and ultimately on the uptake of clean energy.⁵⁰ In places where projects aren't viable today due to less favorable policy incentives or market conditions at the state level, the Accelerator can reduce project costs and put renewables on a level footing with grid power by co-investing alongside private capital.

The Accelerator can also help to expand into markets where resource availability is the limiting factor. By blending its capital alongside private investment, the Accelerator lowers the total return requirement of the project, thus also lowering the capacity factor that is needed to build a viable project. Suddenly whole new geographies with less than ideal wind or solar resources become viable for development.

The Accelerator can further use its financing to more deeply penetrate existing markets. Projects that are small in size, use multiple technologies, and have varied or

unobservable credit quality are chronically underinvested in across the U.S., even though on paper they are economically viable. The Accelerator can help address this problem by aggregating and warehousing these small projects so they can achieve the scale and diversity of risk that is attractive and familiar to private capital providers.

Transmission, Distribution and Storage

Construction of a cleaner and more resilient grid will require investment in new high-voltage, long-distance transmission lines, local distribution systems for micro-grid applications, and a broad deployment of energy storage. As renewable energy increases as a percentage of the energy mix, these technologies become increasingly essential to maintain grid reliability and enable the successful integration of renewable energy.

Transmission is necessary to carry clean electricity from where it is produced to where it is consumed. This is important because the regions that are most conducive to large-scale wind and solar generation are often not situated close to major electricity load centers. Transmission bottlenecks are increasingly becoming an

49 [Carbon dioxide emissions from the US power sector have declined 28% since 2005.](#) EIA Today in Energy. Oct. 29, 2018.

50 ["Adverse effects of rising interest rates on sustainable energy transitions."](#) Nature Sustainability. Sept. 9, 2019.

issue preventing cost-effective renewable resources from being fully used,⁵¹ and major transmission projects have run into repeated roadblocks. For example, the proposed Grain Belt Express transmission line would move up to 4,000 megawatts of power from wind-rich west Kansas to load centers further east.⁵²

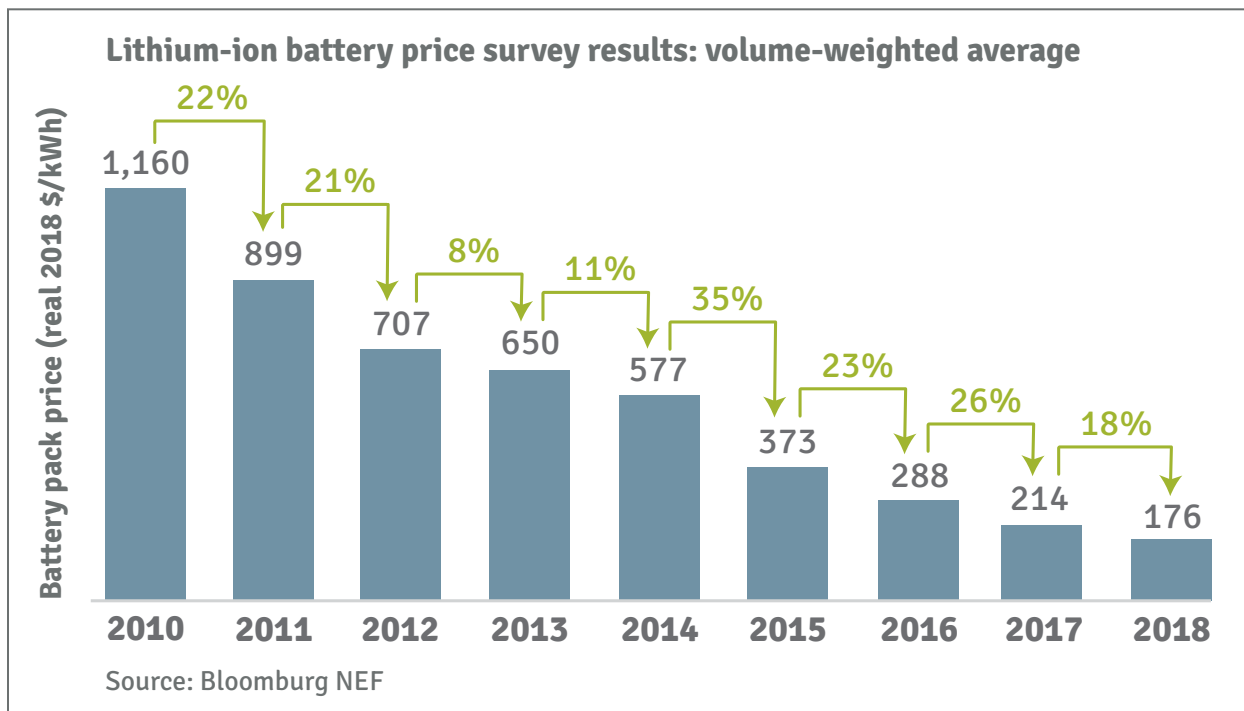
There are have also been notable transmission success stories. In Texas, the state designated Competitive Renewable Energy Zones (CREZ), committed \$7 billion to deliver energy from windy pastures to major cities. The project helped contribute to the rapid growth of wind energy in Texas, which now has the most installed wind capacity of any state.⁵³ Utility Dive quotes state Sen. Troy Fraser on the topic of the new transmission lines, saying: “There were two things that drove the market, the federal subsidy and what we did to build the CREZ line. It was

basically build it and they will come. And they came in droves.”⁵⁴

The Accelerator could help facilitate the construction of new transmission by providing technical assistance and reducing the “soft costs” of coordinating across a wide region, in addition to co-investing in transmission projects. The Accelerator could also finance ancillary services for these transmission projects.

Grid issues also arise from the intermittency of wind and solar power. The timing of greatest power availability in a given location may not always match the time of greatest demand. Transmission and energy storage can both play a role in balancing generation and load, “smoothing out” local peaks and valleys and connecting excess generation at one place and time to a spike in load in another.

Figure 7: Lithium-Ion Battery Price from 2010-2018⁵⁵



51 “New Transmission Lines Required to Avoid Curtailment.” *Wind Power Monthly*. Jan. 11, 2017.

52 “Property Question Prompts Latest Challenge to Grain Belt Express.” Energy News Network. Sept. 5, 2019.

53 “Texas ranks first in US-installed wind capacity and number of turbines.” EIA Today in Energy. July 31, 2019.

54 “Mission Accomplished? Inside the Battle over Texas Renewable Energy Incentives.” Utility Dive. Apr. 22, 2015.

55 “A Behind-the-Scenes Take on Lithium Ion Battery Prices.” BNEF. March 5, 2019.

Advanced energy storage technology, particularly lithium ion-based batteries have fallen dramatically in price, and quickly. The volume weighted average cost of a battery pack fell by 85% from 2010 to 2018.⁵⁶ This technology is now being deployed commercially at the utility-scale so it can be paired with renewable power.⁵⁷

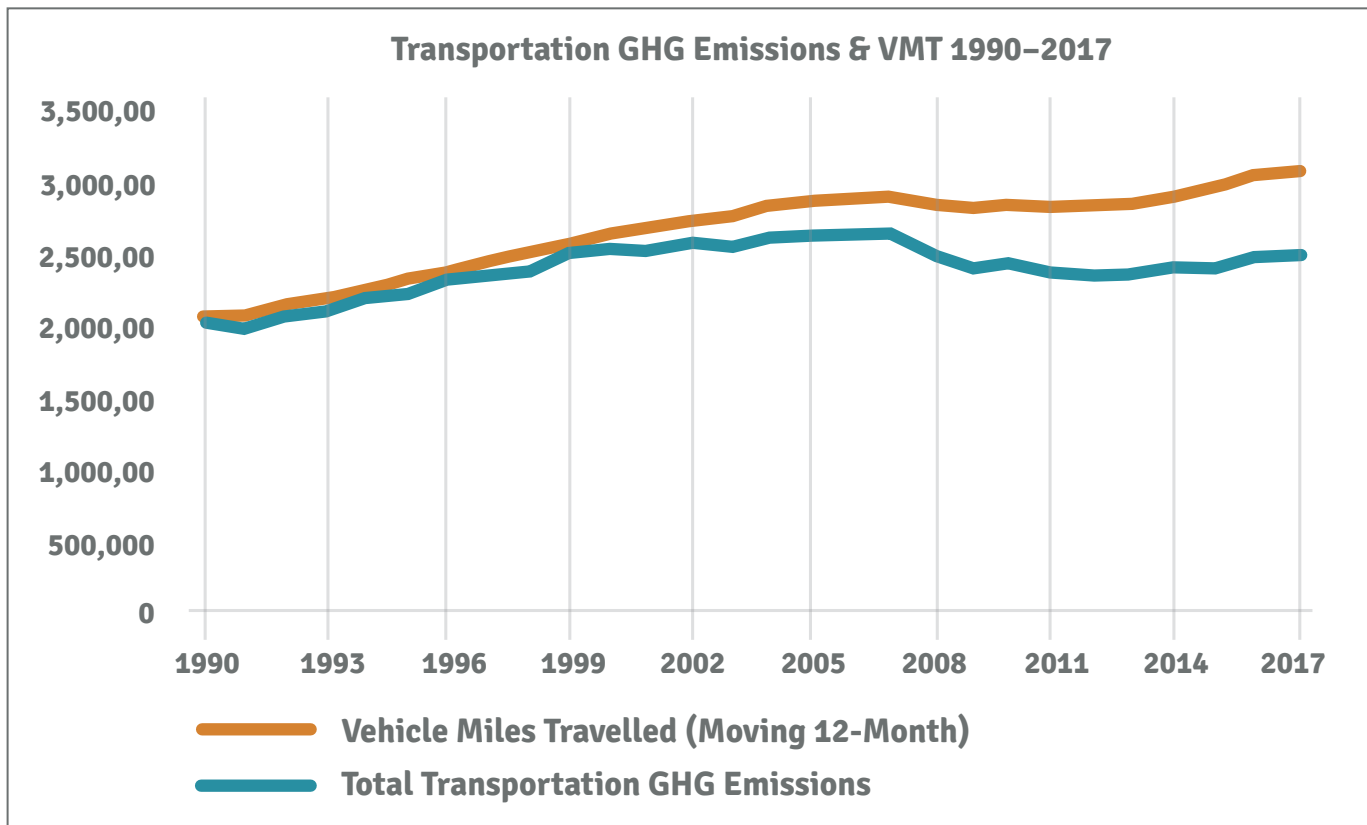
However, rapid deployment across multiple applications will warrant significant new investment from the Accelerator, which can help to overcome investor cautiousness based on unfamiliarity with “first-in-kind” projects. Risk mitigation techniques like loan loss reserves, long-term financing, and innovative underwriting structures to properly account for the full set of storage value streams are all potential Accelerator tools to support storage deployment.

Batteries aren’t the only option for long-term, utility-scale energy storage. Other technologies remain in development, including ideas like gravity storage. However, projects at the early stages of development are focused on securing research and development funding and on venture capital, rather than conventional project finance. The Accelerator would be able to step in at a later stage and help these new technologies scale up.

Clean Transportation

Transportation is America’s largest source of GHG emissions, accounting for 29% of the national total.⁵⁸ These emissions are tightly linked to vehicle miles travelled (VMT) and the associated gasoline use in internal combustion engines (ICE).

Figure 8: U.S. Transportation GHG Emissions and Vehicle Miles Travelled⁵⁹



56 “A Behind-the-Scenes Take on Lithium Ion Battery Prices.” BNEF. March 5, 2019.

57 “A Behind-the-Scenes Take on Lithium Ion Battery Prices.” BNEF. March 5, 2019.

58 “Inventory of U.S. Greenhouse Gas Emissions and Sinks.” EPA. Updated April 2019. Accessed Sept. 2019.

59 “Greenhouse Gas Inventory Data Explorer: US Greenhouse Gas Emissions from the Transportation Sector 1990-2017.” EPA. Accessed Sept. 2019.

In the chart above, emissions have slowly begun decoupling from VMT, due to the increased fuel-efficiency of cars over time.⁶⁰ This is a positive trend, but decarbonizing the transportation sector in line with economy-wide climate goals will require a much faster and more complete approach.

Reducing and eliminating these emissions at a faster rate will require substituting fossil-fueled VMT for VMT from alternatives like electric vehicles (EVs) and even hydrogen-powered vehicles. But current market conditions present obstacles to the adoption of electric vehicles and transportation infrastructure.

EV prices have fallen significantly since mass market introduction in recent years, but they are still generally more expensive than the equivalent internal combustion engine vehicle. The economics of fast-charging infrastructure (EVSE) are also marginal, with revenue generated purely based on the sales of electricity unlikely to generate attractive returns for private capital (though new business models such as advertising-based models show promise). A recent study of direct current fast charging (DCFC) infrastructure found that, under today's economic conditions and utility rates, nearly all DCFC stations lose money.⁶¹ Increased EV traffic would help the stations become profitable, but a chicken-or-egg problem exists where increased density of charging stations is necessary to spur EV adoption.

An Accelerator can inject critical capital, scale and willingness to experiment into this ecosystem. The economic viability and attractiveness of EVs is closely linked to the presence of a charging station infrastructure and vice versa. The Accelerator will be uniquely positioned to consider holistic solutions that can stimulate growth in both EVs and charging infrastructure simultaneously.

In addition to personal electric vehicles and their infrastructure, the Accelerator is also authorized to invest in

public transit. Creative solutions are being pioneered in this area at the local level. For example, a new program in Virginia managed through Dominion would allow schools to apply for electric school buses.⁶² The utility would pay for the difference between the electric school bus and a conventional diesel bus, and install charging stations for the buses. In return, the utility would be able to use the buses as grid-scale storage when not in use transporting students, reducing the costs of balancing supply and demand across the grid.

In New York City, the New York Green Bank has facilitated an investment in a different type of public transportation: the Citibike bikeshare system. The bikeshare operator received nearly \$50 million in two separate loan products from the New York Green Bank, which will fund the installation of nearly 2,000 bikes in low- to moderate-income neighborhoods.⁶³ Monthly operating reports find that the bikeshare system offsets more than a ton of carbon dioxide per month when usage is high.⁶⁴

Working with state and local green banks, the Accelerator could help facilitate this type of creative deal-making in other areas, and provide low-cost financing for the up-front investment. For more on how the Accelerator would capitalize state and local green banks, see the section on state and local institutions.

Industrial Decarbonization

In 2017, direct emissions from the industrial sector made up 22% of U.S. GHG emissions.⁶⁵ Industrial processes like manufacturing of cement, steel and ammonia are energy- and emissions-intensive, and are also closely linked to economic growth. Emissions in this sector are attributable to a several factors, including carbon-based feedstock, burning fuel to generate very high temperatures as part of manufacturing processes, and on-site power generation. On-site combustion of fossil fuels for heat and power make

60 "Greenhouse Gas Inventory Data Explorer: US Greenhouse Gas Emissions from the Transportation Sector 1990-2017." EPA. Accessed Sept. 2019.
"Moving 12-Month Total Vehicle Miles Traveled." Federal Reserve Bank of St. Louis. Accessed Sept. 2019.

61 "Nearly all' high-voltage EV charging stations lose money: Report." Utility Dive. Aug. 22, 2019.

62 "Electric School Buses: FAQs." Dominion Energy.

63 "Governor Cuomo Announces Major Milestone Reached by NY Green Bank with \$2.7 Million in Profits." New York Green Bank. June 22, 2017.

64 "Citibike Monthly Operating Reports." Citibike. Accessed Sept. 2019.

65 "Inventory of U.S. Greenhouse Gas Emissions and Sinks." EPA. Updated April 2019. Accessed Sept. 2019.

up the largest share of the sector’s direct emissions.⁶⁶ The sector also generates “indirect” emissions from the use of electricity generated off-site.

The industrial sector presents special challenges to decarbonization. For the many industrial products that are commodities, the sector can be highly sensitive to cost. Industrial infrastructure is long-lived, and few alternatives currently exist either for the manufacturing processes themselves, or for the substitution of different products on the part of the end-users.⁶⁷

Decarbonizing this sector will require a combination of solutions, including renewable power generation, fuel-switching, the use of carbon capture technologies, and other solutions.⁶⁸ Some progress in this area will likely need to be made at the research and development stage. As mentioned in a previous section, the Accelerator is not designed to provide R&D funding or venture capital, so investment at these early stages may be outside the scope of the Accelerator’s portfolio. However, as new technologies begin to scale up and be commercialized, the Accelerator would be able to play a larger role.

The Accelerator may also be able to play an immediate role in financing technologies like industrial energy efficiency, including combined heat and power, that have the potential to generate economic savings for a facility at the same time as greenhouse gas reductions.

Combined heat and power systems generate power on-site for large power users, and capture the heat emitted as a by-product of power generation for other uses. This can reach 80% efficiency, compared to 45% efficiency for power generation alone.⁶⁹ A 2016 DOE study estimated that more than 240 GW of technical potential exists across all CHP categories.⁷⁰ However, analysis from C2ES found that adoption of combined heat and power systems has stalled in recent years due to high capital costs, technical

complexity, and policy changes.⁷¹ Financial involvement from the Accelerator could bring capital costs down for these solutions and help increase the uptake of combined heat and power and other efficient technologies.

Energy Efficiency and Demand Response

As shown in Charts 2 and 3, energy efficiency has played an important role in the GHG reductions that the U.S. has achieved thus far, and additional increases in efficiency will be needed to contribute to a deep decarbonization scenario. Energy efficiency encompasses a diverse range of technologies that allow customers to reduce their power demand, while still getting the same value out of the power they use.

A comprehensive energy efficiency retrofit to a commercial building might include efficient LED lighting, upgrades to the HVAC system, the addition of insulation to a building’s walls, windows, or roof, and occupancy controls that turn lighting and other systems off when not in use. These improvements lower the user’s energy bills, as well as avoiding the GHG emissions associated with the power they don’t consume.

Energy efficiency can also provide important benefits to the grid as a whole. By reducing power demand, the grid can avoid the need for new power generation and transmission infrastructure, for which all users across the grid would otherwise bear the cost.

These benefits become even greater when coupled with demand response, which focuses specifically on reducing demand at peak times. Demand response programs often involve voluntary participation by users of large quantities of power, which can include commercial and industrial customers. These customers offer to modify their power usage at peak times when the grid is stressed, and receive a benefit in return from the utility, often in

66 “Decarbonizing U.S. Industry.” C2ES. July 2019.

67 “Challenges and Solutions for U.S. Industrial Decarbonization.” Testimony by Dr. Julio Friedman before the House Committee on Energy and Commerce. Via SIPA. Sept. 18, 2019.

68 “Challenges and Solutions for U.S. Industrial Decarbonization.” Testimony by Dr. Julio Friedman before the House Committee on Energy and Commerce. Via SIPA. Sept. 18, 2019.

69 “Combined Heat and Power: A Sleeping Giant May be Waking.” *POWER Magazine*. March 1, 2019.

70 “Combined Heat and Power: A Sleeping Giant May be Waking.” *POWER Magazine*. March 1, 2019.

71 “Decarbonizing U.S. Industry.” C2ES. July 2019.

the form of a monthly payment. This can be a way for the utility to avoid constructing new “peaking plants” which only run at times of extremely high demand.

Paying customers to reduce their usage at key times, and assisting them to become more energy-efficient across the board, can be cheaper than building an entirely new substation or peaking facility.

With the exception of the largest-scale commercial or industrial projects, the Accelerator’s role in financing energy efficiency and demand response would most likely be through capitalization of state and local green banks. These local institutions are a better fit for the distributed and local nature of most smaller-scale energy efficiency projects, and would have comprehensive knowledge of local markets and regulations, as well as relevant market participants. For more on how the Accelerator would capitalize state and local green banks, see the section on state and local institutions.

Agriculture Projects and Forestry

As shown in Figure 1, emissions from agriculture make up a significant minority of U.S. greenhouse gas emissions, at 9% of total emissions. At the same time, land-use change and forestry represents a net carbon sink, offsetting approximately 11% of U.S. greenhouse gas emissions across sectors.⁷² The Accelerator’s involvement in the agriculture and forestry sectors will seek to find ways to reduce agricultural emissions and boost the potential of forests to serve as carbon sinks.

Existing programs and efforts in these areas generally focus on a few avenues for change. In the area of agricultural emissions, most emissions come in the form of methane or nitrous oxide rather than carbon dioxide. These come from sources including fertilizers applied to soils, manure management, and fuel use by farmers.⁷³

Improved crop management practices can lower greenhouse gas emissions from agriculture without reducing yields. Planting crops together rather than in monoculture, reducing the tilling of soil, and rotating crops can all help to reduce a farm’s carbon footprint.⁷⁴ For animal agriculture, improved manure management practices like the use of digesters can capture emissions from waste.

The Accelerator’s involvement has the potential to improve the economics of these interventions. For example, in the case of methane digesters, farmers consider the potential revenue that the digester can generate.⁷⁵ Digesters can be used to produce biofuels, or to capture methane gas that is then burned to generate electricity. Net metering rules allow this power to be sold to the grid, and in some cases local renewable energy credits or the sale of carbon offsets also provide a source of revenue. Low-cost financing from the Accelerator or via a local green bank could make the difference to a farmer’s ability to invest in these technologies.

In the area of forestry, emissions reductions primarily come from preventing the deforestation of existing forests and improving forest management practices. Forests inherently sequester carbon as they grow, so with effective management, forests can be a significant carbon sink.

Revenue from forestry projects comes from the sale of forest products, and from carbon offset credits and incentives in cases where they apply. There are a few ways that forest products can be used commercially which still provide carbon emission benefits. These include the use of woody biomass for residential heating as a replacement for oil and gas, and the use of high-quality solid wood in building applications that maintain long-term carbon sequestration.

Forestry presents challenges to the Accelerator’s potential involvement due to the long-term time horizon for forestry projects. A forestry investment can take 45 to 80

72 [“Inventory of U.S. Greenhouse Gas Emissions and Sinks.”](#) EPA. Updated April 2019. Accessed Sept. 2019.

73 [“Everything you need to know about agricultural emissions.”](#) WRI. May 29, 2014.

74 [“Farming tactics to reduce the carbon footprint of crop cultivation in semiarid areas: a review.”](#) Agronomy for Sustainable Development. December 2016.

75 [“Weighing the Pros and Cons of Methane Digesters.”](#) National Hog Farmer. Sept. 18, 2019.

years for trees to become mature enough to harvest,⁷⁶ and the Accelerator’s chartered lifespan is just 30 years long. Its involvement in these types of projects may be limited to “purchasing” GHG reductions in the form of grants or incentives rather than providing financing. However, the Accelerator’s Board should also work creatively to investigate new ways to finance forestry projects.

Climate-Resilient Infrastructure

The Climate Bank Act authorizes the Accelerator to finance “climate resilience measures.” This is potentially an incredibly wide bucket of activity, which could theoretically encompass projects as diverse as storm walls around Manhattan, and micro-gridding critical infrastructure to allow for baseline levels of safety and security in communities. Specific investment decisions will need to be left to the Board of Directors, but their decisions will be informed by the Accelerator’s stated priorities and mission.

At the top of the Accelerator’s list of priorities is maximizing the reduction of greenhouse gases. Not all resilience projects necessarily accomplish this. So, one possible way to understand the Accelerator’s involvement with resilience is as consideration that informs investments in the categories discussed above. If the Accelerator invests in utility-scale transmission or generation infrastructure, it should be built in a way that is resilient to climate impacts. Smaller projects like energy efficiency upgrades to individual homes or buildings could be bundled with resilience measures.

State and local green banks have begun to set examples for what this could look like. The Florida Energy & Solar Loan Fund (SELF) has found that it can finance the construction of new roofs on Florida homes, and that the resulting savings in home insurance premiums are sufficient to repay the loan. Resilience upgrades are often combined with energy efficiency upgrades that mean that the project as a whole generates GHG reductions. This kind of creative financing will need to be explored and potentially

applied to a wide set of projects that improve America’s ability to withstand the effects of climate change.

DIRECTLY REDUCING GHG EMISSIONS

Per the Senate version of the National Climate Bank Act, the Accelerator is authorized to use its funds to accelerate the retirement of fossil-fuel based power plants. Coal plant retirements have been accelerating, but they remain too slow to avoid dangerous climate change at the current rate. Only 10% of existing coal-fired capacity is scheduled to retire in the next five years.⁷⁷ Accelerating this trend is vital, not only to reduce the amount of emissions from the power sector, but to also create a space for markets to demand a clean power substitute.

Today, when a coal power plant retires in a regulated-utility state, the stranded asset value of that coal plant is passed on to ratepayers, even though the plant isn’t operating. Equally problematic is the fact that, if the plant is shut down by regulatory mandate rather than by market forces, the power used to replace the fossil generation may end up costing more. To make this transition fast and politically viable, the cost on ratepayers for the stranded asset needs to fall or disappear, the substitute power must be cheaper than coal power, and regulators must be given a politically viable pathway out of this predicament.

Accelerator participation will enable this transition to occur more quickly and at lower cost, through a number of interventions. This includes reverse auctions to pay coal plants to stop generating; participating in securitizations to lower the cost passed on to ratepayers to recover the value of stranded assets; and direct negotiations with utilities and regulators to find bespoke financial and regulatory solutions that suit each market situation. The Accelerator is also authorized to invest directly into communities impacted by plant closures.

76 “[The Forest Landowner’s Guide to the Federal Income Tax: Chapter 2: Timber Investment Considerations.](#)” National Timber Tax Website. Accessed Sept. 2019.

77 “[Grid Transformation and Stranded Assets.](#)” Lillian Federico and Steve Piper, S&P Global Market Intelligence. July 23, 2019.

INVESTING IN COMMUNITIES FOR JUST TRANSITION

As with state and local green banks, the Accelerator provides an equity benefit in that it is designed to deliver clean energy at prices competitive with the existing grid. Low-income households devote a greater proportion of their income to energy. By protecting consumers from energy cost increases, the Accelerator avoids the regressive nature of these costs.

However, the Accelerator is also empowered to take a more active role to address inequities related to the burning of fossil fuels and the transition to clean energy. Low-income communities and communities of color have historically borne many of the worst impacts arising from the use of fossil fuels, while being excluded from many of the economic benefits of the transition to clean energy.

Members of these communities are more likely to be directly affected by pollution emitted by a fossil-fueled power plant, and to suffer from related health effects like asthma and preterm birth.⁷⁸ They are disproportionately affected by extreme weather events that are worsened by climate change, including heat waves and degraded air quality.⁷⁹

At the same time, these communities face barriers to the adoption of clean energy technologies. Low-income households are more likely to be renters, who are prevented from modifying their homes by adding rooftop solar or efficiency improvements. In cases where low-income families own their homes and wish to make these improvements, a poor credit rating may be a barrier to financing the work, even in cases where the long-term savings would be significant.

As part of the Cash for Carbon program, the Accelerator is authorized to directly invest in the communities where fossil-fueled power plants and facilities are closed. More broadly, the Accelerator is also empowered to prioritize

projects that benefit rural communities, low- and moderate-income communities, and communities of color.

Exactly what this would look like at a national scale remains to be determined, and should involve feedback and input directly from affected communities. It could mean targeting clean energy investments towards areas that are suffering the greatest public health impacts from air pollution, causing polluting facilities to run less or even to retire. It could also include efforts like job training so that members of local communities can see direct employment gains from new clean energy projects in the area.

State and local green banks are also already developing innovative ways to help under-served communities benefit from clean energy and energy efficiency, and the Accelerator would be able to provide additional capital to their efforts. Examples include the Connecticut Green Bank's Solar for All program, which was begun after the green bank found a racial and income disparity in solar adoption rates in the state. And when it comes to serving renters, Hawaii's new Green Energy Money Saver on-bill financing program is a game-changer.⁸⁰

CONCLUSION

Scenarios for deep decarbonization of the U.S. economy require reductions from all sectors, and the Accelerator is accordingly empowered to invest in a diverse range of sectors and categories. The examples provided here illustrate how the climate bank could facilitate decarbonization of power generation, transportation, commercial and residential buildings, agriculture, and more.

By using financing rather than grants, and mobilizing private investment into clean projects, the Accelerator will be able to maximize its impact and secure the greatest amount of greenhouse gas reductions per public dollar deployed.

The Accelerator would also be able to work with state and local green banks to target projects at a distributed scale

78 ["Multiple threats to child health from fossil fuel combustion: Impacts of air pollution and climate change."](#) Environmental Health Perspectives. Feb. 2017.

79 ["Air pollution: Current and future challenges."](#) EPA. Accessed Sept. 2019.

80 ["Hawaii's On-Bill Financing Program Unlocks Energy Upgrades for the Masses."](#) GreentechMedia, June 10, 2019.

that require local expertise. The Accelerator would be able to provide technical assistance to start-up new local institutions, and provide capital to both new and existing green banks.

With the Cash for Carbon program, the Accelerator would provide an additional push to accelerate the retirement of fossil-fueled power generation, and keep existing fossil reserves in the ground. This program would secure large-scale greenhouse gas reductions at low costs, while also reducing the cost of energy paid by consumers. Fossil-fuel retirements would be replaced by cheaper renewable generation.

Across all efforts, the Accelerator would prioritize environmental justice, seeking to make sure that disadvantaged communities, and especially communities harmed by the effects of fossil fuels and climate change, benefit from the investments made through these programs.

Taken as a group, this set of interventions can rapidly facilitate the transition of the economy from carbon-intensive to clean technologies, maximizing the impact of each public dollar and lowering consumer costs.

Real Examples of Projects the Accelerator Will Finance (Use-Case Summary)

The National Climate Bank Act of 2019 was introduced in the U.S. Senate in July 2019 and in the House of Representatives in December 2019. In 2020, a version of the bill called the Clean Energy and Sustainability Accelerator passed the House with \$20 billion of funding as part of both the Moving Forward Act and the Clean Economy Jobs and Innovation Act. These pieces of legislation capitalize an independent nonpartisan non-profit institution, an “Accelerator,” to finance climate solutions at scale and bring clean energy investment to American communities. This institution is designed to be capitalized with federal funds and charged with raising and investing

capital in partnership with the private sector in order to maximize greenhouse gas (GHG) emissions reductions. The Accelerator is authorized to invest across seven eligible sectors. It is also directed to prioritize investment in “climate-impacted communities.”

To help demonstrate the impact of such a Accelerator, the Coalition for Green Capital has prepared “use cases” based on specific, real projects around the country that could be built with Accelerator participation. Each use case will deliver benefits such as job creation, lower energy costs, private investment opportunity, and lower greenhouse gas emissions. Below is a list of the use cases that have been identified to date.



Accelerated Retirement Of Fossil Fuel Generation & Replacement With Clean Power

Coal Communities

- Accelerating Renewable Replacement of Coal Plants for Rural Co-Ops Bill Relief
- Accelerating the Replacement of Coal-Fired Power in Monopoly IOU Territory with Renewable Power and Supporting Transitioning Coal Workers

Grid-Tied Renewables

- Expanding Utility Scale Wind Markets and Increasing Private Investment in Regions with Less Wind
- Building Offshore Wind Transmission Platform to Enable Rapid Scaling of Project Development at Lower Cost
- Coordinated Interconnection Upgrade Financing for Wind Projects in Upper Midwest

Distributed Solutions & Electrification

Small Businesses, Community Facilities, Municipal Buildings

- Aggregation of Small Commercial PACE-Financed Projects for Commercial Resale
- Financing C&I, Non-Profit and Muni Building Small-Scale Rooftop Solar PPAs

Residential & Commercial Buildings

- Financing Home Heating System Electrification
- Upfront Renewable Energy Credit (REC)-based Financing for Small Renewable Projects
- Community Solar Interconnection Bridge Loan

Underserved Markets & Environmental Justice

- LMI Community Solar Financing Support
- LMI Homeowner Rooftop Solar Lease + Energy Efficiency Savings Agreement
- LMI Residential Clean Energy Upgrade through On-Bill Financing, such as PAYS
- Affordable Multifamily Housing Efficiency Upgrades

Transportation

- Electric Vehicle Financing for High-Mileage Vehicles with Loan Forgiveness to Incentivize More Electric Vehicle Miles Travelled
- Public Bus Fleet Conversion from Gasoline to Electric
- Fleet Conversation and Charging-as-a-Service with Savings-Based Performance Contracting

Forestry & Sustainable Agriculture

Improved Forest Management

- Bond Guarantee for Forest Management to Mitigate Future Costs of Fighting Forest Fires
- Financing for Family-Owned Forest to Improve Forest Management to Capture Carbon

New Revenue Opportunities for Families

- Upfront Financing for Forest Owner to Preserve Trees for Future Use as Cross-laminated Timber
- Supporting Family Farms Transition to Regenerative Agriculture Practices

Resilience

Flood and Hurricane Prone Households in Underserved Communities

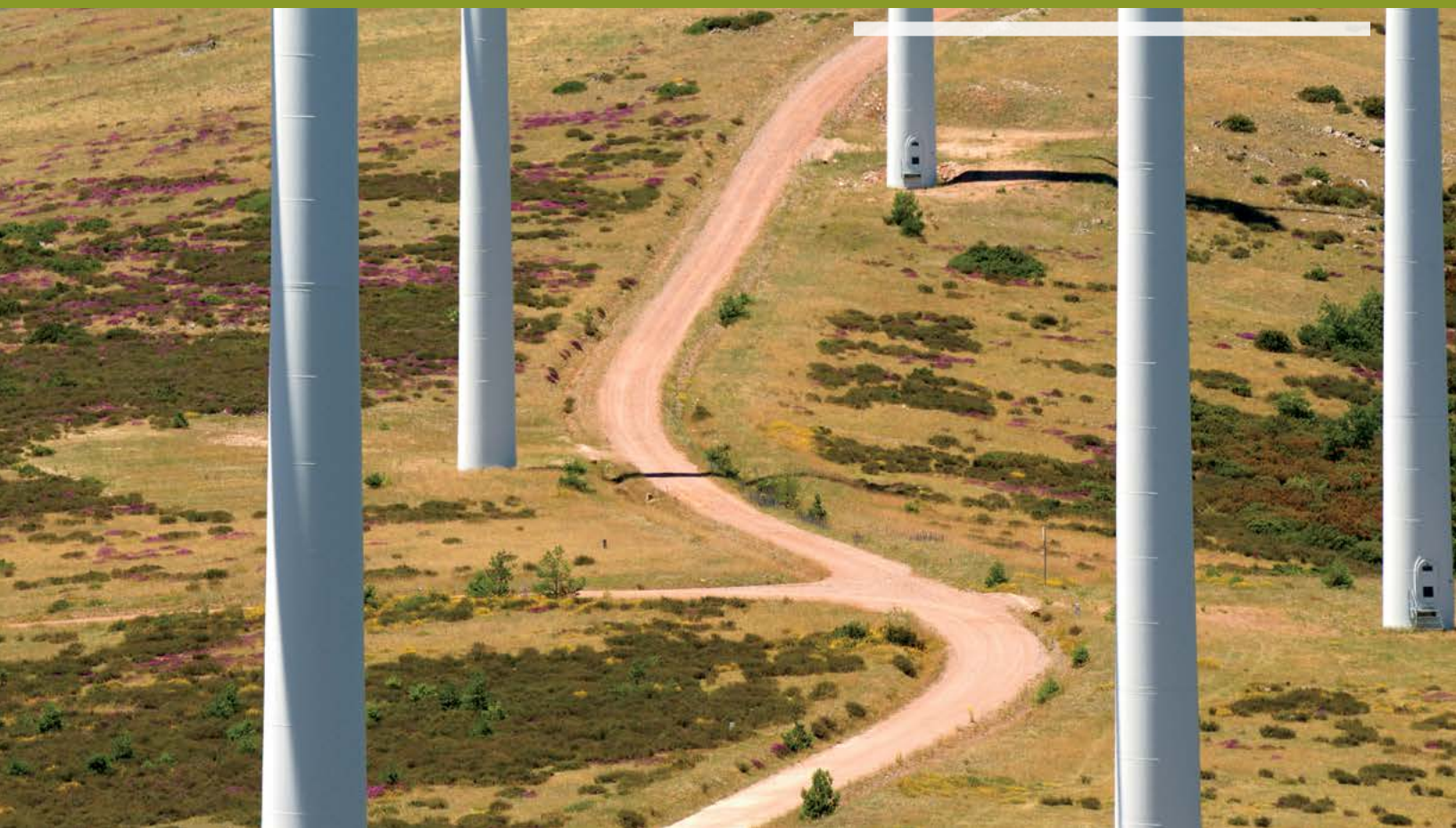
- Residential Conversion of Septic to Sewage Utility to Reduce Flooding-Caused Pollution
- LMI Resilience + Clean Energy Upgrades to Reduce Home Insurance and Energy Costs and Harden Against Hurricanes

Community Resilience

- Financing Public Benefit Microgrids to Ensure Continued Safety and Service During Power Outages
- Solar + Storage Financing for LMI Households
- Large Resilient Infrastructure Project – In Process



Structure of the Accelerator



The Accelerator Must be an Independent Non-Profit

One of the defining aspects of the Accelerator is that it is an independent non-profit corporation outside government. It is not a government agency or a government-owned corporation. This is a specific and intentional design choice based on extensive green bank experience, as well as unfortunate lessons learned from existing federal financing programs within the federal government.

Per the Accelerator's enabling legislation the organization will be governed by a board of seven Directors. The first three Directors will be appointed by the President and confirmed by the Senate, with the requirement that no more than two may be from the same political party. Those three Directors then select the four remaining founding Directors, with the requirement that the three Directors vote unanimously for each. Then the Board operates like that of any other non-profit, self-perpetuating by voting among itself for continued or new membership.

The independent non-profit structure is used for several key reasons.

INSULATED FROM POLITICS

It is essential that the Accelerator be non-political. The finance institution must be seen as a trusted, viable, market participant that others are willing to contract with for multiple decades. If the organization's short-term viability vacillates with changing administrations and national fiscal conditions, that, too, will undermine the effectiveness of the organization. This truth has been sadly proven out by entities within governments and within the green bank community itself.

The first state green bank in the U.S. is the Connecticut Green Bank, which is a quasi-public instrumentality of the government. The institution is held as a point of pride in the state by both parties (it was formed with near

unanimous bipartisan support). But when the state neared financial ruin in 2017, that pride did not save the green bank from having its funds swept by the legislature to plug budget holes, setting back the institution back for years.

Similarly, the national green bank of Australia, the Clean Energy Finance Corporation (CEFC) is a quasi-public, and is constantly fighting for its survival and navigating a winding mission as the government changes its mind every few years whether or not climate change is real. The CEFC has driven nearly \$20B into renewable, efficiency, transmission, and sustainable agriculture projects, among many other innovative solutions. It is the world's largest and most successful national green bank, proving out the model, expanding clean energy markets, lowering GHG emissions, and mobilizing private investment.

Unfortunately, the CEFC was established as a government-owned corporation, with the national government in control of its charter and investment mandate. The result has meant that since the day it was created, it has been fighting for its continued existence and climate-focused mission. As politics and control of government have changed in Australia, so too have attitudes towards the CEFC. Opponents have tried to shut it down,⁸¹ change its mission, sell it⁸² and increase its required rate of return so as to shrink the market for viable investments. And most recently, in a new "Orwellian" proposal, the Australian Energy Minister introduced legislation that will provide CEFC with AUD 1 billion in new capital to finance an expanded list of eligible technologies that now includes natural gas and coal-fired generation.⁸³

Within the U.S. federal government, the case of the DOE's Loan Programs Office (LPO) serves as a flashing red warning light. The LPO was first put into hibernation after the fallout of the Solyndra investment loss. And then the LPO was effectively shut down entirely under the current

81 https://parlinfo.aph.gov.au/parlInfo/download/legislation/billsdgs/2891576/upload_binary/2891576.pdf

82 <https://www.smh.com.au/politics/federal/boss-of-10b-clean-energy-fund-says-government-can-sell-us-if-it-wants-20190819-p52jld.html>

83 <https://www.theguardian.com/australia-news/2020/aug/28/orwellian-coalition-accused-of-planning-to-open-green-bank-to-fossil-fuel-investments>

Administration.⁸⁴ As a result, market participants rarely even consider the LPO as a financing choice when evaluating capital needs for innovative or complex clean energy projects. Political influence has undermined the legitimacy of a finance entity that still has tens of billions of dollars of unused investment capacity.

DOES NOT BORROW AGAINST FEDERAL FULL FAITH AND CREDIT

The Accelerator's non-profit approach is specifically designed to limit the amount of taxpayer funds put at risk. As a non-profit outside government, the Accelerator can borrow money, but will not do so against the federal government's full faith and credit. That means that the financial footprint of the organization on the federal balance sheet is fixed and known from the outset, and is equal to its initial appropriation. This is not so for traditional financing programs within government that use Fair Credit Report Act (FCRA) based accounting and financing methods.

Under FCRA structures, which are used by LPO for example, the funds provided to the LPO by Congress are not actually lent out to projects. Instead, the OMB and White House evaluate each individual investment to determine its "credit subsidy cost", or the amount of money the OMB thinks is the expected loss on the financing. The funds extended to the project come from Treasury, and the Congressional appropriation is used to pay for the credit subsidy cost. If there is no appropriation, the LPO charges the borrower for the credit subsidy cost. That means that the LPO's ability to, for example, extend loan guarantees to projects on the federal government's balance sheet is effectively limitless.

INDEPENDENT FINANCIAL DECISION-MAKING

The Accelerator's Board of Directors and management need to be empowered to decide its own allocation of resources and investment focus, within the bounds of its statutory authority. This means that if the Accelerator

is capitalized with taxpayer funds through a legislative appropriation, it should be the Accelerator itself, and not Treasury or another financial regulator that determines where those funds should be invested. The legislation creating the Accelerator names its specific powers, objectives and eligible areas of investment, but specific asset allocation should be left to the Accelerator.

Similarly, decision-making around individual investments must also be left to Accelerator management. If approvals are required by actors outside the organization and within government, that will both slow down operations and undermine faith market actors must have in the organization's ability to operate like a market participant.

The existing financing programs scattered across the federal government lack independence and ability to make their own investment decisions. Rather than be formed as financial institutions, they are formed as narrowly defined programs, where regulation dictates an extremely narrow kind of financing to be offered for a specific purpose or market segment. For example, the USDA's Rural Utility Service (RUS) has billions of dollars of financing capacity that can be used to support energy efficiency installation at extremely low cost of capital. However, the RUS typically only lends that money to a utility, or a related entity that is capable of pledging the physical poles and wires of a utility as collateral. That means that other credit-worthy (and more motivated) actors capable of deploying that capital are barred from accessing RUS funds. And, importantly, the RUS and USDA have a limited ability to change this.

An Accelerator that is chartered with an objective function of maximizing GHG reduction per public dollar must, for example, have the ability to allocate its resources and make investments based on what the market requires. And that market is dynamic, thus requiring the Accelerator to have its own investment decision-making capacity, which means independence not historically granted to energy financing programs across government. The Accelerator should be treated more like the World Bank, into which the federal government invests capital, and has a

84 <https://www.nytimes.com/2020/04/30/climate/clean-energy-loans-coronavirus-trump.html>

governance role. But the US Treasury does not evaluate or regulate or constrain the specific management and lending decisions of the World Bank.

ACTING LIKE A BANK, NOT A MONEY-IN MONEY-OUT GOVERNMENT PROGRAM

It is vital for the Accelerator to be viewed and operated as a financing entity akin to a development bank. Specifically, that the Accelerator must have a balance sheet with assets and liabilities, rather than a typical government accounting ledger with money in and money out. When the Accelerator makes a loan, that should be treated as the creation of an asset. And the value of that asset sits on the balance sheet and is equal to the net present value of the loan, which accounts for the expected return and the potential losses. If and when the Accelerator borrows

money, similarly that would appear on the balance sheet in the form of a liability.

Also like a traditional financing entity, the Accelerator will generate and retain revenue through its financing activities, and then use that revenue to pay for its operating expenses. This allows the Accelerator to be self-sufficient, not returning annually to Congress to seek further appropriations to pay for its activities. It also allows the Accelerator to revolve its and recycle its capital. This is entirely different to most federal financing programs within the government. In those programs, operating costs are paid for through annual appropriations. Money that is repaid on a loan goes directly to Treasury and is not retained by the financing program. And funds cannot be revolved and relent for future activity.

The Accelerator Builds on the Successes of State and Local Green Banks

The Accelerator's enabling legislation would capitalize a new independent non-profit entity with federal funds and mandate it to make investments in clean energy and climate infrastructure. This idea of leveraging public funds to maximize private investment in clean energy and infrastructure is not new. In fact, this model of "green banking" has been practiced in the U.S. and internationally for the last decade.

Green banks are job-creating, dedicated finance institutions (often public entities or nonprofit organizations) that use innovative financing techniques to connect clean energy projects with capital. Green banks are not banks as they don't take deposits; instead, green banks ensure that financing, the lifeblood of any clean energy project, is readily available to sustainable initiatives in a green bank's jurisdiction.

Often, green banks tackle the toughest problems in the industry, holding together an otherwise unfinanceable project in the eyes of the private sector. In other cases, green banks are front-line lenders where needed. Green

banks are not in the business of competing directly with private capital in perfectly liquid markets. Instead, green banks are in the business of expanding the pie of the financeable market for clean energy projects across the country. This market-expanding focus allows green banks to tackle some of the most difficult-to-finance markets, including projects in low-to-moderate income communities.

15 states and municipalities across the US as well countries including the UK, Australia, Japan and South Africa have successfully used the green bank model to finance tens of thousands of projects that reduce carbon emissions and create jobs in their communities, resulting in over \$50 billion in global investment.

In the US, green banks have helped drive over \$5 billion of investment into clean energy markets, serving as powerful tools to help states and cities achieve their sustainability goals and increase local clean energy development. For example, The Connecticut Green Bank has used \$250 million in public funding to drive over \$1.6 billion in overall investment in the state's clean energy market.

Michigan Saves, Michigan's independent, nonprofit green bank, has used \$19 million in public and philanthropic funding to drive over \$190 million of investment into the state's clean energy market.

While green banks differ in name, scope and approach, they generally share the following core characteristics: a mandate focusing mainly on mobilizing private investment using interventions to mitigate risks and enable transactions; innovative transaction structures and market expertise; independent authority and a degree of latitude to design and implement interventions; and a focus on cost-effectiveness and performance. Typically, green bank activities can be organized around four broad roles:

- **Risk Mitigator:** Encourage other actors to begin or increase their clean energy investment by removing some risk. This could include providing a range of credit-enhancement or co-investment strategies such as a loan loss reserve or subordinated debt.
- **Bundler:** Finance smaller projects with an eye towards selling them off as part of a larger portfolio. Many private sector financiers do not have the capacity or inclination to originate small-scale (<\$1 million) projects. The green bank can take on the work of financing small-scale projects and selling them to private markets once they achieve sufficient scale.
- **Direct Lender:** Provide financing (typically in the form of debt) to clean energy projects. This role is a particularly good fit for markets where there is limited private sector activity, such as LMI market segments, or where project economics are below the target rate of return for private sector investors.
- **Connector:** Work with market participants to overcome gaps in information, expertise, or process. The green bank may facilitate introductions, develop and share document templates, or aggregate information. While the green bank may not invest its own capital in this role, taking on these crucial (but often uncompensated) market development activities allow more transactions to happen.

The roles a green bank chooses to play are largely driven by the conditions present in the target market. Not all solutions work in all markets. For this reason, the role of green banks has differed widely across geographies.

Based on their unique national and local contexts, governments and communities tailor green banks to meet specific, local needs. Green banks have been established with diverse rationales and goals, including creating jobs, expanding clean energy access to historically disadvantaged communities, meeting ambitious emissions targets, mobilizing private capital, lowering the cost of capital, lowering energy costs, developing green technology markets, and supporting local community development. These goals are reflected in the range of metrics green banks use to measure and track their performance and demonstrate accountability: emissions saved, job creation, leverage ratios (i.e. private investment mobilized per unit of public spending) and, in some cases, rate of return.

Regardless of the metrics they use to define success, all green banks have used innovative financing to increase access to capital in clean energy markets. This market-expanding activity has enabled greater private investment in clean energy, driving job creation and project development in market segments theretofore unable to access the capital needed to participate in the clean energy revolution.

The Accelerator Builds on a History of Federal Financing via Independent Institutions

SUMMARY

The National Climate Bank Act of 2019 was introduced in the U.S. Senate in July 2019 and in the House of Representatives in December 2019. In 2020, a version of the bill called the Clean Energy and Sustainability Accelerator passed the House with \$20 billion of funding as part of both the Moving Forward Act and the Clean Economy Jobs and Innovation Act. These pieces of legislation capitalize an independent nonpartisan non-profit institution, an “Accelerator,” to finance climate solutions at scale and bring clean energy investment to American communities. This institution will invest its funds in ways that leverage private investment and generate the most impact out of each public dollar.

This institution will be capitalized with federal funds and charged with investing capital in partnership with the private sector in order to get the most impact out of each public dollar. It will invest across sectors in a range of projects that reduce greenhouse gas emissions, lower costs, and increase access for consumers, including clean energy and supporting infrastructure, energy efficiency, clean transportation, and agriculture. The Accelerator’s enabling legislation empowers it to do this using a variety of methods, including by:

- **Directly financing** large-scale projects across economic sectors.
- **Forming new state and local green banks** with start-up funding and technical assistance, and provide lending capital to new and existing state and local green banks.
- **Investing in communities** to ensure the clean energy transition is fair to all, prioritizing under-served communities and those that stand to face the worst impacts of pollution and climate change.

A key feature of the Accelerator’s design is its establishment as an independent nonprofit, capitalized with federal funds but also able to mobilize private and philanthropic investment dollars.

This approach carries unique advantages compared to a more typical model where programs are funded directly through government agencies. There are also a number of precedents that show how such a structure can work. These entities differ in mission, but each demonstrates the effectiveness of a variety of innovative funding models. They:

- **Mobilize private investment.** Federal finance entities deploy public capital to specifically drive private investment into target sectors or markets.
- **Establish new nonprofits.** Non-profits formed by the federal government and funded with both public and private capital then invest into target sectors and markets.
- **Independently invest federal funds.** Non-governmental entities receive federal funds and independently invest them in service of a mission, outside of the federal government.

This paper discusses their lessons and precedents for the Accelerator, including relevant details of their formation, legal status, capitalization, governance, mission, and accomplishments.

FEDERAL FINANCE ENTITIES DRIVING PRIVATE INVESTMENT

The federal government provides billions of dollars of public financing every year to support agriculture, housing, small businesses, rural development and a range of other sectors. Some of this activity is carried out within existing government agencies, and at other times the federal government has created new dedicated government entities.

Several such entities are specifically designed to catalyze private co-investment into underserved sectors or markets. These entities share similarities with the proposed Accelerator, in that they are meant to address market failures by directing public investment in ways meant to mobilize additional private investment.

US International Development Finance Corporation (USIDFC)

The US International Development Finance Corporation (USIDFC) was originally established in 1971 as the Overseas Private Investment Corporation (OPIC) through an act of Congress, and was reorganized as the USIDFC through the BUILD Act of 2018.⁸⁵ The USIDFC is a wholly owned government corporation, and carries the full faith and credit of the US government.

Its enabling statute describes the purpose of the USIDFC as follows:

“[T]o mobilize and facilitate the participation of private sector capital and skills in the economic development of less developed countries ... and countries in transition from nonmarket to market economies, in order to complement the development assistance objectives, and advance the foreign policy interests, of the United States.”⁸⁶

The USIDFC seeks to “crowd-in” private sector investment in less developed countries. It offers two major products to the market: debt financing and political risk insurance.

The corporation’s debt financing can be offered as either loans or loan guarantees with medium- to long-term options, aimed at countries where conventional financial institutions often are reluctant or unable to lend.

While the USIDFC is intended to facilitate private sector participation in less developed countries and countries in transition from non-market to market economies, it is

also permitted to work in upper-middle income countries if there is a national economic or foreign policy rationale or if the work will further development outcomes in the poorest part of those countries.⁸⁷

The USIDFC has a seven-person board whose members include the CEO of the USIDFC, the Secretary of State (ex officio Chair of the Board), the Administrator of USAID (ex officio Vice Chair of the Board), the Secretary of the Treasury, the Secretary of Commerce, and four representatives appointed by the President with the advice and consent of the Senate. These are selected from four separate lists of five people each. One list is submitted by the majority leader of the Senate after consultation with the Chair of the Senate Foreign Relations Committee. One list is submitted by the minority leader of the Senate after consultation with the ranking member of the Senate Foreign Relations Committee.

On the House side, one list is submitted by the Speaker of the House after consultation with the Chair of the House Foreign Affairs Committee, and one is submitted by the minority leader of the House after consultation with the ranking member of the House Foreign Affairs Committee. This process supports the representation of bipartisan interests on the board, while also maintaining a degree of independence from politics.

The organization is statutorily assigned a CEO, Deputy CEO, Chief Risk Officer, Chief Development Officer, Inspector General’s office, and a nine-person development advisory council. It is allowed a maximum contingent liability of \$60 billion, and has a limitation that the organization’s equity investments must not exceed 30% of the total amount of all equity investment in the project and provided that equity investments make up less than 35% of the corporation’s aggregate financial exposure.

The USIDFC operates as a financially self-sustaining agency, with FY 2018 combined total exposure of \$22.8 billion and net cost of operations of \$149m. The USIDFC

85 “The BUILD Act Has Passed. What’s Next?” Center for Strategic and International Studies. Oct. 12, 2018.

86 22 U.S.C. § 9612(b).

87 “The BUILD Act Has Passed. What’s Next?” Center for Strategic and International Studies. Oct. 12, 2018; 22 U.S.C. § 9612(c).

maintains corporate reserves of \$5.8 billion in Treasury securities.⁸⁸

In using public funds to mobilize private investment towards a defined purpose, the USIDFC is broadly similar in purpose to the Accelerator. The USIDFC's achievement of self-sustainability is also an important precedent, which the Accelerator would aim to replicate. After its initial infusion of public funds, the Accelerator would be expected to operate sustainably based on revenue from its investments.

Export-Import Bank (EX-IM)

The Export-Import Bank (EX-IM or the Bank) was established in 1934 to assist in sustaining US employment during the Great Depression, specifically by supporting US exports to the Soviet Union. The organization was originally an export financing agency, meant to help businesses financially cover their needs during the time gap between an export order being placed and the payment being received.

Like the USIDFC, the EX-IM Bank is an independent agency in the form of an independent federal agency. The EX-IM Bank has \$1 billion in capital stock subscribed by the United States.

EX-IM's charter describes the purpose of the Bank:

“To aid in financing and to facilitate exports of goods and services, imports, and the exchange of commodities and services between the United States or any of its territories or insular possessions and any foreign country or the agencies or nationals of any such country, and in so doing to contribute to the employment of United States workers.”⁸⁹

The Bank also has an explicit statutory mandate to avoid competition with private capital:

“It is also the policy of the United States that the Bank in the exercise of its functions should supplement and encourage, and not compete with, private capital; that the Bank, in determining whether to provide support for a transaction under the loan, guarantee, or insurance program, or any combination thereof, shall consider the need to involve private capital in support of United States exports as well as the cost of the transaction calculated in accordance with the requirements of the Federal Credit Reform Act of 1990.”⁹⁰

In 2018, the Bank authorized \$3.3 billion in loan guarantees, insurance, and direct loans in support of an estimated value of \$6.787 billion of US export sales supporting an estimated 33,000 US jobs.⁹¹

The Bank's lending cap is frozen in place if the organization's default rate exceeds 2% at any one time. The Bank is required to hold reserve accounts in the amount of 5% of total outstanding dollar value at any one time. At least 25% of the Bank's annual aggregate spend must benefit small businesses.

The Bank offers a suite of products including loans, loan guarantees, and insurance. Loans offered by the Bank can be either long-term loans (greater than 7-year tenor and more than \$10 million in value) or working capital loans (up to one-year tenor). These loans can be structured finance transactions (tenor of 10–12 years), project finance transactions (tenor of up to 14 years), and renewable energy transactions (tenor of up to 18 years).⁹²

Guarantees offered by the Bank can be long-term (7+ year tenor, more than \$10 million), medium-term (tenor of between one to seven years, less than \$10 million), or working capital guarantees of up to one-year tenor.

The Bank has a senate-confirmed CEO and First Vice President as statutorily-mandated staff. Statutorily, the Board Chair is the CEO of the Bank, and the Board

88 [“Annual Management Report for Fiscal Years 2018 and 2017.”](#) OPIC. November 9, 2019.

89 12 U.S.C. § 635(a)(1).

90 Id. at § 635(b)(1)(B).

91 [“Export-Import Bank of the United States 2018 Annual Report.”](#)

92 [“Export-Import Bank: Frequently Asked Questions.”](#) Congressional Research Service. April 13, 2019.

Vice-Chair is the First Vice President. The Board is rounded out by three additional Senate-confirmed members, including at least one small business representative.

The Bank also has a seventeen-person Advisory Committee, which is appointed by the Board on the recommendation of the President. Its members are required to be broadly representative of NGOs, think tanks, advocacy organizations, foundations, and other institutions engaged in international development.⁹³

There are a number of statutorily-mandated entities within the Bank: a Small Business Division, an Office of Financing for Socially and Economically Disadvantaged Small Business Concerns and Small Business Concerns Owned by Women, and an Office of Ethics. There is also a Chief Risk Officer within the organization and a Risk Management Committee, whose membership is composed of the full Board of Directors.⁹⁴

Like the EX-IM Bank, the Accelerator would aim to encourage and mobilize private capital rather than compete for the same projects. Capitalizing projects that would have been financed anyway would not be an effective way to achieve impact either for EX-IM or for the Accelerator. When public funds are used to make nonviable deals into attractive investment opportunities, all parties benefit.

Department of Energy Loan Programs Office (LPO)

The Department of Energy Loan Program Office (LPO) is an office within the Department of Energy that came into existence when Congress enacted Title XVII of the Energy Policy Act of 2005 to provide incentives for innovative technologies and authorize the Department of Energy to issue loan guarantees.⁹⁵ The American Recovery and Reinvestment Act subsequently added Section 1705 to the EAct to reauthorize and

expand financing available for certain renewable energy systems, electric power transmission systems, and leading edge biofuels.⁹⁶ This expanded program under section 1705 expired in 2011, but the original program established by Title XVII remains operational.

Applications to the LPO are submitted and reviewed on a rolling basis. After an application is reviewed and approved, the LPO and the applicant reach agreement on a term sheet and conditional commitments. After final negotiations, the two parties sign a final loan guarantee agreement.

The LPO supports projects that meet the following four criteria:

- Utilize a new or significantly improved technology.
- Avoid, reduce, or sequester greenhouse gasses.
- Are located in the United States.
- Have a reasonable prospect of repayment.⁹⁷

To date, more than \$40 billion in loans and loan guarantees for 30 projects have been committed through the LPO.⁹⁸

Currently, there is \$17.7 billion in direct loan authority to support US manufacturing of fuel-efficient, advanced technology vehicles and qualifying components available, \$8.5 billion in loan guarantee authority available for innovative advanced fossil energy projects, \$8.8 billion in loan guarantee authority available for innovative advanced nuclear energy projects, up to \$4.5 billion in loan guarantee authority for innovative renewable energy and efficient energy projects, and up to \$2 billion in partial loan guarantee authority for tribal energy development projects available. The total credit subsidy cost of all LPO financed projects has been \$2.21 billion to date, including \$807 million for loans that have defaulted.

93 22 U.S.C § 9613 (i)(2).

94 12 U.S.C. § 635a.

95 42 U.S.C. § 16511 et seq.

96 "[History of the Loan Programs Office.](#)" US Department of Energy.

97 "[Title XVII Project Eligibility.](#)" US Department of Energy.

98 "[Loan Programs Office: About Us.](#)" US Department of Energy.

The commitments made by the LPO enjoy the full faith and credit of the United States,⁹⁹ and the LPO is permitted to charge and collect fees associated with the financing that is extended. Guarantees extended through the LPO are required to adhere to the Davis-Bacon Act, the Cargo Preference Act, and the National Environmental Policy Act.¹⁰⁰

While the LPO may appear similar to the Accelerator in its purpose and its financial offerings, important differences exist between these institutions. The LPO has operated successfully to provide critical capital for first-of-kind commercial demonstrations of new technologies. It addresses the commercialization “valley of death”, and helps new technologies prove that they can be deployed at scale.

The Accelerator then fills the role of actually facilitating that deployment, focusing on projects closer to the edge of commercial viability. The LPO and Accelerator should be seen as complementary continuous links in an effective public finance strategy to support clean energy development and deployment.

FEDERALLY FORMED & FUNDED NON-PROFITS

The federal government has a long legacy of forming private non-profit corporations to implement charitable purposes. These are often funded with public dollars, but then they are also free to raise other funds from private sources. They have greater independence and insulation from political trends than agencies or corporations owned by the federal government. The Accelerator has been proposed to be incorporated as a 501c3 non-profit corporation based on this model.

A 501c3 corporation is a tax-exempt organization that has no legal owners. A non-profit must be incorporated by a person or group of people, and depending on the jurisdiction, some number of founding board members must be identified in the incorporating documents.

Separate and subsequent to that incorporation, the organization must adopt bylaws that define many operating aspects of the non-profit, including the full board composition, the method by which a board is selected, and the terms of board membership. In a typical non-profit, the board is “self-perpetuating.” This means that as the terms of board members ends, or as board members leave, the remaining board members vote among themselves to replace them. In this way, the board (and therefore the non-profit itself) perpetuates itself.

Neighborhood Reinvestment Corporation

The Neighborhood Reinvestment Corporation, originally called NeighborWorks America, was created by an act of Congress in 1978.¹⁰¹ The Neighborhood Reinvestment Corporation is a federally created non-profit, and is exempt from federal, state and local taxation.¹⁰² The organization was created to formally support a network of local Neighborhood Housing Services (NHS) organizations, which were collectively inspired by a single initiative in Pittsburgh in 1968.¹⁰³ NeighborWorks America receives an annual appropriation from Congress: in FY 2019, NWA received \$150 million for its “core” appropriation.¹⁰⁴

These local NHS programs helped low-income residents secure low-cost loans and other assistance to maintain and improve their homes, as well as to buy their first homes and avoid foreclosure.¹⁰⁵ Their offerings varied (and still vary) by geography. Some provide financial and

99 10 C.F.R. § 609.12.

100 Id. at §§ 609.8, 609.4.

101 42 U.S.C. § 8102(a).

102 Id. at § 8102(d).

103 “Policy Guide: NeighborWorks America.” Community-Wealth.

104 “Neighborhood Reinvestment Appropriation.” National NeighborWorks Association.

105 “Our Mission and History.” Ithaca Neighborhood Housing Services (INHS).

credit counseling, or help prospective homeowners to find affordable properties.¹⁰⁶ Some are federally certified Community Development Financial Institutions (CDFIs),¹⁰⁷ a status which allows them to secure low-cost capital from the federal government and re-lend it to their clients.

The Neighborhood Reinvestment Corporation ties these diverse local institutions together around their common mission, provides a pathway for federal support in the form of funds, technical assistance, and the sharing and tracking of data.¹⁰⁸ Today, the organization has nearly 250 members.¹⁰⁹ It receives direct annual federal appropriations, as well as funding from corporations, foundations, and other partners.¹¹⁰ These funds are distributed to member organizations in the form of grants, which they can use to attract additional funding to expand their local impact.

The Board of Directors governing the Neighborhood Reinvestment Corporation is established in the statute, and is comprised of the heads of six federal agencies including the FDIC and the Federal Reserve System. The law also specifies that the Board of Directors shall elect a Chair, appoint an Executive Director, and create by-laws and administrative procedures.¹¹¹

The overall structure of the Neighborhood Reinvestment Corporation bears some similarities to the Accelerator that go beyond its status as a federally chartered nonprofit. In connecting and supporting a pre-existing network of local and community institutions, the Neighborhood Reinvestment Corporation creates a comparable relationship to the one that the Accelerator would have with the network of state and local green banks.

Foundation for Food and Agriculture Research (FFAR)

FFAR was established by the Agricultural Act of 2014, commonly known as the Farm Bill.¹¹² By establishing FFAR as a nonprofit with the ability to combine public and private investment, its creators sought to increase the total investment impact it could put towards research and development in agricultural technologies to feed a growing global population.

FFAR was initially capitalized with \$200 million in federal dollars, and required to match those funds with equal or greater non-federal dollars. The Agricultural Improvement Act of 2018 then appropriated an additional \$185 million to FFAR, with the request to develop a strategic plan describing a path for sustainability.¹¹³

The organization has six defined research areas, and award grants ranging in size from tens of thousands of dollars to over \$1 million at a time.¹¹⁴ FFAR describes their process as follows:

“We engage stakeholders across academia, public sector and private companies to identify pressing research ideas with potential to fill critical knowledge gaps and advance science. While an independent nonprofit, the Foundation complements and advances the United States Department of Agriculture’s (USDA) mission and builds programs that are of mutual interest to USDA and the agricultural community at-large. We fund only the most innovative, actionable science with the potential for positive impact in the United States and around the world.”

106 [“Our Programs and Services.”](#) Neighborhood Housing Services of Jamaica (NHSJ).

107 [“Our Mission and Vision.”](#) Neighborhood Housing Services of New York City.

108 42 U.S.C. § 8105.

109 [“Become a Member.”](#) NeighborWorks America.

110 [“2018 Annual Report.”](#) NeighborWorks America.

111 42 U.S.C. § 8103.

112 7 U.S.C. § 5939; [“Our History.”](#) FFAR.

113 [“2019 Strategic and Sustainability Plan.”](#) FFAR.

114 [“Our Awards.”](#) FFAR.

FFAR works with its private contributors to provide benefits in addition to the output of the actual funded research. At the highest level, private contributors are granted perks including on-site briefings directly from FFAR’s executive director. However, FFAR also specifies that contributions must align with the organization’s mission and meet the approval of the Board of Directors.¹¹⁵

FFAR’s founding legislation specified that the Board of Directors consists of five ex-officio nonvoting members from different offices within the Department of Agriculture and the National Science Foundation, which would appoint 15 voting members. Of these, eight shall be selected from a list of candidates to be provided by the National Academy of Sciences; and seven shall be selected from lists of candidates provided by industry.¹¹⁶ The Foundation hired its first employee in October 2014, and the hiring committee then selected Dr. Sally Rockey to be the Foundation’s first Executive Director in September 2015.¹¹⁷

In seeking a path to financial self-sustainability, FFAR will follow precedents set by other organizations including the USIDFC, described above. This self-sustainability is an important reason why institutions established using this model can be particularly cost-effective uses of taxpayer funds. For the Accelerator, whose mission is to achieve maximum impact with each public dollar, cost-effectiveness and self-sustainability will be key components of its design.

Foundation for the National Institutes of Health (FNIH)

The FNIH was established by Congress as an independent nonprofit in 1990.¹¹⁸ It began its work in 1996, with the mission of facilitating scientific and medical research at the National Institutes of Health (NIH) and worldwide. It is empowered to raise private funds and create public-private partnerships in support of NIH’s mission.¹¹⁹ The FNIH reports that to date, it has raised more than \$80 for every dollar of NIH funding.¹²⁰ In 2018, FNIH received \$2 million from NIH, comprising about 3% of FNIH’s total revenue and support.¹²¹ FNIH is not named in NIH’s budget requests to Congress or in Congressional appropriations language to NIH.

FNIH provides direct financial support to biomedical science researchers, but also undertakes a range of other activities. For example, FNIH supports programs that provide funding and training for early-career scientists, and holds events and conferences to allow researchers to facilitate the sharing of data and ideas. FNIH also conducts outreach and sponsors exhibits to help the public develop a broader understanding of biomedical science.¹²²

Part of FNIH’s value as an independent organization is its ability to be a resource for unbiased scientific expertise, and to neutrally facilitate conversations that would not otherwise be possible. Exchanges of scientific ideas among private sector entities, and between the private sector and government, can face barriers due to competitive concerns among private companies. FNIH can mediate between these entities.

In selecting private partners, FNIH seeks to strategically draw in expertise, including from scientists, business leaders, donors, physicians, and advocates. Guidelines govern FNIH’s investments, stipulating that “motives for

115 “Contributor Benefits.” FFAR.

116 [H.R. 2642: Agricultural Act of 2014. Subtitle F, Sec. 7601.](#) Via FFAR.

117 “Our History.” FFAR.

118 42 U.S.C. § 290b.

119 “About Us.” FNIH.

120 “Biomedical Science Needs To Achieve More in a Limited World.” Capabilities Brochure. FNIH.

121 “2018 Annual Report.” FNIH.

122 “Biomedical Science Needs To Achieve More in a Limited World.” Capabilities Brochure. FNIH.

participation of the potential funders do not undermine the project.” FNIH policy, for example, excludes participation from the tobacco industry.¹²³

FNIH has ex-officio nonvoting directors comprised of: the Director of the NIH, the Chairman and ranking minority member of the Subcommittee on Health and the Environment (Committee on Energy and Commerce) or their designees, in the case of the House of Representatives; the Chairman and ranking minority member of the Committee on Labor and Human Resources or their designees, in the case of the Senate; and the Commissioner of Food and Drugs.¹²⁴

The ex officio members of the Board appoint voting members from among a list of candidates provided by the National Academy of Sciences. The term of office of each appointed member of the Board is five years. Any vacancy in the membership of the Board is filled in the manner in which the original position was made.

As with FNIH, an important benefit of the Accelerator’s independent nonprofit status would be its ability to use technical expertise to make unbiased investment decisions, and to mediate between stakeholders that might otherwise have competitive relationships.

OTHER INDEPENDENT ENTITIES INVESTING FEDERAL FUNDS

The last set of precedents are entities that sit entirely outside of government and are not operated for or on behalf of the federal government, but which receive federal funds to invest in a mission-based activity. These institutions have an extensive track record using billions in capital to invest in large-scale projects across the globe, and help show how the Accelerator could multiply the impact of its starting capital through leverage and recycling.

The World Bank

The World Bank is an international development financial institution (DFI) that provides loans and grants to governments of low- and middle-income countries. Its mission is the reduction of poverty. The World Bank, also known as the International Bank for Reconstruction and Development (IBRD), was originally created in 1944 at the Bretton Woods Monetary Conference in New Hampshire. Its initial mandate was to help rebuild European countries in the aftermath of World War II.¹²⁵ In the 1970s, the Bank shifted its attention to poverty eradication. Development projects include the construction of infrastructure, projects related to food production, rural and urban development, and population, health and nutrition to serve the poor.¹²⁶

The World Bank is owned and governed by its member countries. Governments around the world provide capital to the World Bank in exchange for shares and voting rights.¹²⁷ The World Bank treats this capital as “equity” and then raises the majority of its lending capital in capital markets by issuing bonds. Some of the largest shareholders in the World Bank include the United States, Japan, Germany and China. Voting rights are allocated by shares. The total amount of capital paid into the World Bank’s IBRD is \$270 billion. The World Bank’s shareholders most recently endorsed additional capital allocations to the World Bank in April of 2018 of \$7.5 billion new paid-in capital for IBRD and \$52.6 billion new callable capital increase for IBRD.¹²⁸

The World Bank headquarters are in Washington DC, and the United States has a controlling voting interest. The President of the World Bank is traditionally from the United States as a matter of custom. Due to its large equity base from sovereign governments, the World Bank consistently enjoys a AAA credit rating, even though the World Bank’s debt is not guaranteed by the shareholding

123 “[Frequently Asked Questions.](#)” FNIH.

124 42 U.S. Code § 290b(d).

125 Cf. International Bank for Reconstruction and Development, Articles of Agreement, Article I.

126 “[History.](#)” The World Bank.

127 Some capital is directly “paid in” and some is made available and is “callable” if the World Bank needs it.

128 “[World Bank Group Shareholders Endorse Transformative Capital Package.](#)” The World Bank. April 21, 2018.

governments. This strong credit rating allows the World Bank to raise debt at very low rates.¹²⁹

The United States is the largest contributor to the World Bank; accounting for the largest share of the IBRD's capital, \$46.4 billion (17.25%) of a total of \$270 billion. Of the U.S. total contribution of \$46.4 billion, \$2.9 billion is paid-in capital. This amount has been fully authorized and appropriated by Congress over the course of several appropriations measures since the World Bank's founding. Each of these authorizations and appropriations was done as a one-off event, with the approval of Congress each time, and was part of a larger capital raise of other contributors from other countries, and from the capital markets.

The remaining portion of the U.S. subscription, totaling \$43.5 billion, is in the form of callable capital, and has also been fully authorized by Congress. However, only \$7.7 billion of that \$43.5 billion has been fully appropriated and could be used by the World Bank without need for further U.S. congressional action.¹³⁰ That is, the United States has made numerous appropriations to the World Bank over many years, both in the form of paid in capital and callable capital. All of the paid in capital, and a portion of the callable capital has already been appropriated and can therefore be "called" without the need for congressional approval. Further capital calls beyond the \$7.7 billion in callable capital (which would only happen in extreme circumstances of severe credit distress at World Bank) would require additional congressional approval.

Since the 1982 foreign operations appropriations bill was adopted, Congress has authorized but not appropriated new callable capital. U.S. law (22 U.S.C. § 286c) requires that Congress give its assent before the United States can vote in favor of a new IBRD funding plan that increases U.S. contributions.¹³¹

The World Bank grows its capital base in four primary ways:

- Receiving additional paid in and callable capital from country shareholders.
- Receiving additional government donor capital.
- Bond issuances on the international capital markets.
- Return on investment.

The World Bank is comprised of two institutions: the International Bank for Reconstruction and Development (IBRD), which lends to middle income countries, and the International Development Association (IDA), which lends to low-income countries.¹³² These loans are primarily sovereign-backed, meaning they are backed by the ability of the borrower government to repay them. In part due to its ability to raise money at low costs, and its ability to raise additional grant financing from country donors, the World Bank offers financing to low- and middle-income countries at low rates and flexible terms.

The IBRD arm of the World Bank focuses on sovereign lending to middle-income countries, offering flexible loans with maturities as long as 30 years. The IDA arm of the World Bank focuses on low-income countries, and offers grants and loans with maturities ranging from 25 to 40 years, grace periods of five to ten years, and interest rates of 2.8% or 1.25%, depending on level of development and indebtedness.

The World Bank facilitates private investment by acting as an intermediary: issuing bonds in the international private capital markets, and then lending to sovereign backed development projects in low- and middle-income countries. In addition, the World Bank can require that certain projects have co-investors (either public or private) participating in a deal.¹³³

129 ["Research Update: International Bank for Reconstruction and Development 'AAA / A-1+' Ratings Affirmed on Revised Criteria, Outlook Stable."](#) S&P Global Ratings. Feb. 13, 2019.

130 ["2018 World Bank Capital Increase Proposal."](#) Congressional Research Service. Dec. 14, 2018.

131 Ibid.

132 The larger World Bank Group also includes the sister organizations International Finance Corporation (IFC), the Multilateral Investment Guarantee Agency (MIGA), and the International Centre for the Settlement of Investment Disputes (ICSID).

133 As part of the larger World Bank Group, the IFC offers financing to private (non-sovereign) actors in countries if they meet investment criteria and development objectives, and MIGA offers political risk insurance to encourage public and private investment

The World Bank, like most DFIs, has stated goals of catalyzing more private investment. Due to the variety of financial products and services offered by DFIs, and lack of consistency on definitions and methodologies, tracking private sector mobilization is a challenge.¹³⁴ Looking at the “climate sector” in particular, the World Bank invested just over \$9 billion in 2014. In that same year, the World Bank estimated private co-finance at \$1.194 billion (for a ratio of 1 : 0.13) and public co-finance of \$10.471 billion (for a ratio of 1 : 1.13).¹³⁵ In 2018, it was estimated that the World Bank Group (including IBRD, IDA, IFC and MIGA) invested 13.435 billion in climate sectors, with private direct mobilization of 5.590 billion (for a ratio of 1 : 0.42), and public direct mobilization of 12.977 billion (for a ratio of 1 : 0.97).¹³⁶

Like the World Bank, the Accelerator would not be backed by the full faith and credit of the U.S. government, and would raise capital based on its own creditworthiness. The Accelerator would similarly seek to leverage its balance sheet and recycle capital into new loans and products as available. The example set by development banks like the World Bank is a key component of CGC’s finding in a separate analysis that the Accelerator can feasibly turn \$35 billion of public capital into trillions of total investment over its 30-year charter.

One difference between the World Bank and existing green banks is the role of leverage at the project level. Development banks do not optimize individual projects to draw in private capital as green banks do, meaning that the Accelerator could be expected to achieve a higher mobilization ratio and create more opportunities for private investment.

The Climate Investment Funds (CIF)

The CIFs are a group of donor Trust Funds established in 2008 to support developing countries’ efforts to invest in climate-friendly projects. The CIFs disperse funding to 72 developing and middle-income countries.¹³⁷ The CIFs have a total capitalization of \$8.3 billion, and these funds are comprised entirely of country donor money from 14 upper-income nations including Japan, the UK, the United States and Germany. The CIFs’ capitalization comes from donors in the form of grants only (not equity or loans), and the CIFs do not raise additional money in the capital markets. The CIFs are headquartered in Washington DC and structured as a donor trust fund, with the World Bank serving in the trustee role with fiduciary responsibilities. The CIFs are governed by a rotating trust fund committee composed of country representatives.

The CIFs are able to provide developing countries grants, concessional loans, risk mitigation instruments, and equity. CIFs administrators seek to use these instruments to leverage significant co-financing from the private sector, multilateral development banks, (MDBs) and other sources. Total CIF funding of \$8.3 billion is expected to attract an additional \$58 billion of co-financing for a portfolio of over 300 projects and counting.¹³⁸ The CIFs are composed of sub-funds or “windows”, notably the Clean Technology Fund (CTF), the Strategic Climate Fund (SCF), the Forest Investment Program (FIP), the Pilot Program Climate Resilience (PPCR) and the Scaling Up Renewable Energy Program (SREP).

The CIFs were established in 2008 and use a model of “equitable governance that fosters participation, partnership, and transparent decision making.”¹³⁹ The CIFs operate with “trust fund committees” that have equal representation of donor and recipient countries, consensus decision-making, and active observer status for private sector, civil society, and indigenous peoples

134 “Reference Guide: MDB Methodology for Private Investment Mobilization.” World Bank. June 2018

135 “Tracking Climate Co-Finance: Approach Proposed by MDBs.” Dec. 4, 2015.

136 “MDB Climate Finance Hit Record High of 43.1 Billion in 2018.” World Bank. June 13, 2019.

137 “History of the CIF.” Climate Investment Funds.

138 “Climate Investment Funds.” Devex.

139 “Governance.” Climate Investment Funds.

representatives. The two primary trust funds that comprise the CIFs, the CTF and the SCF, are each governed by a committee that oversees and decides on operations and activities.¹⁴⁰ The CIF Trust Fund committees are composed of eight representatives from contributor (donor) countries, and eight representatives from recipient countries. Contributor countries are given an 18-month rotation on the committees, and a minimum contribution size is required for eligibility to sit on the trust fund committee. Trust fund committee observers (from civil society, private sector and indigenous peoples groups) have no voting rights.¹⁴¹

The U.S. has pledged just over \$2 billion to the CIFs, out of the total of over \$8 billion in total CIF funds, making it the second largest contributor after the United Kingdom. The initial U.S. pledge to contribute \$2 billion to the CIFs was made at the 34th G8 Summit held in Hokkaido, Japan in 2008 under the Bush Administration.

After this pledge, Congress approved the funding in several discrete tranches. For FY2010, Congress approved \$375 million for the CIF (the Consolidated Appropriations Act, 2010, H.R. 3288; P.L. 111–117); for FY2011, Congress approved \$234.5 million (the Department of Defense and Full-Year Continuing Appropriations Act, 2011, H.R. 1473; P.L. 112–10); and for FY2012, Congress approved \$234.5 million (the Consolidated Appropriations Act, 2012, H.R. 2055; P.L. 112–74), followed by several more appropriations.¹⁴²

The U.S., as one of the largest contributors, sits on the trust fund committees and has voting rights on the CIFs' investment through the trust fund committees. Individual representatives from contributor countries serve for 18-month rotations.

The CIFs offers grants, concessional loans, risk mitigation instruments, and equity to developing countries that are eligible under the CIF framework. CIF rules require, however, that all CIF funds flow through a

Multilateral Development Bank (MDB), such as the African Development Bank, the Asian Development Bank, the Inter-American Development Bank, the European Bank for Reconstruction and Development (EBRD) or the World Bank Group. In order for countries or other actors (such as national development banks) to access CIFs, an application must be developed and submitted by an MDB partner, who then channels CIF funding (along with any of the MDB's matching funds) directly to the country or local project.

The CTF has the following goals with respect to offering funding via the MDBs:

- Finance at scale in the near-to-medium term to meet investment needs to support rapid deployment of low carbon technologies and increase energy efficiency.
- Optimize blending with MDB financing, as well as with bilateral and other sources of finance, to provide incentives for low carbon development.
- Provide a range of financial products to leverage greater private sector investments.
- Provide financial instruments integrated into mainstream development finance and policy dialogue.¹⁴³

To date the CIFs have made over 300 investments in 72 developing and middle-income countries to scale up renewable energy and clean technologies, mainstream climate resilience in development plans and action, and support the sustainable management of forests. Most programs and projects are still in the early stages of implementation, but CIF reports that its funding allocated has already totaled more than \$5.7 billion, and CIF funding has already contributed to over three gigawatts of new renewable energy capacity and close to three million people have benefitted from CIF-supported climate resilience measures.¹⁴⁴

The size and scope of the CIF provide a view towards the scale of impact that the Accelerator seeks to accomplish

140 Ibid

141 "Governance Framework for the Clean Technology Fund." Climate Investment Funds. June 2014.

142 "International Climate Change Financing: The Climate Investment Funds." Congressional Research Service. March 1, 2012.

143 "Governance Framework for the Clean Technology Fund." Climate Investment Funds. June 2014.

144 "History of the CIF." Climate Investment Funds.

within the US. Capitalized with billions of dollars, the Accelerator would work to multiply that impact many times over, construct gigawatts of new clean power capacity, and serve millions of people.

CONCLUSIONS

These precedents show that the proposed structure and functions of the Accelerator are not unique, although its mission and impact would be.

- Federal finance entities like the EX-IM Bank and the USDIFC have established how US public funds can be used to deploy public capital to drive greater private investment into target sectors.
- Nonprofit entities like NeighborWorks America and the FNIH show how the federal government can form new nonprofit corporations with the independence and freedom to engage with the private sector in ways that a wholly-owned government corporation cannot.
- International development finance institutions like the World Bank and the CIFs show the massive scale that can be achieved when billions in public funds are

combined with the ability to mobilize private capital and recycle funds.

In all cases, lessons can be learned from these entities' legal status, funding mechanisms, governance structure, mission and outcomes. In particular, these precedents provide clear reasons to create the Accelerator as a federally chartered non-profit entity that is not an agency or instrumentality of the government. Its independent status would ensure its perpetuity as set forth in its organizing documents, freeing the entity from the effects of policy changes caused by changing administrations. The institution's structure would be critical to its ability to mobilize capital, as lenders and investors' perception of the Accelerator's independence and stability will affect the terms upon which it can secure and mobilize private capital.

Meaningful greenhouse gas emissions reductions to address the climate crisis will require significant investments to transform the energy sector and the nation's infrastructure on a large scale. Learning from established precedents and creating an effective institutional framework for the Accelerator will be critical.

The Accelerator Complements Other Climate Policies and Financing Programs

The National Climate Bank Act of 2019 was introduced in the U.S. Senate in July 2019 and in the House of Representatives in December 2019. In 2020, a version of the bill called the Clean Energy and Sustainability Accelerator passed the House with \$20 billion of funding as part of the Moving Forward Act and the Clean Economy Jobs and Innovation Act. These pieces of legislation capitalize an independent nonpartisan non-profit institution, an "Accelerator," to finance climate solutions at scale and bring clean energy investment to American communities. This institution will invest its funds in ways that leverage private investment and generate the most impact out of each public dollar.

The Accelerator will not come into existence in a vacuum. The federal government currently supports clean energy development and deployment through a variety of programs. Further, a number of national policy interventions have been proposed, e.g. Carbon Tax, Renewable Energy Standard, Cap and Trade regime, to accelerate climate investment. This memo will discuss the constellation of federal clean energy finance interventions and demonstrate how the Accelerator provides a uniquely broad and effective mechanism for clean energy investment, that in many instances complements existing or proposed policies and programs.

HOW THE ACCELERATOR COMPLEMENTS EXISTING FEDERAL CLEAN ENERGY FINANCING PROGRAMS

The federal government has various programs to support the deployment of clean energy. Many of these programs provide grants or direct payments to actors who undertake clean energy or energy reduction projects. A more limited set of programs provide financing to enable certain types of clean energy investment. As a policy matter, multiple approaches can and should be implemented to accelerate investment in clean energy and sustainability projects. There is no silver bullet for climate change. Each of the programs listed is designed to achieve certain objectives, which in turn means it has limits on the way it operates and what it is able to accomplish. The Accelerator is designed to complement each of these programs in distinct ways.

DOE – Loan Programs Office (LPO)

The Title XVII loan program housed in the Loan Programs Office (LPO) at the U.S. Department of Energy provides loan guarantees to support the commercialization of “new or significantly improved” technologies not currently in commercial use at the time the guarantee is issued. Loan guarantees are made to qualified projects and applicants who apply for funding in response to open technology-specific solicitations. The LPO requires that the borrower pay certain costs at the time of loan closing including a “credit subsidy cost” equal to the net present value of the estimated long-term cost of the loan guarantee.

The principal limitation of the LPO is structural. The program is designed to facilitate the commercialization i.e. to prove the commercial viability of clean energy technologies. The program is not designed to facilitate the deployment i.e. financing, installation and operation of clean energy technologies at wide scale. Specifically, the LPO does not have a statutory mandate to address the obstacles to deployment including high customer acquisition costs, information asymmetries, collective action problems, split-incentive barriers, low-customer awareness, demand generation, the capacity of existing labor force

and high transaction costs among others. The Accelerator is an effective complement to the LPO. As a deployment focused entity, it has the mandate to focus on overcoming the obstacles to deploying the technologies that may be commercialized by the LPO.

The second limitation of the LPO is programmatic. Even if the LPO were able to focus on overcoming obstacles to deployment, it’s given tool, loans and loan guarantees would be insufficient. It is well documented that clean energy projects require a variety of capital forms (e.g. subordinated debt, project equity, working capital, credit enhancements etc.) and market support mechanisms (e.g. technical assistance, contract standardization, labor force development) to achieve broad market deployment. This limitation presents another opportunity for complementarity with the Accelerator. The Accelerator will be authorized to use a variety of financial products including debt, equity, credit enhancements and technical assistance to tackle barriers to deployment. If an Accelerator exists, the LPO does not need to broaden its mandate or revise its programs to see the technologies it commercializes achieve broad deployment.

Finally, the LPO’s mandate is limited. It has no authority or ability to target investments into low-income, frontline or underserved communities. And it has no authority or ability to consider job creation in its investment decisions. Two of the Accelerator’s three primary objectives are environmental justice and job creation (in addition GHG emissions mitigation). The LPO cannot meaningfully contribute to achieve these two objectives, which again calls for a complementary Accelerator.

USDA – Rural Energy Savings Program

The Rural electric savings program (RESP) provides loans to eligible entities, typically corporations, states, municipalities and utilities, that agree to make low cost energy efficiency loans to rural consumers and small businesses. Under the program the funds are borrowed at zero percent from the RUS and then can be re-lent to customers at no more than 5% interest. Eligible borrowers must serve customers in rural communities. Recently the RESP

determined that state and local green banks were eligible borrowers under the program.

The RESP program's principal limitation is a dependence on identifying eligible borrowers within rural communities. The Accelerator is mandated to create and capitalize green banks in markets where such entities don't currently exist – large swaths of the country. Every green bank that the Accelerator creates is another potential RESP borrower who can use the green bank toolset to tackle clean energy deployment in a rural market.

IRS – Renewable Energy Tax Credits

Renewable energy tax credits, namely the production tax credit and investment tax credit, reduce a project owner's tax liability in exchange for such taxpayer investing in certain renewable energy generating assets or producing certain quantities of renewable energy. Under the program the taxpayer undertakes an eligible project and then receives a credit against their tax liability on their next tax return. Alongside state policy, federal tax incentives have been the primary policy driver for the growth of wind, solar, and other renewables during the past decade.

The tax credit program is a powerful tool, but is limited by both structure and mechanism. Structurally, the tax credit program requires a taxpayer with tax liability to undertake the project. Projects of a certain size are able to obtain tax equity partners who can monetize the value of the tax credits of a constructed project. However, smaller projects and those occurring where the owner lacks tax liability (e.g. on non-profit buildings) find it difficult to access the value of tax credits. Accordingly, many otherwise viable smaller projects go unconstructed resulting in an under deployment of otherwise deployable clean energy technologies. It also makes the tax credit regressive since all federal taxpayers contribute to the creation of the credit and related payments, but only those wealthy or profitable enough to have a tax liability can benefit. As an institution the Accelerator can seed green banks that aggregate smaller projects from limited tax liability project developers to achieve sufficient scale to access tax equity.

Tax credits are also limited as a deployment mechanism. Essentially, tax credits provide a subsidy to lower overall project costs in order to incentivize adoption of the clean energy technology. However, cost of installation is not the only barrier to clean energy deployment. Many clean energy projects face collective action problems like split incentives, lack development capital or expertise or require warehousing to meet the minimum transaction thresholds. The Accelerator solves for these flaws by providing the other sources of capital, predevelopment, sponsor equity and market building expertise necessary to bring the project to completion.

Finally, the tax credits as they are designed today cannot be geographically targeted. The IRS cannot cause the tax credits to be used more heavily or exclusively in low-income, frontline or communities of color. There is no decision-making capacity or mechanical process to direct the use of the tax credits to benefit certain geographies. Again, the Accelerator complement and indirectly cause the tax credits to flow into targeted communities by supporting clean energy deployment in underserved markets, and to use structures that allow parties to take advantage of tax credits that are otherwise inaccessible.

HOW THE ACCELERATOR SUPPORTS PROPOSED POLICY INTERVENTIONS

The Accelerator is also complementary to proposed national policy interventions like a Carbon Tax, Cap and Trade or a Renewable Energy Standard. In each case, the Accelerator can accelerate the deployment of clean energy technologies that are encouraged or mandated under the policies, and can use its funds in ways to ensure the cost of transitioning to clean energy does not fall on energy users. To mitigate the worst impacts of climate change we need actual projects in the ground, and relying solely on secondary market forces or regulation leaves too much uncertainty about the speed, equity and cost of the transition. The Accelerator is a critical and complementary tool to these policies to put real projects in the ground.

Carbon Tax

A carbon tax would raise the cost to consumers and businesses of carbon intensive goods and services like gasoline, natural gas, and fossil fuel-generated power. The intention of this cost increase is to incentivize customers to purchase less of these goods and services in favor of less carbon-intensive alternatives that do not carry as much penalty. A negative consequence of a carbon tax is that it falls heavily on low-income households who spend a disproportionate amount of their income on carbon intensive goods and services. In addition, there is a fair amount of uncertainty about the elasticity of demand for energy services, particularly in the absence of a liquid, transparent and informed market about the alternatives. In the absence of well-functioning markets for alternatives (i.e. clean energy) it is not clear how much a carbon tax would raise costs on energy consumers without actually causing a switch to clean energy, or how much increased financial burden a consumer would accept before seeking alternatives. Because markets for clean energy alternatives are highly illiquid, are slowed by a myriad of barriers, have intrinsic inequalities that harm low-income consumers, and are rife with information asymmetries, it is critical that complementary steps be taken to knock-down these barriers to switching and facilitate a low-cost transition away from fossil fuel and towards clean energy. The Accelerator is an ideal institutional and investment mechanism to play this role.

First, the Accelerator will be a mechanism for the efficient allocation of the proceeds of a carbon tax into decarbonization projects. It has been well documented that capital does not necessarily create additional projects. A market actor must marry the capital with a technology, off taker, site etc. to realize decarbonization. Absent such a mechanism, the desired impact of carbon tax – switching to clean energy and not just raising costs – may not be realized. Government can raise revenue from carbon intensive sources that should flow to non-carbon sources. If, however low carbon alternatives are not developed, the resulting shortage would increase the short-term price of the low-carbon alternatives. The Accelerator would avoid this negative impact by forming state and local green banks that can help ensure

low-carbon projects are developed in tandem with increases in price on high-carbon goods and services.

Second, the Accelerator would be an optimal tool for resolving the inequity imbedded in a carbon tax proposal. The Accelerator has the ability to assess the distributional impacts of its investment portfolio. Using the Accelerator as a distribution mechanism would enable disproportionate investments in low-carbon resources that benefit low-income communities. Again, this would be very beneficial because, absent low carbon replacements, the carbon tax could create a shortage of low-carbon resources further penalizing low-income communities.

Finally, as a flexible source of financing the Accelerator can pull various levers in transactions to ensure that the cost of switching to clean energy results in a true reduction in energy costs for a household. A household's monthly energy expense before a carbon tax may be \$250, but with a carbon tax it might increase to \$300. Yes, this higher price now means that the household would be better off with a clean energy alternative that lowers the monthly cost back down to \$275. But in reality, this still represents a \$25 increase from their prior monthly costs, meaning that the impact of the transition to clean energy, on net, was a cost increase rather than a new saving. This is not optimal for economic, equity and political reasons, and the Accelerator can rectify this by offering financing at the necessary terms to ensure that the monthly cost of the transition falls to at least \$250, if not lower.

Cap and Trade

A cap and trade places a declining limit on the amount of greenhouse gas emissions a particular market actor, usually a utility, can emit. Market actors may comply with the cap by purchasing allowances at auctions, from other market actors or from offset projects. The revenues raised from such auctions can be used to catalyze the creation of clean energy projects in the same geographic market. A negative externality of cap and trade is that emitting sources in low-cost places remain online (because they have the lowest auction prices). Often low-cost places are places where low-income, black, brown and disinvested communities reside.

Like with a carbon tax, the Accelerator would be a powerful mechanism for allocating the proceeds of a cap and trade regime with an eye to equity. The Accelerator could take the proceeds of a cap and trade auction, couple those proceeds with other forms of public and private capital then invest those proceeds in projects that rapidly offline polluting sources in LMI communities. This model is already in practice. Connecticut, New York and New Jersey have allocated proceeds from the Regional Greenhouse Gas Initiative (RGGI) cap and trade program to state green banks for investment in clean energy projects.

Renewable Energy Standards

A renewable energy standard (RES) requires that a certain percentage of power electric distribution companies (utilities) deliver to customers is generated by renewable sources. Utilities prove this to regulators by showing that, at regular intervals, they own the requisite number of renewable energy credits (RECs), where each REC represents 1 MWh of power renewable power. Utilities acquire RECs either by purchasing RECs that are generated by renewable projects, or by directly owning renewable generation projects which naturally produce RECs that the utility retains. RECs bought and sold on tradable markets are exchanged at prices that are informed by market limitations, price caps and the forces of supply and demand. In short, the RES is a mandate on utilities to own RECs, but it is not a mandate for utilities, or any other actor, to build renewable power. It is up to market design and market forces to cause other actors to decide to build renewable energy projects.

This reliance on market forces to comply with a mandate means that the speed, cost, distribution, location and technologies used to meet the mandate are unknown. For instance, studies have shown that an RES raises the price of power to ratepayers because utilities must procure RECs at a price above and beyond the price of power. Most RES's also allow trading of RECs across states, which means a utility can comply with its state's RES with projects built in entirely different states that may be far away. This means the economic benefits and job creation that come with project construction may accrue elsewhere.

The Accelerator can address this in a fashion similar to how it complements a carbon tax. Rather relying purely on market forces that are spurred to action by a mandate, the Accelerator can proactively work to ensure the outcomes of that market action are cost-saving, equitable and rapid. The Accelerator can strategically invest in projects that deliver benefits not just in the form of REC production, but also that can lower costs to ratepayers and create jobs in targeted communities.

The Accelerator can play be an intermediating function by facilitating transactions between smaller renewable generation projects and utilities. Small projects struggle to access REC markets, as individuals usually do not have the know-how or time to figure out how to register and then sell RECs on large markets. This is a missed opportunity for investment and clean power generation. Accelerator intermediation can lower the cost of renewable power to utilities while enabling more households to access the resilience and savings benefits of small-scale renewable generation. The Connecticut Green Bank has successfully implemented this model by aggregating RECs generated by residential rooftop solar projects in Connecticut and selling them to utilities, generating value for both parties.

Federal Legislative History of the Accelerator

FEDERAL EFFORTS IN 2009

The first federal legislation to create a national green bank was the [Green Bank Act of 2009](#), introduced by then-Rep. Chris Van Hollen.

The bill would capitalize a federal green bank by issuing green bonds. This institution aimed to provide low-cost financing to qualified clean energy and energy efficiency projects, and was referred to Ways and Means Committee.

At the time, the biggest climate policy proposal under consideration in Congress was the American Clean Energy and Security Act (ACES), also known as the Waxman-Markey bill, which aimed to establish a nationwide cap-and-trade program. To ensure the green bank idea moved forward with this larger cap and trade bill, Rep. Van Hollen sought direct sponsorship by members of the Energy and Commerce Committee, which was leading that effort.

On April 30, 2009, Rep. Jay Inslee (lead sponsor), Rep. John Dingell (lead co-sponsor) and Reps. Israel, Weiner, Klein, Halvorson, and Tauscher (original co-sponsors) introduced the [21st Century Technology Deployment Act](#), which provided for the creation of a federal green bank within the Department of Energy and gave it a new name – the Clean Energy Deployment Administration (CEDA). The bill also expanded and updated the loan guarantee program already available from the Department of Energy since 2005. Reps. Polis and Bean later co-sponsored.

This bill was ultimately added to the broader cap-and-trade bill as amendment. On May 19, 2009 the amendment formally was adopted with a [51-6 bipartisan vote](#) in the Energy and Commerce Committee. The broader ACES bill, now containing CEDA, then [passed](#) the full House.

There was [bipartisan](#) support in the Senate Energy and Natural Resources Committee for a [similar provision](#). However, this bill never reached the full Senate for a vote because it did not contain cap-and-trade. As a result, no national green bank was created.

EVOLUTION AND REFINEMENT AT THE STATE LEVEL

Though initial success was not found at the federal level, this development sparked the green bank movement we see today throughout the U.S. at the state and local level. With each new green bank formed came critical lessons learned on the best way to design and operate a green bank. The real-world experience and application of the green bank financing methodologies revealed opportunities for refinement. And with the passage of time, clean energy technology, markets, and financing all changed, pushing green banks to adapt to new market conditions. The net result is the green bank model evolved and improved over time based on real-world conditions and experiences.

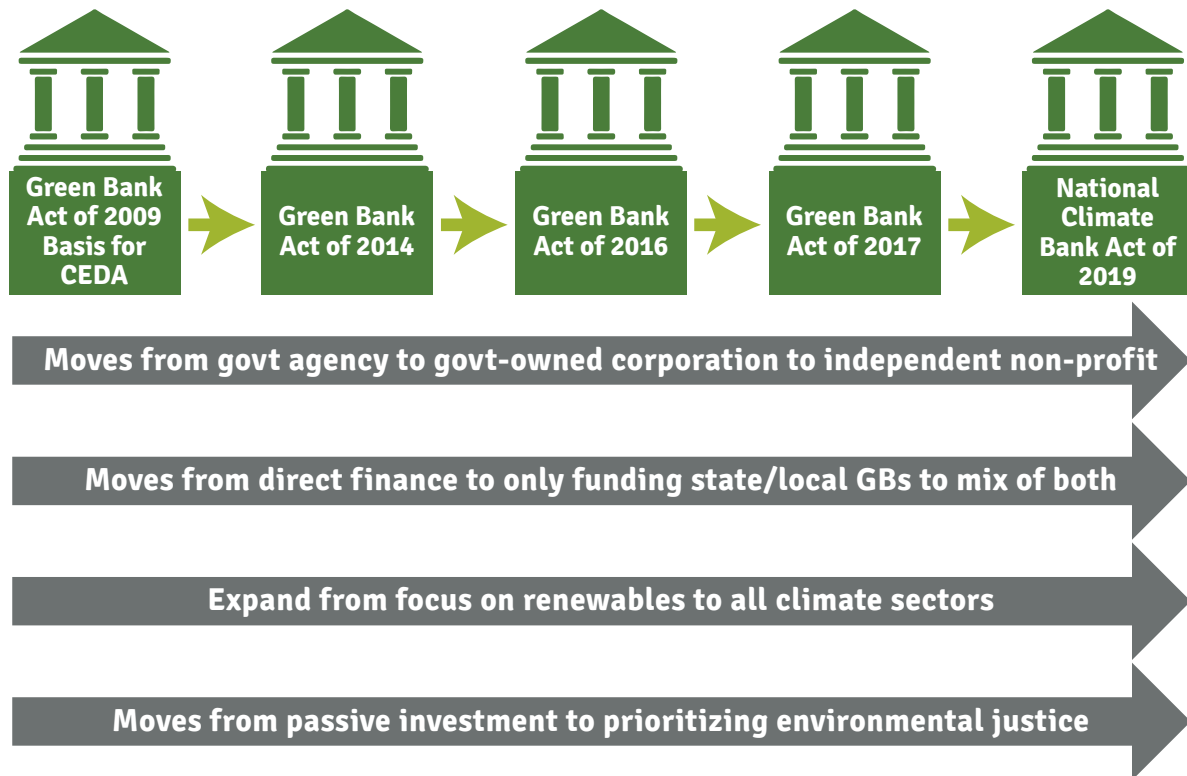
Those critical real-world lessons and changes include:

- Recognizing that direct government operation and control of a green bank has practical downsides, where changes in political and fiscal conditions unrelated to the green bank may severely hamper the green bank's ability to operate successfully
- Understanding the importance of local institutions capable of working with communities and state-based actors to meet the specific needs of discrete energy markets
- Developing expertise and recognizing the need to support activity across all emissions-related sectors, not just renewable power and building efficiency
- Realizing that being a passive, purely market-responsive actor means that certain market segments will be unaddressed, and that instead green banks must be proactive in shaping their investment portfolio with a particular focus on prioritizing environmental justice.

This know-how, in turn, created a positive feedback loop to inform federal policy. Between 2009 and 2019, new iterations of federal green bank legislation were shaped by what was happening at the state level. Green

Bank Acts were introduced in the House and Senate in [2014](#), [2016](#) and [2017](#), each incorporating important updates based on the evolving landscape. This includes forming the federal green bank as a corporation, rather than within a government department. This also includes

directing the federal green bank to capitalize state and local green banks, because such entities now existed and were proving effective at addressing local needs. And, importantly, each reintroduction of the idea lifted awareness and kept the concept vibrant for federal legislators.



THE RIGHT PROPOSAL FOR TODAY

The full evolution of the federal green bank idea is now embodied in the National Climate Bank Act, where for the first time since 2009 there is wide support in Congress and on the campaign trail. The bill incorporates the improvements of prior iterations of green bank legislation and takes them even further to meet the needs of today's climate. The Accelerator is now not just a corporation, but a private non-profit corporation. The Accelerator directly finances projects in addition to capitalizing state and local green banks, and where they don't exist, the Accelerator will help build them. And beyond financing clean power, the Accelerator has a broad remit across all sectors that have an emissions profile or directly address the impacts of climate change.

Importantly, the current legislation also has adapted beyond the original CEDA proposal in recognition of how

the world itself has changed with regard to climate change and social inequity. These key developments are:

- CEDA in 2009 was squarely focused on one-off, large-scale investments to commercialize new carbon-related technologies in order to bring them to market and lower their cost. While it is critical to always advance the next generation of technologies, today in 2020, the technologies needed to decarbonize clean energy largely exist and are widely available. Therefore, deployment of those technologies needs to be prioritized far more than it has been historically.
- On a greenfield basis, clean power is now cheaper than coal nearly everywhere in the country, and also cheaper than natural gas in many regions. This directly informs the nature of investment and the target sectors of the Accelerator.

- Eleven more years have passed, and time is even more urgent. This again means the tactics the Accelerator must use should reflect this urgency.
- Environmental justice is now more fully recognized as an essential and imperative element of a climate transition. This informs both the environmental justice requirements in the bill, and the strong focus on creating and leveraging a growing network of state and local green bank institutions to best serve community needs.

In July 2020 and then again in September 2022, a version of the bill called the Clean Energy and Sustainability Accelerator passed the House with \$20 billion of funding as part of both the Moving Forward Act and the Clean Economy Jobs and Innovation Act. This support demonstrates how the current Accelerator legislation effectively recognizes how the world has changed since 2009 and why this evolution in policy beyond the original CEDA approach is the right one for 2020.



