

There's an enormous geothermal pool under the Latrobe Valley that can provide cheap, clean energy

December 2 2021, by Graeme Beardsmore



Credit: AI-generated image ([disclaimer](#))

About 650 meters beneath the Latrobe Valley, the heart of Victoria's coal country, lies a little-known, naturally hot 65°C pool of water in an enormous aquifer.

This aquifer is a source of geothermal [energy](#)—a renewable source of [heat](#) or electricity that is, so far, being used [to heat an aquatic center](#) in the town of Traralgon. They chose it—over [natural gas](#), coal-fired power or even emissions-free solar and wind—because geothermal energy is now the cheapest option for heating.

The hot aquifer was [first reported](#) as long ago as 1962, when government geologist J.J. Jenkin noted many "occurrences of high temperature waters in East Gippsland." We now know the hot [water](#) underlies about 6,000 square kilometers of Gippsland, from Morwell in the west to Lakes Entrance in the east, and holds the equivalent of [A\\$30 billion](#) of heat at today's natural gas price.

But with natural gas flowing from Bass Strait, and vast reserves of brown coal in the Latrobe Valley, there has been little incentive to develop [alternative energy sources](#). With the coal era now drawing to a close, it's time we made better use of this vast, clean source of energy to help cut national emissions and ease the energy transition.

Geothermal energy around the world

The core of the Earth is about the [same temperature](#) as the surface of the sun. That vast internal heat is like a hotplate warming natural groundwater from below. Beneath the Latrobe Valley, thick coal layers act like a blanket, which makes the underlying aquifers hotter than aquifers in other locations.

The result is unusually hot natural water without needing to burn any fossil fuels—emissions free. At deeper depths we can capture natural steam, and use it to turn turbines for a generator.

In many parts of the world, natural hot water already provides sustainable, low emissions heat to a wide range of residential and

industrial consumers.

In carrying out a recent [global scan of energy production](#) from hot aquifers, I learned large parts of suburban Paris are heated by geothermal energy from a hot (56–85°C) aquifer between 1,600 and 1,800m beneath the city.



Credit: AI-generated image ([disclaimer](#))

In the Netherlands, industrial scale greenhouses are replacing their natural gas heating systems with geothermal heat from aquifers, 1,800-2,200m below the surface.

Beijing is one of the world's leading urban centers using geothermal energy. Wells as deep as 2,600m produce up to 70°C water for many

industrial purposes, from winter heating for hotels and factories, to greenhouse cultivation, to public geothermal bathing pools visited by as many as 50,000 people per day.

On a smaller scale, a town in Hungary circulates natural hot water (64–72°C from 1,450–1,700m depth) through a network of distribution pipes. And Perth, Western Australia, uses natural hot water (40–52°C from 750–1,150m) to heat at least 14 leisure and aquatic centers.

Importantly, in almost every case, the water itself is returned to the [aquifer](#) after delivering its heat. In other words, water is not consumed in the production of geothermal energy, making it renewable and sustainable.

When compared to geothermal systems around the world, it's obvious natural hot water beneath the Latrobe Valley, at only 650m depth, is a truly world class geothermal energy resource that has, until now, been largely overlooked.

A cheaper alternative to gas

It's a lot cheaper to drill a 650m bore than a 1,500m or deeper bore. This means it's cheaper to produce geothermal energy in the Latrobe Valley than many places where geothermal energy already provides economic advantage.

In fact, geothermal heat is very likely a much cheaper alternative to natural gas. Since Australia began exporting liquified natural gas out of Queensland in 2015, the wholesale price of natural gas in eastern Australia has [roughly tripled](#) and is [projected](#) to rise further and remain high.

The higher price of natural gas affects the economy across the whole of

Australia. The [federal government](#) estimates 40% of energy Australian households use is for heating and cooling, and a further 23% is for water heating. A [2019 report](#) commissioned by the Australian Renewable Energy Agency found 52% of energy used by the nation's industrial sector is consumed as heat.

But there are other long-term benefits the geothermal energy resource could deliver to the Latrobe Valley.

Victoria's heavy reliance on natural gas for heat also presents a huge challenge for the state to meet its [legislated](#) greenhouse gas emission reduction targets of net zero by 2050.

Under this plan, the remaining coal-fired power plants in the Latrobe Valley are all scheduled to close in the coming years and decades, requiring support for workers to be reskilled.

Producing [geothermal energy](#) from hot aquifers can help on both fronts: by avoiding greenhouse-gas emissions and by reemploying skilled workers into new industries.

What's next?

I'm working closely with a number of stakeholders—including the Latrobe City Council, the Latrobe Valley Authority, the Geological Survey of Victoria, local businesses and community groups—to help [realize the potential](#) of this massive, undervalued source of clean energy.

We seek to better understand and sustainably develop this resource to help Australia meet its emissions reduction targets, and to bring the price of energy down.

This [includes projects](#) such as mapping, investigating the potential for

power generation from deeper hotter rocks, and identifying and clearing policy and regulatory barriers.

The lessons we learn in the Latrobe Valley will carry across to other parts of Victoria and Australia—such as the Mornington Peninsula, Otway coast, and the Great Artesian Basin spanning NSW, Queensland and South Australia—where [hot water](#) is known to lie deeper, but still very accessible.

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