Summary of Rooftop Solar Analysis

Location: Porto, Portugal **Date of analysis**: Dec/2022

Recommendation: *install 8 solar panels (15.2 m^2), for a net present value of 6201 euros, with a payback of 2.1 years.*

Main economic results

Financing	NPV (EUR)	Payback (years)	IRR (%/year)	LCOE (EUR/kWh)
Gov. subsidies and 75% debt	6201	2.1	61.8%	0.0235
Gov. subsidies and 100% equity	6229	3.2	31.6%	0.0232
No gov. subsidies and 100% equity	3729	9.7	10.0%	0.0483

(All rows are for 8 panels with 375W)

Additional results

For smaller rooftop spaces, a similar NPV of 6039 euros can be achieved by installing a set-up of only 4 panels with 485W/panel. Batteries are not worth installing at their current price, yet the critical break-even price may be reached in the near future.

Main inputs and assumptions

Household and Economics

Electricity consumption	4000	kWh/year	Inflation	2.2%	per year
Electricity price – buy	0.19	EUR/kWh	Bank loan interest rate	4.1%	per year
Electricity price – sell	0.03	EUR/kWh	Bank loan maturity	5	years
			Equity cost of capital	3.0%	per year

PV panels

Peak power	375	W/panel	System losses	13.5%	of output
Panel area	1.9	m^2/panel	Degradation with age	0.5%	per year
Useful life	25	years	Maintenance costs	8	EUR/year per panel
			Total cost of optimal installation size (without subsidies)	3695	EUR
			Total cost of optimal installation size (after subsidies)	1195	EUR

Government subsidies

There are currently no open government subsidies. However, the program is expected to re-open with a refund of 85% of the initial investment, up to a maximum of 2500 euros. This refund is applied retroactively, meaning we can invest now and apply for the subsidy later.

Some PV panel suppliers

- https://www.sunenergy.pt/particulares/autoconsumo/paineis-solares-fotovoltaicos-kits-de-autoconsumo/
- https://www.ikea.com/pt/pt/clean-energy/solar-systems/
- https://goldenergy.pt/paineis-solares/

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