

PV Financing Best Practice: Kocaeli Gebze Güzeller Industrial Zone (Turkey)

General project Description



Gebze Güzeller Organized Industrial Zone (OIZ) is located in Kocaeli province which is the neighbour city of İstanbul. The OIZ is placed in Marmara Region which is the most concentrated and most active industrial region in Turkey. There are 14 OIZs in Kocaeli. OIZ based on its own 350.000 m² land, consists of 52 active blocks (parcels) and 13 blocks under construction. Gebze Güzeller OIZ both with its on-ground and infrastructure facilities and with projects carried out is one of the successful OIZ in Turkey.

The ground-mounted solar plant with 500 kW capacity was built for self-consumption on 6500 m². Since August 2014 it is actively working. The predicted annual generation is 648.000 kWh and the annual performance is expected to be 1271 kWh/kWp. The number of panels are 2040 with 250 W power per panel.

The main driver was to show a good practice in generating electricity for self-consumption specifically for OIZs, proving that generating solar based electricity is possible in Turkey.



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 646554

Business case description / economic parameters

The annual electricity demand of the OIZ is 96 GWh/year. Solar panels are producing 648 MWh of the demand. The system can generate average 1776 kWh per day with an average of 510 kWh per day for one year.

Moreover, supporting the self-consumption solar system with energy efficiency project at the same time showed that energy costs can be decreased.

The investment amount was mostly funded by European Bank for Reconstruction and Development (EBRD) through Turkish Sustainable Energy Financing Facility (TurSEFF) Programme via one of Partner Banks as Yapı Kredi Bank with a 500,000.00 Euro disbursement. 144.404,33 € (equals to 400,000 TL, August 2013 Exchange rate is used 2,77) was granted by East Marmara Regional Development Agency (MARKA). The Investment Return Rate (IRR) is calculated as 13.2% with a 7.6 years of payback period.

The EBRD promotes Sustainable Energy Financing Facility (SEFFs) through targeted credit lines to local partner banks. One of these – the Turkish Sustainable Energy Financing Facility (TurSEFF) – is a credit line from the EBRD to private Turkish banks, specifically dedicated for on-lending to companies implementing energy efficiency projects or small-scale renewable energy generation.

Local partner banks use this credit line to provide commercial loans to their clients with eligible investment opportunities. Every credit line is supported by a comprehensive technical assistance package that helps borrowers define their preferred technical solution and prepare loan applications. This assistance is provided at no cost to the borrower by a project implementation team, consisting of international and local experts recruited by the EBRD and supported by grant funding provided by international donors.

Technical project parameters

The type of the panels used for OIZ is polycrystalline panels. 2040 PV panels were used with 250 W per panel. The expected annual performance of the plant is 1271 kWh/kW. The system uses standard PV technology. Due to the self-consumption, storage systems are not set up. The generated electricity is feeding directly to the local OIZ grid and is consumed directly. The PV plant is monitored from a management office through Supervisory Control and Data Acquisition (SCADA) system.

By definition; net metering is the process in which grid-connected homes generate their own electricity through renewable means and sell any excess to a utility. There are two common methods to approaching this option: net metering and double metering.

In Turkey the application procedures for licenced and un-licenced PV plants are different. The projects over 1MW are obliged to attend a tender to get a licence. OIZs are legally recognised as free-electricity producers with the Renewable Energy Law. Under this law with the regulation called Support Mechanism for Renewable Energy (SMRE), the Organized Industrial Zones that generate their own electricity are exempted for the obligation to follow the licenced procedure for over 1 MW investments. If the institutions decide to sell their electricity to third parties they have to apply for the licence.

The “less than 1 MW” producers can sell the electricity (net-metering) only as a service fee. The existing legislation does not allow them to invoice the electricity itself. So, double metering is not seen yet in Turkey.

Stakeholders / companies / PPA

Regarding the regulation of Energy Market Regulatory Authority, OIZ is purchasing its electricity from a private distribution company and distributes to its members. The PV electricity is sold as part of the general electricity mix delivered by OIZ to its members. PPA type of agreement is not legally possible in Turkey yet. The only beneficiary of the solar based electricity is OIZ and its members.

The PV Plant is managed by Directorate of Electricity of OIZ. The operation and maintenance is carried out by the contracting company TeknoRay Solar as it is stated in their agreement with OIZ for 5 years. Regarding the agreement quarterly system controls are done by the company. The company also is responsible to solve any unexpected technical problem.

Replicability / Outlook

OIZ directorates in Turkey are commonly keen on PV Solar investments to promote renewable energy in their locations. Gebze Guzeller OIZ is a good practice to show that solar based electricity generation is doable for OIZs. The neighbour OIZs, Universities are visiting the PV plant and try to learn both the technology and financing instruments.

OIZ are generating their own electricity and sell it to their members with 6-8 USD cent/kWh. While calculating the return period for PV plant investments they have to use their own price instead of the electric support tariff which is 13.3 USD cent. In this case the return period of this kind of investment increases to 12-15 years rather than 7-10 years. Since they have produced their own energy or supplied electricity from the grid with lower prices due to bulk purchasing power, such a new expensive investment is not so attractive at the beginning.

OIZs can build up PV solar capacity with more than 1 MW without licence legislation duties (i.e. un-licenced) and should consume all electricity for their member companies' needs. If in any case the generated energy exceeds the need of the OIZ and if OIZ decides to feed the grid, in this condition OIZ should apply for licence process to be energy seller. This procedure is also challenging and expensive.

Sources

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