NEW MEXICO ECAM ENERGY CONSERVATION AND MANAGEMENT

State of New Mexico
Energy, Minerals and Natural Resources Department (EMNRD)
Energy Conservation and Management (ECAM)

Information on a Geothermal Ground Coupled Heat Pump System

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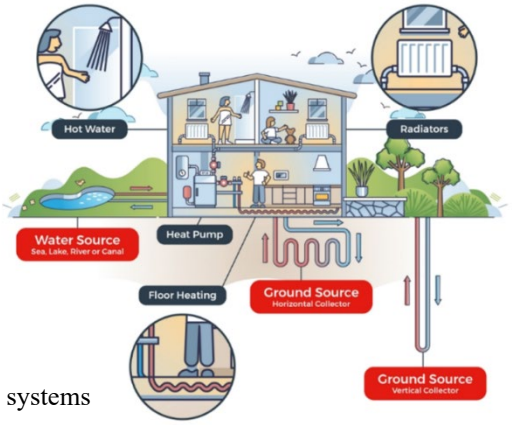


Geothermal Ground-Coupled Heat Pump systems

Geothermal Ground Coupled Heat Pump Income Tax Credit (GGCHP)
3.3.32 NMAC and 7-2-18.24 NMSA - PIT
3.4.19 NMAC and 7-2A-28.1 NMSA - CIT

Introduction

This is a great opportunity for homeowners and businesses in New Mexico to offset costs while adopting clean, renewable energy technology. The New Mexico Geothermal Ground-Coupled Heat Pump Tax Credit was enacted in 2024 to make geothermal energy more affordable for property owners. It provides a tax credit worth 30% of the purchase and installation costs of a qualifying system, up to $9,000.

To qualify, the system must be installed on property you own in New Mexico between May 15, 2024, and December 31, 2034. The year in which you claim the credit depends on when the local building authority certifies the system's final inspection. Also, the heat pump must be fully operational, meet efficiency standards of at least 3.4 COP or a 16 EER, and be installed by a certified professional recognized by IGSHPA or a similar authority. A successful inspection by the local building authority is also required.

The application process is straightforward: after installation, you gather documentation such as proof of ownership, invoices, manufacturer performance ratings, installer certification, inspection reports, and system schematics. You then submit these through the Energy Minerals and Natural Resources Department's online portal. Within three to four weeks, you'll receive a Certificate of Eligibility, which you will later attach to your New Mexico income tax return when filing with the Taxation and Revenue Department.

It's important to note that the program has annual funding caps, so timely applications matter. If your submission is incomplete or non-compliant, it may be rejected, but you can correct and resubmit, but your application will be placed at the back of the queue.

Program Overview

🌎 **Program Overview**

- **Enacted:** 2024 by the New Mexico Legislature
- **Purpose:** Encourage adoption of high-efficiency geothermal ground-coupled heat pumps for residences, businesses, and agricultural enterprises
- **Credit Amount:** Up to **30% of purchase + installation costs**, capped at **$9,000 per taxpayer**
- **Eligible Installations:** Those installed between **May 15, 2024 – December 31, 2034**
- **Property Types:** Residential, business, agricultural (must be owned in New Mexico)
- **Tax Year Determination:** Based on the **date of successful inspection certification** by the local building authority (not the build date nor invoice date).

✅ **Eligibility Requirements**

- System must be **fully operational**
- Efficiency standards:
  - **COP ≥ 3.4** OR **EER ≥ 16**
- Installed by a **certified professional** (IGSHPA or equivalent)
- Must **pass final inspection** by local building authority

📄 **Application Process**

1. **Purchase & Install** a qualifying system

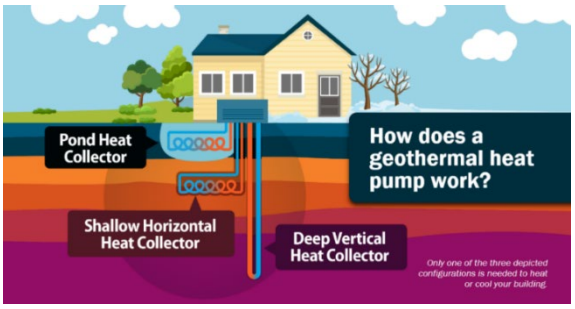
2. **Collect required documents** from installer and local authorities
3. **Submit application** via the EMNRD online portal: GGCHP Tax Credit Page https://www.emnrd.nm.gov/ecmd/tax-incentives/ggchp-tax-credit/
4. **EMNRD processing time:** ~3–4 weeks
5. **Receive a certificate of eligibility** from EMNRD
6. **Include the certificate** with your New Mexico income tax return (filed with Taxation & Revenue Department)

📎 **Required Documentation**

- 🏠 **Proof of property ownership** (deed, property tax bill, or legal description)
- 🧾 Itemized invoices (equipment, labor, manufacturer, model, performance ratings)
- 👷 **Installer certification** (IGSHPA or equivalent)
- ⭐ **Manufacturer documentation** (performance specs, Energy Star sheet, Energy Star label)
- 🛠️ **Final inspection report** (from local building authority)
- 📐 **System design schematic & technical specifications** (loop configuration, flow rates, capacity, model)
- 📑 **Any additional documents requested** by EMNRD

What is a Geothermal Heat Pump

Heat pumps move heat from one place to another using electricity. **Geothermal heat pumps** (**GHPs**) are different from air-source heat pumps. GHP systems exchange heat from the earth, while air-source heat pumps exchange heat from the air. **Ground Source Heat Pump (GSHP**) are also known as GHPs are among the most efficient and comfortable heating and cooling technologies currently available.

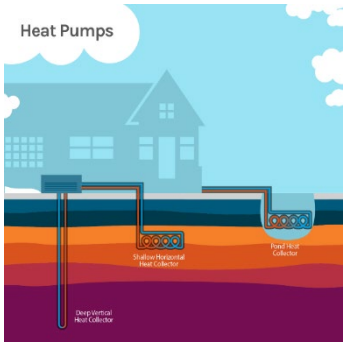


Compared to air-source systems, geothermal systems have been shown to be quieter, last longer, and require less maintenance, and they do not depend on the temperature of the outside air. Temperatures at about 30 feet below the surface remain relatively constant year-round—between about 50°F (10°C) and 59°F (15°C). For most areas in the United States, this means soil temperatures are usually warmer than the air in winter and cooler than the air in summer. Geothermal heat pumps (GHPs) take advantage of these constant underground temperatures to efficiently exchange temperatures, heating homes in the winter and cooling homes in the summer.

A **GHP** system includes:

1. **An underground heat collector**—A geothermal heat pump uses the earth as a heat source and sink (thermal storage), using a series of connected pipes buried in the ground near a building. The loop can be buried either vertically or horizontally. It circulates a fluid that absorbs or deposits heat to the surrounding soil, depending on whether the ambient (outside) air is colder or warmer than the soil.
2. **A heat pump**—When ambient temperatures are colder than the ground, a geothermal heat pump removes heat from the underground collector's fluids, concentrates it, and transfers it to the building. When ambient temperatures are warmer than the ground, the heat pump removes heat from the building and deposits it underground.
3. **A heat distribution subsystem**—Conventional ductwork is generally used to distribute heated or cooled air from the geothermal heat pump throughout the building.

Geothermal heat pumps use the constant underground temperatures of the shallow earth as thermal storage that enables efficient heating and cooling. Systems can vary in the type of collector and connections used.



GHPs can be:

- Used to heat and cool a single house, single business, or an entire community (college campus, neighborhood, etc.)
- Implemented as part of new construction or retroactively added for existing buildings
- Installed in all climates and urban or rural environments.

Types of Geothermal Heat Pump Systems

There are four basic types of geothermal heat pumps systems:

- Closed-loop horizontal
- Closed-loop vertical
- Closed-loop pond/lake
- Open loop

All four types can be used for residential and commercial building applications. An accredited contractor or installer can determine the best type of system to install in a particular location by testing the site's soil and ground makeup and discussing the intended use and can provide information on any regulations or permitting that might be required.

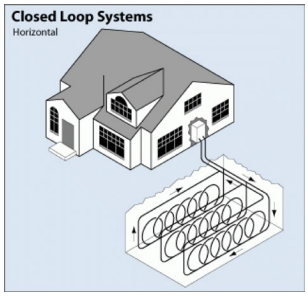
Closed-Loop Systems

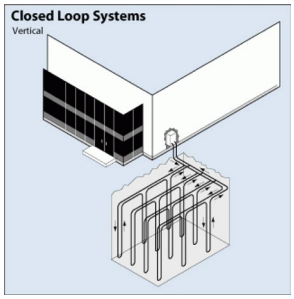
Most closed-loop geothermal heat pumps circulate water or a blended water-glycol solution through a closed loop—usually made of a high-density plastic-type tubing—that is buried in the ground or submerged in water. A heat exchanger transfers heat between the refrigerant in the heat pump and the antifreeze solution in the closed loop. Closed loop geothermal ground loops can last 50+ years — even up to 100 years – with little to no maintenance.

One type of closed-loop system, called direct exchange, does not use a heat exchanger and instead pumps the refrigerant through copper tubing that is buried in the ground in a horizontal or vertical configuration.

Horizontal

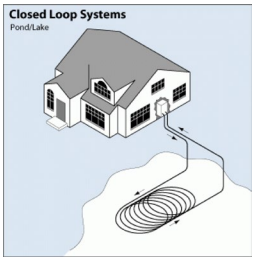
Commonly uses two pipes, one buried at six feet, and the other at four feet, or two pipes placed side-by-side at five feet in the ground in a two-foot-wide trench, requiring trenches at least four feet deep. This type of installation is generally most cost-effective for residential installations, particularly for new construction where sufficient land is available.





Vertical

Holes (approximately four inches in diameter) are drilled about 20 feet apart and 100 to 400 feet deep, allowing for two pipes to be inserted and connected at the bottom with a U-bend to form a loop. Large commercial buildings and schools often use vertical systems when the land area required for horizontal loops would be prohibitive.



Pond/Lake
If a site has a body of water that meets minimum volume, depth, and quality requirements, its geothermal heat pumps can exchange heat with water instead of the ground. A supply line pipe is run underground from the building to the water and coiled into circles, which in cold climates are placed at least eight feet under the surface to prevent freezing.

Open Loop
What are the disadvantages of open loop geothermal systems? The performance of an open loop system may degrade over time if water quality issues like silt, sediment or high mineral content are present or if the water supply diminishes for any reason.

Sections of Geothermal System

A geothermal ground-coupled heat pump system is a highly efficient way to heat and cool buildings by leveraging stable temperatures underground. Here's a breakdown of its main component sections, each playing a vital role in the system's operation:

🌍 **Ground Loop System** (Earth Connection)
This is the heart of the geothermal system, where heat exchange with the earth occurs.
- Closed-loop system: Circulates a water or antifreeze solution through buried pipes.
- Open-loop system: Uses groundwater directly from a well or aquifer.
- Loop configurations:
  - Horizontal: Pipes laid in trenches, ideal for large land areas.
  - Vertical: Deep boreholes, suitable for limited space.
  - Pond/Lake: Coils submerged in a water body, if available.

🌀 **Heat Pump Unit** (Indoor Equipment)
This is the central mechanical system that transfers heat between the building and the ground loop.
- Compressor: Pressurizes refrigerant to facilitate heat exchange.
- Heat exchanger (evaporator/condenser): Transfers heat between refrigerant and water loop.
- Expansion valve: Regulates refrigerant flow and pressure.
- Reversing valve: Allows switching between heating and cooling modes.

🚰 **Distribution System** (Air or Water Delivery)
This section delivers conditioned air or water throughout the building.
- Air-based systems: Use ductwork and air handlers to distribute heated/cooled air.
- Water-based systems: Use radiant floor heating, fan coils, or baseboard radiators to heat/cool the structure.

⚙️ **Control System**
Ensures efficient and responsive operation.
- Thermostats: Regulate indoor temperature settings.
- Sensors: Monitor temperatures, pressures, and flow rates.
- Controllers: Manage system operation and optimize performance.

💧 **Auxiliary Components**

These support and protect the system.

- Circulating pumps: Move fluid through the ground loop.
- Desuperheater: Captures excess heat for domestic hot water.
- Backup heaters: Provide supplemental heating in extreme conditions.
- Filters and strainers: Keep the fluid clean and protect components.

Steps to Install a Geothermal Heat Pump System

Typical steps to install a geothermal heat pump

1. Site Evaluation

- Before installation, a thorough site evaluation is necessary to determine the suitability of your property for a geothermal system. Factors can include:
  - Soil Composition: Different soils conduct heat differently. Sandy soils are less efficient than clay soils.
  - Land Area: Sufficient space is needed for the ground loop. Horizontal loops require more space than vertical loops.
  - Water Table: High water tables can affect efficiency and installation method.

2. System Design

- Designing the system involves selecting the type of geothermal loop and determining the system's capacity based on your home's heating and cooling needs.
- Loop Types:
  - Horizontal Loops: Require trenches 4-6 feet deep and are cost-effective for large properties.
  - Vertical Loops: Require boreholes 100-400 feet deep, suitable for smaller properties or those with rocky soil.
  - Pond/Lake Loops: Utilize a nearby water body, reducing installation costs.
  - Open-Loop Systems: Use groundwater directly, suitable where groundwater is abundant and clean.
- Capacity: A professional will perform a Manual J calculation to size the system correctly.

3. Permitting

- Obtain all necessary permits from local authorities. This may include environmental assessments, especially for open-loop systems that use groundwater.

4. Installation of the Ground Loop

- Horizontal Loop Installation:
  - Trenches are dug using backhoes or trenchers.
  - High-density polyethylene (HDPE) pipes are laid in the trenches.
  - Trenches are backfilled carefully to avoid damaging pipes.
- Vertical Loop Installation:
  - Boreholes are drilled using drilling rigs.
  - HDPE pipes are inserted into the boreholes.
  - Boreholes are grouted to enhance thermal conductivity and protect the pipes.
- Pond/Lake Loop Installation:
  - Coils of HDPE pipe are submerged in the water body.
- Weights are used to keep the coils submerged.

5. Interior Installation

- Heat Pump Unit: The indoor heat pump unit is installed in a mechanical room or basement.
- Ductwork and Distribution: Existing ductwork can often be used, but modifications may be necessary for optimal performance.
- Connecting the Ground Loop: The ground loop pipes are connected to the heat pump unit. Antifreeze solution is added to the loop to prevent freezing.

6. System Testing and Commissioning

- Pressure Testing: The ground loop is pressure tested to ensure there are no leaks.
- System Flushing: The loop is flushed to remove air and debris.
- System Balancing: Flow rates are adjusted for optimal performance.
- Performance Testing: The entire system is tested to ensure it operates correctly and efficiently.

7. Maintenance

- Geothermal systems require minimal maintenance, but regular checks ensure longevity and efficiency.
- Filter Changes: Replace air filters as recommended by the manufacturer.
- Loop Inspection: Check the ground loop for leaks or damage.
- System Check: Have a professional inspect the system annually.

Conclusion

Installing a geothermal heat pump is a significant investment, but one that can pay off through lower energy bills, increased comfort, and reduced environmental impact.

Quick Overview

Here's a step-by-step outline of the application process for the Geothermal Ground Coupled Heat Pump Tax Credit in New Mexico for projects installing Geothermal heat pumps (**GHPs**) Ground Source Heat Pump (**GSHP**).

Application Process Overview:

- Credit Amount: Refundable income tax credit of up to 30% of purchase + installation costs
- Maximum Credit: $9,000
- Applies To: Residences, businesses, and agricultural enterprises located in New Mexico
- Credit Year Determination: Based on the date the local building authority certifies a successful inspection
- Operational Status: System must be fully functional and in use
- Efficiency Standards: Must meet at least one of:
    - COP (Coefficient of Performance) ≥ 3.4
    - EER (Energy Efficiency Ratio) ≥ 16

Installation Requirement:

- Installed by a certified installer (IGSHPA or similar recognized authority)
- Must pass final inspection by local building authority

Assess Eligibility:

- Confirm that the system is installed between May 15, 2024 – Dec 31, 2034
- Verify that the system is operational and meets efficiency standards (COP ≥ 3.4 or EER ≥ 16)
- Ensure installation was done by a certified installer (IGSHPA or similar)
- Obtain final inspection approval from local building authority

Gather Required Documents:
This includes:

- Proof of property ownership (e.g., deed, mortgage, or tax bill)
- Itemized invoice with product and labor costs,
- Manufacturer documentation (model and performance ratings)
- Installer certification (IGSHPA or equivalent)
- Final inspection report
- System design schematic and technical specifications
- Any additional documentation requested by EMNRD

Submit Application via Online Portal:

- Use the Geothermal Ground Coupled Heat Pump Tax Credit (GGCHP) website portal provided by the Energy, Minerals and Natural Resources Department (EMNRD). Applications must be submitted electronically, and supporting documents attached.

Receive Certificate of Eligibility:

- If approved, EMNRD will issue a certificate confirming your eligibility for the tax credit.

To Claim the Tax Credit:

- Submit the certificate with your New Mexico state income tax return through the Taxation and Revenue Department.

Required Documents

Required Documentation Breakdown

1. Proof of Property Ownership

- **What it is:** Deed, title, or property tax statement showing your name and address.
- **Where to get it:** County assessor's office, title company, or your mortgage provider.

2. Itemized Invoice for Purchase and Installation

- **What it is:** A detailed bill listing:
  - Equipment purchased (model, brand)
  - Labor costs
  - Dates of service
- **Where to get it:** From the contractor or installer who performed the work.

3. Certification from a Qualified Installer

- **What it is:** A signed document or license number verifying the installer is certified to install geothermal systems.
- **Where to get it:** Ask your installer for their certification or license documentation.

4. Heat Pump Performance Requirements

- **EER ≥ 16**
- **COP ≥ 3.4**
- **What it is:** Manufacturer's technical specification sheet or AHRI certificate showing these ratings.
- **Where to get it:** From the manufacturer, installer, or AHRI directory.

5. Final Passing Inspection

- **What it is:** Official inspection report or certificate from your local building department.
- **Where to get it:** Contact your city or county permitting office.

6. Geothermal System Design Schematic & Technical Specification

- **What it is:** Engineering drawings and system specs including:
  - Loop configuration
  - Heat pump model
  - Flow rates and capacity
- **Where to get it:** Provided by your system designer or installer.

Accredited Installer

To qualify for the tax credit, the geothermal coupled heat pump (GSHP) system must be installed by an International Ground Source Heat Pump Association (IGSHPA)-accredited installer. Installer accreditation ensures credibility, technical competence, and compliance with industry standards.

Accepted Certification Programs:

- International Ground Source Heat Pump Association (IGSHPA)
- North American Technician Excellence (NATE), in partnership with IGSHPA

Directories for finding accredited installers and certified professionals check Business Member directory for companies offering heat pumps or ground loop installation services.

🏢 **IGSHPA Contact Information:**

Address: 312 S. 4th Street, Suite 100, Springfield, IL 62701
Email: info@igshpa.org
Website: https://igshpa.org
Business Member directory: https://igshpa.org/business-directory/

Qualifying Performance Values

Geothermal heat pumps (GHPs),Ground Source Heat Pump (GSHP) must meet performance requirements (COP ≥ 3.4 or EER ≥ 16). To locate performance values, you may utilize a variety of websites. Locate your product and the model number to find the product performance value. Save an electronic copy of the performance value information to be used as a required supporting document.

Here is a practical approach you can follow to obtain performance value:
- **Identify Your Climate Zone**: Start with the Energy Star Climate Zone Map to determine the regional standards that apply to your location.
- **Find Product Performance Values**:
  - Visit manufacturer websites and input the product model number to obtain technical specification sheet.
  - Use the Energy Star Product Finder to check qualification status and view performance data.
- **Download and Save Documentation:**
  - Screenshots, PDFs, or certificates showing the performance values should be saved electronically.
  - Make sure documentation clearly lists the product model and corresponding climate-appropriate values.

To be eligible for Geothermal Ground Coupled Heat Pump Tax Credit the Geothermal heat pumps (GHPs),Ground Source Heat Pump (GSHP) must meet the following performance values:

Ground Source Heat Pump
(COP ≥ 3.4 or EER ≥ 16)
EER - Energy Efficiency Rating
COP - Coefficient of Performance

The “less than or equal to” sign: ≤
The “greater than or equal to” sign: ≥
The “equal to” sign: =

Links to Obtain Performance Values

Energy Star Website:
All windows, doors, and heat pumps require the model's name number and Energy Star or equivalent performance specification values for their climate zones. **The performance rating certificate** contains the performance values necessary to complete the electronic application.
Search for performance values: https://www.energystar.gov/products/geothermal_heat_pumps

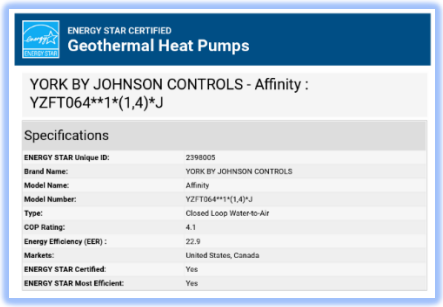
Air-Conditioning Heating Refrigeration Institute (AHRI)

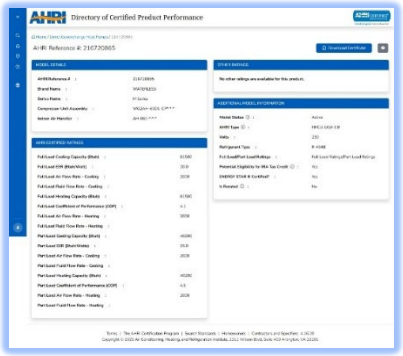
AHRI Directory of Certified Product Performance Website:
AHRI is a third-party non-profit organization that sponsors certified rating and labeling to help consumers compare the performance of heat pumps. AHRI works with state legislators, regulatory bodies, and the utility industry to support programs that would incentivize consumers to replace older, less efficient HVACR and water heating equipment with newer, more efficient equipment. They promote consistency in manufacturer specifications, which increases consumer confidence, and provides a means for manufacturers, third-party laboratories, regulators, and certification bodies to evaluate products objectively and consistently.

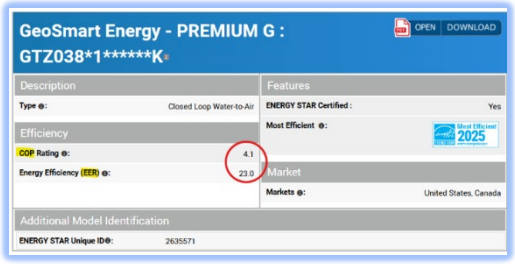
The energy performance of qualified heat pumps must be independently tested, certified, and verified according to test procedures established by the AHRI. The AHRI label can be found on all Energy Star certified heat pump performance ratings.
Search for performance values: *https://www.ahridirectory.org/*

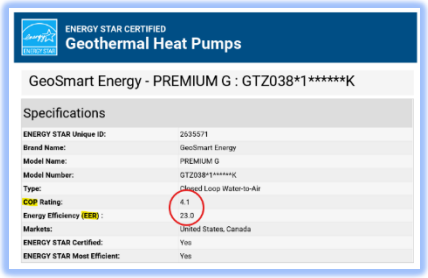
Performance Rating Sample Labels

Heat pump performance rating certificate









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3.4.19 NMAC and 7-2A-28.1 NMSA - CIT

Upgrades/Expansions

A geothermal ground-coupled heat pump system's main component sections are Ground Loop System, Heat Pump Unit, Distribution System, Control System, Auxiliary Components. To be eligible for the Geothermal Ground Coupled Heat Pump tax credit, the system must include a **new replacement heat pump**. An upgrade or expansion of an existing geothermal ground-coupled heat pump system may qualify for a tax credit, provided that the project also includes the installation of a new replacement heat pump as a component of the system. Other upgrades or expansions can be included, but without the new heat pump, the project doesn't qualify.

Tax Credit Eligibility for Upgrades/Expansions

- **Requirements:**
  - To qualify for a tax credit, the project **must include installation of a new replacement heat pump unit** as part of the system.
- **Implication:**
  - Simply upgrading auxiliary components (like pumps or controls) or expanding the ground loop **without replacing the heat pump** does not meet eligibility criteria.
  - The replacement heat pump is the qualifying component that triggers tax credit eligibility.
- **Practical Example:**
  - If you expand the ground loop to improve efficiency **and** install a new heat pump unit, the project may qualify.
  - If you add only more loop piping or upgrade controls, the project likely won't qualify.

Inspection Disclaimer

To ensure compliance with 3.3.32 or 3.4.19 NMAC, applicants agree to allow the department or its authorized representative to inspect the energy conservation product installation described in the application package at any time after the date of submitting the application package until three years after the department has certified the energy conservation product installation, upon the department providing a minimum of five days' notice to the applicant.

Contact Information

Questions on tax credit applications and certificate of eligibility:

State of New Mexico
Energy, Minerals and Natural Resources Department (EMNRD)
Energy Conservation and Management Division (ECMD)
1220 S. St. Francis Dr., Santa Fe, N.M. 87505
e-mail: emnrd.taxcredits@emnrd.nm.gov
www.emnrd.nm.gov/