**Geothermal Power**

[](https://en.wikipedia.org/wiki/File:Geothermal_drills_near_Taupo_I.jpg)

New geothermal drilling north of Taupo (2007).

[**Geothermal power**](https://en.wikipedia.org/wiki/Geothermal_power)**in New Zealand** is a small but significant part of the [energy generation capacity of the country](https://en.wikipedia.org/wiki/Electricity_sector_in_New_Zealand), providing approximately 13% of the country's electricitywith installed capacity of 854 [MW](https://en.wikipedia.org/wiki/Megawatt). New Zealand, like only a small number of other countries worldwide, has numerous geothermal sites that could be developed for exploitation, and also boasts some of the earliest large-scale use of geothermal energy in the world.

Geothermal energy has been described as New Zealand's most reliable renewable energy source, above wind, solar and even hydroelectricity, due to its lack of dependence on the weather. It has also been described as the currently (2000s and 2010s) most attractive new source of energy for New Zealand, as petrochemical fuel prices rise and easy hydro power sites have been tapped - though some warn that the easier geothermal sites now have also been built on, making future large-scale projects more cost-intensive.

**Tidal Power**

Tidal power is generated by capturing some of the energy in the tides as they cycle forth and back, twice each day. Tidal devices can be [weir](https://en.wikipedia.org/wiki/Weir) or dam like structures ([barrages](https://en.wikipedia.org/wiki/Barrage_(dam))), used to hold the tide back, or turbines anchored within the tidal stream.

By world standards, New Zealand's tides are, for the most part, moderate. The tide usually ranges between one and two metres. Tidal currents are usually around two kilometres per hour (one knot). Some exception are in and around [Cook Strait](https://en.wikipedia.org/wiki/Cook_Strait), where tidal currents can be much stronger, and at the entrance to some harbours, particularly [Kaipara Harbour](https://en.wikipedia.org/wiki/Kaipara_Harbour). Headlands and constrictions like these focus the currents, giving energy levels reaching 750 W per square metre.

**Wind Power**



This demonstration wind turbine in [Brooklyn](https://en.wikipedia.org/wiki/Brooklyn,_Wellington,_New_Zealand), [Wellington](https://en.wikipedia.org/wiki/Wellington), was New Zealand's first turbine. It has since been upgraded. It was in operation for 22 years from 1993 to 2015.

[Wind power](https://en.wikipedia.org/wiki/Wind_power) in [New Zealand](https://en.wikipedia.org/wiki/New_Zealand) generates a small but growing proportion of the country's electricity. As of 2016, wind power accounts for 690 MW of installed capacity and over 5 percent of electricity generated in the country.

New Zealand has abundant wind resources. The country is in the path of the [Roaring Forties](https://en.wikipedia.org/wiki/Roaring_Forties), strong and constant westerly winds, and the funneling effect of [Cook Strait](https://en.wikipedia.org/wiki/Cook_Strait) and the [Manawatu Gorge](https://en.wikipedia.org/wiki/Manawatu_Gorge" \o "Manawatu Gorge) increase the resource's potential. These effects make the Lower [North Island](https://en.wikipedia.org/wiki/North_Island) the main region for wind generation. About 70 percent of the nation's current installed capacity lies within this region, with some turbines have a [capacity factor](https://en.wikipedia.org/wiki/Capacity_factor) of over 50 percent in this area.

**Hydroelectric Power**

[](https://en.wikipedia.org/wiki/File:Roaring_Meg_Power_Station_Otago_Aug_2007.jpg)

[Lower Roaring Meg power station](https://en.wikipedia.org/wiki/Lower_Roaring_Meg), part of a small scale scheme commissioned in 1936.

**Hydroelectric power in New Zealand** has been a part of the country's energy system for over 100 years and continues to provide more than half of the country's electricity needs. Early schemes such as the Waipori scheme commissioned in 1903 and the [Lake Coleridge](https://en.wikipedia.org/wiki/Coleridge_Power_Station) power station commissioned in 1914 established New Zealand's use of renewable hydro energy.

By the early 1950s, over 1,000 megawatts (1,300,000 hp) of installed capacity was from hydro energy. By the early 1960s, most North Island hydro sites had been developed while the South Island still had many potential sites. The commissioning of the [HVDC Inter-Island](https://en.wikipedia.org/wiki/HVDC_Inter-Island) link in 1965 made it possible to send large amounts of electricity between the two islands, and from that time hydro capacity in the South Island increased rapidly. Major developments included the 540 MW [Benmore Power Station](https://en.wikipedia.org/wiki/Benmore_Power_Station) (1966), the 700 MW [Manapouri power station](https://en.wikipedia.org/wiki/Manapouri_Hydroelectric_Power_Station) (1971), the 848 MW Upper [Waitaki River](https://en.wikipedia.org/wiki/Waitaki_River) Scheme (1977–85) and the 432 MW [Clyde Dam](https://en.wikipedia.org/wiki/Clyde_Dam)(1992). By the mid-1990s, hydro capacity had reached over 5,000 MW, and remains around this level today.

In 2014, hydro generation produced 24,094 gigawatt-hours (86,740 TJ) of electricity, representing 57% of the total electricity generated.[[1]](https://en.wikipedia.org/wiki/Hydroelectric_power_in_New_Zealand#cite_note-1) The percentage of New Zealand's electricity provided by hydro generation has been between 50% and 60% for the last decade, compared with a high of 84% in 1980.

**Biofuels**

Biodiesel, bioethanol and biomass (generally in the form of wood) are all used in New Zealand as a source of renewable energy.