The overall objective of the project is to maximize the RES harvesting in the built environment by developing and demonstrating cost-effective active building skin solutions as part of an optimised building energy system, being connected into local energy grid and managed by a district energy hub implementing optimised control strategies within a comprehensive economic rationale balancing objectives and performance targets of both private and public stakeholders.

Simulation

Optimization Results

Variable	Value
Installed capacity [kwp]	0.495
Installed area[m²]	3
Capacity of electric storage [kwh]	0.001
System cost [€]	742.5
Expected npv [€]	325.152
Expected payback time	16 years 4 months 16 days
Expected self-consumed-lcoe [€/kwh]	0.146308
Expected lcoe [€/kwh]	0.130249
Self-consumption [%]	82.0605
Self-sufficiency [%]	29.7924
Annual cumulative production[kwh]	371.92
Annual cumulative balance production/consumption	0.37192

Variable	Value
Specific emissions of the whole produced electricity [kg co2-eq/ mwh]	170.73
Specific emission of self-consumed electricity only [kg co2-eq/ mwh]	191.78
Cumulative consumption [kwh]	1000

Optimal PV configuration

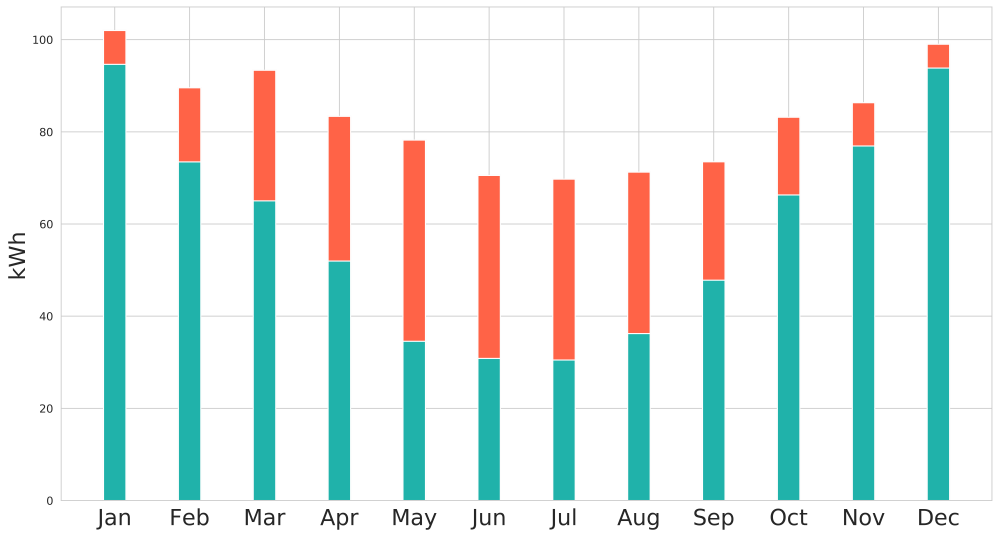
Inputs

Variable	Value	Value Max
Module efficiency	0.165	
Module height	1	
Module width	1	

Variable	Value	Value Max
Performance ratio of the system at stc	0.8	
Optimization type	maximum NPV	
Price of electricity for the consumer €	0.18	
Price of electricity for the provider €	0.05	
Net billing premium €/kwh	0	
Maximum price limit €	none	
Time horizon in years	25	
Cost of the finished pv system €/kwp	1500	
Cost of the storage system €/kwh	500	
Annual mantainance costs €/kwp year	7.5	7.5
Linear annual growth of the elctric load	1.0	1
Linear annual efficiency losses	0.75	0.75
Annual discount rate	1.0	1
Linear annual growth of price for consumer	1.0	1
Linear annual growth of price for provider	0.0	0

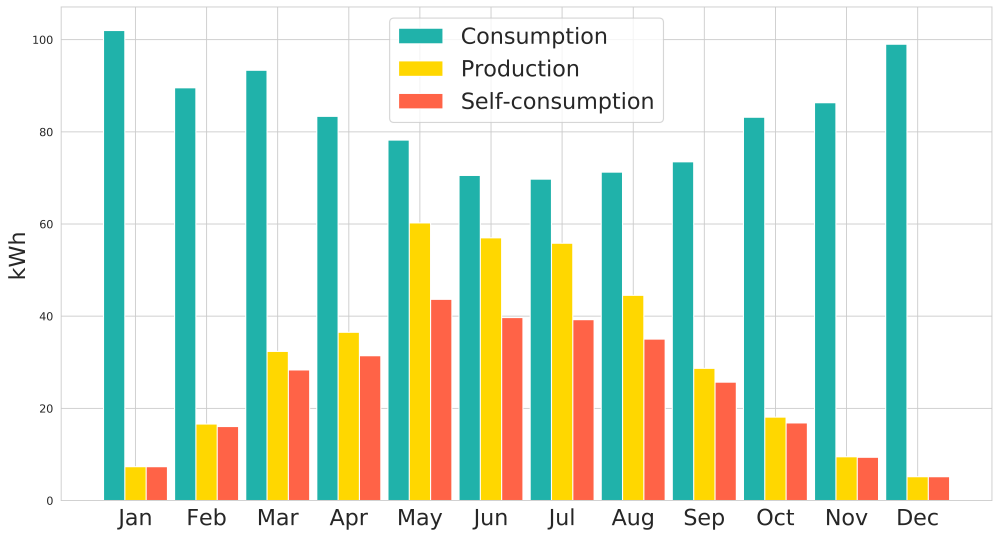
Consumption barchart

The chart shows the original cumulative monthly electric demand and the proportion of it that is contemporaneously covered by PV electricity.



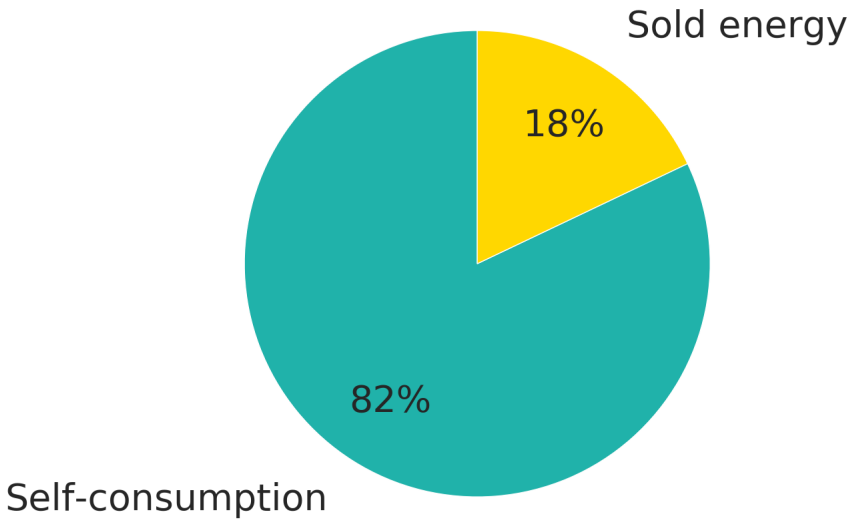
Consumption-production barchart

The chart shows the monthly cumulative production from PV alongside the relative building demand, it shows also the fraction of the produced electricity that is consumed on site (i.e. used contemporaneously or stored).



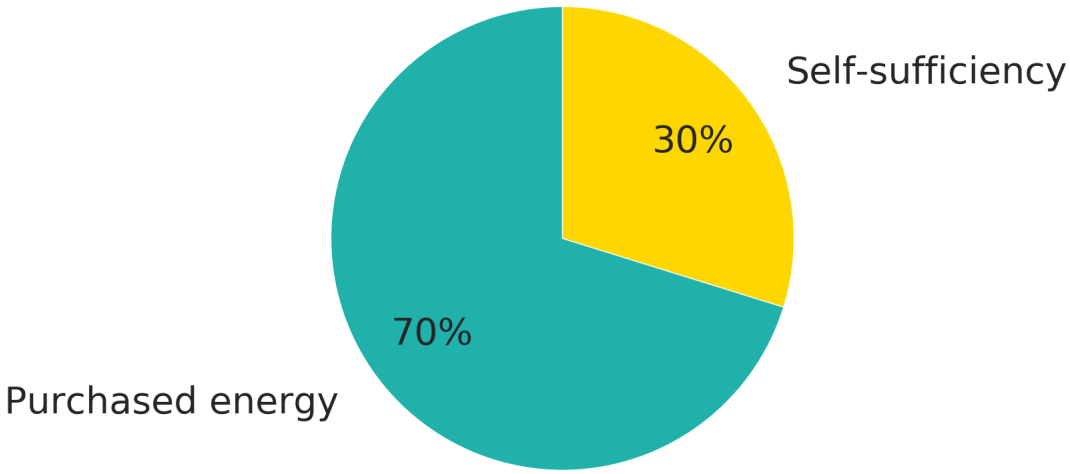
Self-consumption

The pie chart shows the fraction of the electricity produced that is sold to the grid (or curtailed) and the fraction that is effectively utilized in the building.



Self-sufficiency

The pie chart shows how much of the electricity demand in the building is covered by PV, the remainder needs to be purchased from the local grid.



Cashflow

The blue dots represent the expected discounted cashflow of the PV investment over the planned life-time of the system, the red dot represents the expected payback time. The grey area represents all the possible outcomes that can be considered given the stochastic parameters: the two black lines are two extremely unlikely scenarios.