



**On the Record** outlines our concerns<sup>1</sup> about the *bulk power system*. First-time readers can visit [carrollecc.com/on-the-record](http://carrollecc.com/on-the-record) or scan the QR Code to learn more.



Issue 3 is another long and complex publication. Your involvement is requested at the end. I truly understand many members lack the time or interest in reading further and others may disagree with the observations made here. If you continue, please understand this key point.



A continuous **SUPPLY** of DISPATCHABLE (controllable) power generation is necessary to match the always-changing **DEMAND** for electricity...24 hours a day, every day.

Of the 11,068 members responding to previous issues of **On the Record**, 91% (or 10,078) members support the following goals.

**Goal 1.** Protect DISPATCHABLE power sources. A diverse mix of dispatchable resources that includes nuclear, coal, and natural gas will help minimize the various risks associated with becoming completely dependent on natural gas for dispatchable power generation.

**Goal 2.** End unfair subsidies to NON-DISPATCHABLE forms of power generation.

**Goal 3.** Advocate for CONSUMER-FOCUSED wholesale markets that place value on continuous reliability.

**9 of 10 Fully Support**



**DO YOU REMEMBER THE CHILDHOOD GAME RED LIGHT-GREEN LIGHT?** Recent events triggered this memory; however, our industry's problems are not a game.

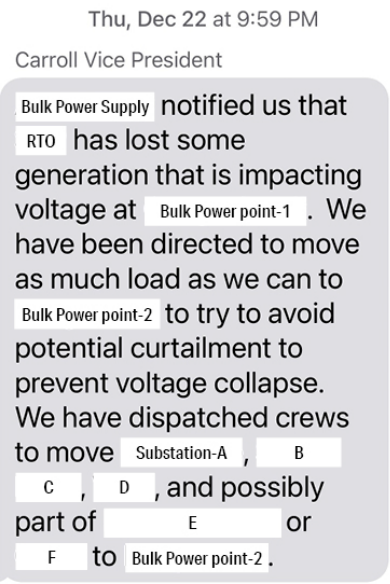
I received this text message (names redacted) before Christmas. ▶

For perspective, this was only the second time we have faced something like this. The first time was in 2021 – which was the original motivation behind **On the Record**. *I'll address the cost of these two events later.*

We do not like outages, and not because of the inconvenience or expense. Everyone at Carroll Electric takes our job to “keep the lights on” very seriously.

December 22-23, 2022, temperatures quickly fell to 6° BELOW ZERO with wind chills at more than 20° BELOW ZERO. When I received this text message, several of Carroll Electric’s crews were already on duty.

It is important to understand that Carroll Electric is a distribution utility and not part of the *bulk power system*. Regardless, if it hadn't been for the actions taken by Carroll’s crews to shift our distribution substations to a different supply point from the *bulk power system*, **tens of thousands** of Carroll Electric members would have been without power – at the very time they needed it most!



<sup>1</sup> Concerns about the *Bulk Power System* are shared by the Federal Energy Regulatory Commission (FERC) and the North American Electric Reliability Corporation (NERC), and various other industry officials. See [carrollecc.com/industry-news](http://carrollecc.com/industry-news) for more information.

Carroll's wholesale power supplier, Arkansas Electric Cooperative, Corp. (**AECC**), coordinates activities on the bulk power system with the Southwest Power Pool (**SPP**) and Midcontinent Independent System Operator (**MISO**). **SPP** and **MISO** are the Regional Transmission Organizations (**RTOs**) in this part of the United States.



**RTOs** are like "air-traffic controllers" of the bulk power system. During December's power generation shortage, **RTOs** ordered the shutdown of certain industrial customers. For about 24 hours, **RTO** conditions for all other consumers toggled back and forth between various **CONSERVATION ALERTS** and **NO ALERTS**. The 13 states that were part of **PJM** (see map) experienced similar outcomes.



**RED LIGHT-GREEN LIGHT** ► Although **RTOs** simply complied with federal guidelines, these fast-changing messages were frustrating to anyone who had just acted upon the previous instruction...assuming that instruction was even received. More importantly, asking customers at the end of the line to turn down the heat, unplug the lights, or abandon Christmas's perfect pecan pie is not the "energy transformation" that has been promoted.

In Tennessee, the situation was even more serious. **ROLLING BLACKOUTS** were needed to avoid the collapse of the entire system. In Nashville alone, over 50,000 customers were impacted in a single hour. These events spilled over into Saturday - even postponing the Tennessee Titans Christmas Eve game.



**LESS RELIABILITY for MORE COST?** As the bulk power system becomes **INCREASINGLY RELIANT ON THE VOLATILITY OF NATURAL GAS**, power generation shortages cause wholesale power prices to skyrocket. This is especially true when home heating and power generation compete for natural gas and limited pipeline capacity. Case in point, the emergency events described earlier resulted in record-setting<sup>2</sup> **WHOLESALE POWER BILLS**. The highest ever was in February-2021, followed by December-2022.

As a member of Carroll Electric, you deserve better.

**It is NOT just a WINTER problem...**

For about a week late last summer, California's electric grid was in jeopardy. **CAISO**, California's **RTO**, asked residents to unplug electric vehicles as the sun (and solar energy) went down. This was just days after California announced<sup>3</sup> a gas car ban.

The **2022 Western Assessment of Resource Adequacy** report<sup>4</sup> states:



"The West is experiencing rapid and significant changes in climate, weather, policy, energy consumption patterns, and technology that are challenging the industry's ability to reliably operate and maintain the grid. These changes, coupled with a rapidly transforming resource mix and push for electrification, create risks that will continue to grow over the next decade. These changes are affecting resource adequacy today and are expected to have increasing impacts in future years. There is an urgent need for the West to address resource adequacy issues now.

...  
Not only is resource adequacy risk growing, **but it is spreading throughout the year beyond the peak load seasons.**"

<sup>2</sup> While Carroll's wholesale supplier passes through fuel costs monthly, the highs and lows are smoothed out over 12 months on your bill.  
<sup>3</sup> See [mystateline.com/news/national/california-asks-residents-not-to-charge-electric-vehicles-days-after-announcing-gas-car-ban/](https://mystateline.com/news/national/california-asks-residents-not-to-charge-electric-vehicles-days-after-announcing-gas-car-ban/)  
<sup>4</sup> See [wecc.org/layouts/15/WopiFrame.aspx?sourcedoc=/Reliability/2022%20Western%20Assessment%20of%20Resource%20Adequacy.pdf&action=default](https://wecc.org/layouts/15/WopiFrame.aspx?sourcedoc=/Reliability/2022%20Western%20Assessment%20of%20Resource%20Adequacy.pdf&action=default)



## IT IS A MATH PROBLEM

We are entering a period of **INCREASING** demand for electricity. This comes from population growth; the electrification of more devices (including appliances and vehicles); and the growth of data centers, crypto-currency mining, and cannabis cultivation facilities. In short, the *bulk power system* is **ALREADY OPERATING TOO CLOSE TO THE EDGE**. Our country **NEEDS MORE** (not less) **DISPATCHABLE POWER GENERATION**.

### **i** INDUSTRY UNDERSTANDING: ALL CAPACITY IS NOT EQUAL

**1 GW** (or 1 million kW) of CAPACITY running 24 hours a day will produce 8,760,000,000 kWh annually (1m x 24 x 365).

However, planned and unplanned maintenance prevents any plant from running 100% of the time. Nuclear, coal, and natural gas can run at full capacity for months. Wind, solar, and batteries are intermittent and cannot run at full capacity throughout a 24-hour period.

According to the U.S. Energy Information Administration (EIA), 83 gigawatts (GW) of coal generation have been closed since 2015. Plant closures are expected to increase in future years.



DISPATCHABLE power is **DECREASING** and being substituted with intermittent resources. The further our nation's energy policy goes down this path, the more days of **RED LIGHT-GREEN LIGHT** instructions, **BLACKOUTS**, and **HIGHER PRICES** are ahead.

Bulk Power Generation Resources	U.S. Capacity EIA 2021	2023 Plant Closures <sup>5</sup>	2023 Plant Construction <sup>6</sup>
<b>Coal</b> Future years: Many more (4 units in Arkansas) are scheduled for retirement or at risk due to proposed regulations.	210 GW	(8.9 GW)	
<b>Nuclear</b> *Represents <u>Vogtle Units 3 &amp; 4</u> , which are the <u>first new nuclear plants built in over 30 years</u> . <b>17-year project</b> (application for permit began in 2006) 2012 cost estimate - <b>\$14 billion</b> 2022 spending estimate - <b>\$34 billion</b>	95 GW		2.2 GW*
<b>Natural Gas</b> Older <u>steam</u> and <u>combustion</u> turbines are being replaced by larger, more efficient, <u>combined-cycle</u> turbines. <b>At times, these plants are restrained by pipeline congestion.</b>	491 GW	(6.2 GW)	7.5 GW
<b>Petroleum &amp; Other</b> Generally, these are only operated during peak periods or when natural gas is not available.	35 GW	(0.4 GW)	
<b>TOTAL DISPATCHABLE RESOURCES</b>	<b>831 GW</b>	<b>(15.5 GW)</b>	<b>9.7 GW</b>
	<b>NET EFFECT = (5.8 GW) DECREASE</b>		
<b>Hydro</b> (conventional and pumped storage) <u>Variable</u> with water conditions.	103 GW		
<b>Wind</b> <u>Variable</u> with wind speed. Can be interrupted during icing events.	132 GW		6.0 GW
<b>Solar</b> <u>Variable</u> with sunlight/clouds/snow/ice. Interrupted at night (during which it <b>requires</b> power for inverters).	61 GW		29.1 GW
<b>Battery Storage</b> <sup>7</sup> About 2-4 hours of discharging at capacity. Subject to 10-15% of loss between charging and discharging.	8.8 GW (in 2022)		9.4 GW
<b>Biomass, Geothermal, and Other</b>	15 GW	(0.1 GW)	0.2 GW

<sup>5</sup> See [eia.gov/todayinenergy/detail.php?id=55419](https://www.eia.gov/todayinenergy/detail.php?id=55419)

<sup>6</sup> See [eia.gov/todayinenergy/detail.php?id=55439](https://www.eia.gov/todayinenergy/detail.php?id=55439)

<sup>7</sup> For more information about energy storage, see Carroll's Case Study – Why not Batteries? [carrollecc.com/upload/files/why-not-batteries.pdf](https://carrollecc.com/upload/files/why-not-batteries.pdf).

## WHAT CAN BE DONE?

The rules of math and physics cannot be changed. I am not going to sugarcoat things; the environment we face with government policy is challenging. That said, we are not about to give up.

### ▶ National Level

The national trade association for electric cooperatives is **NRECA**. **NRECA** has been the most vocal among all utility trade groups (including investor-owned utilities and municipal power systems). **NRECA's** CEO, Jim Matheson, speaks plainly about these issues (see [carrollecc.com/industry-news](http://carrollecc.com/industry-news)). Additionally, **NRECA** has been active in all three branches of government.

Executive Branch: **NRECA** is working with administration officials to convey the seriousness of this issue.

Judicial Branch: **NRECA** has intervened in critical court proceedings, all the way up to the U.S. Supreme Court.

Legislative Branch: **NRECA** and electric cooperative leaders across the country continue to elevate this issue before members of Congress.

### ▶ State Level

**AECC** and its member cooperatives are also working on these issues. Together we have initiated the *Balance of Power* ([carrollecc.com/the-balance-of-power](http://carrollecc.com/the-balance-of-power)), a campaign focusing on what is needed to provide affordable power 24 hours a day, every day. Buddy Hasten, the President/CEO of **AECC**, is a national leader on these issues. Some of Buddy's work is also featured at [carrollecc.com/industry-news](http://carrollecc.com/industry-news).



### ▶ Carroll Electric

As always, this issue of **On the Record** will be shared with government and industry leaders. Educating policymakers is critical. **Demonstrating GRASSROOTS SUPPORT is too.**

Also, we are prepared (to the extent possible) for the future instability of the *bulk power system*. Our team performs mock drills of our *Emergency Load Conservation and Curtailment Plan* and will work faithfully to minimize the disruption to the membership as best we can. If or when this type of situation arises again, we will have relevant information on our website.

### ▶ What can I do?

Please join us **On the Record** by returning the enclosed form or visiting our website in support of these three goals:



- Goal 1.** Protect DISPATCHABLE power. A diverse mix of dispatchable resources that includes nuclear, coal, and natural gas, will help avoid the various risks associated with becoming completely dependent on natural gas for dispatchable power generation.
- Goal 2.** End unfair subsidies to NON-DISPATCHABLE forms of power generation.
- Goal 3.** Advocate for CONSUMER-FOCUSED wholesale markets that place value on continuous reliability.