Battery Production in an Unpredictable Market

Learning Faster than the Market Moves

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Eco-Mobility 2026

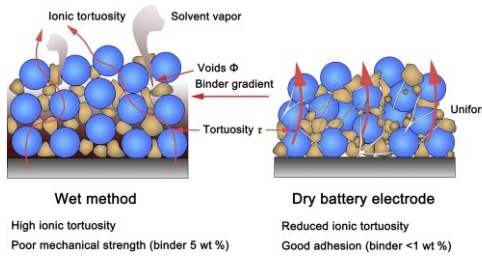
Session 3: Battery & Electric Powertrain

Palais Pálffy, Vienna ; 13 November 2026.

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From Powder to Cell in a Battery Factory

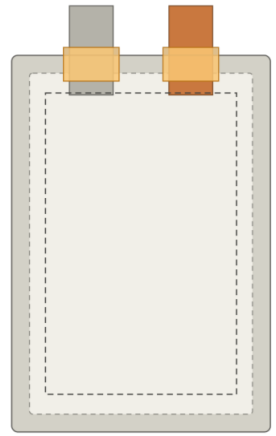
Process Route	Mixing	Coating & Drying*	Calendering	Cell Assembly & Electrolyte Filling	Formation & Aging
Wet Coating (Solvent) Dry Coating (Solvent-free)	Mixing Active Material, Binder, Conductive Agent, Solvent*	Wet: Casting Slurry on Current Collector, Solvent Recovery, Solvent Drying Dry: Film Forming and Lamination	Compressing the Porous Electrodes to Reach Specific Densities	Assembling the Cell into its Form Factor & Filling Electrolyte	Initial Charging of the Battery, Aging, Degassing, Quality Inspection













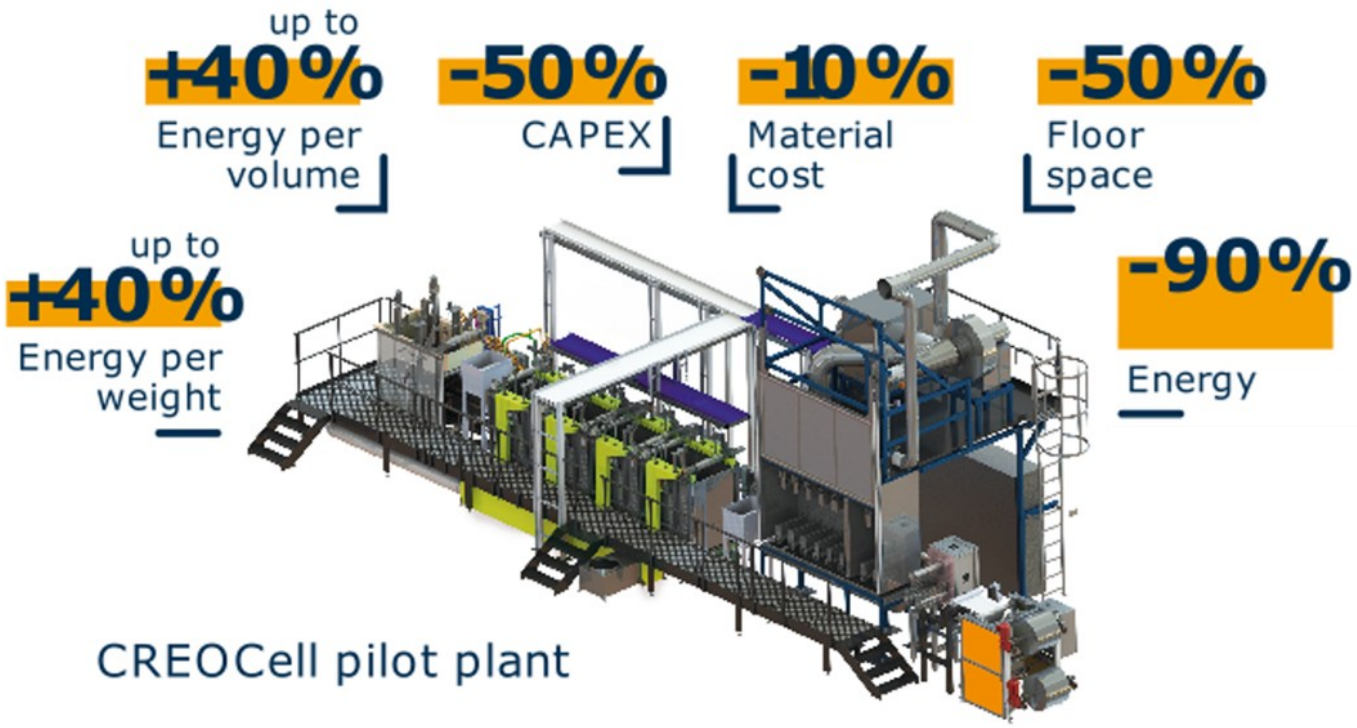
* Exclusive to wet coating

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Photo Credits: Lu, Yang & Zhao, Chen-zi & Yuan, Hong & Hu, Jiang-Kui & Huang, Jia-Qi & Zhang, Qiang. (2022). Dry electrode technology, the rising star in solid-state battery industrialization. Matter. 5. 876-898. 10.1016/j.matt.2022.01.011. Günther, Till & Schreiner, David & Metkar, Ajinkya & Meyer, Chris & Kwade, Arno & Reinhart, Gunther. (2019). Classification of Calendering-Induced Electrode Defects and Their Influence on Subsequent Processes of Lithium-Ion Battery Production. Energy Technology. 8. 10.1002/ente.201900026. LGES, Simymachine.

CreoCell: Outstanding Financial & Environmental Benefits

CAPEX reduction and OPEX reduction | „X-in-1-system“ | sustainability by design



a. **Extrusion into an extraction liquid.**

b. **Avoiding NMP evaporation and recovery.**

c. 90% less CO_2 compared to wet coating.

d. For single electrodes **Scrap almost 0 with „scrap2slurry-recycling“ .**

e. Solvent can be recovered and reused.

f. Waste liquid can be easily recycled.

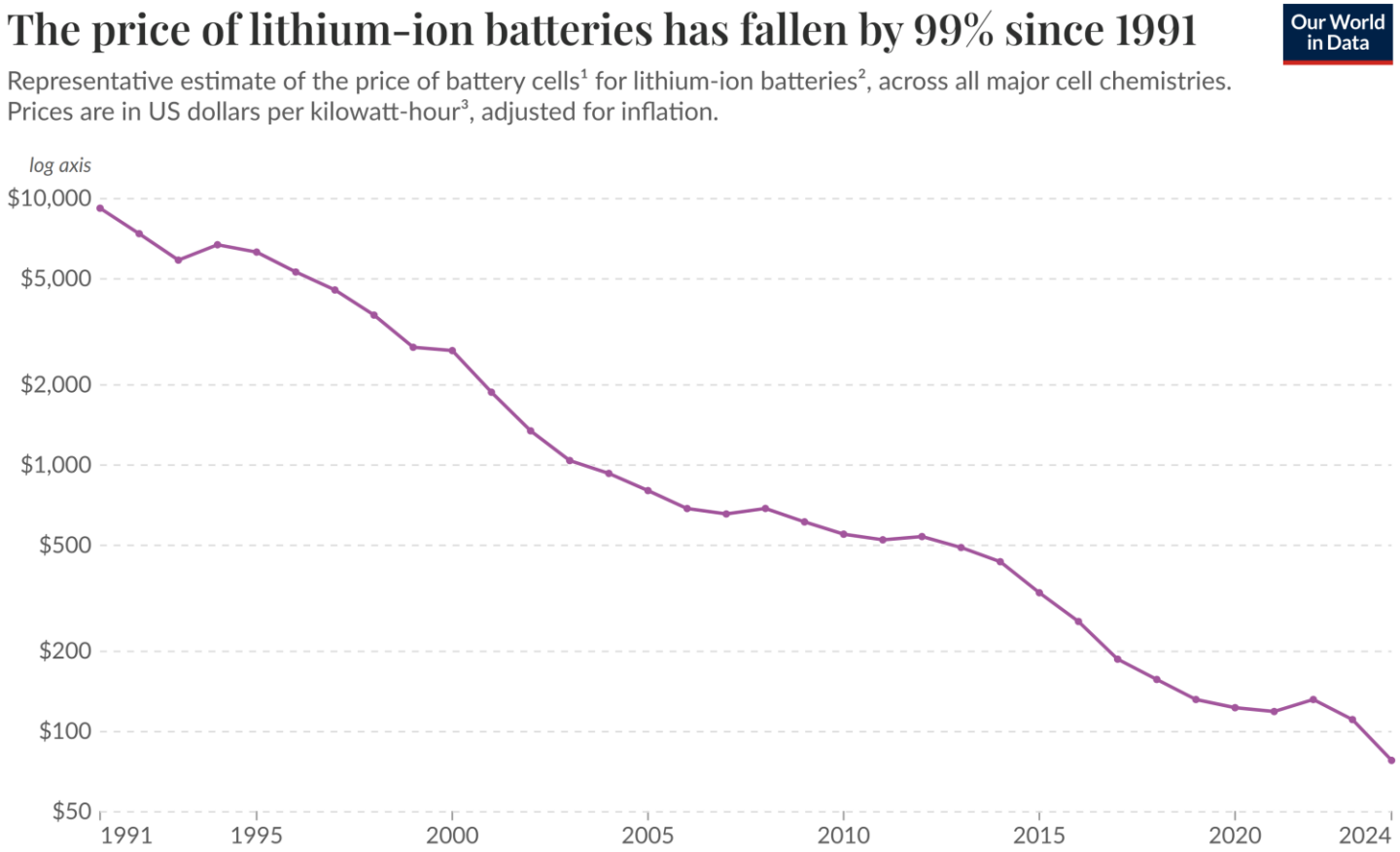
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CreoCell Process Combines Best of Both Worlds

	Wet Coating	CreoCell Process	Dry Coating
Slurry mixing and dispersion	Easy	Easy	Difficult
Binder migration	High	Does not ocurr	Does not ocurr
CAPEX/OPEX	High	Low	Low
Multi-layer electrodes producable	Yes	Yes	Possible, but difficult
Space requirements	High	Low	Low
Depreciation	High	Low	Low
Environmentally-friendly	Low	High	High
Geometric Tortuosity	Difficult	Good	Difficult

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Price falls from 9000 $/kWh to 100 $/kWh in 35 Years

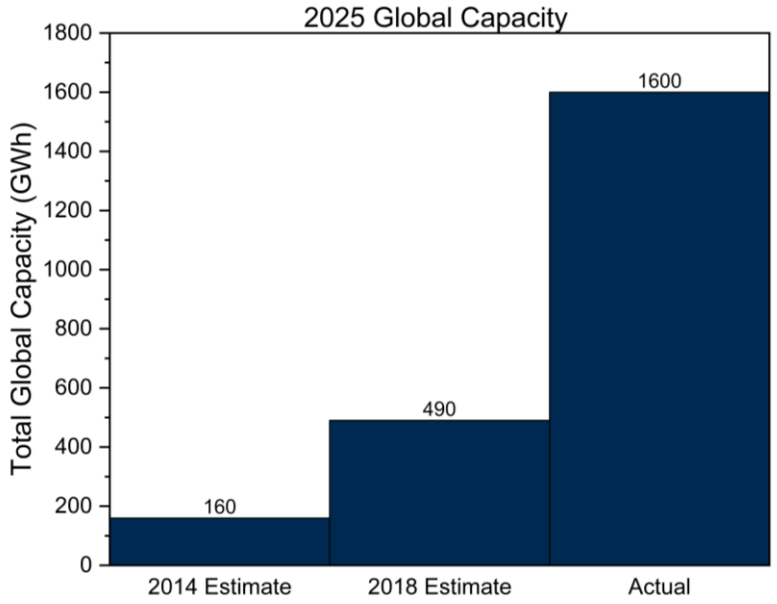


What caused the price to fall?

- **Scale**
  - Estimated global battery production in 2000 was 2 GWh; in 2025 1600 GWh. (800X)
  - Low-cost materials.
  - Low-Cobalt chemistries.
- **Cell-to-Pack and Cell-to-Chassis Architectures**.
- **Micro-Innovations** Bending Macro-Cost Curves:
  - Faster slurry drying times.
  - Thinner current collectors.
  - Laser & tab welding.
  - Faster formation protocols.
  - Automated Gigafactories.

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Markets Move Faster Than Establishing Production



- **~ 5 years from start of operations to competitive yields***.
- Incumbents reuse know-how; newcomers start from zero.
- ‘Ambitions outgrew the workforce’ (Peter Breuer, Former Northvolt)
- **Know-Why decides survival.**

Market Unpredictability

The 18 minutes of trading chaos that broke the nickel market

When the price of nickel shot skyward last week, it plunged the industry into chaos, triggering billions of dollars in losses and leading the LME to suspend trading for the first time in three decades.

Geopolitical Tensions: Fear over Russian Ni Supply in March 2022 led to prices rising. Source: AFR

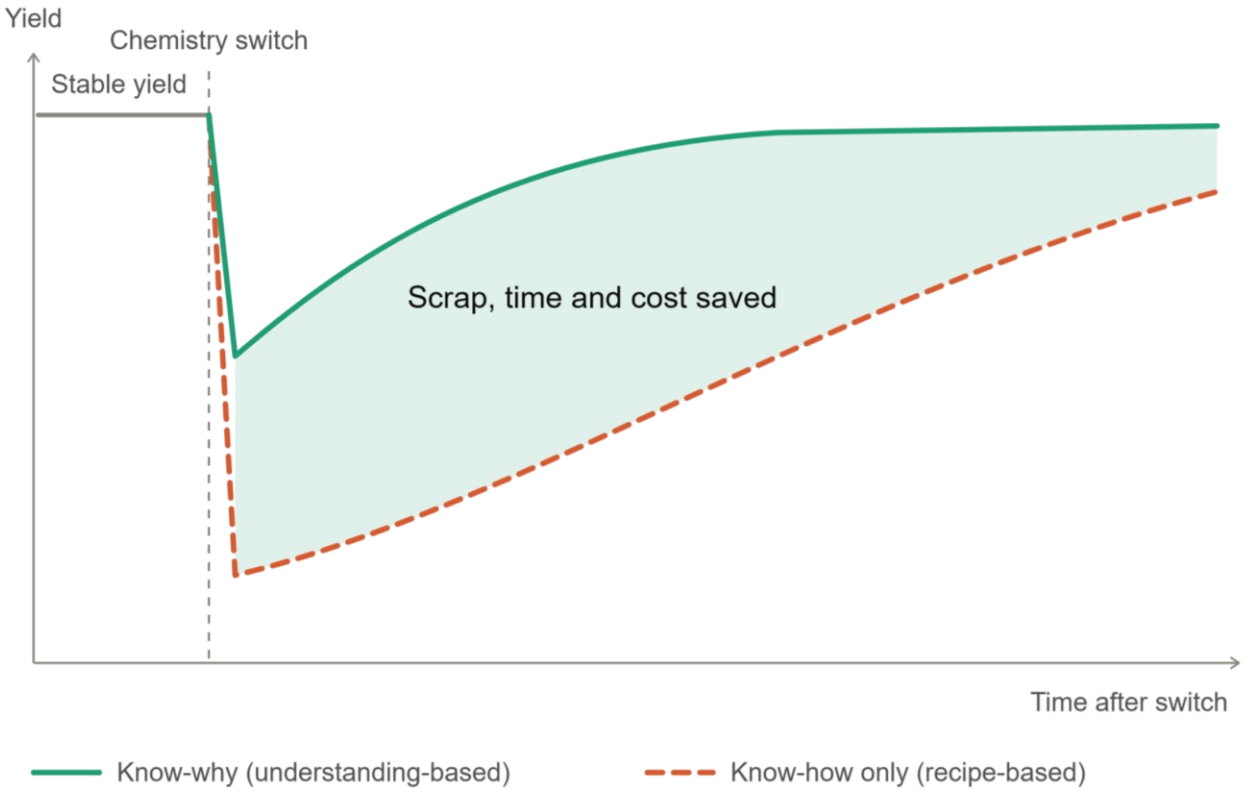


Policy Change IRA 2022, OBBBA 2025
Credit: AP, Bloomberg Finance

*IEA 2026 Based on Fraunhofer FFB & PEM RWTH Aachen (2024), *Mastering Ramp-up of Battery Production*, doi:10.24406/publica-3727

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Know-Why Saves Money & Time



Learning Curve Based on Know-How vs Know-Why.
Schematic is for Demonstration Purposes.

Know-How

- Recipes, Parameter Windows, Operator Experience.
- **Tied to one Chemistry/Product.**
- Lost when you switch.
- Built by Trial & Error.

Know-Why

- Cause & Effect from Material to Process to Performance.
- **Transfers to New Chemistries.**
- Carries Over when switching.
- Built by deliberate experiments.

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Ultium: Industry Expertise Helps Overcome the Unforeseen



Ultium Cells Plant in Tenesse

Ultium Cells:

- Joint venture between GM & LGES.
- Built to supply Nickel-rich pouch cells for GM.
- Demand fell after US tax credits ended.

Timeline:

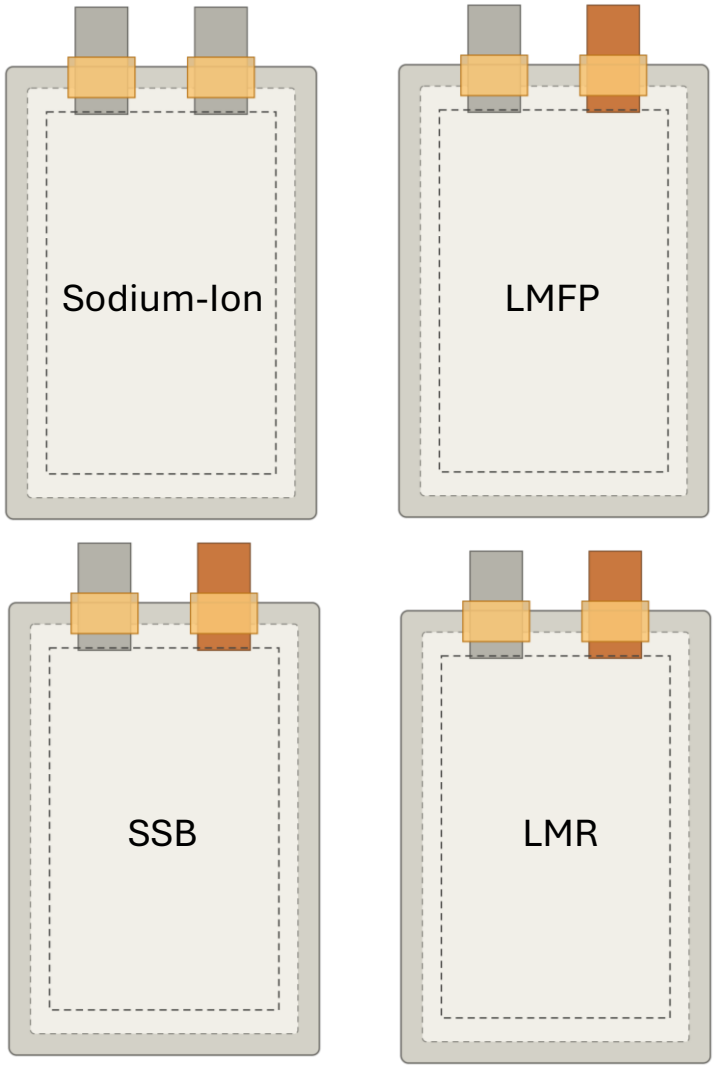
- **January 2026:** Plant paused.
- **March 2026:** ~70 million $ retooling for LFP.
- **July 2026: Mass production** restarted.

Why was the switch fast?

- Same format & wet process
- Easy dry room direction.
- Existing workforce was retrained.
- Know-how and Know-why from LGES.

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The Future and Key Takeaways



The Market:

- **Many chemistries on the horizon; experts struggle to predict which wins.**
- A chemistry can go from niche to dominant in a few years.

The Factory:

- **Process & factory should be flexible by design.**
- **Designed for stricter chemistries.**
- **Know-why can shorten the learning curve.**
- Know-why can keep the lights on (Ultium Case).

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Flexibility & Know-Why Help Survive an Unpredictable Market

Thank you

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