

Energy In Abandoned Wells

Oil prices bottoming out have slashed thousands of jobs in Alberta and unemployment rates have risen just as dramatically as revenues have declined. The number of people out of work sits in the tens of thousands and unemployment among young people stands at close to [14 percent](#) according to the latest figures from the provincial government.

The floor price for Alberta bitumen stood at a mere [\\$10.00 CDN](#) at the start of 2016, allowing wells to run dry as oil and gas companies turned off the taps. The number of abandoned or suspended wells is astonishing. In late October, the [media](#) widely reported that according to a research note by Director at RBC Capital Markets, Shailender Randhawa, almost 100,000 wells dried up in the previous six months thanks to the plunge in prices.

Findings similar to what the provincial energy regulator found. According to a report from the Alberta Energy Regulator (AER), numbers from the same time frame indicated that of the hundreds of thousands of wells drilled in the province, close to 80,000 sit suspended or abandoned. Even more astonishing is that a province, once rich in energy cash flow, is now on the hook for billions. Conservative estimates by the AER indicate it will cost [\\$30 billion](#) dollars to clean up and restore dormant wells. This number could easily rise as more producers cease operations, potentially leaving the people of Alberta with a huge clean-up bill.

All of this comes at a time when Alberta is facing added pressure from all levels of government to further green their energy system. Under the NDP government and Premier Rachel Notley, the [Renewable Electricity Program](#) is looking at ramping up renewables with the goal of having them power one-third of the grid by 2030.

This once wealthy province is now at a critical juncture. Ironically, the same industry that has long been blamed for Canada's climate woes may play a critical part in finding a clean energy solution. Beneath the surface of the earth, at the base of these dormant wells, there sits a tremendous amount of thermal energy and the team at [Terrapin Geothermics](#) is looking to tap into this unused heat and turn it into renewable electricity. Their discovery could breathe life into Alberta's economy, putting people back to work while producing renewable energy from abandoned oil and gas wells.

Geothermal energy is energy from beneath the Earth. As you travel below the planet's surface there is a huge amount of heat. Temperatures hitting highs of thousands of degrees Celsius, similar to the surface of the sun. This continuous flow of heat beneath Earth provides a tremendous opportunity for renewable energy that is capable of providing electricity around the clock.

"For traditional geothermal you need temperatures of 140-150 degrees," stated Sean Collins, President, Terrapin Geothermics.

One challenge in colder climates is that drills must go to deeper depths in order to reach such high temperatures. Through mapping out geothermal reservoirs in the province, the team discovered a tremendous amount of lower-grade heat sitting at the base of oil and gas wells.

"Throughout the province there are hot flowing liquids that are in the 60-120 degree range but not a lot of options as to what people can do with it," said Collins. "It's not hot enough to make steam or drive a turbine so that heat is lost."

That left few options for this resource. At least that was the case up until now. Terrapin Geothermics developed a low-efficiency engine designed to work with Alberta's ambient air temperatures, making it a viable geothermal solution for colder climates and colder heat. Their engine can produce electricity in temperatures as low as 60 degrees, harnessing energy that is left

behind in abandoned oil and gas wells and turning it into clean, renewable electricity.

“The design itself is incredibly simple with few moving parts and very little required maintenance,” according to Jack Bainbridge, Director of Engineering and Technology, Terrapin Geothermics. “We've used standard oil-field components where possible, and our engine will be maintainable by pipe-fitters and mechanical shops that already exist in this province.”

The engine's versatility allows it to also be used on active oil and gas wells and in other industrial facilities that produce waste heat. It's also an affordable energy solution as there is no fuel cost or well-drilling required. Low-grade geothermal energy production would also eliminate the problem of having power disruptions from solar or wind.

“Renewables need coal or gas back up. We need to transition to another baseload source and these are things we are already good at,” according to Collins. “We have the skills and expertise here to do this.”

Partnering with municipalities and industry, Terrapin's invention is capable of bringing geothermal energy to colder climates across the globe while revitalizing once abandoned wells. This new take on geothermal can also eliminate a potential multi-billion dollar liability, finding a new purpose for hundreds of thousands of oil and gas wells across Alberta while putting people back to work. It's an innovative step forward, putting the province on a path to sustainable development and economic growth.