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# Steps to an Energy [R]evolution Geothermal



[www.greenpeace.org.au/energyrevolution](http://www.greenpeace.org.au/energyrevolution)

## Geothermal: more around the clock power than we'll ever need

When people think of renewable energy technologies that supply steady, predictable electricity around the clock, geothermal often springs to mind. Five renewable energy technologies are able to do this, but geothermal has the potential to dominate this part of the electricity market in the long term. Several kilometres beneath Australia lie some of the best geothermal resources in the world. Demonstrating this technology in Australia on a large commercial scale will be a springboard to providing some of the most efficient and reliable renewable energy on offer.

▶▶ Australia's entire electricity needs could be met by harnessing a fraction of one percent of our geothermal resource.

▶▶ Geothermal is an ideal substitute for coal-fired electricity, and uses much of the same technology used to create electricity with a steam turbine.

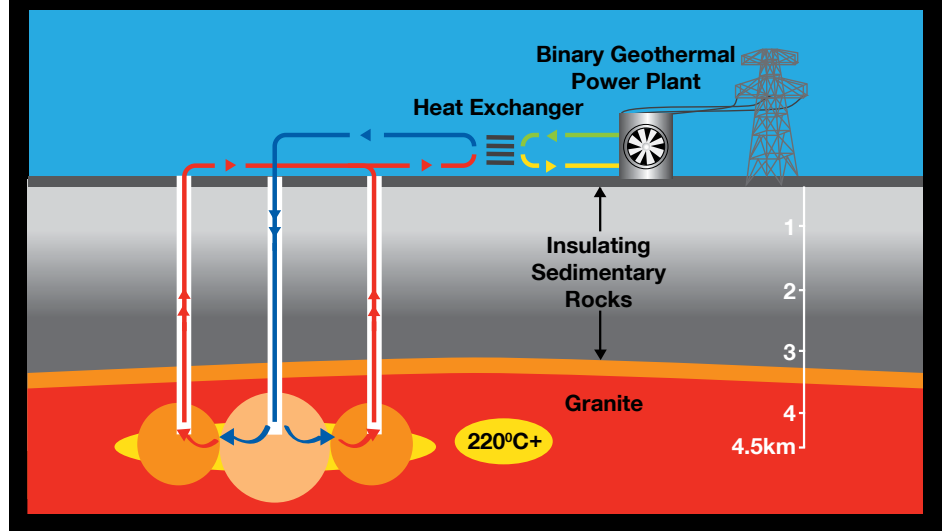
▶▶ The Energy [R]evolution scenario shows that by 2020, geothermal power could provide 7% of Australia's electricity, providing over 2,700 Australian clean energy jobs.

## Geothermal power – how it works:

There are several types of geothermal energy, all of which result in producing steam to spin a turbine and create electricity. In that sense, it is doing just what a conventional power station does, but substituting polluting fuels like coal for clean energy. In many parts of the world, "wet" geothermal technology sources steam directly from beneath the surface in volcanic regions, which is then used for electricity generation and heating needs.

Australia's geothermal resource is referred to as "hot dry rock". Kilometres beneath the Earth's surface, geologic layers can be found that are over 220°C. A geothermal energy rig consists of two to three wells that drill down to the hot rocks and a turbine on the surface. Water is pumped down one well which, once it reaches the hot rocks, heats up to create pressurised steam. That steam rises back to the surface through the other wells. This creates a "closed loop" system where the steam reaches the surface and is used to spin the turbine, generating electricity, before being cooled back to water, after which it is re-circulated through the loop.

### Diagram of how Geothermal Power works



## Geothermal power around the world

Currently, about 10,000 Megawatts of geothermal power is in operation around the world, and 40 countries either have or are building geothermal energy. The United States has the most geothermal energy installed, while the Philippines and Indonesia are also high on the list, having tapped their "wet" geothermal resources, which are common in tropical regions.

The US dominance of the geothermal industry is set to continue, as they build another 5,000 Megawatts, with another 3,000 Megawatts in development elsewhere around the world.

## The potential for geothermal power in Australia

It has been said of our geothermal resource that harnessing just 1% of it would be enough to power Australia's electricity needs more than 26,000 times over. The combined baseload power needs of New South Wales and Victoria could be met with the geothermal resource that is technically accessible in South Australia's Cooper Basin. One study has indicated that, by 2050, geothermal energy could provide enough electricity to power 7 million homes.

Modelling commissioned by Greenpeace has revealed it is technically possible that, by 2020, all of Australia's greenhouse-polluting coal-fired power stations could be replaced with a combination of seven renewable energy technologies and energy efficiency. As geothermal will require a few more years to scale up, our Energy [R]evolution model sees geothermal making a sizeable impact on Australia's energy supply from about 2016.

By 2020, Geothermal would be able to supply about 7% of Australia's total electricity needs, effectively allowing us to retire about 2,600 Megawatts of coal-fired power plant (the equivalent of Bayswater power plant) and reduce our greenhouse pollution by 16 million tonnes per year. Doing so would create over 2,700 direct clean energy jobs.



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## How can we deliver geothermal power in Australia?

Australia urgently needs policies that revolutionise how we produce and use energy, moving us to zero-emission and energy efficient power as soon as possible. Governments must introduce policies that ensure no new coal-fired electricity plants are built, and the renewable energy industry is able to meet its full potential.

Because geothermal plants will be built on a much larger scale than ocean, wind or solar PV, it is important that this technology is provided with substantial public funding to put the earliest projects in place and lower costs for the industry going forward.

Long-term, it is essential that Australia introduce a national feed-in tariff policy that gives space for all renewable energy technologies to meet their potential. Feed-in tariffs pay generators of renewable energy a premium rate for the electricity they provide. As this rate is guaranteed for around 20 years, it provides the industry with long-term certainty and confidence to develop their industry, creating Australian clean energy jobs.

## You can make the Energy [R]evolution happen!

We need Australians to use their power, as consumers, voters and active members of the community to help make the Energy [R]evolution a reality. The planet is teetering on the verge of triggering catastrophic climate change but we have the solutions to prevent it. You can:

- ▶ **Stay informed** – visit the Greenpeace website: [www.greenpeace.org.au/climate](http://www.greenpeace.org.au/climate) to sign up for our monthly emails or learn more about climate and energy issues.
- ▶ **Contact your local MP** – use your power as a voter and make sure your local politicians are aware that this issue matters to you.
- ▶ **Put your savings to work** – like all working Australians, you've got savings in a superannuation fund. Unfortunately, the chances are that your hard-earned savings have been used to invest in risky, unsustainable, coal-fired power stations. Super funds have a legal obligation to consider inquiries from members – so write to yours and ask them to stop investing in coal and start investing in renewables.