A project, made clearer.

Cedar House · fictional sample

PDF PROJECT DECISION REPORT

Static, portable snapshot of the Interactive Project Analysis. Return to the saved project to edit assumptions, replay energy flows and recalculate. This PDF remains readable offline.

Traceability	Snapshot
Generated	2026-09-30T04:33:03.886Z
Project	Cedar House · fictional sample
Scenario / version	8 kW solar + 10 kWh storage / 1
Simulation engine	solar-1
Analysis model / revision	analysis-2 / 1
Report ID	SAMPLE-CEDAR-V2-PREVIEW-20260928
Assumptions last updated	2026-09-28T07:00:00.000Z
Project intent	compare
Data quality	PRELIMINARY

SAMPLE PROJECT - FICTIONAL DATA. Equipment, demand, weather and financial assumptions illustrate the product, not a measured property.

Executive decision summary

34.4 kWh solar and 38.2 kWh requested demand over 24 modeled hours.

7.2 kWh delivered by storage; 0.0 kWh change in stored energy.

14.7 kWh imported and 10.3 kWh exported.

0.6 kWh battery losses and 0.0 kWh curtailed.

Modeled energy-bill difference: $5.68 for this run; initial stored energy can affect this value.

Metric	Modeled value / availability
Solar / battery	8 kW / 10 kWh
Annual solar / consumption	11,854.6 / 12,956.2 kWh · illustrative
Project cost	$26,000
First-year gross / net savings	$1,845 / $1,695
Simple payback	15.3 years
25-year simple ROI	63%

Conclusions recorded by the user

SAMPLE PROJECT - FICTIONAL DATA. This house, all equipment, synthetic weather, monthly space-conditioning demand, tariffs and budgets are assumed for demonstration. Annual values are an illustrative annualization, not a forecast. Compare the benefit of storage with its incremental cost; no configuration is a universal recommendation.

Property & system architecture

Configuration	Saved input
Site type / location	Single Family Home / Fictional Cedar House · 39°N
Latitude / month / duration	39 / 7 / 24 hours
PV array	20 x 400 W; tilt 30°; azimuth 180°
Inverter	7.6 kW AC; efficiency 96%
Battery	10 kWh; reserve 20%; maximum SOC 95%
Grid / dispatch	connected / self / solar
Island capability	Assumed enabled
Architecture	PV to inverter to AC loads / storage / grid.

System sizes and aggregate load schedules are editable starter assumptions, not measured building averages or equipment recommendations.

Generic equipment classes are used unless documented in a verified proposal. Electrical compatibility, protections, structure, permits and commissioning are not certified by this analysis.

Energy-flow summary

Solar generated	**34.4 kWh**
Grid imported	**14.7 kWh**
Loads served	**38.2 kWh**
Grid exported	**10.3 kWh**
Curtailed	**0 kWh**
Storage conversion losses	**0.626 kWh**
Change in stored energy	**0 kWh**

Selected-period balance: solar + grid import = loads served + grid export + curtailment + battery loss + change in stored energy. Battery transfers are internal; they are not counted twice. Residual: 0 kWh.

Selected energy-day frames

Recorded day 1 · 06:00 solar time



SOLAR 0.641 kW | LOAD 2.6 kW | SOC 20%

Battery: 0 kW charging / 0.0196 kW supplying. Grid: 1.9 kW import / 0 kW export. Unserved: 0 kW. Actual interval from this snapshot; artwork is illustrative.

Recorded day 1 · 12:00 solar time



SOLAR 4 kW | LOAD 1.2 kW | SOC 95%

Battery: 0 kW charging / 0 kW supplying. Grid: 0 kW import / 2.9 kW export. Unserved: 0 kW. Actual interval from this snapshot; artwork is illustrative.

Selected energy-day frames · continued

Recorded day 1 · 18:00 solar time



SOLAR 0.371 kW | LOAD 3.2 kW | SOC 65.6%

Battery: 0 kW charging / 2.8 kW supplying. Grid: 0 kW import / 0 kW export. Unserved: 0 kW. Actual interval from this snapshot; artwork is illustrative.

Recorded day 1 · 23:00 solar time



SOLAR 0 kW | LOAD 0.35 kW | SOC 20%

Battery: 0 kW charging / 0 kW supplying. Grid: 0.35 kW import / 0 kW export. Unserved: 0 kW. Actual interval from this snapshot; artwork is illustrative.

Solar & seasonal analysis

Capacity 8 kW DC. Solar retained on site 70% (includes charging losses). Solar energy sent to storage 7.8 kWh.

Month	Solar kWh	Demand kWh	Import kWh	Export kWh
1	880.3	1,342.3	661.9	180.5
2	885.4	1,141	518.9	245.7
3	1,058.1	1,078.8	451.1	411
4	1,062.7	865.5	331.5	509.9
5	1,098.8	894.3	325.5	510.5
6	1,045.4	1,044	388.6	371.2
7	1,067.6	1,184.2	456.4	320.4
8	1,060.8	1,184.2	472	329.3
9	1,001	942	382.1	422.3
10	977.4	920.7	396.4	433.6
11	866.1	1,069.5	501.6	279.4
12	851.3	1,289.6	638.3	180.6

One synthetic representative day per month, settled battery, weighted by calendar days. These are illustrative annualized outputs, not measured weather or a validated forecast.

Solar & seasonal analysis · continued

Winter representative noon · 12:00 solar time



Battery: 2.5 kW charging / 0 kW supplying. Grid: 0 kW import / 0 kW export. Unserved: 0 kW. Actual interval from this snapshot; artwork is illustrative.

Spring representative noon · 12:00 solar time



Battery: 0 kW charging / 0 kW supplying. Grid: 0 kW import / 3.7 kW export. Unserved: 0 kW. Actual interval from this snapshot; artwork is illustrative.

Solar & seasonal analysis · continued

Summer representative noon · 12:00 solar time



SOLAR 4 kW | LOAD 1.2 kW | SOC 95%

Battery: 0 kW charging / 0 kW supplying. Grid: 0 kW import / 2.9 kW export. Unserved: 0 kW. Actual interval from this snapshot; artwork is illustrative.

Fall representative noon · 12:00 solar time



SOLAR 4.1 kW | LOAD 0.65 kW | SOC 95%

Battery: 0 kW charging / 0 kW supplying. Grid: 0 kW import / 3.4 kW export. Unserved: 0 kW. Actual interval from this snapshot; artwork is illustrative.

Battery & grid / resilience

Battery metric	Modeled result
Nominal / operating-window capacity	10 / 7.5 kWh
Reserve / minimum SOC	20 / 20%
Charged / discharged	7.8 / 7.2 kWh
Solar / grid charge source	7.8 / 0 kWh
Equivalent discharged cycles	0.751
Grid independence	61.5%
Net grid purchases	4.4 kWh
Unserved / deferred	0 / 0 kWh

Grid independence measures modeled demand served without contemporaneous grid purchases; initially stored energy and grid-charged batteries can affect interpretation. It is not an off-grid autonomy guarantee.

Modeled outage scenario

24 hours from the original start time and initial SOC. Critical demand served 6.5 of 8.4 kWh. Unserved total 1.9 kWh. First total-load shortfall: 0 hours.

Actual backup performance depends on system design, equipment, conditions and installation. Starting surges, equipment faults and thermal limits are not modeled.

Financial analysis & cash flow

Assumption	Value / source
Solar / battery budget	$14,000 / $8,000 · USER INPUT
BOS / installation	$2,000 / $2,000 · USER INPUT
Total cost override	$26,000 · USER INPUT
Import / peak / export rate	0.22 / 0.22 / 0.05 $/kWh · SIMULATION INPUT
Annual upkeep / incentives	$150 / $0 · DEFAULT 0 unless changed
Escalation / degradation	0% / 0% · DEFAULT 0 unless changed

Year 0 cumulative cash flow **-26,000 USD**



Year 10 cumulative cash flow **-9,052.7 USD**



Year 20 cumulative cash flow **7,894.5 USD**



Year 25 cumulative cash flow **16,368.1 USD**



First nonnegative modeled year: 16.

Gross savings = avoided grid-purchase value + export compensation. Net savings subtract upkeep. Simple payback = net initial investment / first-year net savings when positive. Cash flow is undiscounted and excludes financing, tax treatment and replacements beyond the entered allowance. Degradation scales energy benefits; future physical dispatch is not re-simulated. Incentive eligibility is never assumed.

Scenario comparison

Configuration	Solar / battery	Solar kWh	Imports / exports kWh	Site independence	Cost
8 kW solar + 10 kWh storage	8 kW / 10 kWh	34.4	14.7 / 10.3	61.5%	$26,000
8 kW solar + 20 kWh storage	8 kW / 20 kWh	34.4	7.5 / 2.5	80.3%	$34,000

Configuration	Annual net energy benefit	Basis	Simple payback
8 kW solar + 10 kWh storage	$1,695	Avoided purchases + exports less upkeep	15.3 years
8 kW solar + 20 kWh storage	$2,111	Avoided purchases + exports less upkeep	16.1 years

Each row uses its saved simulation. Different periods, weather, initial stored energy and objectives can prevent a like-for-like comparison. Annual savings/payback and backup resilience are not inferred for comparison scenarios without corresponding analyses. There is no automatic winner.

Marginal value & sensitivity

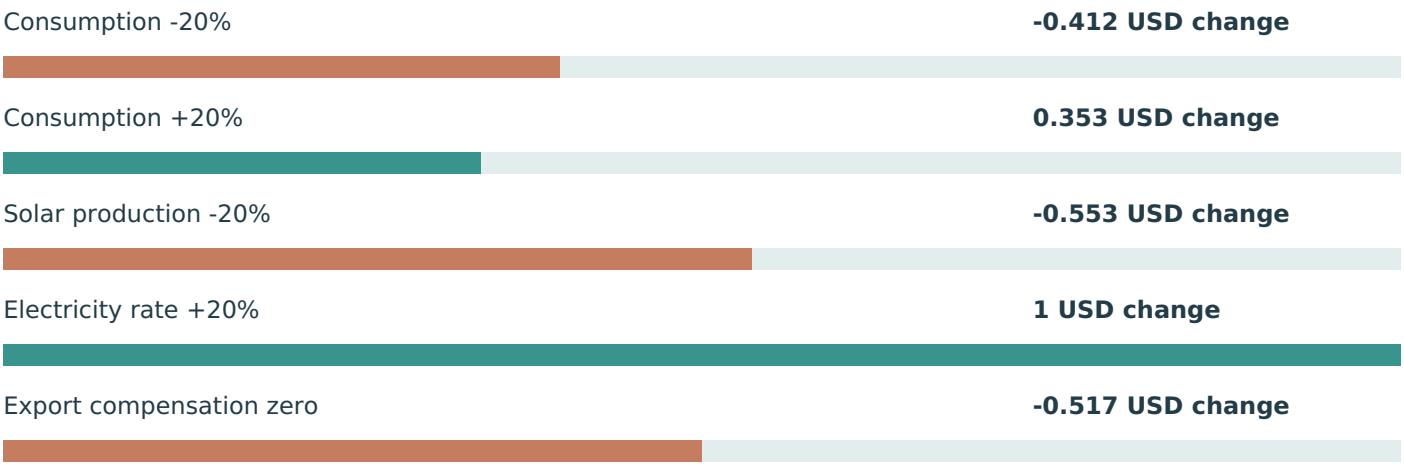
What does the next battery increment buy?

Capacity	Grid independence	Added cost	Storage change
10 kWh	61.5%	$0	0 kWh
20 kWh	80.3%	$8,000	0 kWh
30 kWh	86.3%	$16,000	0 kWh
40 kWh	86.3%	$24,000	0 kWh

What does the next solar increment buy?

Capacity	Grid independence	Added cost	Storage change
8 kW	61.5%	$0	0 kWh
10 kW	64.2%	$4,400	0 kWh
12 kW	66.3%	$8,800	0 kWh
14 kW	68%	$13,200	0 kWh

Compare successive gains, not capacity alone. Identical initial SOC percentages can mean more initially stored energy in larger batteries. Short-run monetary gains must be interpreted with storage change.



One-at-a-time deterministic cases, bounded by model limits. Monte Carlo analysis was not run: defensible probability distributions were not supplied. No outcome probabilities are invented.

Risk, data quality & assumptions

HIGH IMPACT · Synthetic production

Weather, shading and module performance are simplified; obtain a site-specific production assessment.

HIGH IMPACT · Consumption

Load schedules are assumptions; enter twelve monthly bills and check hourly timing.

HIGH IMPACT · Equipment and installation cost

No verified proposal has been entered.

HIGH IMPACT · Tariff and export compensation

Tariff values are unverified simulation assumptions.

MODERATE IMPACT · Battery aging and lifecycle

Dispatch does not model aging, failures or replacement; cash-flow degradation is a simplified financial adjustment.

Analysis Data Quality - PRELIMINARY

Consumption schedules are estimates. No complete twelve-month utility series was entered.

Tariff remains unverified.

No verified proposal entered.

Installation pathway & preliminary BOM

Intent: compare. Planning and project management only. Jurisdiction, equipment and site conditions determine professional, licensed-trade, permitting and utility requirements.

Activity	Planning classification
Bills, records and proposal comparison	Potential DIY
Layout, site measurements and access planning	Professional review recommended
Structure, racking, electrical and protection design	Licensed / authority-dependent
Installation, inspection and interconnection	Licensed / authority-dependent

Category	Specification	Quantity	Budget
PV modules	8.00 kW DC; 400 W modules	20	$14,000
Inverter	7.6 kW AC modeled; island capability assumed	Design required	Not entered
Battery	10 kWh nominal; 7.5 kWh operating window	Equipment selection required	$8,000
Racking & mounting hardware	Site and equipment design required	Not yet determined	Not entered
Energy management & monitoring	Site and equipment design required	Not yet determined	Not entered
Disconnect / combiner equipment	Site and equipment design required	Not yet determined	Not entered
Protection equipment	Site and equipment design required	Not yet determined	Not entered
Labels / signage	Site and equipment design required	Not yet determined	Not entered
Balance-of-system materials	Site and equipment design required	Not yet determined	Not entered

DIY / hybrid versus professional

DIY/hybrid economic budget $20,800; professional budget $26,000. User time is included only when hours and a rate are entered. Schedule, warranty, permits and coordination must be confirmed in proposals. Lower cost does not establish preference.

Roadmap & installer questions

Stage	User-tracked status
Validate	Not marked complete
Design	Not marked complete
Approvals	Not marked complete
Procurement	Not marked complete
Site preparation	Not marked complete
Installation	Not marked complete
Inspection / interconnection	Not marked complete
Commissioning	Not marked complete
Monitoring	Not marked complete

What production and consumption evidence supports this 8.0 kW / 10 kWh configuration?

Which loads can operate during a grid outage, and what transfer/islanding equipment is included?

What costs, warranties, financing terms and utility approvals are excluded?

Methodology & next evidence

Traceability: saved configuration to engine solar-1 to recorded 15-minute power flows to integrated selected-period metrics to current analysis financial and planning assumptions to this timestamped snapshot. PDF values are read from the same analysis object as the interactive workspace.

Input provenance: simulation settings are saved inputs; prices and project budgets are user inputs or explicit defaults; proposal values are user-verified external evidence; metrics are calculated results. No synthetic weather value is labeled measured.

Collect next

Twelve monthly utility bills and, when available, interval usage.

Actual tariff, export compensation and connection rules.

Site-specific shading, structural and weather-based production assessment.

Itemized quotes, exact equipment, warranties, financing and backup scope.

Limitations

Exploratory model, not installation design, professional advice, certification or a performance/financial guarantee. No electrical transients, aging dispatch, component compatibility, demand-charge model, tax treatment or financing amortization. Art depicts a building class, not exact module placement. User-entered information is not independently verified.

Method and interpretation references

DOE Homeowner’s Guide to Solar: https://www.energy.gov/cmei/systems/homeowners-guide-solar

SAM battery dispatch: https://samrepo.nlr.gov/help/battery_dispatch_btm.html

These references inform interpretation. PreviewSolar does not run SAM or PVWatts and these sources do not validate its fictional sample.