

Report

IAEG Work Group 9

Global Battery Regulations and Implications for the Aerospace and Defense Industry





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INTERNATIONAL AEROSPACE
ENVIRONMENTAL GROUP®

Report

Global Battery Regulations and Implications for the Aerospace and Defense Industry

Prepared for IAEG Work Group 9

16 April 2026

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Prepared by



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DEFINITIONS

Term	Definition
A&D	Aerospace and Defense
BSO	Battery Stewardship Organization (State of Washington, US)
Cd	Cadmium
CPCB	Central Pollution Control Board (India)
CEW	Covered electronic waste
Co	Cobalt
COT	Commercial Off-the-Shelf (batteries)
CML	Critical Minerals List
CPA	Certified Public Accountant
CRA	The Cyber Resilience Act (European Union)
CRMA	Critical Raw Materials Act (European Union)
CSIRT	Computer Security Incident Response Team
Cu	Copper
DoD	Department of Defense (United States)
DoE	Department of Energy (United States)
DoT	Department of Transportation (United States)
EC	European Commission
ECL	Environmental Conservation Law (State of New York, US)
EFTA	The European Free Trade Association
ENISA	The European Network and Information Security Agency
EPR	Extended Producer Responsibility
ESG	Environmental, Social, and Governance
EU	European Union
EV	Electrical vehicle
FEOC	Foreign Entity of Concern
GSE	Ground Support Equipment
HM-215Q	Hazardous Materials: Harmonization with International Standards Rule (United States)
IAEG	International Aerospace Environmental Group

Term	Definition
IATA	International Air Transport Association
ICAO	International Civil Aviation Organization
kg	Kilogram
kWh	Kilowatt-hour
Lbs	Pounds (weight)
LFP	Lithium iron phosphate
Li	Lithium
LMT	Light Means of Transport
LQH	Large quantity handler
LRU	Line-Replaceable Units
MH	Metal hybrid
MRO	Maintenance, repair, and operations
NATO	North Atlantic Treaty Organization
NCA	Nickel-cobalt-aluminum
NCM	Nickel-cobalt-manganese
NEV	New Energy Vehicle
NDAA	National Defense Authorization Act (United States)
Ni	Nickel
NIA	National Implementation Act
OEM	Original equipment manufacturer
Pb	Lead
PRO	Producer Responsibility Organization
RCRA	Resource Conservation and Recovery Act
RoO	Rules of Origin
SoC	State of Charge
SRM	Strategic raw materials
TDG	Transportation of dangerous goods
UK	United Kingdom
UN	United Nations

Term	Definition
UN3090	Lithium metal batteries
UN3480	Lithium-ion batteries
US	United States
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
Wh	Watt-hours

EXECUTIVE SUMMARY

Scope and Focus

This report presents a strategic, high-level assessment of the evolving global battery regulatory landscape and its implications for compliance obligations and operational risk across IAEG member companies and their supply chains. The analysis is specifically tailored to regulations relevant to the Aerospace & Defense (A&D) sector.

Jurisdictions where battery regulations are limited to consumer applications, or remain immature, or are under active development, have been excluded. An exception has been made for United Kingdom and Australia which have formed National Battery Strategy policy frameworks to address emerging challenges.

The Transformation of Battery Compliance

As of January 2026, the global regulatory landscape for batteries has evolved from a localized environmental concern to a critical driver of international industrial policy and national security. For the A&D industry, batteries are no longer viewed as simple components; they are now strategic assets subject to lifecycle accountability, digital transparency, and strict geopolitical sourcing mandates. The transformation introduces complex "dual track" compliance where support ecosystems (e.g., ground support, logistics) are increasingly captured by regulations despite traditional military exemptions.

Emerging Developments

Geopolitical Sourcing and "De-risking"

Recent legislation has moved beyond simple trade restrictions to active decoupling from adversarial supply chains. For example, in the US:

- » The FY2026 National Defense Authorization Act (NDAA) establishes a De-risk or De-list mandate, prohibiting the procurement of advanced batteries whose functional components are owned or produced by a Foreign Entity of Concern (FEOC).
- » In the future, under the NDAA, new acquisition programs must prove that 95% of the costs of functional cell components (cathodes, anodes, electrolytes) originate from non-FEOC sources.

Such legislation is being enacted in other jurisdictions as well.

Lifecycle Transparency and Digital Integrity

Governments are mandating digital identities to ensure cybersecurity and material circularity. For example, in the European Union (EU):

- » Digital Battery Passports are mandatory for industrial and electrical vehicle (EV) batteries by February 2027, requiring indelible QR codes linking to performance, durability, and carbon footprint data.
- » Under the EU Cyber Resilience Act, battery systems with digital elements must be "secure by design," bear a European Conformity mark for cyber-compliance, and receive security updates for their expected lifetime.

QR Codes are increasingly being required in many regions across the globe to provide detailed information such as recycled content, repair options, material composition, and sourcing.

Evolution of Extended Producer Responsibility (EPR)

The regulatory burden for battery end-of-life management is shifting from publicly funded waste systems to a polluter-pays model, under which the Importer of Record or Producer assumes full financial and legal responsibility.

In jurisdictions such as the United States and Canada, the absence of comprehensive federal EPR frameworks has resulted in a decentralized, state- and province-led regulatory landscape. This fragmentation introduces high compliance complexity.

Note: *This report includes representative examples for sub-national Battery EPR regulations in the US and Canada to illustrate key regulatory requirements and directional trends. It does not constitute a comprehensive inventory of all applicable sub-national requirements.*

Harmonization of Transport and Safety

Global logistics for batteries is becoming more restrictive to mitigate thermal runaway risks during air transport.

Disclaimer:

This report aims to capture the major global battery regulations in priority countries as defined by IAEG WG9. This analysis is for informational purposes only, does not constitute legal or technical advice, and applicability can vary. Deadlines and thresholds may change through amendments and regulator updates. Users should verify final applicability and submission details using the official links provided, particularly when preparing filings for a specific reporting year. Regulatory compliance expectations are dynamic and as such this report should be treated as a living reference with periodic refresh and confirmation against official sources prior to submissions. Because the regulatory landscape is subject to change and interpretation by local authorities, please consult with your legal counsel or regulatory specialist regarding compliance obligations. IAEG assumes no duty to update this report.



1.0 EUROPE

1.1 European Union

1.1.1 Regulation (EU) 2023/1542 (batteries and batteries waste)

Jurisdiction: European Union (directly applicable in all 27 Member States)

Status: Active (amended by Regulation (EU) 2025/1561)

Key Compliance Date: 18 August 2027 (revised supply chain due diligence deadline)

Summary

Regulation (EU) 2023/1542 shifts the battery compliance model from waste management to lifecycle accountability, treating batteries as strategic assets. For A&D, this creates a divergent requirements profile; while "military use" has exemptions (specifically for equipment connected with the protection of essential security interests, arms, munitions, and war material), the "dual use" support ecosystem falls under the definition of "industrial batteries" if weighing >5 kilograms (kg) or designed for industrial use.

Context and Background

Replacing Directive 2006/66/EC, Regulation (EU) 2023/1542 anchors the EU Green Deal's goal of strategic autonomy in critical raw materials, harmonizing with the Action Plan on Critical Raw Materials Resilience. It addresses risks regarding lithium- (Li-)ion safety and supply chain opacity (e.g., child labor in cobalt mining). The regulation applies immediately as law without national transposition.

Critical Timeline and Deadlines

- » 18 Aug 2024 (past due): Performance and durability documentation required for industrial batteries >2 kilowatt-hours (kWh) (Article 10).
- » 18 Feb 2026 (Active/Sliding): Carbon Footprint Declaration nominally due for industrial batteries >2 kWh (Article 7). This deadline is conditional; the text states it applies from 18 Feb 2026 or "18 months after entry into force of the Delegated Act, whichever is the latest."
- » 18 Feb 2027: Digital Battery Passport mandatory for Light Means of Transport (LMT), industrial batteries >2 kWh, and EV batteries. QR Code must be printed or engraved visibly, legibly, and indelibly on the casing for industrial and LMT batteries (Article 77).
- » 18 Aug 2027: Supply chain due diligence policies must be implemented and audited by a third party (Article 48, as amended by Regulation (EU) 2025/1561¹).
- » 18 Aug 2028: Recycled content declaration required for Co, lead (Pb), Li, and nickel (Ni) (Article 8); nominally, or 24 months after entry into force of the relevant delegated act.

¹ Regulation 2025/1561, published July 2025, officially delayed the supply chain due diligence (Article 48) application date from 2025 to 18 August 2027. It also delays the European Commission's deadline to publish guidelines to 26 July 2026, granting an administrative delay rather than a specific mapping reprieve.

Examples of Collection, Recovery, and Recycling Targets²

Target Category	Milestone Date	Target
Portable battery collection rate (waste)	31 Dec 2027	63 % (minimum collection rate by average weight)
Portable battery collection rate (waste)	31 Dec 2030	73 % (minimum collection rate by average weight)
LMT battery collection (waste)	31 Dec 2028	51 % (minimum collection rate by average weight)
LMT battery collection (waste)	31 Dec 2031	61 % (minimum collection rate by average weight)
Lithium recovery from waste batteries	31 Dec 2027	50 % of lithium content recovered
Lithium recovery from waste batteries	31 Dec 2031	80 % of lithium content recovered
Cobalt (Co), copper (Cu), lead (Pb), nickel (Ni) recovery from waste batteries	31 Dec 2027	90 % content recovery
Co, Cu, Pb, Ni recovery from waste batteries	31 Dec 2031	95 % content recovery
Recycling efficiency (various)	31 Dec 2025 – 31 Dec 2030	Varied by chemistry (See Annex XII, Part B)
Recycled content (battery materials)	From 18 Aug 2031	Co 16%, Pb 85%, Li 6%, Ni 6% (minimum recycled content in active materials)

List of Relevant Annexes and brief description

- » **Annex I (Restriction on Substances):** Outlines the maximum allowable weight limits for hazardous substances (specifically mercury, cadmium, and lead) in batteries. A critical requirement, for example, is that portable batteries cannot contain more than 0.002% cadmium or 0.01% lead, though certain exemptions exist, such as for zinc-air button cells until August 2028.
- » **Annex II (Carbon Footprint):** Details the essential elements, system boundaries, and methodology for calculating and verifying a battery's life cycle carbon footprint. For instance, calculations must include raw material acquisition, cell manufacturing, and end-of-life recycling, but generally exclude the actual "use phase" of the battery by the consumer.
- » **Annex III (Electrochemical Performance and Durability Parameters for Portable Batteries of General Use):** Sets out the performance and durability metrics (such as minimum average duration and capacity retention) required for non-rechargeable and rechargeable portable batteries. Critical metrics to track include charge retention and cycle endurance. For example, rechargeable batteries must prove they can recover a specific percentage of their capacity after being in storage for a set time.
- » **Annex IV (Electrochemical Performance and Durability Requirements):** Lists the specific capacity, power, and resistance parameters required for LMT, large industrial (>2 kWh), and electric vehicle batteries. Geared toward heavy-duty and traction batteries, this annex requires tracking degradation over the battery's lifespan. Critical parameters include, for instance, documenting "capacity fade" (the loss of charge capability over time) and "internal resistance increase" under specific reference conditions.
- » **Annex V (Safety Parameters):** Specifies the required safety tests and protections for stationary battery energy storage systems, addressing risks like thermal shock, internal short circuits, and fire. For example, batteries must safely pass tests simulating severe thermal shock, external short-circuiting, fire exposure, and mechanical crushing.
- » **Annex VI (Labeling, Marking and Information Requirements):** Defines the general information, separate collection symbol, and QR code specifications that must be printed on

² This information is not exhaustive. Please refer to the regulation directly using the annex guide described below.

battery labels. Critical elements include a QR code and the separate collection symbol (a crossed-out wheeled bin). As an illustration, if a battery exceeds the strict thresholds for lead or cadmium, it must have the chemical symbol (Pb or Cd) printed directly beneath the crossed-out bin symbol.

- » **Annex VII (Parameters for Determining the State of Health and Expected Lifetime of Batteries):** Lists the specific data parameters (like remaining capacity and energy throughput) that battery management systems must track. A critical requirement is logging harmful events and capacity data. For example, LMT batteries must record the number of "deep discharge events" and time spent in extreme temperatures so that second-life operators can evaluate the battery's residual value.
- » **Annex VIII (Conformity Assessment Procedures):** Describes the specific assessment modules (Internal Production Control, Quality Assurance, and Unit Verification) manufacturers must follow to demonstrate regulatory compliance. For instance, mass-produced batteries might use "Module D1" (Quality assurance of the production process), which requires an approved quality system and periodic audits by a notified body.
- » **Annex IX (EU Declaration of Conformity):** Provides the standardized model structure and required information fields for drafting a battery's EU Declaration of Conformity. Critical requirements include full traceability data, such as listing the specific battery model, batch numbers, and the identification number of the notified body that certified it.
- » **Annex X (List of Raw Materials and Risk Categories):** Lists the specific raw materials (e.g., cobalt, lithium) and the associated environmental and human rights risks that must be addressed in a manufacturer's due diligence policy. A critical requirement is assessing the sourcing of cobalt, natural graphite, lithium, and nickel against severe social and environmental risks. For example, companies must prove they are mitigating risks related to child labor, forced labor, water pollution, and damage to biodiversity.
- » **Annex XI (Calculation of Collection Rates for Waste Portable Batteries and Waste LMT Batteries):** Details the mathematical methodology for calculating annual waste battery collection rates based on recent market sales. As an illustration, the collection rate is calculated by dividing the weight of waste batteries collected each year by the average annual weight of those same battery types sold in the EU Member State over the preceding three years.
- » **Annex XII (Storage and Treatment, Including Recycling, Requirements):** Establishes the mandatory safety protocols for waste battery treatment and sets the specific percentage targets for recycling efficiency and material recovery. A critical safety requirement, for example, is that waste lithium-based batteries must be stored upright (never inverted) and covered with high-voltage rubber isolation. It also mandates critical material recovery targets, such as recovering 90% of cobalt, copper, lead, and nickel by the end of 2027.
- » **Annex XIII (Information to be Included in the Battery Passport):** Categorizes the specific battery data into tiers (publicly accessible, accessible to those with legitimate interests, and accessible only to authorities) for inclusion in the digital Battery Passport. For instance, while the general public can view the battery's carbon footprint and basic chemistry, sensitive information like exploded disassembly diagrams and part numbers are strictly restricted to authorized repairers and recyclers.
- » **Annex XIV (Minimum Requirements for Shipments of Used Batteries):** Outlines the testing, documentation, and packaging proof required to legally distinguish a shipped used battery from a waste battery. For example, the shipper must attach testing records to the battery and provide a copy of an invoice showing the batteries are destined for direct re-use rather than disposal.

Impact on A&D Industry

- » The Exemption Boundaries:
 - Defense applications: Under Article 1(5)(a), batteries are exempt from the requirements of this regulation if they are incorporated or designed to be incorporated into equipment associated with protection of Member States' essential security interests.
 - Dual use: The military exemption specified above contains a critical boundary for dual-use applications. Article 1(5)(a) explicitly excludes "products that are not intended for specifically military purposes" from the exemption. This means the exemption is determined by the specific end-use of the product, not the battery chemistry or the fact that a defense entity is purchasing it.
 - Space-faring aerospace applications: Article 1(5)(b) explicitly exempts batteries in equipment designed to be sent into space, providing a clear carve-out for space-faring aerospace applications.
- » Civil aviation components that carry batteries (e.g., emergency power units, auxiliary power supplies) will need to comply with lifecycle, labeling, and performance criteria when placed on the EU market. Dual-use equipment (i.e., mix of civil and military functions) often must comply, since the exemption centers on strictly military/essential-security products.
- » Suppliers providing battery components (or complete batteries) to A&D original equipment manufacturers (OEMs) that are not covered by the exemption must comply with EU supply chain due diligence. This aligns with other EU rules (e.g., Conflict Minerals Regulation and Corporate Sustainability Due Diligence Directive), increasing transparency and reporting requirements across the chain. Defense primes sourcing civilian-graded batteries must enforce compliance with these due diligence standards in contracts with subcontractors.
- » Industrial Battery (>2 kWh): Article 3 broadly defines industrial batteries as any battery designed for industrial uses or weighing more than 5 kg that is not LMT, EV, or SLI³. This captures heavy equipment and vehicles not classified as LMT or EV. These require a Digital Battery Passport (Article 77) if >2 kWh or Carbon Footprint Declaration (Article 7) if rechargeable and >2 kWh.
- » Material Obsolescence: Article 6 of the Batteries Regulation requires batteries to comply with existing substance restrictions under REACH Annex XVII and the End-of-Life Vehicles (ELV) Directive (Article 4(2)(a)), so any future tightening of those lists can render specific battery materials non-compliant and effectively obsolete for use in the EU. Moreover, the European Commission and Member States can initiate additional REACH-like restriction dossiers for substances in batteries. Until December 2027, the Commission, assisted by the European Chemicals Agency, is required to prepare a report on Substances of Concern, i.e., substances with effects on human health or environment or that hamper recycling, on the basis of which restrictions will be considered.
- » Traceability Requirements: Non-exempt batteries must carry a QR code printed or engraved visibly, legibly, and indelibly linking to a Digital Battery Passport for LMT, EV, and industrial batteries >2 kWh; or an EU Declaration of Conformity and other documentation for other batteries.

Risks and Penalties

- » Market Access (Article 79): Market surveillance authorities are empowered to withdraw or recall non-compliant products.
- » Liability (Article 56): The "producer" (including importers in A&D contexts) bears full liability Extended Producer Responsibility (financial responsibility for waste management⁴).
- » Reputational (Article 52): Annual public reporting of due diligence findings is mandatory.

³ An SLI battery is a starting, lighting, and ignition battery.

⁴ Note: General obligations for compliance upon placing on the market fall on Importers under Article 41.

Horizon Scanning

- » Methodology: The European Commission is empowered to adopt Delegated Acts for Carbon Footprint Methodologies.⁵

Important Note: While the EU Battery Regulation (2023/1542) establishes a single, directly applicable set of technical and environmental standards across the EU, its operational administration is devolved to individual Member States through a two-layer governance model. At the EU level, the Regulation defines the obligations such as carbon footprint methodologies, recycling targets, and digital passport requirements to ensure uniformity in product design and material restrictions. At the Member State level, National Implementation Acts (NIAs) serve as the administrative bridge, designating specific competent authorities to manage local execution. These NIAs do not rewrite the rules but rather establish the necessary procedural infrastructure, including the management of National Producer Registries, the definition of reporting cadences, and the coordination of market surveillance activities. Consequently, while the compliance standard remains constant across the EU, the administrative interface, where data are lodged and compliance is technically verified, is distinct for each jurisdiction.

The table below identifies the primary competent authority and the primary enforcement act for each of the 27 Member States.⁶ For A&D compliance, the Official Registry is the primary operational interface. Entities or their authorized Representatives must register Producers and report battery weights/chemistries to avoid customs blockages.

Member State	Primary Implementation Act(s) and Ordinance(s)	Primary Competent Authorities	Official Register for Producer Registration	Register Hyperlink
Austria	Waste Management Act 2002 and Battery Ordinance	Federal Ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology and Coordinating Agency for Waste Electrical Equipment	Electronic Data Management (EDM)	https://edm.gv.at/edm_portal/home.do
Belgium	Interregional Cooperation Agreement and Regional Waste Decrees (e.g., VLAREMA)	Interregional Packaging Commission and Federal Public Service (FPS) Public Health, Food Chain Safety and Environment	MyBebat (PRO ⁷ -led)	https://my.bebat.be/en/register
Bulgaria	Waste Management Act and Ordinance on Batteries and Accumulators and Waste Batteries and Accumulators	Executive Environment Agency	National Waste Information System	https://nwms.eea.government.bg/app/base/home
Croatia	Waste Management Act and Ordinance on Waste Batteries and Accumulators	Environmental Protection and Energy Efficiency Fund and the Ministry of Economy and Sustainable Development	Register of Producers with Extended Responsibility	https://rppo.fzoeu.hr/
Cyprus	Waste Management Law of 2011	Ministry of Agriculture, Rural Development and Environment	National Register of Producers of Batteries and Accumulators	https://afiscyprus.com.cy/en/companies/legislation/

⁵ The EU Delegated Acts for Carbon Footprint methodologies are detailed, legally binding rules that explain how companies must calculate and report the carbon footprint of products—especially batteries—under EU law.

⁶ Because there are multiple acts/regulations and competent authorities involved in certain countries, only the Primary Competent Authority is listed.

⁷ PRO = Producer Responsibility Organization

Member State	Primary Implementation Act(s) and Ordinance(s)	Primary Competent Authorities	Official Register for Producer Registration	Register Hyperlink
Czechia	Act No. 542/2020 Coll. on End-of-Life Products	Ministry of the Environment of the Czech Republic	Integrated System for Fulfillment of Reporting Obligations	https://www.ispop.cz/
Denmark	Statutory Order No. 986 of 20 June 2025 on Batteries and Waste Batteries	Danish Environmental Protection Agency	Dansk Producent Ansvar (DPA)	https://producentansvar.dk/en/products-and-responsibility/batteries/
Estonia	Waste Act and Ordinance on the Procedure for Marking Batteries and Accumulators	Ministry of Climate	Register of Products of Concern (PROTO)	https://proto.envir.ee/proto/main/welcome
Finland	Waste Act (646/2011)	Centre for Economic Development, Transport, and the Environment for Pirkanmaa (Pirkanmaan ELY-keskus)	Waste Management Register	https://jatehuoltokompassi.fi/haetietoja/turree/
France	Environmental Code	Agency for Ecological Transition-ADEME	Declarative System for EPR Sectors-SYDEREP	https://syderep.ademe.fr/public/home
Germany	Battery Law Implementation Act	Federal Environment Agency	Stiftung Elektro-Altgeräte Register	https://www.ear-system.de/ear-portal/
Greece	Law 4819/2021 on integrated waste management	Hellenic Recycling Agency (EOAN)	National Producers Register (EMPA)	https://empa.eoan.gr/login.php
Hungary	Government Decree No. 80/2023	The National Waste Management Authority (NWMA)	OKIR gate	https://kapu.okir.hu/o_kirkapuuyvfel/
Ireland	S.I. No. 283/2014 - European Union (Batteries and Accumulators) Regulations 2014	Environmental Protection Agency (EPA)	Producer Register Limited (PRL)	https://www.producerregister.ie/
Italy	Legislative Decree No. 188/2008 and Legislative Decree of February 2026	Ministry of the Environment and Energy Security (MASE)	Register of Battery and Accumulator Manufacturers	https://www.registropile.it/
Latvia	Waste Management Law	Ministry of Climate and Energy (KEM)	Register of Battery or Accumulator Producers (BARR)	https://elektroregistrs.lv/registration/en
Lithuania	Law on Waste Management	Environmental Protection Agency	Unified Product, Packaging and Waste Record Keeping Information System (GPAIS)	https://www.gpais.eu/
Luxembourg	Amended Law of 21 March 2012 on Waste	Environment Agency	Ecobatterien	https://www.ecobatterien.lu/en/professional
Malta	Subsidiary Legislation 549.178: Waste Management (Waste Batteries) Regulations	Environment and Resources Authority (ERA)	Register of Producers of Batteries and Accumulators	https://era.org.mt/topic/batteries-and-accumulators-and-waste-batteries-and-accumulators/
Netherlands	Environmental Management Act and Decision on Batteries and Accumulators 2024	Ministry of Infrastructure and Water Management	UPV Portal	https://shorturl.at/QU0t9
Poland	Act of 2025 on Batteries and Waste Batteries	Marshal of the Voivodeship (Marszałek Województwa)	National Waste Database	https://bdo.mos.gov.pl/
Portugal	Decree-Law No. 24/2024	Portuguese Environment Agency (APA)	Integrated Environmental	https://siliamb.apambiente.pt/pages/public/login.xhtml

Member State	Primary Implementation Act(s) and Ordinance(s)	Primary Competent Authorities	Official Register for Producer Registration	Register Hyperlink
			Licensing System (SILiAmb)	
Romania	Government Decision No. 1132/2008 on the regime of batteries and accumulators and waste batteries and accumulators	National Environmental Protection Agency (ANPM)	National Register of Producers of Batteries and Accumulators	https://raportare.anp.m.ro/iri/portal/public
Slovakia	Act No. 79/2015 Coll. on Waste	Ministry of the Environment of the Slovak Republic	Information System of Waste Management	https://www.iso.h.gov.sk/uvod.html
Slovenia	Decree on the Implementation of the Regulation (EU) on Batteries and Waste Batteries	Ministry of the Environment, Climate and Energy (MOPE)	Register of Producers of Batteries and Accumulators	https://interzero.si/en/our-services/inclusion-in-the-common-scheme/waste-batteries-and-accumulators-management/
Spain	Royal Decree 106/2008 on batteries and accumulators and the environmental management of their waste	Ministry of Industry and Tourism	Registration of Industrial Establishments - Batteries and Accumulators	https://sede.servicios.min.gob.es/en-us/procedimientoselectronicos/paginas/detalle-procedimientos.aspx?idprocedimiento=184
Sweden	Regulation (EU) 2023/1542	KEMI (Swedish Chemicals Agency) ⁸ Naturvårdsverket (Swedish EPA) ⁹	Naturvårdsverket E-service for Producer Responsibility	https://www.naturvarldsverket.se/en/guidance/extended-producer-responsibility-epr/producer-responsibility-for-batteries/

The regulation is also currently under scrutiny to extend its application to the three countries of the European Free Trade Association (EFTA): Iceland, Liechtenstein, and Norway via the European Economic Area Agreement.

Links

- » [Official legal text: Regulation \(EU\) 2023/1542](#)
- » [Summary of Regulation \(EU\) 2023/1542](#)
- » [Regulation \(EU\) 2025/1561 \(Delay of Due Diligence\)](#)
- » [EFTA-Factsheet - 32023R1542](#)

1.1.2 Regulation (EU) 2024/1252 (Critical Raw Materials Act) establishing a framework for ensuring a secure and sustainable supply of critical raw materials

Jurisdiction: European Union (directly applicable in all 27 Member States)

Status: Final Rule (in force as of 24 May 2024)

⁸ KEMI oversees chemical safety aspects of the EU Battery restriction focusing on hazardous substances.

⁹ Naturvårdsverket manages EPR responsibility, collection recycling targets, waste management, and reporting obligations.

Key Compliance Date: 24 May 2025 (identification of "Large Companies"¹⁰ subject to supply chain auditing)

Summary

The CRMA is a strategic industrial policy response to the EU's critical dependency on foreign suppliers for materials essential to A&D. It imposes no chemical bans but obligates Large Companies to map and stress-test their supply chains to identifying vulnerabilities against 2030 resilience benchmarks (e.g., high concentration risks where no more than 65% of any strategic raw material should ideally come from a single third country). The regulation applies to strategic raw materials and critical raw materials as defined by Annexes I and II and cover both processed and unprocessed forms.

A&D stakeholders must conduct rigorous "Tier-N" supply chain risk assessments, mapping raw material origins from extraction through processing to identify and mitigate vulnerabilities. Furthermore, the CRMA mandates a 25% Union-level recycling capacity benchmark for strategic raw materials¹¹ (SRMs) by 2030, effectively forcing Member States to scale battery recycling infrastructure and cultivate robust secondary markets for critical metals.

Context and Background

CRMA addresses the systemic vulnerability exposed by COVID-19 and the Ukraine war: the EU imports >90% of its Rare Earth Elements and heavily relies on imported lithium, leaving the defense industrial base fragile to geopolitical developments. The CRMA also anchors the European battery ecosystem by securing the upstream mineral supply necessary to fulfill the downstream lifecycle mandates of the EU Battery Regulation (2023/1542) by securing the upstream minerals required for batteries (and other applications) and offers fast-track permitting for domestic mining and processing ("Strategic Projects").

Critical Timeline and Deadlines

- » 23 May 2024: Entry into force.
- » 24 May 2025:
 - Designation of Audited Firms – Member States must identify Large Companies (manufacturers of batteries, aircraft, spacecraft [satellites, rocket launchers, drones]) subject to Article 24 risk assessments.
 - Circular Economy Scope – The European Commission adopts implementing acts specifying the list of products, components, and waste streams with relevant critical raw materials recovery potential.
- » May 24, 2026: Magnet Calculation Rules – The Commission to adopt delegated act on calculation and verification of recycled content (neodymium, dysprosium, etc.) in permanent magnets.
- » May 24, 2027: Scope Review – the Commission to review the list of strategic/critical materials; potential for new materials to be added (and every three years thereafter).
- » By 2030: Strategic Benchmarks – EU capacity must meet targets (10% extraction, 40% processing, 25% recycling) and no more than 65% of annual consumption of any strategic raw material from a single third country.

¹⁰ Under CRMA, a large company means a company that meets both of the following criteria: 1) It has more than 500 employees on average during the most recent financial year for which annual financial statements have been prepared; and 2) it has a net worldwide turnover of more than EUR 150 million in that same most recent financial year.

¹¹ Strategic raw materials under Regulation (EU) 2024/1252 are defined as critical raw materials that are essential for the EU economy and face high supply risks due to their concentration in a few countries.

Materials as Defined in the Annexes of the EU CRMA

The regulatory classification applies to the materials described below whether they are in their unprocessed form, at any stage of processing, or occurring as a by-product of other extraction, processing, or recycling operations.

- » **Annex I, Section 1: List of SRMs** - The complete list identifies seventeen raw materials as strategic:
 - Bauxite/alumina/aluminium
 - Bismuth
 - Boron — metallurgy grade
 - Cobalt
 - Copper
 - Gallium
 - Germanium
 - Lithium — battery grade
 - Magnesium metal
 - Manganese — battery grade
 - Graphite — battery grade
 - Nickel — battery grade
 - Platinum group metals
 - Rare earth elements for permanent magnets (Neodymium [Nd], Praseodymium [Pr], Terbium [Tb], Dysprosium [Dy], Gadolinium [Gd], Samarium [Sm], and Cerium [Ce])
 - Silicon metal
 - Titanium metal
 - Tungsten

- » **Annex II, Section 1: List of Critical Raw Materials (CRMs)** - The complete list identifies the following 34 raw materials as critical:
 - Antimony
 - Arsenic
 - Bauxite/alumina/aluminium
 - Baryte
 - Beryllium
 - Bismuth
 - Boron
 - Cobalt
 - Coking coal
 - Copper
 - Feldspar
 - Fluorspar
 - Gallium
 - Germanium
 - Hafnium
 - Helium
 - Heavy rare earth elements
 - Light rare earth elements
 - Lithium
 - Magnesium
 - Manganese
 - Graphite
 - Nickel — battery grade
 - Niobium
 - Phosphate rock
 - Phosphorus
 - Platinum group metals
 - Scandium
 - Silicon metal
 - Strontium
 - Tantalum
 - Titanium metal
 - Tungsten
 - Vanadium

Impact on A&D Industry

- » **Supply Chain Transparency:** The most immediate impact is Article 24 audit obligation. Large Companies must map their supply chains for Strategic Raw Materials to the extraction site. This forces A&D primes to demand data from tier-1 and tier-2 suppliers who historically shielded their sources. For example, entities that buy a battery pack must now know where the lithium was mined and processed.
- » **Information Security:** Articles 1(2), 46(7) explicitly protects information where disclosure is contrary to essential interests of the Member States' security or defense.
- » **Permanent Magnets:** Article 28 (labeling) and Article 29 (recycled content) specifically exempts magnets in products primarily designed for defense or space applications.
- » **Dual-Use:** Commercial off-the-Shelf (COTS) batteries used in military logistics (e.g., forklifts, drones, ground support equipment) are not exempt. These supply chains must fully comply with circularity and reporting rules as they were not primarily designed for defense.

Risks and Penalties

- » Financial: Penalties are established by Member States (Article 47).
- » Liability: Compliance liability for the Article 24 risk assessment rests on the Large Company (the OEM or Prime) placing the product on the market, not the upstream mine.
- » Reputational: While audit details reported to the Board of Directors are confidential, the failure to identify vulnerabilities carries reputational risk.

Horizon Scanning

- » Expansion of Scope: The periodic review (starting by 24 May 2027) could add materials currently "critical" but not "strategic" (e.g., helium, beryllium, currently "critical" in Annex II) to the high priority "strategic" list (Annex I), increasing reporting burdens.
- » Environmental Footprint Declarations: From 2026, the Commission may adopt calculation rules for specific "critical" raw materials. Once adopted, any person placing these materials on the market must make available an environmental footprint declaration (Article 31), and the Commission will establish performance classes to differentiate products.

Links

- » [Regulation \(EU\) 2024/1252 \(Official Journal of the EU\)](#)
- » [European Commission - Strategic Projects Portal](#)

1.1.3 Regulation (EU) 2024/2847 (Cyber Resilience Act) on horizontal cybersecurity requirements for products with digital elements

Jurisdiction: European Union (directly applicable in all 27 Member States)

Status: Final Rule (in force as of 10 Dec 2024)

Key Compliance Dates: 11 June 2026 (notification of conformity assessment bodies); 11 September 2026 (vulnerability and incident reporting obligations); 11 December 2027 (full application),

Summary

The Cyber Resilience Act (CRA) fundamentally reclassifies cybersecurity from an IT (i.e., information technology) concern to a product safety and market access mandate. For A&D stakeholders, it impacts connected hardware that is not developed exclusively for national security or defense purposes. Any battery system product with digital elements, such as a battery system with a microcontroller, firmware (e.g., battery management systems), or logical or physical data connection sold or placed on the market in the EU must now be "secure by design", carry a CE mark for cyber-compliance, and be supported with security updates for its expected lifetime of at least five years, unless the expected product lifetime is shorter. Non-compliance results in a direct prohibition of making products available on the market (resulting in market withdrawal or recall).

Context and Background

The CRA builds on the 2020 EU Cybersecurity Strategy and EU Security Union Strategy. It complements other legislation in this area, specifically the Network and Information Security (NIS2) Directive (which establishes a unified legal framework to uphold cybersecurity in eighteen critical sectors across the EU). It applies generally to all hardware and software products with digital elements, including batteries. It is designed to be technology-neutral and addresses cybersecurity risks across all sectors. The regulation aims to avoid a legislative patchwork by establishing a single set of rules for the entire internal market, rather than creating separate cyber rules for every industry/sector product (e.g., batteries, toys, medical devices).

The implications of CRA are highly relevant to battery manufacturers because modern battery systems meet the definition of a "product with digital elements." It complements other EU harmonization legislation by addressing cybersecurity risks. For example, while the EU Battery Regulation (2023/1542) addresses battery-specific lifecycles and passports, the CRA layers on top to secure the digital aspects of those batteries. If sector-specific rules eventually achieve the same level of protection, the CRA's application may be limited or excluded in the future, but currently, it serves as the cybersecurity baseline. It aims to provide a single market access requirement, functionally becoming the "CE Mark for Cyber."

Critical Timeline and Deadlines

- » 10 Dec 2024: Regulation entered force (transition period begins).
- » 11 Sep 2026: Mandatory reporting live. Manufacturers must report actively exploited vulnerabilities and severe incidents to the Computer Security Incident Response Team (CSIRT) designated as coordinator and ENISA (originally the European Network and Information Security Agency, the EU Agency for Cybersecurity) via a single reporting platform within 24 hours.
- » 11 Dec 2027: Full application. All products placed on the market must be CRA compliant (bearing the CE marking).
- » 11 Dec 2027: Cut-off for new placements. Products placed on the market before this date are not subject to CRA requirements unless substantially modified; distributors may continue to sell this legacy inventory without forced withdrawal.

Impact on A&D Industry

- » Dual use: The regulation exempts products developed or modified exclusively for national security or defense purposes or products specifically designed to process classified information.
- » Supply Chain and Traceability: Manufacturers must produce a Software Bill of Materials covering at least the top-level dependencies of the product.
- » Material Obsolescence (digital): CRA creates Digital Obsolescence.¹²
- » Support Period Liability: Impacted entities must define an Expected Product Lifetime and a Support Period. They are legally obligated to provide security patches for this entire duration. The support period shall be at least five years unless the expected product lifetime is shorter.
- » Vulnerability Reporting: Impacted entities must report exploited vulnerabilities and severe incidents to the CSIRT designated as coordinator and ENISA within 24 hours of awareness.
- » Risk Assessment: A cybersecurity risk assessment must be included in the technical documentation (similar to a Safety Assessment Report).
- » Digital CE Marking: The CE Declaration of Conformity now implies cyber-compliance; for software, the CE marking may be affixed to the Declaration of Conformity or a website.

Risks and Penalties

- » Operational (Stop-Ship): National Market Surveillance Authorities can order the immediate withdrawal or recall of non-compliant products if corrective actions are not taken within a reasonable period.

¹² If a Battery Management System controller chip reaches end of life and the vendor stop issuing security patches, the battery unit can no longer be legally sold and cannot be placed on the market, even if the chemistry is sound, unless the manufacturer remediates the vulnerability.

- » Financial: Fines are set by Member States but are capped at €15 Million or 2.5% of global turnover (whichever is higher) for non-compliance with essential requirements or manufacturer obligations.
- » Liability: Importers must ensure the manufacturer has carried out conformity assessments before placing products on the market. For example, if an importer brings a non-compliant Asian battery into the EU and places it on the market under its own name or trademark, the importer assumes full manufacturer liability.

Links

- » [Regulation \(EU\) 2024/1252 \(Official Journal of the EU\)](#)
- » [The Cyber Resilience Act - Summary of the legislative text](#)
- » [FAQ - Cyber Resilience Act implementation](#)

1.2 United Kingdom

3.1.1 United Kingdom Battery Strategy (with note on UK Critical Minerals Strategy)

Jurisdiction: United Kingdom (UK)

Status: Active Policy Framework (published December 2023)

Key Compliance Date: The UK Battery Strategy does not set any domestic deadlines for requirements related to batteries or battery-passport compliance per se. Instead, it articulates a 2030 vision supported by targeted funding and future regulatory development.

Summary

The UK Battery Strategy is the government's 2030 vision to build a globally competitive supply chain and mitigate heavy reliance on East Asian imports (currently the largest import source). For A&D, this strategy identifies batteries as critical to national security, underpinning defense capabilities including fighter jets. Impacted A&D stakeholders must assess their battery supply chains to ensure UK manufacturers can meet the Rules of Origin (RoO) thresholds. Companies exporting to the EU must prepare for the mandatory Battery Passport system. A "Design-Build-Sustain Approach" also serves as the core operational framework for the UK Battery Strategy. This approach integrates advanced R&D (Design), resilient domestic manufacturing (Build), and circular economy regulations (Sustain) to establish an end-to-end sovereign battery ecosystem.

Context and Background

Originally published in late 2023 to counter the US Inflation Reduction Act and EU Green Deal Industrial Plan, this strategy is integrated with the government's Advanced Manufacturing Plan. It seeks to secure a domestic supply of critical minerals (such as Li, Co, Ni) and harmonize standards with international partners to maintain trade flows. It addresses the strategic vulnerability where the UK currently meets the bulk of its domestic demand through imports (primarily from East Asia), posing a national security risk for defense platforms. Integral to the UK Battery Strategy is the UK Critical Minerals Strategy, which acts as the upstream safeguard to secure the volatile raw materials (such as Li, Co, and Ni) essential for sustaining domestic battery gigafactories and protecting sovereign defence capabilities.

Note on UK Critical Minerals Strategy

The strategy categorizes minerals into an existing critical minerals list and a newly introduced growth minerals list. Minerals that receive support as both critical and growth minerals include: aluminium,

antimony, cobalt, gallium, germanium, natural graphite, hafnium, helium, manganese, nickel, lithium, specific platinum group metals (iridium, rhodium, and ruthenium), rare earth elements (REEs), rhenium, silicon, tantalum, tin, titanium, and tungsten.

The document addresses batteries primarily by focusing on supply chain resilience and recycling. The strategy emphasizes the need for a circular economy, noting the current challenges and high costs associated with recovering critical minerals from end-of-life EV batteries. The policy document anticipates surging future demand for minerals essential to batteries, specifically forecasting the long-term industrial needs for lithium, aluminium, cobalt, and nickel.

Critical Timeline and Deadlines

- » 2027: Mandatory EU Battery Passport – UK exporters to the EU must meet digital labeling requirements to support sustainable battery life cycles. Failure to comply risks market access as the EU adopts mandatory minimum levels of recycled content.
- » Ongoing: UK manufacturers must meet RoO requirements to avoid tariffs on exports to the EU.

Impact on the A&D Industry

- » The UK Battery Strategy does not mandate implementation of the EU Digital Battery Passport, nor does it specify battery-passport compliance dates. Instead, it sets a 2030 strategic vision and a program of funding and regulatory exploration. UK exporters must separately comply with EU Battery Regulation timelines when placing in-scope batteries on the EU market.

Key Risks and Penalties

- » Financial: Under the EU–UK Trade and Cooperation Agreement, exports of EVs and batteries that do not satisfy RoO criteria lose preferential access and can face a 10% tariff at the EU border.
- » Operational: For in-scope industrial, EV and LMT batteries, EU rules require lifecycle carbon-footprint information and, from 2027, a digital battery passport containing defined technical and sustainability data. UK A&D manufacturers exporting these batteries to the EU will need systems capable of generating and sharing the required data to place products on the EU market.

Horizon Scanning

A&D suppliers should prepare for new domestic regulations aimed at increasing collection rates and harmonizing reuse, repurposing, and recycling standards with international partners.

Links

- » [UK Battery Strategy \(official policy paper\)](#)
- » [EU-UK Trade and Cooperation Agreement: Rules of Origin Guidance](#)
- » [UK Critical Minerals Strategy \(official policy paper\)](#)



2.0 NORTH AMERICA

2.1 Canada – Federal-Level

2.1.1. Transportation of Dangerous Goods Regulations (SOR/2001-286)

Jurisdiction: Canada (Federal)

Status: Final rule

Key Compliance Date: In force (mandatory compliance for all non-exempt shipments).

Summary

The Transportation of Dangerous Goods (TDG) Regulations mandate a comprehensive safety framework for transporting dangerous goods, designating most lithium batteries as Class 9 hazards (Li-metal batteries UN3090/3091; Li-ion batteries UN3480/3481). It does not govern end-of-life recycling obligations, but rather the safe handling and transit of batteries across all jurisdictions. Regulatory responsibility is assigned to the "Consignor" (defined as the entity classifying dangerous goods). For A&D stakeholders, the critical requirement is ensuring classification, compliant packaging (TP 14850 for small means of containment; Equivalency Certificates for large means of containment), and labeling before assets leave the facility. Specific to aerospace logistics: UN3090 and UN3480 are forbidden as cargo on passenger aircraft, and air shipments must comply with the International Civil Aviation Organization (ICAO) Technical Instructions. Non-compliance leads to fines and/or imprisonment.

Context and Background

The TDG Regulations exist to mitigate acute safety risks, specifically short circuits, fires, and corrosive leaks, during handling, offering for transport, and transport. The regime incorporates international standards (ICAO Technical Instructions for air) as amended from time to time. This structure mandates that A&D logistics teams monitor ICAO updates continuously to remain compliant in Canada, particularly regarding the prohibition of UN3090 and UN3480 batteries as cargo on passenger aircraft.

Critical Timeline and Deadlines

- » TDG Regulations themselves do not set compliance deadlines for batteries requirements.
- » 30 Jul 2025: Guidance Update (TDG Bulletin "Transporting batteries" modified¹³).

¹³ The Guidance Update issued by Transport Canada does not make any changes to the TDG Regulations. Rather, it is a guidance document that explains how to interpret and apply existing regulatory requirements when transporting batteries. For example, it clarifies interpretation of the current TDG regulatory requirements for batteries (e.g., classification, means of containment, shipping documentation, marks and labels, special provisions) under the existing TDG Regulations. It also explains practical responsibilities for shippers, such as 1) how to classify batteries (cells vs batteries), 2) what packing instructions and standards apply, 3) how dangerous goods marks and placards must be displayed, and 4) what special provisions mean for lithium batteries, damaged or defective batteries, and disposal/recycling transport.

Impact on the A&D Industry

- » Documentation: High impact. Shipping documents must comply with Part 3 and carry precise UN numbers (e.g., UN3090, UN3480). Requirements focus on safety marks and proper classification.
- » Regulated batteries must be packaged in approved containers that prevent release under normal transport conditions. They must be marked and labeled correctly for hazard communication.
- » Verified exemptions include:
 - Special Provision 34: Exempts Li-ion batteries <100 Wh and Li-metal <2 grams (aggregate) from most regulations if conditions are met.
 - Gross Mass: Section 1.15 and 1.16 provide exemptions for gross mass <150 kg or <500 kg if batteries are in means of containment <30 kg.
- » Defective Assets: Special Provision 137 strictly forbids the air transport of damaged or defective batteries.
- » Passenger Aircraft Ban: Special Provision 149 forbids UN3090 and UN3480 as cargo on passenger aircraft.

Risks and Penalties

Failure to comply with the TDG Regulations may lead to fines and/or imprisonment.

Horizon Scanning

No upcoming batteries related updates identified.

Links

- » [Transportation of Dangerous Goods Regulations \(Official Text\)](#)
- » [Transport Canada TDG Lithium Battery Guidance](#)

2.2 Canada – Provincial-Level

Provincial-level battery stewardship regulations are becoming increasingly common in Canada. Below are a list and status of battery recycling laws with regards to the various provinces and territories.

- » Producers required to offer or fund battery recycling: Alberta, British Columbia, Manitoba, New Brunswick, Nova Scotia, Ontario, Prince Edward Island, Quebec, and Saskatchewan.
- » Provincial/territorial battery requirements transitioning, paused, or in development: Newfoundland, and Labrador, and Northwest Territories.
- » No mandatory producer battery recycling requirements: Nunavut.

The sections below summarize requirements in the key states of Ontario and Quebec. For further information covering requirements in every jurisdiction, refer to the regulatory frameworks maintained by the respective provincial environmental ministries and officially recognized Producer Responsibility Organizations¹⁴ (PROs). Refer to the following [link](#) for specifics.

¹⁴ Producer Responsibility Organizations, or PROs, are non-profit, often industry-led entities, that manage the waste collection, recycling, and disposal obligations of manufacturers and brands under Extended Producer Responsibility (EPR) laws.

2.2.1 Ontario Regulation 30/20: Batteries under the Resource Recovery and Circular Economy Act, 2016

Jurisdiction: Ontario, Canada

Status: Final rule (in force)

Key Compliance Date: 30 April (Annual Recurring Reporting Deadline)

Summary

The Ontario Battery Regulation enforces an EPR model, legally mandating that producers (brand holders, importers, or marketers) finance and manage the end-of-life recovery and recycling of primary and rechargeable batteries weighing five kilograms or less. For A&D stakeholders, the call to action is to identify all battery-containing products supplied into Ontario under the 5 kg threshold, register with the regulatory Authority via the Registry, and contract a PRO to handle the stringent collection, processing, and annual reporting requirements.

Context and Background

Made under the 2016 Resource Recovery and Circular Economy Act (RCRA), this regulation transitions the province to a circular economy framework by shifting the financial and operational burden of waste management from municipalities directly to product manufacturers. It establishes a "producer-pays" system, requiring companies to meet mathematically defined management requirements based on historic supply volumes and strict recycling efficiency rates.

Critical Timeline and Deadlines

- 27 February 2020: Regulation officially filed and published.
- 30 November 2020 (passed): Initial deadline for producers marketing batteries in Ontario to register with the Authority.
- 30 April 2022 (and every April 30 thereafter): Recurring annual deadline for producers (or their PROs) to submit detailed performance and management reports through the Registry.
- 30 April 2027: Deadline for the next triennial independent audit report (and every three years thereafter)

Impact on A&D Industry

- » Scope: This law applies only to batteries weighing 5 kg or less. Therefore, large defense articles, heavy aerospace battery systems, and primary aircraft batteries are excluded from this specific regulation.
- » Record Keeping Requirements: Manufacturers and importers must track the exact weights of these batteries supplied into Ontario to calculate their management requirement. Supply chain contracts may need adjustments to ensure downstream battery processors are registered, maintain required recycling efficiency rates (70% for rechargeable, 80% for primary), and provide verifiable data on resource recovery and post-consumer recycled content.
- » Dual use: There is no regulatory exemption for defense use items.

Risks and Penalties

- » Operational: Producers must undergo independent, third-party audits conducted by licensed public accountants. Failing to accurately verify supply weights, failing to ensure battery processors meet the 70-80% recycling efficiency rates, or failing to maintain all compliance records for five years could result in disrupted market access.

- » Financial: The specific regulation text does not explicitly define maximum financial penalties or fines. These are governed by the parent RCRA. Non-compliance fees are as follows:
 - Individuals: Up to \$50,000/day (first offence); \$100,000/day (repeat)
 - Corporations: Up to \$250,000/day (first offence); \$500,000/day (repeat)

Horizon Scanning

While large A&D batteries currently bypass this regulation due to the 5 kg weight cap, the establishment of this rigorous EPR framework signals a mature administrative mechanism in Ontario. Future amendments to the parent Act could easily capture heavier industrial and defense batteries or mandate higher minimums for post-consumer recycled content.

Links

- » [Ontario Regulation 30/20: Batteries](#)

2.3.1 Regulation respecting the recovery and reclamation of products by enterprises

Jurisdiction: Québec, Canada

Status: Final rule (in force)

Key Compliance Date: Ongoing

Summary (focus on batteries)

The amended Québec EPR regulation impacts the battery value chain by enforcing end-of-life recovery obligations for batteries while explicitly excluding some types to avoid over-regulation. The broader category of "batteries" remains listed under the overarching provincial framework for product recovery and reclamation. Notably, small, sealed lead-acid batteries became subject to mandatory producer recovery targets as of January 2023. However, following direct industry feedback, higher-capacity electric vehicle batteries were intentionally removed from this mandatory regulatory update; instead, the government is pursuing an industry-led voluntary recovery program to manage these traction batteries. A&D firms operating in or supplying Québec must audit their energy storage systems to determine whether their specific battery formats fall under mandatory EPR compliance or alternative voluntary frameworks.

Context and Background

The broad EPR framework was implemented in Québec to reduce the volume of residual materials sent to landfills and to accelerate the transition toward a circular economy. By shifting the physical and financial responsibility of a product's post-consumer lifecycle onto the enterprises that market them, the regulation incentivizes better product design, the structuring of domestic recycling infrastructure, and the creation of local markets for reclaimed materials. A wave of amendments was enacted to modernize the aging 2011 framework, capture the rise of online sales from out-of-province enterprises, and strictly prohibit parallel, unauthorized recovery networks that previously undermined official recycling objectives.

Critical Timeline and Deadlines

- » 21 Jun 2022: Final rule amendments published by the Government of Québec.
- » 30 Jun 2022: Initial amendments entered into force, updating extended producer responsibility rules.

- » 30 Dec 2022: (passed): Mandatory requirements for enterprises outside Québec and those operating transactional websites (online sales) to comply as designated producers entered into force.

Impact on A&D Industry

- » End-of-Life Liability: Producers must assume full physical and financial responsibility for the post-consumer recovery and reclamation of the batteries they put on the market.
- » Jurisdictional Expansion: Enterprises located outside of Québec, as well as businesses operating transactional websites (online sales), are now legally designated as producers and must fulfill all recovery obligations for batteries sold into the province.
- » Chemistry-specific mandates: A&D stakeholders and their supply chain partners must ensure that any small, sealed lead-acid batteries utilized in their systems or ground support equipment are managed under official producer responsibility organizations, as parallel unauthorized recovery networks are strictly prohibited.

Risks and Penalties

- » Financial: Specific monetary fines for non-reporting are not detailed in the provided regulatory excerpts; however, non-compliant enterprises risk the financial burden of retroactive compliance costs for failing to take charge of their products' end-of-life useful phase.
- » Operational: A&D firms face operational compliance risks if they or their local partners utilize unauthorized, parallel recovery networks for battery disposal, as the amended regulation explicitly prohibits these networks.
- » Liability: Extended liability is directly placed on entities functioning similarly to an Importer of Record; out-of-province enterprises and businesses utilizing transactional websites (online sales) to market batteries in Québec are now legally designated as producers and must assume the associated recovery obligations.

Horizon Scanning

No upcoming updates identified.

Links

- » [Regulation respecting the recovery and reclamation of products by enterprises](#)
- » [Regulatory overview and history](#)
- » [2022 Press release: New products subject to EPR](#)

2.3 United States – Federal Level

2.3.1 Standards for Universal Waste Management [40 CFR Part 273], § 273.2 Applicability—batteries

Jurisdiction: USA Environmental Protection Agency (USEPA)

Status: Final rule (in force)

Key Compliance Date: Ongoing (immediate applicability upon decision to discard)

Summary

This regulation offers a strategic alternative to the standard RCRA Subtitle C hazardous waste regime. By managing waste batteries as Universal Waste, USEPA allows facilities to forego complex

hazardous waste manifesting and standard RCRA permitting requirements in exchange for streamlined handling, labeling, and accumulation protocols. It requires verification that all eligible hazardous site-level waste streams (specifically for Li-ion, Ni-Cd¹⁵, and alkaline [when hazardous]) are managed in compliance with [40 CFR 273](#) to avoid default classification as fully regulated hazardous waste.

Context and Background

40 CFR Part 273 was established to provide an alternative set of management standards in lieu of standard hazardous waste regulations (40 CFR parts 260 through 272). While a spent lead-acid or Ni-Cd battery generally requires rigorous hazardous waste documentation, 40 CFR Part 273 harmonizes waste management to encourage collection and proper management.

Critical Timeline and Deadlines

- » Ongoing (Trigger Event): Immediate Applicability. A used battery becomes a waste on the date it is discarded; an unused battery becomes a waste on the date the handler decides to discard it.
- » Continuous Monitoring (Not Annual): Facilities must monitor total universal waste accumulation at any time. Accumulating ≥5,000 kg of total universal waste (batteries, pesticides, etc., calculated collectively) triggers "Large Quantity Handler" (LQH) status. This designation is retained through the end of the calendar year in which the limit is met.
- » One-Year Accumulation Limit: Universal waste batteries cannot be stored on-site for more than one year from the date of generation or receipt from another handler. Exception: Accumulation may exceed one year solely to facilitate proper recovery, treatment, or disposal (burden of proof lies with the handler).

Impact on A&D Industry

- » Sourcing: 40 CFR Part 273 establishes management standards for waste batteries but does not dictate upstream design or banning of materials (e.g., Pb, Cd) in new products. However, it imposes strict downstream management requirements. A&D stakeholders must ensure materials, once spent, can be accepted by destination facilities or other handlers. If a shipment is rejected by a receiving facility, the A&D handler must accept the waste back or agree on an alternative destination.
- » Record Keeping Requirements: 40 CFR Part 273 enforces a physical form of traceability regarding accumulation time. A&D facilities must demonstrate that waste batteries have not exceeded the one-year accumulation limit from the date the battery became a waste.
- » Dual use: There is no regulatory exemption for defense use items within 40 CFR Part 273.
- » Per Part 273.2(b), Universal Waste rule does not apply to:
 - Spent lead-acid batteries that are managed under 40 CFR Part 266, Subpart G (the specific recycling standard for lead-acid batteries).
 - Batteries that are not yet waste, i.e., ones that are not discarded or destined for reclamation.
 - Batteries that are not hazardous waste; they must exhibit a hazardous waste characteristic under 40 CFR Part 261 to be subject to universal waste.
 - Batteries that are damaged or leaking to the point that their cell casings are breached may not be manageable under Universal Waste and might instead be regulated under full hazardous waste rules.

¹⁵ Ni-Cd refers to a type of rechargeable battery that uses nickel oxide hydroxide as the positive electrode and cadmium (Cd) as the negative electrode.

Risks and Penalties

- » Operational: The primary penalty is the loss of the "alternative set of management standards" provided by 40 CFR Part 273. If a facility fails to comply with Universal Waste standards (e.g., containment, labeling), the waste becomes subject to full regulation under 40 CFR parts 260 through 272. This effectively negates the exemption, reverting the handler to standard hazardous waste generator requirements.
- » Logistics (Shipment Rejection): There is a high operational risk regarding downstream acceptance. If a destination facility or receiving handler rejects a shipment, the originating A&D handler must either receive the waste back or agree on an alternative destination immediately. LQHs must retain records of these off-site shipments for three years.
- » Non-compliance with § 273.2 or related Universal Waste provisions is treated as a violation of RCRA, and penalties depend on severity and whether the violation is civil or criminal:
 - Civil penalties (USEPA enforcement): Up to \$80,000 per day, per violation.
 - Criminal penalties: Up to \$50,000 per day, and/or up to two years imprisonment for knowing violations of RCRA requirements (intentional or negligent). Repeat offenses can carry higher penalties.
 - Transport violations: Shipping batteries that fail Universal Waste labeling, packaging, or documentation requirements can trigger penalties under 49 CFR Department of Transportation (DoT) regulations, in addition to RCRA.

Horizon Scanning

The USEPA has been drafting an update to the Universal Waste rules to create a distinct universal waste category specifically for lithium batteries and to update or tailor universal waste management standards to address fire and safety risks unique to lithium batteries. USEPA indicated plans to issue a final rule by late 2026, but as of the date of publishing of this report, USEPA has not yet formally published the proposed rule.

Links

- » [eCFR: 40 CFR Part 273 - Standards for Universal Waste Management](#)
- » [USEPA Universal Waste Website](#)
- » [Improving Recycling and Management of Renewable Energy Wastes: Universal Waste Regulations for Solar Panels and Lithium Batteries](#)

2.3.2 Hazardous Materials: Harmonization with International Standards (HM-215Q)

Jurisdiction: U.S. DoT Pipeline and Hazardous Materials Safety Administration

Status: Final rule (effective as of 10 May 2024)

Key Compliance Dates: 31 Dec 2026 (end of transition period for legacy Li battery mark)

Summary

HM-215Q harmonized U.S. hazardous materials regulations with international standards, eliminating the historical air transport exceptions for small, standalone Li batteries shipped by air not packed with or contained in equipment. For A&D stakeholders, this means that small spare batteries (UN3480/UN3090) cannot be shipped as unregulated cargo. They are now regulated Class 9 Section

IB cargo¹⁶ requiring UN-specification packaging and full hazmat declarations Class 9 labels, Li battery marks, shipping papers, and Pilot-in-Command notification. Concurrently, cobalt dihydroxide is now a Division 6.1 Toxic substance (UN3550), demanding stricter handling protocols for raw material movements supporting battery manufacturing.

Context and Background

This rule updates 49 CFR Parts 171-180 to align with the 2023-2024 ICAO Technical Instructions and the 22nd Revised Edition of the United Nations (UN) Model Regulations.¹⁷ The objective of this rule is to address the fact that historically, exceptions for standalone batteries limited the ability of air operators to conduct necessary safety risk assessments. By removing these exceptions, the U.S. DoT has harmonized with the ICAO regime ensuring operator acceptance checks are performed and information regarding the number and location of packages is provided to the Pilot-in-Command.

Critical Timeline and Deadlines

- » 10 Apr 2025: Delayed Compliance Date. All shippers must now comply with the removal of air transport exceptions for small standalone batteries and the new UN3550 classification for cobalt dihydroxide powder.
- » 31 Dec 2026: End of Transition Period. The legacy Li battery mark (containing the telephone number) is authorized for use until this date.
- » 1 Jan 2027: Authorization for the legacy Lithium Battery Mark expires.

Impact on A&D Industry

- » Logistics: Exceptions for air transport for small standalone lithium batteries (UN3480/UN3090) have been removed. Under HM-215Q, these are fully regulated Hazardous Materials subject to stricter regulatory oversight.
- » Material Obsolescence and Toxicity (cobalt dihydroxide): The reclassification of cobalt dihydroxide powder ($\geq 10\%$ respirable particles) from a generic Class 9 to UN3550, Division 6.1 (Toxic), Packing Group I affecting the risk profile for battery manufacturers; the substance may now fall under stricter regulatory categories, which triggers higher safety controls, labeling, and handling requirements.
- » Dual Use: There are no specific exemptions for defense or military shipments in HM-215Q.
- » New Hardware Mandate: Effective May 10, 2024, all Li-ion batteries (excluding cells) must be marked with the Watt-hour rating on the outside case. This applies to both commercial and defense-specific hardware.

Risks and Penalties

- » Operational Stoppage: The highest risk is carrier rejection. Major integrators verify compliance during acceptance checks; missing Wh markings ratings on Li-ion batteries or use of invalid exceptions results in immediate return to shipper.
- » Financial: Civil penalties for hazmat violations and enforcement actions are authorized for non-compliance.
- » Liability: The shipper of record holds total liability. If a battery causes a thermal event and was undeclared due to a misunderstood exception, the firm is liable for aircraft damages.

¹⁶ "Section IB" is a specific sub-category in the International Air Transport Association packing instructions for lithium batteries, mainly under PI 965 – Li-ion batteries (stand-alone) – and PI 968 – Li-metal batteries (stand-alone).

¹⁷ The "UN Model Regulations" refers to the United Nations Recommendations on the Transport of Dangerous Goods – Model Regulations. They are an international framework for safely transporting hazardous materials by all modes of transport: air, road, rail, and sea.

Horizon Scanning

Future harmonization efforts will continue to align with international standards (such as those by ICAO) to reduce the burden of complying with multiple or inconsistent safety requirements.

Links

- » [Hazardous Materials: Harmonization With International Standards](#)
- » [eCFR:: 49 CFR 173.185 - Lithium cells and batteries](#)

2.3.3 Critical Mineral Resources: National Policy and Critical Minerals List (incorporating the Energy Act of 2020)

Jurisdiction: US Geological Survey (USGS)

Status: Final 2025 List of Critical Minerals (published in the Federal Register on 07 Nov 2025)

Key Compliance Dates:

- » Not applicable

Summary (Battery Focus)

The 2025 Critical Minerals List (CML) and recent Department of Energy (DoE) assessments, explicitly targets the domestic extraction, processing, and recycling of essential battery materials, including lithium, cobalt, nickel, manganese, and natural graphite. Foreign entities currently dominate these value chains (e.g. over 60% of global lithium and cobalt processed in China). This policy leverages the USGS and previous DoE assessments to mitigate supply vulnerabilities. A&D stakeholders commonly rely on high-performance energy storage, and this framework accelerates federal backing for domestic battery mineral projects.

Context and Background

The legislative expansion of the national minerals policy was enacted to counter the United States' undue reliance on foreign adversaries for resources essential to defense, energy, and economic security. Lawmakers recognized that modern technology supply chains, including those for advanced batteries, lack diversity and are highly vulnerable to geopolitical disruptions, export quotas, and anticompetitive price manipulation. By mandating regular criticality assessments and establishing formal critical minerals lists, the federal government aims to forecast supply shortages, stimulate domestic resource development, and coordinate resilient supply chains for critical components.

Note on definition of critical minerals and the list (critical minerals list; CML)

Under the Energy Act of 2020, a critical mineral is defined any mineral, element, substance, or material designated as critical by the USGS if:

- » it is essential to the economic and national security of the US
- » it has a vulnerable supply chain
- » it serves an essential function in manufacturing a product.

In February 2022, the USGS published a list of fifty critical minerals with updates every three years. On November 7, 2025, the USGS published a "Final 2025 List of Critical Minerals" in the *Federal Register* and used a new methodology compared with the methodology used to develop the 2022 CML for determining mineral criticality. The 2025 CML of 60 critical minerals includes aluminum, antimony, arsenic, barite, beryllium, bismuth, boron, cerium, cesium, chromium, cobalt, copper, dysprosium, erbium, europium, fluor spar, gadolinium, gallium, germanium, graphite, hafnium, holmium, indium, iridium, lanthanum, lead, lithium, lutetium, magnesium, manganese, metallurgical coal, neodymium, nickel, niobium, palladium, phosphate, platinum, potash,

praseodymium, rhenium, rhodium, rubidium, ruthenium, samarium, scandium, silicon, silver, tantalum, tellurium, terbium, thulium, tin, titanium, tungsten, uranium, vanadium, ytterbium, yttrium, zinc, and zirconium.

Critical Timeline and Deadlines

- » 24 Feb 2021: Executive Order 14017 initiated a comprehensive 100-day review of critical product supply chains, targeting large capacity batteries and critical minerals.
- » 4 Aug 2023: The DoE finalized its 2023 Critical Materials List, explicitly identifying battery materials such as lithium, cobalt, nickel, and natural graphite as essential for energy technologies.
- » 7 Nov 2025: The USGS published the Final 2025 List of Critical Minerals in the Federal Register, reaffirming the criticality of core battery inputs while adding newly assessed materials like copper and lead.
- » 2026: The DoE is scheduled to update its Critical Materials Assessment, which will dictate the medium-term federal prioritization and funding for energy storage materials.

Impact on A&D Industry

The policy document establishes a strategic framework to mitigate vulnerabilities stemming from foreign export quotas and anti-competitive market manipulation. The designation of critical minerals specifies to A&D stakeholders which minerals are being prioritized for domestic extraction and supply chain mapping for industry applications including essential battery inputs.

Risks and Penalties

- » **Financial & Liability:** The framework establishes national strategic policy rather than a punitive regulatory compliance regime; therefore, specific financial fines for non-reporting or direct importer liability clauses are not present in this text.
- » **Operational (Supply Chain Disruption):** A primary risk identified is the severe lack of geographic diversity in battery mineral processing, with over 60% of global lithium and cobalt refined in China. This exposes A&D manufacturers to immediate risks of foreign export quotas, geopolitical volatility, and anti-competitive price manipulation.
- » **Operational (Demand Shortfalls):** Surging demand for advanced batteries is expected to create supply deficits for critical minerals like lithium and cobalt, posing a risk that A&D firms will face raw material shortages and prices driven significantly above production costs.

Horizon Scanning

The DoE is preparing to update its Critical Materials Assessment in 2026, which will re-evaluate supply chain risks and potentially categorize new battery elements as critical. Concurrently, Executive Order 14272 has directed the Secretary of Commerce to investigate the national security effects of importing processed critical minerals and their derivative products, which could signal future tariffs or trade restrictions on foreign battery components.

Links

- » [Congress Report-Critical Mineral Resources: National Policy and Critical Minerals List](#)
- » [DoE Critical Materials Assessment \(2023\)](#)
- » [Final 2025 List of Critical Minerals \(Federal Register\)](#)

2.3.4 Hazardous Materials: National Defense Authorization Act for Fiscal Year 2026 (S. 1071)

Jurisdiction: US Department of Defense (DoD)

Status: Final rule; signed 18 December 2025

Key Compliance Dates:

- » 1 Jan 2028: New acquisition programs
- » 1 Jan 2029: Standard batteries
- » 30 Jan 2031: Existing acquisition programs

Summary

S. 1071 is a "De-risk or De-list" mandate. Section 842 of the NDAA FY2026 prohibits the DoD from procuring advanced batteries and cells whose functional components and technology are owned, sourced, refined, or produced by an FEOC. This applies to end items or batteries embedded within warfighting and support systems. Impacted entities must immediately initiate a Tier-N supply chain audit. A&D companies have a limited runway to re-source or validate that battery cells meet strict exception criteria, specifically that 95% of the costs of the functional cell components (e.g., anodes, cathodes, electrolytes) are from non-FEOC sources. If they cannot prove the origin of cathode, anode, separators, anode foils, and electrolyte (including solvents, additives, and salts) by the applicable deadline (2028–2031), the hardware is ineligible for procurement.

Context and Background

S. 1071 escalates previous efforts (such as NDAA FY2024 Sec. 154) to decouple the U.S. defense industrial base from adversarial reliance. While previous rules focused on specific companies, Section 842 of this Act broadens the scope to materials and components from all FEOC and imposes a strict non-FEOC content quota. It harmonizes with broader US industrial policy but applies a stricter, security-focused lens: exceptions for COTS items are limited to equipment maintenance, non-combat environments (e.g., office/hospital), or research and development. Procurement of advanced batteries for warfighting systems generally requires full compliance unless a waiver is granted based on availability or lack of operational risk.

Critical Timeline and Deadlines

- » 18 Dec 2025: Law enacted (Immediate Due Diligence recommended).
- » 1 Jan 2028: New Acquisition Programs. Prohibition applies to all new defense acquisition programs that have not reached the engineering and manufacturing development phase (Milestone B).
- » 1 Jan 2029: Standard Batteries. Prohibition expands to batteries used in more than one weapons system and not managed by a single portfolio acquisition executive.
- » 30 Jan 2031: Existing Acquisition Programs. Prohibition applies to programs that reached Milestone B prior to enactment.

Impact on A&D Industry

- » Supply Chain Transparency (the "95% Rule"): S. 1071 includes a sourcing clause (Section 4865(c)(1)(A)(ii)). To use a battery not fully made in the US/Allied nations, entities must prove that 95% of the cost of the functional cell components originates from non-FEOC sources.
- » The Recycling Exemption as a Strategy: Section 842(c)(1)(B) explicitly states that any material or component from an entity that has been recycled and reprocessed domestically is considered to originate from that entity regardless of origin.

- » Defense Industrial Base Funding: Section 867 explicitly expands the authorities of the Defense Industrial Base Fund¹⁸ to include Batteries and Advanced Manufacturing. A&D firms leveraging the expanded Defense Industrial Base Fund authorities for batteries and advanced manufacturing must comply with NDAA-mandated domestic sourcing (including FEOC), cybersecurity, and supply-chain disclosure requirements set by DoD and Congress
- » Dual-Use Application: Limited Exemption for Commercial-Off-The-Shelf. Batteries comprising commercially available off-the-shelf items for use only in the maintenance of equipment are explicitly excluded from the prohibition.

Risks and Penalties

- » The DoD is legally barred from procuring advanced batteries and cells from FEOC, whether as end items or embedded within warfighting and support systems. Non-compliance results in immediate ineligibility for contract award or delivery acceptance for new programs starting on 1 January 2028.
- » The Secretary of Defense may waive the prohibition for a specific system or battery for one year if compliant batteries cannot be acquired at reasonable costs or if the battery poses no security risk.

Horizon Scanning

The Secretary of Defense is mandated to revise the DoD Supplement to the Federal Acquisition Regulation no later than 180 days after enactment to incorporate the sourcing prohibitions and definitions established in Section 842. This includes the codification of functional cell components and FEOC definitions within the acquisition regulations.

Links

- » [S.1071 - National Defense Authorization Act for Fiscal Year 2026](#)

2.4 United States – State-Level

State-level battery stewardship regulations are becoming increasingly common in the US. The sections below summarize requirements in the key states of California, New York, Washington, and Maine. Below are a list and status of battery recycling laws with regards to the various US states and territories.

- » Producers required to offer or fund battery recycling: ME, CT, MD, VT, NJ, DC, NY, FL, IL, IA, MN, NE, CO, CA, WA.
- » State battery requirements in effect: NH, PA, WV, VA, NC, SC, KY, IN, WI, MS, AR, LA, TX, NM, UT, WY, ND, SD, HI, PR.
- » No battery recycling requirements: MA, RI, DE, OH, MI, TN, GA, AL, MO, KS, OK, MT, ID, NV, AZ, NV, OR, AK.

For further information, refer to this [link](#) that describes battery recycling laws by state.

¹⁸ The Defense Industrial Base Fund is a DoD funding mechanism designed to strengthen, modernize, and secure the Defense Industrial Base, which is the network of companies and suppliers that design, produce, and sustain military and national-security systems.

2.4.1 California - SB 1215 (Chapter 370, Statutes of 2022) – Electronic Waste Recycling Act of 2003: covers battery-embedded products

Jurisdiction: State of California

Status: Enacted into law on 16 September 2022; Emergency Regulations effective 11 December 2025. The emergency regulations¹⁹ implementing SB 1215 are set to expire on 12 December 2027 unless replaced with permanent regulations.

Key Compliance Date: 1 January 2026 (sales prohibition and fee collection effective date).

Summary

SB 1215 effectively closed the legislative loophole that allowed electronics with non-removable (embedded) batteries to evade California's e-waste fees. For A&D stakeholders, any equipment sold into California containing a battery not easily removable by the user with no more than common household tools are now subject to a per-unit recycling fee (established annually by CalRecycle based on regulatory costs) and strict labeling mandates. Product labels must be readily visible with the manufacturer's brand and identify the battery chemistry (or provide chemistry data via the manufacturer's website). Non-compliant stock is prohibited from sale or offer for sale in California. Specific exemptions apply to lead-acid batteries, motor vehicle batteries, and rechargeable batteries exceeding 5 kg or 300 Wh. Furthermore, manufacturers must initiate annual reporting to CalRecycle by 1 July 2027, detailing sales estimates, battery chemistries, and recycled material content.

Context and Background

SB 1215 regulation modernizes the 2003 Electronic Waste Recycling Act by expanding the definition of "covered electronic devices" to include "covered battery-embedded products." This expansion addresses the operational hazard of batteries being a top cause of fires in California's waste facilities.

Critical Timeline and Deadlines

- » 1 July 2025: Mandatory Retailer Notification. Manufacturers must have notified retailers/distributors of which brand and model numbers are "covered products" subject to the fee.
- » 1 January 2026:
 - Fee Trigger. Consumers begin paying the battery-embedded recycling fee at the point of sale.
 - Sales Prohibition. Sales of products without a readily visible manufacturer brand and battery chemistry label (or a chemistry-identifying website link on the product) are prohibited.
- » 1 April 2026: Recycler Claims Open. CalRecycle begins accepting payment claims for covered electronic waste collected on or after 1 January 2026.
- » 1 July 2027: First Annual Manufacturer Report. Deadline for reporting sales estimates, battery chemistries, and the use of recycled materials in products sold during the previous year. All records must be maintained for a minimum of three years and provided to CalRecycle under penalty of perjury.

¹⁹ These most recent emergency regulations implement and clarify how SB 1215 will operate in practice. They include: i) clarifying the statutory definition of a covered battery-embedded product; ii) establishing an approved cancellation method for dismantling battery-embedded covered electronic waste (CEW); iii) setting battery-embedded CEW recycling payment claim requirements; iv) creating reporting and notification procedures for manufacturers; and v) updating net cost reporting and other CEW program procedures (e.g., reinstatement and payment claim review procedures).

Impact on the A&D Industry

- » Dual-Use: No specific exemptions for defense hardware.
- » Design Constraints: The regulation affects "embedded" designs. A product is captured if the battery is not designed to be easily removed by the user with no more than common household tools.
- » Design Shift: Rechargeable batteries over 5 kg and 300 Wh are currently excluded from the "covered battery" definition, though the product containing them may still be captured if it meets the "battery-embedded" criteria.
- » Supply Chain and Traceability: Manufacturers must provide annual reports to CalRecycle detailing the chemistry (e.g., lithium cobalt oxide, lithium nickel manganese cobalt oxide, and lithium iron phosphate) and the use of recycled content in their products.
- » Audit Exposure: Manufacturers must maintain all compliance records for a minimum of three years and provide them to CalRecycle upon request.
- » Tier-N Visibility: As with all reports and records, A&D operators are required to obligate Tier 2/3 battery suppliers to disclose exact battery chemistries and recycled material percentages to ensure accurate state reporting. Proprietary information and trade secrets submitted in these reports will be protected under state law.

Risks and Penalties

- » Operational: The primary enforcement mechanism is the prohibition on sale or offer for sale.
- » Financial:
 - Civil Liability: Up to \$2,500 per offense (per sale/unit) for administrative violations imposed by CalRecycle.
 - Civil Penalty: Up to \$5,000 per offense imposed by a superior court.
 - False Statements: Civil liability of up to \$25,000 per violation for false statements in reports or failure to comply with the requirements of the chapter.

Horizon Scanning

While CalRecycle reviews the fee annually to ensure fund sufficiency, the authority to establish variable fees based on product categories begins 1 August 2028. The emergency regulations implementing SB 1215 are set to expire on 12 December 2027 unless replaced with permanent regulations.

Links

- » [Bill Text: CA SB1215 | 2021-2022](#)
- » [SB 1215 Covered Battery-Embedded Products Emergency Regulations](#)
- » [CalRecycle - Battery Stewardship](#)

2.4.2 Washington - Chapter 70A.555 RCW (Batteries—Environmental Stewardship) and Chapter 173-905 WAC (Battery Stewardship Program)

Jurisdiction: State of Washington

Status: Adopted Rule effective on 16 January 2026

Key Compliance Date: 1 Jan 2027 (mandatory producer participation)

Summary

This regulation establishes a mandatory EPR regime, shifting the cost of battery end-of-life management from the public sector to the Producer of Covered Batteries (portable²⁰ and medium format²¹). A&D stakeholders must audit supply chains to determine if their entity acts as the Importer of Record for any equipment containing Covered Batteries (defined as ≤25 pounds [lbs] and ≤2,000 Wh) entering Washington. If so, the company is legally liable for funding recycling operations and must join a Battery Stewardship Organization (BSO) by 1 July 2026 to avoid a "stop-ship" order in 2027. Batteries that are not easily removable with common household tools are currently excluded.

Context and Background

The regulation addresses toxicity of materials and safety concerns for workers including fires at solid waste handling facilities caused by improper disposal. While focused on consumer safety, strict definitions of Producer capture commercial enterprises and importers, impacting A&D entities importing hardware for internal use or distribution.

Critical Timeline and Deadlines

- » 1 July 2026: Stewardship Plan Submission (Portable Batteries) – Deadline for the BSO to submit their operational plan to the State of Washington Department of Ecology for portable batteries. A&D firms acting as Producers must be contracted with a BSO prior to this date to be included in the initial plan submission.
- » 1 January 2027: Mandatory Participation – Producers of portable batteries must be active participants in an approved BSO plan.
- » 1 July 2027: Retailers are prohibited from selling or distributing batteries from non-compliant producers. Retailers may rely on Producer certification of compliance.
- » 1 January 2028: Medium-format battery stewardship plans must be submitted (per rule requirements). Producers must begin permanent, clear, and legible marking of batteries with their brand.
- » 1 January 2029: Scope Expansion (Medium Format) - Medium format batteries enter the mandatory compliance scope. Retail prohibition for medium format begins 1 Jul 2029.
- » 1 January 2030: Producers must permanently mark batteries with i) a crossed-out wheeled bin (to indicate they must not go to household waste), and ii) battery chemistry information (e.g., chemical system identifiers).

Impact on the A&D Industry

- » Supply Chain Liability: The definition of Producer creates impacts A&D stakeholders and Tier 1 integrators. Under RCW 70A.555.010, liability follows a strict hierarchy: Manufacturer > Brand Owner > Licensee > Importer. If a company is the Importer of Record for a foreign-made battery and there is no domestic presence for the manufacturer or brand owner, it is considered the Producer.
- » Dual use: No exemptions specified for military or defense equipment or federal procurement.

²⁰ A portable battery under RCW 70A.555.010 means a covered battery that is i) rechargeable, weighing no more than 11 pounds and having a rating of no more than 300 Wh, or ii) primary (non-rechargeable), weighing no more than 4.4 pounds. Examples include i) rechargeable laptop battery packs (if ≤11 lbs and ≤300 Wh), ii) most consumer Li-ion tool batteries within those limits; and iii) standard primary (non-rechargeable) batteries like D, C, AA, AAA (each typically ≤4.4 lbs).

²¹ A medium format battery under RCW 70A.555.010 means a covered battery that is i) rechargeable, weighing more than 11 pounds or having a rating of more than 300 watt-hours, and no more than 25 pounds and a rating of no more than 2,000 watt-hours, or ii) primary (non-rechargeable), weighing more than 4.4 pounds but not more than 25 pounds. Examples include i) larger rechargeable batteries used in some power equipment or electric bikes within the size limits and ii) larger specialty primary batteries between ~4.4 lbs and 25 lbs.

- » Marking: The Marking requirement mandates Producer identification by 1 January 2028 and clear chemistry identification by 1 January 2030. Note: This marking requirement strictly applies only to batteries designed or intended to be easily removable.

Risks and Penalties

- » Operational: Retailers and distributors are legally barred from selling products from non-compliant producers after 1 July 2027. Retailers are explicitly protected if they rely on Producer certification of compliance.
- » Financial: Civil penalties may be imposed administratively up to \$1,000 per violation per day (escalating to \$10,000 for repeated violations). Penalties apply only after the Department provides a written warning and a 30-day window to reach compliance.

Horizon Scanning

Current efficiency targets (60% rechargeable batteries / 70% primary non-rechargeable batteries) are subject to increase via rulemaking beginning 1 January 2032.

Links

- » [Chapter 70A.555 RCW - Official Text](#)
- » [Chapter 173-905 WAC - Rulemaking Page](#)
- » [Washington Dept. of Ecology - Battery Stewardship](#)

2.4.3 New York - Environmental Conservation Law (ECL), Article 27, Title 18: "Extended Producer Responsibility Law for Rechargeable Batteries" (amended by Chapter 712 of the Laws of 2025 / Bill S.73-A).

Jurisdiction: State of New York

Status: Final rule (amended on 19 December 2025).

Key Compliance Date: Retailers must comply with new removal/storage requirements 180 days after the effective date of the 2025 amendment.

Summary

New York has expanded its EPR regime, legally obligating manufacturers that produce, package, or import rechargeable batteries to fund and manage their end-of-life recycling. The regulation covers rechargeable batteries (Ni-Cd, sealed lead, Li-ion, Ni-MH²²) weighing less than fifty pounds. While this captures portable A&D equipment, robotics, and small unmanned systems, the statute expressly excludes batteries used as the principal power source for vehicles (such as automobiles, trucks, tractors, and boats), as well as batteries used for integral memory backup. Manufacturers are prohibited from selling, offering for sale, or distributing rechargeable batteries in the state unless they are operating under a state-approved collection and recycling plan.

Context and Background

Historically, ECL Title 18 focused on consumer batteries. The 2025 amendment expands the definition of rechargeable battery to include units weighing less than fifty pounds. This expansion aligns with new requirements for the Department of Environmental Conservation to promulgate rules ensuring safe storage that minimizes fire risk.

²² Ni-MH = nickel metal hybrid batteries

Impact on the A&D Industry

- » Liability Shift: The statute imposes EPR mandating that battery manufacturers (defined to include entities that import rechargeable batteries into the US for sale/distribution in New York) must fund and arrange for the collection and recycling of used batteries at their own expense.
- » Exclusions: While the new weight limit captures portable power packs, robotics, and maintenance equipment, the statute expressly excludes batteries i) weighing 25 lbs or more, ii) used as the principal power source for a vehicle (such as automobiles, trucks, tractors, boats, and similar devices), iii) used for storage of electricity for alternative power sources, and iv) for integral memory backup. It also excludes non-rechargeable single-use batteries.
- » Storage Mandates: New regulations will require retailers to coordinate with manufacturers for regular battery removal and provide employee training on fire-related hazards, directly impacting A&D logistics and maintenance, repair, and operations (MRO) centers acting as collection point.

Risks and Penalties

- » Manufacturer Liability: Manufacturers violating recycling program requirements face significantly higher penalties, ranging from \$2,000 (first violation) to \$5,000 (subsequent violations).

Horizon Scanning

Regulations will be promulgated within 180 days of the effective date (approx. June 2026).

Links

- » [NYS Senate Bill S73-A / Assembly A4641-A \(2025 Amendment Text\)](#)
- » [Environmental Conservation Chapter 43-B, Article 27: Extended Producer Responsibility for Rechargeable Batteries](#)
- » [NYS DEC: Rechargeable Battery Recycling \(Official Guidance\)](#)

2.4.4 Maine - 38 MRSA § 2165 (regulation of certain dry cell batteries) and § 2166 (rechargeable consumer products)

Jurisdiction: State of Maine

Status: Final rule/in effect

Key Compliance Date: Immediate

Summary

The State of Maine mandates that manufacturers establish collection systems for rechargeable batteries and prohibits their disposal in solid waste streams by businesses. This regulation requires Maine businesses to utilize manufacturer-funded take-back programs (e.g., Call2Recycle) or make alternative arrangements to ensure recycling for all Ni-Cd, Li, metal hydride, and small sealed Pb-acid batteries (e.g., power tools, laptops, portable electronics). Standard facility waste bins are a legal liability; disposal of rechargeable batteries in the trash is illegal for businesses. Additionally, button cell batteries (mercuric oxide, silver oxide) must not be trashed and require recycling or hazardous waste collection.

Context and Background

Originally established to safely manage toxic components to prevent air and water contamination, this statute remains the baseline compliance standard in Maine. It mandates all Maine businesses to ensure recycling of rechargeable batteries.

Critical Timeline and Deadlines

- » 1991: 38 MRSA § 2165 and § 2166 originally enacted; core regulatory requirements were phased in with an effective date of 1 January 1994.
- » July 1, 2020: Implementation of expanded battery stewardship requirements.
- » Current status: Active enforcement; strict prohibition on business disposal of rechargeable batteries in trash; button cell batteries must be recycled or treated as hazardous waste.

Impact on the A&D Industry

- » Disposal Risks: The law specifically targets Ni-Cd, Li, metal hydride, and small sealed lead-acid chemistries. Facilities cannot treat these as general waste. Additionally, button cell batteries (mercuric/silver oxide used in instrumentation) are strictly prohibited from trash disposal and require recycling or hazardous waste collection.
- » Dual use: Maine guidance applies universally to any Maine business, mandating the use of collection systems. There is no stated exemption for military hardware or defense contractors in the regulatory summaries provided.

Risks and Penalties

Liability is not explicitly defined in the text provided, the requirement to establish a collection system falls on manufacturers, while the disposal prohibition applies to businesses.

Horizon Scanning

In 2025, Maine initiated a review of the feasibility and viability of establishing an EPR approach for all batteries not currently covered by existing law (e.g., non-rechargeable). Stakeholder meetings regarding this potential expansion were concluded in August and September 2025. The State of Maine Department of Environmental Protection is currently seeking public input to inform the viability of this program expansion.

Links

- » [Maine Legislature: 38 MRSA § 2165 \(Battery Regulation\)](#)
- » [Maine Legislature: 38 MRSA § 2166 \(Rechargeable Consumer Products\)](#)
- » [Maine DEP Battery Recycling Overview](#)



3.0 ASIA

3.1 China

Batteries regulatory oversight in China is highly tiered and fragmented. It is useful to compare it with a contrasting framework such as that in the EU.

EU's batteries framework (2023/1542) can be described as a "Battery Omnibus," a single, comprehensive regulation designed to replace all previous directives. It comprehensively covers

carbon footprint, recycling targets, safety, and labeling in a single and specific law. In contrast, China’s system around batteries EPR and accountability is not a focused law. The requirements fall under the purview of waste management and have been built incrementally over the last decade and are continually evolving. For A&D firm, navigating the battery regulatory landscape in China means understanding the hierarchy and chronology of triggers, wherein new requirements are generated under existing latent (broad) requirements in older laws.

The tiered system in China follows a “Plan-Law-Measure-Standard” sequence. The system aims to promote agility so that as technology and needs evolve, the government issues new “Tier 3” Measure or “Tier 4” Standards without the need to rewrite the laws. The table below describes the hierarchy of laws and requirements impacting batteries EPR and management in China.

Tier	Milestone	Functional role in hierarchy
1	EPR Implementation Plan (2016)	The foundational plan set the vision that producers own the battery "cradle-to-grave." It lacked enforcement but established the "intent."
2	Solid Waste Law (2020 Amendment)	The 2020 amendments of the law transformed the 2016 vision into a statutory requirement. It provided the legal authority to fine companies for "improper disposal."
3	Interim Measures (Ongoing)	The measures update/impose rules. For example, a 2026 EPR update activates the Digital ID requirement for certain batteries.
4	Standards (Ongoing)	Define technical details with regards to requirements

This table highlights that the lower tier requirements such as “Interim Measures” cannot be understood in isolation. They should be considered in the context that they derive their authority from Solid Waste Law. They may derive their technical specifications from specific standards.

3.1.1 China - Law of the People’s Republic of China on the Prevention and Control of Environmental Pollution by Solid Wastes

Jurisdiction: China

Status: Final rule (2020 amendment)

Key Compliance Dates: 1 September 2020. Entry into Force. Full compliance required for EPR systems (batteries) and hazardous waste tracing.

Summary

This law mandates an EPR regime for electric vehicles and lead-based batteries, requiring manufacturers to establish waste recovery systems that match their sales volume. It imposes strict "cradle-to-grave" traceability on industrial hazardous waste. It enforces joint liability for entities if their downstream waste handlers are unlicensed or non-compliant. A&D firms operating in or sourcing from China must audit their supply chains to ensure all battery waste disposal and recycling partners possess valid environmental licenses to avoid material penalties and operational shutdowns. Transacting with unregistered entities is a direct violation of Rule 4(15), creating immediate supply chain stoppage risk.

Context and Background

Revised in 2020, this Law fundamentally overhauls China’s waste management framework to enforce a "zero import" policy on solid wastes and accelerate the transition to a domestic circular

economy. The law was enacted to mitigate severe environmental risks associated with industrial by-products and hazardous materials by imposing stricter liability on waste generators, shifting the national focus from mere disposal to comprehensive resource utilization and pollution prevention.

Critical Timeline and Deadlines

- » 29 April 2020: Revised Law adopted and published.
- » 01 Sep 2020: Entry into force – full compliance required for EPR systems (batteries) and hazardous waste tracing.
- » Ongoing: Departments publish and update catalogues of outdated production equipment (potentially affecting battery manufacturing lines) which must be phased out within specified time limits.

Impact on the A&D Industry

- » Operational Requirements: The Law explicitly designates "lead-based batteries" and "electric vehicle batteries" for mandatory EPR, compelling manufacturers to build recovery systems proportional to their output.
- » Supply Chain Impact: A&D manufacturers must maintain comprehensive record-keeping books for batteries-related industrial solid waste, tracking waste types, amounts, and receivers to ensure full traceability. Generators bear joint liability for environmental damage if they entrust waste to entities without proper technical capabilities or licenses, necessitating rigorous vetting of local MRO and disposal vendors.
- » Defense Exemptions: There are no explicit exemptions for national security or defense related activities; the law applies to "all entities" within the territory.
- » Restrictions: The transfer of hazardous battery waste across provincial boundaries requires prior approval from provincial ecology and environment departments, potentially complicating logistics for centralized MRO operations.

Key Risks and Penalties

- » Financial: Non-compliance with record-keeping or entrusting waste to unlicensed handlers attracts fines of RMB 100,000 – 1 million yuan. Operating without a hazardous waste license or illegally importing waste triggers fines up to RMB 5 million yuan.
- » Operational: Authorities possess the power to seal or seize facilities and equipment immediately upon suspicion of illegal transfers or potential pollution. Serious violations (e.g., illegal disposal of battery chemicals) result in mandatory business suspension or shutdown.
- » Liability (Joint and Personal):
 - Supply Chain Liability: A&D manufacturers bear joint liability for environmental damage if they entrust waste to a third-party vendor that lacks the specific technical capabilities or licenses to handle it.
 - Importer of Record: Carriers and importers bear joint and several liability for the return and treatment costs of any solid waste illegally entered China.
 - Executive Liability: For severe pollution incidents, executives face personal fines of up to 50% of their annual income and potential administrative detention.

Horizon Scanning

The State Council is mandated to make changes and formulate specific permit management measures, meaning classification codes and handling protocols for specific battery chemistries could change rapidly.

Links

- » [Law of the People's Republic of China on the Prevention and Control of Environmental Pollution by Solid Wastes \(2020 Revision\)](#)

3.1.2. Interim Measures for the Administration of Recycling and Comprehensive Utilization of Used Power Batteries from New Energy Vehicles

Jurisdiction: China

Status: Final rule (2020 amendment)

Key Compliance Dates: 1 April 2026 – entry into force.

Summary

This regulation prescribes a strict EPR framework for “full” lifecycle management of New Energy Vehicle (NEV)²³ power batteries within China. It requires manufacturers and importers to assume full responsibility for battery recycling, mandating the establishment of collection networks and the use of a national traceability platform to track batteries from production to end-of-life. For A&D stakeholders operating within China, this shifts the burden of waste management and data reporting upstream to the entity importing the battery or vehicle.

Context and Background

Issued to reinforce China's Circular Economy Law and Solid Waste Law, the interim measures aim to secure critical resources and mitigate environmental risks associated with the rapid growth of the NEV sector. By standardizing the recycling chain, the state seeks to maximize the recovery of strategic battery materials (e.g., Li, Co, Ni) and prevent secondary pollution through strict oversight of dismantling and utilization processes.

Critical Timeline and Deadlines

- » 31 Dec 2025: Regulation promulgated.
- » 1 Apr 2026: Regulation enters into force.
- » Reporting (Import/Sales): Importers must submit vehicle and battery coding information within 20 days of customs clearance/certification.
- » Reporting (MRO): Repair enterprises must report battery exchanges within 15 to 40 days depending on their relationship with the manufacturer.
- » Legacy Products: For products certified before implementation but still on sale, supplementary technical data must be submitted within six months of the effective date.

Impact on the A&D Industry

- » Operational Requirements (Importers treated as manufacturers): A&D entities importing NEVs or power batteries for ground logistics and base operations in China must fulfill the same recycling obligations as domestic manufacturers, including establishing recycling service outlets.
- » Standardization and Coding: Batteries produced or imported must adhere to the Automotive Power Battery Coding Rules (GB/T 34014) and bear durable, traceable labels. Malicious damage or forgery of these codes is strictly prohibited.
- » MRO Reporting: MROs handling NEV batteries must report replacement data to the manufacturer (or importer) within 15 days. If the MRO is not an authorized partner, they must report directly to the national platform within 40 days.
- » Traceability: A national information platform will monitor the entire lifecycle (production,

²³ In China, NEVs are officially defined by the government as those vehicles with new-type power systems, completely or mainly driven by new energy sources. These include plug-in hybrid electric vehicles (extended-range electric vehicles included), battery electric vehicles, and fuel cell electric vehicles.

sales, maintenance, recycling). Suppliers and importers must upload technical dismantling information and code data promptly.

- » Traceability: A national information platform will monitor the entire lifecycle (production, sales, maintenance, recycling). Suppliers and importers must upload technical dismantling information and code data promptly.
- » Design Constraints: Batteries imported for sale or use must prioritize standardized, easily disassembled designs and avoid toxic materials banned by China.
- » No Explicit Exemption: The text applies to all activities within the territory of China and does not explicitly exempt defense-related ground vehicles or dual-use items.

Key Risks and Penalties

- » Financial: Fines for non-compliance (e.g., failure to code batteries, failure to set up recycling outlets) range up to 50,000 RMB yuan. Improper disposal or entrusting unauthorized recyclers carries fines between 10,000 and 30,000 RMB yuan.
- » Operational: Entities subject to administrative penalties may be barred from applying for "qualified enterprise" status for comprehensive utilization for two years.
- » Criminal Liability: Serious violations involving environmental pollution or safety hazards may trigger criminal investigation.
- » Liability: Importers bear the "cradle-to-grave" responsibility; terminating operations requires making prior arrangements for all outstanding recycling duties.

Horizon Scanning

The interim measures explicitly state that specific measures for the "digital identity card management system" (Article 12) and protocols for handling scrapped vehicles with missing batteries (Article 21) "shall be stipulated separately".

Links

- » [*Interim Measures for the Administration of Recycling and Comprehensive Utilization of Used Power Batteries from New Energy Vehicles*](#)

3.1.3 China - Action Plan for Promoting the Application of Recycled Materials

Jurisdiction: China

Status: Final action plan

Key Compliance Dates: 2030 (target milestone for established recycling systems and production output).

Summary

The Action Plan strategically maneuvers the Chinese battery supply chain toward a circular model, explicitly targeting "power batteries" and "energy storage batteries" for enhanced recycled material integration. It encourages manufacturers to establish waste battery recovery systems and utilize recycled non-ferrous metals in active materials and battery casings, signaling a future requirement for A&D entities procuring Chinese-origin battery cells or strategic minerals to verify recycled content levels and participate in emerging data traceability schemes.

Critical Timeline and Deadlines

- » Current Status: The Action Plan is effective now as a strategic guidance document.
- » 2030 (Target): The national waste recycling system must be "fully improved," with an annual output of recycled non-ferrous metals exceeding 25 million tons.

- » Ongoing: Development of specific quality standards and carbon footprint accounting rules for recycled battery materials.

Impact on the A&D Industry

- » Operational Requirements: The Action Plan explicitly targets "power batteries" and "energy storage batteries," urging manufacturers to incorporate recycled metal raw materials into active cathode/anode production and battery casings. While A&D is not explicitly named, this impacts primes sourcing Chinese cells for ground vehicles, base infrastructure, or auxiliary power units, as suppliers will likely shift chemistries to meet domestic recycled content targets.
- » Restrictions: This regulation does not restrict chemical access (e.g., PFAS); rather, it mandates the integration of recycled inputs (e.g., recycled copper, aluminum, and rare metals) into the supply chain.
- » Defense Exemptions: There are no specific exemptions for defense or national security applications in the text.
- » Supply Chain Impact: The plan calls for the establishment of a "data traceability platform" for recycled materials. Tier-1 suppliers procuring from China will face increasing pressure to provide full chain-of-custody data to verify the percentage of recycled Co, Ni, or Li in their cells.

Key Risks and Penalties

- » Financial: The text is a strategic framework and does not currently list specific administrative fines for non-compliance, though it directs departments to "crack down" on violations.

Horizon Scanning

Implementing standards are pending. The government is explicitly tasked with researching and formulating specific standards for "recycled material carbon footprint accounting" and product-specific application standards for batteries.

Links

- » [Action Plan for Promoting the Application of Recycled Materials](#)

Note: Batteries-related standards that are likely of importance for A&D industry are described in the table below. Some of the technical specifications of the requirements in the laws and regulations mentioned above are prescribed by these standards.

Standard	Description	A&D / EPR Impact
GB/T 34014-2017	Coding rules for automotive traction batteries (and high-capacity equivalents).	Impacted battery >2 kWh must have a unique ID registered on the National Traceability Platform.
GB 18597-2023	Standard for pollution control on hazardous waste storage.	Mandatory for any facility (e.g., A&D hangars) storing decommissioned or damaged lithium batteries.
GB 44240-2024	Safety requirements for lithium batteries in electric energy storage systems.	Mandatory for stationary energy storage used in defense infrastructure/microgrids.
GB 5085.7-2019	General rules for hazardous waste identification.	Determines if a damaged A&D battery must be treated as "Hazardous Waste" or "General Solid Waste."

Standard	Description	A&D / EPR Impact
GB/T 38698.1-2020	Management specification for recycling traction batteries: Part 1: Dismantling.	Technical protocol for certified recycling partners.
GB/T 38444-2020	Technical requirements of traceability system for power batteries.	Defines the data exchange protocols between a manufacturer's ERP and the State platform.
GB/T 44015-2024	(New/Interim) Digital Passport framework for high-capacity lithium batteries.	Established to harmonize China's data points (carbon footprint, SoH ²⁴) with global passport requirements.
GB/T 45565-2025	Coding regulations of Li-ion batteries	Traceability and coding of Li-ion batteries

3.1.4 China Export Controls - Announcement No. 58 of 2025 (Publication of Export Controls on Lithium Batteries and Artificial Graphite Anode Materials); suspended by Announcement No. 70 of 2025.

Jurisdiction: China

Status: Suspended (originally Final Rule, currently paused)

Key Compliance Dates: 10 Nov 2026 (end of suspension period).

Summary

China defined a strict export control regime covering high-energy-density Li-ion batteries (≥ 300 Wh/kg), key cathode precursors (high spec-lithium iron phosphate [LFP], nickel-cobalt-manganese [NCM], nickel-cobalt-aluminum [NCA] hydroxides), artificial graphite anodes, and specialized manufacturing equipment (e.g., winding machines, graphitization furnaces). While exporters were initially required to obtain licenses starting November 2025, authorities issued a suspension order one day prior to implementation. Consequently, while the immediate threat to the A&D supply chain is paused, the regulatory framework remains in place for potential reactivation in November 2026, signaling a high risk for future access to Chinese-origin advanced battery materials.

Context and Background

The Ministry of Commerce described these controls as aiming to safeguard national security. The scope targets the high-end segment of the battery value chain, specifically technologies and materials capable of high performance, rather than commoditized consumer goods. The subsequent suspension suggests a strategic pause, potentially for geopolitical leverage or industry consultation, rather than a permanent withdrawal of the policy.

Critical Timeline and Deadlines

- » 9 October 2025: Announcement No. 58 published, defining the restricted list of battery materials and equipment.
- » 7 November 2025: Announcement No. 70 published, suspending the implementation of Announcement No. 58.
- » 10 November 2026: Action Required: Suspension expires. Unless extended or repealed, export licensing requirements for lithium batteries and graphite take effect.

²⁴ SoH refers to the State of Health indicating a battery's condition relative to its original state. It reflects aging, capacity loss, and internal resistance buildup. A new battery has a SoH of 100%, which degrades over time due to usage and environmental factors.

Impact on the A&D Industry

- » Key Requirements (Operational): The regulation specifically targets batteries with energy densities ≥ 300 Wh/kg. It also controls specific manufacturing equipment (winding, stacking, and liquid injection machines), which could impact A&D primes attempting to stand up domestic battery lines using Chinese machinery.
- » Restrictions: If the suspension lifts, access to high-grade artificial graphite and specific cathode precursors (NCM, NCA, LFP) will require explicit government licensing. This creates a direct bottleneck for Western battery manufacturers dependent on Chinese precursors.
- » "Dual Use" Implications: The regulation explicitly ties these items to dual-use export control lists. There are no stated exemptions for foreign defense entities; in fact, "national security" framing implies defense end-users face the highest scrutiny during license applications.
- » Supply Chain Impact: Importers are responsible for ensuring their suppliers declare parameters accurately. Customs authorities are empowered to detain goods that "resemble" controlled items (e.g., graphite with similar specs) for verification, creating lead-time volatility even for non-controlled goods.

Key Risks and Penalties

- » Operational (Supply Shock): The primary risk is the expiration of the suspension in 2026. A&D programs relying on Chinese-origin cells (≥ 300 Wh/kg) or artificial graphite face a "hard stop" risk if licenses are denied.
- » Liability (Customs): Exporters must verify if items fall within the control parameters. If an item is not controlled but has similar specs, the exporter must explicitly mark "Not a controlled item" and provide detailed technical parameters in the customs declaration.

Horizon Scanning

The critical horizon event is the expiration of the current suspension on 10 November 2026; absent a new decree, the original licensing requirements for high-energy density batteries and graphite will automatically enter into force.

Links

- » [Announcement No. 58 \(Original Control List\)](#)
- » [Announcement No. 70 \(Suspension Order\)](#)

3.2 India

3.2.1 Battery Waste Management Rules, 2022 (S.O. 3984[E]) and Amendment Rules, 2025 (S.O. 958[E])

Jurisdiction: India

Status: Final rule (2022 and 2025 amendment)

Key Compliance Dates: Immediate (registration); 30 June of the following financial year (annual EPR return deadline).

Summary

India has shifted from simple waste handling to a rigorous EPR regime. This regulation holds the Producer (engaging in manufacture, sale, or import of batteries, including those within equipment) legally and financially responsible for the entire lifecycle of the battery. For A&D stakeholders, the

immediate implication is to classify all India-bound batteries (standalone or in equipment) to distinguish exempt items from regulated commercial items. Rules do not apply to equipment connected with the protection of essential security interests (arms, ammunition, war material, and specific military purposes) or equipment designed to be sent into space. For non-exempt items (e.g., dual-use, ground support, commercial aerospace), impacted entities must immediately verify that all Indian local partners and importers are registered with the Central Pollution Control Board (CPCB). Transacting with unregistered entities is a direct violation of Rule 4(15), creating immediate supply chain stoppage risk.

Context and Background

The 2022 Rules repealed the obsolete Batteries (Management and Handling) Rules, 2001, modernizing the framework to address all battery chemistries. The regulation aligns with global circular Economy principles by mandating material recovery to reduce import dependency on raw lithium, cobalt, and nickel.

Critical Timeline and Deadlines

- » 24 February 2025: Producers may now use QR codes/Barcodes on battery packs, equipment, or packaging to display EPR registration numbers, subject to providing written notification to the CPCB.
- » 30 June 2026: Mandatory Reporting: Deadline for filing annual returns (Form 3 for Producers) regarding sales and collection data for the preceding fiscal year.
- » 1 April 2026: Target Increase: Start of FY 2026-27. Mandatory recycled content target for industrial batteries rises to 40% (from 35% in FY 2024-25 and FY 2025-26).

Impact on the A&D Industry

- » Collection, Recycling, and Refurbishment Targets: Producers must meet specific collection targets calculated as a percentage of the batteries they introduced to the market in preceding years (lagged to align with the battery's average lifespan). For e.g., for industrial batteries, governed by a 7-year compliance cycle, producers must collect and recycle/refurbish 70% of the quantity placed in the market in FY 2022-23 for the FY 2025-26 compliance cycle.
- » Mandatory Recycled Content Targets: Producers must ensure a minimum 35% recycled content in new industrial batteries (relevant for non-exempt A&D ground support and energy storage systems) by end of FY 2025-26. This threshold increases to 40% in FY 2026-27 and onwards. For Portable & EV Batteries: Minimum 5% recycled content starting in FY 2027-28, incrementally rising to 20% by FY 2030-31.
- » Dual-Use and Exemptions: The exemption for equipment connected with the protection of essential security interests specifically for military purposes and for equipment designed to be sent into space (Rule 2[2]) is narrow. Batteries for dual-use logistics drones, non-combat Ground Support Equipment (GSE), and general IT infrastructure used by defense contractors do not fall under this exemption and require full EPR compliance.
- » Supply Chain Impact: Under these rules, any entity that imports batteries or equipment containing batteries is defined as a Producer.
- » Labeling and EPR: Additionally, according to the 2025 amendment, producers must print a Barcode or QR code containing the EPR registration number on the battery, equipment, or packaging.

Key Risks and Penalties

- » Financial: Per Rule 13, environmental compensation is levied based on the "polluter pays principle" for non-fulfilment of EPR targets and obligations.

- » Operational: Registration Cancellation Constraint: The CPCB can suspend or cancel the EPR registration of a non-compliant producer.

Horizon Scanning

Digital Compliance (Battery Pack Aadhar²⁵): The Ministry of Road Transport and Highways constituted a committee in September 2025 to develop guidelines for the Battery Pack Aadhaar system. The system proposes a unique 21-character alphanumeric code and QR code to be institutionalized via Automotive Industry Standards. This signals an imminent move toward a mandatory Digital Battery Passport system. While the guidelines focus on electric vehicle batteries, the scope explicitly includes industrial batteries with capacity > 2 kWh, which impacts A&D energy storage and ground support applications.

Links

- » [Battery Waste Management Rules 2022](#)
- » [Battery Waste Management Rules 2025 \(Amendment\)](#)
- » [EPR Portal for Battery Waste Management](#)
- » [Battery Pack Aadhar System Draft](#)

3.3 Indonesia

3.3.1 Regulation Number 24 of 2025 concerning Import Policy and Regulation of Used Goods and Non-Hazardous and Toxic Waste (Permendag No. 24 of 2025)

Jurisdiction: Republic of Indonesia

Status: Final rule

Key Compliance Date: 29 August 2025

Summary

Permendag²⁶ No. 24 of 2025 establishes a restrictive import licensing regime for used secondary lithium batteries (HS 8507.60) and battery waste (HS 8549), permitting entry exclusively for stakeholders holding a Producer Import Identification Number who utilize these materials as feedstock for domestic material recovery and recycling industries.

Background and Context

This regulation was enacted to tighten controls on the importation of used goods and non-hazardous waste, ensuring they serve strictly as industrial feedstock (specifically supporting the domestic electric vehicle ecosystem) while safeguarding environmental standards. This creates a controlled legal pathway for importing used secondary lithium batteries and battery scrap (black mass feedstock) into Indonesia, strictly prohibiting direct resale, and mandating that imports are solely for material recovery and recycling industries.

Impact on the A&D Industry

- » Supply Chain Impact: This regulation directly governs A&D MRO reverse logistics by classifying used aircraft batteries (HS 8507.60.32) and accumulator waste (HS 8549) as restricted imports requiring specific licensing.

²⁵ Battery Pack Aadhaar is a digital identification system designed to ensure end-to-end traceability of batteries throughout their lifecycle, particularly for electric vehicles in India.

²⁶ Permendag refers to the Indonesian Ministry of Trade regulations that govern import policies and procedures.

- » Approval: All imports of used lithium batteries require import approval and are subject to technical verification.
- » Operational Verification: A&D stakeholders exporting end-of-life aircraft batteries to Indonesia must verify that the receiving facility holds valid Industrial Business Licenses and environmental permits, as imports are conditional upon technical coordination meetings to prove processing capabilities.
- » Defense Exemptions: There are no explicit blanket exemptions for defense materials in the text.

Critical Timeline and Deadlines

- » 30 June 2025: Regulation established and signed by the Minister of Trade.
- » 29 August 2025: Regulation entered into force (60 days post-promulgation); all new shipments of used batteries or battery waste must comply with the new licensing regime.
- » Transition Period: Existing import approvals issued prior to the effective date remain valid until their original expiration dates, allowing for the completion of current contracts.

Risks and Penalties

- » Liability and Compliance Obligations: For battery waste (non-B3²⁷), importers must secure a statement from the exporter agreeing to accept the return of shipments if they are found to be heterogeneous, contaminated, or mixed with trash. If the waste cannot be utilized in production, the importer bears full liability for its management or disposal through licensed processors.
- » Financial and Administrative Penalties: Violations of the trading ban on imported used goods or failure to submit realization reports result in administrative sanctions, which may include the revocation of business licenses and import permits.

Horizon Scanning

Monitoring is required for the release of specific technical guidelines from the Ministry of Industry regarding the verification of battery recycling/remanufacturing capabilities.

Links

- » [Regulation Number 24 of 2025 concerning Import Policy and Regulation of Used Goods and Non-Hazardous and Toxic Waste](#)

3.4 Israel

3.4.1 Law for the Environmental Treatment of Electrical and Electronic Equipment and Batteries (2012)

Jurisdiction: Israel

Status: Final rule (active)

²⁷ B3 battery waste refers to batteries that are highly hazardous, often containing lead, acid, cadmium, or other toxic substances — basically wet cells or lead-acid batteries. Non-B3 battery waste is therefore battery waste that does not fall under the B3 hazardous category. Non-B3 battery waste is generally less hazardous but still should be collected and recycled properly, because batteries can still contain metals and chemicals that are harmful to the environment. Examples of non-B3 battery waste are i) ordinary alkaline batteries (AA, AAA, C, D, 9V); ii) rechargeable batteries like Ni-MH (nickel-metal hydride) or Li-ion that are not considered as highly hazardous B3 type; and iii) other small consumer batteries that don't contain lead or highly toxic chemicals.

Key Compliance Dates: Recurring sales reporting and Certified Public Accountant (CPA)-audited reports (sales vs recycling)

Summary

This legislation imposes requirements on importers of batteries, mandating them to finance the collection and treatment of portable, automotive, and industrial batteries through contracts with recognized Compliance Schemes. The regulation strictly imposes recycling rates (calculated as a percentage of the total weight sold by the importer) which are 30% for lead-acid, 35% for Ni-Cd, and 25% for others (including Li-ion), and submit audited annual reports detailing the weight of batteries sold versus recycled. While equipment intended for space is explicitly excluded, dual-use or standard industrial batteries imported for defense manufacturing remain subject to full recycling liabilities unless a specific ministerial decree grants a security exemption.

Background and Context

Enacted to mitigate the environmental and health risks associated with hazardous waste accumulation, this law establishes a domestic circular economy framework designed to prevent the landfilling of toxic materials like lead and cadmium.

Impact on the A&D Industry

This regulation does not impose specific chemical restrictions on battery inputs but focuses entirely on downstream end-of-life management and financing. A&D entities acting as the Importer of Record for batteries face liability to finance their collection and treatment, requiring precise tracking of imported battery weight and chemistry. While equipment intended for use in space is automatically exempt, other defense-related batteries are subject to the law. Defense importers must apply for a specific Security Exemption from the Ministry of Environmental Protection.

Critical Timeline and Deadlines

- » 1 January 2014: Regulation fully entered into force; importer/producer responsibility obligations active.
- » 1 January 2021: Landfill Ban: Absolute prohibition on the landfilling of untreated battery waste; all battery waste must undergo recognized recycling or recovery.
- » Recurring (Semi-Annual): Importers must report battery sales data (weight/type) within two months of the half-year end.
- » Recurring (Annual): Importers must submit a CPA-audited annual report detailing sales versus recycling performance within six months of the fiscal yearend.

Risks and Penalties

- » Financial: Corporations face administrative financial sanctions up to 694,020 NIS for severe violations such as illegal disposal or failure to meet treatment standards. Additionally, a specific fine of 3,470 NIS applies for every tonne of battery waste that falls short of the mandatory recycling targets.
- » Liability: Corporate officers face a legal presumption of responsibility and potential criminal penalties, including imprisonment of up to one year if they fail to actively supervise and prevent compliance failures.
- » Operational: The mandatory requirement to remove batteries from waste equipment requiring specific tooling and hazardous waste protocols for battery extraction.

Horizon Scanning

The Minister of Environmental Protection may enact secondary regulations that revise recycling targets and define the calculation methodology for recognizing exported waste towards these quotas.

Links

- » [Law for the Environmental Treatment of Electrical and Electronic Equipment and Batteries, 5772-2012](#)

3.5 Japan

3.5.1 Law for the Promotion of Effective Utilization of Resources

Jurisdiction: Japan

Status: Active/in force (significant amendment submitted to Parliament in Feb 2025)

Key Compliance Date: Ongoing (immediate obligations for labeling and self-collection of sealed rechargeable batteries)

Summary

This Law is the foundational framework for Japan's circular economy, currently mandating downstream responsibilities for manufacturers and importers of "compact rechargeable batteries." A&D entities importing devices powered by these batteries currently face strict labeling requirements to facilitate sorting and self-collection obligations (often managed via industry schemes). A major pending amendment (currently in consideration) will shift regulatory focus upstream, introducing mandatory quotas for using recycled resources in production and new eco-design certifications.

Background and Context

Enacted in 2000, this law was designed to transition Japan from simple waste management to a "Sound Material-Cycle Economic System." It codified the "3Rs" (Reduce, Reuse, Recycle) into industrial policy, designating specific industries (like copper smelting) and products (like rechargeable batteries) that require regulatory intervention to minimize by-products and maximize resource recovery.

Impact on A&D

- » Labeling: A&D importers of "Specified Labeled Products," specifically sealed Li-ion, Ni-metal hybrid (MH), and Ni-Cd batteries, must apply distinct sorting labels (e.g., the recycle symbol with chemical designation) prior to distribution.
- » Collection: Importers of "Specified Resource-Recycled Products" (batteries and devices containing them) are legally obligated to "promote self-collection and recycling."
- » Restrictions (Design-for-Environment): Manufacturers of "Specified Reuse-Promoted Products" (which includes devices using compact rechargeable batteries) must design products that are "easily reused or recycled." The upcoming amendment strengthens this by introducing a formal certification system for "designs that facilitate disassembly."

Critical Timeline and Deadlines

- » April 2001: Law entered into force. Obligations for labeling and self-collection of sealed rechargeable batteries (Li-ion, Ni-Cd, Ni-MH) are active.

- » 25 Feb 2025: Cabinet-approved amendment bill submitted to the Diet on 25 Feb 2025 to introduce mandatory use of recycled resources and related obligations for designated products and operators).

Risks and Penalties

- » Cost of Remediation (Orders): If an importer fails to establish a self-collection system for battery-powered devices, the Competent Minister may issue a "Recommendation." Continued non-compliance leads to an administrative "Order" to take specific action.
- » Liability: The "Importer" is explicitly responsible for labeling and recycling duties if no domestic manufacturer exists.
- » Revocation of Business Authorization: For entities licensed to conduct voluntary recycling/recovery, failure to meet standards can result in the "Abolishment of authorization."

Horizon Scanning

The 2025 Amendment will shift the law from "encouraging" recycling to "mandating" it. "Implementing Acts" (Cabinet Orders) will soon define the specific "designated products" subject to the new mandatory recycled content quotas. A&D primes should anticipate reporting requirements on the % of recycled Li/Co in their supply chain.

Links

- » [Law for the Promotion of Effective Utilization of Resources](#)
- » [2025 Amendment](#)

3.6 Singapore

3.6.1 Resource Sustainability (Prescribed Regulated Products) Regulations 2019

Jurisdiction: Singapore

Status: Final rule

Key Compliance Date: 1 July 2021 (ongoing annual reporting required)

Summary

This regulation enforces Singapore's EPR framework, mandating that producers of industrial batteries, EV batteries, and portable batteries register with the National Environment Agency if supply volumes exceed specific thresholds (e.g., three tonnes for portable batteries). It defines industrial batteries specifically as Li-ion or Ni-MH chemistries designed for industrial use, requiring stakeholders to track supply weights and retain records for five years to ensure end-of-life management. The regulation applies thresholds (first schedule) only to Regulated Consumer Products. Industrial batteries are listed in the second schedule without a specific tonnage threshold, implying they may be regulated regardless of volume.

Background and Context

This legislation was enacted under the Resource Sustainability Act 2019 to establish a circular economy framework for managing priority waste streams in Singapore, specifically electrical and electronic waste (e-waste). By defining regulated products and setting licensing thresholds, the government aims to shift the financial and physical responsibility of waste management (including complex waste streams like chemical batteries) onto producers and importers.

Impact on A&D

- » Registration: Producers of non-exempt batteries exceeding supply thresholds (e.g., five tonnes for consumer EV batteries) must register via the agency website and maintain detailed supply records for a prescribed period of five years.
- » Licensing: Firms utilizing dual-use COTS batteries in non-military support equipment must verify if their import volumes trigger the licensing scheme thresholds in the first schedule.
- » Exemptions: Exemptions exist for products designed for military use from these requirements. However, for commercial aerospace and MRO operations, industrial batteries (strictly defined as Li-ion or Ni-MH) and portable batteries remain regulated if they are not exclusively for military applications.

Critical Timeline and Deadlines

- » 1 July 2021: Compliance year for obligations applicable to portable batteries (three tonnes) and consumer EV batteries (five tonnes).
- » Ongoing (annual): Producers must track supply weights to determine if they meet registration thresholds; records must be retained for five years.

Risks and Penalties

- » Operational (Registration and Tracking): A&D manufacturers supplying industrial batteries (specifically Li-ion or Ni-MH) or dual-use portable batteries exceeding three tonnes/year must register as producers with the National Environment Agency.
- » Liability (Record Keeping): Failure to maintain supply records for the prescribed five-year period constitutes non-compliance.
- » Financial: Monetary fines for non-compliance.
- » Exemption Risk: The military use exemption requires strict internal classification; dual-use batteries used in non-military aerospace ground support equipment may still face EPR liability.

Horizon Scanning

No updates identified

Links

- » [Resource Sustainability \(Prescribed Regulated Products\) Regulations 2019](#)
- » [Waste and Resources Management System \(WRMS\)](#)

3.7 South Korea

3.7.1 Act on Promotion of Transition to Circular Economy and Society

Jurisdiction: Republic of Korea (South Korea).

Status: Active (core framework enforced 1 January 2024)

Key Compliance Date: 1 January 2024 – entry into force of the Act.

Summary

The Act enforces a regulatory bifurcation regarding the legal status of end-of-life batteries to balance industrial activation with environmental safety. The Ministry of Environment distinguishes battery management based on the disposal method:

1. Reuse/Remanufacturing (Circular Resource): Intact batteries where cells are not crushed are eligible for designation as Circular Resources. Upon designation, these are exempt from waste regulations, effectively treating them as products to facilitate logistics and market circulation.
2. Recycling (Waste Status): Batteries destined for crushing, pulverizing, or melting remain classified as waste due to risks of hazardous substance leakage (e.g., electrolytes) and fire. They remain regulated as waste until processed into black powder²⁸ (or other active materials) that meets specific quality standards (in development).

Context and Background

The update aligns South Korean policy with global standards regarding the management of hazardous waste and supply chain security. Previously, the broad classification of used batteries as waste created logistical barriers. The current framework deregulates reusable units to foster the resource circulation industry, while maintaining strict controls on recycling operations to prevent environmental hazards. The Ministry of Environment explicitly cites supply chain security and management of black powder and active materials as hazardous waste as the rationale for retaining waste status during the recycling phase. Rather than specific content percentages, the Act mandates Circular Economy Performance Management. Entities of a certain scale must submit implementation plans and achieve targets regarding the circular use ratio and waste generation reduction.

Critical Timeline and Deadlines

- » 1 January 2024: Effective date for the Act.
- » Ongoing: Circular Economy Performance Management.

Impact on the A&D Industry

- » Reverse Logistics: The designation of batteries specifically for reuse and remanufacturing (where cells are not crushed) as Circular Resources significantly reduces administrative burdens for A&D Line Replaceable Units (LRUs).²⁹ Returns to Korean OEMs for repair/overhaul are exempt from waste regulations, streamlining cross-border logistics. Returns regarding damaged units intended for disassembly or crushing remain classified as waste to prevent hazardous substance leakage, requiring strict adherence to waste control protocols until processed into quality-certified black powder.
- » Performance Reporting (Data Requirements): The Act mandates Circular Economy Performance Management. A&D suppliers meeting specific scale criteria must submit implementation plans and performance records regarding circular use ratios and waste reduction to the Ministry of Environment.
- » No Explicit Defense Exemption: The Act applies broadly to business entities and does not explicitly exempt military hardware.

Risks and Penalties

- » Misclassification Risk: The primary operational risk is the incorrect classification of end-of-life batteries. Batteries intended for destructive recycling (crushing/melting) must be managed as waste due to hazardous substance leakage risks. Declaring these as Circular Resources (which requires the item to be safe, sealed, and intended for reuse) constitutes a violation of the Act.

²⁸ Black powder, sometimes referred to as black mass, is the dark, fine powder left after Li-ion batteries are shredded and processed for recycling. It is used to recover critical metals (Li, Co, Ni, etc.) that are refined and reused to make new batteries.

²⁹ Line Replacement Units are modular components designed to be quickly removed and replaced at the point of use where downtime is expensive and dangerous. Examples include aircraft avionics boxes, radar or navigation modules, power supply units, communication cards, and control computers.

- » False Labeling: Entities that falsely label products as "made from circular resources" without proper certification face imprisonment for up to two years or fines not exceeding 20 million won (~\$15,000 USD).

Horizon Scanning

The government is promoting the enactment of the Bill for Promoting the Used Battery Industry and Ensuring Supply Chain Stability (tentative name).

Links

- » [Act on Promotion of Transition to Circular Economy and Society](#)
- » [Enforcement Decree of the Act on Promotion of Transition to Circular Economy and Society](#)
- » [Ministry of Climate, Energy and Environment Press Release: Establishing an Integrated Management System for Used Batteries to Support the Formation of a New Market](#)



4.0 OCEANIA

4.1 Australia

4.1.1 National Battery Strategy (with note on Critical Minerals Strategy)

Jurisdiction: Australia

Status: Active Policy Framework (published May 2024)

Key Compliance Date: Non-binding policy; critical funding milestones commence with the Critical Minerals Production Tax Incentive on 1 July 2027, supporting broader 2030 and 2035 supply chain resiliency targets.

Summary

The Australian National Battery Strategy is a framework aiming to transform the nation from a raw mineral exporter into a competitive domestic manufacturer of high-value battery products, deliberately strengthening sovereign economic resilience. For A&D stakeholders, the call to action is to evaluate emerging Australian supply chains as a secure, high-ESG³⁰ alternative for battery sourcing, and to potentially leverage government funding (such as the \$523.2 million Battery Breakthrough and \$1.7 billion Innovation Fund).

Context and Background

This strategy addresses the extreme risk of current global battery supply chains, which are highly concentrated with up to 87% of critical lithium products processed in a single country (China). It aligns comprehensively with the Future Made in Australia Act and the Critical Minerals Strategy, serving as a strategic response to international movements like the EU's mandated carbon footprint declarations and upcoming "Battery Passport" traceability requirements.

Additional note on Critical Minerals Strategy

³⁰ ESG = Environmental, Social, and Governance

The Critical Minerals Strategy provides the foundational framework for the Battery Strategy by prioritizing the onshore value-adding and downstream processing of essential raw materials to secure and diversify global supply chains for advanced technologies. Australia's Critical Minerals List consists of twenty-six essential minerals, with a strategic priority placed on key battery components like lithium, cobalt, graphite, and vanadium to drive the global clean energy transition and support domestic manufacturing.

Critical Timeline and Deadlines

- » 1 July 2027: The Critical Minerals Production Tax Incentive commences, providing a refundable tax offset of 10% for eligible Australian processing costs.
- » 2030: National target deadline to transition Australia's electricity grid to 82% renewable energy and reduce emissions by 43%.
- » Note: The source is a strategic policy document rather than binding legislation, meaning standard regulatory deadlines (e.g., "Reporting Starts" or "Stop-Ship Date") for manufacturers and importers are not established in this text.

Impact on the A&D Industry

- » This framework is relevant to A&D stakeholders since it targets the electrification of the defense and heavy transport manufacturing sectors. It prioritizes localized production to reduce vulnerability to international supply chain disruptions.
- » A core regulatory and operational focus is the development of cyber-secure battery management systems designed specifically for integration into sensitive environments, such as defense estates.
- » From a supply chain and traceability perspective, the strategy pushes for world-leading ESG standards and aims to utilize mechanisms like the Guarantee of Origin scheme to track and verify emissions, directly impacting how A&D suppliers will report carbon footprint data.
- » While it does not implement material obsolescence bans, it aggressively funds circular economy practices to handle lithium-ion waste, providing with structured, domestic end-of-life recycling pathways for batteries.

Key Risks and Penalties

- » Financial: The strategy document does not stipulate any maximum fines or direct financial penalties for manufacturers or importers.
- » Operational: The text outlines that the government and states are actively exploring options to align the regulatory framework with the global state of the art. For e.g., mandating modern safety standards for lithium-ion products. For A&D stakeholders, failure to integrate strong cybersecurity measures may limit a manufacturer's ability to supply batteries for sensitive installations, such as defense related applications.

Horizon Scanning

The forthcoming Future Made in Australia Act will introduce a National Interest Framework to direct targeted public investment into clean energy manufacturing, including the domestic battery sector. Concurrently, regulators are pursuing an opt-in Guarantee of Origin scheme to verify emissions and a unified national safety framework for lithium-ion batteries, signaling a distinct precursor to stricter ESG, traceability, and product stewardship regulations.

Links

- » [National Battery Strategy \(official policy paper\)](#)
- » [Critical Minerals Strategy \(official policy paper\)](#)



5.0 SOUTH AMERICA

5.1 Brazil

5.1.1 Resolução CONAMA nº 401/2008 (establishing limits for lead, cadmium, and mercury in batteries)

Jurisdiction: Brazil

Status: Final rule

Key Compliance Date: Annual reporting

Summary

This regulation establishes maximum limits for lead, cadmium, and mercury in batteries sold within Brazil and mandates strict responsibility for their life-cycle management. Impacted entities must audit all batteries imported into Brazil (whether loose or contained in equipment) to ensure they meet chemical thresholds and to establish a Management Plan for the collection and recycling of used units. Failure to present the plan or annual physico-chemical composition reports can result in the suspension of import licenses and penalties.

Background and Context

Replacing the previous 1999 standard (Resolution 257/99), this rule addresses the environmental contamination caused by the improper disposal of heavy metals by enforcing cleaner production techniques and prohibiting landfill disposal for specific chemistries like lead-acid and Ni-Cd.

Impact on A&D Industry

- » Reporting and labeling: Compliance is critical for importers of batteries. The regulation links the Battery Management Plan directly to obtaining an import license. Importers are also required to submit annual submission of chemical composition data to maintain customs clearance eligibility.
- » Strict traceability rules mandate that industrial batteries (lead-acid, Ni-Cd, mercury oxide) bear permanent, Portuguese labeling identifying the importer and disposal warnings.
- » Exemptions: The regulation contains no explicit exemptions for military or defense hardware.

Critical Timeline and Deadlines

- » Pre-Import (Ongoing): Importers must present a battery management plan (collection/recycling) to the competent environmental agency (IBAMA³¹) specifically to obtain an import license.
- » Annual (Recurring) Lab Report Submission: Manufacturers and importers must submit a physico-chemical composition report every year to prove compliance with heavy metal limits.

³¹ IBAMA stands for Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis, which in English is the Brazilian Institute of Environment and Renewable Natural Resources.

- » Substance Restrictions (in force): Mandatory caps on mercury (0.0005% or 2.0% depending on type), cadmium (0.002%), and lead traces (0.1%) entered into force for portable, button, and miniature batteries.

Risks and Penalties

- » Import License: A compliant Management Plan is a statutory prerequisite for obtaining an import license.
- » Mandatory Recall: Verified non-compliance with substance limits results in the obligation for the importer to recollect all lots that disagree with the norm.
- » Financial: The text states offenders are subject to penalties (referencing Law No. 6.938/1981)

Horizon Scanning:

The regulation includes a continuous improvement mandate, requiring manufacturers and importers to conduct ongoing studies to substitute hazardous substances or reduce their levels to the lowest technologically viable values.

Links

- » [Resolução CONAMA nº 401/2008](#)
- » [IBAMA Battery Reporting Guideline](#)



6.0 GLOBAL

6.1 66th Edition (2025) of the International Air Transport Association (IATA) Dangerous Goods Regulations and the 2025-2026 edition of the ICAO Technical Instructions for the Safe Transport of Dangerous Goods by Air.

Jurisdiction: Global (international air transport)

Status: Final rule (effective 1 January 2025)

Key Compliance Date: 1 January 2026 (mandatory compliance for State of Charge [SoC]) limits on batteries packed with equipment and vehicles).

Summary

The IATA DGR 66th Edition implements stricter controls on Li-ion and sodium-ion shipments, moving from bulk cargo restrictions to expanded controls on batteries packed with equipment and vehicles. The Year 2025 introduced new classifications for sodium-ion batteries (UN 3551/3552/ 3558) and transition periods for vehicles until 31 March 2025. The critical operational requirement is the 1 January 2026 mandate: the 30% SoC limit, previously only for bulk batteries (loose UN 3480), becomes mandatory for batteries packed with equipment and electric GSE powered by batteries exceeding 100 Wh.³²

³² Note: For batteries contained inside equipment (UN 3481, PI 967), such as avionics with installed backup batteries, the 30% SoC remains a recommendation.

Context and Background

This regulation updates global air transport standards to mitigate thermal runaway risks associated with lithium- and sodium-ion batteries. It closes a significant safety gap where "packed with equipment" shipments (e.g., A&D spares/LRUs) were previously allowed at higher charge levels than bulk batteries, despite posing similar risks. This edition harmonizes with the UN Model Regulations, formally recognizing sodium-ion batteries as a distinct regulated category under UN 3551/3552 and superseding the generic battery-powered vehicle classification (UN 3171) for lithium/sodium mobility devices such as electric GSE.

Critical Timeline & Deadlines

- » 1 January 2025: Immediate Effect. New UN numbers for sodium-ion (UN 3551/3552) and vehicles (UN 3556/3557/3558) are live. The battery mark now applies to sodium ion shipments, requiring the appropriate UN number display.
- » 31 March 2025: Transition Deadline. End of transition period for shipping lithium-powered vehicles and GSE under the old generic UN 3171. Must use UN 3556/3557 thereafter.
- » 1 January 2026: Mandatory Compliance. 30% SoC becomes mandatory for:
 - Li-ion packed with equipment (PI 966): Mandatory for all Section I batteries, and Section II where battery >2.7Wh.
 - Li-ion/sodium-ion vehicles (PI 952): Mandatory where battery >100Wh.

Impact on A&D Industry

- » Logistics: The 2026 mandate for Packing Instruction 966 (batteries packed with equipment) represents an operational risk. Previously, A&D suppliers could ship a replacement LRU with a fully charged spare battery in the same box, allowing immediate field deployment. From 1 January 2026, these spare batteries must be offered for transport at less than or equal to 30% SoC if categorized as Section I, or if categorized as Section II with a Wh rating exceeding 2.7 Wh.
- » Sodium Ion Introduction: The regulation introduces UN 3551 and UN 3552 for sodium ion batteries with organic electrolyte, and UN 3558 for sodium ion powered vehicles. These are now regulated similarly to Li-ion, meaning the same packaging specifications, testing (UN 38.3), and SoC constraints apply.
- » Ground Support Equipment: The shift from UN 3171 to UN 3556 (Li-ion vehicles) and UN 3558 (sodium ion vehicles) affect electric tugs, forklifts, and logistics drones. From 1 January 2026, any vehicle with a battery >100Wh must be shipped at less than or equal to 30% SoC (or show less than or equal to 25% capacity on the indicator) unless approved by the relevant authorities.
- » Exemptions: There is no blanket exemption for military cargo in civil air transport. A&D shipments moving on commercial freighters (e.g., FedEx, DHL, Chartered Civil Air) must comply fully.

Risks and Penalties

- » Shipment Rejection. This is the primary risk. A "Packed With" kit offered in violation of the 30% SoC limit in 2026 is forbidden for transport without specific state approvals.
- » Financial: Violations constitute a breach of the DGR. All sodium-ion and Li-ion batteries are classified as dangerous goods; failure to comply with classification, packing, and documentation requirements exposes the shipper to regulatory enforcement actions.
- » Liability: The entity signing the "Shipper's Declaration for Dangerous Goods" assumes full legal liability.

Horizon Scanning

- » No significant changes at the horizon were identified.

Links

- » [Dangerous Goods Regulations](#)
- » [IATA Significant Changes \(66th Ed\)](#)
- » [IATA Battery Guidance Document](#)

6.2 NATO Defence-Critical Supply Chain Security Roadmap and list of twelve defence-related critical raw materials

Jurisdiction: The North Atlantic Treaty Organization (NATO)

Status: Endorsed (roadmap endorsed June 2024; list published 11 Dec 2024)

Key Compliance Date: Not applicable

Summary (battery focus)

NATO has officially designated crucial battery components, specifically lithium, cobalt, graphite, and manganese, as defence-critical raw materials, embedding them into a comprehensive allied supply chain security roadmap. Under this framework, NATO is initiating lines of effort that will impact A&D stakeholders, including the establishment of strategic stockpiling recommendations and new mandates for recycling and substituting these key materials. A&D stakeholders must proactively audit their battery supply chains to ensure resilience against geopolitical disruptions and align with upcoming NATO mitigation directives.

Context and Background

NATO implemented the Defence-Critical Supply Chain Security Roadmap and established the list of twelve critical materials to mitigate the fragile nature of global supply chains exposed by recent consecutive disruptions, including the COVID-19 pandemic and Russia's war of aggression against Ukraine. The primary objective is to protect allied nations industries, ensure the continuous development of military capabilities, and guarantee that supply chains for essential battery and advanced defense materials remain free from the hostile influence of potential adversaries.

Critical Timeline & Deadlines

- » 1 June 2024: NATO Defence Ministers officially endorsed the Defence-Critical Supply Chain Security Roadmap.
- » 11 December 2024: Final publication of the twelve defence-related critical raw materials list, formally identifying battery inputs like lithium, cobalt, graphite, and manganese for capability development.
- » Ongoing (Active): NATO is actively engaging with allies and industry to identify the way ahead for strategic stockpiling, recycling, and substituting these defense-critical battery materials.

Impact on A&D Industry

This NATO initiative defines defense-critical raw materials impacts the A&D sector which includes essential battery materials (such as lithium, cobalt, graphite, and manganese). Graphite is currently assessed as a "very high risk" material across nearly all major defense platforms, including fighter aircraft and submarines, while cobalt presents a "high risk" for jet engines and missiles. Operationally, Tier-1 suppliers will likely need to map their raw material origins to support NATO's requirement to share assessments regarding supply chain vulnerabilities. Furthermore, A&D

stakeholders must prepare to implement emerging NATO recommendations for the strategic stockpiling, recycling, and substitution of these critical battery materials.

Risks and Penalties

- » Operational: There are severe operational risks of raw material shortages for essential defense platforms if supply chains for critical raw materials are disrupted by hostile adversaries or global events.
- » Financial & Liability: Failure to secure critical material supply chains may jeopardize A&D contract fulfillment, allied operational readiness, and long-term industry resilience.

Horizon Scanning

- » No significant changes at the horizon were identified.

Links

- » [NATO News Release: List of twelve defence-critical raw materials](#)
- » [NATO Factsheet](#)