

Our Power Grid

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By Thomas Beck, AIA, NCARB

What is the status of our national power grid in the USA? We know that in recent years some states have experienced horrendous outages in freezing winter temperatures. We know that our energy bills have increased. We also know that a bipartisan infrastructure bill was passed, and the funding is making its way out to the states.

According to this RMI article the “United States is the only macro grid in the world that doesn’t have a plan of any type.” (<https://rmi.org/the-united-states-has-the-only-major-power-grid-without-a-plan/>)

We have 12 different transmission planning regions, 11 of which are under jurisdiction of Federal Energy Regulatory Commission (FERC). Texas stands alone in its Electric Reliability Council of Texas (ERCOT) which during Winter Storm Uri in February of 2021 saw over 210 deaths, 70 percent of the state lost power and 50 percent lost water. That event cost at least \$80 billion dollars. We are not sure of the total dollar amount the federal government provided Texans for this emergency, despite their non-participation in the FERC, but FEMA provided 60 generators, 10,000 gallons of gas, 10,000 gallons of winterized diesel “for the last 7 days” to support critical infrastructure.

(<https://www.fema.gov/press-release/20210220/fema-responds-severe-winter-weather-southeast>)

FERC has proposed rules which will help within the 11 transmission planning regions, but fixing planning between the regions is only in its early stages.

In the past our entire country was able to get behind a president who completed an enormous infrastructure project whose scope covered the United States coast to coast. Our highway interstate system would never have happened if individual states refused to take part.

Our modern infrastructure is dependent on reliable energy. Our modern grid is in serious need of updating.

Virtual power plants (VPP) create opportunities for individuals, businesses and organizations to positively impact grid bottlenecks by managing grid needs through flexible technologies. It is a little like crowd sourcing for energy use. VPPs provide incentives to conserve energy through meaningful compensation. “While a handful of power plant owners are paid millions to keep the grid operating, millions of homeowners [in California] were paid nothing to stabilize the grid when it really mattered.” Alternatives to this model exist. According to the RMI VPP article, other customers were paid by partnering “with companies like OhmConnect, SunRun, Leap, Autogrid, Voltus, Tesla, and others to join with their neighbors to form “virtual power plants.”

“At its core, a VPP is comprised of hundreds or thousands of households and businesses that offer the latent potential of their thermostats, electric vehicles (EVs), appliances, batteries, and solar arrays to support the grid. These devices can be flexibly charged, discharged, or managed to meet grid needs. When these devices are aggregated and coordinated, they can provide many of the same energy services (capacity, energy, ancillary services) as a traditional power plant.

“The components of a VPP can include electric vehicles (EVs) and chargers, heat pumps, home appliances, HVAC equipment, batteries, plug loads, and industrial mechanical equipment. Single-family homes, multi-family homes, offices, stores, factories, cars, trucks, and buses can all participate in a VPP.” (<https://rmi.org/clean-energy-101-virtual-power-plants/>)

There are many opportunities for states and communities to fund positive upgrades to our power grid. This Funding Opportunity Announcement (FOA) listing on the Department of Energy, National Energy Technology Laboratory website is one example. BIL FOA DE-FOA-0002740 - The

activities to be funded under this FOA support three BIL sections, including Section 40101(c): Grid Resilience Grants; Section 40107: Smart Grid Grants; and Section 40103(b): Grid Innovation Program. Together DOE refers to these programs as the Grid Resilience and Innovation Partnerships (GRIP) program. Original Closing Dates:

Topic Area 1: 4/6/2023

Topic Area 2: 3/17/2023

Topic Area 3: 5/19/2023

<https://netl.doe.gov/node/12202>

As we reinvest in our nation and our communities we need to recognize the power of many, combined, crowd sourced, each small action able to make huge differences when combined with those of others. By addressing our energy needs, we also must invest in education, research opportunities, and innovation, feeding the promise of generations who will stand on our shoulders.

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