Testimony of the Honorable Jim Matheson
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to the Energy Subcommittee of the
Committee on Energy and Commerce
U.S. House of Representatives

"Building a 100 Percent Clean Economy:
Solutions for the U.S. Power Sector."

October 30, 2019

Introduction

Chairman Rush, Ranking Member Upton, and members of the subcommittee, thank you for inviting me to testify and for the opportunity to return to the Committee on which I proudly served for eight years. As Chief Executive Officer of the National Rural Electric Cooperative Association (NRECA), I have the honor today of carrying the community-focused perspective of electric cooperatives into this important conversation.

America's electric co-ops are engines of economic development focused on responsibly delivering affordable, reliable electricity in communities across the nation. Diversity of electric generation, including baseload sources, is essential to meeting co-op members' expectations. Consistent with that approach, electric co-ops thoughtfully explore all ideas that promote these core principles as they work to meet the evolving energy needs of their local communities. That's why co-ops have and will continue to diversify their energy portfolios, with a majority of their power now coming from low and no-emissions resources. Electric co-ops have invested in a variety of measures to reduce emissions, such as rapidly expanding renewable sources, energy efficiency and storage options, and research on carbon capture technologies.

Ultimately, and most importantly, every cooperative's resource mix is unique and will continue to vary greatly depending on existing resources and assets, the impact on rates for member-consumers, reliability implications, the availability of alternative electric generation, geographic location, and other local circumstances. Policymakers should be mindful of this and ensure that any proposals provide long-term certainty and flexibility that maintains energy diversity for electric co-ops, protects reliability of the electric grid, and minimizes undue economic impact for consumers – especially those in rural and persistently poor communities.

Electric Cooperatives Power Rural America

NRECA is the national service organization for more than 900 rural electric cooperatives, responsible for keeping the lights on for more than 42 million people across 48 states. Electric co-ops are community-focused organizations that work to efficiently deliver affordable and reliable energy to consumer members. They were built by and belong to the communities they serve so each cooperative is different depending on their community's specific needs. Each co-op is locally governed through a board of directors elected by these consumer members. NRECA's members include 62 generation and transmission (G&T) cooperatives and 831 distribution cooperatives, which provide electricity to 1 in 8 Americans. All but three of these co-ops are classified as small businesses. Importantly, electric co-ops serve 92% of the nation's persistent poverty counties.

The G&T cooperatives are owned by the electric distribution co-ops they serve, which in turn deliver power to their consumer-members. Roughly half of distribution co-op electric retail sales comes from G&T-owned facilities, while the remaining half is provided by non-NRECA members, either directly or through G&T market purchases. Both distribution and G&T cooperatives share an obligation to responsibly serve their members by providing reliable and affordable electricity.

Electric cooperatives are vital to the economic health of their communities given the critical role they play in providing electric service and, increasingly, broadband service. In 2017, electric co-ops supported 611,600 direct and indirect American jobs and contributed an estimated $88.4 billion to U.S. GDP. This includes more than $1.1 billion in excess revenue returned directly to their consumer-members.

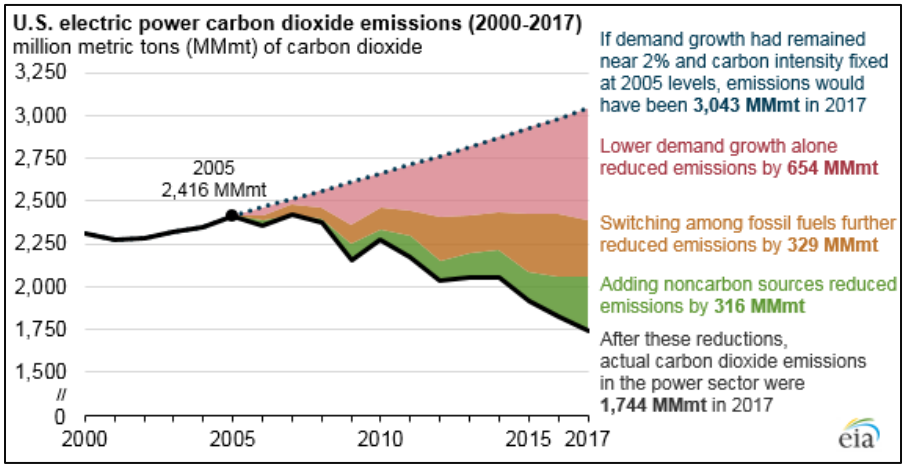
Electric cooperatives proudly shouldered the responsibility of bringing electricity to rural and exurban communities alike. This obligation is not without its challenges. Sparsely populated and primarily residential communities are more expensive to serve and provide less revenue per consumer compared to the more industrialized and densely populated areas served by investor-owned or municipal utilities. Electric co-ops serve an average of eight consumers per mile of distribution line and collect annual revenue of approximately $19,000 per mile. Other utility sectors combined average 32 customers and $79,000 in annual revenue per mile.

The average electric co-op household uses significantly more electricity every month than other utility customers, due in part to mostly single-unit or manufactured housing that endures significant exposure to the elements. Many co-op members live in areas with harsh winters and without access to natural gas or affordable heating alternatives. Further, the median household income for co-op consumers is 11% below the national average. These factors make it especially important for co-ops to keep electric rates affordable while maintaining reliability and improving sustainability, particularly for those who can ill afford increased electricity costs.

Electric Cooperatives are Adapting to Maintain Reliable, Affordable Power in a Carbon-Constrained World

NRECA members are part of the American energy sector that has already made substantial reductions in carbon dioxide (CO_2) emissions, with those emissions from the electric sector decreasing to around 1988 levels. This continuing emissions reduction exceeds projections from even a few years ago. As a result, the electric sector is no longer the largest domestic source of carbon emissions and is well-positioned to contribute to CO_2 reductions in other sectors through beneficial electrification.

Figure 1: U.S. Electric Power Carbon Dioxide Emissions (2000-2017)

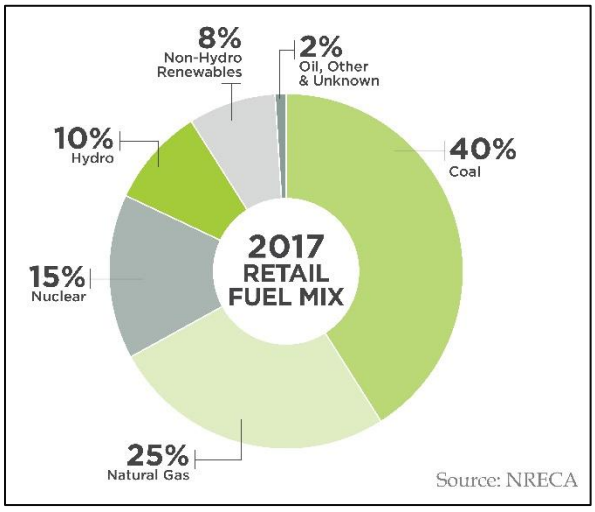


Source: U.S. Energy Information Administration, *U.S. Energy-Related Carbon Dioxide Emissions*, 2017

Carbon dioxide emissions in 2017 from cooperative-owned generating facilities were 12 percent below 2005 levels, even as co-op electric generation output has significantly increased. These reductions have been facilitated by measures that include increased consumer energy efficiency and replacing certain coal power plants with non-emitting sources and lower-emitting natural gas plants.

As not-for-profit entities, electric co-ops often rely on long-term power purchase agreements for significant wind and solar capacity, providing an indirect path to take advantage of federal tax incentives. Thus, the carbon intensity of all electricity delivered by co-ops reflects an even larger reduction than co-op-owned generation alone.

Figure 2: Co-op Retail Fuel Mix, 2017



From 2009 to 2016, the share of renewable energy that electric co-ops provided to their members increased from 13% to 17%. All but 5% of co-ops include renewable resources in their resource mix.

Solar. Electric co-op solar capacity has more than quadrupled since 2016 to 868 MW, with an additional 2,400 MW planned. In fact, co-ops are responsible for 75% of utility-sponsored community solar programs across the country. This is due in large part to the Solar Utility Network Deployment Acceleration (SUNDA) project, a partnership among the Department of Energy, NRECA and 17 co-ops. The project helped reduce soft costs of solar installations, identify and overcome deployment barriers, and develop financing models and resources to support electric co-ops nationwide. Working together to reduce risk and costs, solar energy development skyrocketed across the cooperative sector.

Wind. Electric co-ops own or have under contract more than 7.5 GW of wind capacity, with an estimated 1.5 GW of new capacity planned over the next two years. The Energy Department last week selected NRECA to research small-scale, community-based wind energy solutions that can be deployed by electric cooperatives. NRECA is partnering with the Pacific Northwest National Laboratory and others to evaluate and deploy diverse types of distributed wind projects. The project aims to increase understanding of the potential benefits of distributed wind and reduce market barriers for the adoption of these technologies in rural areas. Distributed wind solutions can use various wind technologies, ranging from small off-grid or residential scale turbines to one or more multi-megawatt turbines deployed alone or with other distributed energy technologies.

Hydropower. Hydropower remains the primary source of cooperative zero-emission, renewable generation. More than 600 rural electric cooperatives in 34 states purchase electricity at-cost from the Power Marketing Administration's federal hydropower facilities, providing 10 GW of power annually to co-op members. NRECA opposes any effort to privatize PMA assets or change from a cost-based to a market-based rate structure, as either action would result in higher electricity costs for millions of homes and businesses. Co-ops have more than 700 MW of hydroelectric capacity owned or under contract in addition to federal hydropower.

Nuclear Energy. Several G&T co-ops also have part ownership in nuclear power plants. Nuclear energy is an important source of baseload, zero-emission power for co-ops in certain regions. It will be difficult to make sustained emissions reductions if nuclear plants continue to retire as projected (and are replaced even in part by natural gas generation) and if significant developments are not made to develop next-generation reactor technologies.

Energy Storage. Going forward, improved energy storage, paired with intermittent resources, will also help improve resource adequacy and reliability and reduce pressure

on existing infrastructure from load peaking. Interest among electric co-ops in deploying energy storage is steadily growing and should accelerate as more experience is gained, costs decline, and technological advances improve battery performance. Federal policy should support the advancement of energy storage research, development and deployment, particularly for co-ops as they work to adopt these technologies. NRECA supports several pieces of legislation aimed at increasing investment in research, development and deployment of storage technologies. One bill in particular, H.R. 4447, led by Reps. O'Halleran and Mullin, would replicate the SUNDA project for storage deployment.

Natural Gas. A significant portion of co-op CO_2 emission reductions is the result of natural gas generation replacing retiring coal power plants. From 2005 to 2017, the average utilization of co-op natural gas combined cycle (NGCC) generation increased from 27 percent to 40 percent. At the same time, co-op ownership of NGCC facilities more than doubled from 4.8 GW to 11.6 GW, with more projects planned in the coming years. Of new capacity planned from 2019-2027 across the entire power sector, 46% is projected to be generated from natural gas and 48% from wind and solar.

Coal. Coal-fired power makes up 40 percent of the electricity provided by co-ops, and at a capacity-weighted age of 37 years, the co-op fleet is newer and has greater useful life remaining than the national average. However, from 2014 to 2018, electric co-ops retired or converted 1.5 GW of coal capacity, with another 2 GW of retirements announced through 2028. Even as the share of coal capacity is expected to decline, it will remain a critical source of reliable, affordable power due to the intermittency challenges of renewable power and limited long-term energy storage options. That is particularly true in regions of the country where deployment of renewable sources is neither affordable nor reliable.

Innovation Can Assure the Continued Viability of Reliable and Affordable Fossil Fuel Power, Address CO_2 Emissions, and Minimize Risks of Stranded Assets or Increased Costs

About two-thirds of co-ops' operating coal power plants were built under the mandates of the 1978 Powerplant and Industrial Fuel Use Act (before it was repealed in 1987). Under this law, any new baseload generation for self-generation built by G&Ts were mandated to be "coal capable" to preserve natural gas supplies for non-electric and non-industrial purposes. Many co-ops at the time could not purchase affordable generation from other utilities, which necessitated the building of self-generation. As a result, co-ops had little choice but to build coal plants and bear higher capital costs since they could not build less capital-intensive natural gas-based generation. Today, practical and geographic limitations prevent many of these facilities from converting to natural gas while still providing competitively priced electricity. Electric cooperative

consumers-members should not be burdened with loss of these reliable resources that were developed based on federal government policy.

Knowing that both natural gas and coal will continue to play an important role in providing affordable and reliable electricity in a carbon-constrained future, electric co-ops are actively engaged in carbon capture, utilization, and storage (CCUS) research and development. Federal policies should continue to support private and public sector efforts to demonstrate and deploy these technologies, permit CO_2 pipelines, and sequester or utilize this CO_2. In particular, NRECA supports H.R. 1166, the "Utilizing Significant Emissions with Innovative Technologies (USE IT) Act", led by Reps. Peters and McKinley. This legislation will provide needed certainty for electric cooperatives and other power generators, as well as industrial sources, as they look to deploy CCUS technologies. This bill could ultimately bring down the costs of deployment and spur further innovation.

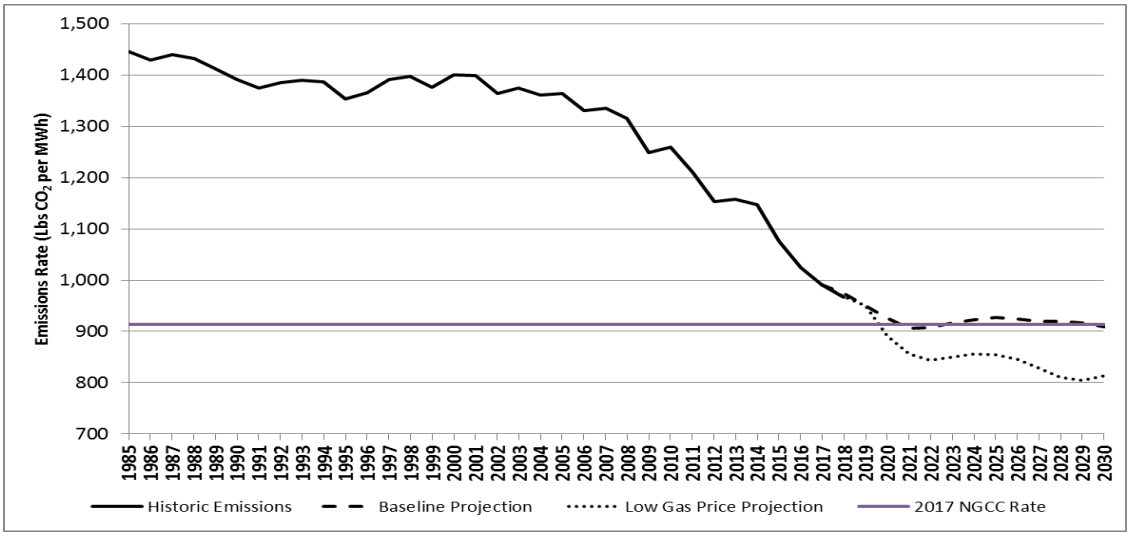
As not-for-profit utilities, all costs incurred by co-op generators, including the construction and maintenance of electric generation sources, ultimately are passed on to consumer-members. That is why co-op members are committed to generating power as efficiently and cost-effectively as possible. There are no equity investors that can absorb these costs. Federal policies that result in stranded assets would increase electric costs for consumer-members and significantly impact local economies that can least afford to endure these costs. During periods of transition in the energy sector, electric cooperatives have often found that a mix of financial incentives, technical assistance, and transferable tax provisions can be most effective in reducing costs and addressing barriers to adopting advanced and innovative technologies.

Economy-wide Changes will Rely on Beneficial Electrification

The carbon intensity of electric generation has greatly declined over the last decade and continues to trend downward (Figure 3).[1] According to the U.S. Energy Information Administration, the U.S. power sector produced 49 percent more electricity (1.3 Billion GWh) in 2018 than 30 years ago with roughly the same total CO_2 emissions. This is critical to understand as policymakers consider the role beneficial electrification – the use of electricity in place of on-site consumption of fossil fuels – can play in the broader analysis of a carbon-constrained future. Policymakers should also be mindful of the progress that has already been made domestically and ensure that actions to further reduce CO_2 emissions, which may have limited impacts without commensurate efforts internationally, do not significantly hinder U.S. economic growth.

[1] EIA's *Monthly Energy Review*; EIA's *Annual Energy Outlook*. Calculated using Average Tested Heat Rate for combined cycle plants and average Carbon Dioxide Uncontrolled Emissions Factors for natural gas from *Electric Power Annual 2017*. The dashed line is a projection from EIA's Reference Case and the dotted line is from EIA's High Oil and Gas Resource and Technology Case. For comparison, the average emissions rates of a natural gas combined cycle plant in 2017 (purple line) is included.

Figure 3: Carbon Intensity of U.S. Electric Sector Generation, 1985-2030



Source: EIA, *Monthly Energy Review*, *Annual Energy Outlook 2019*, and *Electric Power Annual 2017*

As utility sector CO_2 emissions are declining, electric co-ops are developing beneficial electrification programs to assist other sectors. While demand for digital technologies has already driven greater electrification in the U.S. economy, there are significant opportunities for further electrification of commercial, industrial and agricultural applications. This shift toward additional electrification of end-uses could significantly increase the "emissions efficiency" of the entire economy (i.e., everything powered by the grid plus the amount of the other sectors electrified), with the collective impact of lowering overall U.S. CO_2 emissions even if electric sector emissions remained the same. Increased reliance on electricity, however, greatly increases the importance of maintaining grid reliability and resiliency.

Transportation electrification in both personal and fleet applications is an attractive policy option to reduce vehicle emissions and improve air quality in our communities. Many cooperatives have invested in charging infrastructure and consumer education and have designed rates and other incentives to encourage EV adoption. These investments, however, depend on continued federal support for EVs (while recognizing and being consistent with state law), including incentives for deployment of electric vehicles and funding for charging infrastructure, particularly in rural areas where the electric distribution equipment may also need to be upgraded.

Electric co-ops are also adopting grid modernization, cybersecurity and resilience technologies to better incorporate these innovations. These modernization efforts should be recognized and supported by funding research and development programs that enable the use of artificial intelligence and technology to get the most out of grid-enabled devices. Investments in programs that promote more efficient data transfer and

feedback between transmission and distribution systems, and support for the development of distributed energy resources, will also be critical.

Conclusion

Providing reliable, affordable, and responsible electricity remains the shared commitment of all of NRECA's members. For over 75 years, electric cooperatives have responded to the needs and desires of their communities and adapted to changes in federal policy in meeting that commitment. NRECA appreciates the opportunity to work with this Committee and with other policymakers as Congress explores opportunities and challenges to reducing emissions in the power sector and across the economy.

In the electric cooperative family, however, we have a saying: "If you've met one co-op, you've met one co-op." Every single co-op is unique – from the local community it's owned by and serves to how it decides to power those homes, businesses, and farms and the innovative work it's undertaking. A technology, program, or policy that works for one co-op might not work for another. I encourage you to visit with electric cooperatives in your district, state, and region to understand what will be most helpful and impactful to their operations and communities.