

PLUMAS-SIERRA RURAL ELECTRIC COOPERATIVE

2017 GeoExchange Exterior Loop Loan Program



© Plumas-Sierra Rural Electric Cooperative
73233 State Route 70, Portola CA 96122
Phone 530.832.4261 • Fax 530.832.5761

This program is subject to change without prior notice.

Table of Contents

| | |
|--|-----------|
| <i>GeoExchange Program Overview</i> | <i>1</i> |
| PSREC GEOEXCHANGE PROGRAM INCENTIVES | 2 |
| 1) INTEREST-FREE, 15-YEAR LOAN ON EXTERIOR LOOPS | 2 |
| 2) 50% OFF Marathon Water Heater W/Loan, OR FREE W/Rebate Option | 2 |
| Program Eligibility and Requirements | 2 |
| Member/Applicant | 2 |
| Installer | 3 |
| Loop Installations | 3 |
| Permits | 4 |
| System Size | 4 |
| Warranty | 4 |
| Service Entrances, Metering and Data Collection | 4 |
| Building site | 4 |
| TIPS ON HIRING A CONTRACTOR | 4 |
| CERTIFIED GEOEXCHANGE CONTRACTORS IN OUR REGION | 5 |
| USEFUL QUESTIONS FOR YOUR GEOEXCHANGE CONTRACTOR | 5 |
| Comparison of Energy Use Between Various Heating Technologies | 7 |
| Facinating facts about geexchange technology | 8 |
| According to the United States Environmental Protection Agency, GeoExchange systems: | 8 |
| Facts from the Geothermal Heat Pump Consortium: | 8 |
| <i>GEOEXCHANGE Exterior loop loan Application and forms</i> | <i>9</i> |
| <i>LETTER OF INTENT</i> | <i>10</i> |
| <i>ADDENDUM TO LETTER OF INTENT</i> | <i>12</i> |

GEOEXCHANGE PROGRAM OVERVIEW

According to the U. S. Department of Energy, space heating and cooling represents the largest energy expense for most people—up to 43 percent of one’s total annual energy bill.¹

Plumas-Sierra Rural Electric Cooperative (“PSREC”) offers incentives to encourage the installation of GeoExchange (Ground Source Heat Pump) systems, a highly efficient, renewable energy technology, in member homes and businesses.

GeoExchange is a modern heating and cooling technology that surpasses most traditional and alternative systems by simply *moving* heat from its source to another area. In the heating mode, GeoExchange *extracts energy* from the earth—typically using a buried water loop—and *moves* it indoors. In the summer, GeoExchange *moves heat* from indoors into the relatively cool earth, via a water loop. The result in both seasons is that less energy is needed than with conventional air-to-air heat pumps, natural gas, or oil heating systems.

There are two major components to a GeoExchange system: the heat pump and air-ducting portion, and the in-ground water loop well system. “Loop Loans” are available to members for the exterior loop portion of the GeoExchange system. These loans bring down the upfront cost of the system and help you invest in a sustainable heating and cooling system without having to look for financing or pay interest.

¹ http://www.energysavers.gov/tips/heating_cooling.cfm

PSREC GEO EXTERIOR LOOP LOAN PROGRAM INCENTIVES

1) INTEREST-FREE, 15-YEAR LOAN ON EXTERIOR LOOPS

Every member can take advantage of PSREC's interest-free loan program for the exterior loops of your GeoExchange system.* Maximum loan amount is \$15,000. Amounts exceeding loan cap are due and payable upon completion of loop installation.

*Excludes members taking advantage instead of the PSREC HVAC rebate option.

2) 50% DISCOUNT ON ENERGY EFFICIENT WATER HEATER

Members participating in the loan program can receive a 50% discount* on a Rheem Marathon water heater. Rheem manufactures the most efficient electric tank heater on the market with added peace of mind. Because the Rheem Marathon is super-insulated with Envirofoam Insulation®, heat loss is minimal. Furthermore, Rheem water heaters are warranted against leaks for as long as you own your home!

Members must submit the Rheem Marathon Claim Form at least three weeks prior to planned pick-up from our Portola office. PSREC does not deliver or install water heaters. If a member chooses to have the water heater installed prior to completion of the GeoExchange installation, a Letter of Intent must be submitted and notarized.

*Members choosing the rebate option will receive a FREE Rheem Marathon water heater.

PROGRAM ELIGIBILITY AND REQUIREMENTS

MEMBER/APPLICANT

Interest-free GeoExchange Loop-Loans and other program incentives are available to all PSREC members. The applicant must be the utility member of record at the location where the equipment will be located. The member must be the system owner—no loans offered for developer homes. Owners must maintain a valid and continuing insurance policy on the residence or business at all times, including during construction—no exceptions. Members are encouraged to follow our “Tips for Hiring a Contractor” (included in this document) to ensure their contractor is certified. Although PSREC provides a list of local contractors, PSREC cannot provide contractor recommendations or endorsements. Members are responsible for verifying contractor qualifications. PSREC strongly recommends members obtain multiple bids.

To apply for a loan on GeoExchange loops, the member must first submit a Letter of Intent (LOI) and Addendum to Letter of Intent to PSREC. Certified contractors on PSREC's contractor list should have copies of these forms, and will provide application assistance.

INSTALLER

To be eligible for a loan, the GeoExchange system must be installed by a Certified GeoExchange Installer.

If you are a certified GeoExchange installer and would like to be included on PSREC's list, you must:

- Be a licensed contractor in accordance with rules and regulations adopted by the State of California Contractors State Licensing Board (CSLB). Contractors must have an active C-20 and C-36 license for installing GeoExchange systems.
- Have an active business license.
- Be IGSHPA certified, and have completed a Heat Pump Manufacturer & Loop Training course.
- Provide proof of General Liability Insurance and Workman’s Compensation Insurance.
- Provide references from customers of at least three GeoExchange installations.

LOOP INSTALLATIONS

The wells for the in-ground loop systems fall into two categories: vertical or horizontal. The installation configuration you choose will depend heavily on soil conditions and available land. Vertical wells are generally more expensive due to the increased cost of drilling versus trenching, but tend to be *slightly* more efficient due to the depth of the wells. Horizontal wells can be trenched in conventional *straight* configuration—or *slinky-style*, if space is limited. Horizontal configurations require longer loop lengths for efficient heat exchange due to seasonal variations in soil temperature and moisture content.

Your GeoExchange contractor will be able to advise you on the best configuration for your specific situation. In all instances, the GeoExchange loop installation must conform to the manufacturer’s specifications.

When you and your GeoExchange contractor determine the appropriate loop configuration, your contractor will size your system and submit building heat calculations and the Letter of Intent to PSREC.

If you choose a horizontal loop configuration, your contractor will schedule the installation of the loops. If you choose a vertical configuration, PSREC will apply for a permit with the appropriate county and place you on our drilling schedule.

PERMITS

A drilling permit is required for vertical loops. PSREC will submit a drill permit application and associated fees to the appropriate County Environmental Health Department, along with a plot plan, on behalf of the Member.

SYSTEM SIZE

To be eligible for the PSREC GeoExchange Loop-Loan program, the loops system must be sized to compensate for 100% of the building’s heat loss; or the contractor must include auxiliary heat. Heat calculations must be provided to PSREC. For retrofits, ducting must also be installed or modified to deliver adequate airflow.

WARRANTY

All GeoExchange loop systems must have a warranty provided by both the manufacturer and installer to protect the purchaser against defective workmanship, system or component breakdown.

PSREC only provides financing for GeoExchange exterior loops and does not in any way warranty the heat pump itself.

SERVICE ENTRANCES, METERING AND DATA COLLECTION

PSREC may, at their discretion, install, own, and maintain a kilowatt-hour sub-meter for the purposes of monitoring GeoExchange system performance.

PSREC cannot recommend the size of electrical service you will need to adequately install your GeoExchange system. Please consult your licensed electrician and HVAC installer. Also check your county codes.

BUILDING SITE

Due to geologic conditions and county regulations, PSREC cannot guarantee that all building sites will be able to utilize GeoExchange technology. Installers are required to assess the viability of the building site and advise the member about potential constraints or conditions that may increase the installation cost, which may include, but are not limited to certain soil conditions, known water conditions (like calcium and iron) and the like.

TIPS ON HIRING A CONTRACTOR

- ◆ Make sure your system is installed by professionals who are accredited by, and follow procedures established by, the International Ground Source Heat Pump Association (IGSHPA).
- ◆ Ask contractor for references of GeoExchange systems they have previously installed. Visit or call these references to ask about their experience and obtain recommendations.
- ◆ Expect a site evaluation so your contractor can make the best recommendation. This should include checking ducts, insulation and other features for building heat loss.
- ◆ Get written cost estimates from two or three contractors. Ask for a breakdown between equipment and labor and get clarification on any questions.
- ◆ Get a written contract (including all terms, costs and start-stop dates) and a copy of the warranty (on the system and the installation). Be sure to ask for an owner's manual.
- ◆ Call Plumas-Sierra Rural Electric Cooperative at (530) 832-4261 or toll-free at (800) 555-2207 if you have any other questions or concerns.

CERTIFIED GEOEXCHANGE CONTRACTORS IN OUR REGION

| COMPANY NAME | PHONE NUMBER | FAX NUMBER |
|-------------------------------------|----------------|-------------------|
| Almanor Energy Plus, Inc | (530) 596-3128 | (530) 596-4340 |
| Dryden Plumbing & Heating | (530) 993-4048 | same (call first) |
| Heat Transfer Systems | (530) 283-3665 | (530) 283-5172 |
| JH Heating | (530) 257-7202 | (530) 257-1812 |
| Madden Plumbing & Heating | (530) 283-1605 | (530) 283-2485 |
| MD Mechanical (Washoe Co., NV Only) | (530) 832-5217 | (530) 832-4129 |
| Sierra-Air | (775) 356-5566 | (775) 356-7940 |

USEFUL QUESTIONS FOR YOUR GEOEXCHANGE CONTRACTOR

- ◆ Is a GeoExchange right for me? *Discuss your needs for heating and cooling your home, any variations in occupancy, and whether you should "zone" your system.*
- ◆ Should I have the loops installed vertically or horizontally?
- ◆ What heating capacity (Btu per hour) does my home require and how is this determined?
- ◆ Will auxiliary heat be required for my home?
- ◆ What is the brand name and efficiency of the system?
- ◆ What type of duct system will be installed and what is the insulation value?

- ◆ How do you seal your ductwork and do you test to verify the seal?
- ◆ How many supply and return vents will be installed and what are their locations?
- ◆ Is my system a single or dual capacity unit?
- ◆ Is my blower (fan) motor standard or variable speed?
- ◆ There are many air filtration options available; discuss these with your contractor.
- ◆ Ask if your contractor has a maintenance plan and how much it will cost?
- ◆ What type of warranty is provided with my system and what is covered?
- ◆ There are many options in thermostat control; discuss these with your contractor.
- ◆ Will the system be connected to the Marathon water heater PSREC provides?
- ◆ What are the benefits of a de-superheater and should I install one?

COMPARISON OF ENERGY USE BETWEEN VARIOUS HEATING TECHNOLOGIES

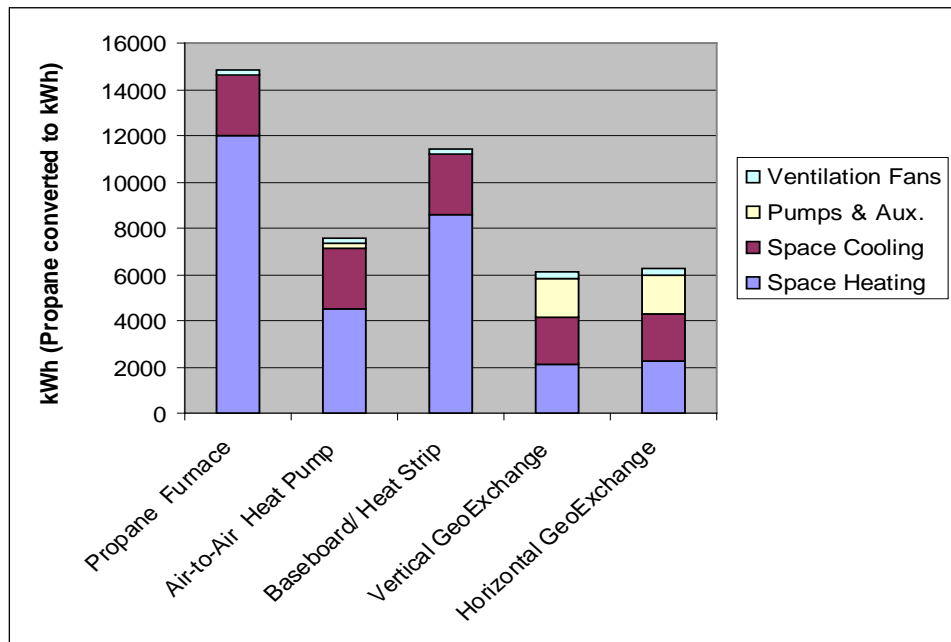
Plumas-Sierra Rural Electric Cooperative hired Efficiency Services Group, LLC (ESG), an independent engineering firm, in 2009 to complete an engineering evaluation of GeoExchange performance in PSREC’s climate. What follows is a summary of their findings.

ESG modeled three homes in a range of sizes including 1,200, 2,000 and 3,000 square feet, which corresponded to HVAC loads in our area of approximately 3, 4 and 5 tons, respectively. The study modeled five types of space conditioning scenarios for each home. This method generated 15 different scenarios.

The resulting data (as indicated in the chart below) revealed that a vertical GeoExchange system provides the most efficient means to heat a residence and is almost three times as efficient as a propane furnace system, and twice as efficient as a baseboard electrical system (BBES.)²

According to the study, GeoExchange installations provided an average savings of over 4,000 kWh per year over base board heating, (or an average reduction in kWh consumption of 46 percent.)

eQuest 2000 SqFt. (4 Ton Model) Data Analysis



² McManus, Ryan, Efficiency Services Group, LLC, “PSREC Engineering Evaluation of GeoExchange Program,” pg. 2, February 8, 2010

FACINATING FACTS ABOUT GEOEXCHANGE TECHNOLOGY

ACCORDING TO THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, GEOEXCHANGE SYSTEMS:

- ◆ Are the most energy-efficient, environmentally clean, and cost-effective space conditioning system available.
- ◆ Significantly reduce greenhouse gas and other air emissions associated with heating, cooling and water heating residential buildings, compared with conventional technologies.
- ◆ Are an average of 48% more efficient than the best gas furnaces on a source fuel basis, and over 75% more efficient than oil furnaces, even taking all losses in the fuel cycle into account.
- ◆ Generate no on site emissions and have the lowest emissions among all heating and cooling technologies.
- ◆ Can reduce energy consumption- and corresponding emissions- by up to 70% compared with electric resistance heating with standard air-conditioning equipment.

FACTS FROM THE GEOTHERMAL HEAT PUMP CONSORTIUM:

- ◆ Polls consistently show that more than 95% of all GeoExchange customers would recommend GeoExchange to a family member or friend.
- ◆ During the heating season, GeoExchange systems take the heat that the earth absorbs/stores from the sun at an efficiency of about 350%, and returns it during the cooling season.
- ◆ Currently, more than 900,000 GeoExchange systems are installed in the U.S., which has resulted in the emissions reduction of more than 5.2 million metric tons of carbon dioxide annually.
- ◆ These 900,000 systems also annually reduce energy consumption by more than 7 billion kWh and 36 trillion Btu's of fossil fuels, as well as reduce electricity demand by 2.3 million kW every year.
- ◆ The enormous impact of the current use of GeoExchange technology is equivalent to:
 - ◆ Taking more than 1,165,000 cars off the road
 - ◆ Planting more than 346 million trees
 - ◆ Reducing U.S. reliance on foreign oil by 19.3 million barrels per year.

SAMPLE GEOEXCHANGE EXTERIOR LOOP
LOAN APPLICATION AND FORMS



Plumas-Sierra Rural Electric Cooperative

73233 State Route 70 • Portola, CA 96122
(800) 555-2207 • (530) 832-4261 • FAX (530) 832-5761

GeoExchange System (Ground Loops)

LETTER OF INTENT

I/We, _____ (OWNERS) are, or will be, members of Plumas-Sierra Rural Electric Cooperative (Plumas-Sierra REC) intend on having installed on our property a GeoExchange exterior loop system as arranged by Plumas-Sierra REC. **Plumas-Sierra REC cannot guaranty that all building sites, due to soil, rocky or cobble conditions and/or county requirements will be able to utilize GeoExchange technology. Program details / charges are subject to change without prior notice.**

The OWNERS agree to a monthly loan payment of \$_____ per month.* (see attached addendum). **MAXIMUM LOAN \$15,000.00, (any charges over \$15,000.00 will be billed to OWNER by PSREC and will be due and payable upon receipt).** *The monthly loan payments will be added to OWNERS ELECTRIC account as soon as the GeoExchange system has been installed, and will continue on a month-to-month basis until paid in full.

The total amount of the loan is \$_____ (15-year term, interest free, non-transferable).

The OWNERS further understand that they must contact and make arrangements with Plumas-Sierra REC at 530-832-4261 to execute a loan and license agreement and a short form deed of trust **WITHIN 30 DAYS FROM INSTALLATION** of the GeoExchange exterior loop system.

The OWNERS of a residence/business to be newly constructed understand that it is their responsibility to notify the installing contractor, _____, of the HVAC system and Plumas-Sierra REC of any changes made during the construction of their home, which may effect the heat loss, or gain of the structure.

If the OWNERS are retrofitting an existing structure, they have fully communicated to the best of their knowledge such information as necessary for the installing contractor, _____, to complete the calculations necessary for designing the GeoExchange system. It is understood that all assumed energy efficiency upgrades **including modifying existing ductwork**, if contractor deems necessary, must be completed if the upgrades were part of the building heat gain/loss calculations. When the GeoExchange system is designed with an auxiliary fuel source, it will not operate correctly without it. These homeowner requirements are mandatory and designed to ensure that the GeoExchange system is engineered to optimum efficiency.

Plumas-Sierra REC will not be financially or otherwise responsible for modifications to the GeoExchange system that are a direct result of building design changes, improper building construction, building upgrades not completed, or any other changes to the structure that impact the building envelope efficiency that were not clearly communicated in writing to the HVAC contractor of the GeoExchange system.

Mr. and/or Mrs. _____ hereby indicate that they intend to obtain a "LOOP-LOAN" on a GeoExchange exterior loop system to be installed on their property as arranged by Plumas-Sierra REC. OWNERS must maintain a valid and continuing insurance policy on the property at all times, including during construction, no exceptions. **Residence/business must be owner occupied, no loans offered for "spec" homes.**

Owner _____ Owner _____

HVAC Contractor _____ Date _____

PLEASE COMPLETE THE INFORMATION SECTION ON THE BACK OF THIS DOCUMENT



Plumas-Sierra Rural Electric Cooperative

LETTER OF INTENT INFORMATION

PSREC Member Information

PSREC member please complete this section

| |
|--------------|
| Member Name: |
| Spouse Name: |

| | | |
|-------------|-----------------|--------|
| Home Tel #: | Business Tel #: | Other: |
|-------------|-----------------|--------|

Current Mailing Address:

| | |
|---------|--------|
| Street: | State: |
| Town: | Zip: |

Location of Installation:

| | |
|---------|--------|
| Street: | State: |
| Town: | Zip: |

Legal description of the property or attach a copy of the Deed. **Include APN:**

Proposed Date of Move-in:

Contractor Information

Please submit the system engineering and design software results with this information

Contractor Name:

| | | | |
|------------|------------|--------------|---------------------|
| Heat Loss: | Heat Gain: | Calc Method: | Unit Size Selected: |
|------------|------------|--------------|---------------------|

| | | | |
|-------------|---------------------|--------------|--------------|
| Loop Style: | Trench/Bore Length: | Pipe Length: | Loop Config: |
|-------------|---------------------|--------------|--------------|

| | |
|-----------------------------|-------------------------|
| Proposed Installation Date: | Square Footage of Home: |
|-----------------------------|-------------------------|

ADDENDUM TO LETTER OF INTENT

In order to receive the 15-year interest free loan for the exterior loops member **MUST** choose a contractor from the certified geothermal contractor list supplied by PSREC.

Graeagle, Clio & Johnsville loop loans, due to cobble/rocky conditions (if determined the loop can be installed), may need to be adjusted by the cooperative before any monthly amount is agreed to on the letter of intent.

Grizzly Ranch loop loans, due to containment issues and/or cobble/rocky conditions (if determined the loop can be installed), may need to be adjusted by the cooperative before any monthly amount is agreed to on the letter of intent.

All jobs in Gold Mountain must be vertical (drilled).

Sand, if the soil is very dry the system needs either a larger horizontal field or must be drilled (Herlong/Red Rock area).

Horizontal installations – the site will be disturbed and will settle (contractor / homeowner responsibility).

Dirt Bags – If used on your site, it is your geothermal contractor’s responsibility to let it dry out and dispose of it.

If your system is not sized to 100%, your contractor needs to bid auxiliary heat.

During the winter (late Oct-late Apr) PSREC has the right to postpone drilling for good weather.

| <u>Application/Condition</u> | <u>Yes</u> | <u>No</u> | <u>Approved/Noted by PSREC</u> |
|------------------------------|------------|-----------|--------------------------------|
| Horizontal | _____ | _____ | _____ |
| Vertical | _____ | _____ | _____ |
| Auxillary Heat | _____ | _____ | _____ |
| Winter | _____ | _____ | _____ |
| Cobble/Rock | _____ | _____ | _____ |
| Artesian | _____ | _____ | _____ |
| Sand | _____ | _____ | _____ |
| Dirt Bag | _____ | _____ | _____ |
| Graeagle | _____ | _____ | _____ |
| Clio | _____ | _____ | _____ |
| Johnsville | _____ | _____ | _____ |
| Grizzly Ranch | _____ | _____ | _____ |
| Containment issues | _____ | _____ | _____ |

Customer Signature

Customer Signature

for Plumas-Sierra REC

Date