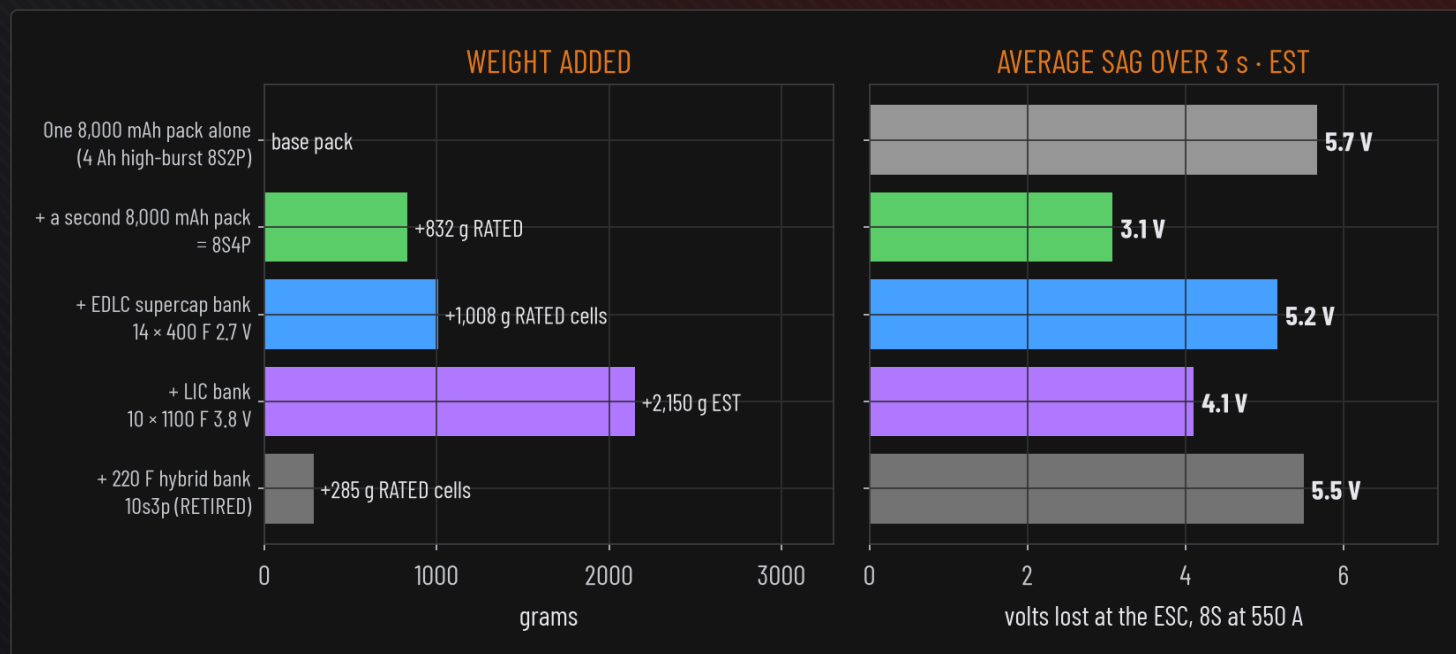


WHY NOT SAG CAPS?

Buy more battery. A second 8,000 mAh pack in parallel sags less than any sag cap bank we modeled, adds less weight, and you can buy it.



3.1 V

average sag, two 8,000 mAh packs in parallel (8S4P), +832 g **EST**

4.1 V

one pack + a LIC bank, ≈+2.15 kg, quote-only **EST**

5.2 V

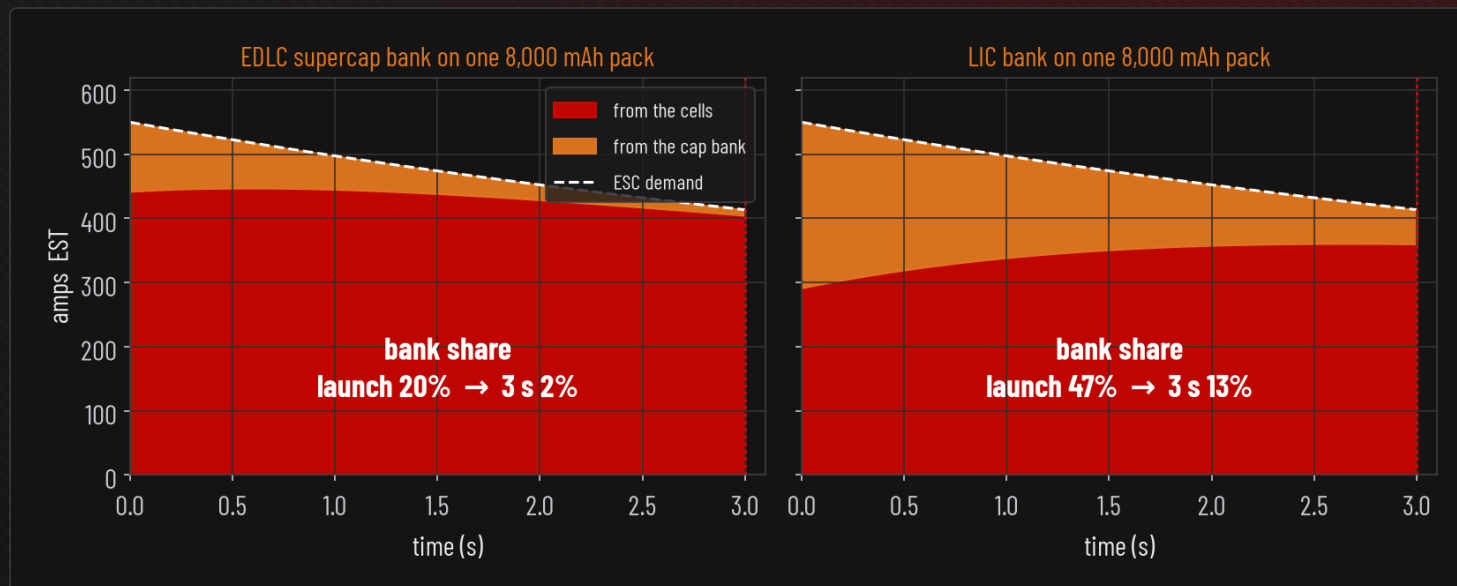
one pack + a 14-cap EDLC bank, +1008 g **EST**

ON ONE 8,000 MAH PACK	CAN YOU BUY IT?	FITS A 1/7 OUTLAW CAR?	STILL HELPING AT 3 S?	COST PER VOLT SAVED
+ second 8,000 mAh pack (8S4P)	YES	YES · +832 g RATED	YES · whole pass	ordinary cells
+ EDLC bank, 14 × 400 F 2.7 V	YES	heavy · +1008 g RATED	2% of the amps EST	costly per volt saved
+ LIC bank, 10 × 1100 F 3.8 V	QUOTE ONLY	NO · ≈280×130×64 mm, ≈2.15 kg EST	13% of the amps EST	quote only
+ 220 F 3.8 V hybrid, one per cell	YES	+285 g for 10s3p	under 6% at any point EST	RETIRED

8S, 4.20 V/cell, 550 A ESC limit (XC E6 MAX) **RATED**, 5000 W, 12 lb, grip 1.2, 3 s pass **EST**. One 8,000 mAh pack = 4 Ah high-burst cells (4000 mAh, 40C, 52 g **RATED**) in 8S2P. Cap values from maker datasheets **RATED**.

CAPS FADE, CELLS DON'T

A cap bank only gives current while its voltage is above the pack's. As it gives, its voltage falls, and it hands the load back to the cells before the pass is over.



LIC SAG BANK

280 × 130 × 64 mm · ≈2.15 kg EST

top view, to scale

+1 PACK

8,000 mAh · 832 g

16 bare cells stacked: 149 × 72 × 38 mm EST

Same job:
the extra pack
sags LESS
at 40% of
the weight.

RETIRED: 220 F HYBRID CAPS, ONE PER CELL. Datasheet: 8

A peak, 100 mΩ max ESR **RATED**. Even three strings take under 6% of a 550 A launch **EST**. They don't fix sag.

KEEP THE RIPPLE BOARD. The ESC switches thousands of times a second; no battery can follow that. A low-ESR ripple board at the ESC leads can. See the Ripple Pack Build Guide and evulempire.com/ripple/.

APPENDIX · THE MATH **EST**

- Current splits by resistance: $I_{\text{bank}} = (V_{\text{bank}} - V_{\text{bus}}) \div R_{\text{bank}}$, so the bank only helps while its voltage is above the bus.
- Series strings divide the farads and add the resistance: $14 \times 400 \text{ F} = 28.6 \text{ F}$ at 45 mΩ with wiring, against 11 mΩ for one 8,000 mAh pack. $10 \times 1100 \text{ F} = 110 \text{ F}$ at 12.5 mΩ.
- The fade: $\tau = C \times (R_{\text{pack}} + R_{\text{bank}}) \approx 1.6 \text{ s}$ (EDLC) and 2.6 s (LIC). After 1 τ the bank's share is down to 37%.
- Cells in parallel: pack resistance = cells in series × cell IR ÷ P + leads. Doubling P halves the cell part for the whole pass. Cell IR = 0.414 V ÷ burst amps; bank precharged, 0.46 mΩ wiring and fuse.

Calculator: evulempire.com/drag-pack/ · Questions: evul@evulempire.com · (724) 338-8557