

# Keep Calm and Use Geothermal Energy

*Did you know that geothermal energy is a renewable source of energy? A renewable source is a power source that can produce energy forever! Many countries are already using geothermal energy around the world, and it will play an important role in obtaining the goal of carbon neutrality in the future. There needs to be more development to make geothermal cheaper so that more people can have access to this type of energy.*

## But what is geothermal energy?

Geothermal energy is generated from the heat stored from the earth's core. So, it is limitless. It can be used for heating, like heating a pool or a home. It can also be used to generate electricity and then use that electricity for cooling. Any appliance can work with the electricity obtained from geothermal energy.

Unlike fossil fuels, geothermal energy is harmless to our planet because it does not produce greenhouse gases. Thus, it does not contribute to climate change.

Globally, geothermal energy is produced by more than 20 countries. In 2017, total geothermal production was 13,171 MW (megawatts). The top 10 producers were: the U.S., the Philippines, Indonesia, Turkey, New Zealand, Mexico, Italy, Iceland, Kenya, and Japan in 2017. [1]

The value of the total production of geothermal energy is now close to 5 billion U.S. dollars. This is still a small share of the total energy market but there are large opportunities for future growth. In the Philippines, for instance, geothermal energy already supplies 12% of the country's energy needs. [2]

One may think that the Philippines are in a unique position for producing geothermal energy because they have many volcanoes. However, there are also opportunities for exploiting geothermal energy in countries like Switzerland that do not have volcanoes.

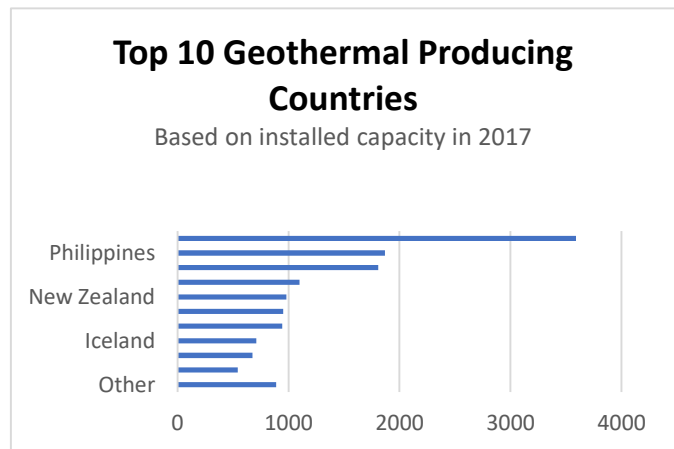


Diagram of the top ten geothermal energy users around the world made by Anna and Magda

While Switzerland is not among the top users globally, geothermal energy is also important in this country, and it will become even more important in the future.

In Switzerland, the government has set a goal to become CO2 neutral by 2050. Geothermal energy will be an important

component in reaching the goal of carbon neutrality. [3]

Thanks to its many hot water sources, Switzerland has a vast potential for increasing its production of geothermal energy. Exploiting these new sources of energy will be expensive. However, this will not be a problem because Switzerland is a rich country that has the needed financial resources.

Today, almost 15% of Swiss heating systems use geothermal heat pumps. [4] Studies show that by 2050, this share will reach 25%. [5]

In Geneva, the government would like to have 80% of new buildings running on renewable energy in the future.

Over the last two years, SIG (the company that distributes electricity and water in the Canton of Geneva) conducted a series of tests aimed at mapping the presence of geothermal energy in the canton. This was the first time that a Swiss canton conducted such tests covering its whole territory. The results of these tests, which were released on November 15<sup>th</sup>, 2022, indicated that there is great potential for geothermal energy production. SIG expects to start producing energy with geothermal sources in 2026. It estimates that by 2035, geothermal energy will cover about 14% of the energy needs of the canton. This share is expected to reach 30% by 2050. [6]

The transition to carbon neutrality and investing in geothermal energy will stimulate new business and lead to new employment opportunities. Geothermal energy plants are being developed in many Swiss cantons.

One important project is the Vinzel geothermal project [7] in the canton of Vaud for which planning started nearly 20 years ago. Engineers have now begun to drill with the objective to reach reservoirs of hot water at a depth of 2300 meters. While there are risks of earth tremors associated with this project and there is uncertainty associated with the flow of hot water that can be obtained if everything goes well the project will be able to provide heating and hot water for up to 3000 homes for more than 40 years.

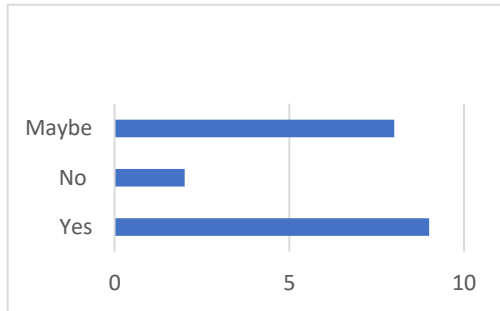
Many more investment projects similar to this one is being started all around Switzerland.

The main downside of these projects is their cost, [8] which right now is much higher than that of producing energy with fossil fuels. However, as technology evolves, these costs are likely to decrease. For the moment, the Federal government is helping to fund these innovative ways of producing clean energy. Federal funding makes geothermal energy projects attractive to local communities. Another downside is that geothermal energy is not available everywhere. Luckily, Switzerland is fertile ground for geothermal energy exploitation.

Switzerland imports gas from Russia and the Russian invasion of Ukraine shows the importance of relying on alternative sources of energy. The Russian invasion has led to a reduction in the supply of Russian gas and an increase in the cost of energy which has hurt Swiss households and the Swiss economy. An increase in the production of renewable energy and locally sourced geothermal energy can protect Switzerland from such shocks in the future. This will be good for the

environment and good for the Swiss economy.

Nineteen Moser students were asked the following question: “Would you would use geothermal energy as a replacement for fossil fuels even though it is more expensive than the energy obtained with fossil fuels?”



Poll of the following question: “Would you would use geothermal energy as a replacement for fossil fuels even though it is more expensive than the energy obtained with fossil fuels?” asked to 19 students in a Ecole Moser classroom by Anna and Magda.

Nearly 50% of polled students (9/19) replied that they would be willing to switch to geothermal energy and about 40% (8/19) said that they might be willing to switch. Only two students replied that they would not be willing to pay a higher cost for geothermal energy.

These results suggest that there is a strong majority of young people who in principle are willing to bear the cost associated with the production of cleaner energy. Of course, the students who participated in this poll did not have to put in real money to back their answers. Things might have been different if they had to do it. The majority of Swiss citizens did not support a referendum that wanted to reduce carbon emissions in Switzerland. [9] Hopefully, the next generation will give more importance to protecting the environment.

Summing up, geothermal energy can help in maintaining a good quality of life while also fighting climate change. There are costs associated with expanding the use of geothermal energy, but these costs are worth paying if we truly want to save our planet.

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