

GEOHERMAL HEAT PUMPS THE NEW GOLD!!!



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1615 M.Street N.W. Suite 800 Washington DC 20036

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HOUSEKEEPING

What do we call it... **Geothermal, Ground Source, GeoExchange.**

The feds call it **geothermal heat pumps (GHP).**

They are ground loops, boreholes not **WELLS** (unless you are doing an open system)



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Minnesota Facts!

There are over 5.3 million people in Minnesota, which is the 12th largest State. The State experiences temperatures ranging from a low of -60F to a high of 114F, that is a 174 degree temperature variation, the third largest in the US, behind North & South Dakota.

The earth temperature is 46 to 52 degrees constant year round.



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Minnesota Facts!

Coal produces 60% of Minnesota's electricity generation and nuclear contributes 23.5% to the generation mix. Minnesota does not have any fossil fuel resources so coal is imported from Montana & Wyoming.

The State has two oil refineries that process crude that comes from Canada.



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Why GHP Technology?

The US Department of Energy states, **36%** of the primary energy used in the US is from energy use in buildings. This is more than the energy used by the transportation industry.

AND

40% of the total energy used in a building is for space conditioning and water heating.



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Energy Independence & Security

According to a study conducted by NREL, there is a reduction of .55 to .88 Kw reduced per ton of installed capacity.

Western Farmers Utility in OK is experiencing a reduction in peak load of up to .75Kw per ton of installed capacity.



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The “ENERGY UNDER OUR FEET”

A four ton system extracts an equivalent of **8.94** Kilowatts of energy per hour from the ground.
(NREL)

That equates to **30,510 BTUs** being extracted every hour, 24 / 7, 365 days a year. (one Kilowatt equals 3413 BTUs)



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Minnesota Energy Facts!

MN is a member of the Midwestern Regional Greenhouse Gas Reduction Accord a regional agreement among six American Governors and one Canadian premier to target greenhouse gas reductions BUT regulations imposed in the name of reducing Carbon Dioxide and greenhouse gases are especially costly!



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Minnesota Energy Facts!

It has been stated that there is no cost-effective way to limit these emissions that would not dramatically increase the price of natural gas, petroleum or coal!

BUT



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Environmental Stability.

The US Environmental Protection Agency states that GHPs reduce Greenhouse Gas Emissions (the leading contributor to Climate Change) by up to **40%** over convention HVAC systems.



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Are geothermal heat pumps “RENEWABLE”

The US Department of Energy definition is:
“The geothermal heat pump, also known as the ground source heat pump, is a highly efficient **renewable energy** technology that is gaining wide acceptance for both residential and commercial buildings.”



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WHAT IS THE DEFINITION OF RENEWABLE!!!

Definition of RENEWABLE

1

: capable of being renewed <*renewable* contracts>

2

: capable of being replaced by natural ecological cycles or sound management practices <*renewable* resources>



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Are geothermal heat pumps “RENEWABLE”

A GHP system is comprised of two separate parts, the ground loop heat exchanger (GLHE) and the Geothermal heat pump (GHP).

The GLHE is the **renewable** portion of the system and the GHP is the **energy efficient** part of the system.



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The real problem we have is:

“SEMANTICS”

Dependency on fossil fuels, increased emissions, transmission congestion, job creation. These are all the problems “renewable” technologies are supposed to **SOLVE.**



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Let's Call it “**DIRECT USE**” geothermal

Direct-use systems typically include three components:
Production facility — usually a well — to bring the hot water to the surface;

Mechanical system — piping, heat exchanger, controls — to deliver the heat to the space or process;
and

Disposal system — injection well or storage pond — to receive the cooled geothermal fluid.



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What are the “BARRIERS” to this technology

The primary barrier and some think the ONLY barrier is FIRST COST.

One of the ways to remove this barrier is to have the ground loop taken out of the equation.

If Utilities could own the ground loop and have it be a Rate Recoverable asset. This would make our technology “explode”.



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BREAKTHROUGH !!!

The States of MD and NH have approved Bills, which effectively makes GHPs an accepted technology available for **Renewable Energy Credits (RECs)** under the state's **Renewable Portfolio Standard (RPS)**.

This “breakthrough” legislation recognizes GHPs as a **renewable energy source** giving electric utilities credit for the thermal load avoided.



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BREAKTHROUGH !!!

This may be the catalyst for Utilities to see the value of owning a geothermal loop field.

MN currently recognizes Solar Thermal as a class 1 renewable asset, I would suggest working with your PUC Commissioners and Legislators (There are 23 newly elected Senators and 42 newly elected Representatives) to tell the story of GHP Technology and have it inserted in the RPS.



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GHP's a Renewable Technology for **Utilities.**

1- They are a “demand reduction” technology which does not have to have “backup” generation. A equivalent megawatt of installed ghp capacity, reduces almost that amount from the grid.

2- They work 24/7, 365, never needing the sun to shine or the wind to blow.



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GHP's a Renewable Technology for **Utilities.**

- 3- It is a permanent (50 year) demand reduction, one that does not need any notification.
- 4- It can become a new business unit (Loop leasing or collection of REC benefits).
- 5- It is using “energy” already owned by the consumer but delivered by the Utility.



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We must ensure that the program

Succeeds !!!

Work with the legislators to develop the standards for the ghp installations.

Demand that only trained and certified designers, drillers and installers participate.

Be cognizant of the utility needs and responsive to their customers.



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The discussion has **CHANGED!!!**

Super storm Sandy has reinforced the growing sense in political circles that the reality of Climate Change puts homes and safety at risk.

This opens the door for the discussion of how GHP technology could have a positive impact, in the rebuilding process with it's **Triple E benefits** of **E**nergy independence & security, **E**nvironmental stability and **E**conomic prosperity.



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Let's Work Together



I mentioned previously the Midwestern Regional Greenhouse Gas Reduction Accord, the States involved are; MN, WI, IL, IA, MI, KS and the Canadian Province of Manitoba. Observers of the accord are; IN, OH, SD and the Province of Ontario. This would point to the position that the Geo organizations in these States work together to promote GHPs as a viable solution to the issue of Greenhouse Gas Reduction.



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Let's Work Together



I would suggest that the organizations in those States join forces to make the legislators in your state aware of the benefits an aggressive GHP program can have.

I would also suggest informing them of the number of jobs this technology can provide.

A commercial ghp project creates or retains 22 Job classifications far greater than other renewables.



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What should we do.

This will not happen without **YOUR** involvement and it will come through State's initiatives.

I would suggest that you petition your legislators to support having GHPs recognized as a renewable resource and included in the States RPS.

I would also suggest demanding sustainable rebuilding using GHP technology.



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REMEMBER

**Geothermal Heat Pumps go
beyond being a “GREEN”
Technology...**

**They are a “GOLD”
technology....**



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**We cannot solve our
problems with the same
thinking we used when we
created them.”**

- Albert Einstein



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If you have any questions or need further information please contact me at 610-659-4998 or e-mail me at jdienna@geo-nii.org



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