

The Big Green Energy Company

ROI Calculation Report

Date: 2025-05-08

Assumptions & Constants

- Battery efficiency: 85% (round-trip efficiency for battery storage)
- Usable battery percentage: 90% (portion of battery capacity that is usable)
- Battery degradation: 70% capacity after 10 years, linear decline to 0% at 15 years
- Maximum battery lifespan: 15 years
- Solar generation factor: 850 kWh/kW/year (typical UK value)
- Solar self-use percentage: 50% (if not home during day), 70% (if home during day)
- Solar export percentage: 50% (if not home during day), 30% (if home during day)
- Battery cost per kWh: £500.00
- Solar cost per kW: £1,500.00
- Tariff rates: User-selected or typical market rates for peak, off-peak, and export
- All calculations are based on the above constants and user-provided inputs.

Input Summary

Calculation Breakdown

Worked Example: Year 1 ... Year 15

Year 1:

Year: 1

Cumulative Savings: £-7543.28

...

Year 15:

Year: 15

Cumulative Savings: £4851.58

Charts

Summary

How We Calculate Your Results

Battery Savings (per year):

The lesser of (Usable Battery Max Capacity × Degradation Factor × 365) or Usage, multiplied by (Peak Rate minus Offpeak Rate), multiplied by Battery Efficiency.

Solar Savings (per year):

(Solar Used × Peak Rate) plus (Solar Export × Export Rate).

Yearly Total Savings:

Battery Savings + Solar Savings.

Cumulative Savings (per year):

The sum of Yearly Total Savings up to this year, minus the Initial Cost.

Payback Period:

The first year when Cumulative Savings becomes greater than zero.

ROI Percentage:

(Total Savings divided by Initial Cost) × 100.

What the variables mean:

Usable Battery Max Capacity: Maximum usable battery capacity (kWh)

Degradation Factor: Battery degradation for the year (e.g., 0.85)

Usage: Annual energy usage (kWh)

Peak Rate, Offpeak Rate, Export Rate: Tariff rates (GBP/kWh)

Solar Used: Solar energy used on-site (kWh)

Solar Export: Solar energy exported (kWh)

Battery Efficiency: Battery round-trip efficiency (e.g., 0.85)

Initial Cost: Upfront system cost (GBP)

Total Savings: Cumulative savings at the end of the period (GBP)

Explanatory Notes

This report details the calculations and assumptions used to estimate the return on investment for your solar and battery installation. For questions, contact our support team.