

# Renewable Energy Project



## Aydin Geothermal Energy Project

This project uses geothermal energy to generate electricity at a 7.95 MW grid-connected, renewable power plant in the province of Aydin, Turkey.

### Standard



### Project start date

10 May 2006

### Country

Turkey

## About your project

Geothermal liquid is stored beneath the ground and heated naturally by the Earth's core to temperatures of between 172°F and 338°F. Four wells have been constructed at the project site which brings this liquid – comprised of brine and steam - to the surface. The hot liquid then passes through a heat exchange process where its temperature is used to vaporize a second fluid, creating steam, which drives a turbine and generates renewable energy.

The technology at this plant is a closed loop system called 'organic rankine cycle and binary' and is the first of its kind to be installed by a private company in Turkey. Being a closed loop system, there is no waste of resources; as the geothermal fluid cools, it is reinserted into the ground and the secondary fluid condenses back into liquid form, which is re-used in the heat exchange process.

Turkey has almost 73 million inhabitants making it the 18th most populous country in the world. Migration from rural areas to cities began in the 1950s, and now over 75% of the population live in urban areas, increasing the demand for energy. Currently this demand is largely met with energy from fossil fuels which are responsible for the majority of the country's CO<sub>2</sub> emissions. However, Turkey has the potential to source energy from its abundant renewable reserves. With less than 1% of Turkey's energy derived from geothermal or wind, projects like this are essential to help the country develop in a sustainable way.

Alongside the environmental benefits, the project has created 100 temporary, construction jobs and 25 permanent roles. Additionally, the project owner has supported the local communities by:

- Providing computer equipment to the Salavatli primary school
- Constructing toilet facilities at a primary school in the village of Yavuzkoy
- Reconstructing a classroom for a primary school in the nearby town of Kosk
- Providing the initial infrastructure to supply clean, potable water to the 800 residents in the village of Yavuzkoy.



These images have been provided by individuals working with the project operators

## About geothermal energy

Geothermal energy originates from the radioactive decay of minerals within the Earth's core and from solar energy absorbed at the planet's surface. This heat can be used for: direct heating applications (such as heating buildings), generating electricity, or a combination of the both (also known as cogeneration). Small scale, direct-use applications like domestic heating can use heat from shallow ground, however industrial scale electricity generation requires much higher temperatures to be efficient. To access these higher temperatures, geothermal power plants are often located near tectonic plate boundaries where the Earth's heat can be harnessed more easily by using underground reservoirs relatively close to the surface. The power plants then route hot fluid (steam or hot water) from the geothermal reservoir through a turbine/generator – either directly or through a heat exchanger - to produce electricity. Geothermal is considered renewable because the heat in the Earth's core is so abundant that minute amounts removed for energy production do not deplete this resource.



## How carbon offsetting helps the project

It is expensive to develop and operate renewable technologies and that is where carbon finance can play an important role. Geothermal projects like this one are not required by law and often have to overcome financial and technological barriers to realize implementation. Carbon finance provides an additional revenue stream, helping to make these projects an attractive and viable option. In this case, the incentives from carbon finance are enabling the development of a geothermal power plant to generate renewable energy.

The reductions in CO<sub>2</sub> emissions achieved by this project are incremental to business-as-usual and measured by an independent verifier to internationally recognized standards. These are bought as carbon credits by clients of The CarbonNeutral Company to neutralize their own emissions.

### Verification:

This project is verified to the Voluntary Carbon Standard (VCS) and is used to supply The CarbonNeutral Company's Green-e Climate certified offset, The CarbonNeutral Company Offset (Turkey - Renewable Energy) Product.



### Project area coordinates:

The geographical location of the project is latitude 37°53'22.85 North and longitude 28°06'33.50 East.