

A GREEN COVID-19 RECOVERY: LESSONS FROM THE ARRA

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As argued in *A Green Recovery: The Case for Climate-Forward Stimulus Policies in America's COVID-19 Recession Response* (Gunn-Wright et al. 2020), the United States has an opportunity to respond to the climate and COVID-19 crises, simultaneously, by building an economic stimulus package targeted at both. In this brief, we explore the American Recovery and Reinvestment Act (ARRA) of 2009, which provides lessons for what—and what not—to do when investing stimulus funds into clean energy. We define “green stimulus” as investments in decarbonization, clean energy, environmental justice, and climate disaster mitigation that serve the dual goals of speeding the transition away from fossil fuels and spurring the investment, job creation, and financial flows necessary to recover from the current recession.

MAKING THE CASE FOR GREEN STIMULUS: BENEFITS OF THE ARRA

In the aftermath of the Great Recession, the ARRA invested \$90 billion, or one-eighth of total stimulus spending authorized, into the generation, development, and deployment of clean energy and related technology. Comparatively, \$3.4 billion was allotted to the Office of Fossil Energy to fund the research, development, and deployment of technologies to use coal more cleanly and efficiently. This is very different from the Coronavirus Aid, Relief, and Economic Security (CARES) Act—the main stimulus package built in response to the recession instigated by COVID-19—which has invested billions in fossil fuel industries but has not provided any targeted funding to clean energy.

The ARRA’s “green” investments not only saved the solar and wind industries in the US from collapse (as we will discuss later), but they also supported the rapid expansion of clean transportation, energy efficiency, and clean energy manufacturing. In fact, the ARRA’s clean energy investments supported roughly 900,000 job years from 2009 to 2015 (CEA 2016). These investments also supported a rapid expansion of the number of green jobs, which paid, on average, more than the national median income. For example,



between 2010 and 2015, the solar industry added workers at a pace that was 12-times faster than the overall economy (CEA 2016), and the median wage for a typical clean economy job approached \$44,000 in 2011—13 percent higher than the national median wage in 2011 (Muro et al. 2011) and 9 percent higher than in 2019 (Gould 2020). The programs also leveraged an additional \$150 billion in private investment, bringing the total level of investment—direct and indirect—to \$240 billion, or at least 25 percent more than the total amount of new clean energy investment globally prior to 2009.

Before the ARRA, there was no formal federal strategy for directly investing in clean energy or sustaining its industries. The largest federal investment even proposed before 2009 was only \$6.3 billion, and the limited funding that was available was concentrated in a handful of tax credit and loan programs that focused, almost entirely, on incentivizing private investment (Royden 2002). However, private investment in clean energy was sluggish even before the Great Recession, hovering around \$44 billion in 2007 and 2008 (compared to a record high of \$55.5 billion in 2019) (Liebreich 2013). As a result, many solar and wind companies faced losing the vast majority of their funding—public and private—after capital markets tightened following the global financial crisis, as energy efficiency and other publicly funded green sectors faced significant cutbacks. The ARRA's green stimulus laid the groundwork for the significant increase in solar and wind deployment, which the US has benefited from over the past decade.

The ARRA not only sought to save these industries but, perhaps more importantly, also to support their long-term growth and expansion.

Policymakers did this in three ways. **First**, they diversified avenues for public investment in clean energy by creating 45 investment programs (with an initial allocation of \$60.7 billion) and 11 tax incentives that invested \$29.5 billion in “nearly every aspect of the value chain for [eight] key clean energy technologies”: renewable generation, energy efficiency, grid modernization, advanced vehicles and fuels, transit, carbon capture and storage, green innovation and job training, and clean energy manufacturing (CEA 2016).

Second, ARRA investments were designed to address “an array of market failures” that had contributed to “underinvestment in clean energy, energy efficiency, and research and development” (CEA 2016). According to a 2016 report from the Council of Economic Advisors (CEA), the ARRA needed to correct four types of market failures: environmental externalities from the burning of fossil fuels, energy security externalities from the use of oil, innovation, and information. Arguably, the ARRA did not—and could not—tackle environmental externalities and security externalities. In 2009, much like now, supply-side restrictions that limit the production of fossil fuels—were considered too politically



controversial to pursue as part of a recovery package. Yet, it is difficult to address these types of externalities purely through demand-side policies that try to discourage fossil fuel consumption by increasing the deployment and use of alternative energy sources. In contrast, policymakers were able to design and implement policies that directly addressed innovation and information market failures, particularly as they related to capital markets and banks.

Innovation and information failures occur when the actors in a market fail to invest in new technologies either because they have inadequate or poor information about said technologies (information failures) and/or they expect that the social rate of return is higher than the private rate of return (innovation failure). Prior to the ARRA, both failures were rampant in US energy markets. As Brandon Hurlbut, Deputy Chief of Staff at the Department of Energy (DOE) during the ARRA, remarked: “In that time [2009,] there had not been a solar [photovoltaic (PV)] project in the United States above 100 megawatts—to build a power plant based on solar requires much more. [But] if you asked for a \$500 million loan to get started, banks wouldn’t lend because they had not seen it done before” (Hurlbut 2020).

Prior to the ARRA, public sector investment in renewable energy was also thwarted by specific loan requirements. For example, until 2008, DOE’s loan guarantee program for “innovative” technologies was limited only to energy projects that “employ[ed] new or significantly improved technologies” (Carr 2020). But this stipulation prevented investment in nascent technologies that had reached the point of early deployment but still needed federal support for production and development to be commercially viable. This—along with the fact that the program had been focused primarily on large-scale nuclear energy projects until 2007—prevented most renewable energy companies from benefitting.

To counter this, policymakers broadened existing federal programs and intentionally invested stimulus funds into large-scale solar and wind projects that, if successful, could prove the viability and reliability of renewable energy: as an investment, electricity source, and significant job creator. For example, the ARRA altered the requirements for the previously mentioned loan guarantee program so that loans could be awarded to renewable energy projects, even if they did not meet the previous definition of “innovative” technologies (so long as they substantially reduced pollution), and it waived many of the fees associated with federal lending. Policymakers then used this new 1705 program to award loans to “one of the largest wind farms in the world (Caithness Shepherds Flat in Oregon), the largest utility-scale PV generation facility (Agua Caliente in



Arizona), and the largest solar power plant in the world (BrightSource in California).” The success of these projects, in turn, encouraged the private sector to lend to these projects on their own. Mike Carr (2020), then a senior counsel to the Senate Energy Committee and one of the main designers of the 1705 program, explained:

The private sector lending had completely dried up [prior to the ARRA]...so we...removed the requirement that the technology be “innovative” and let it just be “clean” [for the 1705 program]... We lent directly; we built the biggest wind and solar projects in the world in the US; and [we] demonstrated to the market that these are doable projects. And with the tax credit, [we] created many new jobs and gave momentum to an industry that was stagnant.

Third, as Carr alludes to, policymakers designed the ARRA’s clean energy loan programs to complement clean energy tax credits in the hopes of spurring long-term growth, both for clean energy industries and the US economy. In particular, the ARRA’s largest clean energy tax credit, the 1603 program, offered direct payments in lieu of investment tax credits (ITC) and production tax credits (PTC), both of which required significant tax equity—and willing private investors—to qualify. As a result, “the 1603 program incentivized small-scale and distributed generation, particularly in solar energy, where nearly 76,000 projects received grants.” Furthermore, it “made the program more accessible to small-scale project managers who were less likely to take advantage of ITC or PTC incentives” (Mundaca and Richter 2015).

The combination of federally funded loans and tax credits—and the unprecedented ability for renewable energy projects to qualify for both—helped the US’s clean energy sector to become not only much more diverse but also much, much larger. By the end of 2011, for example, 470 wind turbine manufacturing facilities were located in the US—more than 10 times than in 2004—due, at least in part, to “\$2.3 billion in tax credits for clean energy manufacturing, including wind turbines.” This also made clean energy much cheaper, which increased its competitiveness in an energy market dominated by fossil fuels. “According to [National Renewable Energy Laboratory (NREL)] analysis of various financing scenarios, the low-cost debt available under the loan guarantee program had the potential to reduce [the levelized cost of energy (LCOE)] by approximately 20 [percent], and possibly more, depending on the amount of debt allowed” (Mundaca and Richter 2015).



THE ARRA'S SHORTCOMINGS

The Obama administration's focus on providing only temporary investments not only kept the ARRA's clean energy investments from being as effective as they could have been, but it also helped to prevent a structural shift to clean energy from taking hold. Both the tax credits and loan programs were designed to provide aid quickly; and with the exception of some transportation funding, most expired within three years of the ARRA's passage (CEA 2016). As Mike Carr (2020) remembered: "Summers and his crowd[,] their mantra was: timely, temporary[,] and targeted. The only one of these that ended up making sense was 'timely.' We couldn't [fund] offshore wind because of the temporary timeline. We rushed battery grants to try to get some things built, but it was before there was enough demand. We could have put things in place to be a globally competitive player in these technologies if we had more time."

Udai Rohatgi, former chief of staff for the Office of Energy Efficiency and Renewable Energy (EERE), had similar experiences working in DOE's EERE programs during the ARRA. "My time was spent getting projects out the door, more than we spent time trying to get policy changes and financing changes to make it possible for these projects to keep going," he said. "We tried HomeStar, tried creating a clean energy standard to fix the value of debt so they had a market to get into, but it failed. [Thankfully,] states have renewable portfolio standards now [and] don't limit anything to [three] years" (Rohatgi 2020).

The emphasis on targeting also limited the impact of the ARRA's clean energy investments, in part, because different stakeholders had conflicting ideas about who should be targeted. "The issue with 'targeted' is that the guys on the econ[omics] team were obsessed that we couldn't crowd out private lending," Carr (2020) said. But Carr, like some others, thought that there was scant evidence that this would be an issue and preferred to directly fund what they saw as necessary projects to meet climate, jobs, and innovation goals, even if it meant private lenders might be excluded from a particular project. As Carr said: "Who cares if banks don't lend on a solar plant?"

Furthermore, neither the economics team nor the energy efficiency team appears to have sufficiently prioritized targeting disadvantaged communities and workers. Later analysis of the impacts of ARRA clean energy investments showed "the stimulus was poorly targeted to those in economic need," even though one of the stated goals of the ARRA was "to assist those most impacted by the recession" (Mundaca and Richter). "Research found the geographic distribution of stimulus funding was more aligned with policy goals of advancing clean energy, medical and scientific research, repairing existing infrastructure,



and subsidizing state and local government services than with helping those in economic hardship (e.g., areas with the highest unemployment)” (Mundaca and Richter 2015). One reason for this outcome, Carr (2020) mentions, was again the mandate that the ARRA only include fast-moving, timely “stimulus.” This meant that ARRA investments had to focus on projects where permitting, capital formation, and siting were furthest along,” most of which did not target disadvantaged communities before the stimulus program began to offer support.

NEXT STEPS: “STAPLING THE POLICIES” AND EXPANDING THE SCOPE

The ARRA’s clean energy investments provide important lessons for developing green stimulus and recovery policies to address the current recession. **First**, public investments in clean industries *must* be tied to the policies that will put that money to work. During the ARRA-era—particularly as the clean energy investments began to sunset—policymakers were stymied when they attempted to pass policy that dictated how funding that had been appropriated was to be used, even if the funding had not been strictly allocated or threatened to go unspent. As Rohatgi (2020) emphasizes, “If we don’t staple the money and the policies together, it won’t work. If we pass a bunch of money to be spent, the Republicans will just vote against the policies we want to go with it.”

As we contemplate designing a new green stimulus plan, it is key to not only take into account the efforts that will be made to hinder these efforts but to also ensure that every dollar is accompanied by a codified purpose. We are not guaranteed “two bites at the apple” (Rohatgi 2020). It is also important, as Carr points out, “that the long term policy objective of achieving competitive domestic industries, from the manufacturing to the installation, is the key. A slug of money, though important, doesn’t get targeted at robust industry development, nor does it entice sufficient matching private capital, unless it is paired with a sustained market driver that industries can rely on in making large scale investments.”

Second, the ARRA teaches us that in order to meet decarbonization goals and to create globally competitive green industries, the scale of green stimulus will have to expand dramatically beyond the level of investment in the ARRA. Today, the US is unable to develop or implement the new technologies needed to meet international climate goals. “We want to get to net zero by 2050[,] but when you think about the sheer amount of



technology that has to be designed... we are way behind," Rohatgi (2020) warns. Ultimately, a substantial increase in federal investment is needed to enable the US to live up to its decarbonization commitments.

Third, future green stimulus investment should go toward policies beyond the scope of what was considered during the ARRA. That means that investments in the technology needed to conduct large-scale efficiency, building retrofits, environmental justice, and infrastructure upgrades should be considered in addition to solar and wind. "The job creator aspect of that (heat pump, retrofit expansion) if you're touching every single home is huge," Rohatgi (2020) predicts. "[And] if you design them properly, they can be high-paying or union jobs."

As of October, 2020, 11.1 million Americans are unemployed (BLS 2020); an expansion into these sectors could provide massive employment opportunities, which will stimulate demand and household consumption. Furthermore, the investments would drive down cost curves for the goods in question, which would make efficiency upgrades more affordable and accessible and, ultimately, reduce energy costs for households across the US.

CONCLUSION

Green investments are not only stimulative in the short-term but also lay the groundwork for new, lasting markets that the US has long ignored. As Zenghelis (2014) explains, "Why green rather than alternative investment, such as schools, housing, and hospitals? The answer is that many forms of investment will have short-run stimulus properties, but it makes sense to prioritize those that are credible enough as long-term markets to leverage private investment with minimal call on the public purse." Ultimately, incorporating lessons from the ARRA into future green recovery policies could help recreate the environment the US needs for clean energy, new industries, and our economy to flourish.



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