BIPV in the Inside Out project, a plus energy retrofit of a high-rise apartment building

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insideout

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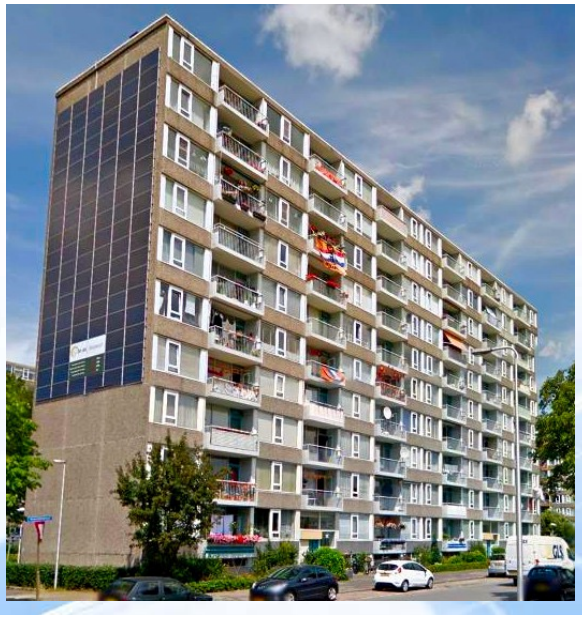
Social housing renovation

Energy demand 2019
Electricity
Gas (heating, cooking)



Energy demand 2021
Electricity
Energy positive

Utrecht, the Netherlands

Integration

Heatpumps on the roof
Hidden underneath a ***PV pergola***

Facades:
- BAPV
- Per apartment BIPV, glass-glass, semitransparent and grey

Grey panel (RAL7030)

Ceramic coating on outside
- 35% loss of light
- 66 mono cells
- 340 Wp → 220 Wp

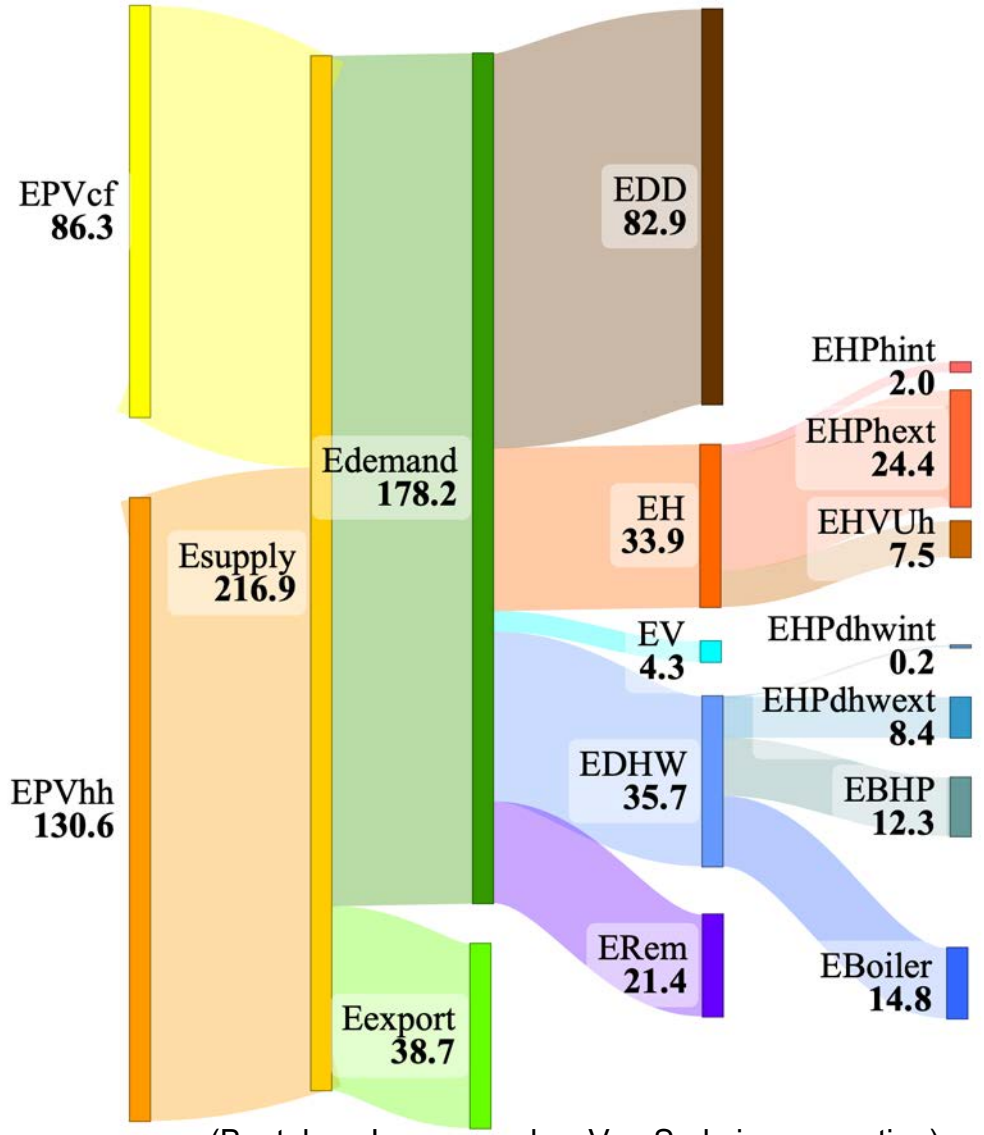
Overview of the PV system

Location	Type	P_peak (Wp)	Modules Installed	Total Installed Capacity (kWp)
SE Facade	Grey, BIPV	160 - 220	160	31.2
SE Balcony	Semi-transparent	300	116	34.8
NE Facade	Black	340	160	54.4
SW Facade	Black	340	160	54.4
SE Crown	Black	340	116	39.4
NW Crown	Black	340	116	39.4
SE Roof 18°	Black	355	174	61.8
NW Roof 28°	Black	355	116	41.2
Total			1118	356.6

Energy balance

2023 (Sankey diagram):
- Supply 216.9 MWh
- Demand 178.2 MWh
- SURPLUS: 38.7 MWh

Specific yield 608 kWh/kWp



(Bontekoe, Lampropoulos, Van Sark, in preparation)

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Thank you!

This is an initiative of

Seamless-PV

Co-funded by the European Union

Grant N°101096126. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or CINEA. Neither the European Union nor the granting authority can be held responsible for them.

Project funded by

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Confederation

Federal Department of Economic Affairs, Education and Research EAER
State Secretariat for Education, Research and Innovation SERI