

# **A GREEN RECOVERY:** THE CASE FOR CLIMATE- FORWARD STIMULUS POLICIES IN AMERICA'S COVID-19 RECESSION RESPONSE

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# Introduction

As of September 2020, the federal government has invested more than \$2 trillion in stimulus measures to mitigate the COVID-19 emergency. Though those funds held off some of the most disastrous economic effects instigated by the pandemic, additional funding is still needed, both to provide immediate relief—to communities, businesses, and state and local governments—and to drive an economic recovery that countervails the economic recession triggered by COVID-19 and the attendant government response. Unfortunately for our planet and its people, the initial round of pandemic relief unintentionally fueled investment in fossil fuels. Because all stimulus policy choices can affect climate, future relief efforts must affirmatively work to help decarbonize the economy.

The US is experiencing one of the worst—and fastest—recessions in its history. The economy peaked in February, as the pandemic began to quietly take hold in the US, and by mid-April the country had lost more than 22 million jobs (BLS 2020), and the official unemployment rate had reached 14.7 percent—the highest level of unemployment since the Great Depression.<sup>1</sup> By mid-May, nearly one in five workers, or 34.2 million people, were either receiving unemployment benefits or waiting for approval (Shierholz 2020).

Despite its depth, diffusion, and speed, the COVID-19 recession did not continue apace as some predicted, due in large part to the emergency relief measures authorized by the nearly \$200 billion Families First Coronavirus Response Act (FFCRA) and the \$1.7 trillion Coronavirus Aid, Relief, and Economic Security (CARES) Act. The combination of federal relief to families and the (often premature) lifting of stay-at-home orders allowed unemployment to drop over the summer, reaching 7.9 percent in September (BLS 2020d).

However, September's numbers also showed that the failure of the federal government to renew key provisions of the CARES Act—especially the \$600 enhancement to unemployment insurance that expired at the end of July—and pass state and local fiscal relief and other measures has already begun slowing the economic recovery. There are still 10.7 million fewer jobs than there were in February, and if job growth continues at last month's rate it will take years for

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<sup>1</sup> The actual unemployment rate in April was likely much higher—23.5 percent—due to a misclassification error that led the Bureau of Labor Statistics (BLS) to undercount individuals who were temporarily absent from work because of reasons related to COVID-19 (Gould 2020).



the labor market to fully recover (Gould 2020a). Meanwhile, early indications of a decline in consumer spending (Franck 2020a), and skyrocketing COVID-19 case counts, point to the possibility of another economic decline.

Furthermore, both the COVID-19 health crisis and the economic crisis it has precipitated are exacerbating underlying inequities that fueled the downturn, and also actively reshaping our labor market in ways that could undermine economic growth. Among the most troubling consequences are the hundreds of thousands of women who have dropped out of the labor market (Gupta 2020) and the increasing unemployment rates among people of color (Groeger 2020). Additionally, the wildfires in the Western states have highlighted how opportunities for economic recovery will also be affected by—and increasingly so—extreme weather events and mounting climate damages.

Over the past 12 years, the US has suffered from the failure to advance bold, public investments to combat the last economic crisis. The insufficient federal response to the Great Recession contributed to a decade-long recovery, the job gains from which were completely erased when COVID-19 shocked the economy (Gould 2020).

The federal response to the current crisis must fill both the output gap created by the current recession *and* the output gap left behind from 2008.<sup>2</sup>

### ***We argue that all fiscal policy is climate policy.***

As policymakers debate how to initiate and sustain a recovery from the COVID-19 recession, investments in decarbonization and clean energy—what we refer to throughout as “green stimulus”—offer a compelling path forward. Here, we argue that all fiscal policy is climate policy. A green stimulus policy recognizes this, building the dual goals of reducing emissions and speeding the transition away from fossil fuels into efforts to induce greater investment, job creation, and financial flows across the wider economy.

**Ultimately, the US can and should recognize this moment for what it is—a rare opportunity to address two existential crises, climate and economic catastrophe, at once—and work to craft economic packages that capitalize upon it.**

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<sup>2</sup> Following the 2008 recession, real GDP growth never returned to pre-recession trends as it had in previous downturns. In “The Macroeconomic Case for a Green New Deal,” J.W. Mason (2019, 12) shows that real GDP per capita dropped well below pre-2007 projections and did not rejoin the projected growth trend. A true recovery from the COVID-19 recession will require rectifying what’s occurred now and closing the gap in potential output that remains from the Great Recession.



Green stimulus investments can provide immediate and direct economic assistance to the people and institutions most in need right now and move the US toward a fundamental reorientation of our economic system. With the exception of disaster relief, the climate policy debate tends to be dominated by a focus on long-term, large-scale interventions, such as the Green New Deal. However, there are many climate solutions that can provide immediate economic relief, reduce emissions, facilitate a transition away from fossil fuels, and, in some cases, redress environmental and economic injustice.

As we show, green stimulus policies offer the US an unprecedented chance to do what systems theorist Dr. Elizabeth Sawin (2018) refers to as “multi-solving”: to “pool expertise, funding, and political will to solve multiple problems with a single investment of time and money.” Thus far, however, COVID-19 stimulus packages have not supported green investments. This is a significant shortcoming that threatens to undermine the development of clean energy—an industry not only directed toward preserving the planet but one that was responsible for two of the three fastest-growing jobs in the US prior to the pandemic (BLS 2020b). Meanwhile, the same stimulus bills enabled the transfer of billions in aid to fossil fuel companies, forcing the Federal Reserve (the Fed) to take on riskier debt and further tying the health of the US economy to dying industries and major pollution emitters.

This report proceeds as follows:

- First, we explain how ignoring climate crisis mitigation in order to conduct economic stimulus is a grave mistake and show why “climate-neutral” stimulus is a myth. In fact, every policy put in place to combat this recession will impact the environment.
- Second, we explain why a green recovery can meet the immediate economic relief efforts and stimulus goals borne from COVID-19, both efficiently and effectively. Not only is addressing climate change imperative to preserving our planet, it is also a smart investment. Notably, we outline the principles that we believe are foundational in creating a green stimulus package. To build a green stimulus program that is effective, it must 1) meet the scale of the current economic and environmental crises, 2) be fast-acting and implemented quickly, 3) move money effectively and through the right mechanisms, 4) continue until a true recovery is achieved (short-term stimulus limits this goal), 5) promote and center the health and welfare of the public, and 6) move the



economy in a direction that ensures sustainable prosperity. Future stimulus packages have the potential to launch us forward; no policy that takes our economy backward should be included.

- Next, we outline several green stimulus policies that are fast-acting and can contribute to immediate relief efforts.
- Finally, we demonstrate how other leading economies have led the way in a climate-centered recovery.

In this report, we do not assess the cost of a green stimulus package. We do, however, wish to state that the cost of doing too little in response to the COVID-19 recession and the climate crisis far exceeds the cost of doing too much (Stiglitz 2020).

***Not only is addressing climate change imperative to preserving our planet, it is also a smart investment.***





## Putting Climate Policy “On Hold” Could Disrupt Economic Recovery

This decade, when the US is working to recover from the COVID-19 recession, is the decade in which we will have to reduce global emissions by 7.6 percent every year in order to limit global warming to 1.5 degrees Celsius, the target set by the Paris Agreement (Paul, Fremstad, and Mason 2019). And as the West Coast wildfires and Hurricane Laura have shown, the recession and climate change are not happening in isolation; we are trying to rebuild our economies at the same time—and in the same places—as fires rage, waters rise, and homes are destroyed.

### “CLIMATE-NEUTRAL” STIMULUS IS A MYTH: ALL STIMULUS POLICY CAN BEAR CLIMATE IMPACTS

***Based on the economic response to the COVID-19 recession thus far, there is ample reason to believe that so-called “climate-neutral” approaches will actually inhibit progress on decarbonization and the overall recovery.***

The choice facing policymakers is not “climate-friendly” policies or “climate-neutral” policies. All stimulus policies have the potential to affect emissions levels, even if they do not directly relate to climate or emissions. In that sense, policymakers are choosing between policies that are climate forward and those that will entrench carbon-intensive industries and infrastructure. Based on the economic response to the COVID-19 recession thus far, there is ample reason to believe that so-called “climate-neutral” approaches will actually inhibit progress on decarbonization and the overall recovery.

As Mason (2019) argues, stimulus policies affect economic output and employment long after a crisis—and the initial investment—has ended. This is partially due to hysteresis, a phenomenon whereby current demand conditions have lasting

effects on future potential output. And it is partly due to the ways well-crafted stimulus programs can support the supply side of the economy, by raising public investment, maintaining and upgrading workers' skills, and supporting technological progress. In the case of a green stimulus—which requires significant spending on job creation, worker training, and new production technology—these investments not only help to decarbonize but also spur growth in wages, jobs, and GDP at levels that the US needs to meet economic demand, better our global competitive positioning, and respond to scientific and public health mandates.

Conversely, “climate-neutral” stimulus measures (more accurately referred to as “climate-blind” stimulus) can cause a long-term drag on the economy, doubling down on harmful technologies that are destined for near-term obsolescence. These policies result not in new investments and industries but in the further entrenchment of fossil fuel industries and interests. There’s a danger that a poorly targeted stimulus could delay or even reverse the long-term shift of US power generation away from fossil fuels.

Fossil fuel power generation has experienced steady diminution since 2018, despite efforts by the Trump administration to slow this decline by loosening environmental restrictions and reversing Obama-era energy policies. By 2019, coal accounted for 24 percent of electricity generation in the US, down from 48 percent in 2010 (US Energy Information Administration 2020); 5 percent of coal-fired power capacity was retired (Hodge 2020); at least 11 coal companies had declared bankruptcy (Moritz-Rabson 2019); and the Energy Information Administration (EIA) projected that generation from coal would decline an additional 13 percent in 2020 (Hodge 2020).

Renewables, on the other hand, were surging pre-COVID-19. By January 2020, it was cheaper, on average, to build new renewable energy generation than to operate existing coal-fired power plants (Marcacci 2019) or to build and operate new natural gas lines (Dyson and Glazer 2019). New investments in renewable energy had also risen to a record high of \$55.5 billion after increasing 28 percent between 2018 and 2019. Additionally, by the end of 2019, 37 states had adopted renewable portfolio standards that required new renewable energy generation. As a result, in January of this year, the EIA predicted that 76 percent of new generation in 2020 would come from solar and wind (Ray 2020).



## THE CARES ACT IS FUELING THE FOSSIL FUEL INDUSTRY

At first glance, the CARES Act does not appear to explicitly benefit clean energy or fossil fuel companies. However, since its passage, fossil fuel companies have exploited its provisions—including the Fed’s new lending facilities—to create a “stealth” bailout for fossil fuel industries (Dlouhy 2020). To date, oil, gas, and coal companies have claimed and sought more than \$5.8 billion in aid authorized by the CARES Act. Conversely, clean energy companies have received very little aid, even as industry analysts conservatively predict that “the clean energy sector will lose about a quarter of its workforce[,] or 850,000 jobs[,] by the end of the second quarter [of 2020] if no actions are taken to support the clean energy industry and its workers” (Jordan 2020). Funneling COVID-19 stimulus to the fossil fuel industry is shortsighted, at best, especially as part of an economic stimulus package. As Hepburn et al. (2020) note, “a key objective” of economic stimulus is to “stabilize expectations, restore confidence, and to channel surplus desired savings into productive investment.” Intentional or not, bailing out fossil fuels undermines all of these aims.

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The COVID-19 crisis and how the federal government responds to it represent a unique opportunity to hasten the transition away from fossil fuel power and jump-start the growth of green energy. Though carbon emissions have declined significantly during the COVID-19 shutdowns, global temperatures are still on track to increase 2.6 to 4.1 degrees Celsius without new, aggressive climate policies (Forster et al. 2020). Emissions often decline during recessions, but they often rebound—and sometimes rise—as spending increases once the economy begins to recover. Investing in fossil fuels—especially without mandated emissions reductions—only exacerbates this danger, especially at a time when fossil fuel prices are so low.

Fossil fuel investments also distort markets, both by making oil, gas, and coal seem more financially viable than they actually are (and certainly will be in the



future) and by undermining renewables in the eyes of cautious investors. Granted, markets are not “natural”; they are the result of many factors, including regulation, public subsidies, and policy choices. Providing aid to fossil fuel companies and not to clean energy firms is simply another way that federal policy is being used to shape energy markets in ways that encourage the continued use of fossil fuels and slow the transition to renewable energy.

If federal policy continues to send supportive signals about fossil fuels, capital markets for green energy investments could freeze further than they already have,<sup>3</sup> significantly slowing the expansion and deployment of renewable energy (Crist 2020). This, of course, hurts the pace at which the US can decarbonize. But, as importantly, it also threatens to derail the industries that are critical to generating enough demand (and jobs) for the US economy to fully recover from the COVID-19 recession.

Supporting fossil fuel lending also exacerbates financial fragility in the economy and may contribute to a new crisis once current support is withdrawn. Oil and gas companies owe \$744 billion in outstanding debt, which is roughly 9.4 percent of total corporate debt in the US as of April 2020 (Sanzillo 2020). Notably, much of that debt is below investment-grade. Such a high level of risky debt creates the possibility of a crash if liquidity conditions tighten, particularly when combined with the structural issues—namely, falling prices and consistent overproduction—that have plagued the industry.

Nevertheless, after intense lobbying from fossil fuel advocates, the Fed loosened eligibility conditions for the emergency “Main Street” lending programs established by the CARES Act, which made it easier for oil and gas companies to receive loans and to use them without restriction. The changes included reversing rules that prevented loans from being used to refinance and pay down existing debt; allowing larger companies to qualify for loans; increasing debt thresholds such that oil companies that were previously considered too indebted could now qualify for loans; and removing the requirement that companies prove that the loan is needed due to “exigent circumstances presented by the coronavirus disease 2019 (‘COVID-19’) pandemic” (CARES Act 2020). As Tom Sanzillo (2020), the director of finance at the Institute for Energy Economics and Financial Analysis writes:

Federal lending to the oil and gas sector would be a complete waste of money...  
The federal [stimulus] money is for companies with short-term liquidity

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<sup>3</sup> The recession already threatens to reduce private investment in clean energy, such that by mid-March, BloombergNEF downgraded expectations for solar, battery, and electric vehicle markets in 2020 (Holder and Murray 2020).



problems, but the oil and gas industry faces long-term solvency issues... If the money were to be channeled exclusively to this sector, the net result would still be an oil and gas industry that is oversupplying the market, pummeled by low prices, and sitting in last place on the stock market.

The changes that the Fed made to the Main Street Lending Program not only undermine the agency's duty to "seed strategic investments in future economic stability" (Raskin 2020), they do so for little reason; providing loans to the fossil fuel sector is expected to neither increase employment nor create new jobs, given that most loans are expected to be used to pay down existing debt and require no commitment from employers that they will use the loans to retain employees. As importantly, these changes illustrate that even as we face what could be an unprecedented economic crisis, policymakers are still rigging the rules in favor of large, politically connected corporations—even if it means potentially undermining the country's prospects for economic recovery and a habitable planet.



## Green Policies Can Meet Economic Relief and Stimulus Goals, Efficiently and Effectively

***For the economy to recover from the COVID-19 downturn, the federal government must significantly increase investments in financial relief for impacted families, funding to create jobs, and support for state and local governments. Green stimulus policies can help do all three.***

Though immediate relief efforts—including a one-time stimulus check, employment supports through the Paycheck Protection Program (PPP), and expanded unemployment compensation—mitigated some effects of the COVID-19 economic shutdown, the early termination of these benefits and the prolonged impact of the pandemic seem to be pushing the economy toward a more traditional demand-driven recession. The bungled federal response to the outbreak and shutdown has prolonged the periods of business closures and inserted significant uncertainty, resulting in permanent unemployment for millions (as of September 30, 2020, 7.3 million Americans have been unemployed for over 15 weeks compared to 2 million in September of 2019 (BLS 2020c)), the constriction of private and public sector employment, and the permanent closure of at least 100,000 businesses (Long 2020). For the economy to recover from the COVID-19 downturn, the federal government must significantly increase investments in financial relief for impacted families, funding to create jobs, and support for state and local governments. Green stimulus policies can help do all three.

In the end, the US has long needed to speed its pace of decarbonization, and the COVID-19 response offers a unique opportunity to do so. Many policies designed to both decarbonize and redress environmental injustice are also well suited to support short-term stimulus needs and a long-term recovery. They can also spur the creation of millions of green jobs, which could change the composition of

the labor force—and the economy—in ways that will make it more equitable and resilient. In the first half of this section, we will show how green stimulus can revive and reshape the US labor market; then, we will outline six principles for an effective stimulus package that can achieve the greatest fiscal impact for enduring recovery, climate mitigation, and environmental justice.

## **GREEN STIMULUS INVESTMENTS CAN CREATE MUCH-NEEDED JOBS, BOLSTER THE CLEAN ENERGY SECTOR, AND RESHAPE THE US LABOR MARKET AND ECONOMY**

Climate policies have the potential to generate large numbers of high-quality jobs quickly and at every skill level. Compared to fossil fuels, clean energy is highly labor-intensive. In fact, investments in clean energy generate nearly three times more jobs than comparable investments in fossil fuels (Garrett-Peltier 2017). This is largely because “investments in clean energy—including the direct spending on specific projects plus the indirect spending on purchasing supplies—devote significantly more of their overall budgets on hiring people and relatively less on acquiring machines, supplies, land (either on- or offshore), and energy itself” when compared to fossil fuels (Pollin et al. 2014). Renewables also create many more jobs in the short term, which leads to more private spending, an expansion of demand, and an increase in short-run GDP multipliers.

Without significant investment, however, clean energy companies will not be able to sustain their current workforce, much less lift the US economy out of the recession as some electoral leaders hope. Before the pandemic, clean energy was one of the fastest-growing industries in the US; between 2015 and 2019, clean energy added jobs 70 percent faster than the overall economy (E2 2020), and the Bureau of Labor Statistics (BLS) projected that jobs in clean energy would be the fastest growing occupations this decade (BLS 2020b). But COVID-19 has crippled energy demand and consumer spending and, with it, any prospects for significant growth in clean energy. Solar Energy Industries Association (SEIA) estimates that residential solar installations will decrease by 31 percent in 2020, compared to 2019 (SEIA 2020a). The installation of battery storage systems is also expected to decline by 31 percent by the end of 2020. Furthermore, if the pandemic continues to delay on-site work, clean energy projects could become ineligible for crucial tax credits, such as the investment tax credits created by the Energy Policy Act (2005), destroying their “economies” and causing further collapse in the sector (Wood Mackenzie 2020).



## The Power of Public Investment in Green Initiatives

Stimulus measures that direct public investment to clean energy and related industries could provide the capital needed to rebuild their green workforces and employ millions more. We know this from experience:

- The American Recovery and Reinvestment Act (ARRA) of 2009's clean energy investments created roughly 900,000 jobs between 2009 and 2015, while also laying the groundwork for the expansion of solar and wind deployment in the US over the last decade.
- Recent analysis by Robert Pollin and Shouvik Chakraborty (2020, 8) found that if US governments—local, state, and federal—invested \$320 billion per year in clean energy and land restoration, they could generate 4.5 million jobs per year for 10 years.
- Similarly, investing \$260 billion per year in transportation and low-carbon infrastructure could produce an additional 4.6 million jobs per year (Pollin and Chakraborty 2020, 5).

Additionally, public investment in clean energy could create opportunities to build a new US labor market that is more equitable and resilient. Unlike the retail, care, and hospitality sectors—the three largest sectors by employment in 2019, which employed 32 percent of the total labor force that year—clean energy creates jobs at *all* pay levels, rather than clustering the majority of workers in low-wage jobs (BLS 2020a). Moreover, employment in clean energy tends to also be concentrated in fields that provide meaningful career ladders to move from entry-level jobs into positions with higher wages and skill levels, such as construction and advanced manufacturing. These effects can be further magnified if investments in clean energy are paired with commensurate investments in policies that train and place workers of color in green jobs, such as a federal jobs guarantee program.

Nevertheless, jobs in clean energy still pay less, on average, than jobs in fossil fuel sectors; however, because clean energy is much more labor-intensive, investments in clean energy yield *more* total jobs that provide family-supporting wages and benefits when compared to investments in fossil fuels. Robert Pollin et al. (2014) found that if \$138 billion were to be invested in renewables and non-renewables, the investment in renewables would yield 1.5 million more jobs compared to the





investment in non-renewables. Furthermore, renewable energy and other clean energy sectors were rapidly adding jobs before the COVID-19 pandemic, but the share of jobs in fossil fuels was declining (Berardelli 2020).

Finally, green stimulus programs can reshape our economy in the long term, generating economic benefits for years to come. Government green spending can spark a private-investment boom by fostering technological change and transformations within the market. Mason (2019) argues that “historical investment booms... are invariably associated with the spread of new technologies that led to large-scale reorganization of production, from electricity in the 1920s, to the shift from rail to highways in the 1960s, to information technology in the 1990s.” Decarbonization could unleash a similar wave of transformation in the US, which would be welcome given that oil and natural gas were two of the top-growth industries in the US as of 2019 (Iaccino 2019) and as analysts predict that reduced demand for fossil fuels could become a permanent post-pandemic reality (Horowitz 2020).

***Government green spending can spark a private-investment boom by fostering technological change and transformations within the market.***

It is critical that we begin a true green recovery as quickly as possible. But too often, climate policy, like the climate crisis itself, is constricted as a matter of long-term change and large-scale interventions. However, there are a number of policies that can be enacted as part of immediate COVID-19 relief legislation that can meet the economic needs of this moment and set America on the path toward a better climate and stronger economy.



## Six Principles to Guide a Green Stimulus

To help design a timely and well-targeted stimulus package, one that is tailored to the current economic reality, we propose six specific principles of an effective stimulus that, taken together, can and should guide policymakers in crafting a spending package that achieves the greatest fiscal impact for enduring recovery, climate mitigation, and environmental justice.

- 1. The scale of stimulus must match the scale of the economic crisis:** In addition to the human tragedy unfolding around us, the US is facing high levels of job loss, income loss, and economic dislocation. There is broad consensus that the risk of doing too little is much higher than the risk of overshooting. This means providing meaningful, ongoing support to struggling families and individuals. It will also require creating large numbers of good, high-quality jobs that can be performed safely (through major expenditures on labor-intensive activities) and making ambitious investments now in an inclusive, prosperous future economy, financed through robust federal borrowing. Further, to reach the full breadth of impacted communities, the effects of any stimulus program should be broadly distributed both geographically and across sectors of the economy.
- 2. Stimulus must start quickly, be fast-acting, and be immediately impactful:** To support low- and middle-income workers and families, marginalized communities, and hard-hit industries and regions of the country, resources must be mobilized as quickly as possible. This is the only way to make an immediate difference in people's lives—people faced with immense hardship far beyond their control. This urgency will bias stimulus toward fast-moving cash infusions, especially to households, small businesses, and state and local governments, to sustain consumption and avoid more layoffs and service cuts. In addition, however, certain “shovel-ready” construction projects may be relatively fast-acting as well, when approved and permitted, allowing for investment to continue in the newly built environment, sustaining the flow of high-quality wages and supporting domestic supply chains.
- 3. Stimulus must move money effectively, not just rapidly:** In assembling a stimulus package, it is important to pick the right funding mechanisms to maximize impact. Federal stimulus investments should leverage proven channels for moving funds paired with accountability for achieving the intended results. Cash supports for low income families such as the Supplemental Nutrition Assistance Program (SNAP) program, for example,



offer a proven and extremely rapid mechanism for putting federal dollars to work in the economy, acting through the budgets of working families. Likewise, federal support for existing state and local government programs offers a well-worn pathway for infusing capital reliably and at scale within communities. Federal fiscal relief for cities and states also works double duty by preventing damaging cuts to critical services, as the burdens of a stalled economy cascade to impact state and local tax bases, threatening spending cuts just when public funds and programs are needed most. As a matter of job creation, pushing dollars down to the community level is also highly impactful.

4. **Stimulus must support true recovery, continuing until the economy is strong:** Ongoing support and sustained investment will be required to produce a lasting economic recovery. In the current economic crisis, a short-term infusion of cash, while necessary, is unlikely to sustain impacted workers and businesses until the economy is functioning at least as it was before the COVID-19 downturn. Therefore, any immediate cash stimulus program should be paired with longer-term investments and expansions to social safety nets that lay the groundwork for future large-scale expenditures over the course of several years. A well-balanced stimulus and recovery package should thus include efforts to strengthen public welfare programs to serve as automatic stabilizers in future downturns, as well as investment in public infrastructure and construction. Given historically low interest rates, these durable investments are also timely to modernize the built environment and lay groundwork for more resilient labor markets and a more productive economy in future years.
5. **Stimulus must protect health and safety and advance public welfare:** Given the unique drivers of this economic crisis, with its roots in a public health emergency, attention to personal and environmental health and safety—and resilience to disaster—must also be at the root of any near-term recovery plan. Specifically, jobs created through this policy should be safe to perform despite the COVID-19 pandemic, and existing work should be reoriented to preserve the health and safety of workers and the population at large. This will allow for the most rapid return to robust economic activity, while avoiding the looming potential of triggering a new wave of contagion as social distancing diminishes. A natural extension of this principle is that capital investments made in the name of short-term stimulus should not create new future harms to public health and welfare by increasing toxicity, vulnerability to natural disaster and warming temperatures, or otherwise weakening the stability and



sustainability of any recovery once achieved. A science-based approach to both short-term public health threats and long-term risk drivers from climate and environmental hazards simply represent prudent public policy in the age of COVID-19.

- 6. Stimulus must anticipate future needs to build sustainable prosperity:** The purpose of stimulus is to not only get the economy moving again when stalled, but also to move the country forward, affirmatively in the right direction. Put simply, any investment that exacerbates extant structural risks to the macroeconomy or that sows the seeds of future economic collapse should be taken off the table, regardless of whatever immediate jolt they may provide. Today, climate risks represent the source of our next crisis. Therefore, prudent stimulus must invest in activities, practices, and infrastructures that aim to build a green economy that is resilient to the looming threat of climate disaster and works to diminish climate impacts. As policymakers debate forms and levels of investment, careful attention should also be paid to the impact of any spending on patterns of wealth and inequality. Only in this way can we ensure that stimulus not only stops the immediate hemorrhaging of jobs and earnings, but that it also positions US workers, communities, and businesses to thrive, by making a substantial down payment on improved livelihoods and a better quality of life for all of America's families.



## Fast-Acting Green Policies to Enhance Immediate Relief Efforts

Green investments are excellent stimulus policies. Fiscal stimulus can include a range of government policies undertaken with the intention of inducing greater investment, hiring, and financial flows across the wider economy. Such stimulus can be triggered through a range of policies from direct cash payments, to changes in the tax code, to public investment in construction projects, or even through direct hiring by government entities.

***These policies can be enacted immediately and serve as models for how proven economic stimulus pathways, such as direct aid to households and fiscal relief for state and local governments, can be used to simultaneously address the dual economic and human crises of COVID-19 and climate change.***

The policies below are by no means an exhaustive green stimulus list or recovery package. There are several proposals for comprehensive, large-scale investment already in circulation that meet the above criteria. What we present instead is a sample of green stimulus measures designed to meet the continued need for immediate and robust stimulus to families, US businesses, and local communities, while also directly contributing to decarbonization, environmental justice, and long-term economic sustainability. These policies can be enacted immediately and serve as models for how proven economic stimulus pathways, such as direct aid to households and fiscal relief for state and local governments, can be used to simultaneously address the dual economic and human crises of COVID-19 and climate change.

### LIHEAP AND WAP: DIRECT AID TO HOUSEHOLDS WITH LASTING EFFECTS

A dramatic expansion of funding and eligibility for both the Low-Income

Home Energy Assistance Program (LIHEAP) and the Weatherization Assistance Program (WAP) could provide lasting financial relief to millions of families in the US by subsidizing and permanently reducing their energy costs, while also creating thousands of jobs—and fast. As importantly, these investments would disproportionately help the same communities hurt most by the recession and COVID-19. Low-income families spend significantly more on energy; for the median low-income household, energy absorbs 7.2 percent of household income, compared to 3.5 percent for all households and 2.3 percent for middle- and upper-income families. Similarly, low-income Black and Latinx households are more vulnerable to energy poverty and utility shut offs than white people at similar income levels (Reames 2016; Bednar et al. 2017). African Americans earning less than 150 percent of the poverty level are about twice as likely to have their electricity shut off as white households with comparable incomes, despite being more likely to forgo other necessities in order to pay energy bills (Kowalski 2020).

Without federal intervention, unpaid utility bills will increase to the highest level in decades (Chediak and Freitas Jr. 2020). Nearly 16.2 million US households faced energy poverty before COVID-19; 14 million had unpaid utility bills, and an additional 2.2 million households have had their utilities disconnected. Utility arrearages are rising rapidly. The National Energy Assistance Directors' Association, representing the state LIHEAP directors recently estimated that if Congress does not provide additional federal funding for LIHEAP, electric and natural gas arrearages could reach as high as \$32 billion by the end of the year. Reflecting the rapidly changing conditions, NEADA estimated between 15 to 20 percent of residential customers are at least 60 days behind on their electric and natural gas bills. As of July 31, 2020, the estimated resulting electric arrearages are between \$8.0 billion and \$9.9 billion, and natural gas arrearages are between \$975 million and \$1.3 billion (Wolfe 2020).

LIHEAP, the largest federal program for direct utility assistance to households, is chronically underfunded. Even in 2010, at the height of ARRA emergency funding, the program was allocated \$5.1 billion and served an estimated 8.1 million households, which was fewer than 20 percent of the estimated 45 million households eligible that year (CRS 2018). At \$4.64 billion, funding for the program was even less for Fiscal Year (FY) 2020, even after emergency support from the CARES Act. As a result, LIHEAP currently serves only a fraction of the eligible population and covers only part of their energy bills. More than 50 percent of US adults live in households that have lost income in the current recession (Luhby 2020); that means that significantly more families will likely need utility



assistance, including many that exceed LIHEAP's maximum income eligibility, which is the greater of 150 percent of the federal poverty level (FPL) or 60 percent of state median income.

Current federal funding for LIHEAP is not sufficient to help prevent record numbers of families being shut off from power when the moratoriums end. In states where moratoriums have expired, there are already reports of families being shut off from power; these reports will only increase as the job-related losses due to the pandemic continue.

Similar issues exist with the Weatherization Assistance Program (WAP), the largest federal weatherization program in the US. Like utility assistance, weatherization is crucial to reducing energy burdens, especially for low-income families. Living in less energy-inefficient housing is one of the primary reasons why low-income households pay more for energy; the difference is so profound that low-income households pay, on average, 21 percent more per square foot for energy than households that have higher incomes. Utility assistance should be coupled with weatherization assistance not only to amplify the utility assistance's effect but also to generate lasting reductions in energy costs and greenhouse gas (GHG) emissions. Though payment assistance provides immediate financial support, the long-term effects will be minimal—for family budgets and carbon budgets—without additional investments in weatherization and electrification.

Despite providing \$4.50 in total benefits per dollar invested—\$1.72 in energy benefits and \$2.78 in non-energy benefits—WAP has received no additional stimulus funding and was allocated only \$290 million for FY 2020. Similar to LIHEAP, WAP can only serve a fraction of applicants at current funding levels as a result. The program currently serves 35,000 households and supports 8,500 jobs (Department of Energy 2019), compared to the 28,000 jobs and 800,000 sites during the period covered by ARRA, when the federal government invested \$5 billion in weatherization programs from 2009 to 2013 (CEA 2016). According to a recent analysis by Robert Pollin and the Political Economic Research Institute, investing an additional \$7 billion into WAP over five years could yield 18,760 jobs per year (over 98,000 jobs total) (Pollin and Chakraborty 2020).

With additional resources and wider eligibility, LIHEAP and WAP could serve significantly more households (Duckworth 2020). We recommend increasing income eligibility for both programs temporarily to 250 percent of the FPL to serve the moderate-income households that are hard hit by COVID-19, as well as increasing funding for both programs by \$70 billion. This funding level would be



enough to provide the full annual cost of home energy payments for 50 percent of the eligible population and would help all families in this income category that have lost their jobs due to the pandemic. It would also provide comprehensive weatherization services to weatherize 3.5 million homes and provide air conditioning units for the approximately 9 million low income households that do not have air conditioning (Wolfe 2020a).

Just as importantly, LIHEAP and WAP should be quickly scaled up in tandem, in order to deliver these services. In addition, the ramp-up in Weatherization could—and should—be expanded to provide assistance with home electrification, solar panel installation, and participation in community solar projects, in order to maximize savings to low-income households and reductions in GHG emissions.

## **EXTENDING THE PRODUCTION AND INVESTMENT TAX CREDITS: AID TO SMALL BUSINESSES THAT BOOSTS EMPLOYMENT AND THE CLEAN ENERGY SUPPLY**

Production Tax Credits (PTC) and Investment Tax Credits (ITC) were crucial to bolstering clean energy companies during the Great Recession and should be extended to prevent further contraction in the clean energy sector as it faces dramatic job losses since the onset of the COVID-19 recession (SEIA 2020). Extending PTC and ITC credits is also crucial to protecting small businesses and preventing further corporate concentration in solar and wind industries.

Typically, the PTC and ITC tax credits require significant tax equity to qualify. But most small solar and wind companies have too little tax liability to take advantage of the credits without the support of third-party investors. During the 2008 to 2010 financial crisis, the pool of willing investors for solar ITCs and PTCs for wind shrank dramatically, prompting the federal government to make the tax credits refundable through a cash grant program to incentivize continued investment. Without this intervention, it is possible that the solar and wind industries would have collapsed during the Great Recession (Roth 2020).

The solar and wind industries in the US are significantly more mature now but have suffered a similar contraction in private investment during this recession—especially as the CARES Act and other COVID-19 policies have benefited fossil fuel companies and overlooked renewable energy firms. Congress should convert the ITC and PTC to refundable cash grants under Section 1603 of the statute to again





side-step the need for third party investors and preserve small businesses, which currently comprise 90 percent of all solar firms (SEIA 2019). From 2009 through 2015, \$25 billion in funds from the ARRA were used to support renewable energy projects through the 1603 cash grant program (CEA 2016), and similar levels of investment should be considered now. Furthermore, the deadlines for starting construction and for meeting the safe harbor to qualify for renewable tax credits should be extended from December 31, 2020, through all of 2021 to provide renewable energy developers with more time to overcome disruptions resulting from the pandemic (St. John 2020).

## **GREEN INFRASTRUCTURE SPENDING: ENVIRONMENTAL JUSTICE THROUGH STATE AND LOCAL FISCAL RELIEF**

***These projects are essential to environmental justice, and their neglect creates tremendous costs for communities, both in regard to public health—as evidenced by the crises in Flint, Michigan, and Newark, New Jersey—and to climate impacts.***

States currently provide 72 percent of all infrastructure spending in the US (McNichol 2019). Without federal relief, investments in water and transit infrastructure are likely to slow, if not cease, as the recession—and likely forthcoming austerity measures—continues to bleed state budgets dry. These projects are essential to environmental justice, and their neglect creates tremendous costs for communities, both in regard to public health—as evidenced by the crises in Flint, Michigan, and Newark, New Jersey—and to climate impacts.

Federal stimulus and recovery investments can help close the existing \$1.3 trillion funding gap in water infrastructure. Ninety-five percent of this spending is funded at the local level; without federal assistance, it will be impossible for localities to close this gap (ASCE 2017) (ASCE 2017b). Federal investment should fully fund and then expand federal support for the Drinking Water State Revolving Fund (DWSRF) and the Clean Water State Revolving Fund (CWSRF) to provide low-cost financing and other financial support to community drinking water



and stormwater projects. This effort could drive billions of new investments each year into communities, while reducing climate risk and supporting long-term public health. Additionally, for more direct short-term fiscal relief with immediate environmental justice impacts, the federal government should pair these investments with grants to states to relieve them of the costs of water infrastructure operations and maintenance. States and localities spent \$128 billion on water resources and utilities in 2017 (CBO 2018), compared to \$14 billion in federal spending (Office of Management and Budget 2017).

New federal stimulus investment to states and cities should also be used to strengthen coastal and inland water infrastructure, including culverts, dams, levees, seawalls, and locks. The inland levee system in the US currently protects \$1.3 trillion in property values, all of which is at risk due to the system's increasing age and disrepair (ASCE 2017a). (The American Society of Civil Engineers has given the nation's inland levee system a "D" grade in its infrastructure report card.) At the same time, the flooding, storms, and erosion driven by climate change threaten \$1 trillion more in coastal property. In the long term, replacing and rebuilding this infrastructure will require federal, state, and local funding. During the current recession, the federal government should prioritize direct, short-term fiscal relief with immediate environmental justice impacts. There are multiple immediate "shovel-ready" investments that could improve water infrastructure, make communities more resilient to climate change, and stimulate local and regional economies, such as the \$7.8 billion inland waterway improvements, as outlined in the "Bold Plan to Revive and Reinforce the Infrastructure of the Mississippi River Corridor" (Klipsch and Johnson 2019). These investments are projected to support eight major economies, to create more than 147,000 jobs, and generate \$23.58 billion in economic activity.

Another major state and local expenditure in need of additional federal support is public transportation. The CARES Act provided \$25 billion in funding for mass transit operations and investment through the Urbanized Area Formula Funding program and the Formula Grants for Rural Areas program (Department of Transportation 2020), but transportation advocates estimate the actual need to be \$32 billion (Transportation for America 2020). Fully funding transit shortfalls through federal investment would directly replace a portion of the spending that states would otherwise undertake for public transit—a critical component of any decarbonization plan. This would also help maintain support for transit systems and workers and lay the groundwork for the increased investments in public transit that are key to a comprehensive green recovery.



## Follow the Leaders: Experts Approve of and Major Nations Have Adopted Green Stimulus

COVID-19 response packages must focus on addressing the public health crisis, protecting essential workers, and providing the immediate economic relief that families, businesses, and state and local governments need to weather the ongoing recession. However, as the pandemic continues and the recession worsens, economists have begun to embrace investments in green stimulus as a key component of recovery packages related to COVID-19 (Rathi 2020).

In March, a team of leading economists, including Joseph Stiglitz, Nicholas Stern, and Cameron Hepburn, surveyed 231 finance ministers, central bank officials, and economists from all 53 G-20 nations to gauge the efficacy and attractiveness of potential recovery measures that could be included in forthcoming recovery packages. Respondents consistently ranked green stimulus policies higher than “traditional” measures when compared on four metrics: speed of implementation (from the time of legislation), long-run economic multipliers, “climate impact potential,” and overall desirability. Participants not only considered the climate-friendly policies highly desirable but also often ranked these proposals—particularly investments in clean energy infrastructure, disaster preparedness, and clean energy research and development (R&D) spending—among their top-10 desired recovery policies. Conversely, perceptions of income tax cuts, investments in traditional transport infrastructure, and business tax relief, were far more mixed, with all of the worst-ranked policies coming from this group (Hepburn et al. 2020).

Other countries have already recognized the importance of green stimulus policies to economic recovery. The European Union (EU), for example, has committed to allocating 25 percent of its proposed economic recovery package—totaling more than \$200 billion—to decarbonization measures “like building renovation [for increased energy efficiency], clean energy technologies, low-carbon vehicles[,] and sustainable land use” (Jaeger 2020). Several EU member nations have also designed national recovery packages that provide additional green stimulus measures, including \$4 billion for green renovations to social housing (Denmark) (Jaeger 2020); \$44 billion for “clean growth” R&D funding for next-generation, clean energy technology (UK)

(Department of Business, Energy, and Industrial Strategy 2020); and an additional \$43.5 billion to support low-carbon transportation and energy alternatives (Germany) (Pontecorvo 2020).

To date, green stimulus measures have not been included in the economic response to the recession here in the United States. Congress still seems to view green policies as separate from the fiscal and economic policies needed to stimulate economic recovery, particularly in the short term. Furthermore, whereas some legislators have expressed support for including investments in decarbonization and clean energy in future stimulus packages,<sup>4</sup> there has been little indication that policymakers see climate action as an essential part of the plans for economic recovery. However, as we have shown, green stimulus policies are more than nice “bonuses” to tack onto otherwise traditional stimulus measures, and there are far deeper reasons to center climate in discussions of economic stimulus than the chance—however rare and important—that it presents to score a two-for-one deal on the cost of existential crises.

## **Conclusion: Bold, Structural Policies Will Also Be Needed to Promote a Resilient Economy and Shared Prosperity**

***Federal investment must meet the magnitude of the crisis, and stimulus policies must be designed to create sustainable, long-term growth.***

Immediate relief is only the beginning: Our federal response to the dual health and economic crises we now face will decide the fate of our economy for decades to come. To underestimate the depth of this recession and the impending threat of climate disaster would be a costly mistake—and, unfortunately, one that we have made before. The lasting and underlying infirmities that were exposed in 2008 were not remedied, and our insufficient and piecemeal response locked our

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<sup>4</sup> See the THRIVE proposal (2020) introduced by Rep. Ilhan Omar (D-MN) and Sen. Ed Markey (D-MA), as well as the letter signed by Rep. Nanette Diaz Barragán and 59 other members of Congress (2020).

economy into a grinding, decade-long recovery despite declarations otherwise. It is imperative that the response to this recession is different. Federal investment must meet the magnitude of the crisis, and stimulus policies must be designed to create sustainable, long-term growth.

We acknowledge that, on their own, the green investments outlined in this paper will not reduce emissions or realign markets enough to offset the uncertainty caused by the climate or COVID-19 crises—especially since non-climate spending dwarfs climate spending at least three to one, even in the most climate-friendly recovery packages (Jaeger 2020). Full and lasting recovery will require significant structural changes to our economy. Both climate change and COVID-19 require “decisive state interventions” that can alter the structure of our national economy and redirect resources toward “a productive and balanced portfolio of sustainable physical capital, human capital, social capital, intangible capital, and natural capital assets” (Hepburn et al. 2020).

These interventions include rapidly scaling up production of key goods and services, transitioning workers into different sectors and activities, filling gaps in supply chains, and sustaining people’s incomes as existing forms of employment lapse or end completely—all steps that the federal government has yet to take in response to either crisis (Hepburn et al. 2020). Effective interventions also include not only assessing and limiting the climate impacts of “non-climate” recovery spending but also limiting public investment into fossil-fuel-dependent industries; otherwise, it is likely that emissions will return to pre-recession levels as economic activity resumes—especially if governments invest in fossil fuel industries as a means to stimulate economic activity, as they did after the 2008 financial crisis (Peters et al. 2012).

## **RESTRUCTURING THE ECONOMY AND COMBATING SYSTEMIC INEQUITY**

The need for structural economic interventions is particularly acute. Structural racism has shaped our economy and thus the consequences of climate change and COVID-19. Black, Latinx, and Native American people have been ravaged by the intersections of environmental injustice, COVID-19, and the recession (Adejumo 2019). All three populations disproportionately suffer from poor air quality, while also being least likely to be able to work from home (Gould and Shierholz 2020) and having the least access to needed health and wellbeing supports. As a result, people of color—Black people especially (COVID Tracking Project 2020)—have the



highest rates of death and hospitalization from COVID-19 (Stafford et al. 2020).

Stimulus measures that address the economic structures that contributed to these disparities could significantly improve financial and health outcomes for people of color. Additionally, if coupled with supplementary policies to tighten and redress inequities in the labor market, such as a jobs guarantee, could raise their wages (Paul et al. 2018), increase their share of national income (Mason and Bossie 2020), and improve the likelihood of full economic recovery (Harvey 2011). Meanwhile, these direct federal investments in employment can put people to work on projects that will aid in decarbonization and redress environmental injustice, like the weatherization and electrification programs discussed earlier, which predominantly harm communities of color.

Ultimately, economic recovery requires *sustained* increases in economic activity, and green stimulus policies can both revive the economy and mitigate future climate disruption in ways that move the US toward sustained resilience and a living planet for future generations. As we discussed in Section 2, green stimulus measures can create millions of jobs, while also reducing emissions. The CARES Act and earlier stimulus packages did not invest in clean energy but instead facilitated investments in fossil fuel industries that not only create far fewer jobs but also threaten to slow investment in clean energy and create more economic risk, as outlined in Section 1.

Without green stimulus policies, full and lasting economic recovery is much less probable—if not impossible. Investments in decarbonization, adaptation, and environmental justice are necessary to transition workers to industries that can withstand future crises and reverse the damage of a centuries-long dependence on fossil fuels. Green stimulus policies have also proven to be smart investments that can put people to work quickly and at scale, and they've been shown to move countries toward equitable economies and a healthier climate. The Federal Reserve has already effectively lowered interest rates, eliminating runaway debt concerns as a critique of robust debt-financed federal investment (Konczal 2020). Now is the moment to enact change. To halt the progression of climate disaster and secure the recovery the current economic crisis demands, a green stimulus program is essential.



# References

- Adejumo, Vincent. 2019. "African-Americans' Economic Setbacks from the Great Recession Are Ongoing—and Could Be Repeated." *The Conversation*, February 5, 2019. <https://theconversation.com/african-americans-economic-setbacks-from-the-great-recession-are-ongoing-and-could-be-repeated-109612>.
- American Society of Civil Engineers (ASCE). 2017. "Drinking Water D." 2017 Infrastructure Report Card. ASCE. [https://www.infrastructurereportcard.org/cat-item/drinking\\_water/](https://www.infrastructurereportcard.org/cat-item/drinking_water/).
- American Society of Civil Engineers (ASCE). 2017a. "Levees D." 2017 Infrastructure Report Card. ASCE. <https://www.infrastructurereportcard.org/wp-content/uploads/2017/01/Levees-Final.pdf>.
- American Society of Civil Engineers (ASCE). 2017b. "Wastewater D+." 2017 Infrastructure Report Card. ASCE. <https://www.infrastructurereportcard.org/wp-content/uploads/2017/01/Wastewater-Final.pdf>.
- Barragán, Nanette Diaz, Jared Huffman, Brenda Lawrence, Chellie Pingree, and Alcee L. Hastings. 2020. "Green Stimulus Letter." July 1, 2020. [https://alceehastings.house.gov/UploadedFiles/Green\\_Stimulus\\_Letter\\_Final\\_7-1-20.pdf](https://alceehastings.house.gov/UploadedFiles/Green_Stimulus_Letter_Final_7-1-20.pdf).
- Bednar, Dominic J., Tony Gerard Reames, and Gregory A. Keoleian. 2017. "The Intersection of Energy and Justice: Modeling the Spatial, Racial/Ethnic and Socioeconomic Patterns of Urban Residential Heating Consumption and Efficiency in Detroit, Michigan." *Energy and Buildings* 143 (May): 25–34.
- Berardelli, Jeff. 2020. "As Fossil Fuel Jobs Falter, Renewables Come to the Rescue." *CBS News*, September 25, 2020. <https://www.cbsnews.com/news/renewable-energy-jobs-replacing-fossil-fuel-jobs-oil-wind/>.
- Bureau of Labor Statistics (BLS). 2020. "Employment and Earnings Summary Table B." US Bureau of Labor Statistics. <https://www.bls.gov/web/empsit/cesesummary.htm>.
- Bureau of Labor Statistics (BLS). 2020a. "Employment by Major Industry Sector." US Bureau of Labor Statistics. <https://www.bls.gov/emp/tables/employment-by-major-industry-sector.htm>.
- Bureau of Labor Statistics (BLS). 2020b. "Fastest Growing Occupations." US Bureau of Labor Statistics. <https://www.bls.gov/ooh/fastest-growing.htm>.
- Bureau of Labor Statistics (BLS). 2020c. "Table A-12. Unemployed persons by duration of unemployment." US Bureau of Labor Statistics. <https://www.bls.gov/news.release/empsit.t12.htm>.
- Bureau of Labor Statistics (BLS). 2020d. "The Employment Situation - September 2020." US Bureau of Labor Statistics. <https://www.bls.gov/news.release/pdf/empsit.pdf>.
- Council of Economic Advisors (CEA) 2016. "A Retrospective Assessment of Clean Energy Investments in the Recovery Act." Executive Office of the President of the United States. [https://obamawhitehouse.archives.gov/sites/default/files/page/files/20160225\\_cea\\_final\\_clean\\_energy\\_report.pdf](https://obamawhitehouse.archives.gov/sites/default/files/page/files/20160225_cea_final_clean_energy_report.pdf).
- Chediak, Mark, and Gerson Freitas Jr. 2020. "Virus Could Push Unpaid US Utility Bills to Highest in Decades." *Bloomberg*, May 11, 2020. <https://www.bloomberg.com/news/articles/2020-05-11/virus-could-push-unpaid-u-s-utility-bills-to-highest-in-decades>.
- Congressional Budget Office (CBO). 2018. "Public Spending on Transportation and Water Infrastructure, 1956 to 2017." Congressional Budget Office. <https://www.google.com/url?q=https://www.cbo.gov/system/files/2018-10/54539-Infrastructure.pdf&sa=D&source=hangouts&ust=1602956157326000&usg=AFQjCNGnkCygqkx5WXD068JhNbsxqEQZeg>.



- Congressional Research Service (CRS). 2018. "LIHEAP: Program and Funding." Congressional Research Service. [https://www.everycrsreport.com/files/20180622\\_RL31865\\_85805bac2287a504f2a4eb05e4637a3cd21eaa2e.pdf](https://www.everycrsreport.com/files/20180622_RL31865_85805bac2287a504f2a4eb05e4637a3cd21eaa2e.pdf).
- COVID Tracking Project. 2020. "The COVID Racial Data Tracker." The COVID Tracking Project. <https://covidtracking.com/race>.
- Crist, Meehan. 2020. "What the Coronavirus Means for Climate Change." *New York Times*, March 27, 2020. <https://www.nytimes.com/2020/03/27/opinion/sunday/coronavirus-climate-change.html>.
- Department for Business, Energy, and Industrial Strategy. 2020. "Press Release: Government Launches New £40 Million Clean Growth Fund to Supercharge Green Start-Ups." GOV.UK. <https://www.gov.uk/government/news/government-launches-new-40-million-clean-growth-fund-to-supercharge-green-start-ups>.
- Department of Energy (DOE). 2019. "Weatherization Works!" Office of Energy Efficiency & Renewable Energy. <https://www.energy.gov/sites/prod/files/2019/07/f64/WAP-Fact-Sheet-2019.pdf>.
- Department of Transportation (DOT). 2020. "Federal Transit Administration." Department of Transportation. <https://www.transit.dot.gov/frequently-asked-questions-fta-grantees-regarding-coronavirus-disease-2019-covid-19#CARES>.
- Dlouhy, Jennifer A. 2020. "'Stealth Bailout' Shovels Millions of Dollars to Oil Companies." *Bloomberg*, May 15, 2020. <https://www.bloomberg.com/news/articles/2020-05-15/-stealth-bailout-shovels-millions-of-dollars-to-oil-companies>.
- Duckworth, Tammy. 2020. "Letter From 16 Members Requesting Environmental Justice Priorities in Next Stimulus," April 20, 2020. <https://www.duckworth.senate.gov/imo/media/doc/04.20.20-Letter%20from%2016%20members%20requesting%20EJ%20priorities%20in%20next%20stimulus.pdf>.
- Dyson, Mark, and Grant Glazer. 2019. "The Climate Opportunity of Clean Energy Portfolios." Rocky Mountain Institute. <https://rmi.org/the-climate-opportunity-of-clean-energy-portfolios/>.
- E2. 2020. "Clean Jobs America 2020: Repowering America's Economy in the Wake of COVID-19." E2. <https://e2.org/wp-content/uploads/2020/04/E2-Clean-Jobs-America-2020.pdf>.
- Energy Information Administration (EIA). 2020. "Electric Power Monthly." Eia.Gov. [https://www.eia.gov/electricity/monthly/epm\\_table\\_grapher.php?t=epmt\\_1\\_01](https://www.eia.gov/electricity/monthly/epm_table_grapher.php?t=epmt_1_01).
- Energy Policy Act of 2005. H.R. 6. 109th Cong. (2005). <https://www.congress.gov/bill/109th-congress/house-bill/6>.
- Federal Reserve Bank of St. Louis (FRED). 2020. "Personal Consumption Expenditures." Federal Reserve Bank of St. Louis. <https://fred.stlouisfed.org/series/PCE>.
- Flavelle, Christopher. 2020. "Fires and Storms Push Demand for Emergency Shelter to a New High." *New York Times*, October 1, 2020. <https://www.nytimes.com/2020/10/01/climate/disaster-shelter-red-cross.html>.
- Forster, Piers, Zeke Hausfather, Gabi Hegerl, Steven Sherwood, and Kyle Armour. 2020. "Guest Post: Why Low-End 'Climate Sensitivity' Can Now Be Ruled Out." *Carbon Brief* (blog), July 22, 2020. <https://www.carbonbrief.org/guest-post-why-low-end-climate-sensitivity-can-now-be-ruled-out>.
- Franck, Thomas. 2020. "Economy Doesn't Need More Stimulus for a V-Shaped Recovery, Trump Advisor Kudlow Says." *CNBC*, September 22, 2020. <https://www.cnbcm.com/2020/09/22/economy-doesnt-need-more-stimulus-for-v-shaped-recovery-trump-advisor-kudlow-says.html>.
- Franck, Thomas. 2020a. "Metrics Show Consumers Pulling Back on Spending in September as Congress Debates Second Stimulus." *CNBC*, September 18, 2020. <https://www.cnbcm.com/2020/09/18/metrics-show-consumers-pulling-back-on-spending-in-september-as-congress-debates-second-stimulus.html>.





- Garrett-Peltier, Heidi. 2017. "Green versus Brown: Comparing the Employment Impacts of Energy Efficiency, Renewable Energy, and Fossil Fuels Using an Input-Output Model." *Economic Modelling* 61 (February): 439–47. <https://doi.org/10.1016/j.econmod.2016.11.012>.
- Gould, Elise. 2020. "A Waking Nightmare: Today's Jobs Report Shows 20.5 Million Jobs Lost in April." *Economic Policy Institute* (blog). May 8, 2020. <https://www.epi.org/press/a-waking-nightmare-todays-jobs-report-shows-20-5-million-jobs-lost-in-april/>.
- Gould, Elise. 2020a. "Slowdown in Jobs Added Means We Could Be Years Away from a Full Recovery." *Economic Policy Institute*. <https://www.epi.org/press/slowdown-in-jobs-added-means-we-could-be-years-away-from-a-full-recovery/>.
- Gould, Elise, and Heidi Shierholz. 2020. "Not Everybody Can Work from Home: Black and Hispanic Workers Are Much Less Likely to Be Able to Telework." *Economic Policy Institute* (blog). <https://www.epi.org/blog/black-and-hispanic-workers-are-much-less-likely-to-be-able-to-work-from-home/>.
- Groeger, Lena V. 2020. "What Coronavirus Job Losses Reveal About Racism in America." *ProPublica*, July 20, 2020. <https://projects.propublica.org/coronavirus-unemployment/>.
- Gupta, Alisha Haridasani. 2020. "Why Did Hundreds of Thousands of Women Drop Out of the Workforce?" *New York Times*, October 3, 2020. <https://www.nytimes.com/2020/10/03/us/jobs-women-dropping-out-workforce-wage-gap-gender.html>.
- Harvey, Philip. 2011. "Back to Work: A Public Jobs Proposal for Economic Recovery." Demos. [https://www.demos.org/sites/default/files/publications/Back\\_To\\_Work\\_Demos.pdf](https://www.demos.org/sites/default/files/publications/Back_To_Work_Demos.pdf).
- Hepburn, Cameron, Brian O'Callaghan, Nicholas Stern, Joseph Stiglitz, and Dimitri Zenghelis. 2020. "Will COVID-19 Fiscal Recovery Packages Accelerate or Retard Progress on Climate Change?" *Oxford Review of Economic Policy* 36 (20): 4. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7239121/>.
- Hodge, Tyler. 2020. "EIA Forecasts Slower Growth in Natural Gas-Fired Generation While Renewable Energy Rises." *Today in Energy* (blog). <https://www.eia.gov/todayinenergy/detail.php?id=42497>.
- Holder, Michelle, and James Murray. 2020. "Coronavirus Dampens 2020 Outlook for Clean Energy and Electric Vehicles." *GreenBiz*, March 17, 2020. <https://www.greenbiz.com/article/coronavirus-dampens-2020-outlook-clean-energy-and-electric-vehicles>.
- Horowitz, Julia. 2020. "The World May Never Recover Its Thirst for Oil." *CNN Business*, April 29, 2020. <https://www.cnn.com/2020/04/29/economy/oil-demand-peak/index.html>.
- Iaccino, Bob. 2019. "How Much Does Oil and Gas Drive US GDP?" *TheStreet*, June 5, 2019. <https://www.thestreet.com/markets/how-much-does-oil-and-gas-drive-u-s-gdp-14981567>.
- Jaeger, Joel. 2020. "Europe Charts a Course for Sustainable Recovery from COVID-19." *World Resources Institute* (blog). <https://www.wri.org/blog/2020/06/europe-charts-course-sustainable-recovery-covid-19>.
- Jordan, Philip. 2019. "Clean Energy Employment Initial Impacts from the COVID-19 Economic Crisis." [bw] Research Partnership. <https://e2.org/wp-content/uploads/2020/05/Clean-Energy-Jobs-April-COVID-19-Memo-FINAL.pdf>.
- Konczal, Mike. 2020. "For a Full Economic Recovery, Debt Is No Object." Roosevelt Institute (blog). <https://rooseveltinstitute.org/2020/08/06/for-a-full-economic-recovery-debt-is-no-object/>.
- Kowalski, Kathiann M. 2020. "Racial Disparities Persist in Electric Service. Is 'Willful Blindness' to Blame?" *Energy News Network*, July 1, 2020. <https://energynews.us/2020/07/01/midwest/racial-disparities-persist-in-electric-service-is-willful-blindness-to-blame/>.



- Klipsch, Frank, and Lionel Johnson. 2019. "2019 Federal Policy Platform of the Mississippi River Mayors: A Bold Plan to Revive and Reinforce the Infrastructure of the Mississippi River Corridor." Mississippi River Cities and Towns Initiative. <https://static1.squarespace.com/static/5845a70859cc6819f2dfdb9e/t/5c87b6096e9a7f38beaf70bb/1552397864078/Platform+One-Pagers+19.pdf>.
- Long, Heather. 2020. "Small Business Used to Define America's Economy. The Pandemic Could Change That Forever." *The Washington Post*, May 12, 2020. <https://www.washingtonpost.com/business/2020/05/12/small-business-used-define-americas-economy-pandemic-could-end-that-forever/>.
- Luhby, Tami. 2020. "More than 50% of US Adults Live in Households That Lost Income in Pandemic." *CNN*, July 30, 2020. <https://www.cnn.com/2020/07/30/politics/lost-income-jobs-covid-congress/index.html>.
- Marcacci, Silvio. 2019. "The Coal Cost Crossover: 74% Of US Coal Plants Now More Expensive Than New Renewables, 86% By 2025." *Forbes*, May 26, 2019. <https://www.forbes.com/sites/energyinnovation/2019/03/26/the-coal-cost-crossover-74-of-us-coal-plants-now-more-expensive-than-new-renewables-86-by-2025/#5bd7ff7e22d9>.
- Mason, J.W. 2019. "The Macroeconomic Case for a Green New Deal." Roosevelt Institute. [https://rooseveltinstitute.org/wp-content/uploads/2020/07/RI\\_Macroeconomic-Case-for-the-GND\\_brief-201906.pdf](https://rooseveltinstitute.org/wp-content/uploads/2020/07/RI_Macroeconomic-Case-for-the-GND_brief-201906.pdf).
- Mason, J.W., and Andrew Bossie. 2020. "The Public Role in Economic Transformation: Lessons from World War II." Roosevelt Institute. <https://rooseveltinstitute.org/publications/the-public-role-in-economic-transformation-lessons-from-world-war-ii/>.
- McNichol, Elizabeth. 2019. "It's Time for States to Invest in Infrastructure." Center on Budget and Policy Priorities. <https://www.cbpp.org/research/state-budget-and-tax/its-time-for-states-to-invest-in-infrastructure>.
- Moritz-Rabson, Daniel. 2019. "Eleven Coal Companies Have Filed for Bankruptcy Since Trump Took Office." *Newsweek*, October 30, 2019. <https://www.newsweek.com/eight-coal-companies-have-filed-bankruptcy-since-trump-took-office-1468734>.
- Office of Management and Budget. 2017. "Budget of the US Government." Office of Management and Budget. <https://www.govinfo.gov/content/pkg/BUDGET-2017-BUD/pdf/BUDGET-2017-BUD.pdf#page=123>.
- Paul, Mark, William Darity Jr., and Darrick Hamilton. 2018. "The Federal Job Guarantee—A Policy to Achieve Permanent Full Employment." Center on Budget and Policy Priorities. <https://www.cbpp.org/research/full-employment/the-federal-job-guarantee-a-policy-to-achieve-permanent-full-employment>.
- Paul, Mark, Anders Fremstad, and J.W. Mason. 2019. "The Realities of Climate Change." Roosevelt Institute. [https://rooseveltinstitute.org/wp-content/uploads/2020/07/RI\\_Realities-of-Climate-Change\\_brief\\_201906.pdf](https://rooseveltinstitute.org/wp-content/uploads/2020/07/RI_Realities-of-Climate-Change_brief_201906.pdf).
- Peters, G.P., G. Marland, C. Le Quéré, T. Boden, J.G. Canadell, and M.R. Raupach. 2012. "Rapid Growth in CO2 Emissions after the 2008—2009 Global Financial Crisis." *Nature Climate Change* 2 (January). [https://www.globalcarbonproject.org/global/pdf/pep/Peters\\_2012\\_RapidGrowthCO2EmissionsAfter2008-2009GFC.NatureCC.pdf](https://www.globalcarbonproject.org/global/pdf/pep/Peters_2012_RapidGrowthCO2EmissionsAfter2008-2009GFC.NatureCC.pdf).
- Pollin, Robert, Heidi Garrett-Peltier, James Heintz, and Bracken Hendricks. 2014. "Green Growth: A US Program for Controlling Climate Change and Expanding Job Opportunities." Political Economy Research Institute. [https://www.peri.umass.edu/publication/item/download/80\\_831bbb6e70d5f7fb5b0f70c707c28d85](https://www.peri.umass.edu/publication/item/download/80_831bbb6e70d5f7fb5b0f70c707c28d85).
- Pollin, Robert, and Shouvik Chakraborty. 2020. "Job Creation Estimates Through Proposed Economic Stimulus Measures: Modeling Proposals by Various US Civil Society Groups; Macro-Level and Detailed Program-by-Program Job Creation Estimates." Political Economy Research Institute (PERI). <https://www.sierraclub.org/sites/www.sierraclub.org/files/PERI-stimulus-jobs.pdf>.



- Pontecorvo, Emily. 2020. "Guten Tag, Germany Has a Green Stimulus." *Grist*, June 8, 2020. <https://grist.org/beamcon/guten-tag-germany-has-a-green-stimulus/>.
- Rathi, Akshat. 2020. "Green Stimulus Finds Support From G-20 Officials, Central Bankers." *Bloomberg Green*, May 4, 2020. <https://www.bloomberg.com/news/articles/2020-05-04/world-s-economists-agree-economic-stimulus-ought-to-be-green?sref=gMvqgK3G>.
- Ray, Suparna. 2020. "New Electric Generating Capacity in 2020 Will Come Primarily from Wind and Solar." Today in Energy (blog). <https://www.eia.gov/todayinenergy/detail.php?id=42495>.
- Raskin, Sarah Bloom. 2020. "Why Is the Fed Spending So Much Money on a Dying Industry?" *New York Times*, May 28, 2020. [https://www.nytimes.com/2020/05/28/opinion/fed-fossil-fuels.html?smtyp=cur&smid=tw-nyclimate&fbclid=IwAR2iFqt1XeM8OiQRiubeP51G79iRETH6IY\\_r46Pbr16Ehm2mH4i3LvupKA0](https://www.nytimes.com/2020/05/28/opinion/fed-fossil-fuels.html?smtyp=cur&smid=tw-nyclimate&fbclid=IwAR2iFqt1XeM8OiQRiubeP51G79iRETH6IY_r46Pbr16Ehm2mH4i3LvupKA0).
- Reames, Tony Gerard. 2016. "Targeting Energy Justice: Exploring Spatial, Racial/Ethnic and Socioeconomic Disparities in Urban Residential Heating Energy Efficiency." *Energy Policy* 97 (October): 549–58.
- Recognizing the duty of the Federal Government to implement an agenda to Transform, Heal, and Renew by Investing in a Vibrant Economy ("THRIVE"). H.R. 1102. 116th Cong. (2020). <https://www.congress.gov/116/bills/hres1102/BILLS-116hres1102ih.pdf>.
- Reuters. 2018. "Global Temperatures on Track for 3-5 Degree Rise by 2100: U.N." *Reuters*, November 29, 2018. <https://www.reuters.com/article/us-climate-change-un/global-temperatures-on-track-for-3-5-degree-rise-by-2100-u-n-idUSKCN1NY186>.
- Roth, Sammy. 2020. "Should We Spend Billions on Clean Energy? It Worked during the Last Crisis." *Los Angeles Times*, April 10, 2020. <https://www.latimes.com/environment/story/2020-04-10/congress-billion-clean-energy-coronavirus-crisis>.
- Sanzillo, Tom. 2020. "IEEFA Update: Federal Lending to the Oil and Gas Sector Would Be a Complete Waste of Money." Institute for Energy Economics and Financial Analysis. <https://ieefa.org/ieefa-commentary-federal-lending-to-the-oil-and-gas-sector-would-be-a-complete-waste-of-money/>.
- Sawin, Elizabeth. 2018. "The Magic of 'Multisolving.'" *Sanford Social Innovation Review*, July 16, 2018. [https://ssir.org/articles/entry/the\\_magic\\_of\\_multisolving](https://ssir.org/articles/entry/the_magic_of_multisolving).
- Shierholz, Heidi. 2020. "More than One in Five Workers Are Either Receiving Unemployment Benefits or Waiting for Approval: Congress Must Do Much, Much More." *Economic Policy Institute* (blog). <https://www.epi.org/blog/more-than-one-in-five-workers-are-either-receiving-unemployment-benefits-or-waiting-for-approval-congress-must-do-much-much-more/>.
- Solar Energy Industry Association (SEIA). 2019. "Fueling Small Solar Business Growth Requires the ITC." Solar Energy Industry Association. <https://www.seia.org/blog/fueling-small-solar-business-growth-requires-itc#:~:text=More%20than%2090%25%20of%20the,services%20that%20underpin%20solar%20growth>.
- Solar Energy Industry Association (SEIA). 2020. "COVID-19 Erases Five Years of Solar Job Growth." Solar Energy Industry Association. <https://www.seia.org/news/covid-19-erases-five-years-solar-job-growth#:~:text=The%20solar%20industry%20is%20now,to%20previous%20estimates%20for%20June.&text=All%2050%20states%20show%20solar%20jobs%20losses%20C%20with%2036,suffering%20job%20losses%20above%2030%25>.
- Solar Energy Industries Association (SEIA). 2020a. "US Solar Market Insight." Solar Energy Industries Association. <https://www.seia.org/us-solar-market-insight#:~:text=The%20U.S.%20installed%203.6%20gigawatts,power%2015.7%20million%20American%20homes.&text=The%20impact%20has%20been%20felt,in%202020%20than%20in%202019>.



- Stafford, Kat, Meghan Hoyer, and Aaron Morrison. 2020. "Racial Toll of Virus Grows Even Starker as More Data Emerges." *Associated Press*, April 18, 2020. <https://apnews.com/article/8a3430dd37e7c44290c7621f5af96d6b>.
- Stiglitz, Joseph E. 2020. "Four Priorities for Pandemic Relief Efforts." Roosevelt Institute. [https://rooseveltinstitute.org/wp-content/uploads/2020/07/RI\\_Four-Priorities-for-Pandemic-Relief-Effort-WP-202004-1.pdf](https://rooseveltinstitute.org/wp-content/uploads/2020/07/RI_Four-Priorities-for-Pandemic-Relief-Effort-WP-202004-1.pdf).
- St. John, Jeff. 2020. "Solar, Wind and Storage Industries Seek Relief in Coronavirus Stimulus Package." *Green Tech Media*, March 19, 2020. <https://www.greentechmedia.com/articles/read/clean-energy-groups-seek-tax-credit-extensions-direct-pay-provisions-in-coronavirus-stimulus-package>.
- Sundaram, Anjali. 2020. "Yelp Data Shows 60% of Business Closures Due to the Coronavirus Pandemic Are Now Permanent." *CNBC*, September 16, 2020. <https://www.cnbc.com/2020/09/16/yelp-data-shows-60percent-of-business-closures-due-to-the-coronavirus-pandemic-are-now-permanent.html>.
- Transportation for America. 2020. "House Bill Proposes \$15 Billion for Transit. It's Not Enough." *T4America Blog* (blog). <https://t4america.org/2020/05/13/house-bill-proposes-15-billion-for-transit-its-not-enough/>.
- Wolfe, Mark. 2020. "Electric and Gas Arrearages are Growing Rapidly." National Energy Assistance Directors Association (NEADA) Public Press Release. July 31, 2020.
- Wolfe, Mark. 2020a. "Estimated Cost to Provide Energy Assistance for Households." National Energy Assistance Directors Association. Memo to Congressional Staff. July 11, 2020.
- Wood Mackenzie. 2020. "Press Release: Coronavirus Impact Trims US behind-the-Meter Storage Forecast by 31%." Wood Mackenzie. <https://www.woodmac.com/press-releases/coronavirus-impact-trims-us-behind-the-meter-storage-forecast-by-31/>.





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