



Starting or Improving a Geothermal Heat Pump Incentive Program

This guidebook is meant to provide the sponsoring utility (electric, gas, water) with information on how to start a new geothermal incentive program or give ideas to the utility that is looking to enhance or change their existing program. Much of the information contained in this document is based on successful programs at numerous utilities around the nation.

GeoExchange is here to help and has individuals on staff with years of experience. We can assist you directly or put you in contact with other utilities that are running successful geothermal incentive programs.

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I. Organizational Buy-in on Geothermal Heat Pump Technology

- a. Determine how upper-level administration and board feel about the benefits of geothermal technology (CEO, CFO, Engineers, Board). Do they fully understand the technology and the benefits for your utility and your customers?
 - i. Create a presentation for your management team and/or the board that focuses on the benefits for the utility.
 - 1. Demand reduction (show graphs and scenarios based on number of geothermal heat pumps on a system)
 - 2. Increase in revenues based on a scenario that converts a percentage of conventional heating systems to electric.
 - 3. Decreases in carbon and other GHG emissions based on how many geothermal systems are installed.
 - 4. Load Factor improvement benefits (if the utility has a lot of customers that heat with gas).
 - 5. Geothermal as an alternative renewable that you can promote to the customers that significantly benefits (not hurts) the utility's bottom line.
 - ii. Create a second presentation or have alternate slides demonstrating the benefits to the customers.
- b. **If the program is approved, consider tracking all geothermal installations with details about the system size, what type of system it replaced or was compared to, and any other detail that can help when calculating long term benefits of the program.*
 - i. *An annual summary of the number of units and the associated savings should be developed, even if not required.*

II. Develop Incentive Program Rules and Requirements

- a. Decide if you are going to require certain criteria that must be met to get the incentive.
 - i. Sizing Requirements: Delta T parameters based on set indoor/outdoor temperatures. The Delta T criteria will

determine if you want the geothermal unit to heat 100% of the time (likely to use a larger unit) or whether you will allow a supplemental heating source to kick in during extreme weather conditions. This type of unit will heat only X% (less than 100%) of the time and then use a supplemental heating system (electric strip heat, fossil-fuel furnace/boiler) to augment the heat output.

1. Example: 70° Indoor Temperature / -10° outdoor temperature = 80°Delta T (Depending on your geographical location, the higher Delta T's can result in a unit that is able to provide heat 100% of the time)
 2. *This decision may depend on the overall goals of the program. If reducing peak demand for the utility is important, you may want to restrict any electrical resistance use in the heating system.
*Sizing to 100% heating load can reduce or eliminate future high bill discussions because there will be no electric resistance heating involved.
 3. Decide if the program will require submission of a design calculation (Manual J report).
- ii. Loop Requirements: Depending on soil conditions or the climate in the area, consider requiring a minimum length of loop material for each type of loop install. This can help ensure the geothermal heat pump will perform as expected during extreme weather events. (Ex: verticals must be drilled 200' instead of the standard 150' for the area)
 1. You may also require a loop design to be submitted using easily available software. This loop analysis will confirm the unit will perform as designed and sold.
 - iii. Ductwork Requirements: Ductwork configurations vary widely, with potential issues that may arise if not properly installed or maintained. Potential issues include lack of insulation, leaky connections or poor design. You may want to consider certain requirements.

1. Must be insulated in appropriate areas such as attics, crawlspaces, and unheated basements.
 2. All joints must be taped or use mastic to seal leaks.
 3. No flex pipe may be used on main trunklines due to inefficient airflow.
- iv. Emergency Heat requirements: Even if a unit is sized for 100% heat capacity, the option of 'emergency' strip heat may be allowed. However, since the strip heat will cause issues with overall demand, you may wish to require certain restrictions.
 1. Emergency strip heat must be put on a separate breaker that is turned off unless loop pumps fail.
 2. Emergency strip heat must not be wired in until a failure occurs, and it is needed for temporary heat.
- v. Inspection Requirements (utility and/or local requirements): The utility inspection may be nothing more than an onsite visit to verify that the unit that was submitted for the incentive was the actual unit installed.
 1. Require proof of passing local inspection.
- vi. Training Requirements: Determine the specific training certifications that the contractor must have for their installations to qualify for the incentive.
 1. Example: Contractors must be trained by IGSHPA or another agency to qualify for the incentive.
- vii. Do you allow open loop systems or DX systems? Open loop systems (a.k.a.; pump and dump) may not be allowed in your jurisdiction and must be properly installed and maintained. DX (Direct Exchange) systems can have corrosion issues in the loop piping in certain areas of the country.
- b. Create Program Requirement documents that can be kept on file and/or provided to contractors and utility customers (Consider utility policy requirements and implications).

Example: **(See Sample Form #2 in Section VII)**
- c. Consider creating a checklist to track all program requirements. This will prove useful in ensuring that all program requirements are being met and can provide a record if future questions arise.

Example: (See Sample Form #1 in Section VII)

- d. Show the process a contractor and customer need to follow to earn the incentive.
 - 1. Examples:
 - a. You may wish to request that the manual J report be submitted before the project starts so that any issues can be addressed before completion.
 - b. All invoices must be turned in once the unit is installed and active.
- e. Decide on the specific incentive amount, as well as any other inducements you may wish to pair with the incentive.

Example: (See Example #1 in Section VII)

III. Outreach to Contractors

- a. Call and/or visit local contractors that install geothermal heat pumps.
- b. Contractor Vetting:
 - i. How many GHPs have they installed?
 - ii. Can they provide customer references to attest to the quality of their work?
 - iii. Are they IGSHPA-certified installers? (many contractors will go through a training regimen that is provided by the OEM that is accredited IGSHPA training)
- c. Provide the contractor with the program requirements document so they know what is expected.
 - i. You may want to consider hosting a contractor meeting at your utility to meet all the participating contractors and lay out the rules and requirements.
 - 1. Consider making this an annual event to keep your contractors updated on changes to your programs and/or the industry.
- d. Have a detailed conversation with each contractor to let them know that it is a privilege and advantage to be included on the contractor list. Being on the list is endorsement and free advertising. Make sure they also understand that if they don't follow the rules or if

there are continual issues with installation and/or sizing, they can be removed from the list.

IV. Create a Qualified Contractor List

- a. The Qualified Contractor List can be provided for any customer inquiry about GHP installing contractors. The list does not promote any contractor over another, but it does allow the utility to retain some control to encourage successful installations.
- b. The Qualified Contractor List can allow you to have as much control over your program and contractors as you deem necessary.
 - i. Example: Require all contractors to be IGSHPA-trained designers and installers; Require that certification certificates be submitted before the system can qualify for the incentive.
 - ii. Example: Require all contractors to provide written verification that ductwork is sized properly for the GHP unit installed (pertains to retrofit issues primarily).
 - iii. Example: Require all contractors to provide written verification that they have installed the proper amount of loop, regardless of the number of bores or trenches.
- c. Make sure that the list is continually updated. Add and subtract as necessary; keep contact information up to date.
- d. It is likely that a customer will ask your opinion on different bids. Be sure to advise as a neutral party when comparing bid details. To preserve utility fairness and impartiality, it is important to never share bid details with other contractors.

V. Marketing Your Geothermal Incentive Program

- a. Add specific information to the utility website that covers the geothermal incentive program. This will often be located near other program incentives, but with a specific Geothermal Program heading.
 - i. Provide information that explains how geothermal heat pumps work.
 - ii. Provide information that explains all the specific benefits of geothermal heating, cooling and water heating.

- iii. Provide information that covers all the specific requirements that must be met to qualify for the incentive.
- b. Create GHP ads to run on your social media platforms.
Create new ads or look at organizations like GeoExchange, IGSHPA, and/or your state GHP association for any generic ads that they are willing to share.
- c. Place articles about geothermal in utility newsletters and publications, or email blasts that are sent to customers.
- d. Mention geothermal incentives on/with utility bills, either as a bill stuffer or printed directly on the bill.
- e. Hold an 'Energy Efficiency' event to educate customers on saving energy. Be sure to highlight geothermal technology and incentives.
- f. If your utility has an Annual Meeting, have information tables or booths, consider adding one that covers the utility's energy efficiency incentive programs.
- g. Create a geothermal promotional campaign with your industry associations or neighboring utilities. This may qualify for discounts on advertising through bulk purchasing.
- h. Make sure every utility employee that has contact with customers has a basic working knowledge of geothermal technology, available incentives and program requirements (consider GEO 101 training through IGSHPA).

VI. Department Tasks & Knowledge

- a. CSR or Front Desk Employees
 - i. Should have basic knowledge of how geothermal heat pumps work and the benefits of geothermal heating/cooling (GEO 101 from IGSHPA can provide education).
 - ii. Should be familiar with the fundamental details of the utility incentive program (\$ per ton, flat amount, rate, etc.).

- iii. Should be aware of general program requirements that must be met to be eligible for geothermal incentives (Not necessary for them to know or explain specific technology or program details).
 - iv. Main Task – Provide enough information to keep the customer interested in the technology; refer the customer to a more knowledgeable person with specific program knowledge (Customer Service or Energy Efficiency Tech).
- b. Communications Employees
 - i. Should have basic knowledge of how geothermal heat pumps work and the benefits of geothermal heating and cooling (GEO 101 from IGSHPA can provide education).
 - ii. Should be familiar with the details of the utility incentive programs (\$ per ton, flat amount, rate, etc.).
 - iii. Should be familiar with the requirements that must be met to be eligible for the incentive.
- c. Main Task – Promote the program through the utility’s website, social media platforms, written documents, etc.
- d. Customer Service & Energy Efficiency Tech Employees
 - i. Should have basic knowledge of how geothermal heat pumps work and the benefits of geothermal heating and cooling (GEO 101 from IGSHPA can provide education). *Higher levels of education can be beneficial and received through IGSHPA)
 - ii. Should be familiar with the details of the incentive programs (\$ per ton, flat amount, rate, etc.).
 - iii. Should be familiar with the requirements that must be met to be eligible for the incentive.
 - iv. Main Tasks –
 1. Provide the customer with all pertinent details about the technology, program incentives, and specific requirements.
 2. Develop and maintain contractor list (if applicable).
 3. Develop relationships with local contractors and make sure they understand program requirements.

4. Make sure all requirements of the program have been met (Maintain checklist if applicable).
5. Track all installed systems and related information (if applicable).
6. File all documents related to the project (invoices, load calculation reports, inspection reports, etc.).
7. *Optional – Run whole-house Manual J calculations to double check contractor system sizing.

e. Staking Engineer Employees

- i. Should have basic knowledge of how geothermal heat pumps work and the benefits of geothermal heating and cooling (GEO 101 from IGSHPA can provide education).
- ii. Should know that there are incentive programs available (not necessary to know specific details).
- iii. Main Task – Inform new customers that are planning a new residential or commercial building project that geothermal heat pumps can have financial benefits and there are utility incentives available to offset some of the upfront costs.

f. Key Account and/or Economic Development Employees

- i. Should have basic knowledge of how geothermal heat pumps work and the benefits of geothermal heating and cooling (GEO 101 from IGSHPA can provide education)
- ii. Should be familiar with the details of the incentive programs (\$ per ton, flat amount, rate, etc.).
- iii. Main Task – Encourage existing or new key account customers to utilize geothermal heating and cooling in their buildings. Use the benefits (financial, GRECS, less equipment, lower maintenance, improved grid stability) as a tool.

VII. Program Tracking

- a. Maintain a spreadsheet that tracks all the geothermal heat pump incentives and associated information.
 - i. Customer Name and Map location
 - ii. System Size and contractor that did the installation.

- iii. If it uses electric strip heat or a secondary system for emergency or supplemental heating.
- b.*** The information in this spreadsheet can be used for future analysis of the program and as reference for future inquiries. ***(See Sample Form #3 in Section VIII)***

VIII. Sample Forms
(Forms shown on following pages)

Sample Form - #1

XYZ Electric Utility Geothermal Install Checklist



Customer Name:

Customer Address:

Date:

GHP Size:

☐

Manual J Report Submitted

☐

Design Criteria Used (Delta T - 70°)

☐

Loop Lengths 200' per bore

☐

Insulated Duct in unconditioned space

☐

Emergency Heat on separate breaker (in off position)

☐

Contractor Verification that existing ductwork is adequate

☐

Invoices Submitted

☐

County Inspection Completed

☐

Utility Inspection Completed

Project Notes:



America's Electric Utility

Requirements for GHP Incentive

The following requirements must be met before an incentive will be issued. All noted documentation must be included with the incentive application form.

Geothermal Heat Pump – Residential Installation Requirements

1. All geothermal systems will be sized using the following criteria.
 - a. Indoor air temperatures will be figured at 70° and outdoor temperatures at -5°(Delta T of 75°)(This is a minimum criterion and can be figured with a higher Delta T).
 - b. Manual J Report using the above criteria must be submitted.
2. All geothermal systems allow emergency strip heat, but it must be installed on a separate breaker that stays in the off position unless needed.
3. If the geothermal incentive is for a retrofit, all ductwork systems must be checked and a signed affirmation saying the system is adequate must be submitted by the contractor.
4. All installed systems are subject to inspection by the cooperative before an incentive may be issued.
5. All invoices must be submitted (including loop field installation if separate from the geothermal heat pump installation).

Electric Utility Programs Examples #1

Set Amount / Ton

- Ameren Illinois (IL): \$500/ton rebate
- Black Hills Energy (CO): \$1,700/ton rebate
- Rockland Electric Company (NJ): \$2,000/ton rebate

Set Amount / Ton with Other Incentives

- Dakota Electric Association (MN) \$400/ton plus 20% more/ton if done by a Master Installer. (cooperative has a list of master installers)
- Lorain-Medina Rural Electric Cooperative (OH): \$800/ton for new units, \$400/ton for replacement units. Heat Pump rate applies to usage after the first 1k kwh's.

Flat Amount Per Unit

- Baltimore Gas and Electric (MD): up to \$3,000/unit rebate
- Potomac Edison (MD): \$7,000/unit rebate

Flat Amount Per Unit with Other Incentives

- Carrol White REMC (IN): \$1500 + \$2000/ closed loop system, offers \$150/install to the contractor. Offers Loop Buy Program to offset upfront costs.
- Coles-Moultrie Electric Cooperative (IL): \$250/unit, \$0.07/kwh heat pump rate (regular residential rate is \$0.104/kwh)

Other Incentives

- Central Hudson Gas & Electric (NY): \$2,000/10,000 Btu
- Adams Electric Cooperative (PA): \$0.055/kwh rate for heat pumps.
- Tri-County Electric Cooperative (IL): offers a Geothermal Loan Fund that maxes at \$30k.

Sample Form - #3

[illegible]