

Curing Gridlock: How the Bipartisan Infrastructure Bill is a first step to solving the nation's 21<sup>st</sup> century energy issues.

Within the core of President Roosevelt's New Deal was a visionary plan to electrify rural America. The Rural Electrification Act (REA), passed on May 20, 1936, provided federal funding to build a network of electrical infrastructure to serve America's growing agrarian heart.<sup>1</sup> Instead of funding large utility companies to tackle this unique problem, the act allowed the farmers themselves to form co-ops that received the REA funding and handled construction.<sup>2</sup> The co-ops and the REA were a huge success, with nearly 900 of the original co-ops still serving their customers to this day.<sup>3</sup> The REA has since been amended and repurposed by both George Bush, and Obama to help serve these same communities with broadband internet<sup>4</sup>. As a New Deal success story, the REA shows the influence the government can have on tackling a national utility challenge.

The nation's electric grid has grown exponentially since the REA's enactment in 1936, and its challenges have kept pace. Texas experienced this firsthand in early 2021 as shifting weather patterns, a result of climate change, dropped Texas temperatures below their normal levels.<sup>5</sup> As the weather caused generation sources to drop off the grid, Texas residents surged demand as they turned on their heaters.<sup>6</sup> Due to its independent nature, Texas was unable to bring power in from other states and so unable to meet demand, the grid failed.<sup>7</sup> In California, Pacific Gas and Electric (PG&E) have also had to tackle their own climate-related utility nightmares. After their infrastructure was implicated in a massive and fatal wildfire in 2020 the company faced criminal charges.<sup>8</sup> Since then, utilities in the Pacific Northwest have invested tens of millions of dollars in reducing the risk of creating new wildfires.<sup>9</sup>

Across the globe, Ukraine has been a case study in the other major challenge facing a national power grid, cyber-attacks. Starting in 2015, Russian cyber agents have continually pounded Ukrainian energy utilities and the country's electric grid.<sup>10</sup> While subsequent attacks were not as successful, the first attack in December 2015 was able to take away power from over 200,000 customers.<sup>11</sup> Despite the

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<sup>1</sup> Kiera Taylor, *Rural Electrification Act*, INVESTOPEDIA, (February 22, 2022), <https://www.investopedia.com/rural-electrification-act-5119177>

<sup>2</sup> *Id.*

<sup>3</sup> *Id.*

<sup>4</sup> *Id.*

<sup>5</sup> Bill Hogan, *Understanding Texas Energy Grid Failure*, HARVARD KENNEDY SCHOOL, (February 23, 2021), <https://www.hks.harvard.edu/faculty-research/policy-topics/environment-energy/understanding-texas-energy-grid-failure>

<sup>6</sup> *Id.*

<sup>7</sup> John Thompson, *Cold Collapse: A Look Inside the Texas Energy Grid Failure*, WESTERN TODAY, (March 2, 2021, 10:40 AM), <https://westerntoday.wvu.edu/features/cold-collapse-a-look-inside-the-texas-energy-grid-failure>

<sup>8</sup> Ivan Penn, *PG&E Faces Criminal Charges Over Fatal 2020 Wildfire in California*, N.Y. TIMES, (Sept 27, 2021), <https://www.nytimes.com/2021/09/24/business/pge-wildfire-criminal-charges.html>

<sup>9</sup> Tom Banse, *Electric Utilities Spending Millions to Lower Wildfire Risk*, U.S. NEWS, (April 30, 2022) <https://www.usnews.com/news/best-states/oregon/articles/2022-04-30/electric-utilities-spending-millions-to-lower-wildfire-risk>

<sup>10</sup> Alicia Hope, *Ukraine Warns of Massive Russian Cyber Attacks on the Country's and Allies' Critical Infrastructure*, CPO MAGAZINE, (October 7, 2022), <https://www.cpomagazine.com/cyber-security/ukraine-warns-of-massive-russian-cyber-attacks-on-the-countrys-and-allies-critical-infrastructure/>

<sup>11</sup> *Id.*

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Ukrainian grid being an easier target due to its already close ties with Russia prior to the attacks,<sup>12</sup> it still provides Russian agents with vital practice.

So can the lessons taught by the REA help the American electric grid address its new problems? The Bi-Partisan Infrastructure bill appears to think so. Out of the bill's \$550 billion investment<sup>13</sup>, more than \$62 billion go directly to the U.S. Department of Energy<sup>14</sup>. Out of the \$62 billion, \$11 billion goes directly to states, tribes, and utilities to prepare for extreme weather and cyber-attacks<sup>15</sup>, while \$3 billion goes to adopting "Smart Grid" solutions<sup>16</sup>. Additionally, the Bipartisan infrastructure bill establishes programs such as the "Rural and Municipal Utility Advanced Cybersecurity Grant and Technical Assistance Program"<sup>17</sup> to develop cybersecurity best practices to help American utilities prepare.

Perhaps most importantly, at least to this author, buried within the bill's list of eligible uses for grant money is an investment that may help a utility solve both above-mentioned problems: investment in microgrids.<sup>18</sup> A microgrid is exactly what it sounds like, a smaller grid and utilities can embed these within their existing systems.<sup>19</sup> While the traditional grid relies on power transmitted from a far away power plant, microgrids rely on local generation (often called "distributed energy resources") to power their direct neighborhoods.<sup>20</sup> Microgrids have already been implemented across the country to provide backup power to vital locations such as hospitals<sup>21</sup>. If, for some reason, the main electric grid were to fail a microgrid can cut itself off from the main grid and continue to supply power to its own small circuit.

At the heart of microgrids, distributed energy resources help address climate change by providing renewable energy another place to enter the market. (In fact many homes powered by solar can become their own nano-grids own by islanding themselves if needed.)<sup>22</sup> Microgrids also provide the possibility of cyber resilience to utilities in their planning. A proper cybersecurity plan implementing microgrids can ensure that, in case of a cyber attack on utility transmission or the grid as a whole, the microgrids can cut themselves out of the loop (and away from the attack) while still servicing their vital

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<sup>12</sup> Donghui Park & Michael Walstrom, *Cyberattack on Critical Infrastructure: Russia and the Ukrainian Power Grid Attacks*, UNIVERSITY OF WASHINGTON, (October 11, 2017), <https://jsis.washington.edu/news/cyberattack-critical-infrastructure-russia-ukrainian-power-grid-attacks/>

<sup>13</sup> THE WHITE HOUSE, *Updated Fact Sheet: Bipartisan Infrastructure Investment and Jobs Act*, (August 02, 2021), <https://www.whitehouse.gov/briefing-room/statements-releases/2021/08/02/updated-fact-sheet-bipartisan-infrastructure-investment-and-jobs-act/>

<sup>14</sup> DEPARTMENT OF ENERGY, *DOE Fact Sheet: The Bipartisan Infrastructure Deal Will Deliver For American Workers, Families and Usher in the Clean Energy Future*, (November 9, 2021) <https://www.energy.gov/articles/doe-fact-sheet-bipartisan-infrastructure-deal-will-deliver-american-workers-families-and-0>

<sup>15</sup> *Id.*

<sup>16</sup> *Id.*

<sup>17</sup> H.R. 3684, 117<sup>th</sup> Cong. (2021-2022)

<sup>18</sup> *Id.*

<sup>19</sup> DEPARTMENT OF ENERGY, *How Microgrids Work*, (June 17, 2014), <https://www.energy.gov/articles/how-microgrids-work>

<sup>20</sup> *Id.*

<sup>21</sup> David Wagman, *First Utility-Scale Microgrid in U.S. Enters Service*, IEEE, (May, 26, 2017), <https://spectrum.ieee.org/first-utility-scale-microgrid-in-us-enters-service#toggle-gdpr>

<sup>22</sup> See PALMETTO, *Solar Islanding and Anti-Islanding: What You Need to Know*, (last visited October 9, 2022), <https://palmetto.com/learning-center/blog/what-is-solar-islanding-and-anti-islanding>

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customers.<sup>23</sup> Finally, critics of the infrastructure bill should know that the government spending on utility improvement is going to create American jobs and fund American paychecks. The major players in the industry providing to America's utilities have manufacturing sites throughout America's heartland: Eaton in Milwaukee, S&C Electric in Chicago, G&W in Chicago, and SEL in Pullman<sup>24</sup>. (It should be noted that the author of this blog post formerly worked for Eaton at their recloser facility in South Milwaukee, Wisconsin.)

It's easy to not think about how your power gets to your home. Since 1936, electric power has become an expected part of American life and one doesn't wonder how electrons reach the TV, they just expect it to turn on for Netflix. Perhaps this complacency is deserved, after all since the REA was implemented, American utilities have flourished and not been met by many roadblocks. Unfortunately, as we get deep into the 21<sup>st</sup> century that has changed, and its time we take a closer look at the nation's backbone. The Bipartisan infrastructure bill is an important first step to funding the new American grid the question now is what's next?

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<sup>23</sup> Elisa Wood, *Why We Need Microgrid Cybersecurity: The Threat is Real*, MICROGRID KNOWLEDGE , (November 3, 2017), <https://microgridknowledge.com/microgrid-cybersecurity-sc/>

<sup>24</sup>The following links direct to these manufacturers main websites where one can learn more about all of their histories. The growth of the electric grid and utility technology has been a remarkable and very American journey, all of these companies have very interesting and inspiring stories on how they got ot where they are today. Check them out! <https://www.eaton.com/us/en-us.html> <https://www.sandc.com/> <https://www.gwelectric.com/> <https://selinc.com/>