

Zero export in practice: production vs consumption before and after a load change

Case study · 20 kWp on-grid solar plant, Chiang Rai · Solar ESS Co. Ltd. · 16 October 2026

When two adjacent buildings were disconnected from a 20 kWp zero-export plant on 1 October, recorded consumption fell 42%, and solar production also fell 21%, even though October's weather was better. With export disabled, the inverter can only produce what the site uses, so about 35% of October's potential solar went unused.

Data: the plant's daily monitoring records, 16 Sep – 15 Oct 2026 (two 15-day periods). The plant has no battery and export to the grid is disabled in the inverter.

Side by side (15 days each)

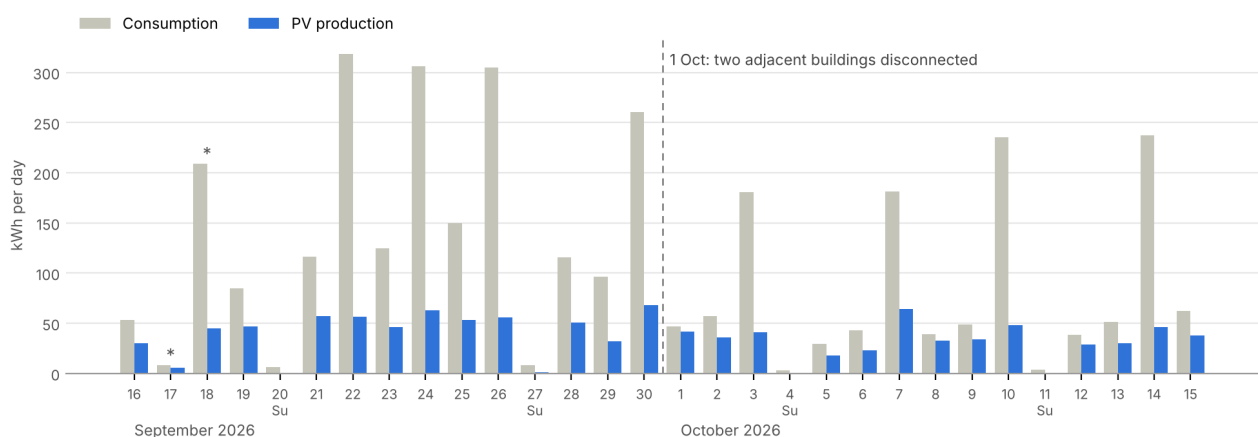
Measure	16–30 Sep	1–15 Oct	Change
PV production	611.6 kWh (40.8/day)	482.3 kWh (32.2/day)	–21%
Full-load hours	2.04 h/day	1.61 h/day	–0.43 h
Consumption	2,162 kWh (144/day)	1,258 kWh (84/day)	–42%
Grid import*	1,393 kWh	789 kWh	–43%
Grid export*	78 kWh (14% of PV)	69 kWh (14% of PV)	about the same
Solar share of the load*	24.8%	32.9%	+8 points
PV used on site*	86%	86%	the same

* 17–18 Sep are left out of the import and export figures: the meter logged impossible values on those days, most likely a current-sensor (CT) or meter fault during wiring work.

Daily production vs consumption

PV stays at 30–68 kWh a day while the load swings from 3 to 320 kWh

* meter fault day · Su = Sunday



On light days and Sundays the PV bars are capped by the load, not the weather. On heavy days (Wednesdays and Saturdays in October) they reach 46–68 kWh.

Findings

1. Load fell much more than expected. The two disconnected buildings were estimated at about 10% of the main building's load, yet recorded consumption fell 42%: light days from 106 to 46 kWh (–56%) and heavy days from 280 to 209 kWh. Part of the drop is a change in what the meter measures, since the sensor had also been reading the other buildings' flows, and part is the end of the very high loads seen while the buildings were linked.

2. Production follows the load, not the sun. October had fewer rainy days (7 vs 11), yet production fell, because with export disabled the inverter throttles to the site's use:

- **Heavy days (180–320 kWh load):** 50–58 kWh of PV, about 2.5–2.9 h, close to this season's real potential.
- **Light days (about 46 kWh load in October):** only about 31 kWh of PV.
- **Sundays (3–8 kWh load):** PV near zero with the grid on, on all four Sundays.

Taking heavy days as the potential, about 200 kWh (16–30 Sep) and 265 kWh (1–15 Oct) of solar went unused, roughly THB 950–1,250 per fortnight at 4.70 THB/kWh, or 35% of October's potential.

3. Zero export still leaks. About 14% of production still reached the grid in both periods, up to 20.8 kWh in a day, sometimes on the same day as 130 kWh of import. This fits a phase imbalance: the inverter feeds all three phases evenly, but one phase carries about 90% of the load, so the lightly loaded phases export while the heavy phase imports. Export without a sell-back agreement earns nothing.

4. The work pattern is clear. In October the heavy production days fell exactly on Wednesdays and Saturdays; other weekdays were light and Sundays were shut.

5. Money. Solar used on site was worth about THB 2,270 (Sep) and THB 1,940 (Oct) per fortnight. Grid import fell by about 605 kWh (about THB 2,840 per fortnight), mostly from the lower load and the change in metering scope, not from more solar.

What to do with a zero-export plant like this

1. **Balance the phases first.** Move single-phase loads off the overloaded phase to stop most of the export leak and steady the zero-export control.
2. **Shift flexible loads into midday on light days and weekends,** such as pre-cooling with air conditioning, water pumping and charging. The solar is there but unused.
3. **Test control changes carefully.** Switching off the CT while export is disabled may stop the inverter seeing the load; test on a light, sunny day with someone watching the grid reading.
4. **Recover the curtailed solar,** either through a PEA sell-back agreement or with a small battery that charges from the midday surplus and runs the evening load.

Solar ESS reviews monitoring data like this for its customers and can advise on phase balancing, load shifting, PEA sell-back applications and battery sizing. Book a consultation at www.solaress.org.