The Big Green Energy Company
ROI Calculation Report

Date: 2025-05-20

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.

Installation Cost Assumptions

- Assumed total installation cost: £8500.00 GBP

Input Summary

Calculation Breakdown (Yearly Table)

Year	Usable Battery (kWh)	Degradation	Shiftable (kWh)	Battery Savings (£)	Solar Used (kWh)	Solar Export (kWh)	Solar Savings (£)	Yearly Total (£)	Costs Outstanding (£)
1	4.50	0.97	1593.23	£202	1700.00	1700.00	£755	£957	£-7543
2	4.50	0.94	1543.95	£196	1700.00	1700.00	£755	£950	£-6593
3	4.50	0.91	1494.68	£189	1700.00	1700.00	£755	£944	£-5649
4	4.50	0.88	1445.40	£183	1700.00	1700.00	£755	£938	£-4711
5	4.50	0.85	1396.13	£177	1700.00	1700.00	£755	£932	£-3779
6	4.50	0.82	1346.85	£171	1700.00	1700.00	£755	£925	£-2853
7	4.50	0.79	1297.57	£164	1700.00	1700.00	£755	£919	£-1934
8	4.50	0.76	1248.30	£158	1700.00	1700.00	£755	£913	£-1021
9	4.50	0.73	1199.03	£152	1700.00	1700.00	£755	£907	£-114
10	4.50	0.70	1149.75	£146	1700.00	1700.00	£755	£901	£786
11	4.50	0.56	919.80	£117	1700.00	1700.00	£755	£871	£1658
12	4.50	0.42	689.85	£87	1700.00	1700.00	£755	£842	£2500
13	4.50	0.28	459.90	£58	1700.00	1700.00	£755	£813	£3313
14	4.50	0.14	229.95	£29	1700.00	1700.00	£755	£784	£4097
15	4.50	0.00	0.00	£0	1700.00	1700.00	£755	£755	£4852

Note: All cost values in this table are rounded to the nearest pound.

Worked Example: Year 1 ... Year 15

Year 1:

Year: 1
Costs Outstanding: £-7543.28
Costs Outstanding: £-7543

Working Out (Year 1):
Usable Battery Max Capacity: 4.50 kWh
Degradation Factor: 0.97
Shiftable: 1593.23 kWh
Solar Used: 1700.00 kWh (50%)
Solar Export: 1700.00 kWh (50%)

Battery Savings: £202
Solar Savings (self-use): £474
Solar Savings (export): £281
Costs Outstanding: £-7543
Yearly Total Savings: £957

...

Year 15:

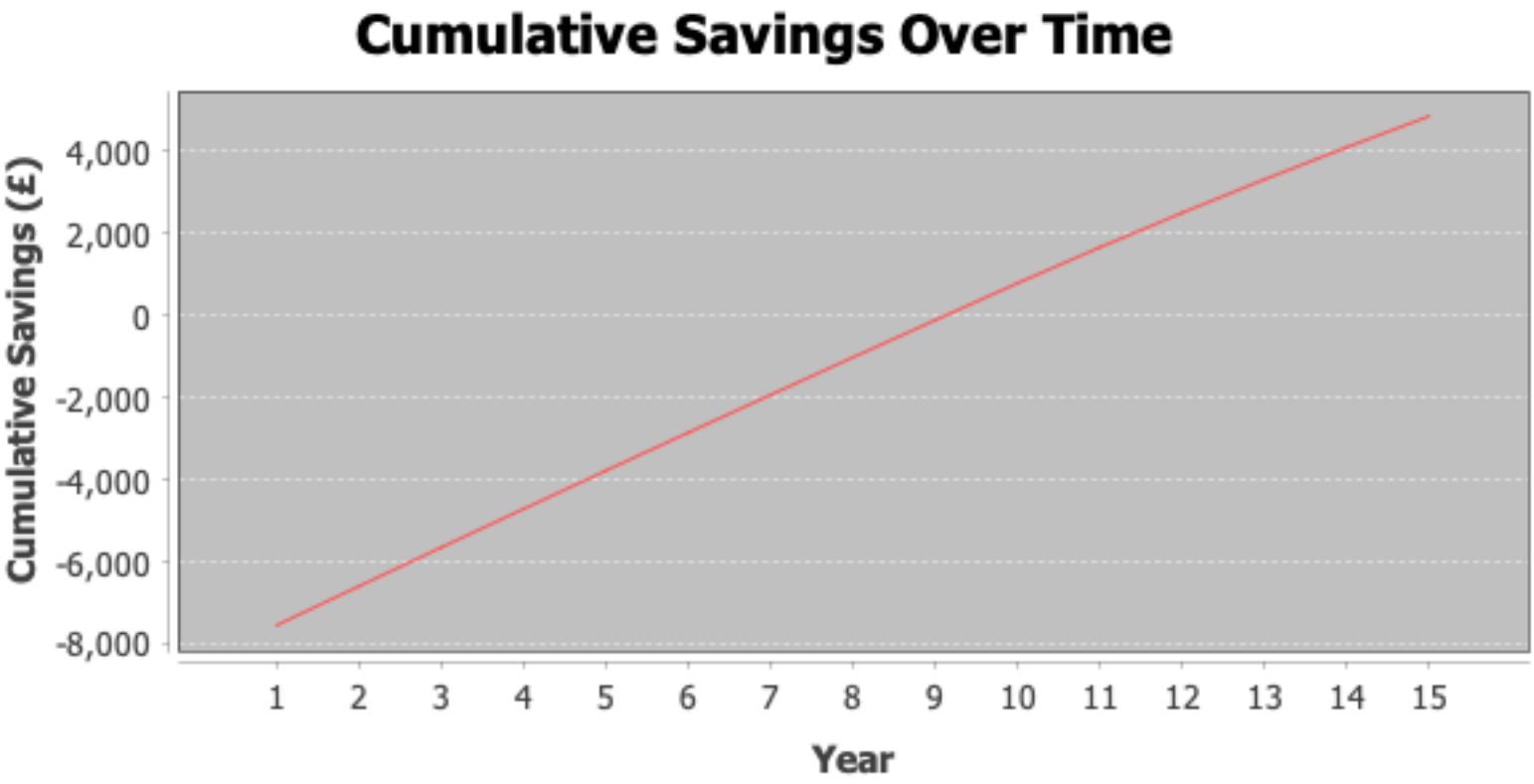
Year: 15
Costs Outstanding: £4851.58

Cumulative Savings Chart

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.