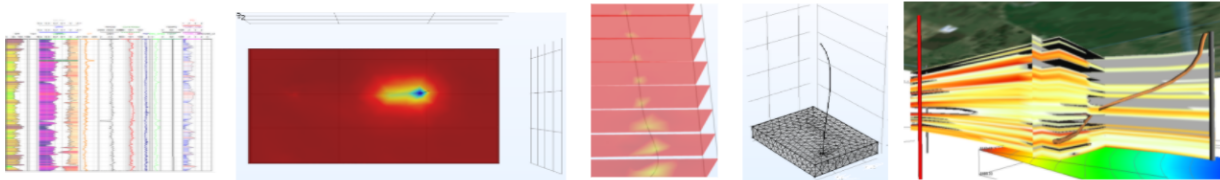


Planning Projects for Direct Heat Solutions Anywhere

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Summary

There are a combination of situations and technologies that make planning and implementing Geothermal Projects ideal in Canada and the US. Geothermal heat is available anywhere on earth but since we are not on the Ring of Fire in Western Canada, we need to adjust our exploration philosophy. Instead of only looking for geothermal energy hotspots on earth we should be concentrating on bringing direct heat and making it work anywhere people are. Going deeper for heat is a good solution, however several combinations of factors will be important to optimize investments, improve project economics and reduce payouts of long term projects.

Theory / Method / Workflow

Geothermal project heating/electricity needs for buildings, communities or businesses need to be based on stable heat for 30 to 50 years. In order to get the right geothermal energy over time we need to design innovative schemes to retrieve heat that involve new schemes. By that we mean modelling and characterization of rock, fluid and thermal properties of the rocks and heat simulation using both vertical and horizontal well configurations. Proposed closed loop systems are safe and can be implemented with a small surface footprint.

There will be a much faster uptake of geothermal wells in the coming years, as part of sustainable green solutions in the face of increasing environmental concerns and the unrelenting energy demands. With the cost of Carbon/CO₂ going up, any method to displace it is a winner for the environment. A large part of our energy use is heating homes and businesses with Oil & Gas resources. In a transition to reduce CO₂, other renewable energy sources need to be considered. Geothermal heat is a base load heat source, constant, reliable and available 24/7. Minimal CO₂ impact once installed, it is scalable. Compared to solar and wind Geothermal Energy Resources has a much lower footprint for implementation, it is considered green and available anywhere under our feet in our cities. It's a new resource and requires

the will and technology from the Oil & Gas side to make it work.

Results, Observations, Conclusions

The presentation will further explore the processes and geological/geophysical considerations for moving from raw Oil & Gas data to green heat at the surface where we need it.

Consulting through 40 years of practice on the Oil & Gas side are providing the path to renewable energy space for direct heat for buildings with emphasis to closed-loop systems that work like radiators. Since no fracking / stimulation is involved it is easier to implement the concept anywhere. Other systems where natural permeability and fractures are present, injector/producer pairs can also work at desired depth.

Since rock and heat properties vary and are very specific, project area needs to be modelled geologically, geophysically and thermal conductivities need to be characterized. Creative combinations of well designs in various depth and rock types need to be designed and Simulated for energy recovery. Resulting Heat modelling would be used to find the sweet spot for best economic returns of sustainable designed heat for long term forecasts.

Acknowledgements

United Geothermal Inc. <https://www.unitedgeothermal.ca/>