

# PV Financing Best Practice: Malatya Inonu University Turgut Ozal Medical Faculty – Public Building (Turkey)

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## General project Description



Inonu University is a public university in Malatya, Turkey. The university is one of the biggest university in the eastern part of Turkey with six campuses, five institutes, thirteen faculties, nineteen research centres and an innovative science and technology park (Technopolis) which is called Malatya Technology Development Zone in Malatya.

Inonu University Turgut Ozal Medical Center is one of the biggest research and implementation hospital in Turkey. It serves as a district hospital and accepts patients from neighbouring regions and countries as well.

The university has a PV plant that generates electricity for self-consumption of Turgut Ozal Medical Faculty. It is actively working since 2014. The plant will decrease the electricity cost 29% of Turgut Ozal Medical Centre with 5,3 MWp capacity.

The main driver for this solar plant installation was to reduce the annual electricity cost of the Medical Centre by saving 1.115.488,24 € (equals to 2,844.495 TL. Calculated with August



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

2013 exchange rate). In 2012 the university spend 8.28 million TL for electricity consumption. 55% of this consumption occurred during day hours. In more general terms, the project also serves to decrease the foreign source dependency for electricity of Turkey.

## **Business case description / economic parameters**

The PV plant is the biggest plant in Turkey so far. The owner of the PV Plant is the University. Un-licenced solar electricity generation plants cannot sell the electricity by law. The university is purchasing electricity from a private company. The electricity invoice amount is a considerable expense. Investing on this kind of saving is significantly effective on the total university budget.

The annual demand of the Medical Centre is 29 GWh. The annual electricity generation capacity of the PV plant is average 8 GWh. The investment cost is 19 million TL financed with equity capital. 15 million TL which is 78% of the total investment was financed with bank loan. The payback period is expected to be 7 years.

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. Although the capacity of Turgut Ozal Medical Centre is over 1MW the university was exempted from this regulation under the Renewable Energy Law. Under this law with the regulation called Support Mechanism for Renewable Energy (SMRE), the Organized Industrial Zones and Universities 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.

## **Technical project parameters**

The plant is constructed on a 130.000 m<sup>2</sup> land with 21.177 PV panels. The type of the panels are polycrystalline. Double metering system is set up and the system is online. So far, the daily electricity generation average is 24 MWh and the electricity is consumed 100% by the university. The PV plant does not have a storage mechanism.

## **Stakeholders / companies / PPA**

The university is using the solar based electricity generation for self-consumption. There is no other stakeholders benefiting from the system. The university is purchasing its electricity

from a private electricity distribution company with a special agreement. The cost of the electricity is reduced with PV plant.

Anel Group constructed the PV plant and is responsible for three years of operation and maintenance. The height of PV panels are only 1,8 m from the ground and are specifically located to prevent them from the strong wind damages. Online double-metering systems collect data. The PV plant is monitored from a management office through Supervisory Control and Data Acquisition (SCADA) system. The system is monitored very closely with monthly, quarterly, six months and yearly reports which include detailed data analyses.

## Replicability / Outlook

Since it is the biggest PV plant in Turkey the attention to the plant is high with numerous visitors. Especially other universities are interested to learn how this kind of investment is done and what kind of technology is used. The project is a good practice to show how to have a significant decrease in electricity bills for big organizations. This kind of investments are profitable in long terms.

To replicate the project being a university is an advantage due to the exemption from licenced application procedure. The university used its own land for the PV plant. Regarding this fact, universities without suitable lands for a PV Plant can have difficulties to find an area. The size of the land for the PV Project can also be a barrier due to the permission procedures.

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<http://basin.inonu.edu.tr/haber.php?id=955>

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