CUSTER PUBLIC POWER DISTRICT Currents

With Area Service Centers in Sargent, Callaway, Stapleton and Thedford

Powering the "Good Life" over 8000 square miles of service territory.

Public Power Week
October 3 - 9, 2021

photo credits Linda Teahon

CUSTER PUBLIC POWER DISTRICT Currents

Newsletter of the
Custer Public Power District
Serving Custer, Loup, Blaine, Thomas, Hooker, McPherson, Logan, and parts of Sherman, Garfield, Brown, Cherry, Lincoln, and Dawson Counties

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From the GENERAL MANAGER'S desk

Finding the Right Balance

Over the last few years, we have heard a lot of talk about renewable energy, reducing the amount of carbon in the air, and minimizing our dependence as a country on foreign oil.

Electricity is produced from four different categories of power plants. Each of these categories impacts the way electricity is generated. We stack them, just like building blocks, from the least cost to the highest cost per kilowatt-hour produced.

First are *"base load"* power plants. These are the most expensive to build, so you want to run them as much as possible to spread out the large capital costs of ownership (billions of dollars for one plant) over the sale of as many kilowatt-hours as possible.

Base load generation units tend to be very large. It takes time for the units to start generating power. In some cases, it can take 3 to 4 days before they get to 100 percent power. The generating units that make up this class of electric generation are typically coal and nuclear fuel units. In Nebraska, these base load generators provide about 72 percent of the electricity we use at Custer Power.

Second are *"intermediate"* generating units. These units typically use more expensive

Board Meetings

The regular monthly meeting of the Custer Public Power District Board of Directors is on the last Thursday of each month, beginning at 9:00 a.m.(CDT) in the main office in Broken Bow at 625 E South E on HWY 2.

An agenda for each regular meeting of the board is available for public inspection during business hours.

In the event of matters of an emergency nature or conflicts with other meeting dates, the Board of Directors will set changes. Any change in the monthly meeting date will be posted in the legal notice at the main headquarters building at Broken Bow and at each of the District's area service centers located in Callaway, Sargent, Stapleton and Thedford, Nebraska.

fuels and sometimes are cheaper to build. They are usually gas-fired plants, but there are some coal-fired plants in this category. Intermediate plants are the ones that kick in after all the base load units are running, but more power is still needed. In Nebraska, intermediate units make up about 15 percent of all generating units and could cost about 300 percent (3 times) more than base load plants per megawatt-hour.

Third are *"peaking"* units. These are the highest cost units to run and typically include either gas-fired or diesel units. These units run when everything else is going full blast yet still more power is needed – such as in the middle of the afternoon on a hot August day.

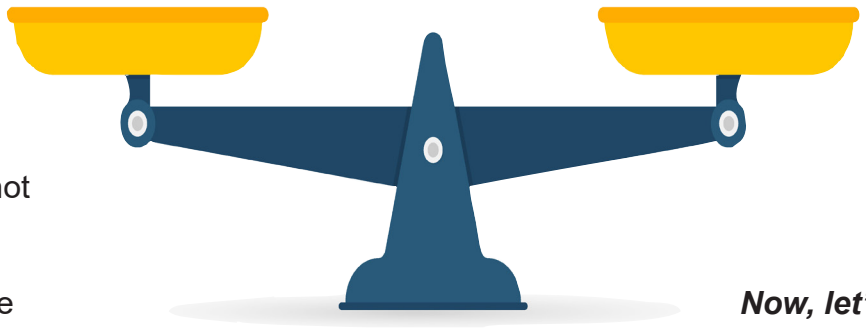
Peaking units can be turned on and get running fairly quickly, which means when they are not needed, they are shut off. In Nebraska, peaking units make up about 5 percent of all generating units and cost about eight times more than base load units.

The last type of generating units are *"renewable energy"* units. This includes wind, solar, and hydroelectric generation along with anything else that can produce electricity from a source that is renewable.

These units will run whenever they can – when the wind is blowing, when the Corps of Engineers is letting water out of the dams, and when the sun is shining.

For wind-powered generation, that is typically 30 to 40 percent of the time. Since these units are capital intensive (our fancy word for "expensive to build"), the electricity produced must be forecasted and taken into the electric grid or distribution system 100 percent of the time no matter where renewables are generating - unless there is a reliability issue on the grid or distribution system. If the wind is blowing less than forecasted, the wind farm will not generate, and *"other units"* will be needed for generation. Or, if the wind is higher than forecasted it puts additional pressure on the transmission system where *"other units"* generation will be dispatched down. At times when the wind is too high, the turbines are shut down due to potential damage to the turbines. The *"other units"* are the higher cost intermediate and peaking units.

In Nebraska, renewable energy facilities make up about 10 percent of all generating capacity, and wind energy currently costs about 50% more per kilowatt-hour than power from the base load plants.



Now, let's bring the subject around to where we started. The first thing to remember may sound obvious, but it's important to keep in mind. We have to produce electricity a split second before it is needed. This means, when you flip the switch, the power will be there, and the light will come on.

Our energy operators are very good at knowing minute-by-minute how much electricity they need to be putting on the system/lines. They use

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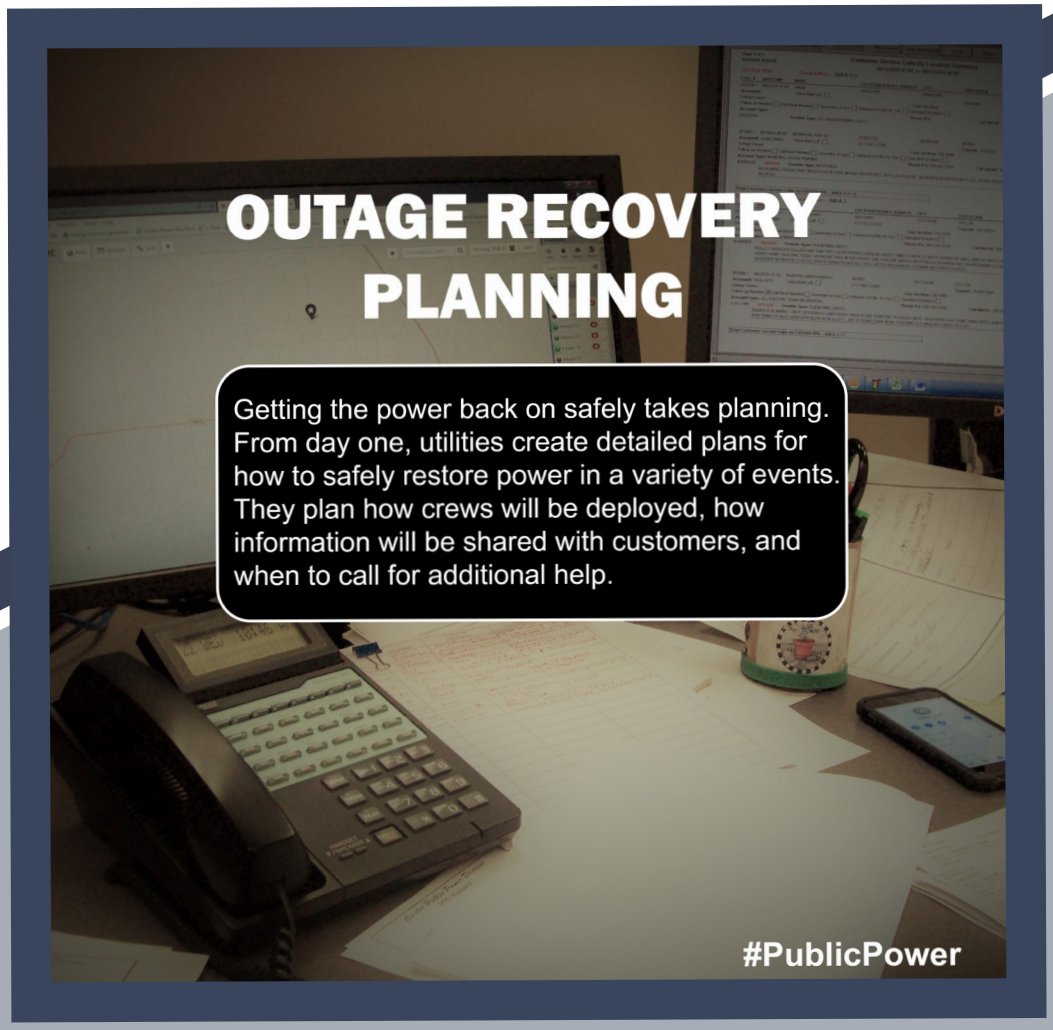

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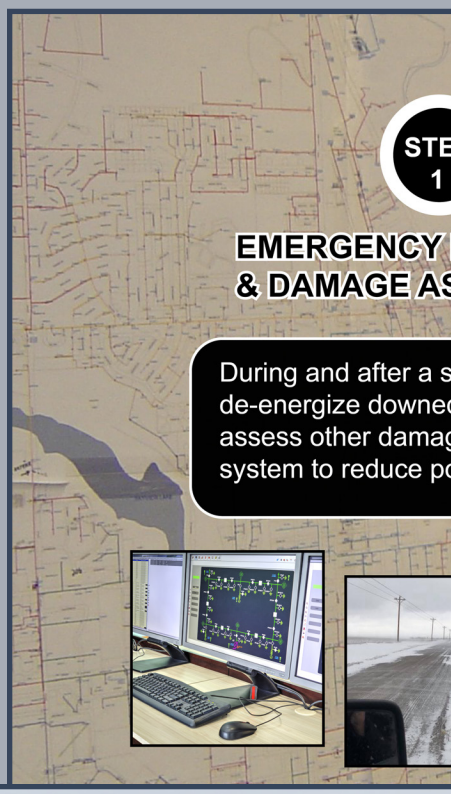

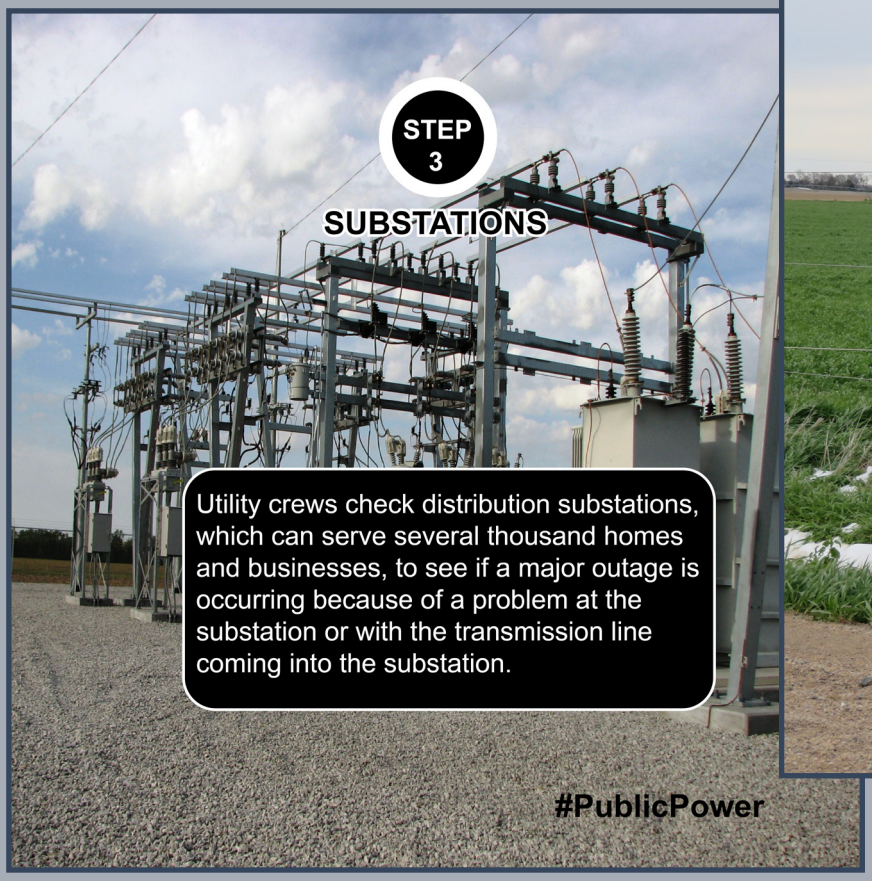

er District's mission is to safely deliver electricity to our
keep the District in a sound financial position, and exceed
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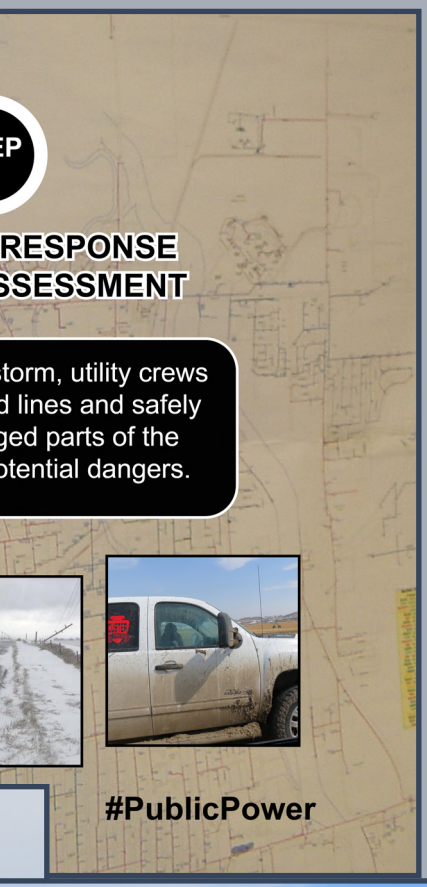

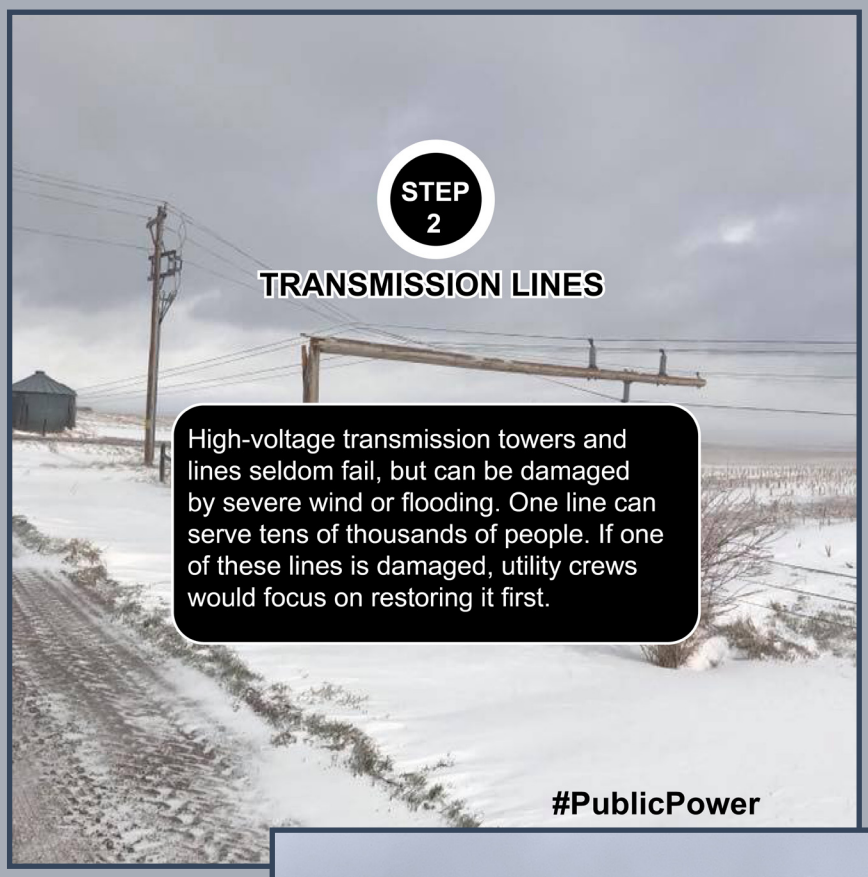

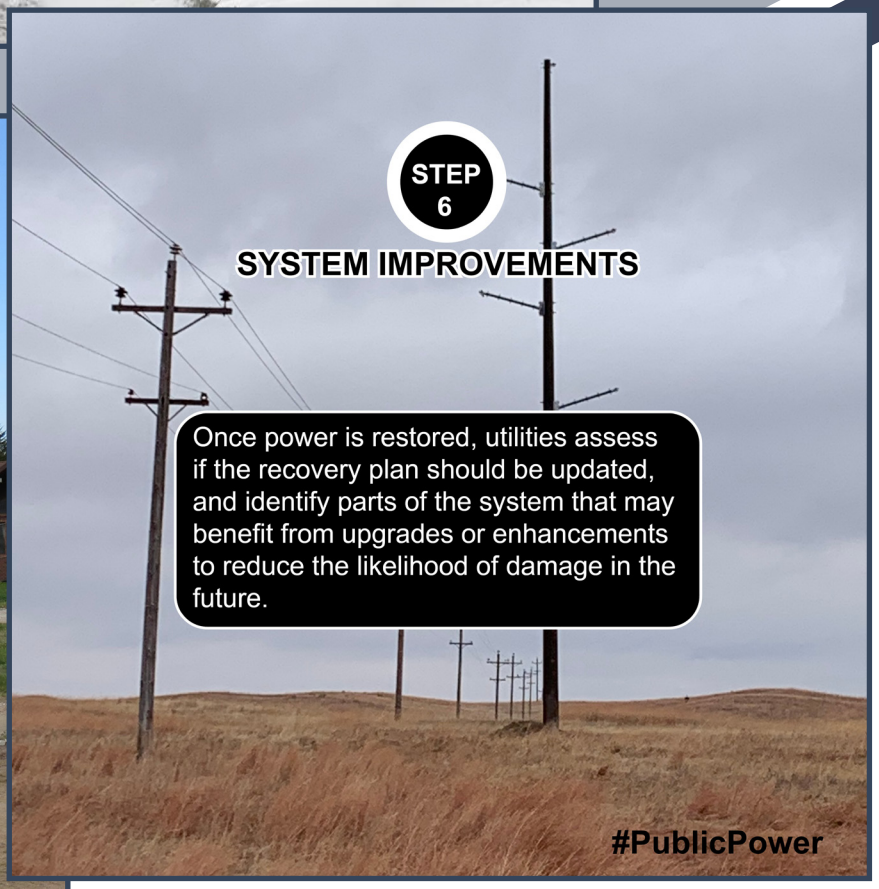

RECIPES

CUBAN PORK TENDERLOIN

- 1 1/2 pounds pork tenderloin (trimmed)
- 1/4 cup orange juice (fresh)
- 1/4 cup grapefruit juice (fresh)
- 2 tablespoons cilantro (chopped)
- 1 teaspoon cumin
- 1 teaspoon dried oregano
- 2 cloves garlic (finely chopped)
- 1/2 teaspoon kosher salt
- 1/2 teaspoon red pepper flakes

Directions

1. Using thin knife, trim silver skin from tenderloin. Mix orange juice, grapefruit juice, cilantro, cumin, oregano, garlic, salt, and hot pepper in gallon-sized zip-top plastic bag. Add pork, close, and refrigerate for at least 30 minutes and up to 4 hours. Meanwhile, make Rice and Black Bean Salad.
2. Prepare outdoor grill for direct medium-hot grilling. For a gas grill, preheat grill on high. Adjust temperature to 400°F. For a charcoal grill, build fire and let burn until coals are covered with white ash. Spread coals and let burn for 15-20 minutes.
3. Lightly oil cooking grate. Remove pork from marinade, drain briefly, but do not scrape off solids. Place on grill and cover grill. Cook, turning occasionally, until browned and instant-read thermometer inserted in center of pork reads 145 degrees Fahrenheit, about 20-27 minutes. Transfer to carving board and let stand 3-5 minutes. Cut on slight diagonal and serve with *rice and black bean salad.*

www.yummly.com/recipe/Cuban-Pork-Tenderloin-1302448

RICE & BLACK BEAN SALAD

- 1 cup rice (long-grain)
- 1/2 zest (orange, grated)
- 3 tablespoons orange juice
- 1 tablespoon red wine vinegar
- 1/2 teaspoon salt
- 1/4 teaspoon black pepper (freshly ground)
- 2 tablespoons extra-virgin olive oil
- 15 ounces black beans (drained and rinsed)
- 2 scallions (white and green parts, chopped)
- 2 tablespoons cilantro (chopped)

Pork.org recipes are found on www.yummly.com

Directions

1. To make salad, bring a medium saucepan of lightly salted water to a boil. Add rice and cook (like pasta) until tender, about 16 minutes. Drain in wire sieve, rinse under cold water, and let cool.

2. In medium bowl, whisk orange zest and orange juice, 1 tablespoon vinegar, 1/2 teaspoon salt, and 1/4 teaspoon pepper. Whisk in oil. Add cooled rice, black beans, scallions and cilantro, and mix. Let stand at room temperature for up to 4 hours. (If refrigerated, let stand at room temperature for 30 minutes before serving, or rice will be hard.)

www.yummly.com/recipe/Rice-and-Black-Bean-Salad-2249046

Share Your Recipes

Earn a free gift if we publish your recipe.

Mail to:
Custer Public Power District
Att. Tarin Burrows
P.O. Box 10
Broken Bow, NE
68822

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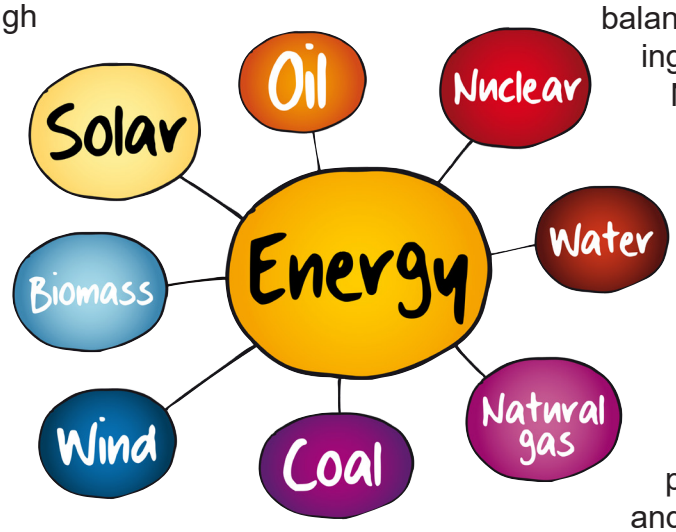
the *base load* plants first because they're the ones that are cheapest, most reliable, and oftentimes have the most power output compared to the other generating types.

As demand for electricity increases, power plant operators kick on their *intermediate units*. During the summer months, both the *base load* and *intermediate units* will be running most of the time. During the winter months, *base load* plants run but most likely *intermediate units* may not, though they are always available. The last units that come on during the highest peak demand times are the *peaking units* - diesel units because they are so expensive and do not have as much power output. That means diesel provides a very small portion of the total electricity generated in Nebraska. It runs only in extreme circumstances.

Since we use so little diesel fuel, the goal of reducing our dependence on foreign oil just won't get much help from the electric industry. America, thankfully, is already pretty much energy-independent when it comes to the production of electricity. Therefore, one way we can help reduce carbon emissions, is to build nuclear *base load* units and reduce the use of coal and gas plants for *base load* power. I understand concerns over how we store spent nuclear fuel rods, but if the primary goal is lower carbon emissions, for now, the answer – practically and economically speaking – has to involve more nuclear power.

We don't yet have the technology for storing wind and solar energy on the scale required so that they could be used as base load power. What storage we do have technologically available right now is pretty expensive. Also, today, technology does not exist on a commercial-wide scale to remove carbon from coal plants.



While one may argue river dams could be used as a form of energy storage, there are also environmental considerations about building more dams and limits as to how much untapped hydropower potential we have available. In 2011, Hoover Dam produced about 4.2 billion kilowatt-hours; all the fossil fuel generating plants in the United States produced 2,788.9 billion kilowatt-hours. To replace all that energy with hydroelectric would require 644 Hoover Dams to be built. There is some potential, to be sure, but not enough to be a magic cure-all. Currently, the Hoover Dam is at historically low levels due to the drought and increased energy demands in the southwestern part of the nation.

With all of the above points in mind, I think most will agree that the United States of America should keep working on the technology that can solve these problems; and, in the meantime, focus on finding the right balance among the four existing categories of generation. NPPD, Custer's power provider, has more than 60 percent carbon-free generation today and customers benefit from this diverse resource mix.

We also can do this by using the energy we do produce more efficiently and conserving it better. So far, our efforts to do that in Nebraska (like using irrigation load control and energy conservation awareness) have helped Nebraska avoid building at least one big power plant. This is a good start as we seek to find the right balance. ♦

OFFICE HOURS

Monday through Friday
8:00 a.m. to 5:00 p.m. CDT
The office will be closed on September 6 in observation of Labor Day.

For after hour emergencies call 1-888-749-2453.

PUBLIC POWER DISTRICT
CUSTER
Empowering Progress

P.O. Box 10
Broken Bow, NE 68822

Through rain, wind, snow, sleet and hail, NEBRASKANS TRUST PUBLIC POWER will get their power on as soon as safely possible.

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