Summary of rooftop solar analysis

Location: Düsseldorf, Germany **Date of analysis**: Dec/2021

***Recommendation**: install 30 solar panels (48 m^2), for a net present value of 13,770.01 euros, with a payback of 10.53 years.*

Main economic results

Financing	NPV (EUR)	Payback (years)	IRR (%/year)	LCOE (EUR/kWh)
[Gov. subsidies and] 75% debt	9,517.07	4.05	16.52	0.075
[Gov. subsidies and] 100% equity	13,770.01	10.53	7.59	0.058
[No gov. subsidies and] 100% equity	4,554.63	18.90	2.54	0.069

(All rows are for the same number of panels)

Additional results

A system of 10 panels, coupled with a battery of 11.8 kWh, requires an initial investment of 17,344.17 euros, but provides an NPV of 16,358.01 euros, with a payback of 13.07 years.

Main inputs and assumptions

Household and Economics

Electricity Consumption	4,326.6	kWh/year	Inflation	1.46%	per year
Electricity price – buy	0.2829	EUR/kWh	Bank loan interest rate	2.8%	per year
Electricity price – sell	0.07/0.03	EUR/kWh	Bank loan maturity	20	years
			Equity cost of capital	0.17%	per year

PV panels

Peak power	330	W/panel	System losses	15%	of output
Panel area	1.6	m^2/panel	Degradation with age	0.5%	Per year
Useful life	25	Years	Maintenance costs	1.5%	of investment per year
			Total cost of optimal installation size (without subsidies)	12,621.77	EUR
			Total cost of optimal installation size (after subsidies)	10,621.77	EUR

Government subsidies

Fixed fed-price into the grid tariff of 7 cents per kWh for a period of 20 years, when selling excess energy.

Additional subsidy given by the city of Düsseldorf: Purchase premium when installing a rooftop PV-system, the amount depends on the system size but is up to 2,000 €.

Some PV panel suppliers

- https://www.alpha-solar.info
- https://www.brenner-energie.de/photovoltaik-düsseldorf
- https://www.eon.de/de/pk/solar.html

Author of this report

Niklas Gerth

niklas.gerth@t-online.de

https://de.linkedin.com/in/niklas-gerth-270634128