

2013

PHOTOVOLTAICS FORMS LANDSCAPES

a special event 28th EU PVSEC

Paris, France

08h30 - 12h30

Auditorium 515 A/B

CALL FOR CASE STUDIES

Astrid Schneider

Apartment building with "Cafe zum Speicher"

apartment building / cafèrestaurant), Nechlin (DE), 2013



Photovoltaic shading louvers and PV-window shutters are used as design elements connecting history and future

The apartment building with 'Cafe zum Speicher'

features different PV-systems, which are oriented to nearly all directions.
The main street facade is oriented to the south-west with PV at the roof and facade.
The pediment's PV-roofs are directed to north-west and south-east.

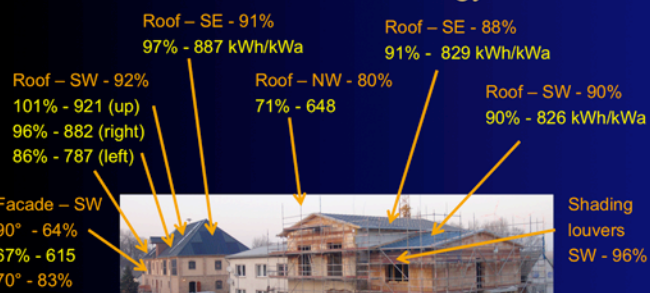
The BIPV-systems:

- Solar Window Shutters – SW oriented – 90° (vertical) – 1160 W (mono crystalline)
- Solar Shading Louvers – SW oriented – 30° – 1960 W (mono crystalline)
- Roof – Street Facade – SW oriented – 15° – 5440 W (aSi triple junction thin film)
- Roof – pediment – SE oriented – 15° – 4350 W (aSi triple junction thin film)
- Roof – pediment – NW oriented – 15° – 4350 W (aSi triple junction thin film)

Sum of BIPV systems installed power: 17,560 W



Different Orientation and Energy Yield



Simulation: 916 kWh/kW = 100% - Measured energy yield in the year 2012 in kWh

Weather data / irradiation in Nechlin near Prenzlau: 100% optimal would be 38° tilted roof with an irradiation of 1195 kWh/m² year (1026 on horizontal) -> 916 kWh per kW installed solar system per year.

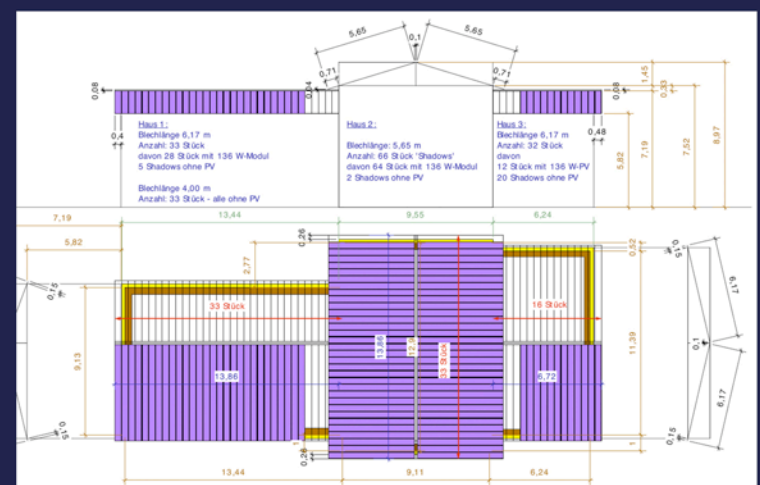
Renewable Energy System in Nechlin



The renewable energy system consists of different parts:

- PV-Systems
- Biooil-CHP
- Rape-Seed pellets heating
- Wooden chips pellets
- Heat network
- Biodiesel filling station

Source: Jörg & Ute Müller GbR



The historic village 'Nechlin' is situated at the Eastern German countryside, north of Berlin. Some buildings in the village were near break down – and the question was, whether to demolish or to renovate. So the idea of solar renovation came up. The building is named 'Schnitterkaserne' as it was used in summertime for workers who helped harvesting the crop. As a result the complete building shelter was badly insulated and had to be refurbished. The 'Magazine-building' and the 'Schnitterkaserne' are now interconnected with its own electricity and heat network based on renewable energy including biomass. All the PV-plants feed into one central feed in point in the magazine building, where the inverters are located. The aim is, to supply the village step by step in the future with 100% renewable energy.

Client:
ENERTRAG Wärme für Nechlin GmbH & Co KG, Uckerland, Germany – www.enertrag.com

Planning:
Solar Facade and Roof Design – BIPV-system engineering: Astrid Schneider, Solar Architecture, Berlin, Germany – www.astrid-schneider.de
Renovation Buildings: Gerhard Krekow Architect, KM Planung, Prenzlau, Germany – www.krekow-planung.de

Companies:
Metal Work – Installation Solar Shading System: Walter Mikesch, Solventure AG, Wettingen, Switzerland – www.solventure.ch
Custom Sized Glass-Glass Solar Modules Facade: Solarnova GmbH, Wedel, Germany – www.solarnova.de
Standard BIPV Roofing System: Unisolar aSi-triple-junction-modules, included in steel roofing elements by Hösch Contecna Systembau GmbH