Summary of rooftop solar analysis

Location: Peso da Régua, Portugal **Date of analysis**: Dec/2023

***Recommendation**: install 5 solar panels (7.85 m^2), for a net present value of 4 749 euros, with a payback of 2.3 years.*

Main economic results

Financing	NPV (EUR)	Payback (years)	IRR (%/year)	LCOE (EUR/kWh)
Gov. subsidies and 75% bank debt	4749	2.3	47.0	0.0392
Gov. subsidies and 100% equity	4820	4.8	21.9	0.0381
No gov. subsidies and 100% equity	3720	8.0	12.6	0.0556

(All rows are for the same number of panels)

Additional results

For the same system of panels, switching from a simple tariff to a time-of-use tariff raises the net present value to 5 718 euros. Installing 6 panels of 410 Wp with a 5.8 kWh battery yields an NPV of 4 259 euros with subsidies.

Main inputs and assumptions

Household and Economics					
Electricity Consumption	4300	kWh/year	Inflation	2.0%	per year
Electricity price – buy	0.18	EUR/kWh	Bank loan interest rate	4.5%	per year
Electricity price – sell	0.03	EUR/kWh	Bank loan maturity	10	years
			Equity cost of capital	3.28%	per year
PV panels					
Peak power	410	W/panel	System losses	13.5%	of output
Panel area	1.57	m^2/panel	Degradation with age	0.5%	Per year
Useful life	25	Years	Maintenance costs	9	EUR/year per panel
Total cost of optimal installation size (without subsidies)				2600	EUR
Total cost of optimal installation size (after subsidies)				1500	EUR

Government subsidies

The Portuguese government refunds up to 95% of the initial investment outside of Lisboa and Porto, up to a maximum of 1 100 euros for the installation of photovoltaic panels, with rolling admissions until the fund reaches its endowment of 30 million euros. Subsidy is paid ex-post, and requires that the project is paid for upfront, prior to application.

Some PV panel suppliers

- https://www.sunenergy.pt/particulares/autoconsumo/paineis-solares-fotovoltaicos-kits-de-autoconsumo/
- https://www.edp.pt/particulares/servicos/energia-solar/
- https://www.iberdrola.pt/casa/energia-solar/smart-solar

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