

IS GEOTHERMAL REALLY WHAT IT CLAIMS TO BE????

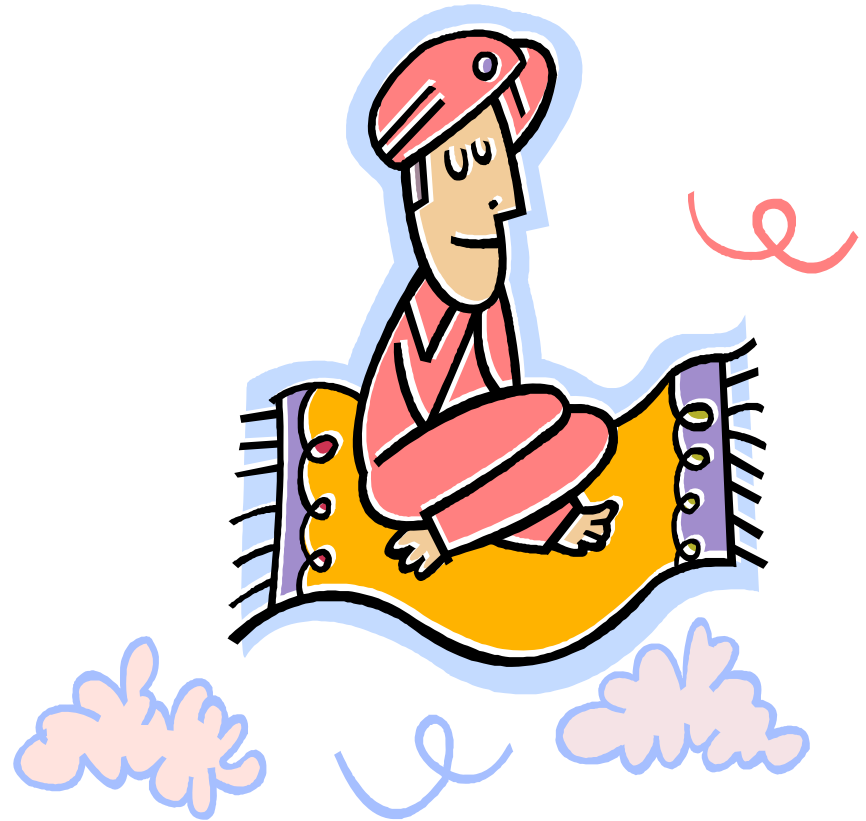


WEIGHING THE EVIDENCE.

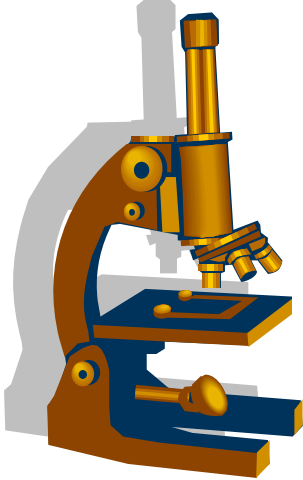
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There Are A Lot Of Myths Flying Around Out There!

- There is no payback on Geothermal.
- Well built houses don't need efficient heating & cooling.
- No one will spend the additional dollars.
- Geothermal is a high maintenance system.



Let's Take A Closer Look!



If We Are Willing To Look At The Facts, In Light Of The Science, We May Have To Re-Think Some Of The Things We Have Come To Accept, Based On Misinformation.

- **Pay-back & ROI can be calculated & proven.**
- **Well built homes use smaller systems, so the value is still there.**
- **People will spend money for value added. If no one was interested in quality, we would all still be diving Dodge Darts. Besides, Geothermal has a great pay-back & return on investment.**
- **Every independent study in Europe & North America has proven that Geothermal has far lower life-cycle costs than any other HVAC system available.**

So Where Is The Misinformation Coming From?

- **People who have had a bad experience.**
- **Uninformed “experts”.**
- **HVAC Contractors who put one in 10 years ago and “it never worked”.**
- **People who resist technology because it is easier to do it the “old way”.**
- **People who perceive geothermal as something new and unproven.**
- **The same folks who are too lazy to do accurate load & operating cost calculations.**

Compare Energy Costs

320% efficient ground-source heat pump	Nat gas and a 80% efficient furnace	Nat gas and a 90% efficient furnace	Propane and a 80% efficient furnace	Propane and a 90% efficient furnace	Fuel oil and a 60% efficient furnace	Fuel oil and a 80% efficient furnace
With electricity at:	You'd have to buy a CCF of natural gas for:		You'd have to buy a gallon of propane for:		You'd have to buy a gallon of fuel oil for:	
\$0.030	\$0.22	\$0.25	\$0.20	\$0.23	\$0.23	\$0.31
\$0.035	\$0.26	\$0.29	\$0.23	\$0.26	\$0.27	\$0.36
\$0.040	\$0.29	\$0.33	\$0.27	\$0.30	\$0.31	\$0.41
\$0.045	\$0.33	\$0.37	\$0.30	\$0.34	\$0.35	\$0.46
\$0.050	\$0.37	\$0.41	\$0.34	\$0.38	\$0.38	\$0.51
\$0.055	\$0.40	\$0.45	\$0.37	\$0.42	\$0.42	\$0.56
\$0.060	\$0.44	\$0.49	\$0.40	\$0.45	\$0.46	\$0.62
\$0.065	\$0.48	\$0.54	\$0.44	\$0.49	\$0.50	\$0.67
\$0.070	\$0.51	\$0.58	\$0.47	\$0.53	\$0.54	\$0.72
\$0.075	\$0.55	\$0.62	\$0.50	\$0.57	\$0.58	\$0.77
\$0.080	\$0.59	\$0.66	\$0.54	\$0.60	\$0.62	\$0.82
\$0.085	\$0.62	\$0.70	\$0.57	\$0.64	\$0.65	\$0.87
\$0.090	\$0.66	\$0.74	\$0.60	\$0.68	\$0.69	\$0.92



Whole-House Estimation

Provided By: Energy Dynamics
 PO Box 172
 Carthage, SD 57323
 605-772-5639

For: EXAMPLE
 BOX 123
 YOUR TOWN, USA
 123-456-7890

Prepared By: Lyle Darnell

Date: 12/19/2006

<u>Measured Element</u>	<u>Area</u>	<u>Winter Loss</u>	<u>Summer Gain</u>
STRUCTURE TOTAL		54,685	39,978
Floor 1			
North Windows	12	1,026	240
E/W Windows	160	13,646	7,980
South Windows	54	4,617	1,620
Doors	21	2,174	273
Walls	1,513	5,448	4,540
Ceiling	1,912	4,302	2,753
----Floor 1 Total		31,213	17,406
Basement			
E/W Windows	110	9,405	5,500
Walls	1,879	3,937	1,804
Floor	1,912	5,162	
Basement Total		18,504	7,304
Other Influences			
People	2		600
Ducts			
Appliances			1,200
Latent			8,786
Ventilation - CFM	50	4,968	1,512
ACCA Factor for ARI			1,904
----Other Factors Total		4,968	14,002
Temperatures	Inside	Outside	Diff
Winter	72	-20	92
Summer	72	100	28



Estimated Annual Cost

Provided By: Energy Dynamics
PO Box 172
Carthage, SD 57323
605-772-5639

For: EXAMPLE w/Geothermal
BOX 123
YOUR TOWN, USA
123-456-7890

Prepared By: JOE CONTRACTOR

Date: 12/19/2006

GIVEN VALUES	FACTOR	HEATING	COOLING
	Temp. Diff	92	28
	Degree Days	7800	750
	Fuel	Electricity	Electricity
	Unit Fuel Cost	\$.04/KWH	\$.04/KWH
	Equip. Efficiency	300 %	20 SEER
	BTUH Load	54685	39978
ESTIMATED			
	Annual Cost	\$ 282	\$ 59



Estimated Annual Cost

Provided By: Energy Dynamics
PO Box 172
Carthage, SD 57323
605-772-5639

For: EXAMPLE w/Propane
BOX 123
YOUR TOWN, USA
123-456-7890

Prepared By: JOE CONTRACTOR

Date: 12/19/2006

GIVEN VALUES**FACTOR****HEATING****COOLING**

Temp. Diff

92

28

Degree Days

7800

750

Fuel

LP Gas

Electricity

Unit Fuel Cost

\$ 1.60/Gallon

\$.08/KWH

Equip. Efficiency

90 %

13 SEER

BTUH Load

54685

39978

ESTIMATED

Annual Cost

\$ 1403

\$ 184



Economic Analysis Worksheet

Comparing Propane @ 90% Eff. to Geothermal

Prepared

For: EXAMPLE

Date: 12/19/2006

Address: BOX 123

YOUR TOWN, USA

Phone: 123-456-7890

Prepared By: Joe Contractor

Phone: 987-654-3210

Operating Costs: (estimated)

Fossil Fuel Heating	\$	1403	Geothermal (heating)	\$	282
A/C @ 13 SEER		184	Geothermal (cooling)		59
Blower (estimated)*		100	(Blower operation is		
Fossil or Air to Air	\$	1687	Geothermal Total	\$	341

Savings: (estimated)

$$\frac{1687}{\text{Fossil Fuel Total}} - \frac{341}{\text{Geothermal Total}} = \$ \frac{1346}{\text{Estimated Annual Savings}}$$

Payback: (simple)

$$\frac{16000}{\text{Geothermal Cost (installed costs)}} - \frac{10000}{\text{Conventional System Cost (installed costs)}} = \frac{6000}{\text{Cost Difference}}$$

$$\frac{6000}{\text{Cost Difference}} / \frac{1346}{\text{Annual Savings}} = \frac{4.4}{\text{Payback (years)}}$$

Return on Investment: (simple)

$$\frac{1346}{\text{Annual Savings}} / \frac{6000}{\text{Cost Difference}} = \frac{22}{\text{ROI}} \%$$

*To estimate the approximate operating cost of a furnace blower during heating and cooling operations, use the following formula: Heating Degree Days + Cooling Degree Days X .16 X Electric Rate in dollars. Example (8000 X .16 = 1280 X .05 = \$64.00).



If You Had Made A Capital Investment On January 31, 2004 You Would Have Enjoyed The Following Returns Thru January 31, 2009 (Five Years).

Microsoft = Average Annual Net Loss of <5.34%>

Treasury Bills = Average Annual Net Gain of less than 1%

General Electric = Average Annual Net Loss of <11.5%>

Bank of America = Average Annual Net Loss of <15.9%>

Bank CD's = Average Annual Net Gain of 2.6%

Geothermal System = Average Annual Net Gain of 22% *

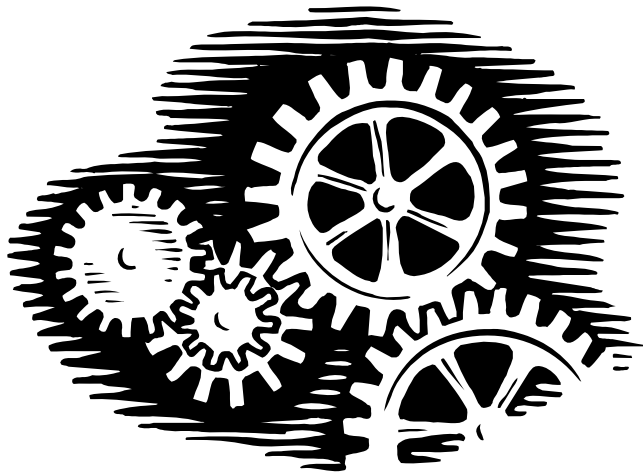
*Based on Actual Computer Generated Model. Your Actual Return Will Vary.



**Now There Are Several
Thousand More Good
Reasons To Consider A
Geothermal System!!**

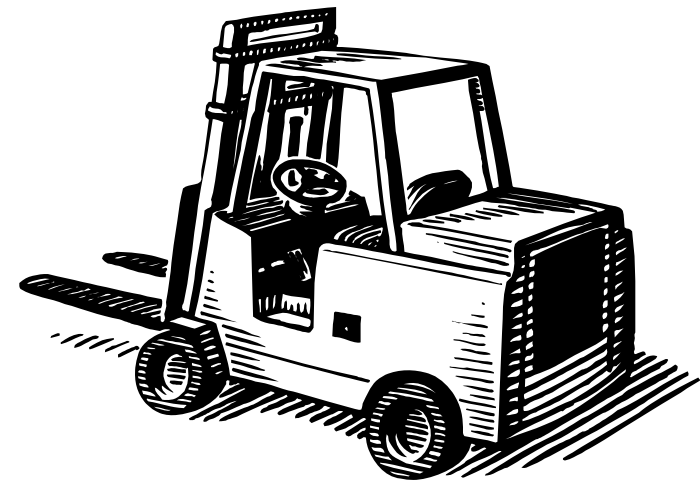
**From Now Through 2016 There Is A 30% Federal
Tax Credits Available For Qualifying Residential
Geothermal Installations. These Credits Apply to
The Entire Installation Cost & May Be Carried
Over Into Following Years, So Just About
Everybody Can Use Them.**

**This Makes Geo A “No-Brainer”, For Just
About Anyone.**



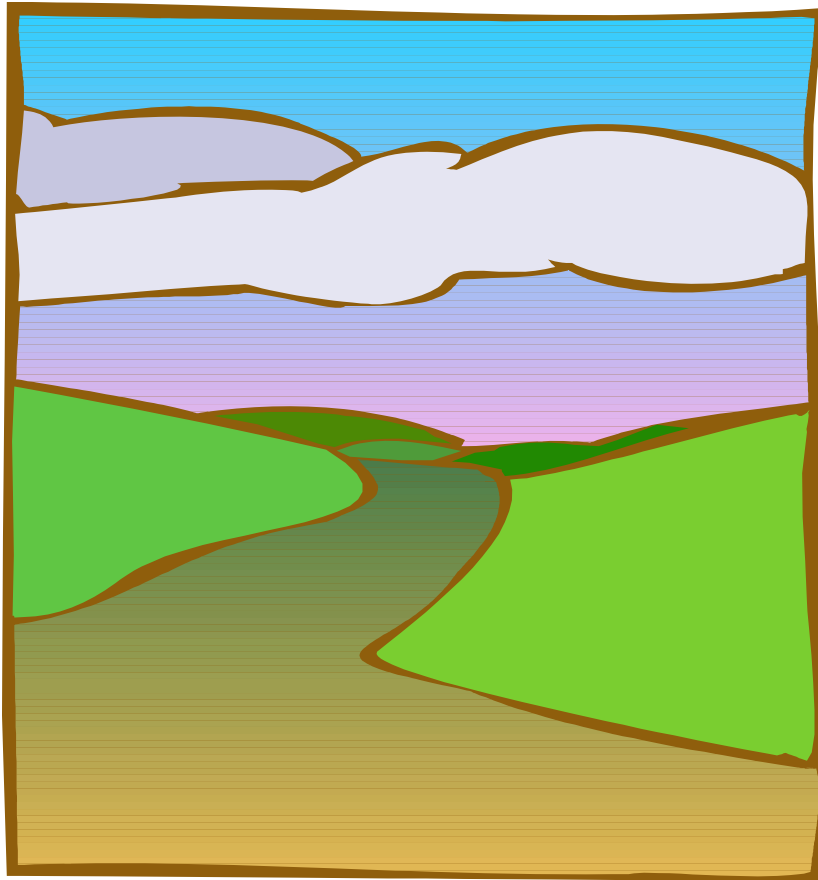
There is also a 10% tax credit available for commercial and industrial projects. This credit covers geothermal & other energy saving measures.

There are also accelerated depreciation considerations. These are very complex, and interpretation & application should be left to professional tax advisors.



Some commercial projects may qualify for grants, through 2009. These require special energy analysis, performed by certified professionals.

Staying In The “Comfort Zone”



The path of least resistance leads straight to mediocrity.

None Of Us Like To Venture Too Far From The Familiar.

It Is For That Reason That You Will Hear People, Who Should Know Better, Say Geothermal Is No Good Or There Is No Payback.

It's Easier Than Learning The Facts.

“Running With The Pack” Is Only Good For Sled Dogs.



Men may buy the coal but women pay for it

LOOK at your walls back of pictures, if you think your coal heated home is clean!

Start washing the woodwork and note the contrast. Give a party and count the days spent before in washing, scrubbing and dusting!

Then ask yourself if there is any special reason why your neighbor's wife who has an Oil-O-Matic should be relieved of this drudgery.

If you believe your family is comfortable with coal-heat, hide the shovel from your wife while you are downtown. Or start the furnace too early or too late in the fall. Then ask any Oil-O-Matic owner to tell you what comfort really means.

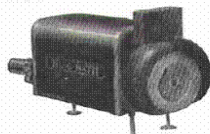
If you think coal isn't a nuisance, try leaving the house for a few days. Your wife can't leave it for five hours! But with Oil-O-Matic heat you may stay away for as long as you wish. You will never have to hurriedly leave a festive party to "fix the furnace." Spasmodic coal heat is unhealthy. How many winters does your family go through without colds due to fluctuating temperature and drafty rooms?

Compare your doctor bills with those who have Oil-O-Matic heat.

Yes, you may buy the coal, but your wife and family pay for it. Selection of an oil burner for your house, doesn't require that you know anything about oil burning. Most owners of Oil-O-Matic couldn't tell you how it works. But they will hasten to tell you that it has never failed to work.

Your local oilomatician can tell you how much a guaranteed installation will cost in your heating plant. Whether it's steam, hot water or a warm air furnace. Let him explain his deferred payment plan that spreads the initial cost over a full year.

For the complete story, send the coupon below for "Heating Homes with Oil," and basement plan for ideal arrangement of space. It's sent free and postpaid.



No part inside the fire box

**WILLIAMS
OIL-O-MATIC
HEATING**
World's Largest Producer of Automatic Oil Burners

Williams Oil-O-Matic Heating Corp.
Bloomington, Illinois
Without obligation, please send me "Heating Homes with Oil," by return mail. N. G. 66

Name: _____
Street: _____
City: _____ State: _____

This ad appeared in a large Eastern newspaper around the turn of the century.

As you can see the Williams Company was trying to convince a skeptical public that fuel oil was better than coal.

Move ahead 100 years. The HVAC business is still evolving.

**LET'S TAKE A LOOK AT
HOW IT WORKS.**

IT'S NOT MAGIC.



**THE FACT IS, IT
USES SOME OF
THE OLDEST AND
BEST PROVEN
TECHNOLOGY IN
THE WORLD.**

Your Refrigerator Is A Heat Pump.



When told that it's impossible to heat a home with 35 degree water, I have often lead a customer to his refrigerator and asked how the heat got out of those 35 degree pickles?

Then put his hand in the freezer and explain that absolute "0" is actually 459 below!

THE OLD FRIG OR FREEZER HAS BEEN DEPENDABLE FOR MANY YEARS.



**JUST WHERE IS
ALL OF THIS
FREE HEAT
COMING FROM?**

**It's Quite Simple Really.
The Earth Is The Best
Solar Collector Known To
Man.**

**Geothermal Systems
Extract This Huge Mass Of
Stored Energy.**



How Do We Do That?

By sending chilled fluid into the warmer earth, Geothermal “harvests” this huge amount of “stored” heat.

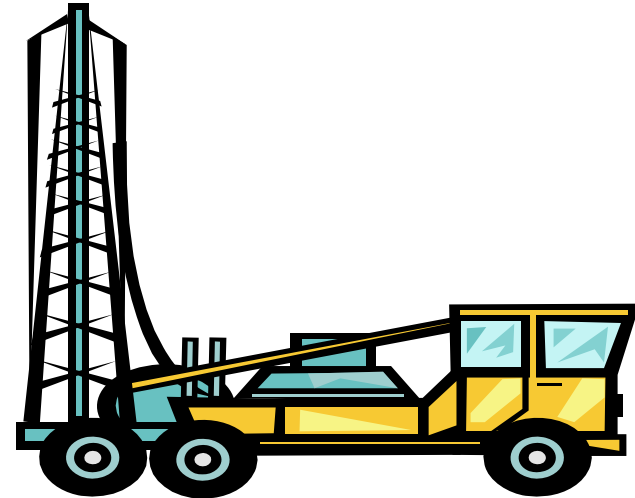
Since “moving” heat takes only a fraction of the energy it takes to “make” it, the savings are very substantial.

In the cooling mode, the process is simply reversed.

About Residential Vertical Loops

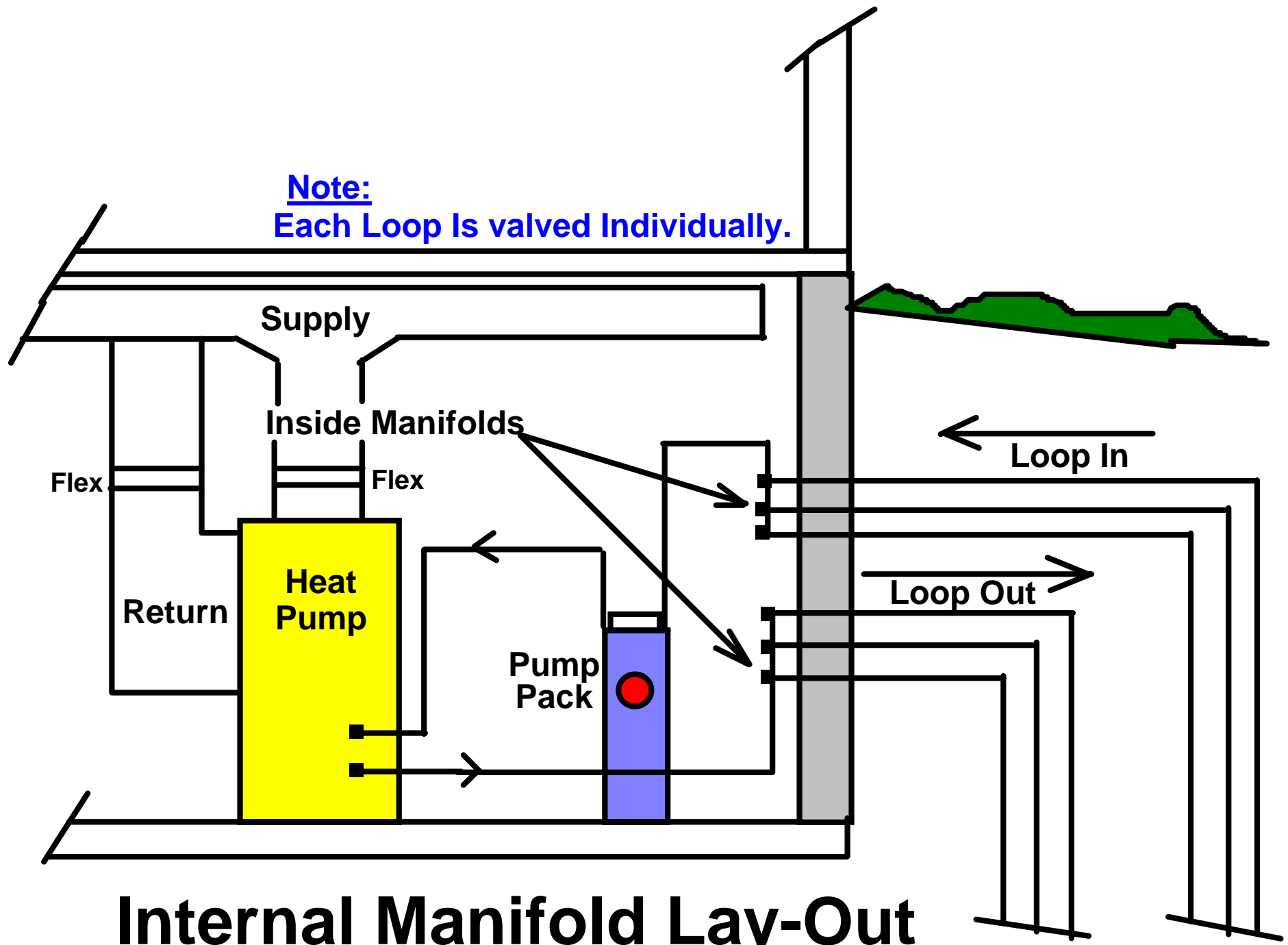
- Need 150' to 200' bore holes. (per ton, dep. on climate)
- Use ¾" PE pipe (SDR11).
- Must use fused connections.
- Use 20% food grade PG.
- Must grout from bottom up.
- Pump @ 3gpm – per ton.
- Should run 30 to 40 degrees at coldest point.

Teaming With The Right Loop Installer Is The Most Important Thing You Can Do!



**Most States
Require A Drilling
License.
Should Be IGSHPA
Certified.**

Note:
Each Loop Is valved Individually.



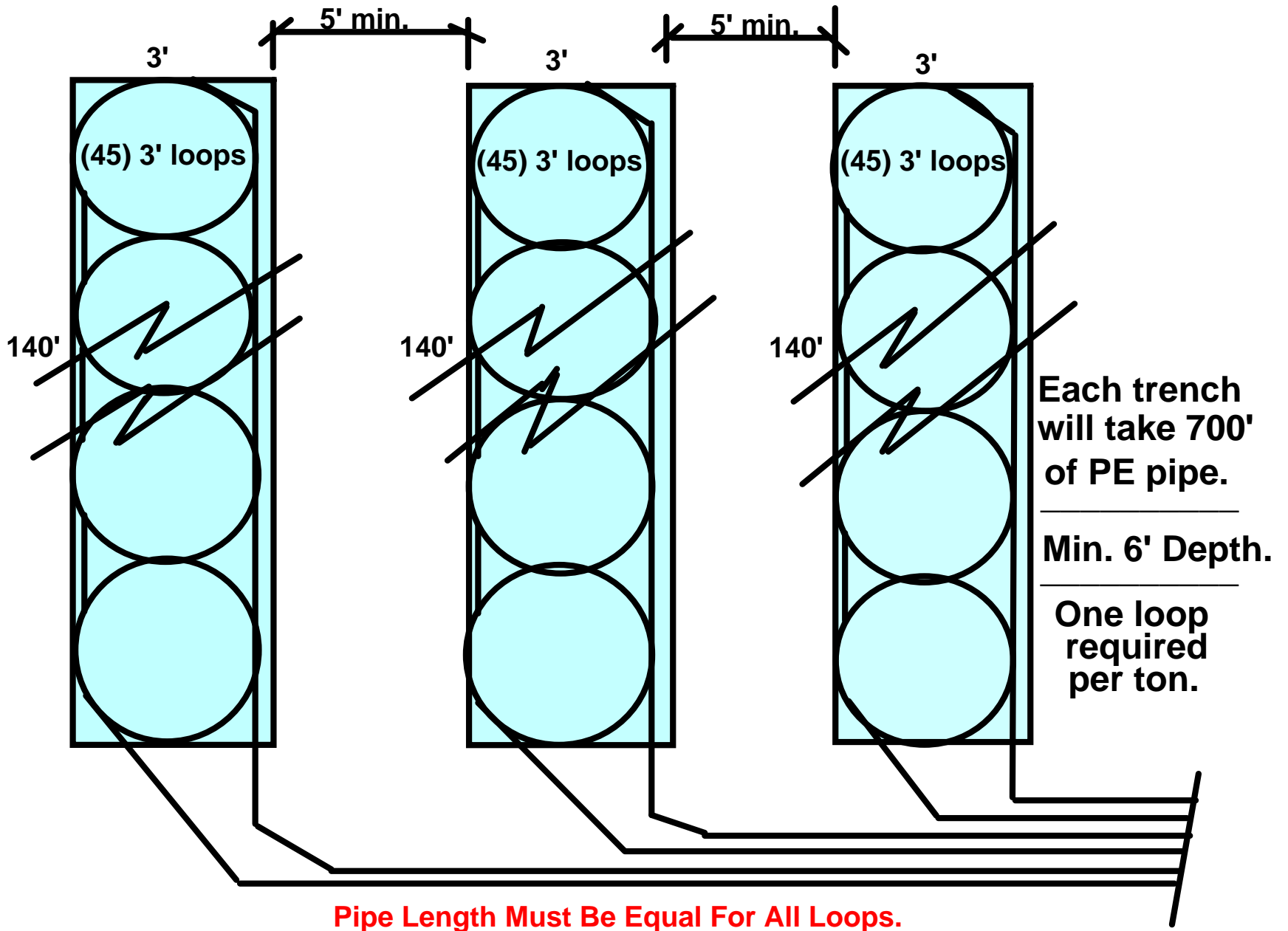
Internal Manifold Lay-Out

About Residential Horizontal Loops



**Can Be Installed By
Local Excavator And
Any Competent
Contractor, After
Training.**

- Need 700' of pipe per ton.
- Place in 3' wide X 140' long trench, or 6" wide X 350' long trench. (all min. 6' deep)
- Use $\frac{3}{4}$ ' PE pipe (heat fused)
- Use 20% PG solution.
- No grout required.
- Will run same temp as vertical.
- Dry soils may need soaker.



Typical Slinky Loop Lay-Out

PUMP & DUMPS

When considering a system, where the source side will be coming from a well, you should remember that equipment performance changes, as the EWT changes.

Always know your well capacity and temperature and check with your contractor, as performance changes with temperature.

You May be able to down-size equipment & use less GPM, as performance improves with EWT.

Water Quality Can Affect Your System Performance!

Some Important Issues With Pump & Dump Systems

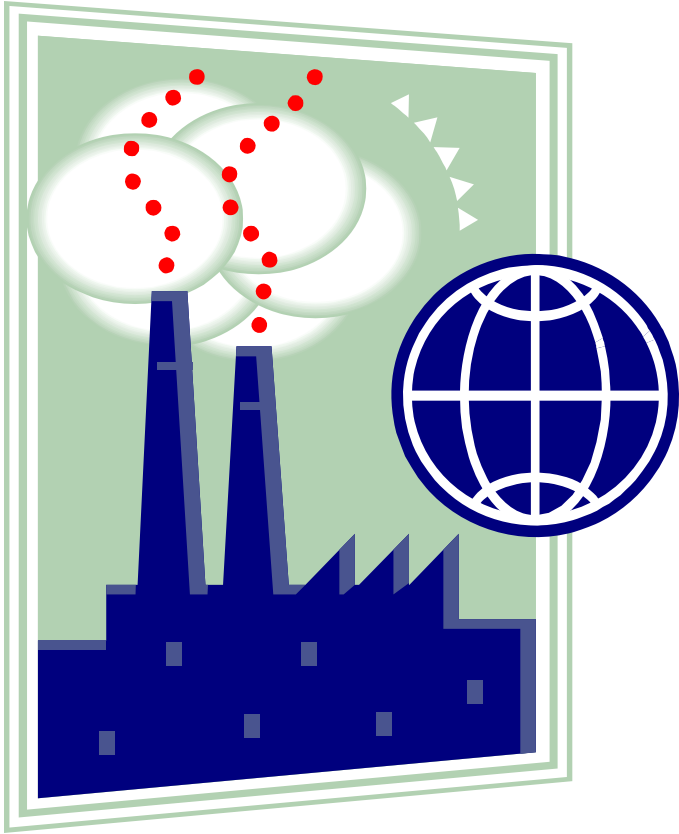
- **Know how many GPM you will be dumping?**
- $1.5 \text{ gpm} \times 4 \text{ ton} \times 60 = 360 \text{ gph} \times 24 = 8640 \text{ gallons per day} \times 365 = 3,153,600 \text{ gallon}$ divided $\times 3 = 1,051,200$ dumped per year (Assuming 1/3 run time).
- **THAT'S A LOT OF WATER!!!**
- Make sure you are within all code requirements.
- Provide back-flush valves for coil cleaning.
- Always use cupro-nickel heat exchangers if you are unsure of water quality.

What About The “Green” Side?



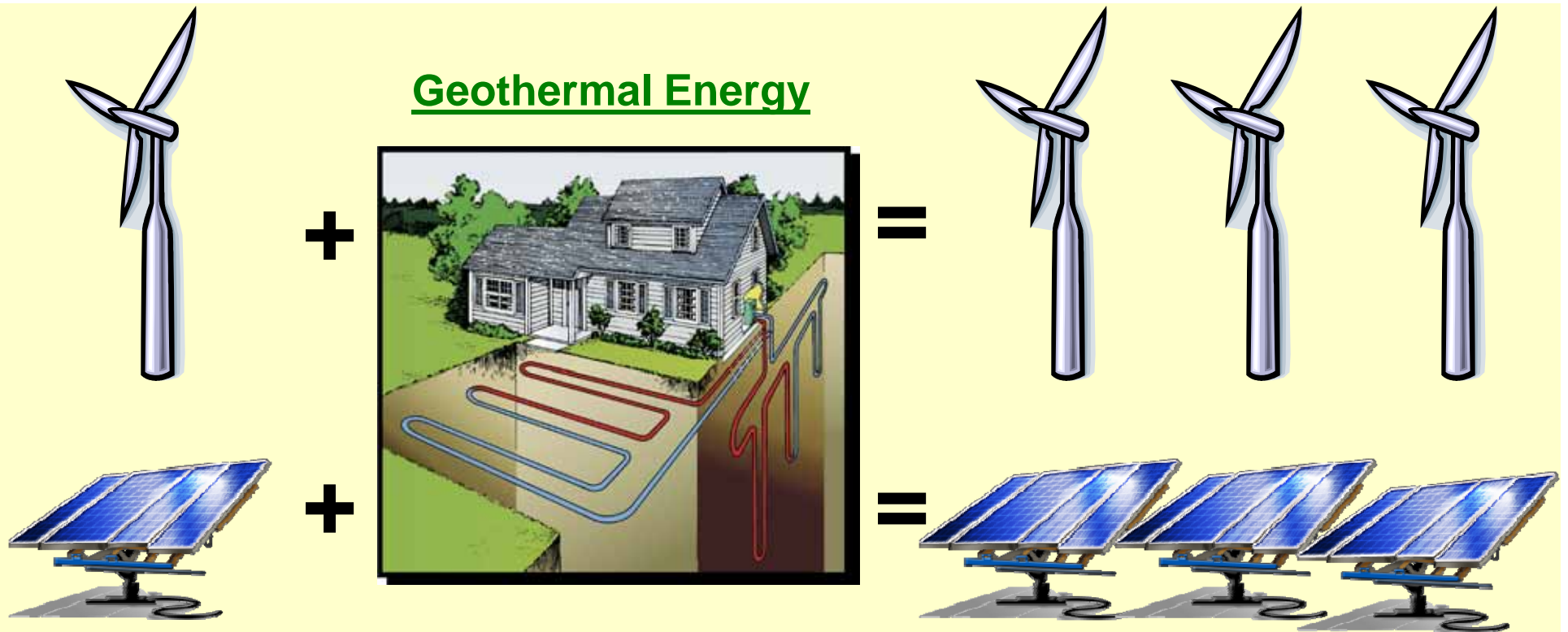
This Side of The Geothermal Story is Not Being Told Nearly Enough. It Is a Regional Thing, As In Many Areas Of The Country It Is What Drives The Market.

Whether you are very environmentally conscious, or are simply tired of sending American dollars to the Middle East, there are good reasons to understand how saving energy, also helps to save our environment and greatly helps the US economy.



***Both The Department of Energy
& The Environmental Protection
Agency Recognized
Geothermal As The Most Cost
Effective and Environmentally
Friendly Way To Heat & Cool A
Structure.***

***Geothermal Technology Is Well
Developed & Is Available To All
Of Us, As An Affordable
Alternative.***



If every Kw of power placed on the grid from other renewable energy sources were used to power Geothermal systems, it would be the same as tripling those resources. Imagine getting three times the value from the capital costs of wind and solar systems. Every time we added one photovoltaic solar panel or wind turbine, it would be like adding three.

Now That's Fast Tracking Toward Energy Independence & A Cleaner Environment.



**THE BIGGEST
CHALLENGE
OUR INDUSTRY
FACES, TODAY,
IS EDUCATION.**

With The Recent Surge In Awareness & Popularity In Geothermal, Comes Some Challenges That Have Caught Our Industry Unprepared. Without Highly Qualified Designers & Installers, There Is A Real Danger Of Less Than Optimal Performance Of The Technology.

Our Dealers Receive The Most Comprehensive Training In The Industry, With Highly Experienced Technical & Product Support.

—ENERGY DYNAMICS INC. *is the largest*
"Renewable Energy Specialist" *Geothermal service & distribution*
company on the Northern Plains.

We have over 20 years of exclusive
Geothermal experience.

Geothermal Systems
Hydron
Module®

**GeoComfort**
Geothermal Systems
Live comfortably.™

Equipment Built In and For The North
Country.

All Of Our Equipment Is Built In Mitchell, South Dakota



**Our Distribution
Facilities Are
Located In Carthage,
SD – 40 Miles From
The Factory.**

**Enertech's Newly
Expanded 40,000
sq. ft. Facility Is
An Ultra-modern
Operation.**



THANK YOU FOR YOUR TIME!

IF YOU HAVE ANY QUESTIONS

PLEASE FEEL FREE TO ASK!

OR CONTACT US ANYTIME.



Carthage, SD – 1-800-444-8583

www.energy-dynamics.com