

Watt's Happening? #256

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GEOTHERMAL ENERGY

Is it the next big thing?



The rig in this photo looks very familiar to most folks across northeast British Columbia and Alberta. But no, this rig is drilling for heat, not oil or gas. Thanks to new Canadian technology, you don't have to be in

Iceland (where this photo was taken) to harvest the infinite clean resource of geothermal energy: you can do it anywhere now, and that includes northeast BC and Alberta!

There is infinite energy beneath our feet. It's non-polluting and will last forever. Best of all, it provides a clear pathway for oil and gas workers to transition to sustainable energy. It's called geothermal.

INFINITE CLEAN ENERGY

The molten iron core of the Earth sits at a temperature of about 5,500 C, a bit hotter than the outer layers of the Sun. This immense heat energy radiates up through the earth to the surface, so that

just 8 or 10 meters down the ground temperature sits at about 12 C. year around, never changing. For every kilometer you go down, that temperature increases by about 25 C. Get down a few kilometers, and it's hot!

That's a lot of energy, and modern heat pump technology can easily and very efficiently extract that heat, concentrate and use it for everything from heating buildings to generating electricity.

Like solar and wind energy, geothermal energy not only lasts forever, it creates no pollution

during operation. But better than solar and wind, geothermal is “base load power”. Like hydro electric, geothermal can run night and day, 24/7, year around.

GEOTHERMAL FOR YOUR HOME

Small scale geothermal (properly referred to as “geoexchange”) is quite commonly used for space heating and has been in use for decades. Several schools, homes and businesses in my area of the BC Peace Region are heated with geoexchange systems.

Fluid is pumped through pipes in shallow trenches or bore holes drilled vertically into the ground, and can efficiently extract shallow ground heat and concentrate it to heat buildings at very low cost and very high efficiency.

But if you want to power the world with ground-source heat, you have to drill deeper, much deeper, where it’s really hot.

ANYWHERE ON EARTH

It used to be that to find a good geothermal resource we had to look for especially hot areas underground. Volcanic Iceland is well known for its use of geothermal energy for heat and power. 90% of all homes there are heated by geothermal energy.

But that’s a pretty special case. There are only a few places in the world where you can find a hot underground aquifer to extract hot liquid to generate usable energy.

But the latest tech overcomes this problem. Basically it uses the same “pumping a fluid through underground pipes and extracting the heat with a heat pump” technology that is used in geoexchange, but going much deeper and scaling the systems way up.

With advanced directional drilling technology, we no longer need to look for rare underground hot spots. Like geoexchange, we can do this new tech anywhere on the surface of the Earth, and it can be scaled up to produce huge amounts of base-load heat and electricity.

And here is another cool thing about advanced closed-loop geothermal: when you get down a few kilometers where it is always hot, the thermosiphon effect of a hot fluid rising will naturally cause the fluid to circulate up to the surface and back down again. A perfect closed loop, and no pumping!

JOURNEY TO THE CENTRE OF THE EARTH

One company pushing rapidly ahead with closed loop geothermal is Eavor (pronounced “Ever”) based in Calgary. Their website (Eavor.com) says: “No water Use, No fracking, No earthquake risk, No aquifer contamination, No greenhouse gas emissions.”

Their system requires no connection to the outside world, can fit in your back yard or power whole cities, operates without fuel and is completely emission-free.

Eavor’s first demo project was near Rocky Mountain House, Alberta in 2019 and another test site in New Mexico has reached a depth of 5,500 meters (18,000 ft) and found temperatures of 250 C.

Their first commercial project is now being built in Germany to produce both heat and electricity. Many more are planned as they perfect their technology and scale it way, way up.

MUCH LIKE OIL AND GAS

Much like oil and gas, geothermal involves large scale directional drilling. The skills, equipment and expertise needed in both industries are very similar, opening huge clean energy opportunities in both northeast BC and across Alberta.

We already have exactly what is needed to become world leaders in geothermal energy technology. This is good news for everyone working in the conventional energy industry, and everyone living on planet Earth.

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