

New Enterprise Rural Electric Cooperative, Inc.

A Touchstone Energy® Cooperative 



One of 14 electric cooperatives
serving Pennsylvania and New Jersey

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From the General Manager/CEO



Generation: Producing energy

By Mark Morrison

OVER THE past several months, energy policy and the state of our energy grid have been the focus of many news outlets. Since our inception, electric cooperatives have been the leaders for rural communities throughout America, providing safe, reliable, and competitively priced electricity to the homes, farms and businesses of our members. Over the next few months, we will focus on the moving parts of what it takes to provide electricity to our members.

There are three basic pieces needed to get electricity to your home, farm or business: generation, transmission and distribution. This article will focus on the generation piece of our business.

Power: Where does it come from? Electricity moves near the speed of light, and large-scale, viable storage technology is negligible and in its infancy, at best, so a unit of energy is created, distributed and used in the same moment. Current global electricity sources include natural gas, coal, nuclear, hydro, oil, solar, geothermal and wind.

Electricity is generated by transferring one form of energy into another. Of the sources listed above, natural gas, coal, oil and nuclear all use heat to convert water into steam that turns a turbine attached to a generator. These sources all produce reliable and dispatchable energy, or energy we can control. Consumers do not have to call the electric company and tell it to increase power generation before turning on the stove, clothes dryer or other electric devices. Instead, dispatchable sources of electricity are monitored and controlled by grid operators, who

manage the amount of power entering the system — either ramping it up or down — to meet the demand.

Power generated by wind also uses some type of turbine attached to a generator, but it does not use steam to spin the generator. Solar or photovoltaic sources use sunlight to create energy. Both wind and solar are forms of non-dispatchable energy. If conditions are not ideal, they could become unreliable, meaning we cannot control when and how much power they produce. A solar installation will only work during daylight hours, and if wind conditions are not in the turbines' operating range, the wind generators will not be able to supply electricity to the power grid.

In the cooperative's early years, many of our members remembered when the lights came on. Fast forward some 80-couple years, and we find ourselves in a time when electricity is viewed as a necessity — or something that is expected without interruption. While we strive to provide the most reliable service we can, outages are sometimes unavoidable. Those who manage the grid's power flow work to provide a solid, reliable and predictable flow of energy to all of us. There are many sources available for power generation; the question is, what mix of those will meet our safety, reliability and cost needs effectively?

Stay tuned for next month's article on transmission, the second piece of the electricity delivery machine. As always, feel free to stop in or give us a call and let us know how we are doing. ☼

Powering the U.S. with rural land

By Mark A. Morrison,
General Manager & CEO

AT AN electric energy conference earlier this year, one of the speakers shared his perspectives on the energy industry, current energy production policies, and resources necessary to meet our current and future energy needs.

His name is Robert Bryce. He is an author and journalist, who for the past 30 years has focused his work on the economical and societal impacts electricity has on countries and people throughout the world. Power density was one of the topics Bryce spoke about at length. Power density is a measure of power output per unit volume. If a system has a high power density, then it can output large amounts of energy based on its volume. He broke real power density down into a formula, which got the room thinking about the land and resources it takes to supply the grid with energy. I particularly started picturing the power generation resources close to us in Indiana and Cambria counties and the amount of rural space required for them.

Some comparisons using county geographic information system information, generation owners' websites and internet searches revealed interesting numbers related to power density, including how many acres it takes to generate a unit of electricity. CPV Fairview is a gas-powered plant in Vinco, Cambria County. The plant occupies 85 acres and is rated at potentially generating 1,050 megawatts (MW), according to its website. This is enough power for around a million homes with a power-density number of around 12 MW per acre. This site began operation in 2019, and is an efficient use of rural space for the electricity it can generate.

The Homer City generation station, a 2,000-MW coal-fired plant in Indiana County, occupies about 2,400 acres and can supply electricity to around 2 million homes with a power density of 0.833 MW per acre.



CPV Maple Hill is a 100-MW solar farm in Portage Township, also in Cambria County. According to a press release on the CPV website, the facility occupies more than 700 acres with the ability to power 18,000 homes. The power-density number for this project is 0.14 MW per acre.

We have seen many solar installations popping up in rural areas due to the vast footprint needed for solar electricity production. Your neighbors may have been solicited to repurpose farms and crop-producing land to make way for solar panels, turning our green rural areas into not-so-green-looking “green energy” solar panelscapes. Take a moment and do a general internet search for “rural solar farm.”

The Allegheny Ridge Wind Farm, which was built by Gamesa in parts of Cambria and Blair counties near Blue Knob, has a capacity of 80 MW and is situated on 1,100 acres. The land occupied by the wind farm is open to other uses. However, using power-density math, the wind farm has a power-density number of .07 MW per acre.

Lately, the current administration's push for an immediate transition to

renewable energy is being blasted at the American public daily in every news outlet. Legislation has allowed taxpayer dollars to subsidize all types of power generation over the years, and the “renewable” energy sector is the next to pile on. One piece of information not being shared with the public is the list of the many materials necessary to manufacture renewables. These critical, rare-Earth minerals share some of the same characteristics as fossil fuels, in that they are not a renewable resource.

Minerals mined and processed for solar panel and battery technology include lithium, cobalt, copper and nickel. The role of these minerals has increased as the green movement pushes manufacturers to develop and consumers to purchase electric vehicles (EVs). The International Energy Agency's (IEA) website, iea.org, has an interesting graph that indicates EVs use more than 200 minerals compared to a conventional car that requires less than 50. A similar graph showed the same relationship for power generation with power produced from natural gas and coal using less than 4,000 minerals and nuclear using less than 6,000.

Solar, on the other hand, comes in at more than 6,000 minerals, and wind generation ranges from 10,000 to just under 16,000.

The IEA's website also listed countries that extract and produce selected minerals and fossil fuels. The United States leads the charge for extraction of oil and natural gas, while China extracts the most rare-Earth minerals. These items are processed in various countries, as well. The United States, China and Russia top the list for oil refining, and Qatar, Australia and the United States are the top three for liquified natural gas export. Mineral processing has China as a dominant player because it more than doubles the processing output of all other countries. Meanwhile, the United States is not listed in the top three in any category for processing the minerals needed for the "renewable energy" transition.

Our need for power and energy has grown exponentially since the late 1800s, when Thomas Edison and J.P. Morgan competed against Nikola Tesla and George Westinghouse in the "current war." Tesla and Westinghouse revolutionized large-scale power generation with their hydro generators at Niagara Falls in 1895. Since that time, American invention and entrepreneurship has transformed energy generation. The world is more dependent than ever on the supply of safe, reliable, affordable, and dispatchable power, and there isn't a country on the planet that has done more to generate electricity cleaner and more efficiently than the United States.

Power sources labeled as green or renewable are an important source of necessary power to consumers, but we also cannot discount the benefits and safety that essential, reliable, and dispatchable baseload power from traditional sources provide to us all. It will take a diverse mix of power generation to meet the power needs of the world over the next century. Whatever the makeup of the sources of our power, it should be safe, it should be reliable, it should be there when we need it, and it should be affordable to those who use it. ❁



October is National Co-op Month!

We're all about you! **Co-op members** are at the heart of everything we do.

Energy Efficiency Tip of the Month

With winter weather on the way, now is the time to seal drafty windows. If you can see daylight around a window frame or if you can rattle a window (movement means possible leaks), the window likely needs to be sealed.

Most window leaks can be sealed with caulk or weatherstripping, which come in a variety of compounds and materials. Visit www.energy.gov/energysaver to learn how and where to seal air leaks.

Source: energy.gov

Unclaimed capital credits

We need your help! Periodically, we attempt to return capital credits to inactive accounts by sending a check to the last known address. Some checks, however, have not been cashed. It may be we don't have the correct address, or the checks may have been set aside and forgotten. Whatever the reason, we would like to get this money to the following people and businesses. If you know someone on this list, please ask them to contact us with their correct address at 814-766-3221, toll-free 800-270-3177 or info@newenterpriserec.com.

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