Policy Framework for Grid Investments in Economic Recovery

GridWise Alliance developed the following framework for new federal investments in grid modernization in conjunction with our Policy Council, a group of member companies including utilities, grid equipment manufacturers and vendors that provides a focal point for Alliance members to engage in ongoing policy efforts. Guiding principles for the investments recommended in this framework are:

- Funding should flow through existing agency programs with well-established rules and procedures to deliver investments quickly into the economy.
- Funding should result in the large-scale deployment of technologies critical to modernizing the grid.
- The importance of grid modernization to meet ambitious state climate goals, build resilience, and secure the grid against malicious cyber attacks and severe weather has grown since the 2009 Recovery Act, and therefore the scale of new federal investments in a stimulus package must be larger.
- State energy offices can effectively distribute federal funds and deliver locally appropriate outcomes, often without requiring cost share.
- The different business models of investor-owned, cooperatives and public power utilities require multiple funding mechanisms to achieve similar outcomes.
- There are broad and long-standing coalitions advocating for storage, electric vehicles, renewable energy generation, energy efficiency incentives in a stimulus package, and GridWise Alliance will support those proposals, rather than developing our own.
- Broadband policy proposals should be been linked to grid modernization, both to eliminate the digital divide that prevents some consumers from taking advantage of the services of a modern grid and to leverage utility communication networks that are critical for grid modernization.

Many low- and moderate-income families have lost their jobs and are struggling to afford basic necessities, including electricity service, as a result of the COVID-19 crisis. At the same time, electricity demand from industrial and commercial customers has declined. Electric utilities are facing billions of dollars in lost revenue and unpaid bills as a result of the COVID-19 crisis. Congress must increase funding for Low Income Home Energy Assistance Program (LIHEAP) and other programs that help families with their bills and utilities to provide essential services.

Recommendations for Grid Investments for Economic Recovery

1. **Deployment of technologies to enhance grid flexibility**
   To balance electricity supply and demand, especially as more renewable energy comes on-line, the grid must have system flexibility, which can be provided by a mix of supply- and demand-side options, including flexible conventional generation, curtailment of renewable generation, new transmission, and more responsive loads.[1] Grid technologies like controls, sensors, storage, data analytics and software-as-service (SAS) can provide flexibility by improving visibility of the system for grid operators, helping to quickly rebalance the system with autonomous controls, and facilitating the aggregation of distributed energy resources to serve as assets to grid operations. These technologies help integrate utility-scale and distributed renewables, can relieve transmission constraints and reduce the need for peak generation. These flexibility technologies also build resilience by providing back up power, automatically rerouting power around damaged lines, and self-healing grid damage. Funding can also be used to increase the capacity of transmission lines across grid seams.

   - **$5 billion for DOE OE Smart Grid Investment Grant Program**
   - **Increase borrowing authority of DOE Power Marketing Administrations by $2 billion (Use Section 301 of ARRA)**

   1a. Demonstration and Evaluation of Technologies in Support of Smart Grid Investment Grants Projects
   To promote the deployment of advanced technology in the course of addressing the primary goal of the stimulus (jobs), Smart Grid Investment Grants for technology deployment could be supplemented by a companion appropriation for demonstration and evaluation of advanced technologies. These would be a supplementary award to an awarded grant. It would not cover the basic deployment, rather it would be an, optional, competitive R&D "grant" that would supplement an awarded stimulus grant. The additional funds would be used to develop advanced features and test and evaluate them in the process of the stimulus deployment.

   1b. Grid Data
   The Energy Information Administration collects and publishes a significant amount of data regarding the grid including hourly electric system operating data from electricity balancing authorities on system demand, net generation, and interchange. The Department of Energy should work with stakeholders to explore gathering reasonably accurate data on the delivered generation resource mix and emissions rates for load-serving entities and develop a recommendation to amend its data collection efforts and reflect progress as part of an annual report.

[1] https://www.nrel.gov/analysis/electric-flexibility-storage.html

2. **Deployment of technologies to enhance grid integration of buildings and vehicles**

Building-to-Grid Integration

Buildings consume large amounts of energy for heating, cooling, lighting and other functions, but they can also be a significant asset to the grid through load shifting, demand response, and aggregation of distributed generation. According to the National Association of State Energy Officials (NASEO), greater optimization of the significant energy demand and supply functions that buildings offer—on an automated basis—has far reaching electricity policy and regulatory implications. The benefits include lower costs, enhanced resilience, reduced peak loads, enhanced energy efficiency and better integration of distributed energy resources.[2] Building-to-Grid Integration funding should include grid investments to facilitate aggregation and management of building loads, grid-connected Energy Management Systems and equipment/appliances within the building, and Advanced Meter Infrastructure (AMI) at the grid-building interface. Advanced metering infrastructure is an essential tool for increasing grid flexibility and gaining visibility into the system to improve grid planning, operations and interconnection requests--but only if the meters include key capabilities at the time the meter is installed.

- **$1 billion to DOE OE Smart Grid Investment Grant Program for reaching 100% deployment of smart meters (could also be used for smart inverters)**
- **$3 billion to DOE Federal Energy Management Program for procurement and installation of grid-integrated Energy Management Systems for federal buildings**
- **$3 billion for DOE State Energy Program for procurement and installation of grid-integrated Energy Management Systems for state and local government buildings**
- **$1 billion to DOE Energy Efficiency and Conservation Block Grants program for states to establish or continue rebate program for smart appliances with capability for demand response**

Vehicle-to-Grid Integration:

Electric vehicles (EV) are one of the most cost-effective ways reduce carbon emissions from the transportation sector, but they will depend on clean and reliable electricity from the power grid. Converting the transportation fleet to electric will create tremendous demand for electricity and we will need a grid that is prepared to reliably provide that electricity. This will require adding distribution and transmission capacity, implementing digital solutions to manage these new electricity demands, and investing in advanced technology to improve reliability, like microgrids and energy storage. The development and deployment of technologies that enable and manage the nexus between charging infrastructure and the power grid will be integral to achieving climate goals in both the power and transportation sector.

Federal investment in demonstration and deployment of technologies and infrastructure that enable and integrate electric transportation with the power grid is necessary to transition the transportation sector and the economy to electricity and create jobs.

- **$500 million for joint DOE EERE-OE initiative on vehicle-grid integration**

[2] https://naseo.org/data/sites/1/documents/publications/v3-Final-Updated-GEB-Doc-10-30.pdf

3. **Cybersecurity technology and workforce**

   Cyber attacks are one of the most significant threats to the security of the grid. DOE funds platforms that can monitor cyber attacks and share information across the utility industry and can also provide funding for the deployment of technologies that can prevent cyber attacks from damaging grid equipment. Even with federal funding for monitoring platforms and technology, protecting the grid from cyber attacks is hampered by the lack of qualified cyber professionals. The current cybersecurity workforce shortage in the United States alone is projected to be 498,480.[3]

   - **$500 million to DOE Cybersecurity for Energy Delivery Systems (CEDS) for cybersecurity workforce development**
   - **$500 million to DOE CEDS for cyber assessments and cyber threat monitoring for small and medium utilities**
   - **$1 billion to DOE CESER for cybersecurity technology deployment**

4. **Section 48c manufacturing tax credit**

   The Section 48C Advanced Manufacturing Tax Credit in ARRA originally provided a 30 percent investment tax credit to 183 domestic clean energy manufacturing facilities valued at $2.3 billion and was extended to provide an additional $150 million in 2013. The tax credit helped build a U.S. manufacturing capacity and supported significant growth in U.S. exports. Qualifying manufactured clean energy products in the statute include electric grid to support the transmission of renewable energy, including storage.

   - **$8 billion in tax credits to manufacturing entities approved by DOE**

5. **Utility communications**

   Utilities' investments in operational fiber and wireless broadband communications network are essential for a modern grid. Utility communication systems can include fiber networks and private wireless networks that could also be leveraged to provide middle mile broadband and last mile internet service for end-use consumers. The Chattanooga utility EPB leveraged a $111.7 million ARRA Smart Grid grant to build a $222 million fiber optic communications network that enables the city's smart grid and provides high speed broadband access to all customers. A new study suggests that EPB's fiber optics has helped generate at least 2,800 new jobs and added $865.3 million to the local economy by cutting power outages, improving Internet links and attracting businesses to the "Gig City."[4]

   - **$1 billion in additional borrowing authority for Rural Utility Services for rural cooperatives**
   - **$2 billion for DOE OE Smart Grid Matching Grant Program for Investor Owned Utilities (IOUs) and Public Power**

[3] https://www.cpomagazine.com/cyber-security/cybersecurity-workforce-shortage-continues-to-grow/

[4] https://www.timesfreepress.com/news/business/aroundregion/story/2015/sep/15/study-finds-epb-fiber-optics-generates-over-865-million-benefits-chattanooga/325235/

6. **Resilience**

The U.S. economy is increasingly dependent on electric power. As extreme weather events increase in frequency and strength, grid operators are taking deliberate measures to ensure the system's reliability and flexibility supports the Nation's needs. Moreover, our digital economy, and our critical infrastructure systems, are increasingly interdependent. This interdependency increases the risk of a "cascading effect" during an extreme event. Many grid edge technologies already exist that can, and do, make a difference in significantly enhancing electric system reliability and resilience, thus preventing and minimizing the worst potential impacts of a major weather event or a cybersecurity-related threat.

Mission Critical Public Infrastructure and Emergency Preparedness: Federal funding should be provided to defray the costs of resiliency, critical infrastructure, intelligence, flexibility of buildings, cybersecurity and other emergency preparedness investments within a performance contract or other public private partnership arrangement. Federal funding would be limited to one fifth of the total investment for over $100B for grid-integrated resiliency infrastructure.

- **$18 B via the existing State Energy Program** for state, local, cities, community and potentially private hospitals and medical facilities utilize the existing State Energy Program. Distribution based on state formula. Funds can also be used for transmission and distribution planning.
- **$2.5 B to DOD's Army, Navy and Air Force execution agencies ($1.5B), VA medical facilities ($250 M), GSA Public Building fund ($250M) and DOE AFFECT Grant Program ($500M)** for rest of Federal government at $500 M to leverage performance contracts
- **$1.5 B for the Public Housing Authorities via HUD t**o leverage P3s and add resiliency and critical infrastructure components per the above. Allow the leverage for PHAs to pay for up to 40% of projects overall.
- **$1 billion to Office of Electricity for threat assessment and risk mitigation measures at utilities serving Defense Critical Energy Infrastructure (DCEI, new authorization may be necessary)**

Wildfire Prevention

- $500 million to Smart Grid Investment Grant Program for wildfire prevention technology, including LiDAR technology for vegetation management and wildfire detection and in-field monitoring technologies

7. **Workforce development (OE Smart Grid)**

- **$400 million to DOE Office of Electricity for workforce training for digital, high tech grid jobs with $100 million to DOE Office of Economic Impact and Diversity**
- Immediate expansion of on-line programs for utility workers and related career paths during COVID-19 mandatory stay-at-home period and beyond