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A Progressive Climate Innovation Agenda

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TABLE OF CONTENTS

3	Executive Summary
4	Introduction: Why Progressives Should Embrace Innovation
6	Section 1: Defining the Progressive Climate Innovation Platform
13	Section 2: Lessons & Shortcomings of U.S. Innovation To Date
18	Section 3: Essential Components of a Progressive Climate Innovation Platform
20	Conclusion

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EXECUTIVE SUMMARY

The coronavirus pandemic has rattled the United States, leaving more than 170,000 Americans dead, millions sick, and tens of millions unemployed as we write. The nation needs expanded and prolonged federal relief to help people weather this storm, followed by a renewed commitment to the institutions and approaches that can prevent looming social, economic, and environmental crises. To help avoid the worst effects of the climate crisis and contribute to economic recovery, the federal government should invest in developing and deploying the next generation of clean technologies and infrastructure that can make us safer, healthier, and more resilient—and in doing so mobilize millions of Americans to create the low-carbon economy we need. Not only is clean energy innovation a key part of a smart economic recovery package, but it should also be considered an essential component of the progressive climate platform.

Using government money to drive down costs for green technologies—when deployed alongside infrastructure investment, pollution standards, and equitable safeguards for vulnerable populations—will speed up our transition to a clean and vibrant economy. Historically, though, much of the rhetoric around U.S. federal energy innovation has focused on fossil fuels, energy independence, and geopolitics. Even as federal investment in clean technologies has ramped up, many lawmakers have presented it as an alternative to government regulation of climate pollution. These approaches fall short of what is necessary to transform our economy in the timeframe science demands.

An effective federal clean energy innovation strategy is not only critical for tackling climate change but also a winning political issue that progressives should embrace. This report offers a framework and policy recommendations for a federal innovation agenda that complements other climate policy to unlock a net-zero emissions global economy, establish United States leadership on climate, and advance progressive social and economic objectives.

In Section 1 of this report, we define a progressive federal innovation policy as one that can answer “yes” to the following questions (the “three Es”):

Does it **expand** the federal innovation apparatus to include the full suite of activities necessary to integrate **new technologies** into the energy system at scale?

Does it focus on improving the cost and performance of technologies that can rapidly reduce **emissions** in the most **polluting** and **hard-to-tackle** areas of the economy?

Does it combat the historically unequal impacts of pollution, while providing **equitable** access to new economic opportunity, improved public health, and resilient communities?

In Section 2, we show that the current federal innovation agenda falls short on all three criteria. The existing innovation ecosystem is underfunded, is disproportionately focused on the power sector, and has failed to prioritize funds for social equity, climate justice, and other social and economic goals. In Section 3 and the accompanying policy brief, we dive into the components of a federal innovation agenda that meets these goals. The federal government should at least double research and development funding over the next five years; dramatically expand demonstration, deployment, and financing programs; refocus efforts on the most polluting and hard-to-decarbonize areas of the economy; and build new institutions, goals, and capacity to support equitable outcomes.

Finally, the accompanying polling memo shows that the framework and policies we recommend are broadly popular across the political spectrum and extremely popular among Democrats.

Why Progressives Should Embrace Innovation

The coronavirus pandemic, and the U.S. government's response, has left more than 170,000 Americans dead, millions sick, and tens of millions unemployed at the time of writing. It has also provided the most egregious example yet of the Trump administration's disregard for and hollowing-out of technical and scientific expertise—which left us vulnerable to the pandemic, is preventing us from recovering from it, and is leading us down the path to disastrous climate change. Even in the midst of the current public health crisis, two-thirds of Americans remain worried about global warming, and there is increasing evidence that climate change compounds risks associated with the virus. Climate policy is a major political weakness for the current administration—and a winning issue for Democrats.

The ongoing crisis has also struck the energy system, leading to a projected 20 percent drop in global energy investment this year. To rebuild our economy and prevent the worst effects of climate change, the federal government needs to invest heavily in the development and widespread uptake of clean energy technologies that can make our energy, transportation, and industrial systems safer, healthier, and more resilient. That means enacting a massive program to deploy existing low-carbon technologies and infrastructure that will stimulate the economy, put people to work, and reduce harmful pollution, as Evergreen Action and Data For Progress outlined in the Clean Jumpstart for America. It also means rebuilding and scaling up the federal government's role in energy innovation to tackle the deepening crisis of climate change. The Clean Jumpstart proposal includes several programs that are central to a smart energy innovation portfolio—the Weatherization Assistance Program, State Energy Program, clean energy tax incentives, a national climate bank, and more.

In this report, we argue that pursuing an ambitious, effective federal clean energy innovation platform is critical for tackling climate change *and* a winning political issue that progressives should embrace. The programs mentioned above, combined with others outlined in this report, can fill out an innovation strategy that unlocks a zero-emissions global economy, makes the United States a leader in clean energy technologies, and aligns with progressive goals.

Americans across the political spectrum are waking up to the stark reality of climate change and demanding government action. Democratic leaders are pushing ever stronger climate policy packages, while Republican lawmakers are scrambling to pull together some semblance of a plan after decades of outright climate science denial. At the center of Congressional Republicans' agenda is innovation. Even

those unfamiliar with climate policy debates can recognize the allure of “American innovation,” which conservatives often frame as the free-market balm for the scourge of government regulation. Senators Murkowski and Manchin have seized on the widespread appeal of energy innovation as they attempt to pass bipartisan policy that promotes technologies from renewables to carbon capture on coal power, most recently through the American Energy Innovation Act.

However, policy wonks have critiqued the emergent Republican climate agenda as a half measure at best and a trojan horse for climate delay at worst. David Roberts of Vox points out that some of the innovation proposals are just a way to repackage longtime conservative priorities—subsidies to fossil fuel companies, coupled with “a promise of deregulation”—behind a climate-friendly smokescreen. Indeed, a set of bills pushed by Republican minority leader Kevin McCarthy in March 2020 does just that: It focuses federal research dollars on enhanced oil recovery and other approaches that enable the continued operation of fossil fuel companies.

It is no wonder that innovation policy can feel like a bit of a third rail for progressives, who are rightly skeptical of technology being posited as an alternative to regulation or a “silver bullet” to systemic social and economic challenges. However, while it is true that innovation alone is insufficient, innovation coupled with regulations and other ambitious climate policies can accelerate the transition to clean energy, generate new economic opportunity, and stave off the worst effects of climate change. This is all the more reason for progressive politicians to proactively set the climate innovation agenda, capitalize on its broad popularity, and tailor it to tackle our interrelated environmental, social, and economic crises.

Defining The Progressive Climate Innovation Platform

No comprehensive and sustained federal innovation strategy has ever prioritized technologies to combat the threats of climate change—though the Obama Administration did make significant strides with its [Strategy for American Innovation](#) and commitment to [Mission Innovation](#). Still, even as the federal innovation toolbox remains oriented around antiquated priorities like oil independence and nuclear arms, a number of critical climate technologies have benefited greatly from federal innovation programs at the Department of Energy. These examples, which we discuss in *Section 2: Lessons & Shortcomings from U.S. Innovation To-Date*, provide encouraging evidence that federal innovation—properly reoriented to tackle greenhouse gas pollution—is a must-have element of the progressive climate agenda.

Since “innovation” is a vague term that is often co-opted to advance conservative priorities, it is critical that we define federal innovation policy, the precise role it can play in the climate fight, and the hallmarks of a truly progressive innovation agenda.

WHAT IS FEDERAL INNOVATION POLICY?

Federal innovation policy generally refers to the range of public programs and standards designed to spur the development of technologies critical to advancing the national interest. Innovation policy also drives improvements in the performance and cost of those technologies over time. Historically, technologies deemed critical to the national interest, and thus worthy of federal investment, have been those that improve national security (weapons and surveillance), energy security (domestic fossil fuel and clean energy production), food security (agricultural products and machinery), communications, and health care. With a few notable exceptions, such as some efforts at the Obama Administration’s Department of Energy, technologies that reduce greenhouse gas emissions or improve resilience to climate change impacts have not been the primary goal of federal innovation efforts—despite the clear evidence that rapid emissions abatement is [just as critical for our health and security](#) as any other area of federal investment.

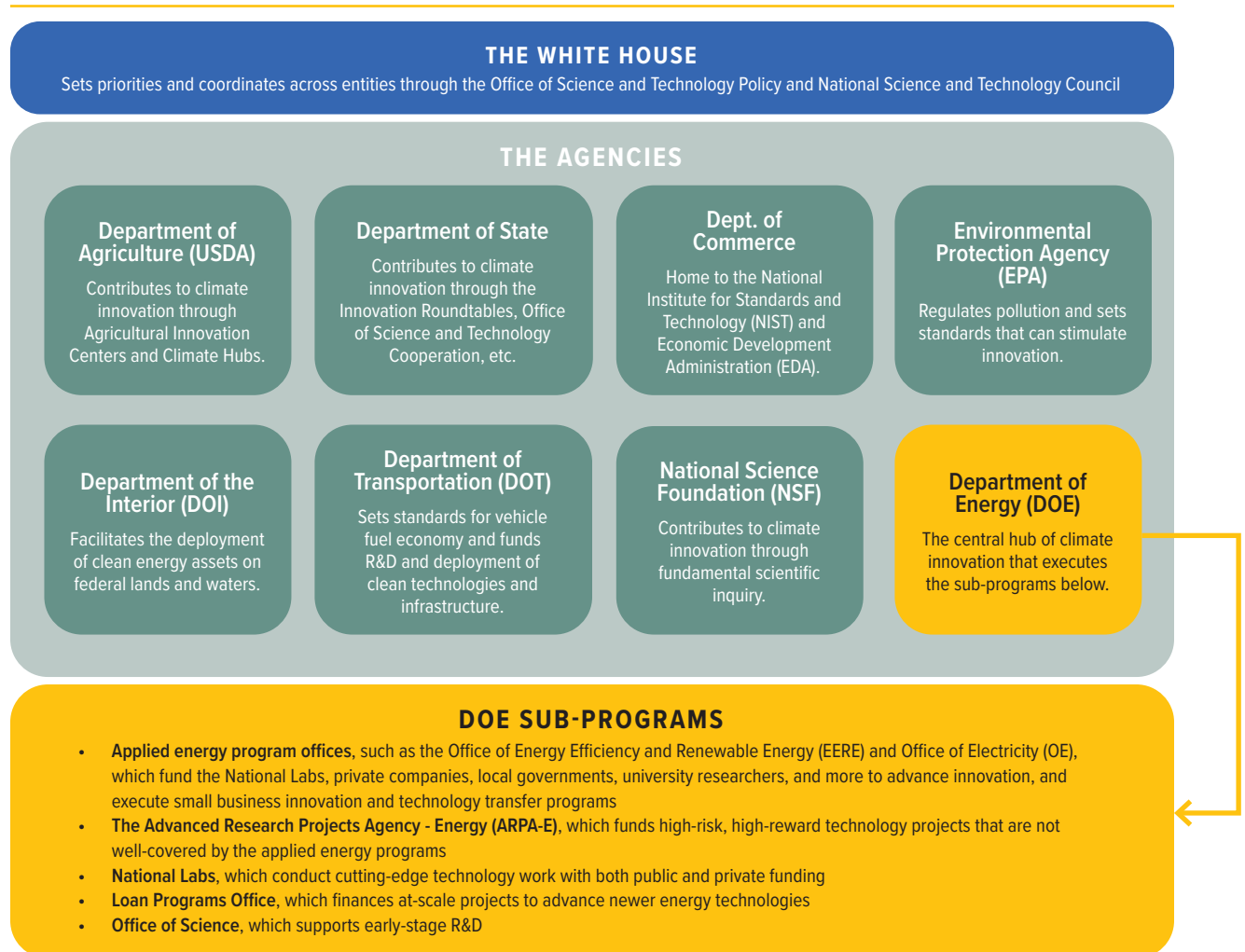
Whether publicly or privately funded, efforts to innovate are often referred to as research and development, or R&D. However, innovation policy can and should extend to technology demonstration (RD&D), deployment (RDD&D), and beyond.

- ▶ **Research:** Basic scientific inquiry that underpins a technology (e.g., nuclear physics).
- ▶ **Development:** Creation of a new technology, including cheaper or higher-performance versions of existing technologies (e.g., LED bulbs).

- ▶ **Demonstration:** Pilot projects for new technologies to test their real-world effectiveness and discover opportunities and challenges that emerge at true—not laboratory—scale (e.g., Direct Air Capture demonstration plants).
- ▶ **Deployment:** Programs, incentives, regulations, and performance standards that promote widespread adoption of proven technologies to drive additional improvements (e.g., solar energy tax credits, vehicle standards, building codes).
- ▶ **Enabling Policies:** Other policies and programs that reduce barriers to adoption of new technologies (e.g., reform of electricity markets to accommodate renewable resources with zero fuel cost, workforce development programs to eliminate incentives to stick with existing technologies, elimination of fossil fuel subsidies that keep entrenched or outdated technologies alive).

The full range of RDD&D programs make up the federal innovation ecosystem. Innovation efforts funded by the federal government are implemented through a complex network that includes federal agencies, national labs, universities, businesses, nonprofit organizations, and local governments—with agencies largely serving as the grant-making institution to the other entities. In recent years, the most relevant pieces of this ecosystem to reducing greenhouse gas emissions have included:

KEY ELEMENTS OF THE FEDERAL CLIMATE RDD&D ECOSYSTEM



As we discuss in this report and the accompanying policy brief, reforming the federal innovation ecosystem to meet the scale of the climate challenge will require leveraging many of these existing institutions, and building new ones.

GOVERNMENT INNOVATION SPENDING IS CRITICAL TO FIGHTING CLIMATE CHANGE

If humanity is to successfully address climate change, technologies that are not yet widely available (in the prototype, demonstration, and early adoption stages) are likely to provide 75 percent of the necessary emissions reductions, according to the [International Energy Agency \(IEA\)](#). Government innovation spending plays a critical role in developing these new technologies that can unlock emissions reductions in difficult-to-decarbonize parts of the economy, such as heavy industry. Further, by improving the cost and performance of *existing* low-carbon technologies, government innovation can accelerate the move away from fossil fuels even in parts of the economy that are already transitioning, such as the electricity sector. It can also contribute to environmental justice, energy justice, and social equity by cutting pollution in frontline communities, providing funding in communities that have faced structural disinvestment, and expanding access to (and targeting the benefits of) clean energy.

DOE [analysis](#) shows that continuing current funding for federal clean energy innovation, on its own, can double U.S. emissions reductions through 2040 against a business-as-usual scenario. Innovation coupled with a modest carbon price significantly amplifies the effects of that policy on U.S. emissions, creating a synergistic effect. In other words, climate innovation is not redundant with other climate policy but is absolutely necessary to maximize U.S. emissions reductions in concert with other policies.

Finally, innovation also opens the doors to a wider set of climate policies and builds more political support for bold climate action by driving down the costs of clean energy technologies. Done properly, innovation can create a [virtuous circle](#) that connects public policy to resulting technology cost reductions, which then translate back into stronger policy as a result of increased political will. Federal innovation efforts have already nullified right-wing talking points about exorbitant clean energy costs, and expanded innovation programs will move the political needle even further.

SETTING THE CRITERIA FOR PROGRESSIVE INNOVATION POLICY: EXPANSION, EMISSIONS, AND EQUITY

A progressive federal innovation agenda is one that develops and integrates the technologies needed to meet the scale of the climate crisis at the speed science demands, while advancing other progressive goals to improve public health, quality jobs, and justice for frontline communities and fossil fuel workers. Progressives should push policy that reforms the federal innovation ecosystem to stand up to scrutiny in three dimensions (our “three Es”):



EXPANSION.

Does it expand the federal innovation apparatus to include the full suite of activities necessary to integrate new clean technologies into the energy system at scale?



EMISSIONS.

Does it reduce the cost and improve the performance of technologies and strategies that can rapidly decarbonize the most polluting and hard-to-tackle areas of the economy?



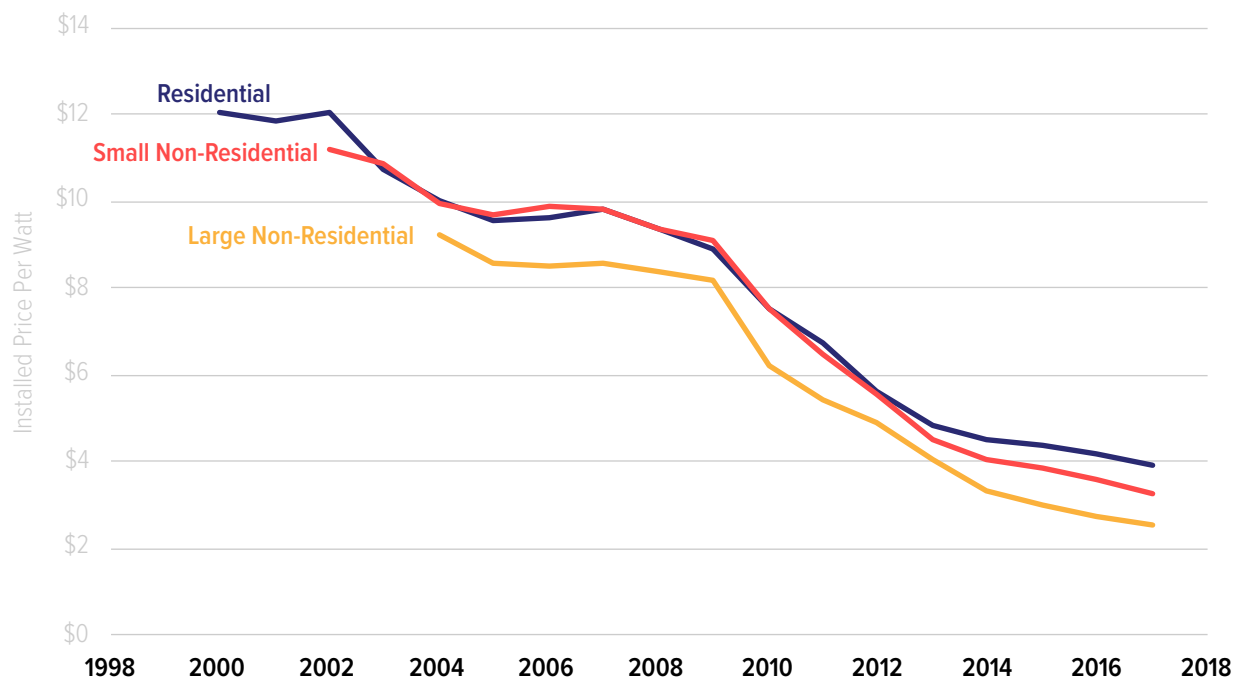
EQUITY.

Does it combat the historically unequal impacts of pollution, while increasing equitable access to new economic opportunity, improved public health, and resilience?

1. Does it expand the federal innovation apparatus to include the full suite of activities necessary to integrate new technologies into the energy system at scale?

The impact of innovation programs depends greatly on the scale of funding and the scope of activities. While sustained funding at today’s levels will continue to reduce emissions, expansion of the programs will lead to greater reductions. For example, fulfilling the Mission Innovation pledge to double clean energy innovation spending within 5 years could triple reductions compared to a business-as-usual scenario. Even so, the Mission Innovation funding levels, coupled with carbon pricing, only get us to about 40–50 percent reduction in U.S. emissions by 2040, well short of what science tells us is necessary to avoid the worst effects of climate change. Moreover, the existing innovation programs (and many proposed upgrades to these programs) are too narrow, focusing primarily on early-stage research without properly expanding to the later-stage activities necessary for a strong innovation ecosystem. We need to build a bigger and better innovation mouse-trap—one that better connects basic research to more ambitious demonstration, deployment, and enabling policies, supported by funding levels to match the scale of the crisis, in order to rapidly integrate clean technologies into the energy system.

FIGURE 1 Prices in distributed solar power continue to decline, decades after the first federal R&D and 11 years since the Obama Administration ramped up deployment.



Source: Lawrence Berkeley National Laboratory.

We know that the benefits of federal innovation do not stop when a technology leaves the lab. Sustained public investment, both in the United States and abroad, has helped to drive down the costs of residential solar (see Figure 1), showing that continued support for even well-established low-carbon technologies can spur performance improvements, save consumers money, and help replace fossil fuels more quickly. Cost reductions also enable wider access to clean technologies, which in turn broadens political support and expands the policy options for swift decarbonization.

Rather than becoming a trojan horse for conservative economics, smart and progressive innovation policy can crowd in investment and accelerate the decline of fossil fuels. Moreover, a significant expansion of the existing clean energy innovation ecosystem is popular across the political spectrum already. According to Data for Progress polling, a majority of Americans (51 percent) support a trillion dollar investment to expand existing clean energy programs at the Department of Energy.

2. Does it reduce the cost and improve the performance of technologies and strategies that can rapidly decarbonize the most polluting and hard-to-tackle areas of the economy?

Many of the worst impacts of climate change will occur if global temperatures exceed 1.5°C above pre-industrial levels by the end of the century, according to the Intergovernmental Panel on Climate Change. To have a good chance of curbing warming to that level, we need a total transformation of the global economy at an unprecedented pace to cut emissions by 50 percent by 2030 and reach net-zero carbon

emissions by 2050, involving rapid technology turnover across energy-using sectors, massive buildout of new infrastructure, and ambitious policy at all levels of government. We know that we have many of the solutions today to get there: rapidly deploying renewables in the power sector, replacing internal combustion engine vehicles with electric cars, designing cities and transit systems to reduce personal vehicle use, heating and cooling our buildings with electric heat pumps, and retrofitting our homes with energy-efficient materials and appliances.

Even so, improved technology will make our toolkit more effective. And in some parts of the economy—such as heavy industry, freight, and agriculture—we are not well-equipped to eliminate every unit of climate-warming pollution, which is why a strong federal innovation program is necessary alongside standards and deployment policies. A progressive innovation agenda must rebalance federal RDD&D spending to focus on technologies that can tackle the sectors that are short on existing solutions and contribute the most to climate change.

Data For Progress polling shows that this re-alignment of priorities is popular: Seventy-six percent of Americans support investments in technologies to reduce carbon pollution in “hard-to-abate” industries. This proposal enjoys support from a majority across party lines: Eighty-five percent of Democrats, 78 percent of Independents, and 65 percent of Republicans support investments in new technologies to reduce carbon pollution in “hard-to-abate” industries. Given the overwhelming bipartisan popularity and efficacy of this proposal, progressives have every reason to embrace it.

3. Does it combat the unequal impacts of historic pollution, while providing equitable access to new economic opportunity, improved public health, and resilient communities?

Communities of color and low-income groups have been disproportionately affected by toxic air and water pollution from the use of fossil fuels and face the brunt of climate change driven by those same fossil fuels. Environmental justice (EJ), a core tenet for the progressive movement, demands that public policy be oriented to combat this discrimination. The EJ movement has justifiably been skeptical of environmental “techno-fixes,” which can perpetuate existing systems of inequality and are often developed and supported without affected communities at the table. Government innovation programs must center EJ principles, include frontline communities in decision-making and grantmaking processes, and ensure that technologies to reduce emissions are, first and foremost, desirable and accessible to the communities who face the greatest impacts.

We cannot talk about the unequal impacts of historic pollution without acknowledging the outsized burden placed on developing nations as the result of Western emissions. The United States is responsible for a plurality of global cumulative emissions, but the worst effects of climate change will fall instead on many of the nations—including small island states and less developed countries—that have contributed least to the problem. We therefore have a responsibility to be a global leader in innovation, both to invent climate solutions and to drive down the cost of technologies that enable a more rapid, accessible transition to a clean global economy. This point appeared in the 2019 Green New Deal Resolution, which resolved that it be a national priority to promote “the **international exchange of technology**, expertise, products, funding, and services, with the aim of making the United States the international leader on climate action, and to help other countries achieve a Green New Deal.”

The United States has a responsibility to ensure that the extractive fossil fuel economy is not replaced by a similarly extractive clean energy economy. That means pursuing climate solutions, technological and otherwise, that reduce natural resource extraction, which overwhelmingly affects low-income people of color and Indigenous communities across the globe.

Fortunately, directing federal research dollars to the communities most harmed by pollution is exceedingly popular. Data For Progress [polling](#) shows that 66 percent of Americans support the federal government targeting R&D funds toward communities that are most affected by pollution. A majority of Democrats (78 percent), Independents (55 percent), and Republicans (62 percent) support targeting R&D funds for the communities on the front lines of hazardous pollution. Given such overwhelming bipartisan support, lawmakers should prioritize equity in R&D funding for new advanced green technologies.

Finally, beyond unequal historic impacts, increased investment in climate innovation should actively seek to combat any disproportionate economic burdens on workers and communities driven by the shift to cleaner technology. Federal dollars for technology demonstration and deployment should come with stipulations for high-quality union jobs, project labor agreements, and prevailing wages, prioritizing projects that promote economic opportunity for workers and communities historically reliant on the fossil fuel industry. Investing public resources in a manner that contributes to a “just transition” for the fossil fuel workers who built our economy is an essential component of an equitable innovation agenda.

Lessons & Shortcomings of U.S. Innovation to Date

The climate crisis demands American leadership to shape a clean global economy, on a scale unprecedented since the 1940s; as such, some progressives, such as Senator Elizabeth Warren, have appropriately called for a [Green Marshall Plan](#). However, the current U.S. energy innovation ecosystem is poorly suited to the challenge. When it was founded in 1977, the Department of Energy was designed to house the federal government’s nuclear weapons efforts and a smattering of other programs intended to advance domestic energy development. While the department has steadily evolved, this original orientation, forged against the backdrop of Cold War geopolitics and the oil crises of the 1970s, is still recognizable in the department’s focus on nuclear weaponry and energy independence. As climate action has grown politically divisive, most federal climate progress has been conducted by proxy, using the framing of national security and energy independence to pass funding for innovation in energy efficiency, solar and wind technologies, electric vehicle batteries, and nuclear power. Fortunately, the success of these programs provides compelling evidence that clean energy innovation is a powerful tool in the climate fight, even if the federal innovation ecosystem is not yet properly calibrated to the climate challenge.

RECENT INNOVATION SUCCESSES FOR CLEAN ENERGY PROVE THE RDD&D MODEL

Innovation policies and investments have already launched successful clean technologies. Decades of federal R&D investment contributed to steady improvements in technologies like solar panels, wind turbines, electric vehicle batteries, and highly efficient light bulbs. These technology improvements laid the groundwork for large-scale demonstrations and early financing of clean projects, such as the first 100-megawatt solar photovoltaic projects which were financed through DOE’s Loan Programs Office in the early 2010s. Now, tax incentives, standards, and deployment grants at the federal, state, and local level are driving costs even lower and leading to even greater improvements in the technologies.

Public clean energy innovation has also been proven to catalyze reductions elsewhere in the world, whether the innovation occurs in government-funded labs or is induced in the private sector by deployment subsidies. For instance, [Gerarden \(2017\)](#) finds that, from 2010 to 2015, “32% of the [global] solar adoption due to increased technical efficiency [i.e., innovation] would not have occurred in the absence of German subsidies... highlighting the spillovers generated by decentralized government intervention in a global market.” Innovation programs will be even more successful with global cooperation to collectively improve technologies and ramp up manufacturing capacity.

TODAY’S INNOVATION ECOSYSTEM WILL NOT EQUIP US TO TACKLE CLIMATE CHANGE

Despite some early successes in technologies like wind, solar, and batteries, which broadly validate the clean energy innovation model, existing federal innovation programs are insufficient to tackle the hard-to-decarbonize sectors, improve the pace and equity of climate solution deployment, or demonstrate leadership on a global scale. Today’s federal energy RDD&D portfolio falls short on all “three Es” in our rubric for a progressive climate innovation agenda.



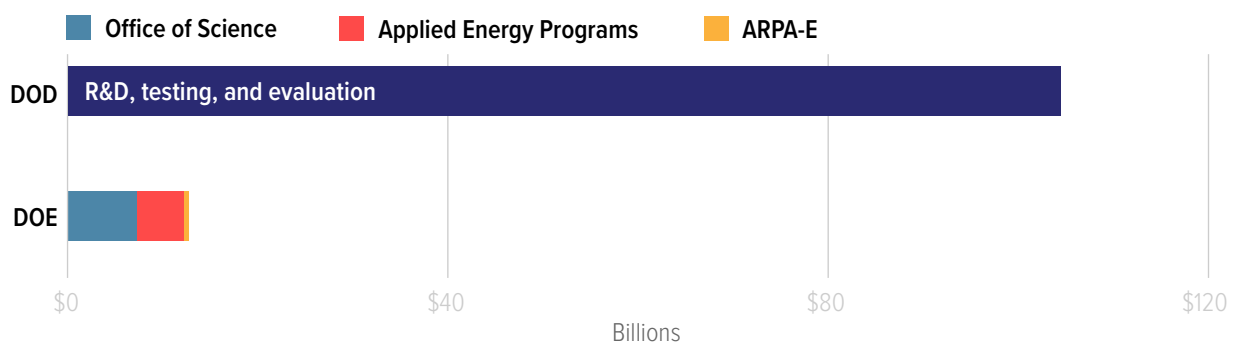
EXPANSION

Today, the federal climate innovation apparatus has too little funding and too narrow of a scope.

Funding for energy RD&D has kept pace with neither the growth in the economy, nor the growing urgency of the climate crisis. When DOE was created in the 1970s, its budget for energy RD&D was more than \$10 billion (in today’s dollars), which is greater than the \$8 billion that Congress provided in 2020. If growth in spending had matched growth in the economy and kept up with inflation, DOE’s RD&D budget would be \$32 billion today—four times current levels. In a similar vein, the United States has officially missed its Mission Innovation pledge to double clean energy research and development funding from 2015 to 2020 (funding increased by roughly 10 percent by 2019). The challenge of addressing the climate crisis demands significantly greater investment in energy innovation. The federal innovation budget is far lower than what it needs to be to rapidly bring about 100 percent clean energy systems, address barriers to realizing the transformation to a carbon-neutral economy, and make that transformation smoother and less costly.

The problem extends beyond funding levels. Existing climate innovation programs are heavily weighted toward earlier stage innovation activities. For example, the vast majority of funding for DOE’s basic and applied energy programs goes toward R&D. Even within R&D programs, basic research wins out. The Office of Science (which focuses on basic science and early stage R&D) has a budget of \$7 billion, while the applied energy programs (which cover later-stage R&D and include the offices of Energy Efficiency and Renewable Energy, Fossil Energy, Nuclear Energy, Electricity, and Cybersecurity) have a combined budget of about \$5 billion. Existing programs have long lacked funding for large-scale demonstrations, early financing, deployment, and procurement to drive demand.

FIGURE 2.1 Government RD&D spending is overwhelmingly Defense-oriented, despite overwhelming public preference.



Sources: FY20 DOE Appropriations and FY20 DOD Appropriations.

Alarming, the federal government spends far more money on weapons R&D than it does on clean energy, despite overwhelming public support for clean energy innovation. The Department of Defense budget for military research, development, testing, and evaluation was more than eight times greater than DOE’s energy innovation budget in 2020. That stands in stark contrast with public preference: According to Data for Progress [polling](#), 68 percent of Americans think the federal government should spend more money to develop clean energy technologies than to develop military weapons.

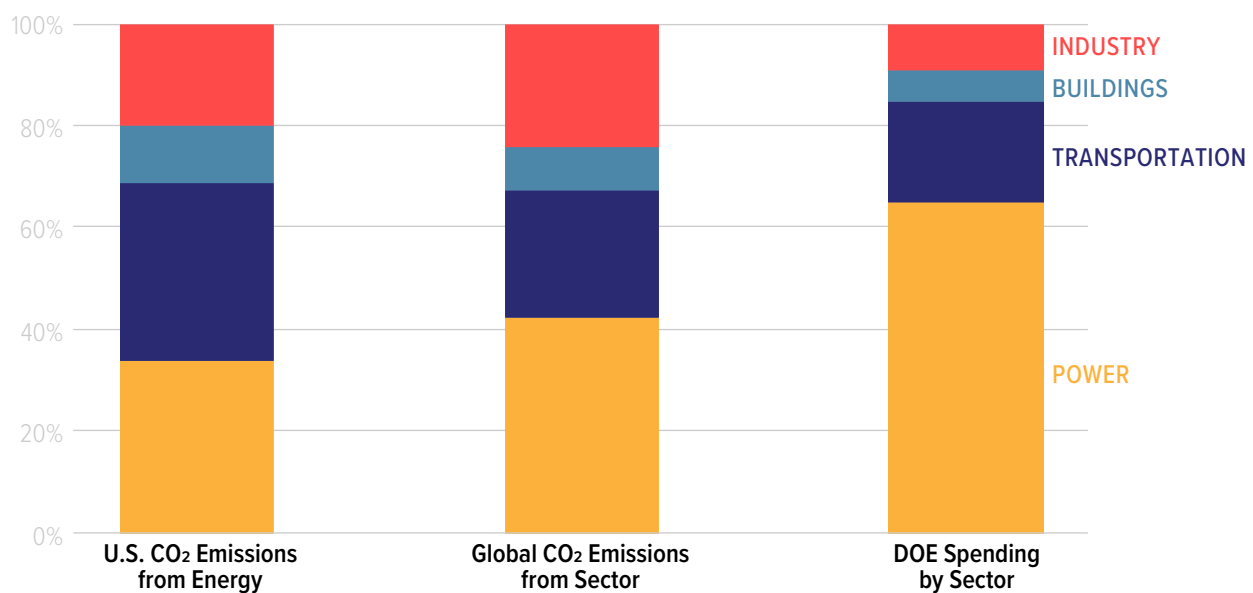


EMISSIONS

Existing innovation programs are not designed to address climate change. That fact becomes clear when you consider the allocation of funding from Congress and the funding decisions made by federal agencies. For example, DOE innovation funding is [poorly aligned](#) with the biggest and most difficult-to-tackle sources of climate pollution. The power sector receives the largest chunk of funding by far, while direct use of fossil fuels in the end-use sectors (e.g. transportation and industry) accounts for the lion’s share of emissions in the United States and globally.

Figure 2.2 shows the magnitude of the disparity. The 2019 budget for DOE’s applied energy programs allocated 65 percent of funding for power sector technologies, while the power sector accounts for 27 percent of U.S. GHG emissions and roughly 33 percent of global GHG emissions. Meanwhile, only 9 percent of applied energy funding went toward industrial applications, which make up 22 percent of direct U.S. GHG emissions and 28 percent of global emissions. Building and transportation technologies are also underfunded.

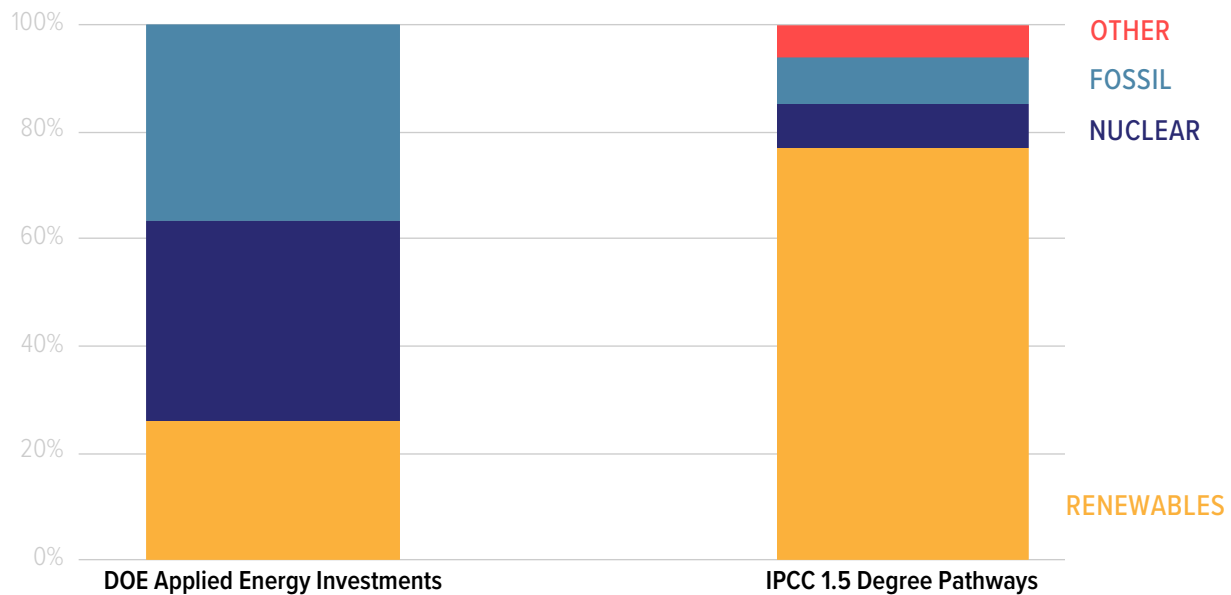
FIGURE 2.2 Comparison between GHG emissions and DOE spending by sector.



*GHG emissions exclude agriculture and “other”

Sources: [2018 U.S. CO₂ Emissions](#), [2017 Global CO₂ Emissions](#), [FY19 DOE Appropriations](#)

FIGURE 2.3 Comparison of DOE Power Sector Spending with Global 2050 Generation Mix in IPCC 1.5 Degree Scenarios



Sources: FY19 DOE Appropriations, IPCC Pathways

Even within the most well-funded sector in DOE’s innovation ecosystem—the power sector—investments are wildly misaligned with pathways to global climate mitigation. While renewables make up 77 percent of the global 2050 electricity composition in international models that manage to limit warming to 1.5°C, only 26 percent of the power sector investments within DOE’s applied energy programs go toward renewable technologies. Use of renewable energy technologies must rapidly accelerate, while use of fossil fuels must rapidly decline, yet DOE’s power sector investments are heavily weighted toward fossil fuels. Energy storage, a crucial enabler of a clean electricity grid, only makes up 2 percent of DOE’s applied innovation budget.



EQUITY

Federal innovation programs, in their current state, fail to properly acknowledge the unequal impact of historic pollution or ensure equitable access to the benefits of new technologies. To this day, DOE applied energy programs have no requirement to include equity, energy justice, climate justice, workforce development, or other essential social and economic goals. The absence of these goals manifests in operation of the programs and distribution of grant funding. For instance, the Office of Fossil Energy’s innovation portfolio remains focused on increasing fossil fuel production and promoting energy independence and does not explicitly account for the historic, disproportionate burden of fossil fuels on low-income and minority communities.

Moreover, this administration has attempted to gut the few programs that have attempted to make progress in this arena. The President’s annual budget repeatedly seeks to cut support for domestic clean

manufacturing, low-income and tribal energy programs, and the Weatherization Assistance Program, while focusing on “American energy dominance.” Likewise, USDA climate adaptation programs that should be investing in solutions to protect frontline communities have floundered under an administration that has consistently squashed climate science. Alarming, DOE’s national labs still see more than half of their budget go to weapons research, rather than climate solutions. All of these decisions have directed federal energy research and development dollars away from the communities, workers, and families that need them most.

The failures of innovation programs to achieve equitable outcomes extend beyond this administration’s proposed cuts to the agencies. Technology improvements, on their own, do not ensure that everyone has access to clean energy. Worse, public investments that help large corporations capitalize on clean technology opportunities will perpetuate systemic economic and racial inequality. And federal innovation programs, as they are currently designed, do not ensure that the benefits of clean energy growth—including pollution reductions, jobs, wealth generation, cost savings, and resilience—reach communities of color and low-income, frontline, and deindustrialized communities. Some notable DOE programs, including the Weatherization Assistance Program and the Solar Energy Technologies Office, have developed targeted efforts to bring the benefits of clean energy to low-income households, but these programs are the exception, not the rule. To achieve progressive goals, the entire federal innovation apparatus must prioritize equity and justice. That means more targeted programs like WAP, but it also means new community engagement processes to ensure democratic design and implementation of clean energy projects, new types of grants and financial assistance, provisions to encourage community ownership and leadership of clean energy projects, and building personnel capacity at the agencies to effectively implement these changes.

Components Of A Progressive Climate Innovation Platform

The federal government should address the shortcomings of current innovation policy and create a robust, coordinated innovation strategy with the right tools, mission, and priorities to fit within a strong federal mobilization to address climate change.

A progressive innovation strategy is one that expands the federal innovation apparatus, focuses efforts on eliminating emissions from the global economy, and works toward social equity and justice. We preview the most critical steps here and lay out the full set of policies we recommend in each of these three categories in an [accompanying policy brief](#).

1. **Expansion:** A progressive innovation platform must include the full suite of innovation activities necessary to integrate new technologies into the energy system at scale. That means moving beyond research and development investments alone to demonstration, deployment, financing, and standards, and increasing funding across the board. Specific proposals include:
 - ▶ At least double annual funding for R&D over the next five years and increase funding to three or four times current levels by 2030.
 - ▶ Expand programs for large-scale demonstrations, deployment, and public financing for technologies that contribute to deep decarbonization, alongside policies to use federal procurement to drive demand for clean products.
 - ▶ Issue performance standards to require adoption of cleaner, better technologies, thereby spurring private sector innovation.
2. **Emissions:** Federal innovation programs are severely lacking in resources devoted to critical sectors for tackling the climate challenge. A progressive innovation platform should boost funding for underfunded sectors and create new programs to advance promising technologies not supported by existing policy.
 - ▶ Realign funding for innovation programs to more closely match the scale of the problem within each sector and cease investing in technologies that promote the further extraction and use of fossil fuels.
 - ▶ Create a new industrial decarbonization program focused on addressing the remaining challenges to eliminate emissions from heavy industry and a transportation decarbonization program that ramps up efforts to cut emissions from freight and aviation.

- ▶ Develop robust, cross-agency innovation initiatives to advance carbon dioxide removal technologies, improve solutions for the agricultural sector, and improve our tools to study and plan for climate impacts.
3. **Equity:** Federal innovation programs need a reframing from the top down to properly align with the interconnected issues of social, environmental, and economic justice. That means updating the mission of these programs, building new processes to consult communities in designing programs and allocating funding, and expanding activities that complement RD&D investments.
- ▶ Update the mission of federal innovation programs to include global climate and environmental justice and realign program objectives and personnel to that mission.
 - ▶ Allocate at least 40 percent of investments to disproportionately burdened communities and implement new community engagement processes and program management structures to deliver funds to frontline communities, support communities historically dependent on fossil fuels, and ensure equitable adoption of clean energy technologies.
 - ▶ Expand workforce development programs to help build an equitable clean energy economy.

Read more specific recommendations for each of the "three Es" in our [accompanying policy brief](#).

CONCLUSION

A federal innovation strategy is a necessary part of the suite of climate policies we need to confront the crisis. While insufficient to eliminate pollution on its own, innovation policy hastens the pace of decarbonization, makes clean energy technologies more accessible, broadens the policy tools at our disposal, and increases the political will for action. Innovation has risen to the forefront of the Republican stance on climate change, but many of their current proposals are incomplete, miss the mark entirely, or are excuses for inaction. As such, progressives need a vision for a bold, revamped federal innovation strategy that rises to the scale of the climate emergency.

That vision must be grounded in **expansion** of federal programs to include the full range of RDD&D investments and enabling policies that drive innovation; alignment of funding to address the technologies and strategies necessary to eliminate **emissions** from the global economy; and new goals, management structures, and processes designed to ensure that innovation investments address historical pollution burden and put **equity** and justice at the heart of the clean energy transition.

This report is not comprehensive of all the policies and programs necessary for a progressive innovation agenda. Instead, it lays out a framework for crafting and judging such an agenda and recommends a list of policies as a starting point.