

## Netherlands: Nieuw-Sloten PV houses

### BIODATA

<b>PV community name:</b>	Nieuw-Sloten
<b>Kind of community:</b>	Residential – urban
<b>Main building type in community:</b>	Houses - attached houses
<b>New/Retrofit/Added:</b>	New district/community – building integration
<b>Type of project:</b>	Demonstration project
<b>Start of operation:</b>	Year 1996
<b>Location/City:</b>	Nieuw Sloten, Amsterdam
<b>Country:</b>	The Netherlands
<b>Latitude:</b>	N52 20' 39"
<b>Longitude:</b>	E4 48' 19"

### PV SYSTEM CHARACTERISTICS

<b>PV power total community:</b>	250 kW
<b>Number of houses/buildings:</b>	About 100 dwellings
<b>PV power per unit:</b>	2,5 kW/house
<b>Energy yield per year:</b>	174 MWh in 1997
<b>Main PV system type:</b>	Grid-connected – supply side
<b>Main PV application type:</b>	Inclined roof – integrated
<b>Main PV module type:</b>	Framed regular module
<b>Main PV cell type:</b>	Crystalline silicon – general, mixed or unknown
<b>PV module manufacturer/brand:</b>	Shell RSM 50 and BP 275
<b>Inverter manufacturer/brand:</b>	SMA 150 kW (1x), SMA 5000 (3x) and Sunmaster 1800 (2 x 4)
<b>Investment for PV systems/modules:</b>	2,5 million EUR

### OWNERSHIP

<b>Building owner:</b>	PV dwellings are individually owned
<b>PV owner:</b>	NUON, Spaklerweg 20, 1096 BA Amsterdam
<b>PV energy user:</b>	NUON, Spaklerweg 20, 1096 BA Amsterdam



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## PV COMMUNITY DESCRIPTION

### PV Community Brief

The Nieuw Sloten PV houses project is located in the south-west of the city of Amsterdam and can be found on: [http://wikimapia.org/2636556/nl/Nieuw\\_Sloten\\_Zonnepaneel\\_Huizen](http://wikimapia.org/2636556/nl/Nieuw_Sloten_Zonnepaneel_Huizen)

The goal of the project in Nieuw Sloten was to realize a fully integrated PV system in a new to build residential area with approximately 100 dwellings. The PV system was integrated physically (PV modules instead of roofing tiles), electrically (connected to the public grid) and organizationally (the project was embedded into the area development process).

### Grid issue

The total PV system in Nieuw Sloten consists of 6 PV areas and 4 electrical subsystems, working on 300 V DC. The AC sides of all inverters are connected together on the low voltage bus bar leading to the transformer room from where the current is distributed to the district.

PV system is connected to the public grid on one point. The PV electricity is used within the district.

The quality of the electricity matches the requirements regarding decentral electricity production as defined by the Dutch energy federation EnergieNed.

Utility has gained experience with PV in residential areas. The voltage housekeeping in the area of Nieuw Sloten has been thoroughly analyzed in order to find out if the PV system causes any distortions. This knowledge has been later used while developing the City of the Sun.

### Urban planning and architectural issues

In a densely populated area such as Amsterdam it is not always possible in urban planning to orientate houses towards the South. This was the first project in Europe to allow East and West oriented PV roofs, but with low roof inclinations (for better insolation).

The architect has taken PV thoroughly into account in order to create good and attractive PV houses, among others:

- the family houses were provided with extra windows along the roofs because it was not possible to build dormers (roof extensions which are very usual in the Netherlands);
- the color of the cladding material is specially chosen to match the color of the PV modules;
- the chimneys were specially shortened in order to avoid shadowing of PV;

PV arrays fully cover the roof surface of the PV dwellings; the roof elevation is 25° (East and West) and 35° (South) respectively. The apartment building has cladding (elevation 80°, South) and a PV roof (20° inclined, South).

### Economic / financial issues (including information on tariff, net-metering etc.)

The PV roofs are owned by the utility company on the houses, which are in private ownership. Originally, the owner was the Energy Company of Amsterdam, now NUON.

The owners of PV houses have allowed the utility to exploit the PV system on their roofs. In exchange, the utility is responsible for the maintenance of the PV roofs.

NUON sells this electricity as a part of the renewable energy product called 'Natuurstroom' (a mix of solar, hydro and wind energy).

### Other remarks

As for all large renewable energy installations owned by NUON, the electricity generation of this system is being monitored online.

Due to several reorganizations within NUON, the historical data over the project are lost. Further information can be obtained from Mrs. J. Cace who has been the manager of the project at the time.

## COMMUNITY INFORMATION

**Project leader company:** NUON, Spaklerweg 20, NL-1096 BA Amsterdam

**Other project company:** RenCom, Jan de Beyerhof 14, NL-1191 EP Ouderkerk a/d Amstel

**Project's www:** <http://www.bipvtool.com/index.php?case=The%20Netherlands>

**Contact address:** Jadranka Cace, RenCom, jadranka@rencom.nl

Jan de Beyerhof 14, NL-1191 EP Ouderkerk a/d Amstel