May 2022

Lessons from Recovery Act Funding in the West

Informing Deployment Strategies for the Infrastructure Investments and Jobs Act

Developed For

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Acknowledgments

This paper was initiated by Bryce Yonker of Grid Forward in collaboration with Cadeo Group. We would like to thank the industry experts who shared their insights and perspectives with our team through interviews, including Michael Pesin of the US Department of Energy (DOE); Obadiah Bartholomy of the Sacramento Municipal Utility District; Uzma Siddiqi of Seattle City Light; Louis Ting of Los Angeles Department of Water and Power; Jeff Cook of Bonneville Power Administration (BPA); Larry Bekkedahl of Portland General Electric, Mike Wilding, Erik Brookhouse, and Kerstin Rock of PacifiCorp; John Gibson of Avista; and James Mater of QualityLogic. We are also appreciative of Jane Peters of Peters Advising for sharing her knowledge of relevant literature to support our review of secondary research.

Notice

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Introduction

The American Recovery and Reinvestment Act of 2009 (Recovery Act or ARRA) was a stimulus package developed in response to the Great Recession signed into law by President Barack Obama. The Infrastructure Investment and Jobs Act (IIJA) of 2021 is a bipartisan package primarily designed to modernize America's infrastructure, including for the transportation and electric grid, signed into law by President Joe Biden. These legislative packages share similarities in their massive and unprecedented injection of funds into the U.S. economy with some common designations for use of funds. They also have key differences that are expected to yield different results. The legislative objectives of each are detailed in Table 1.

Table 1: Legislative Objectives

	Recovery Act Objectives	IIJA Objectives
Primary	• Create jobs • Stimulate economic growth/recovery quickly	• Modernize roads, bridges, transit, rail, ports, airports, broadband, and drinking and wastewater infrastructure
Secondary	• Modernize the nation's energy and communication infrastructure	• Create jobs

This paper summarizes the objectives of these packages and highlights the Recovery Act lessons learned from utility industry experts to inform strategies for participation in grid-enhancing aspects in the IIJA. The research methods for this paper included informal, mainly in-person, interviews and light secondary literature reviews.

Utility industry professionals learned the following key lessons:

- Not all Recovery Act grant recipients felt "the juice was worth the squeeze" due to the intensive reporting requirements and the internal disruption resulting from the rapid reprioritization of projects.
- Entities with seasoned grant writers or those who partnered with academic and/or government institutions, such as universities or national labs, were more successful in getting funding and managing reporting requirements.
- Focusing on shovel-ready projects during the Recovery Act had negative consequences for strategically motivated projects that required further planning and completion timelines.

- Projects funded by the Recovery Act facilitated smart grid deployments with unprecedented speed and scale, creating a solid foundation for IIJA funds to build upon the value of those investments.
- The rapid deployments of smart grid projects during the Recovery Act had mixed results with respect to longer term use and strategic value.

Plan Ahead to Minimize Disruption

Through personal interviews and literature review, we determined that the competitive nature of the Recovery Act grant program coupled with arduous reporting proved to be overwhelming for many in the utility sector. The Recovery Act's objective to quickly inject funds into the economy and stimulate rapid recovery translated into aggressive project timelines; requiring fund seekers to act quickly to secure competitive funds and to implement projects rapidly once those funds were received.

In less than two years, $551 billion of the Recovery Act's total funds had been distributed through states, counties, and cities. DOE also piloted a central tracking system for all Recovery Act grant activities as part of an effort to meet the Recovery Act's transparency provisions which required additional reporting and communication by implementing agencies and recipients of funds.[1] All participants were required to provide detailed frequent spending updates that were then published by DOE online.

Interviewees also noted that a lack of organizational planning and culture of collaboration created additional challenges in pursuing and implementing impactful Recovery Act–funded projects.

Interviewees noted that a lack of organizational readiness, including specific plans around grant application procedures and pre-identified qualified projects, coupled with cultures that often lacked this type of internal cross-functional team collaboration, created significant challenges in pursuing and implementing impactful Recovery Act–funded projects. One utility representative stated that not engaging with a local labor union prior to securing Recovery Act funding resulted in project delays and scope reductions due to union pushback on automation and job transitions that would require new skill development and training from advanced metering infrastructure (AMI) implementation. A different utility representative spoke about staffing challenges and interdepartmental reshuffling of utility employees to handle the overwhelming workload to meet Recovery Act reporting requirements and the massive projects they were suddenly undertaking, which impacted existing projects and utility departments.

[1] Rhiana Gunn-Wright and Kristina Karlsson, "A Green COVID-19 Recovery: Lessons from the ARRA," Roosevelt Institute, December 2020, https://rooseveltinstitute.org/wp-content/uploads/2020/12/RI_ARRA_IssueBrief_202011.pdf.

Some utilities have already taken steps to increase innovation and flexibility needed for successful participation in IIJA. One utility representative interviewed by Cadeo spoke about newly created teams responsible for identifying and developing high-impact projects in advance of being funded. Their work centers on building internal teams focused on fostering a culture of cross-functional partnerships, as well as developing strategic partnerships with community organizations in determining project scope, feasibility, funding needs, and benefits. In doing this work up-front the utility hopes to hit the ground running when IIJA does become available by having a queue of pre-vetted projects and partners ready for the application process.

As utilities prepare for IIJA, it is vital they learn from experiences with Recovery Act and implement best practices. Fostering collaboration both within utilities and across public organizations is key to establishing project priorities, reaching sufficient staffing support, and building the trust needed for effective participation in the program. More importantly, doing so before applications for funding open ensures organizational preparedness for a process that is expected to be as arduous and intense as the Recovery Act.

Collaborate to Maximize Successes

When Recovery Act grants became available, most utilities lacked staff familiar with the federal grant application process: a major hurdle in securing Recovery Act funding. Without experienced grant writers, existing utility staff with little to no experience in grant writing had to take on the application process—and the additional workload that comes with it. Utilities that managed to avoid this problem did so by hiring specialized staff to handle applications or by partnering with organizations familiar with the federal grantmaking process, namely universities and national labs. Such partnerships not only improved efficiency but also fostered greater trust from the DOE and inspired greater cross-institutional collaboration, giving utilities with these types of partnerships a competitive advantage.

Several success stories from Recovery Act–funded utility projects have one thing in common: cross-organizational collaboration. Some of the strongest partnerships leveraged national labs, universities and industry organizations to identify impactful projects, distribute grant applications, and manage work to allow utilities to focus on meeting project deliverables while simultaneously "keeping the lights on".

For the Pacific Northwest Smart Grid Demonstration Project, the largest of Recovery Act demonstration projects with total funding of $179 million, BPA and 11 other utilities partnered with the University of Washington and five technical firms across five states to undertake smart grid projects across the region. Pacific Northwest Division of Battelle Memorial

> ***Some of the strongest partnerships leveraged national labs and universities to identify impactful projects, distribute grant applications, and manage work to allow utilities to focus on meeting project deliverables.***

Institute was in charge of DOE funding and reporting, allowing participating utilities the luxury to focus their resources more on planning and executing projects, while BPA and Battelle handled coordinating efforts. Collaborating across organizations made a project of this scale feasible despite its aggressive timeline. Tackling the projects separately would not have been possible and the learnings would have been more isolated.

The Pacific Northwest Smart Grid Demonstration Project was made possible, in part, due to the size and significance of the stakeholders involved. But not all entities have those attributes on their side. Equitable access to funding was a challenge with the Recovery Act and likely to be a challenge with IIJA, especially for rural communities and small municipalities and cooperatives. Intentional focus needs to be placed on collaboration amongst these entities and additional help from IIJA to support less populated regions that desperately need infrastructure upgrades but that lack large investor owned utilities capable of coordinating grant writing and reporting obligations.

Look Beyond Shovel-Ready

The Recovery Act's objective to quickly stimulate economic growth in response to the Great Recession resulted in a focus on shovel-ready projects, where planning and engineering was advanced enough that construction could begin almost immediately. Although this strategy prioritized projects that could be executed quickly, it was limiting in that it did not prioritize projects with the most long-term value and instead escalated project priorities based overwhelmingly on how quickly the projects could begin. This disregard for the tried-and-true (albeit often lengthy) project planning practices generally employed by utilities and their stakeholders, introduced additional project risks, atypical prioritization procedures, avoidance of comparative business case assessments, and an emphasis on some small-scale research and development projects that could be more easily expediated.

As a result, the Recovery Act had negative consequences for more strategically motivated projects that required additional planning and longer completion timelines. In some cases, these projects would likely have provided more durable value for utilities and the communities and customers they serve. This minimized the intended impact of incremental job creation and economic growth from the Recovery Act.

IIJA is designed to avoid some of these challenges. It has a longer duration of spending, a focus on long-term infrastructure improvements, targets accelerating commercial capabilities, and includes initiatives designed to help tackle the climate crisis and address the inequities in disadvantaged communities. These legislative distinctions are viewed as an opportunity for IIJA applicants to focus on projects that maximize the broader value of these new funds to generate even greater societal benefits. For example, designing at-scale projects rather than pilot projects

that can leverage advancements in clean energy, climate technologies, and wildfire mitigation will be highly valuable. Offering projects that support diversity, equity, and inclusion and/or environmental justice will be more successful under IIJA than was possible with the Recovery Act. Another challenge with the Recovery Act that IIJA could rectify is using a consistent set of metrics to demonstrate how funds are having an impact. For example, tracking the reduction of greenhouse gas emissions per each billion dollars spent or evaluating the reliability of electricity on tribal lands relative to IIJA funded projects would help maintain a focus between the legislative intent and actual outcomes of IIJA funds.

Lean into the Smart Grid

With AMI meters now in place in most US homes, businesses, and factories, now is the time to deploy the advanced services and capabilities of smart meters.

An expansive smart grid infrastructure was created during the Recovery Act era, giving IIJA the opportunity to extend the value of these historic investments and improve resilience, reliability, and clean energy. This opportunity must not be overlooked. As of 2020, U.S. electric utilities completed 102.9 million smart meter installations, 88% of which were in the residential sector[i]. With AMI meters in place in most U.S. homes, businesses, and factories, now is the time to deploy the advanced services and capabilities of smart meters to help realize greater benefits that are now possible due to the significant progression of grid capabilities in the last decade. For instance, distributed resource aggregation and integration, virtual power plants, distribution automation, electric vehicle optimization, distribution asset monitoring, real-time grid analytics and predictive maintenance for critical infrastructure (i.e. transmission and distribution systems) are key areas that are considerably more robust and commercially ready for scaling.

Outage management systems (OMS) have always been a critical component of the distribution system. With more frequent extreme weather events extending fire season, causing extreme drought, and producing excessive heat waves, robust OMS has never been more important. The integration of AMI and OMS greatly increases operational intelligence with near real-time data, expediting outage detection and restoration verification. Prioritizations of restoration efforts, communication on outage sizes and durations, and emergency response efforts are essential to a timely, safe, and effective response. A smart grid is better able to respond to these situations.

Another big evolution in the industry is the transition toward electrification, which represents a monumental and simultaneous shift in the energy and transportation sectors. Driven largely by automotive manufacturers transforming the vehicle market, utilities are now faced with the reality that they will eventually (in many ways likely soon) become prominent fuel providers to most drivers. Though electric utilities, gas stations, and car manufacturers have not historically worked closely in a way that will make this a seamless transition, there is a valuable opportunity

for utilities to embrace this transformation while benefiting from increased resilience, load balancing, and revenue. With drivers increasingly embracing electric vehicles and a global population aware of the unrelenting challenges of climate change, utilities must lean into proven vehicle-to-grid technologies that make bidirectional energy flows work for consumers and the grid at large. The increased load will add stress to the grid, but with diversification and innovation, optimized fleet charging, real-time fault remediation, and predictive maintenance, the smart grid of the future is poised to meet these challenges with strategic infrastructure investments.

The next-generation smart grid also offers immense promise in how we will integrate renewables, dispatchable and otherwise, into the national portfolio of energy resources more effectively. Microgrids, distributed energy resources, and increased solar and wind production will continue to be challenges the smart grid of the future needs to take into account. Strategic planning, detailed forecasts, collaboration among stakeholders, and assistance from technology providers and industry associations will help bring the possibilities of the future smart grid to life.

Regional nuances are also important to consider when trying to build a more robust grid in our changing climate. Shifting demand patterns, variations in vehicle and building electrification, and aging/expired transmission and distribution systems are examples of challenges with unique regional considerations. The record-breaking heat wave experienced in the Pacific Northwest in the summer of 2021, where temperatures reached 119 degrees Fahrenheit in Oregon, expedited residential trends towards air conditioning in a region that has historically not been dominated by residential summer cooling loads. More immediately, some customers did lose power, but due to sheer luck, California helped the region avert greater disaster by not also being at peak usage. The next extreme climate event may not come with such luck from the neighboring state. Recent wildfires have expanded beyond seasonal to year-round, with impacts on solar energy production and far-reaching air quality implications. Technology and infrastructure investments, including wildfire mitigation, can help us learn from the near misses and inform forecasting models designed to predict unprecedented future situations.

Conclusion

As utilities prepare to participate in IIJA, it is important to reflect and learn from the collective experiences with the Recovery Act. Federal resources undeniably helped accelerate grid modernization projects. Without Recovery Act funding, many projects simply wouldn't have come to fruition. Going forward, with the stakes to the environment greater than ever, utilities should shift their focus away from demonstration projects and instead concentrate on pursuing strategic, high-impact work that maximizes benefits for all customers. This means moving away from purely shovel-ready projects in favor of high-impact projects that further advance clean

technology, mitigate climate change risks, and contribute to a stronger infrastructure. In the meantime, utilities should also strategize and partner across organizations to scope out most impactful activities and define a collaborative approach to IIJA funded efforts to ensure success and minimize hurdles encountered under the Recovery Act. Cross-organization collaboration is especially important if underserved communities are to benefit from IIJA funded projects. Past experiences have demonstrated the difficulty of serving these communities under best circumstances. Smaller cooperative utilities for instance did not have the resources to navigate the application process for Recovery Act funds and were unable to take advantage of the program. These organizations also serve a large proportion of rural communities. Partnering with organizations that do have the resources to provide technical assistance with IIJA applications will improve equity outcomes for IIJA funding.

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[i] Energy Information Administration, "How many smart meters are installed in the United States, and who has them?" *https://www.eia.gov/tools/faqs/faq.php?id=108&t=3#:~:text=How%20many%20smart%20meters%20are,installations%20were%20residential%20customer%20installations*, May 2022