



BUSINESS CASE STUDY | BATTERY ENERGY STORAGE



Combined view of two independent erf systems | June and July 2026

INSTALLED ASSET | 79.98 kWp PV | 50 kW AC | 90.4 kWh BESS

15.53 MWh PV PRODUCTION	764 kWh PV SURPLUS CAPTURED	7.34 MWh BESS DISCHARGE TO LOAD	0 kWh GRID EXPORT OBSERVED
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CASE RESULT The BESS captured 764 kWh of same-erf PV surplus and returned 7.34 MWh to load. At average FY2026/27 Miniflex rates, BESS dispatch contributes R32,295 over 61 days; total PV+BESS saving value is R68,718, plus a R7,139 network-demand saving.

VERDICT Across 61 winter days, the combined ██████████ installation increased the amount of solar that could be used behind the meter, maintained zero measured export, and shifted energy into periods when site load exceeded PV output.

EXECUTIVE CASE

- 764 kWh of same-erf PV surplus was absorbed by the batteries instead of having no on-site load available.
- 7.34 MWh was discharged into local load - an average of 120 kWh per day.
- Observed combined discharge reached 41.2 kW, directly reducing Eskom supply at those moments.
- At average FY2026/27 Miniflex rates, BESS dispatch contributed R32.3k over the measured 61 days; its simple annualised return is R193.2k.

Installed asset confirmed by the preliminary handover

PV array	Hybrid inverters	Battery storage	Export control	Completion
129 x 620 W 79.98 kWp	2 x 25 kW 50 kW AC	10 x BAT 10 90.4 kWh	2 Sigen sensors 1 per incomer	Practical: 3 Mar Certified: 11 Mar

Two erfs, combined only at reporting level

██████████ is supplied through two separate electrical points. Inverter/BESS 1 and Inverter/BESS 2 cannot exchange energy across the erf boundary. Each interval was therefore calculated per system first, and only then added into the combined case study.

Electrical system	Observed PV	PV surplus captured	BESS discharge	Observed discharge peak
Erf / System 1	7.98 MWh	187 kWh	3.81 MWh	21.1 kW
Erf / System 2	7.55 MWh	577 kWh	3.53 MWh	21.0 kW
Combined report	15.53 MWh	764 kWh	7.34 MWh	41.2 kW

EVIDENCE BASE

Measured Energy

The analysis uses all 122 daily exports supplied for June and July. Each record is a 5-minute average power reading; energy is the interval sum divided by 12.

Measured curtailment capture and BESS throughput

Combined business view; calculations performed separately for each erf

■ June ■ July

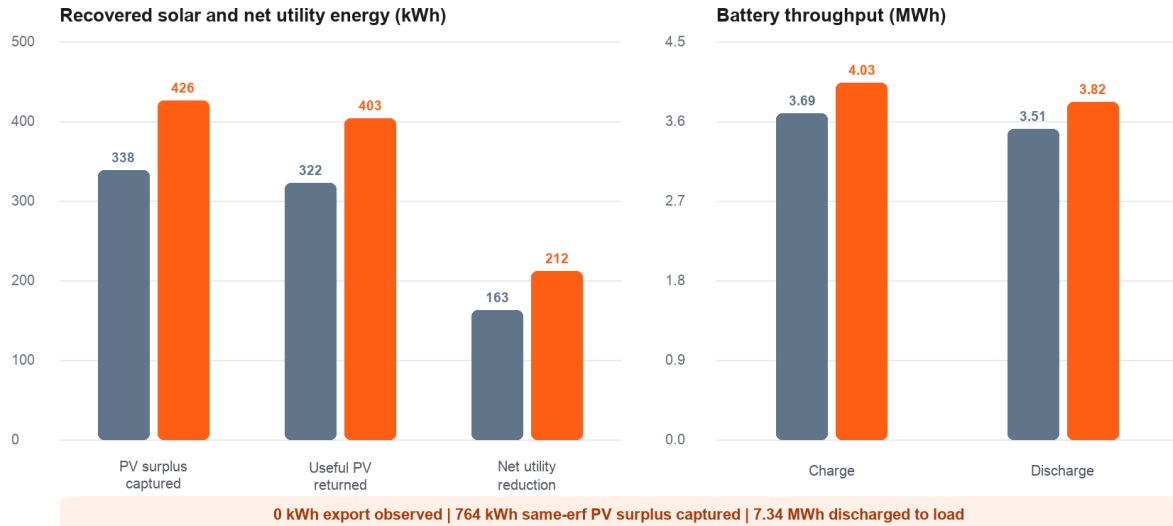


Figure 1. Monthly performance. Useful PV returned applies the observed charge-to-discharge retention to the measured PV-surplus capture.

Period	PV MWh	Load MWh	Eskom MWh	BESS Charge MWh	BESS Discharge MWh	PV Captured kWh
June	7.10	37.00	30.07	3.69	3.51	338
July	8.43	37.56	29.34	4.03	3.82	426
Total	15.53	74.55	59.41	7.72	7.34	764

Source: PG1 and PG2 5-minute exports. Figures may not sum exactly due to rounding.

DATA QUALITY 99.91% of expected system intervals were usable. One PG1 file had 28 missing intervals and two obvious PG1 telemetry spikes above 500 kW were excluded. The remaining interval power balance reconciles.

LOAD PROFILE | JUNE AND JULY

June 2026: typical combined weekday and weekend profile

Median of each 5-minute time bucket across the month

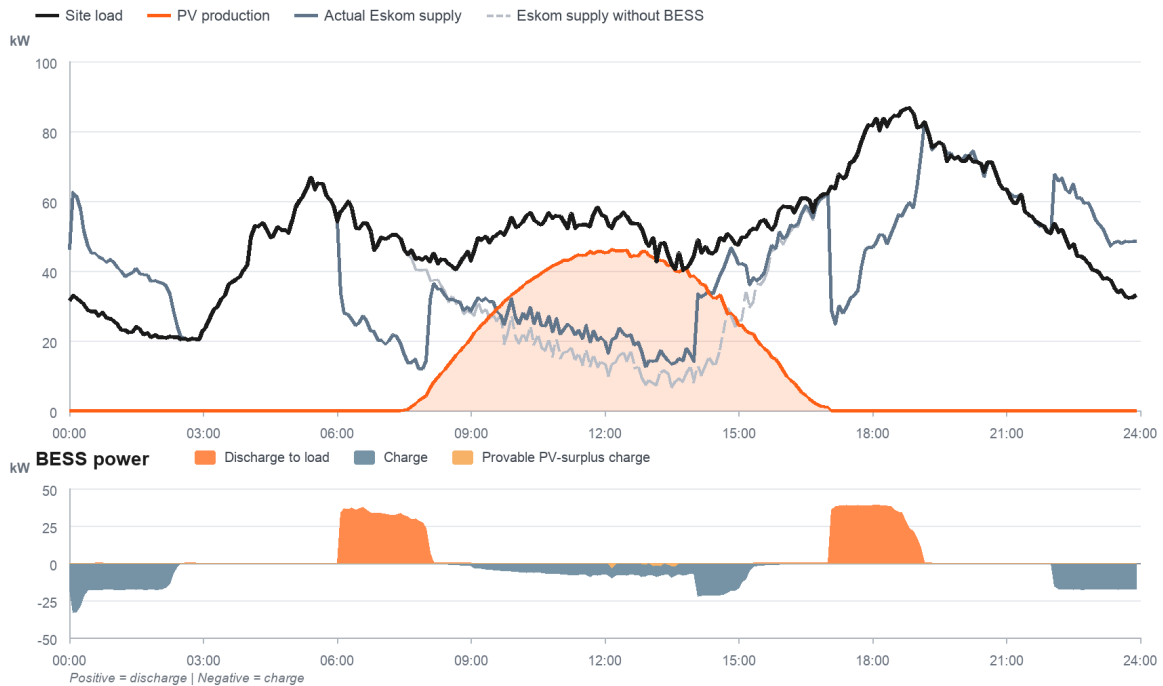


Figure 2. Typical June profile. The no-BESS line is calculated separately for each erf before aggregation.

- The BESS delivered 3.51 MWh to load in June, with the strongest reduction in utility supply during the morning and early evening.

July 2026: typical combined weekday and weekend profile

Median of each 5-minute time bucket across the month

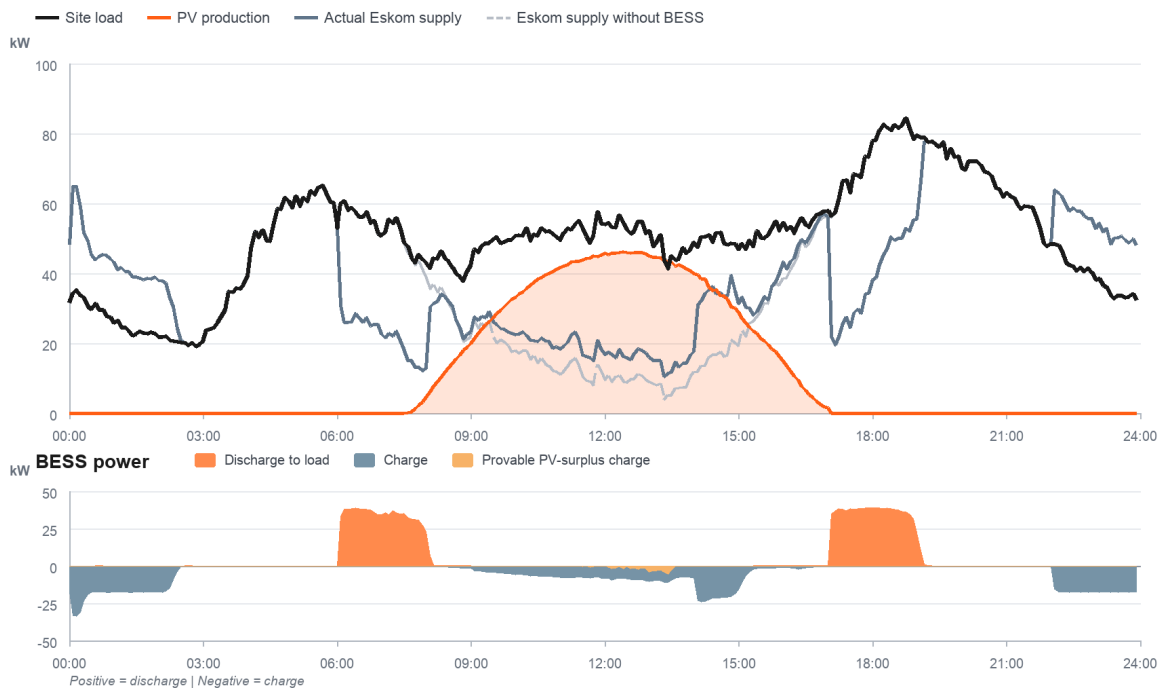


Figure 3. Typical July profile. The BESS lowers the actual grid line below the no-BESS requirement during discharge periods.

- BESS discharge increased to 3.82 MWh - 9% above June.

LOAD PROFILE | WEEKDAY AND WEEKEND

Average weekday: combined two-erf profile

Mean of each 5-minute interval across 45 weekdays | June-July 2026

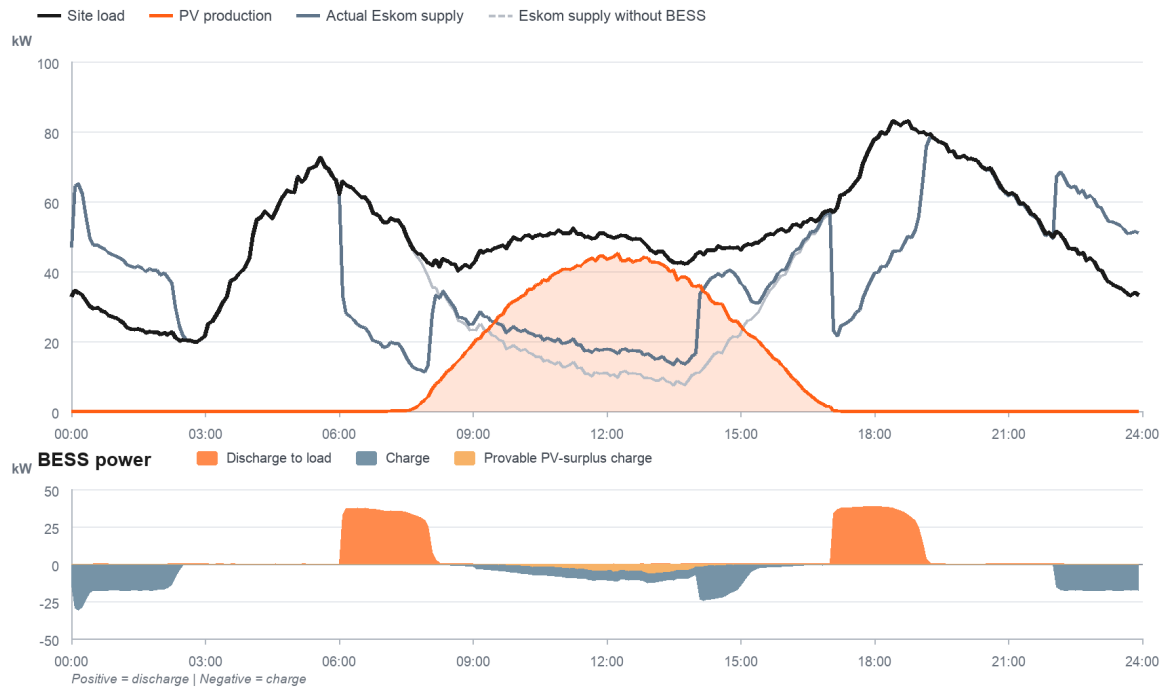


Figure 4. Average weekday profile across 45 days. The no-BESS line is calculated separately for each erf before aggregation.

- The average weekday delivered 144.4 kWh from the BESS and captured 15.7 kWh of same-erf PV surplus.

Average weekend day: combined two-erf profile

Mean of each 5-minute interval across 16 weekend days | June-July 2026

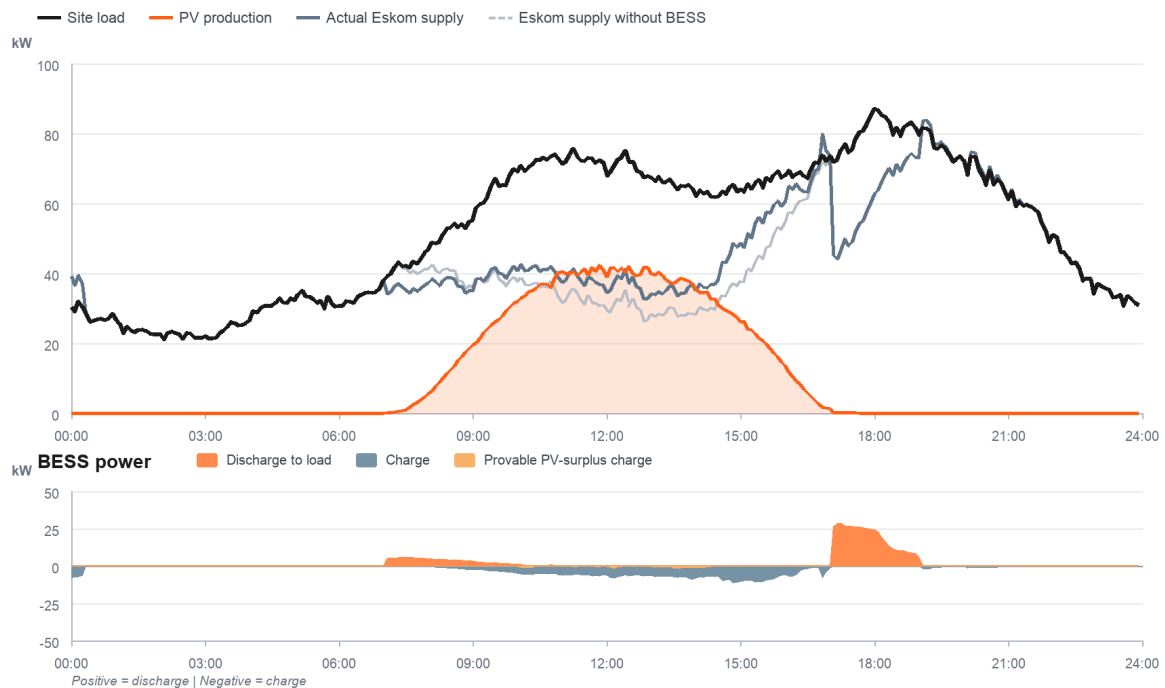


Figure 5. Average weekend profile across 16 days. Lower winter cycling reduces the gap between actual and no-BESS Eskom supply.

- Weekend dispatch was lighter: the BESS discharged 51.1 kWh and captured 3.6 kWh of same-erf PV surplus on an average day.

MINIFLEX VALUE CASE

TOU tariff materially strengthens the BESS business case

savings are calculated on Eskom's FY2026/27 Miniflex tariff for a direct non-local-authority supply. The calculation assumes the <500 V, ≤300 km transmission-zone category, excludes VAT, and uses the requested simple average of high- and low-season rates.

Dispatch assumptions: all direct PV offsets standard-period imports; grid-sourced BESS charging occurs off-peak; and all BESS discharge offsets peak-period imports. High season is June-August and low season is September-May.

Charge component	High season c/kWh	Low season c/kWh	Simple avg R/kWh	Effective variable R/kWh
Peak active energy	739.28	306.82	R5.2305	R5.9105
Standard active energy	184.82	172.50	R1.7866	R2.4666
Off-peak active energy	123.20	123.20	R1.2320	R1.5890
Network demand (peak + standard)	32.30	32.30	R0.3230	Included above

Measured tariff value

Measured item	Energy	Rate / basis	61-day value	Simple annualised run-rate
Direct PV → standard self-supply	14,766 kWh	R2.4666/kWh	R36,423	R217,941
Peak BESS discharge saving	7,335 kWh	R5.9105/kWh	R43,356	R259,423
Less off-peak grid charging	(6,961 kWh)	R1.5890/kWh	(R11,061)	(R66,182)
Net BESS TOU arbitrage contribution	—	Discharge less charge	R32,295	R193,241
Combined PV + BESS saving	—	All items above	R68,718	R411,182

The 764 kWh of measured PV-surplus charging is removed from direct-PV self-supply before the discharge value is calculated, avoiding double counting. Only the remaining 6,961 kWh of charging is costed at the off-peak grid rate.

DEMAND SAVING R7,139 over 61 days (R42,716 simple annualised) from the 32.30 c/kWh network-demand charge. R2,369 of the measured saving is attributable to BESS peak discharge; R4,770 is attributable to direct PV during standard periods.

Tariff source: Eskom Schedule of Standard Prices, 1 April 2026 to 31 March 2027, Miniflex non-local-authority tariff.

NOTES

Interpretation, limitations and next steps

1. Miniflex provides a genuine TOU arbitrage opportunity. The value case therefore costs grid charging at the average off-peak rate and values BESS discharge at the average peak rate.
2. Miniflex also attracts a network-demand charge in peak and standard periods. The report quantifies this billable saving separately from active-energy savings.
3. The fixed network-capacity charge of R54.22/kVA/month and generation-capacity charge of R5.29/kVA/month are not treated as savings. A reduction requires invoice evidence that NMD or annual utilised capacity can be lowered.
4. Winter loads are higher—particularly as geysers work harder—while PV production is lower. Less surplus PV is therefore available for the BESS to capture than in summer.
5. The 61-day June-July window is a conservative winter measurement, not an annual forecast. Annualised figures simply multiply the measured result by 365/61.
6. The two erfs are electrically independent and billed separately. Energy cannot be transferred between the systems, so interval benefits are calculated per erf before aggregation.
7. Only PV measured above simultaneous same-erf load is counted as captured. No unmeasured or modelled curtailment is treated as a realised saving.
8. The financial view excludes VAT. As ██████████ Property Fund is not VAT registered, this should be added.

Observed 30-minute maximum-demand effect

Month	Actual sum of erf peaks	No-BESS counterfactual	Observed change
June 2026	140.4 kW	159.8 kW	19.4 kW reduction
July 2026	113.0 kW	110.9 kW	2.1 kW increase

Sources: 122 ██████████ PG1/PG2 five-minute exports, June-July 2026; Emira ██████████ Preliminary Handover; Eskom FY2026/27 Schedule of Standard Prices.

VIABILITY AND ROLLOUT

The ██████████ installation is a technical and tariff-based proof of BESS viability

VIABILITY VERDICT The 79.98 kWp PV / 50 kW AC / 90.4 kWh BESS installation proves both the curtailment-recovery mechanism and a strong Miniflex value stack. Across 61 measured winter days, the BESS contributed R32.3k of variable tariff value and the complete PV+BESS system R68.7k. This excludes a R7.14k network-demand saving.

Future-site value stack

1	2	3	4
CURTAILMENT	ARBITRAGE	PEAK	RESILIENCE
Store PV that cannot be used or exported.	Charge in low-cost periods and discharge in high-cost periods.	Reduce billed demand and peak-period grid exposure.	Maintain critical operations during supply interruptions.