

The Global PFAS-Free Battery Market 2026-2036: Technologies, Regulation, Companies and Forecasts

<https://marketpublishers.com/r/GE73F9B358B0EN.html>

Date: May 2026

Pages: 215

Price: US\$ 1,400.00 (Single User License)

ID: GE73F9B358B0EN

Abstracts

The global PFAS-free battery market sits at the intersection of three converging forces: European regulation, US state and federal action, and procurement-led commitments from automotive and consumer-electronics offtakers. Lithium-ion battery manufacturing is among the most fluorochemistry-dependent of all modern industrial processes — a typical NMC pouch cell contains poly(vinylidene fluoride) as cathode binder, lithium hexafluorophosphate as the principal salt, fluoroethylene carbonate and other fluorinated additives, and increasingly PTFE in dry-electrode processing, with fluoropolymer coatings extending into separators, current-collector tabs, gaskets and pack-level fire-protection layers. Across an EV-grade NMC cell, total PFAS content typically falls between 1.5% and 3% by weight.

The European Chemicals Agency's universal REACH restriction proposal, submitted by five Member States in January 2023, advanced decisively in March 2026 with the Risk Assessment Committee's final opinion and the Socio-Economic Analysis Committee's draft opinion. Final committee opinions are expected by end-2026, European Commission adoption in Q3 2027, restriction entry into force in 2028, and sector-specific derogations running 6.5 to 13.5 years thereafter. In parallel, US TSCA Section 8(a)(7) reporting obligations apply through October 2026, and state-level laws in Minnesota, Maine and California increasingly capture battery materials by reference. Apple, BMW, Volkswagen, Mercedes-Benz, Stellantis, Renault, Volvo and Tesla have all written PFAS reduction into supplier specifications ahead of any regulatory deadline.

The Global PFAS-Free Battery Market 2026-2036: Technologies, Regulation, Companies and Forecasts provides a comprehensive analysis of the global PFAS-free battery materials, cells and packs market over 2026–2036, addressing the technologies, regulatory drivers, market sizing, and competitive landscape that will define this decade-

long transition.

Report contents include:

Technical analysis of PFAS-bearing components in lithium-ion cells, including cathode and anode binders, electrolyte salts and additives, separator coatings, current-collector coatings, sealants, pouch laminates and pack-level fire-protection materials

Detailed regulatory analysis of EU REACH, US TSCA, US state-level laws, China, Japan, South Korea and other jurisdictions, including likely derogation timelines for battery applications

Material substitution pathways across PFAS-free binders, electrolytes, separators, sealants and pack-level materials, with performance benchmarking against incumbent fluoropolymer chemistries

Manufacturing process implications including NMP elimination, aqueous slurry conversion, dry-electrode trade-offs and gigafactory capex and opex implications

PFAS substitution analysis by chemistry — LFP, LMFP, NMC, NCA, LCO, sodium-ion, solid-state, lithium-sulfur, redox flow, lead-acid and NiMH

Application-level analysis across passenger BEVs, commercial vehicles and buses, grid-scale stationary energy storage, behind-the-meter storage, consumer electronics, and industrial, marine, aviation and defence applications

Three-scenario market forecasts (Slow, Base, Fast) covering materials segments, regions and cell production volumes

Competitive landscape assessment with strategic positioning matrices for materials suppliers and cell makers

Risk and bottleneck analysis covering regulatory, technical and commercial dimensions

Profiles of 94 companies across the PFAS-free battery materials, cells, processes and pack-level systems value chain. Companies profiled include

Addionics, Advano, Anthro Energy, APB Corporation, Altex Technologies, Altris, Ateios Systems, BASF, Blue Current, Blue Solutions (Bollor? LMP), BroadBit Batteries, BYD, Capchem, CarbonScape, CATL, CBAK Energy Technology, CellCube, Chemix, CMBlu Energy, Customcells / Cellforce, ENTEK, Eos Energy Enterprises, ESS Inc., EVE Energy, Factorial Energy, Farasis Energy, FDK Corporation, Flint, Forge Nano, Form Energy, Gotion High Tech, Group14 Technologies, Hansol Chemical and more....

Contents

1 EXECUTIVE SUMMARY

- 1.1 Why PFAS-free batteries, and why now
- 1.2 Key findings
- 1.3 The regulatory timeline at a glance
- 1.4 Global market forecasts, 2026–2036
- 1.5 Strategic implications
 - 1.5.1 For battery cell manufacturers
 - 1.5.2 For materials suppliers
 - 1.5.3 For automakers and energy-storage integrators

2 PFAS IN BATTERIES: WHERE, WHY AND HOW MUCH

- 2.1 Definition and classification
- 2.2 PFAS-bearing components of a lithium-ion cell
- 2.3 Why PFAS have been hard to replace
- 2.4 Health and environmental concerns
- 2.5 Quantifying the PFAS footprint of the global battery industry

3 THE REGULATORY LANDSCAPE, 2023–2030

- 3.1 European Union: REACH universal PFAS restriction
 - 3.1.1 Procedural timeline
 - 3.1.2 RAC and SEAC positions
 - 3.1.3 Likely derogations for batteries
 - 3.1.4 Interaction with the EU Batteries Regulation (2023/1542)
- 3.2 United States
 - 3.2.1 Federal: TSCA Section 8(a)(7)
 - 3.2.2 State actions
- 3.3 China
- 3.4 Japan and South Korea
- 3.5 Other jurisdictions
- 3.6 Voluntary and procurement-driven phase-outs

4 PFAS-FREE BINDERS

- 4.1 Function and requirements of a battery binder

- 4.2 PVDF and its variants: the incumbent
- 4.3 Anode binders: largely already PFAS-free
- 4.4 Cathode binder alternatives
 - 4.4.1 Acrylate-based aqueous binders (SA, PAA, PAA-Li)
 - 4.4.2 Aromatic polyamide (aramid) binders
 - 4.4.3 Bio-based polymers: lignin, alginate, cellulose derivatives
 - 4.4.4 Thermoplastic elastomers
 - 4.4.5 Dry-process PFAS-free binders
- 4.5 Performance comparison
- 4.6 SWOT — PFAS-free cathode binders
- 4.7 PFAS-free cathode binder market forecast

5 PFAS-FREE ELECTROLYTES

- 5.1 The electrolyte system: salt, solvent, additives
- 5.2 The lithium salt
 - 5.2.1 LiPF₆: the incumbent (and its regulatory status)
 - 5.2.2 LiFSI and LiTFSI: fluorinated sulfonimide salts
 - 5.2.3 Fluorine-free salts
- 5.3 PFAS-bearing solvents and additives
- 5.4 Solid and semi-solid electrolytes as a PFAS-free path
- 5.5 SWOT — PFAS-free electrolytes
- 5.6 Market forecast: PFAS-free electrolyte salts and additives

6 PFAS-FREE SEPARATORS

- 6.1 Separator basics
- 6.2 Ceramic-coated separators and PVDF binders
- 6.3 Aramid and non-woven alternatives

7 CURRENT COLLECTOR COATINGS, SEALANTS AND PACK MATERIALS

- 7.1 Aluminium and copper current-collector coatings
 - 7.1.1 Function and incumbent chemistry
 - 7.1.2 PFAS-free coating chemistries
 - 7.1.3 Suppliers of carbon-coated current-collector foils
 - 7.1.4 Strategic importance of carbon-coated foil supply
- 7.2 Tab welds, gaskets and hermetic seals
 - 7.2.1 Function

- 7.2.2 Incumbent PFAS materials
- 7.2.3 PFAS-free alternatives
- 7.2.4 Suppliers of PFAS-free sealants and gaskets
- 7.2.5 Tab-weld interface materials
- 7.3 Pouch laminates and prismatic can liners
 - 7.3.1 Pouch cell laminate construction
 - 7.3.2 Major pouch laminate suppliers
- 7.4 Targray — distribution of multiple pouch film grades
 - 7.4.1 Prismatic and cylindrical can liners
- 7.5 Pack-level structural materials
 - 7.5.1 Structural adhesives and bonding
 - 7.5.2 Dielectric and electrical-insulation coatings
 - 7.5.3 Thermal interface materials (TIMs)
 - 7.5.4 Vibration damping and structural foams
 - 7.5.5 Cell-to-cell isolation pads (compressible thermal-runaway barriers)
- 7.6 Pack material substitution summary
- 7.7 Strategic implications

8 PFAS-FREE BATTERY-PACK FIRE PROTECTION

- 8.1 Why fire protection is the largest near-term PFAS-free opportunity
- 8.2 The thermal-runaway protection challenge
 - 8.2.1 What pack fire protection has to do
 - 8.2.2 Why fluorochemistry was historically the default
 - 8.2.3 The substitution paradox
- 8.3 Three sub-segment families
 - 8.3.1 Intumescent coatings
 - 8.3.2 Ceramic and aerogel thermal barriers
 - 8.3.3 Cell-to-cell isolation pads
- 8.4 Market forecast and competitive landscape
- 8.5 Application and platform dynamics
 - 8.5.1 EV battery packs
 - 8.5.2 Commercial vehicles, buses, heavy-duty trucks
 - 8.5.3 Grid-scale stationary storage
 - 8.5.4 Consumer electronics
 - 8.5.5 Defence and aerospace
- 8.6 Supplier landscape and competitive positioning
- 8.7 Strategic implications

9 MANUFACTURING PROCESS IMPLICATIONS

- 9.1 The end of NMP
 - 9.1.1 NMP's role in conventional Li-ion manufacturing
 - 9.1.2 What aqueous slurry processing eliminates
 - 9.1.3 The brownfield-greenfield asymmetry
- 9.2 Aqueous slurry process changes
 - 9.2.1 Carbon-coated aluminium foil
 - 9.2.2 Surface treatment of cathode active material
 - 9.2.3 Rheology, viscosity and mixing
 - 9.2.4 Drying-oven profiles
 - 9.2.5 Calendering and porosity
 - 9.2.6 The cumulative qualification cost
- 9.3 Dry electrode processes
 - 9.3.1 Why PTFE is hard to replace
 - 9.3.2 The three architectural alternatives
 - 9.3.3 Other dry-process equipment suppliers
 - 9.3.4 The strategic dilemma for cell makers
- 9.4 The three competing manufacturing routes
- 9.5 Capex and opex implications
- 9.6 Quality control and process analytical technology
- 9.7 Process equipment vendors and the manufacturing ecosystem
- 9.8 Manufacturing-readiness summary by application
- 9.9 Strategic implications

10 PFAS CONSIDERATIONS BY BATTERY CHEMISTRY

- 10.1 LFP (lithium iron phosphate)
 - 10.1.1 Why LFP is the easiest
 - 10.1.2 Energy density and cost trajectory under PFAS substitution
 - 10.1.3 Chinese LFP capacity and the structural PFAS-free position
 - 10.1.4 European, US and Indian LFP capacity build-out
 - 10.1.5 LMFP and the energy-density gap to NMC
 - 10.1.6 Cell formats and integration architectures
 - 10.1.7 LFP/LMFP recycling and end-of-life PFAS implications
 - 10.1.8 LFP substitution timeline
- 10.2 NMC and NCA (nickel-rich layered oxides)
 - 10.2.1 The compounding substitution challenge
 - 10.2.2 NMC sub-chemistry detail

- 10.2.3 Cathode active material supply chain and surface treatments
- 10.2.4 Korean cell maker positioning in detail
- 10.2.5 European premium NMC players
- 10.2.6 Tesla 4680 and the dry-process question
- 10.2.7 Other major NMC/NCA cell makers
- 10.2.8 NMC cost trajectory under PFAS substitution
- 10.2.9 NMC timeline
- 10.3 LCO (lithium cobalt oxide) and other consumer-electronics chemistries
 - 10.3.1 LCO and consumer-cell players
 - 10.3.2 Specialty consumer chemistries
- 10.4 Sodium-ion batteries
 - 10.4.1 Three Na-ion cathode families in detail
 - 10.4.2 Hard carbon anode supply chain
 - 10.4.3 Sodium-ion electrolytes
 - 10.4.4 Chinese Na-ion cell makers
 - 10.4.5 Western, Indian and other Na-ion players
 - 10.4.6 Na-ion market trajectory
- 10.5 Solid-state batteries
 - 10.5.1 Three solid electrolyte families
 - 10.5.2 Cell maker landscape — sulfide-based
 - 10.5.3 Cell maker landscape — oxide-based
 - 10.5.4 Polymer-electrolyte and hybrid
 - 10.5.5 Lithium-metal anode programmes
 - 10.5.6 ASB substitution timeline
 - 10.5.7 Li-S players
- 10.6 Redox flow batteries
 - 10.6.1 Membrane alternatives
 - 10.6.2 Vanadium flow players
- 10.7 Lead-acid, NiMH and primary cells

11 APPLICATIONS

- 11.1 The application landscape, 2036
- 11.2 Passenger battery electric vehicles
 - 11.2.1 Demand structure
 - 11.2.2 What's driving PFAS-free conversion in BEVs
 - 11.2.3 The cell supply structure
 - 11.2.4 Forecast
- 11.3 Commercial vehicles, buses and trucks

- 11.3.1 Demand structure
- 11.3.2 What's driving PFAS-free conversion in commercial vehicles
- 11.3.3 Forecast
- 11.4 Grid-scale stationary energy storage
 - 11.4.1 Demand structure
 - 11.4.2 What's driving PFAS-free conversion in grid storage
 - 11.4.3 System integrators and project developers
 - 11.4.4 Forecast
- 11.5 Behind-the-meter storage (commercial, industrial, residential)
 - 11.5.1 Demand structure
 - 11.5.2 What's driving conversion
 - 11.5.3 Forecast
- 11.6 Consumer electronics
 - 11.6.1 Demand structure
 - 11.6.2 What's driving conversion
 - 11.6.3 Forecast
- 11.7 Industrial, marine, aviation and defence
 - 11.7.1 Demand structure
 - 11.7.2 Notable players
 - 11.7.3 Forecast
- 11.8 Cross-application synthesis

12 GLOBAL MARKET FORECASTS 2026–2036

- 12.1 Methodology
 - 12.1.1 Scenario definitions
- 12.2 Three-scenario total PFAS-free battery materials forecast
- 12.3 Forecast by region, 2036 (Base scenario)
 - 12.3.1 Regional dynamics
- 12.4 PFAS-free Li-ion cell production forecast (GWh)

13 COMPETITIVE LANDSCAPE

- 13.1 Materials suppliers — landscape overview
- 13.2 Strategic positioning matrix
- 13.3 Cell makers — public PFAS-free positions
- 13.4 Strategic positioning matrix visualisation

14 RISKS, BOTTLENECKS AND OPEN QUESTIONS

- 14.1 Regulatory risks
- 14.2 Technical risks
- 14.3 Commercial and supply-chain risks
- 14.4 Key open questions

15 COMPANY PROFILES (96 COMPANY PROFILES)

16 RESEARCH METHODOLOGY

- 16.1 Scope and approach
- 16.2 Data sources and validation
- 16.3 Forecast model architecture
- 16.4 Limitations

17 REFERENCES

List Of Tables

LIST OF TABLES

Table 1. PFAS-free battery materials market by segment, 2026–2036 (US\$ billion, Base scenario)

Table 2. PFAS-free Li-ion cell production, 2026–2036 (GWh, Base scenario)

Table 3. PFAS-free battery materials demand by end application, 2036 (US\$ billion, Base scenario)

Table 4. Typical PFAS content of a representative 75 kWh NMC811 EV cell pack

Table 5. Estimated PFAS use in Li-ion battery production, 2025–2036 (kilotonnes)

Table 6. Indicative regulatory deadlines for PFAS in batteries (Base scenario)

Table 7. Selected PFAS-free cathode binder performance vs PVDF benchmark

Table 8. Global PFAS-free cathode binder demand and value, 2026–2036 (Base scenario)

Table 9. Global PFAS-free electrolyte materials demand, 2026–2036 (US\$ million, Base scenario)

Table 10. PFAS exposure and substitution status by pack-material category

Table 11. PFAS-free pack fire-protection coatings market, 2026–2036 (US\$ billion, Base scenario)

Table 12. PFAS-free pack fire-protection suppliers

Table 13. Indicative gigafactory cost differential, PVDF/NMP vs PFAS-free aqueous (per GWh of capacity)

Table 14. PFAS-free manufacturing-readiness by application and 2026 status

Table 15. PFAS-free battery materials demand by application, 2026–2036 (US\$ billion, Base scenario)

Table 16. PFAS-free battery materials market under three scenarios, 2026–2036 (US\$ billion)

Table 17. PFAS-free battery materials value by region, 2036 (US\$ billion, Base scenario)

Table 18. PFAS-free Li-ion cell production, 2026–2036 (GWh, Base scenario)

Table 19. Strategic positioning of materials suppliers

Table 20. Cell makers and their public PFAS positions

List Of Figures

LIST OF FIGURES

- Figure 1. Where PFAS lives in a typical Li-ion EV battery cell
- Figure 2. PFAS regulatory timeline, 2023–2042
- Figure 3. PFAS-free battery materials market by segment, 2026–2036
- Figure 4. PFAS mass distribution in a 75 kWh NMC811 EV pack (kg, mid-range estimate)
- Figure 5. Annual PFAS use in Li-ion battery production, 2025–2036 (kilotonnes)
- Figure 6. RAC versus SEAC positions on PFAS in batteries
- Figure 7. PFAS-free cathode binder chemistry landscape
- Figure 8. Voltage stability vs commercial maturity for PFAS-free cathode binders
- Figure 9. SWOT — PFAS-free cathode binders
- Figure 10. PFAS-free cathode binder consumption and market value, 2026–2036
- Figure 11. Lithium electrolyte salt landscape by PFAS status
- Figure 12. SWOT — PFAS-free electrolytes
- Figure 13. PFAS-free electrolyte materials market, 2026–2036
- Figure 14. PFAS-free separator substitution paths
- Figure 15. Pack fire protection: the fastest-growing PFAS-free segment
- Figure 16. PFAS-free pack fire-protection market by sub-segment, 2026–2036
- Figure 17. Three cathode manufacturing routes and their PFAS exposure
- Figure 18. Gigafactory capex differential at 50 GWh scale (US\$ million, one-off)
- Figure 19. PFAS substitution difficulty matrix by chemistry
- Figure 20. PFAS-free battery materials demand by application, 2026–2036
- Figure 21. PFAS-free battery materials demand by application, 2036
- Figure 22. Three-scenario PFAS-free battery materials forecast, 2026–2036
- Figure 23. PFAS-free battery materials demand by region, 2036
- Figure 24. PFAS-free Li-ion cell production trajectory, 2026–2036
- Figure 25. Materials supplier strategic positioning matrix
- Figure 26. All-polymer battery schematic.
- Figure 27. All Polymer Battery Module.
- Figure 28. Resin current collector.
- Figure 29. Ateios thin-film, printed battery.
- Figure 30. Blue Solutions module.
- Figure 31. Gelion Endure battery.
- Figure 32. Schematic of Ion Storage Systems solid-state battery structure.
- Figure 33. Lyten batteries.
- Figure 34. Prieto Foam-Based 3D Battery.

Figure 35. ProLogium solid-state battery.

Figure 36. SES Apollo batteries.

Figure 37. Solid Power battery pouch cell.

Figure 38. Stora Enso lignin battery materials.

Figure 39. Zeta Energy 20 Ah cell.

I would like to order

Product name: The Global PFAS-Free Battery Market 2026-2036: Technologies, Regulation, Companies and Forecasts

Product link: <https://marketpublishers.com/r/GE73F9B358B0EN.html>

Price: US\$ 1,400.00 (Single User License / Electronic Delivery)

If you want to order Corporate License or Hard Copy, please, contact our Customer Service:

info@marketpublishers.com

Payment

To pay by Credit Card (Visa, MasterCard, American Express, PayPal), please, click button on product page <https://marketpublishers.com/r/GE73F9B358B0EN.html>