

Grid-connected electricity generation from wind turbines in Turkey



Project summary

With the carbon offset program “Kores Kocadağ 17.5 MW Wind Power Project”, myclimate and its local partner contribute actively to climate protection, improved local air quality, livelihoods and sustainable renewable energy industry development and Turkey’s energy autonomy.

The seven wind power turbines are located in the middle of the peninsula of Çeşme in the province of Izmir. Since December 2009, they deliver renewable power to about 22,000 local people of the Izmir province.



Project summary

The program has lead to a reduction of CO₂ while making a contribution to sustainable development in the region:

- Reduction of greenhouse gas emissions and diversification of Turkey’s electricity generation mix.
- Stimulation of the wind power industry locally and nationally, especially of larger grid connected wind farms.
- Recovery of non-renewable resources.
- Overall reduction of pollutants resulting from business-as-usual power generation industry.
- Creation of local employment during the construction and the operation phase of the wind farm.
- Reduction of Turkey’s increasing power import dependency.

Facts and figures on the carbon offset project

Project location	Turkey, province of Izmir, peninsula of Çesme
Project name	Kores Kocadağ 17.5 MW Wind Power Project
Project standard	Gold Standard VER
Project type	 Wind
Emission reductions	268,564 t CO ₂ e (over 7 years)
Situation without project	Regional fuel mix
Project start	December 2009

The project country

Turkey is a large, middle-income country with relatively few natural resources. The country's main environmental issues are water pollution from the dumping of chemicals and detergents, air pollution in urban areas and the potential for spills from the 5,000 oil- and gas-carrying ships passing through the Bosphorus annually. Another main issue to focus on is land degradation which is a critical agricultural problem, caused by inappropriate use of agricultural land and deforestation. Consequently, serious soil erosion has occurred in nearly 70 per cent of Turkey's land surface.

Actually, Turkey's economy experiences a transition from a high degree of self-reliance on agriculture and heavy industry to a more diversified economy. Turkey, with its young population and growing energy demand per person, its fast growing urbanization, and its economic development, has been one of the fast growing power markets worldwide for the last two decades. Renewable energy development is making good progress in Turkey. However, investments into wind power plants in Turkey still means taking high risks, as experience is sparse and attractive financial incentives for electricity generation from renewable sources are lacking. Hence, most of the energy still derives from fossil fuels. For this reason, the project will help Turkey to stimulate and commercialise the use of grid connected renewable energy technologies and markets.



Map of Turkey: The red circle shows the project region.

Indicator	Turkey	Switzerland
Total area (in km ²)	783,562	41,285
Population	79,749,461	7,870,134
GDP in USD per capita (2011)	14,600 USD	47,817 USD
Share of population living below the national poverty lines (2010)	16.9 %	6.9 %
Energy use per capita (kg of oil, 2010)	1,441 kg	3,361 kg
CO ₂ -emissions per capita (2008)	4.0 t	5.3 t
	Istanbul	Zurich
Min. working time to buy 1 kg of rice in min	43	9
Min. working time to buy 1 kg of bread in min	12	12

Turkey vs. Switzerland. (Source: CIA – The World Factbook, www.cia.gov/library/publications/the-world-factbook/; World Development Indicators, web.worldbank.org/; Bundesamt für Statistik [2010])

The situation in the project region

Çeşme is the center-town of the Izmir Province, counting around 40,000 inhabitants. The name Çeşme meaning fountain probably derives from the many Ottoman fountains scattered across the city. The Izmir Province is located in western Anatolia on the Aegean coast. The province's traditional export products such as cotton, tobacco, grapes, figs and olives have been replaced by electronics, chemicals, beverages and automotives in terms of volume of trade and thanks to industrialisation. Nevertheless, the province is still one of the most important regions in terms of food and agricultural products, ranking second after Konya in terms of agricultural production value. Besides export production, Izmir is one of the most popular tourism destinations of Turkey for domestic and foreign tourism.

As mentioned before, investments into wind turbines still means taking high risks due to the intermittent nature of wind. However, on the peninsula of Cesme the risk is acceptable as there is a lot of wind and the villages are spread wide apart.

How the project is implemented

The license for the 15 MW wind power plants was issued to the project owner Kores in June 2006. The six first turbines have been in operation since December 2009.

In order to inform the local stakeholders as well as guarantee their acceptance and support for the project and to comply with the Gold Standard VER (Voluntary Emission Reduction), a local stakeholder meeting was held in September 2008. At this meeting, the public and the local stakeholders were informed about the project. Particularly sensitive indicators were not identified and stakeholders have raised no concerns. When asked at the stakeholder meeting, what they like about the project, a local said: "I like that it is renewable energy and the decreasing external dependency." Mehmet Kutluay, another local, said: „I like its benefits to nature and it creates employment. There should be more such projects."

The power plant

The wind power plant consists of seven wind turbines Nordex N90 of the 2.5 MW output, 90 metres diameter and a hub height of 80 metres. The wind turbines are connected to the wind farm substation through 34.5 kV underground cables. The voltage is raised to 154 kV, transferred to the Electricity Transformer Station and then fed into the national power grid. The power plant produces around 56,000 MWh of electric power annually what leads to annual emission reductions of about 36,000 tons of CO₂.



Two of the seven turbines



Subject for postcards: the turbines by night.



The hub height is 80 metres, the diameter 90 metres.



The electricity transformer station



"Kores Kocadağ wind plant". The generated electricity is fed into the national power grid.

The information center

To meet the requirements of the Gold Standard, an information centre out the wind power plant was built to inform people about the plant and to sensitise about climate change. Mostly pupils and students, but also members of civil associations and journalists from media companies have been visiting the centre so far. A guide explains the mechanism of the wind turbines first in a conference room before they are shown around at the plant. At the end, the visitors can write their opinions and comments on forms, which are hung afterwards on a board.

Environmental aspects

Projects under the Gold Standard scheme, as compared to other schemes, have to fulfil strict criteria regarding the involvement of stakeholders into the project development process and on the documentation of environmental and socio-economic impacts.

All potential environmental issues were discussed in detail on the stakeholder consultation in September 2008. The evaluation of environmental indicators regarding the project is based on the Sustainable Development Assessment Matrix provided in the Local Stakeholder Consultation Report as well as on common sense regarding the wind power plant technology. No negative or critical indicators were identified.

Besides a reduction of greenhouse gases, all other air pollutants such as SO_x or NO_x, particles and volatile organic compounds are avoided thanks to the wind power plants. The project leads neither to any significant changes nor to harmful consequences on water quality and soil condition in the project area. All bushes and trees cut were replaced by the Forestry Directorate and financed by the project partner, and routes of access were changed to minimise the number of trees which had to be cut down. The excavated waste during the construction phase was used to reorganize the area and for landscaping work.

A concern often mentioned in relation with wind power plants is the noise caused by the turbines. Since the noise of the seven turbines' rotation cannot be heard further than 200 metres to the turbines and the closest settlements (Birgi and Zeytinler Villages) are located 3.5 kilometres from the power plant, nobody is affected in any way by the noise of the turbines.

There isn't any endangered flora in project area. The immigration line of birds – an often heard concern regarding wind projects – is not influenced by the wind farm.



Pupils arriving at the information centre.



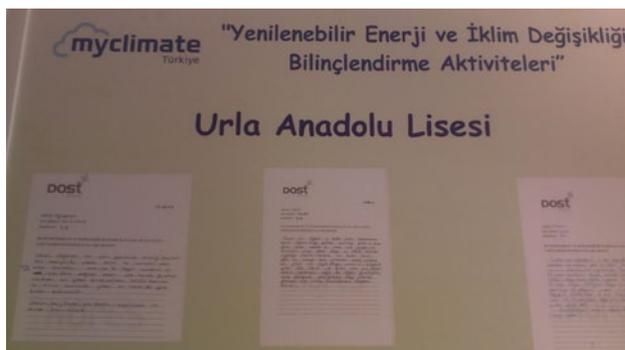
On top of the platform, it is mostly very windy.



Pupils listening to a presentation.



The wind turbines are 80 metres high.



Students from the Anatolian High School in Urla have commented on what they have seen and heard.

Socio-economic aspects

As mentioned earlier, Turkey still has a high potential for investments into wind power plants. With this project, another step is taken towards the designation and production of renewable energy technologies in Turkey. Accordingly, it is one of the main goals to encourage entrepreneurs to invest in wind power and to provide infrastructural investments in the areas around the project site.

Subsequently, the creation of employment is an important part of the project. To achieve this goal, materials for the foundations, cables and other auxiliary equipment is sourced locally, whenever possible. As local employment is cheaper and more sustainable than moving or sending their maintenance workers to Cesme, local workforce is preferred.

“The project created part and full time jobs during both the construction and the operation phases”, says A. Emre Samsun, Investment Coordinator of the project partner. “Currently two persons from the neighbouring villages work as a security staff at the plant from 8.00 to 18.00. They spend most of their time patrolling through the park and also in the watch box at the entrance of the park.”

Health and Safety as well as operation and maintenance trainings were held to guarantee the employee’s own security as well as correct maintenance of the plant.

Monitoring

The Clean Development Mechanism (CDM) baseline and monitoring methodology of the UNFCCC guarantees the external monitoring. According to the CDM, the project activity satisfies the qualifying criteria for Renewable Energy Projects and Grid connected renewable electricity generation. Hence, the choice of project category and methodology is justified.

Furthermore, the Gold Standard requires that indicators are included into the monitoring plan that are either crucial for an overall positive impact on sustainable development or particularly sensitive to changes in the framework conditions or where the public consultation has yielded concerns of stakeholders. The project’s positive impact on sustainable development is the reduction of greenhouse gas emissions from electricity generation and the implementation of the environmental sound technology in Turkey.

For further information please contact:
myclimate – The Climate Protection Partnership
Sternenstrasse 12
CH-8002 Zurich
Switzerland

www.myclimate.org
info@myclimate.org
Tel: +41 (0) 44 500 43 50
Fax: +41 (0) 44 400 43 51