

Science & Technology

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The man single-handedly taking on Zambia's big issue: Energy

By Ione Bingley

Constant power cuts are stifling economic growth in Zambia and the pressure is on to find a new energy source to match its booming mining industry and growing middle class. CEO of Kalahari GeoEnergy, Peter Vivian-Neal is on a mission to tackle the energy crisis with, arguably, the most mysterious form of renewable energy: Geothermal.

A mining man originally, Vivian-Neal moved to mineral-rich Zambia because, in the words of city gold mogul Algy Cluff, "there's no gold in the Surrey hills". When his mining company was bought out in 2010 he found himself casting around for a reason to stay.

Watching an egg being boiled in a puddle on safari, he began to ponder the geological reasons behind Zambia's hot springs and decided to figure it out for himself, two years on and he was deep into geothermal.

"I discovered, having looked at the whole country, by myself, and on nobody else's money, that there were some geological scenarios where geothermal could work here and we went from there."



Most renewable options require a backup energy source because their power output is affected by inconsistencies in the power supply, like the wind or the sun. If there is a storm or no wind then energy will not be generated and may fail to match the demand. Geothermal energy is special because the heat from the ground is constant, totally reliable, totally green and totally abundant.

"If only 1% of the thermal energy contained in the uppermost 10km of our planet could be tapped, this amount would be 500 times that contained in all oil and gas resources of the world," states the US geological survey 2003.

Large pools deep underground hold ancient water that is very hot.

Geothermal energy harnesses the heat held within the Earth's crust by pumping that hot water out and using it either directly, as hot water for homes and industry, or indirectly, to power turbines to create electricity. The water is then pumped back into the ground under the same pressure so there is no risk of tremors or sinkholes. (seismic activity)

At the moment, 96 percent of Zambia's power comes from hydroelectric energy and with climate change causing lower water levels and a heightened risk of drought, supply is struggling to meet demand and is at risk of destabilising the economy if key mining investors take their business elsewhere.

With 60 percent of the total energy

produced by the dam being sapped by the mines and a quarter going to agriculture and to neighbouring countries, the people are left to fight over just 25 percent of it.

"Every single day there's no power for 5, 6 sometimes 8 hours. There isn't enough electricity to go round so they'll shutdown one area for a while and then they'll shut down the next area so what power there is, is spread out. It's called load shedding and it doesn't happen in Europe but it does happen in Africa and that's simply because there isn't enough capacity," explains Vivian-Neal.

Due to the lack of electricity, the people have turned to the biodiversity-rich and ecologically important forests for charcoal to make cooking fires. The charcoal is openly sold all along the roads and is neither illegal nor officially legal, it is merely tolerated, and has greatly accelerated the rate of deforestation.

Many of the Zambian people rely heavily on the forest ecosystem for their livelihood, but according to leading environmental knowledge hub REDD, Zambia has the second worst deforestation rate in Africa. Zambia is also home to 12,505 species in 14 different ecosystems including 85 species found on the IUCN Red List including the African elephant, the pangolin and the white rhino.

With geothermal plants already providing, what they claim to be, nearly 50 percent of their total energy requirements in Kenya. True or not, it is a success story giving hope to the Kalahari GeoEnergy team. And while Vivian-Neal believes Zambia's energy crisis is so huge that "no one is going to solve it single handedly", he is confident that he will be adding his new power to the mix very soon.