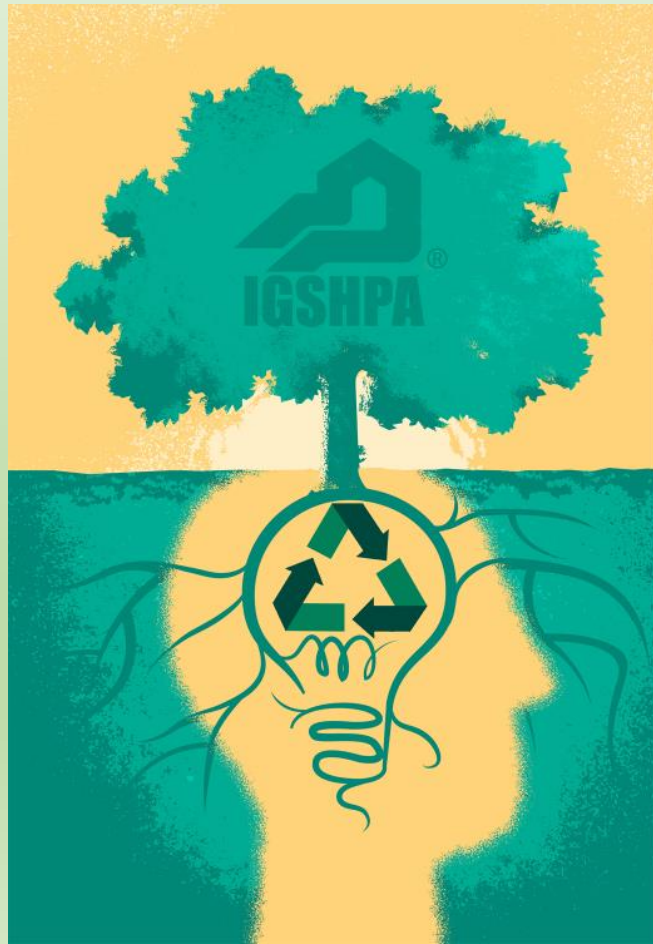


The Institutional Market and the Value It Presents to the Drilling and Geothermal Industry!

Jack Dienna, Executive Director

THE GEOTHERMAL NATIONAL & INTERNATIONAL INITIATIVE



Geothermal: The Genius Renewable

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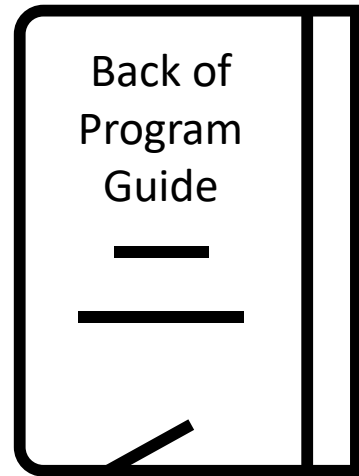


Las Vegas, NV

December 5-7, 2023

CEUs for this workshop

Be sure to scan the QR for Tuesday, Wednesday, and Thursday workshops to get points towards your IGSHPA certification CEUs



Important Places to Check Out!

2023 Conference Survey

We would like to get your feedback on future conferences. Please use the QR code to the right (for your laptop/desktop, go to <https://igshpa.org/2022conferencesurvey>) to complete a survey to let us know your preferences and suggestions. *Thank you for helping us build the Groundwork for Sustainability!!*



Get CEUs for Your Certification Renewals

Tuesday's Sessions

Scan the QR code to the right. For your laptop/desktop, go to: <https://igshpa.org/2023-conference-CEUs-TU>



Wednesday's Sessions

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Thursday's Sessions

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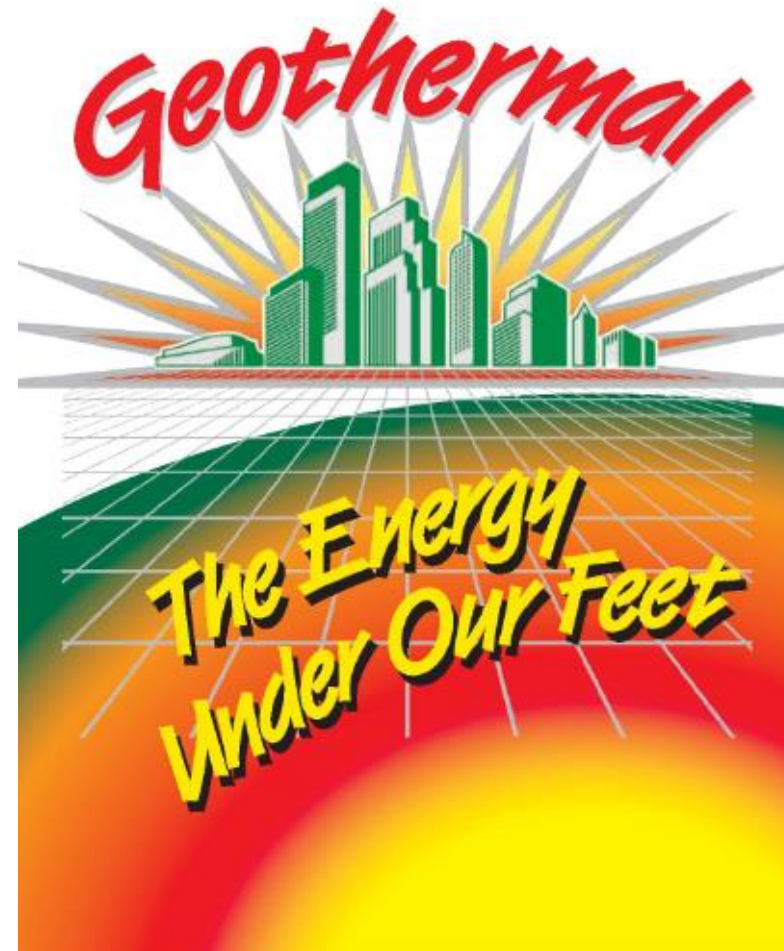
 **2023 Conference & Expo**
Las Vegas, Nevada



The Institutional Market and the Value It Presents to the Drilling and Geothermal Industry!

JACK DIENNA EXECUTIVE DIRECTOR

THE GEOTHERMAL NATIONAL & INTERNATIONAL INITIATIVE



Annual Conference, December 5 - 7, 2023 – Las Vegas, NV



Why would I become involved with Geothermal Technology?

Well for one thing, **Geothermal Technology** is finally being recognized as a valued **Renewable Thermal Asset** by US DOE (Consolidated Appropriations Act 2021), this along with the “Climate Change” narrative should have opened the flood gates for this technology.... But it hasn't. We are still having to fight the lack of awareness for not only the technology but more importantly the many benefits these systems bring to the table.

Another reason is that the **US DOE** states that **building energy use** accounts for over **36% of the primary energy used in the US** and **40% of the total energy used in those buildings** is for space conditioning & water heating.



What Buildings would have the most impact on the Geothermal Industry?

K to 12 Schools are the **second largest public infrastructure investment in the US & are one of the biggest energy consumers in the public sector. They spend over \$8 billion annually on energy.**

K to 12 Schools also consume about **8% of all energy used in commercial buildings and emits as much carbon dioxide as 18 coal powered generating plants.**



K to 12 Schools in the US

By the time a student graduates High School they have spent **15,600 hours** inside a school, 2nd only to the time spent at home.

There are **129,000 Public & private K to 12 schools** in the US with **3.6 million public & private school students**

According to the National Council for School Facilities the average age of a school building is **50 years old & 41% of those have failing HVAC systems!**



Geothermal Technology is healthier!

Reports from **research done by both Harvard and Yale** point to the fact that higher relative humidity (between 40% & 60%) impedes the transmission of respiratory viruses.

Heating only schools have a relative humidity between **10% & 20%**

Installing a geothermal system in a school **increases the relative humidity levels to 40% to 55%** which improves the health and safety of both students and staff.



What does this mean for the Drilling Community?

The total number of school buildings in the US is **129,000**, **41%** or **52,500** have HVAC systems that should be replaced with a geothermal system.

Breaking down that number equates to **28,000** Public PreK to 8 school buildings & **9,642** Public High Schools.

In the private sector there are **7,736** PreK to 8 school buildings & **1,480** High Schools.

The assumptions I will use is that a **PreK to 8 School building** is approximately **118,500 sq. Feet** and I will use **400 sq feet** per installed ton. that would equate to **296 tons** per school

With **High Schools** I will use **173,727 sq. feet** also **400 sq feet** per ton that would add up to **434 tons** per school.



What does this mean for the Drilling Community?

The Public sector PreK to 8 school buildings number 28,000 multiply by the 296 tons that equals 8,288,000 tons of capacity.

The Public sector high school number is 9,642 multiply that by 434 tons and that equals 4,184,628 tons of capacity.

The Private sector PreK to 8 school buildings number is 7,786 once again multiplied by 296 ton equals 2,305,000 tons of capacity.

The Private high school number is 1,480 multiplied by 434 ton equals 642,320 tons.

The total number of tons for all sectors is 15,420,000 tons divided by 400 Ft per ton that equates to 38,550, 400 ft bore holes



What does this mean for the Utility Community?

A study conducted by **Western Farmers CO-Operative** in OK found that every installed ton of geothermal heat pump capacity **reduced PEAK LOAD by .55KW.**

Given the total number of installed tons possible (**15,420,000**) in the PreK to 12 market that could result in a **peak load reduction of 28.03MW** using the renewable thermal asset as the catalyst.

This would also result in an emissions reduction using a **non-wires non-pipeline alternative** to support the utilities climate goals.

This could also become a rate based new business opportunity for the utility in the ownership of the ground loop for the geothermal heat pump systems.



The Anchor Tenant Concept a True “Networked” System!

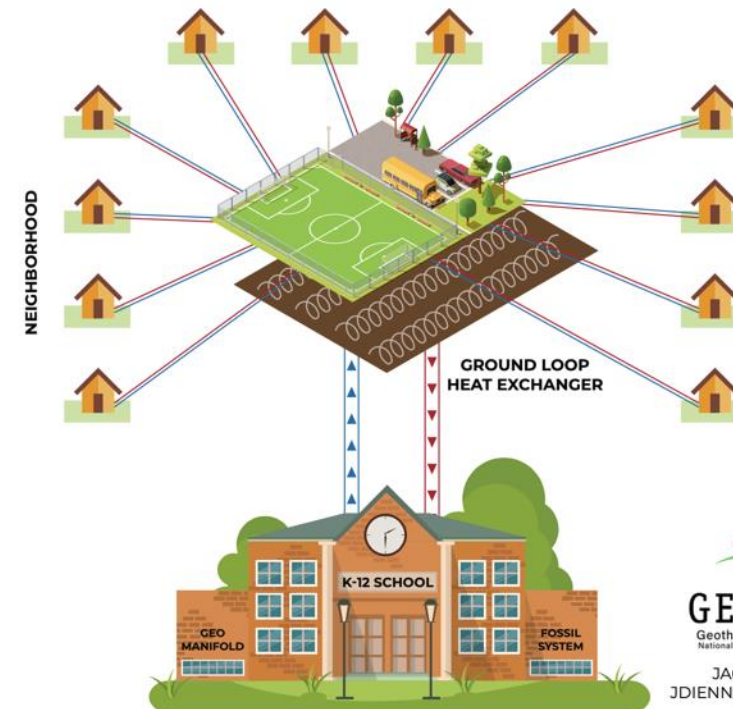
The system I am proposing is one that **uses the Pre K to 12 school as the Anchor tenant** and the **loop field branching out to the surrounding community.**

The system would be designed at **100 % capacity for the school** but loop field may be increased to include any of the surrounding houses that agree to install a geothermal system.

This initiative has a number of benefits, it takes advantage of the diversity of the system, the main needs of the school are opposite that of the surrounding residential customer.

It ensures that the system will have a major client and can promote the technology to the students & staff.

Anchor Tenant Concept / Initiative




GEO-NII
Geothermal Heat Pump
National & International Initiative
JACK DIENNA
JDIENNA@GEO-NII.ORG

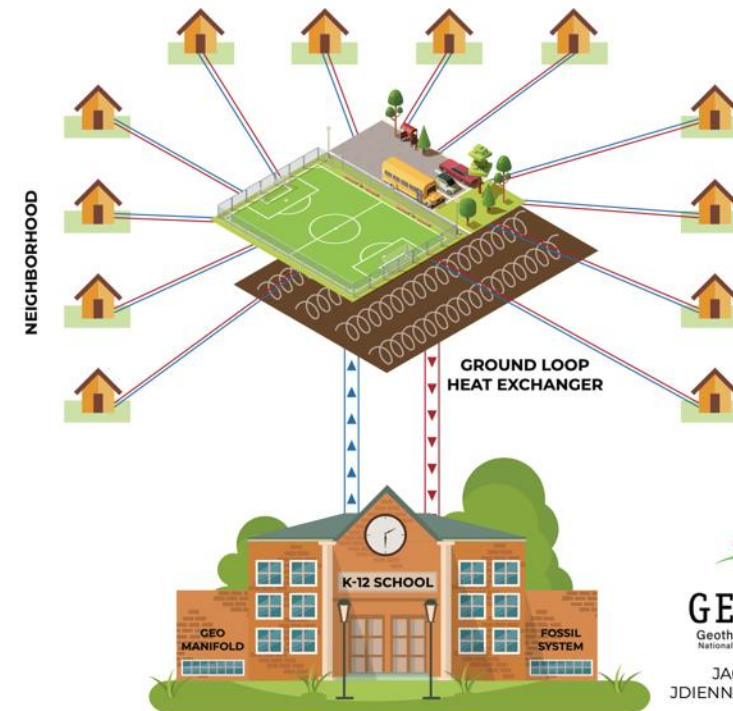
The Anchor Tenant Concept a True “Networked” System!

By using K to 12 Schools as the “ANCHOR” for a network geothermal system, it not only promotes a better learning environment but serves as an educational and **solid marketing tool for the residential market**. It gives us 25 “geo promoters” per classroom.

Lastly it supports a safer and healthier learning environment for our **greatest asset..... Our KIDS!**

Remember Geothermal Heat Technology is not only **Revolutionary, it’s Evolutionary!**

Anchor Tenant Concept / Initiative




GEO-NII
Geothermal Heat Pump
National & International Initiative
JACK DIENNA
JDIENNA@GEO-NII.ORG



What does this mean for the Geothermal Community?

The biggest impact is going to be for the **manufacturing community** based on the assumptions I made for the PreK to 12 school market. The **total tonnage was 15,420,000 tons of geothermal heat pumps**, this would mean that all of the manufacturers would have to increase production by **100 times** what is being done now.

That would increase their workforce and the capacity of their manufacturing plant etc.

The design community would have to increase the number of **Certified Geothermal Designers (CGD)**, through **IGSHPA** as this is the “gold standard” for designing commercial or institutional geothermal systems.

There would be a need for an **increase in the IGSHPA certified installer network as well.**



What should be my next steps, as a driller or drilling company if I want to pursue this?

1. Obtain an IGSHPA Driller's certification when it becomes available.
2. Formulate relationships with utilities, design engineers & geothermal installation companies through IGSHPA.
3. Develop a resume' of commercial projects that you have completed, market your company & services. Be aware of possible projects.
4. If you have none institutional work previously, work toward getting some through the network you will develop using step #2.



What does this mean for the Geothermal Community?

This initiative will impact every part of the geothermal community from Drillers, Installers, Designers and the ancillary equipment like the manufacturers of pipe, the drilling equipment and most of all the drill rigs. Which brings to mind a quote from a famous British philosopher, GTD Simon who stated...

REMEMBER...
NO HOLE NO BOX!

So this is a call to action for the Drilling community and it is also a call to action for the Geothermal community.



THE GEOTHERMAL NATIONAL & INTERNATIONAL INITIATIVE

If you have any questions...

Or need further information,

Please contact me at 610-659-4998

or email me at jdienna@geo-nii.org



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