

enerlytica

PV Disaggregation

Modelling production & consumption from grid draw & grid feed

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Spin-off

ETH zürich

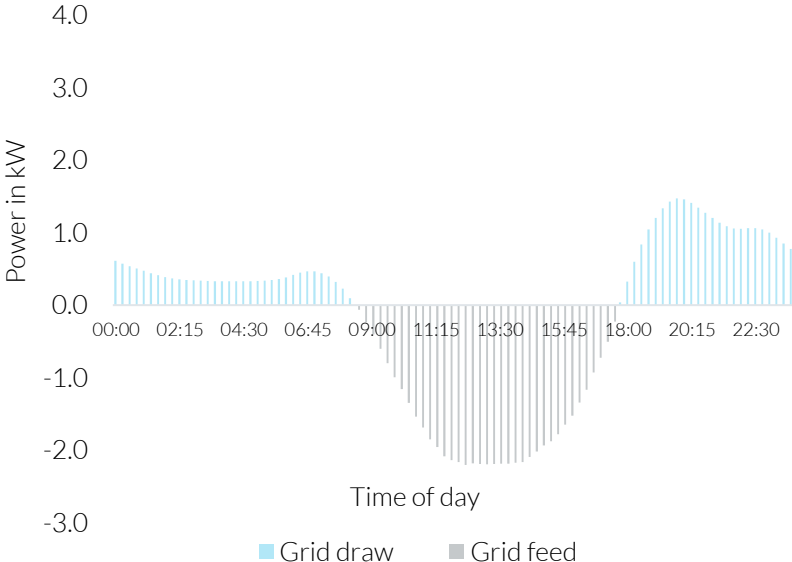


swiss made software

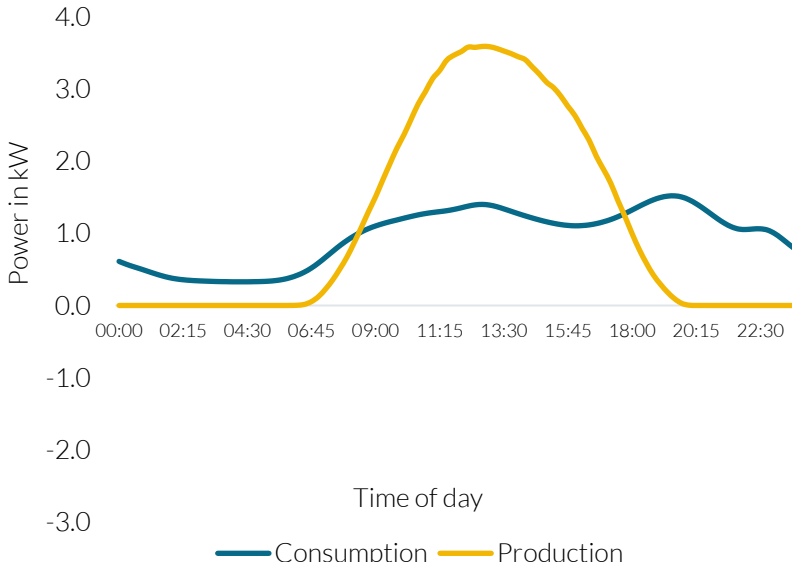
Utilities don't know the electricity consumption of their customers once they own a PV system – they only know grid draw and grid feed. Connecting to an inverter is not feasible for residential customers on a large scale.

PV Disaggregation allows utilities to know what customers consume and produce with a 15-minute granularity

Input - Grid draw and Grid feed



Output - Consumption and Production

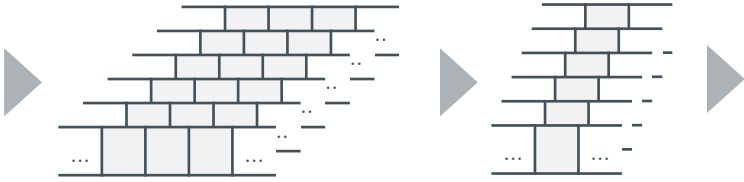


We built and trained a special form of an Artificial Neural Network, a so-called Convolutional Neural Network (CNN) to determine PV production

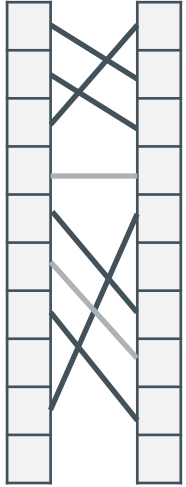
15-minute slot for which the PV production is to be determined

Grid draw
Grid feed
Time of day/year
Time of week
Reference production
Sunshine hours
Solar radiation
Precipitation
Snow cover
...

N*9 matrix (15-minute slot +/- 4 15-minute slots) as input



«Convolution»



«Neural Net»

Our PV Disaggregation is currently integrated into our Digital Energy Consultant and available via API



Grid draw & feed
Location/address
Reference PV



Digital Energy
Consultant



API

For over 80% of households with a PV system, we can estimate consumption and production with a Mean Absolute Error (MAE) below 4%

Customer requirements – calculated by Enerlytica

▶ Customer need to have a PV system on their main smart meter and at least 30 days of 15-minute grid draw and grid feed-in data

▶ Customers should have a max grid feed-in of at least 3 kW (corresponding to 7-8 modern panels)

▶ Customers should have at least a ratio of 0.5 between max grid feed-in and max grid draw over the last 12 months

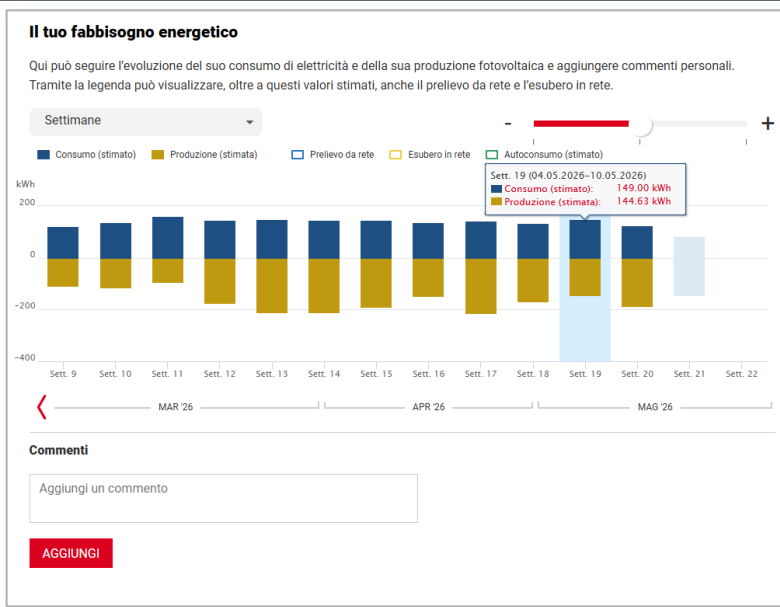
▶ Customers should have a data coverage of at least 90% over the estimation period and grid draw or grid feed-in above 1 kWh

Data requirements – weather data from Enerlytica

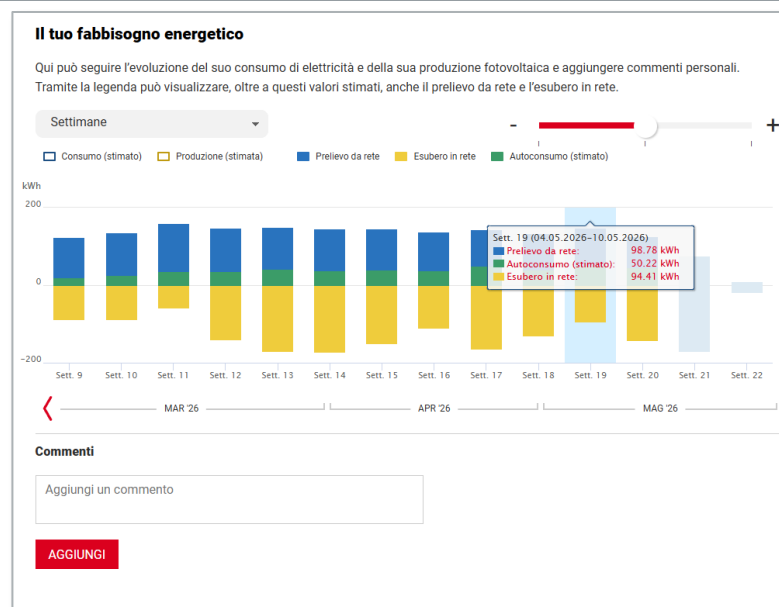
- Data provided by the utility
 - Smart meter data, i.e. grid draw and grid feed for households
 - Household address to map weather data to nearest reference PV
 - Production values of separately metered PV systems
- Weather data
 - Sunshine hours
 - Solar radiation
 - Precipitation
 - Snow cover and cloud cover
 - Temperature
 - Humidity
 - Air pressure and wind

Due to the high accuracy of the PV Disaggregation, it is already live and currently implemented as part of our Digital Energy Consultant

Estimated consumption & production



Grid draw, grid feed-in & self-consumption



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