Nebraska Energy Quarterly

NEBRASKA
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Federal funding updates from NDEE

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Nebraska by Numbers: Nebraska Weatherization Assistance Program

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Federal funding updates from NDEE

The Nebraska Department of Environment and Energy (NDEE) is pursuing several federal funding opportunities through the Infrastructure Investment and Jobs Act (IIJA) and the Inflation Reduction Act (IRA). In all, NDEE has applied for roughly 30 grant programs, both competitive and non-competitive, and has been awarded more than $132 million to date.

Photo by Chad Peltola on Unsplash

The Nebraska Department of Environment and Energy continues to make progress on federal funding opportunities through the Infrastructure Investment and Jobs Act and the Inflation Reduction Act.

To help the public keep track of these grant programs and their deadlines, NDEE regularly updates a PDF on the front page of its website titled "NDEE IIJA/IRA Grant Funding Status." It encompasses NDEE's IIJA /IRA applications to the U.S. Environmental Protection Agency (EPA) and the U.S. Department of Energy (DOE).

Below are updates on NDEE's energy-based programs funded through IIJA/IRA grants since the last Nebraska Energy Quarterly was published in March:

Climate Pollution Reduction Grant

The EPA's Climate Pollution Reduction Grant provided $3 million to develop Nebraska's Priority Climate Action Plan (PCAP), and a Comprehensive Climate Action Plan (CCAP). The federal program also includes a competitive implementation grant to help applicants carry out ideas in their PCAPs.

After completing the state's first-ever PCAP on March 1, 2024, NDEE submitted an application to the EPA for funding to implement specific greenhouse gas-reducing measures outlined in the plan. The implementation application was sent on March 29, 2024.

Measures Included in Nebraska's CPRG Implementation Grant Application

Energy Efficiency and Electrification

- Energy Efficiency Upgrades for Non-Residential Facilities
- Residential Pre-Weatherization Program
- Irrigation Well Electrification

Solar Projects

- Micro-solar Arrays for Critical Infrastructure in Low-Income Rural Communities
- Solar on Unused/Contaminated Land, Ag and Industrial Facilities, and Solar Canopies

Agriculture Measure, including:

- Carbon Intensity Score Registry
- Regenerative Agriculture Incentives
- Precision Agriculture Incentives

Waste Management

- Hub-and-Spoke Anerobic Digester/Biogas Facilities
- Production and Use of Biochar

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Nebraska's PCAP focuses on voluntary, incentive-based measures to reduce greenhouse gas emissions, some of which build on already-existing, successful programs in the state.

These measures were developed through a public outreach campaign, which included workgroup sessions with stakeholders in the six economic sectors identified by the EPA (Agriculture, Energy Production, Industry, Waste and Wastewater, Commercial and Residential Buildings, and Transportation), and public meetings held across the state. In addition to improving air, land, and water quality, these GHG reduction measures also provide economic benefits to each of the economic sectors.

The EPA plans to award winning applicants this summer. NDEE will develop the state's Comprehensive Action Plan through public outreach and stakeholder input. The Comprehensive Plan is due to the EPA in August of 2025.

Grid Resiliency Grant Program

NDEE accepted applications for the Grid Resiliency Grant Program through June 21. This program is designed to help utilities improve the reliability of the state's electrical grid and to enhance the system's ability to recover after disruptive events and attacks. Grant awards will be announced later this year.

This program is funded through the DOE's Preventing Outages and Enhancing the Resilience of the Electric Grid/Hazard Hardening Program through the IIJA. NDEE has $10 million available for the first two years of this five-year program. The agency expects to receive approximately $5 million each year for three additional years for a total award of $25.8 million.

Keep up with NDEE's energy IIJA/BIL & IRA Formula Funding grant applications on our update page.

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Energy Innovations

Heat Pumps 101

by Andrew Hug
NDEE Environmental Specialist

Heat pumps are one of the appliances that can increase the energy efficiency of a home while still providing comfort. In the future, Nebraskans may be able to receive additional financial incentives to install this equipment through the U.S. Department of Energy's Home Energy Rebates programs.

The Nebraska Department of Environment and Energy is currently working to create state programs that will carry out the these rebate programs. NDEE is preparing its applications for the grants, which are due to the DOE on Jan. 31, 2025.

As part of the Inflation Reduction Act, the Home Energy Rebates programs will provide $91 million to Nebraskans for projects that help lower energy bills. If you're looking to install a heat pump or replace a current air conditioning system now or in the future, here is some Heat Pumps 101 information to get you started:

Image by freepik

Heat pumps can be an energy efficient way to heat and cool your home. They absorb heat energy from outside to heat homes during winter, and absorb heat from inside your home to move it outside during the winter.

What is a heat pump?

During summer, a heat pump absorbs heat energy from inside the house and moves it to the outside air, while in winter it absorbs heat energy from outside air and moves it inside. Heat pumps are an adaptation of long-standing refrigeration technology to both heat and cool a home more efficiently than furnaces and air conditioners, while still providing comfort.

Types of heat pumps and uses

Heat pumps come in a variety of forms; they can utilize air-to-air, water, or geothermal sources to heat or cool an entire home or even a single room. This article will focus on the most prevalent configuration in US homes – a whole-home, air source heat pump with a cold-weather backup furnace. A homeowner will need to decide if their best choice is a system that uses duct work, is ductless or uses radiant systems. Generally, these systems need to be professionally installed, but manufacturers have begun to market do-it-yourself solutions designed similarly to a window air conditioner that renters can install to cut their energy bills.

Nebraska homes already have them

Americans bought 462,000 more heat pumps than gas furnaces in 2022, and the US Census Bureau reported in 2021 that 40% of new single-family homes used heat pumps and 19% did so in the West North Central states region, which includes Nebraska. The Air-conditioning, Heating & Refrigeration Institute reported the trend continued in 2023 with 3,616,632 heat pumps and 2,989,516 gas warm air furnaces shipped.

Backup heat

With common technology, a backup heat source is often expected in Nebraska. As the temperature outside drops, the

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pump's ability to move heat inside falls and a furnace can be more economical to run. A heat pump that could handle the few coldest nights in Nebraska would be oversized most of the year and would impose increased costs and functional issues.

Heat pumps are often sold in tandem with a matched backup furnace just like central air and furnaces often are, however, there are some situations where the existing furnace can be the backup which can save the homeowner on installation costs .

To optimize the economics for the homeowner, an HVAC contractor sets a temperature for the equipment to automatically switch between heat pump and furnace. That temperature depends partly on electricity costs vs. furnace fuel costs, as well as the energy efficiency ratings of the furnace and heat pump. For example, they may set the switchover temperature at about 15°F for a gas furnace, but at about 32°F for a propane furnace because it costs more to heat with propane. The homeowner can choose to set a different temperature.

Technology improvements, however, have begun to reduce the need to rely on backup heating systems. The US DOE established the Cold Climate Heat Pump Challenge in 2021, encouraging manufacturers to produce models rated for -20°F. and as of this writing, the EnergyStar website lists 207 heat pump models with the Cold Climate designation.

Choosing between ducted and ductless (mini-split) systems
Ducted heat pumps consist of an outdoor compressor with a single refrigerant line that runs inside to a coil and blower, usually in the furnace, which causes conditioned air to circulate via air ducts. A whole home ductless or mini-split system also utilizes an outdoor compressor, but runs multiple refrigerant lines to multiple indoor heads, each of which can be controlled individually to condition and circulate the air.

A ducted system is typically less expensive to install if the home's current system uses air ducts in good condition. If the current system does not use ducts or the ducts need extensive work or replacement, a ductless mini-split might be less expensive to install.

Heat Pumps for Renters

Existing heat pumps require professional installation and are designed around property owners rather than renters. New York issued a challenge in 2021 for firms to engineer a heat pump that operates on a regular 120-volt outlet and can be easily installed by renters themselves. Two firms have already met that challenge, their products were installed last winter, and they are working to bring these new products to wider markets

Variable speed compressors – cost and comfort
The industry has improved heat pumps so they more efficiently adapt to heating and cooling demands. The higher cost of variable speed systems is offset by greater incentives from utilities and lower operating costs, plus they produce more consistent and comfortable inside air.

Sizing the system
Heat pump sizing is just as critical as it is with furnaces or air conditioners. Too large a system costs more to purchase, runs less efficiently, suffers greater wear and tear, and can reduce comfort by allowing indoor air to become stale or humid. Your contractor should perform a load assessment to right-size your investment.

Costs
The cost of a heat pump with backup is generally somewhat more than the cost of a furnace and central air system, but DOE reports they can cost 50% less to operate. Also, financial incentives from some utilities can lower the cost to down to or better than a conventional furnace with central air. The upcoming federal home energy rebate programs will provide low-and-moderate income households with additional incentives.

Angi reports a combined air conditioner and furnace installation costs between $5,000 and $12,500 with an average at $7,500.

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Estimated Installed Replacement Costs for Home HVAC Systems

Item	Cost Range
Central AC Unit	$3,700 - $7,400
Electric Furnace	$2,000 - $6,300
Natural Gas Furnace	$3,500 - $9,000
Ducted Heat Pump with Backup Furnace	$3,000 - $15,000

Source: Forbes

Depending on the configuration of the house and HVAC system, replacing an old HVAC system with a heat pump and backup furnace, rather than central air plus furnace, can be about the same price or even lower after utility incentives and will provide a cost savings on utility bills over the long run.

More detailed information on heat pump technology, including advice on selecting energy efficiency levels, makes, models and contractors can be found at:

Consumer Reports
https://www.consumerreports.org/appliances/heat-pumps/buying-guide/

Energy Sage
https://www.energysage.com/clean-heating-cooling/air-source-heat-pumps/

Northeast Energy Efficiency Partnerships
https://neep.org/sites/default/files/resources/ASHP_buyingguide_5.pdf

Bob Vila
https://www.bobvila.com/articles/best-heat-pump/

https://www.bobvila.com/articles/heat-pump-cost/

US DOE
https://www.energy.gov/energysaver/air-source-heat-pumps

https://www.energystar.gov/productfinder/product/certified-central-heat-pumps/results

https://www.energystar.gov/productfinder/product/certified-mini-split-heat-pumps/results

Financial Incentives for Heat Pumps

NDEE — https://neo.ne.gov/programs/loans/loans.html#item-04
LES — https://www.les.com/sustainability/sustainable-energy-program
NPPD — https://nppd.energywisenebraska.com/
OPPD — https://www.oppd.com/environment/environmental-programs/energy-efficiency/

NDEE is standing up two Home Energy Rebates program to provide grants and loans to low- and-moderate income households for more energy efficient home appliances as well as for whole home energy efficiency improvements such as insulation and air sealing. These programs will be described in future Energy Quarterly articles.

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NDEE provides rebates for replacing diesel irrigation engines

Nebraska Department of Environment and Energy Interim Director Thad Fineran announced on April 18 that the 2023 Nebraska Clean Diesel Program is awarding approximately $599,000 in rebates to 31 farmers across the state to aid in replacing diesel irrigation engines with electric motors.

The diesel engines being replaced must be scrapped in order to eliminate their harmful pollutant emissions. Nitrogen oxides emitted by diesel engines can have direct adverse effects on respiratory health as well as contribute to the formation of harmful ground-level ozone. The projects in this year's program are expected to reduce nitrogen oxide emissions by more than 10 tons annually.

NDEE awarded approximately $599,000 in rebates for 31 farmers to replace old diesel irrigation engines with electric motors. These replacements will help reduce harmful air pollutants.

"The Clean Diesel Program funds allow the department to provide financial assistance to reduce diesel emissions across the state," Fineran said. "This year, we were able to use both an EPA grant and Volkswagen settlement funds to award rebates to all eligible applicants."

Nebraska's Clean Diesel Program is funded by an annual grant from the U.S. Environmental Protection Agency. Applications for this year's program were accepted from October 1 through December 7, 2023. NDEE's web page for the Clean Diesel Program is at http://dee.ne.gov/NDEQProg.nsf/OnWeb/NCDGP.

Since its inception, the Clean Diesel Rebate Program has awarded more than $6.8 million to recipients, altogether funding the replacement of 40 school buses and 29 diesel trucks with new cleaner-burning vehicles, and 174 diesel irrigation engines with all-electric equipment. The program has also retrofit pollution control devices on 334 diesel engines, and installed idle-reducing auxiliary power units on 39 long-haul trucks.

These efforts have reduced:

- Nitrogen oxide emissions by 1,210 tons
- Diesel particulate emissions by 59 tons
- hydrocarbon emissions by 82 tons

carbon monoxide emissions by 249 tons.

NDEE has included incentives for irrigation well conversion from diesel to electric as a priority measure in the state's Priority Climate Action Plan and its application for implementation funds.

The list of 2023 Clean Diesel Rebates recipients is on the next page.

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2023 Clean Diesel Rebate Recipients

Recipient	County	Rebate
Baumgartner, Peter	Lincoln	$20,000
Boe, Sheralee	Madison	$18,888
Brummels, Peter E.	Cedar	$20,000
Czarnick, Shane	Nance	$20,000
DBR Farms Inc	Thayer	$20,000
Eagle Creek Acres	Holt	$19,603
Feeney, Harry	Lincoln	$20,000
Fricke, Lori	Butler	$20,000
Harimon, Terry K.	Morrill	$20,000
Herman's Heritage LLC	Fillmore	$20,000
Jensen, Cody	Greeley	$9,869
Keetle Farms Inc.	Antelope	$16,711
Kemling Farms LLC	Perkins	$20,000
Kerkman Sandhills Farms	Antelope	$20,000
Krupicka, Collin	Thayer	$19,979
Krupicka, Eric	Thayer	$18,210
Maxwell-Zikmund LLC	Butler	$20,000
Reichmuth, Keith	Madison	$20,000
Reichmuth, Sandi	Madison	$20,000
Sandberg, Robert Jr	Keith	$20,000
Sanne Trust	Antelope	$20,000
T&T Bader Farms	Butler	$20,000
Trambly, Nelson & Kelly	Franklin	$17,932
Trambly, Nelson F & Maryetta	Franklin	$20,000
Twin Pine Ranch	Custer	$20,000
Winkelbauer, Matthew	Holt	$20,000
Woitaszewski, Adam	Hall	$20,000
Woitaszewski, Andrew	Hall	$18,218
Yindrick Farms LLC	Butler	$20,000
Yindrick, Todd	Butler	$20,000
Young Farms, Bruce	Keith	$20,000
Total		**$599,411**

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Nebraska by Numbers

Nebraska Weatherization Assistance Program

The Nebraska Department of Environment and Energy (NDEE) administers the Weatherization Assistance Program. This federally funded program weatherizes homes for those with limited incomes so they can save energy and money and increase the comfort of their home. The agency is responsible for inspecting the homes that are weatherized and for monitoring the sub-grantees—primarily community action agencies—that are responsible for the weatherization improvements.

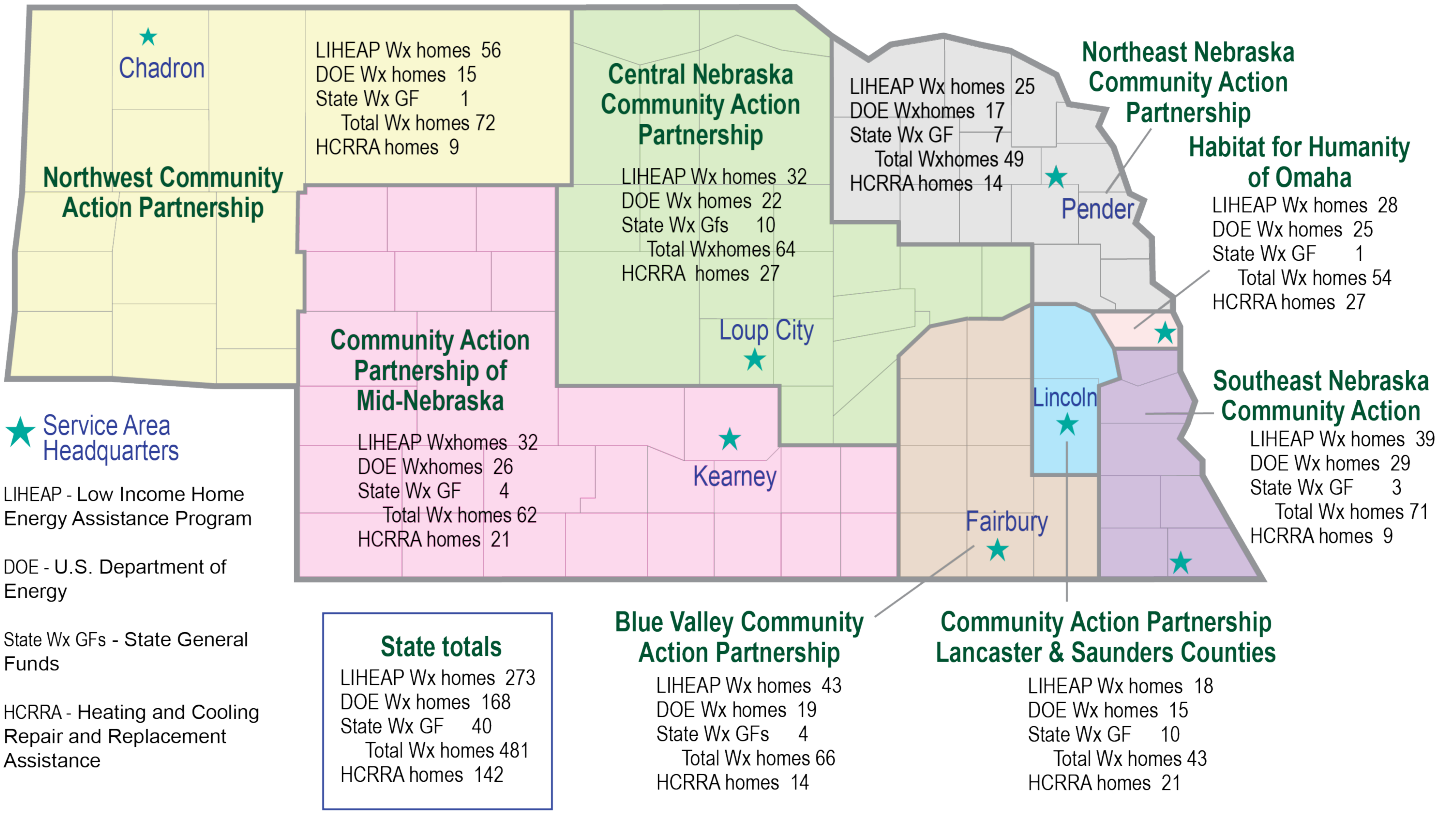
The types of improvements made through the weatherization program are determined based on the energy audit analysis completed on each home and the type of home construction. The most common improvements generally are:

- Adding insulation
- Replacing and repairing furnaces
- Reducing air leakage
- Installing high efficiency lighting
- Insulating water heater tanks and pipes
- Repairing cracked windows

Since the Weatherization Assistance Program began in 1977, $230 million has been spent to make energy efficiency improvements in 71,195 homes. See the map below to learn how many Nebraska homes were weatherized in the last fiscal year.

Learn more about the Weatherization Assistance Program in our 2023 Annual State Energy Report.

Total Nebraska Homes Weatherized by Area Providers, July 2022 - June 2023



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Energy tips to use before turning on the AC

Information from the
U.S. Department of Energy

Your first thought for cooling may be air conditioning. While air conditioning is often required to remain safe and comfortable in the hottest of climates, there are many alternatives that provide cooling with less energy use in climates where passive cooling is sufficient.

Using a combination of proper insulation, energy-efficient windows and doors, daylighting, shading, and ventilation will usually keep homes cool with less air conditioning. Before choosing a cooling system, you may want to familiarize yourself with the principles of heating and cooling.

Photo by Tycho Atsma on Unsplash

During the warmer months, there are ways to cool your living space before resorting to the air conditioner, such as using window coverings to block the sun's heat.

Cooling Tips

- Set your programmable thermostat as high as is comfortable in the summer, and raise the setpoint when you're sleeping or away from home.
- Clean or replace filters on air conditioners once a month or as recommended.
- Turn off kitchen, bath, and other exhaust fans within 20 minutes after you are done cooking or bathing; when replacing exhaust fans, consider installing high-efficiency, low-noise models.
- During summer, keep the window coverings closed during the day to block the sun's heat.
- Select energy-efficient products when you buy new cooling equipment. Your contractor should be able to give you energy fact sheets for different types, models, and designs to help you compare energy usage. See the efficiency standards for information on minimum ratings, and look for the ENERGY STAR when purchasing new products.

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