

Second-Life EV Batteries Are Becoming Grid Storage

The \$7.5B Repurposing Economy and Why Grading Lines Decide It

Retired EV packs still hold 70–80% of original capacity. Repurposed into stationary storage, that “waste” is now a USD 2.0 billion market scaling toward USD 7.5 billion by 2031. The constraint is no longer demand — it is the ability to grade, age and certify heterogeneous packs fast enough to hit margin. This one-page brief summarizes the market, the cost case versus new LFP/NMC, and the standards that made second-life bankable.

1. Market & Feedstock Snapshot (2025–2026)

Metric	2026 value	Source
Global second-life EV battery market size	USD 2.0 billion	Knowledge Sourcing Intelligence
Forecast market size, 2031	USD 7.5 billion	KSI (30.3% CAGR)
Retired capacity available for reuse (2025)	~25–30 GWh	KSI
Cumulative retired packs, end-2025	~180 GWh	IIM / industry estimates
Cost of raw retired cells	\$25–\$75/kWh	Industry / Fortum
Second-life LFP grid system, all-in	\$110–160/kWh usable	Marketintelo

2. Installed Cost Comparison (1–4 h grid storage, 2025)

System type	All-in \$/kWh (usable)
Second-life LFP (graded, UL-certified)	\$110–\$160
New LFP BESS	\$220–\$280
New NMC BESS	\$350–\$450
New stationary LFP pack (excl. integration)	~\$70 (BNEF 2025)

3. Standards That Made It Bankable

- UL 1974 — grading / repurposing facility standard; 100% audited grading is the entry ticket.
- UL 9540 / 9540A & UL 1973 — system- and cell-level stationary safety.
- NFPA 855 (2026 edition) — fire-code integration with the NEC.
- EU Battery Regulation (2023/1542) — digital battery passport from 2026–2027; cuts due-diligence cost ~20–30%.
- US DOE Second Life Battery Guidance (2024) — UL 9540/1973 systems qualify for the same ITC; +3–5 pt IRR.

4. Grading-Line Checklist for Repurposers

- Grade first: SOH-sort yield dominates economics — target ~1.8 s/cell, >96% binning consistency.
- Capture SoH data automatically (UL 1974, EU passport, DOE ITC all require records).
- Plan for mixed chemistry: flexible fixturing for cylindrical, prismatic and pouch formats.
- Build for full lifecycle: route aged-out modules into certified recycling.

NEGUP MACHINE (Huizhou Negup New Energy Equipment Co., Ltd.) builds the NG-013 Grading Machine and NG-014 Aging Machine — the two process steps second-life repurposing lives or dies by. WhatsApp +86 153 0769 0902 | rain@negupgroup.com | www.negupmachine.com