Summary of rooftop solar analysis

Location: Porto Empedocle (AG), Italy **Date of analysis**: April/2022

***Recommendation**: install 3 solar panels (7.92 m^2), for a net present value of 7863€, with a payback of 4 years.*

Main economic results:

Financing	NPV (EUR)	Payback (years)	IRR (%/year)	LCOE (EUR/kWh)
Gov. subsidies and 75% debt	7863	4.0	45.9	0.0453
Gov. subsidies and 100% equity	7975	3.6	29.1	0.0431
No gov. subsidies and 100% equity	7059	6.6	15.6	0.0706

Additional results:

However, a system of 5 panels, together with a battery of 5 kWh (5000€ battery price), requires an initial total investment of 9500€ of which only 1188€ are of equity, but provides an NPV of 9143€, with a payback period of 7.6 years and an IRR of 17.5%. This considering government subsidies (50% off the initial price).

Main inputs and assumptions:

Household and Economics					
Electricity Consumption	3550	kWh/year	Inflation	2%	per year
Electricity price – buy	0.25	EUR/kWh	Bank loan interest rate	6.15%	per year
Electricity price – sell	0.03	EUR/kWh	Bank loan maturity	4	years
			Equity cost of capital	1.71%	per year
PV panels chosen					
Peak power	375	W/panel	System losses	14%	of output
Panel area	2.64	m^2/panel	Degradation with age	0.5%	per year
Useful life	25	Years	Maintenance costs	10	EUR/year
Total cost of optimal installation size (without subsidies)				2700	EUR

Government subsidies:

The government subsidies as March 2022 entail a discount of 50% on the invoice price. However, by using the government subsidies it is not possible to sell the energy back to the grid, but this problem might be overcome with the use of a battery, depending on the implant size.