CANTINA SOLAIRE

PRACTICAL BUILDING GUIDE · BY: DILETANTE(N) / KEO

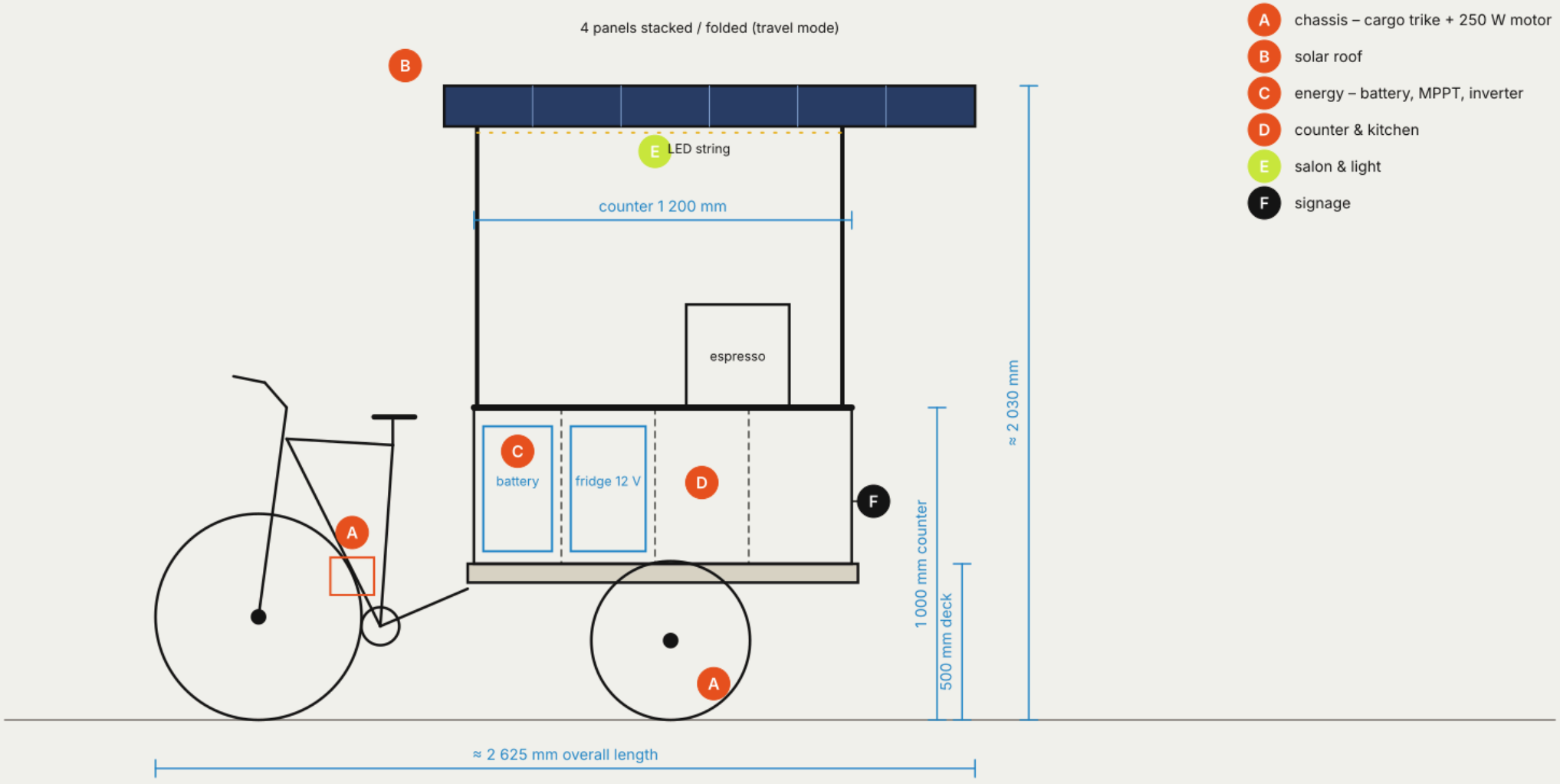
A solar-powered cantina on a cargo trike that brings rural topics into the city – a café, an exhibition and a pitch on three wheels.



Plans and details worked out by Claude, based on the concept and budget by KEO. All measures and prices are guide values – check them before building.

01 · SIDE VIEW – TRAVEL MODE

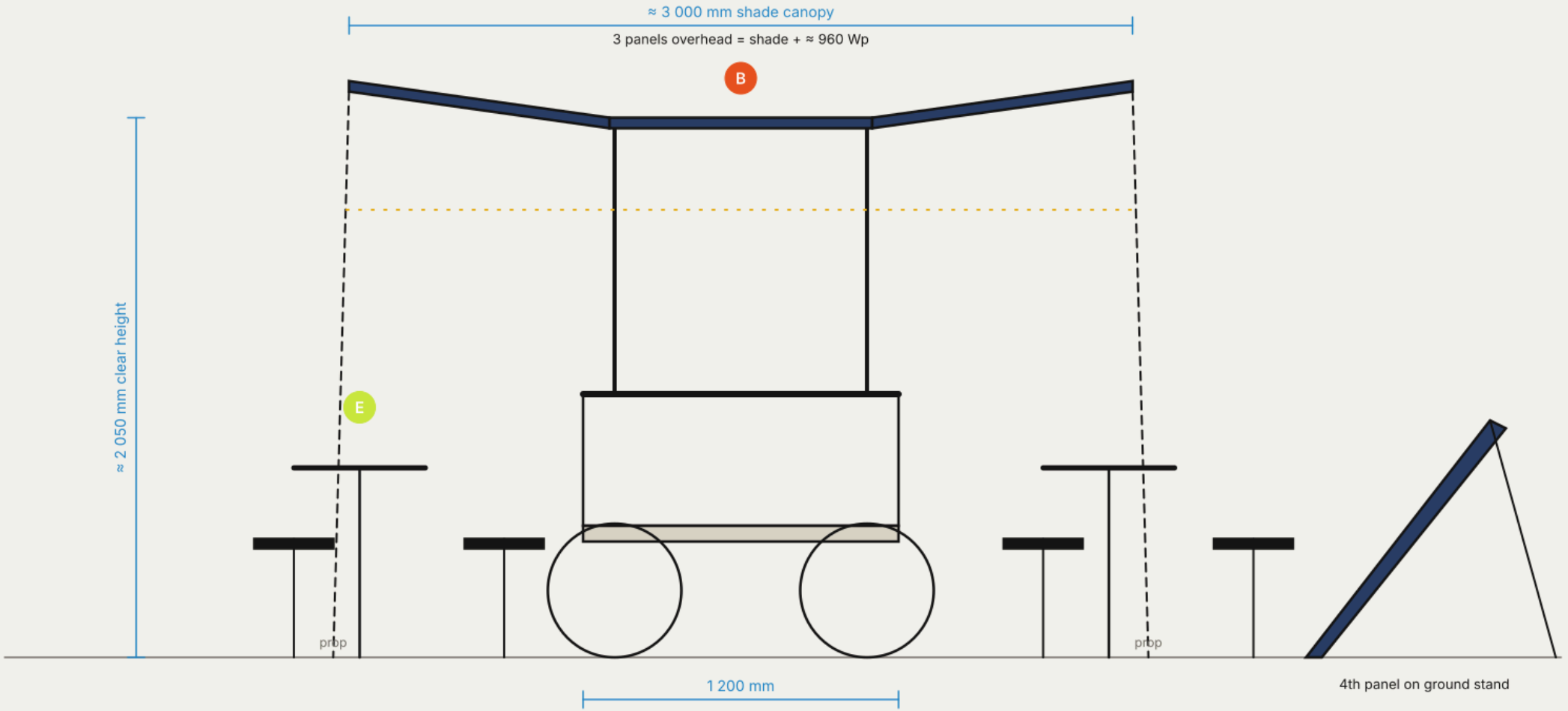
Cantina rolls as a bicycle: roof folded, salon packed on the deck



A chassis – cargo trike + 250 W motor
B solar roof
C energy – battery, MPPT, inverter
D counter & kitchen
E salon & light
F signage

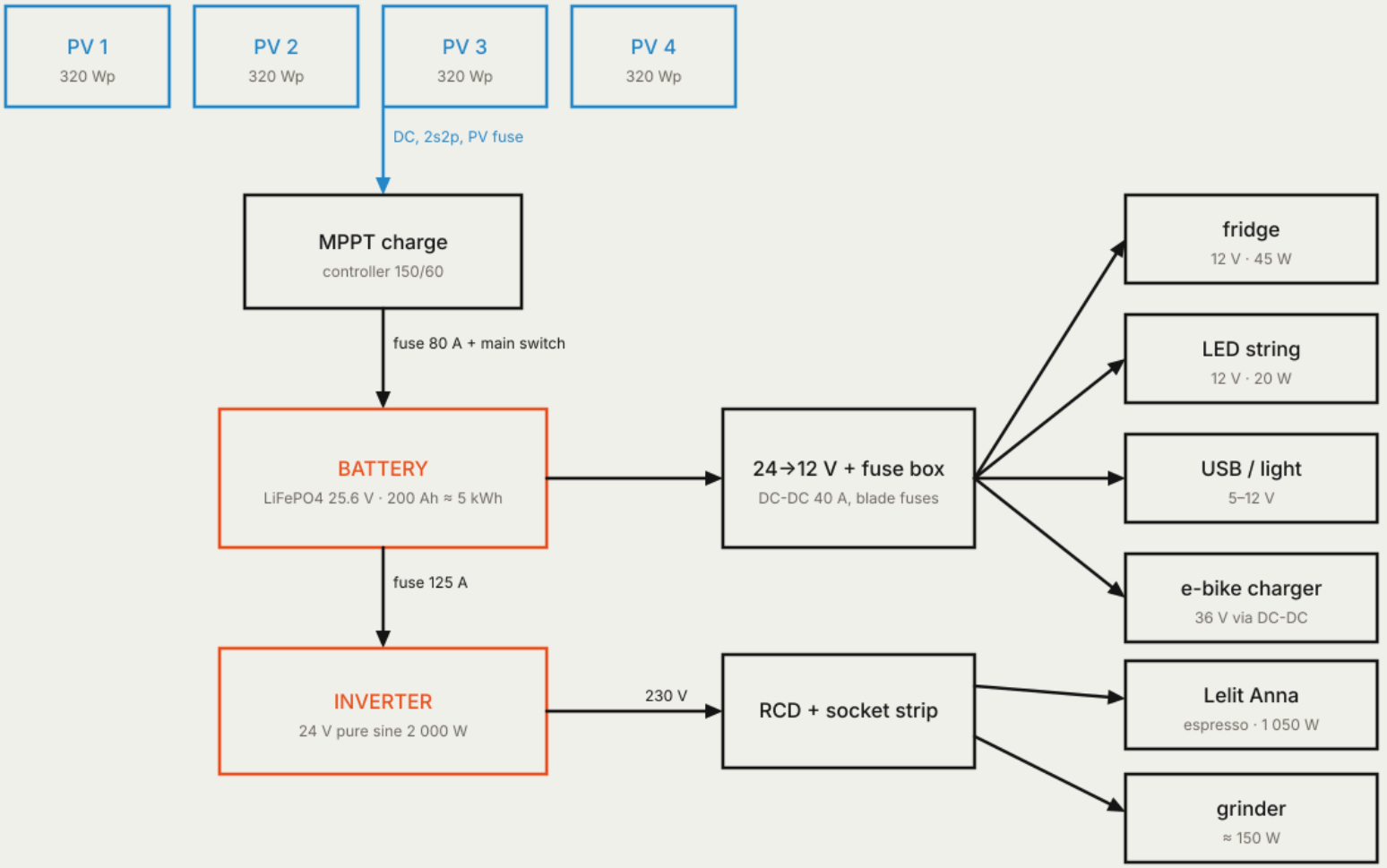
02 · FRONT VIEW – PARKED & OPEN

Wings unfold, props go down, tables and stools come off the deck



03 · ENERGY & WIRING

From the roof to the cup – one battery, two circuits



Energy per sunny day (Graz, summer):

harvest ≈ 4–5 kWh (1.28 kWp × ≈ 3.5 full-sun hours)

Lelit Anna, 6 h service ≈ 1–1.5 kWh (estimate)

fridge ≈ 0.5 kWh · light ≈ 0.1 kWh

→ 5 kWh battery = a full day without sun

Safety:

fuse every line close to the battery

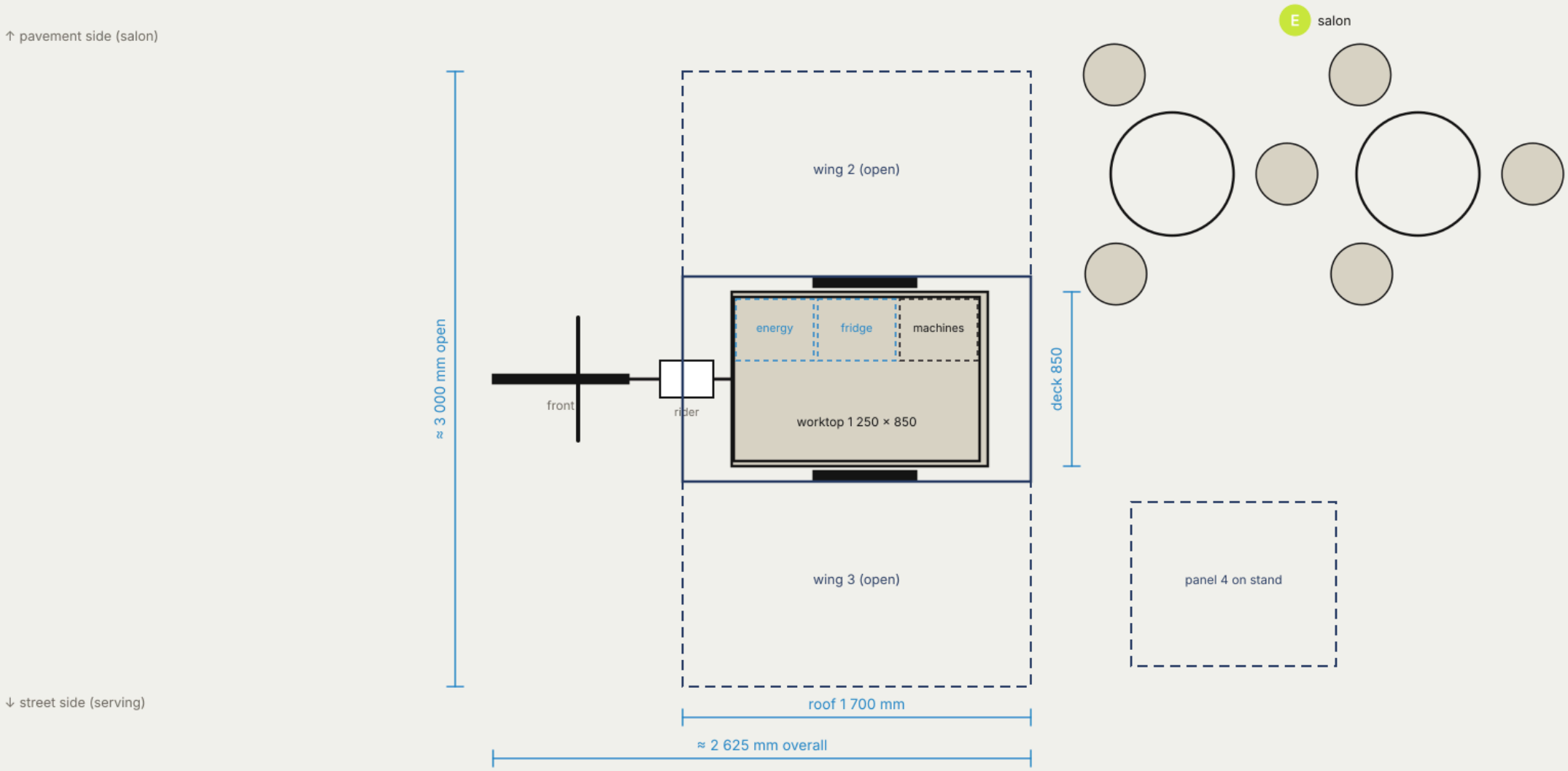
battery in a vented, closed box

230 V side: RCD, checked by an electrician

never charge LiFePO4 below 0 °C

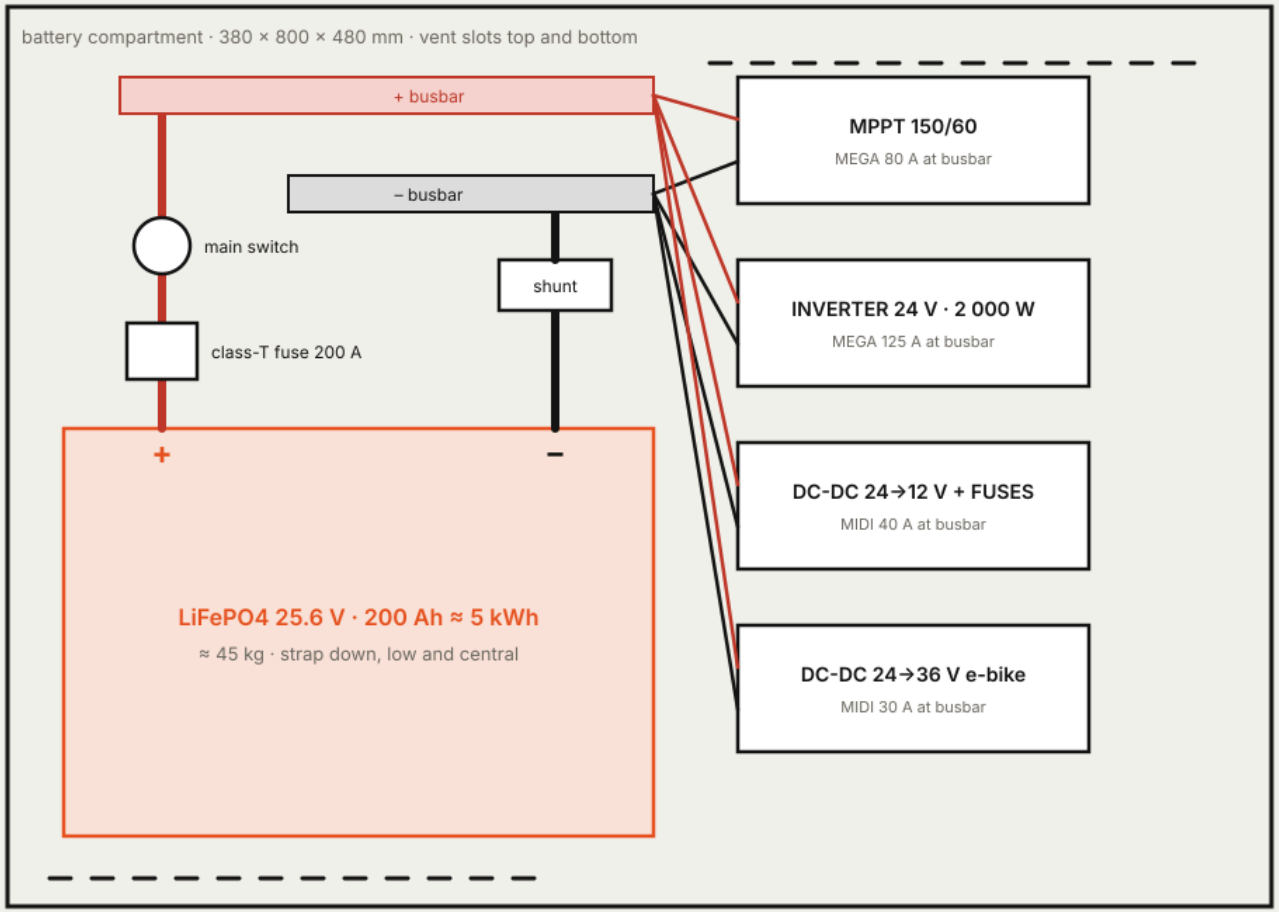
04 · TOP VIEW – FOOTPRINT

Travel mode (solid) and open mode (dashed) on one parking space



05 · ENERGY BOX – DETAIL

Everything that carries high current sits in one vented compartment



Cable sizes (copper, ≤ 1.5 m):

· battery ↔ busbars: 35 mm²
· inverter: 35 mm²
· MPPT battery side: 16 mm²
· PV ↔ MPPT: 6 mm² (UV-proof)
· 12 V loads: 2.5 mm²
· DC-DC: 6–10 mm²

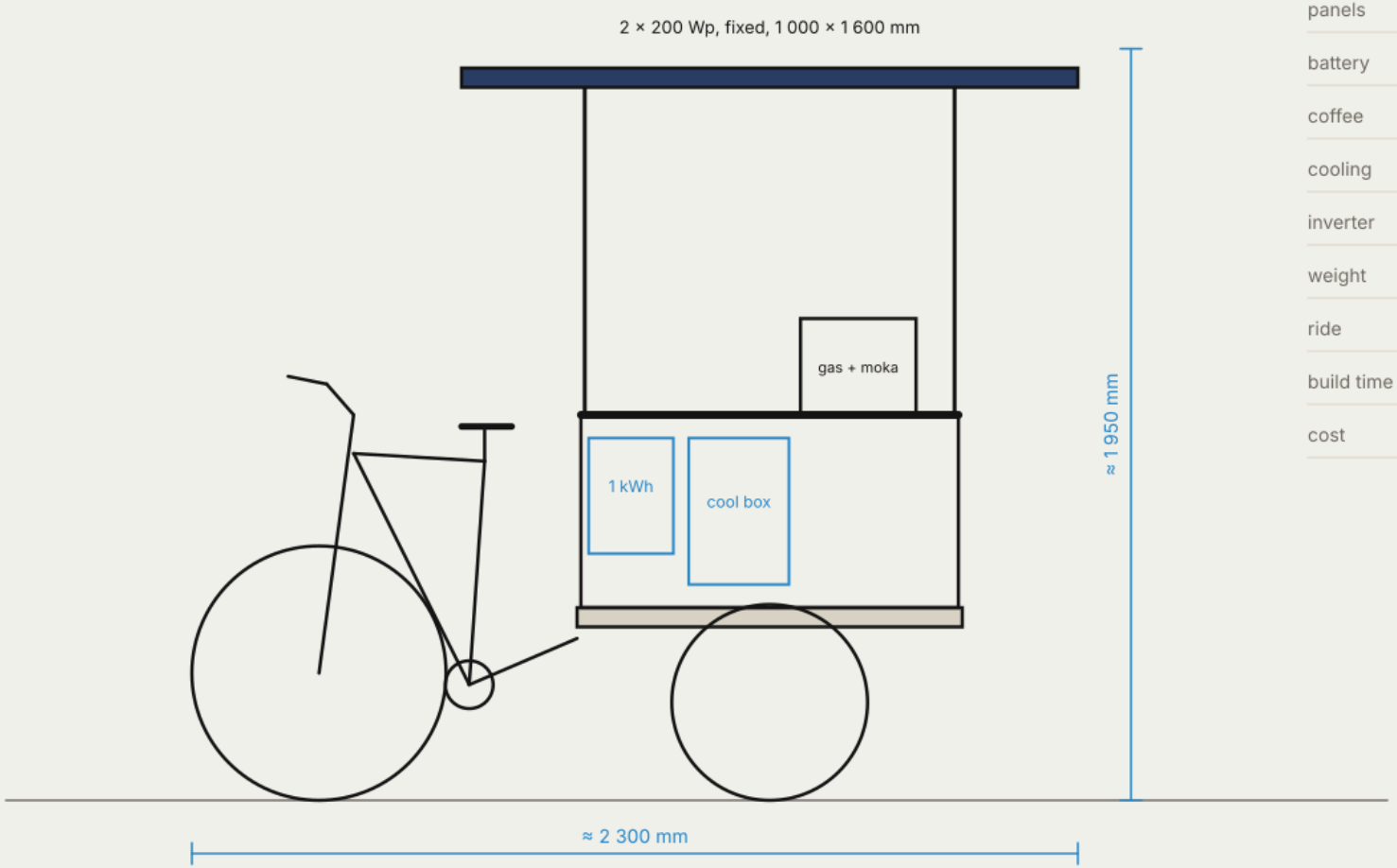
Order of work:

1 · mount everything, switch OFF
2 · busbars + fuses, no battery yet
3 · connect battery last
4 · MPPT: battery first, then PV
5 · test each circuit, then load test

battery monitor on the shunt shows charge level on the phone

06 · CANTINA LITE

Half the weight, less than half the cost – solar for cooling and light, coffee by hand



	FULL	LITE
panels	4 × 320 Wp, folding	2 × 200 Wp, fixed
battery	5 kWh (24 V)	1 kWh (12 V)
coffee	Lelit Anna (electric)	hand lever / moka on gas
cooling	compressor fridge 45 l	compressor cool box 25 l
inverter	2 000 W	300 W or none
weight	≈ 245 kg	≈ 110 kg
ride	flat routes	also gentle hills
build time	≈ 6–8 weekends	≈ 3–4 weekends
cost	≈ €9 000–15 000	≈ €3 000–6 000

PARTS & COSTS – FULL VERSION

A	Cargo trike, heavy-duty, payload ≥ 300 kg (new)	€ 3 000–5 000
A	Pedal-assist motor kit 250 W + 36 V battery	€ 500–800
B	4 PV panels 320 Wp	€ 400–700
B	Aluminium posts + roof frame, hinges, gas struts, props, ground stand	€ 400–700
C	LiFePO4 battery 25.6 V / 200 Ah (≈ 5 kWh)	€ 1 200–2 000
C	MPPT charge controller 150/60	€ 400–600
C	Pure-sine inverter 24 V / 2 000 W	€ 400–800
C	Switch, fuses, busbars, shunt monitor, cables, RCD, DC-DC 24→12 V and 24→36 V	€ 450–700
D	Plywood, worktop, fittings	€ 400–700
D	12 V compressor fridge 45 l	€ 350–600
D	Espresso machine Lelit Anna (1 050 W) + grinder	€ 800–1 500
D	Sink, water canisters, pump	€ 100–200
E	Folding tables, stools, LED string	€ 300–600
F	Signage	€ 100–250
	Total (guide values)	**≈ €9 000–15 000 (with a used trike ≈ €7 000–12 000)**

Guide prices, rough ranges – check current offers. Letters = modules in the plans.

BUILDING IN NINE STEPS

1. **Plan the weight.** Add up everything before buying: panels ≈ 72 kg, battery ≈ 45 kg, counter and roof ≈ 70 kg, fridge, machines and water ≈ 60 kg – about 245 kg. Choose the trike for this load plus the rider, and keep the heavy parts (battery, water) low and between the rear wheels.
2. **Deck.** Bolt the 18 mm plywood deck to the trike frame with M8 bolts and large washers; seal the edges with oil or varnish.
3. **Counter body.** Build the three-compartment box from 15 mm plywood (glued and screwed), with vent slots for the energy compartment and the fridge. Mount it to the deck with angle brackets.
4. **Posts and roof frame.** Bolt the four aluminium posts to the inside corners of the counter, connect them at the top with the roof frame and brace them diagonally with steel cable so the roof cannot sway.
5. **Solar roof.** Fix panel 1 flat on the roof frame. Hinge panels 2 and 3 to its long sides as wings (gas struts help to open them); panel 4 travels on top and stands on its ground stand when parked. Strap everything down for travel.
6. **Energy.** Mount the battery in its vented compartment, then switch, fuses and busbars as close to the battery as possible (plan 05). Wire the panels 2 in series × 2 in parallel to the MPPT, the 12 V loads via the DC-DC converter and fuse box, and the 24 V inverter with its own fuse. Connect the battery last. Have the 230 V side and the RCD checked by an electrician.
7. **Kitchen.** Install fridge, espresso machine, grinder, sink and canisters; secure every device against sliding with brackets or straps.
8. **Salon and light.** Fix the LED string under the roof edge; store tables and stools flat on the deck behind the counter.
9. **Test.** Charge the battery on a sunny day, run fridge and espresso machine together for an hour, check temperatures and fuses, then do a slow test ride with full load.

SAFETY & RULES

Fuse every positive cable close to the battery. · Battery in a vented, closed box; strap it down. · 230 V side: RCD, checked by an electrician. · Never charge LiFePO4 below 0 °C. · Check local rules for cargo bikes (width, length, lights, brakes) and permits for selling food and drinks in public space.

CANTINA LITE – THE REALISTIC START

A fixed roof with 2 × 200 Wp (≈ 1 000 × 1 600 mm) stays within the size of the cart – no folding wings, no props.

Solar power runs only cooling, light and phones; coffee is made by hand (lever espresso or moka) on a small gas cooker. That removes the inverter, half the battery and most of the weight.

About 110 kg instead of 220 kg: the cargo trike can also manage gentle hills, and a used trike or a heavy bike trailer is enough.

Energy: 400 Wp × ≈ 3.5 full-sun hours ≈ 1.4 kWh per day – enough for a 25 l compressor cool box (≈ 0.4 kWh), LED light and USB.

Gas in public space needs its own permit and a safe, ventilated place for the cartridge – ask the city before the first stop.

A	Used cargo trike (or a heavy bike trailer ≈ €500–900)	€ 1 500–2 500
B	2 PV panels 200 Wp	€ 150–300
B	Roof frame wood/aluminium	€ 150–300
C	LiFePO4 battery 12.8 V / 80 Ah (≈ 1 kWh)	€ 250–450
C	MPPT charge controller 100/30	€ 150–250
C	Switch, fuses, cables	€ 100–200
D	Compressor cool box 25 l	€ 250–450
D	Manual lever espresso or moka + gas cooker	€ 150–400
D	Counter: plywood, fittings	€ 300–500
E	Folding salon	€ 200–400
F	Signage	€ 50–150
	Total (guide values)	**≈ €3 000–6 000**