

# PV Energy Community Case Study:

## Passive Residence Warsaw, Poland



**Passive Residence is located in Dąbrowa Chotomowska, a small village 30 km from Warsaw.**

This private building was built at the beginning of 2016 as a result of the owner realising his dream of building a zero-energy consumption house. The house has 204.23 m<sup>2</sup> floor space with a family of four living in the residential building.

The energy demand for heating and cooling the house is 12.6 kWh/m<sup>2</sup>a. The house is equipped with heat pumps, cool and hot water and a mechanical ventilation with heat recovery system. The PV installation is situated on the roof of the house and is fitting with the Passive Residence appearance. Its PV modules are installed at an angle of 40° facing south.

The Passive Residence was designed by the Passive M2 Office and has achieved positive verification of NF15 (National Fund for Environmental Protection and Water Management). It is currently awaiting verification by the Passive House Institute in DARMSTADT.



Aerial view of Passive Residence with PVs

The PV installation covers the total residence's electricity needs on an annual basis. In Poland, prosumers (individual consumers of energy who generate electricity in small installations) have access to a support scheme that helps them to cover their electricity demand by installing PV systems. There is not a fixed tariff for this initiative but prosumers are allowed to exchange any surplus energy produced for gaps in energy production.

The rates in relation to this are 1 to 0.8 in the case of micro-installations with capacity up to 10 kW and 1 to 0.7 in the case of micro-installations with capacity above 10 kW (but below 40 kW). Prosumers sign an

agreement with the energy seller and the seller calculates the difference between the produced and consumed energy.

Due to current regulations, a PV system of 9.75 kW was integrated to the distribution grid, which has a energy storage function. The total energy consumption of the Passive Residence was approximately 9 MWh for the last year, while the total electricity production provided by the PV system was 10.3MWh.

It is worth noting that all of the energy produced was consumed by the residence. The self-consumption rate was approximately 23% with the excess energy being exported into the grid. The support scheme provides prosumers whose installations have a capacity of up to 10 kW with a refund of 80% for each kilowatt they inject into the electricity system.

Last year, Passive Residence fed the grid with 7.95MWh. The Passive Residence owner received “a discount” for receiving 6.36MWh without any additional costs, but had to buy 303 kWh in order to cover the entire energy demand. Due to this the owner was obligated to pay for both 303 kWh and the fixed fees.