

PV Energy Community Case Study:

Aardehuizen-Olst Olst, Netherlands



Aardehuizen-Olst PV E.CO is an ecological housing project Olst, Netherlands consisting of 23 self-sufficient earth-houses with extremely low power consumption and 1 village house.

All buildings were built by the residents themselves, via VAON (the association), between 2011 – 2014. The Aardehuizen-Olst community makes optimal use of existing local waste materials and natural resources, working to significantly reduce the carbon footprint of its residents.

The Aardehuizen-Olst community is equipped with its own water supply, sanitation and sewage system. All buildings are designed to minimise their heating needs using thermal mass. This is achieved by the inclusion of a glass facade along the entire south-facing side of the buildings. The three remaining walls are made from earth-rammed (recycled) tires and backed up by substantial earth berms. As a consequence, the interior temperature of each is stabilised year-round at approximately 15 degrees celsius without the need for additional heating.



Rooftop solar-modules during installation

During the coldest time of the year, additional heating is deployed via special high-performance wood burning ceramic heaters or other heating installations. The thermal mass below ground by floor-isolation is also exploited during these colder periods.

A notable part of the community's electrical needs is serviced by a number of small PV systems, installed primarily on the roofs. The total installed PV capacity is 69.18 kWp.

The smaller grid-connected PV systems installed mainly on the roofs of the houses supply a large part of the community's annual electricity needs, which are around 101 MWh. 21 residences are equipped with 6 to 24 solar modules so are as self-sufficient as possible in terms of electricity-use, whilst three houses will be fitted with solar modules in the future.

All of the buildings do not have gas grid connection but are connected to the local distribution network, using it as a battery; on sunny days there is a surplus, on cloudy days the power-grid is used when needed.

PV production on an annual basis currently stands at approximately 66 MWh. Aardehuizen-Olst PV E.CO is investigating the option of distributing and storing the surplus electricity amongst the community's buildings, offering a possible solution of a second independent and separate DC low voltage grid of 24V with batteries.

It is hoped that the level of self-sufficiency in the Aardehuizen-Olst PV E.CO will be raised to "energy +" with the extra modules being installed on the three houses and a central PV-system being built on the roof of the car park. It is worth noting that, depending on the acquisition of subsidies (request submitted march 2018), VAON plans to build a central storage system in 2019 with an estimated power of 60 kW.