Nebraska Energy Quarterly

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DEPT. OF ENVIRONMENT AND ENERGY

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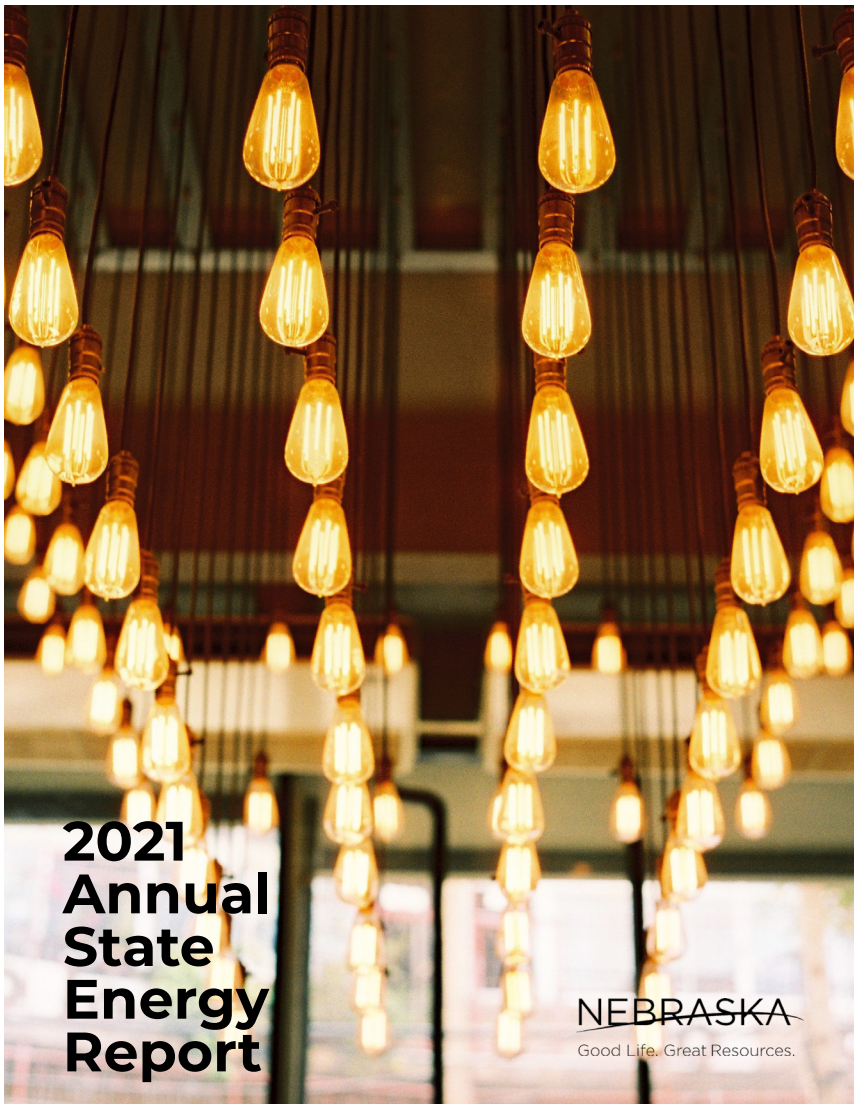
NDEE releases 2021 Annual Energy Report

The Nebraska Department of Environment and Energy has released its 2021 Annual Energy Report to the legislature. It can be found in its entirety on the agency's website.

This report fulfills obligations set by Neb. Rev. Stat. §81-1607, which requires NDEE to submit an annual report that identifies emerging trends in energy supply, demand and conservation within the agricultural, commercial, residential, industrial and transportation sectors, along with other sector information that may be useful.

Information on NDEE's energy programs is also included in this report. There are summaries of FY2020 activities for NDEE's Weatherization Assistance Program, Dollar and Energy Saving Loans Program, State Heating Oil and Propane Program and other special projects.

Questions or comments on this report may be submitted to neo.energy@nebraska.gov.



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A primer on electric vehicle charging

Connections may differ among EVs

by Randy Smith
Environmental Specialist, NDEE

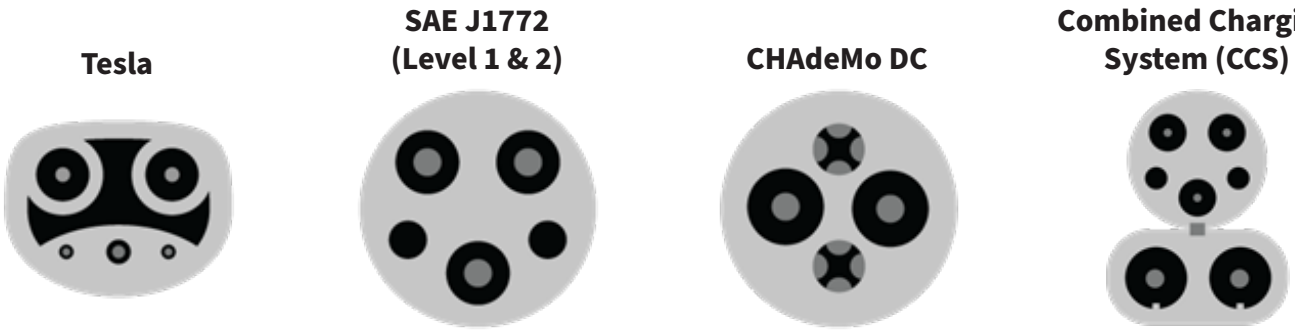
Last quarter, we discussed how there are different types of charging equipment for electric vehicles and how that equipment can affect drivers' time to charge their EV battery.

As a recap, Level 1 Charging uses a 120-volt alternating current circuit and is the slowest method of charging. Level 2 Charging delivers a 240-volt alternating current and a faster charge – all current EVs can accept this type of charging. Lastly DC Fast Charging operates on a direct current. DC charging is the fastest charging method and is used in high-traffic public locations.

But charging equipment isn't the only thing that differs when it comes to EVs. EVs and charging stations may have different cables that are important to consider.

The cables used to charge an EV have a connector at the end that plugs into a port on the vehicle. This connection not only serves to deliver electricity to the EV, it also provides two-way communication between the EV battery management system and the external charger to control the charging session.

Too many connectors
Tesla vehicles have a unique charge port and connector that works for all their charging equipment (Level 2 chargers and DC fast chargers, called Superchargers). All other manufacturers equip their cars with a Society of Automotive Engineers (SAE) J1772 charge port for Level 1 and Level 2 charging. (All Tesla vehicles come with a J1772 adapter that allows them to use non-Tesla Level 2 chargers.)



Source: U.S. Department of Energy Alternative Fuels Data Center

There are two different types of connector used in non-Tesla EVs for DC fast charging, CHAdeMO and the SAE Combined Charging System (CCS). The older CHAdemMO standard, developed by Japanese automakers, is a dedicated DC connection. EVs with a CHAdeMO port therefore must also have a separate J1772 port for Level 1 and 2 charging.

The more recent CCS standard is designed around the J1772 connector specification, but has additional pins for DC charging, so the single CCS port can be used for all charging levels. The simplicity of this system is leading to more widespread use, with some manufacturers switching from CHAdemMO to CCS in newer EV models. Many public DC fast chargers, including those funded by NDEE through the Nebraska Electric Vehicle Charging Rebate Program, have both CHAdeMO and CCS connectors to enable use by all EVs. (Tesla Model S and Model X owners can purchase an adapter for the CHAdeMO connector.)

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The Future: Wireless Charging
In wireless (or inductive) charging, a magnetic field generated between a pad on the ground and a pad on the vehicle transfers electricity to the EV without a cord. High-power commercial versions of this technology are already being used to charge transit buses and other fleet vehicles, and companies and academics are working on systems for public and home use. The convenience of this approach encourages more frequent partial charging to keep vehicles operating throughout their daily service cycle.

Public power districts set carbon neutral goals

Nebraska's three largest public power utilities – Nebraska Public Power District, Omaha Public Power District, and Lincoln Electric System – have all set decarbonization goals.

The NPPD Board of Directors approved the utility's goal to achieve net-zero carbon emissions from generation sources by 2050 in December 2021.

OPPD is also aiming to become a net-zero carbon producer by 2050, which is included in its integrated resource plan.

LES's goal for net-zero carbon emissions by 2040 was set by its administrative board in November 2020.

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Millions available for Rural Energy Projects in Nebraska

By USDA RD Midwest Public Affairs

The U.S. Department of Agriculture's Rural Development (RD) offices have grants and loans available for agricultural producers and small businesses seeking renewable energy solutions or improvements in rural locations across America.

In Nebraska last year, RD invested more than a million dollars in energy projects across the state, provided assistance that helped keep businesses open through the pandemic and generated or saved enough additional energy to power 716 homes. The deadline to apply for grants this year is March 31, 2022.

Photo courtesy USDA RD Midwest Public Affairs

Scratchtown Brewing Compnay in Ord used USDA Rural Development's Rural Energy for America Program (REAP) to help fund the installation of a solar array that saves the business around $3,281 and generates 32,359 kWh per year. These savings came at a crucial time as the Covid-19 pandemic unfolded.

The Rural Energy for America Program, better known as REAP, provides financial assistance for renewable energy system installations and energy efficiency improvements in rural communities with 50,000 residents or fewer. Some of last year's 34 projects included replacing grain dryers, installing rooftop and ground solar systems, replacing irrigation motors, updating lighting and updating refrigeration cases for eligible business applicants.

Agricultural producers are individuals or entities who receive more than 50% of their gross income from agricultural operations such as farming, ranching, aquaculture, forestry operations, nurseries or dairies. Rural small businesses that meet the Small Business Administration size standards are also eligible to apply. Agricultural producers may apply for new energy-efficient equipment and new system loans for agricultural production and processing. Individual borrowers must be citizens of the United States or reside in the U.S. after being legally admitted for permanent residence. Private-entity borrowers must demonstrate that loan funds will remain in the United States.

Loan guarantees are available for up to 75% of total eligible project costs for amounts of $5,000 to $25 million, while grants are available for up to 25% of total eligible project costs in amounts of $1,500 to $250,000 for energy efficiency improvements, and $2,500 to $500,000 for renewable energy systems. Combined grant and loan guarantee funding can be used for up to 75% of total eligible project costs.

Scratchtown Brewing Company, LLC, in Ord is one local business that has benefited from REAP. The business saved nearly 70% in energy costs thanks to a REAP renewable energy grant awarded in 2019 to purchase a new 24-kilowatt rooftop solar array. These renewable energy improvements are estimated to be saving the brewery approximately $3,281 per year and generate 32,359 kWh per year, which is enough energy to power nearly three homes and contribute to reducing their carbon footprint.

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While the REAP grant helped with the affordability of financing the solar array installation, the renewable energy generated contributed to a decrease in the brewery's electrical bills, allowing that savings to be put back into the business, according to Scratchtown Brewing Company President Caleb Pollard.

"It has contributed to a 10-fold decrease in our electrical bill. During the past year, we produced an excessive amount of power needed for six months out of the year, and in total, had an energy bill for only three months of the calendar year," Pollard said.

The energy savings couldn't have come at a better time with the outbreak of the coronavirus pandemic occurring less than a year after installation. "The offset in electrical costs was a godsend during the worst parts of Covid-19 when businesses were closed. In our industry, any cost savings could mean the difference between making it or losing it all," Pollard said.

In partnership with Cornerstone Bank and the Nebraska Department of Environment and Energy, USDA's REAP grant helped Pollard make this project more affordable and remain a viable business during a difficult economic time.

"Our energy savings alone helped us keep the doors open. Any and all dollars retained during this situation has been imperative to our business's survival," Pollard said.

REAP can help fund a variety of projects. For example, in Juniata, corn and soybean farm FTS Enterprises Inc. was awarded an $18,189 grant to install a 15-kW wind turbine. The project is expected to save the farm nearly $4,000 in energy costs per year and generate nearly 52,000 kWh of electricity per year, enough energy to power four homes.

In Hay Springs, Farm to Family Cooperative Grocery Store was awarded a $1,803 grant to install an energy-efficient deli case counter, produce cooler and sandwich prep cooler. The new equipment is expected to save the store nearly $2,300 in electrical costs per year and save 26,524 kWh per year.

Jeff Carpenter is an energy coordinator with USDA Rural Development based out of Lincoln. He said the cost savings REAP provides can be vital to local businesses.

"The impact REAP can have on agricultural operations and rural small businesses is significant," Carpenter said. "Decreased energy costs or savings realized can be enough to keep the applicant in operation, which has a positive impact on the environment and drives the country toward energy independence. I'd encourage anyone interested in this program to visit our website or give me a call for more information."

Interested persons can research area eligibility by visiting the Rural Development website here, or contacting Nebraska Energy Coordinator Jeff Carpenter, (402) 437-5554, Jeff.Carpenter@usda.gov. To subscribe to USDA Rural Development updates, visit our GovDelivery subscriber page.

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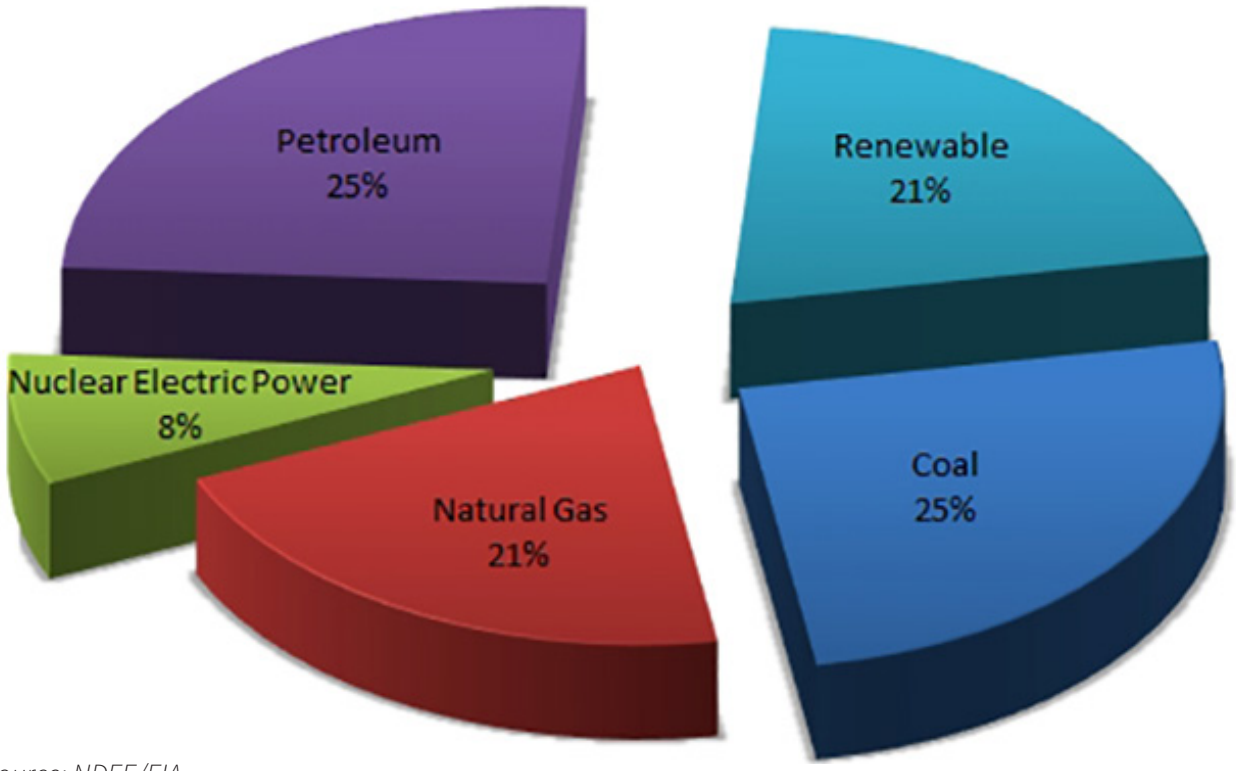
Wind generation continues to grow in Nebraska

Sources of energy for Nebraska are changing. According to the Nebraska Department of Environment and Energy's 2021 annual energy report, renewable fuel production peaked in 2019 and made up 21% of Nebraska's total energy consumption that same year.

NDEE is keeping up with this changing energy landscape by updating its wind and solar community generation maps. These maps show communities with wind facilities and solar energy generation across the state. As renewable energy changes, these maps will be updated.

The wind map can be seen below, and a solar map will be included in a future NEQ. Both the wind and solar maps are available online, and more energy information can be found on our statistics webpage.

Total Energy Consumption by Fuel Type in 2019



Source: NDEE/EIA

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Wind Development in Nebraska

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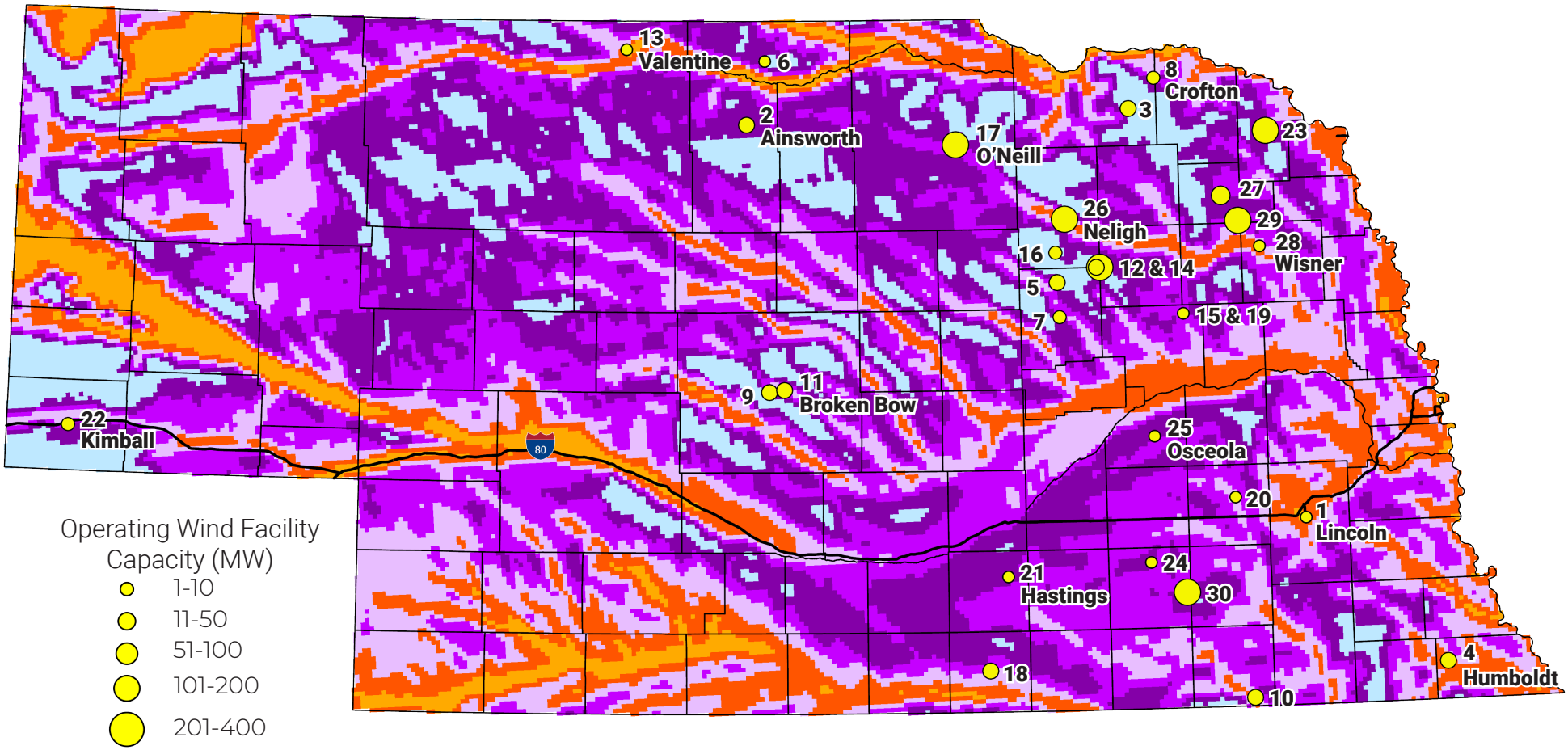
Operating Facilities



Total operational MW: 2,666.26

Numbers on the map correspond with the table on the back.
Wind facilities as of July 2021.
Map shows 80-meter wind overlay.

For questions or comments on this map, contact neo.energy@nebraska.gov.
For more information, visit: https://neo.ne.gov/programs/stats/inf/89.htm

Sources: Base map provided by National Renewable Energy Laboratory for U.S. Department of Energy (2017).
Facility locations provided by the Nebraska Department of Environment and Energy (2021).

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Wind Development in Nebraska

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	Operating Wind Facilities	Year of Commercial Operation	MW	Turbines	Locations
1	Salt Valley	1998 and 1999	1.32	2	Northeast of Lincoln, Lancaster County
2	Ainsworth Wind Energy	2005	59.4	36	Ainsworth, Brown County
3	Elkhorn Ridge Wind, LLC	2009	81	27	Bloomfield, Knox County
4	Flat Water Wind Farm, LLC	2010	60	40	Near Humboldt and Beatrice, Richardson County
5	Laredo Ridge Wind Farm	2010	80	54	Petersburg, Boone County
6	Springview II	2011	3	2	Springview, Keya Paha County
7	Petersburg, LLC	2011	40.5	27	Boone County
8	Crofton Bluffs Wind Farm	2012	40.6	22	Peoria, Knox County (southwest of Crofton)
9	Broken Bow Wind, LLC	2012	77.6	50	Broken Bow, Custer County
10	Steele Flats Wind	2013	75	44	Steele City and Odell, Jefferson and Gage counties
11	Broken Bow Wind II	2014	75	43	Broken Bow, Custer County
12	Prairie Breeze I	2014	200.6	118	Petersburg, Antelope County
13	Valentine Wind, LLC	2014	1.85	1	Valentine, Cherry County
14	Prairie Breeze II	2015	73.39	41	Adjacent to Prairie Breeze I
15	Creston Ridge, LLC	2015	6.8	4	Creston, Platte County
16	Prairie Breeze III	2016	35.8	20	Elgin, Antelope County (adjacent to I and II)
17	Grande Prairie Wind, LLC	2016	400	200	O'Neill, Holt County
18	Cottonwood Wind Project	2017	89.7	52	Webster County
19	Creston Ridge II Wind Farm	2017	6.9	3	Creston, Platte County
20	Seward Wind Facility	2017	1.7	1	Seward, Seward County
21	Hastings Wind Farm	2017	1.7	1	Hastings, Adams County
22	Kimball Wind Project	2018	30	12	Kimball County
23	Rattlesnake Creek Wind Project, LLC	2018	320	101	Dixon County
24	Perennial Wind Farm	2018	6.9	3	Fairmont, Fillmore County
25	Prairie Wind	2018	2.5	1	Osceola, Polk County
26	Upstream Wind Energy, LLC	2019	202.5	81	Neligh, Antelope County
27	Sholes Wind Energy Center	2019	160	71	Wayne County
28	Cuming County Wind Farm	2019	2.5	1	Wisner, Cuming County
29	Plum Creek Wind	2020	230	82	Wayne County
30	Milligan 1 Wind Farm	2021	300	99	Milligan, Saline County
	Totals		**2,666.26**	**1,239**	

	Retired Wind Facilities	Years of Commercial Operation			
	Springview Wind Energy	1998-2007			
	Valley	2001-2016			
	Kimball Wind Project	2002-2017			

Note: Operating facilities with more than one year listed have multiple turbines that began commercial operation in different years.

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Energy Saver: Spring and summer energy-saving tips

Information from the U.S. Department of Energy

Here you'll find strategies to help you save energy and keep costs down during the spring and summer when the weather is warm and you are trying to keep your home cool. Some of the tips below are free and can be used on a daily basis to increase your savings; others are simple and inexpensive actions you can take to keep energy affordable through the spring and summer.

If you haven't already, conduct an energy assessment to find out where you can save the most.

Use your windows to keep out heat
Install window coverings to prevent heat gain through your windows during the day. Find out about window treatments and coverings that can improve energy efficiency.

Operate your thermostat efficiently
Set your thermostat at a temperature you find comfortable and that provides humidity control, if needed. The smaller the difference between the indoor and outdoor temperatures, the lower your overall cooling bill will be.

Photo by Sean D on Unsplash

One way to save energy, and money on your bills, is to keep your home warmer when your away and lowering the thermostat when you come home. Programmable or smart thermostats can make this energy saving step easy.

Keep your house warmer than normal when you are away, and lower the thermostat setting when you return home and need cooling. A programmable thermostat allows you to do this automatically and without sacrificing comfort.

Avoid setting your thermostat at a colder setting than normal when you first turn on your air conditioner. It will not cool your home any faster and could result in excessive cooling and unnecessary expense.

Use fans and ventilation strategies to cool your home
Turn off ceiling fans when you leave the room. Remember that fans cool people, not rooms, by creating a wind chill effect.

When you shower or take a bath, use the bathroom fan to remove heat and humidity from your home. Your laundry room might also benefit from spot ventilation. Make sure bathroom and kitchen fans are vented to the outside (not just to the attic). ENERGY STAR certifies ventilation fans that are efficient.

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Keep your cooling system running efficiently
For maximum energy affordability, schedule regular maintenance for your cooling equipment. Learn about operating and maintaining your air conditioner, evaporative cooler, or heat pump.

Avoid placing lamps or TV sets near your room air-conditioning thermostat. The thermostat senses heat from these appliances, which can cause the air conditioner to run longer than necessary. Learn additional tips for operating a room air conditioner efficiently.

Vacuum your air intake vents regularly to remove any dust buildup. Ensure that furniture and other objects are not blocking the airflow through your registers.

Consider a range of appliances and lighting options
Consider lighting options that operate at cooler temperatures. Learn more about your options for efficient lighting and find out when to turn off your lights.

If convenient, take advantage of daylight instead of artificial lighting, but avoid direct sunlight. Learn more about strategies for efficient daylighting.

Wash full loads of dishes and clothes for better efficiency. Learn more about efficient dishwashing and laundry.

Keep hot air from leaking into your home
Seal cracks and openings to prevent warm air from leaking into your home. Learn more about air sealing new and existing homes.

Add caulk or weatherstripping to seal air leaks around doors and windows. Find how to select and apply the appropriate caulk, learn how to select and apply weatherstripping, and find other ways to improve the energy efficiency of your windows.

Lower your water heating costs
Water heating accounts for about 18% of the energy consumed in your home. The Consumer Product Safety Commission recommends setting your water heater at no more than 120 degrees Fahrenheit to prevent scalding. The lower setting will also conserve energy and save money. Find other strategies for energy-efficient water heating.

The Nebraska Energy Quarterly is funded, in part, by the U.S. Department of Energy through the State Energy Program.

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