

## Summary of rooftop solar analysis

**Location:** Oslo, Norway

**Date of analysis:** Apr/2024

**Recommendation:** It is not recommended to install solar panels in Oslo. For example, with subsidies, installing 12 solar panels (30.96 m<sup>2</sup>) would yield a net present value of -37,147 NOK (€-3,230), with a payback of 29.19 years.

### Main economic results

Financing	NPV (NOK)	Payback (years)	IRR (%/year)	LCOE (NOK/kWh)
Gov. subsidies and 75% bank debt	-37,147 (€-3,230)	29.19	0.29	1.2067 (€0.1049)
Gov. subsidies and 100% supplier's credit	-39,893 (€-3,469)	N/A	-0.25	1.2241 (€0.1064)
Gov. subsidies and 100% equity	-28,911 (€-2,514)	24.55	1.58	1.1544 (€0.1004)
No gov. subsidies and 100% equity	-45,111 (€-3,922)	27.32	0.73	1.2572 (€0.1093)

(All rows are for 12 panels)

### Additional results

In the benchmark scenario of 12 panels, adding a battery storage of 9.6 kWh will further lower the NPV to -65,248 NOK (€-5,674), with no payback period. Ceteris paribus, to achieve an NPV = 0, either the cost of the PV system must be 103,788 NOK (€9,025), the buy price of electricity must be 1.47 NOK/kWh (€0.1278/kWh), or the governmental subsidies must be 50,798 NOK (€4,417).

### Main inputs and assumptions

#### Household and Economics

Electricity Consumption	27,000	kWh/year	Inflation	1.9%	per year
Electricity price – buy	1.1588	NOK/kWh	Bank loan interest rate	5.54%	per year
Electricity price – sell	0.4283	NOK/kWh	Bank loan maturity	10	years
EUR/NOK	11.50		Equity cost of capital	3.63%	per year

#### PV panels

Peak power	580	W/panel	System losses	12.6%	of output
Panel area	2.58	m <sup>2</sup> /panel	Degradation with age	0.4%	per year
Useful life	30	Years	Maintenance costs	2%	

Total cost of optimal installation size (without subsidies)	0	NOK
	0	EUR
Total cost of optimal installation size (after subsidies)	0	NOK
	0	EUR

### Government subsidies

ENOVA SF, a government enterprise, grants households a fixed rate of 7,500 NOK (€652) for installing a photovoltaic system. Furthermore, they will receive a variable rate of 1,250 NOK (€109) for every kWp installed. However, this amount is restricted to 20 kWp, meaning households can receive a maximum of 32,500 NOK (€2,826). In the benchmark scenario of 12 panels, ceteris paribus, the subsidies must be 50,798 NOK (€4,417) for this project to have an NPV = 0.

### **Some PV panel suppliers**

- <https://www.solcelle-energi.no/>
- <https://www.solcellespesialisten.no/>
- <https://www.otovo.no/>

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