Webinar

Batteries 101 : beyond chemicals

Batteries chemicals compliance and beyond

31 October 2024

Speaker

Batteries 101 : beyond chemicals

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A member of the Enhesa Product Intelligence analyst team, Stacey is a librarian by training. She has a Masters in Information and Library Science and has 20 years' experience identifying and analyzing global product compliance laws.

- Experience in delivering bespoke research and analysis to global companies
- Experience in launching compliance products for a wide range of sectors

Follow Stacey on LinkedIn

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Batteries 101 : beyond chemicals

Today's webinar

On the agenda

- The EU Battery Regulations: A global benchmark
- Spotlight on battery regulations in the US, Canada, China and beyond

Also:

- Q&A
- Events to look out for
- Take Poll

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Batteries 101 : beyond chemicals

Practicalities

During the webinar:

- Let us know of any technical issues
- Ask your questions via the chat

Following today's webinar we will share:

- Webinar recording
- Presentation slides

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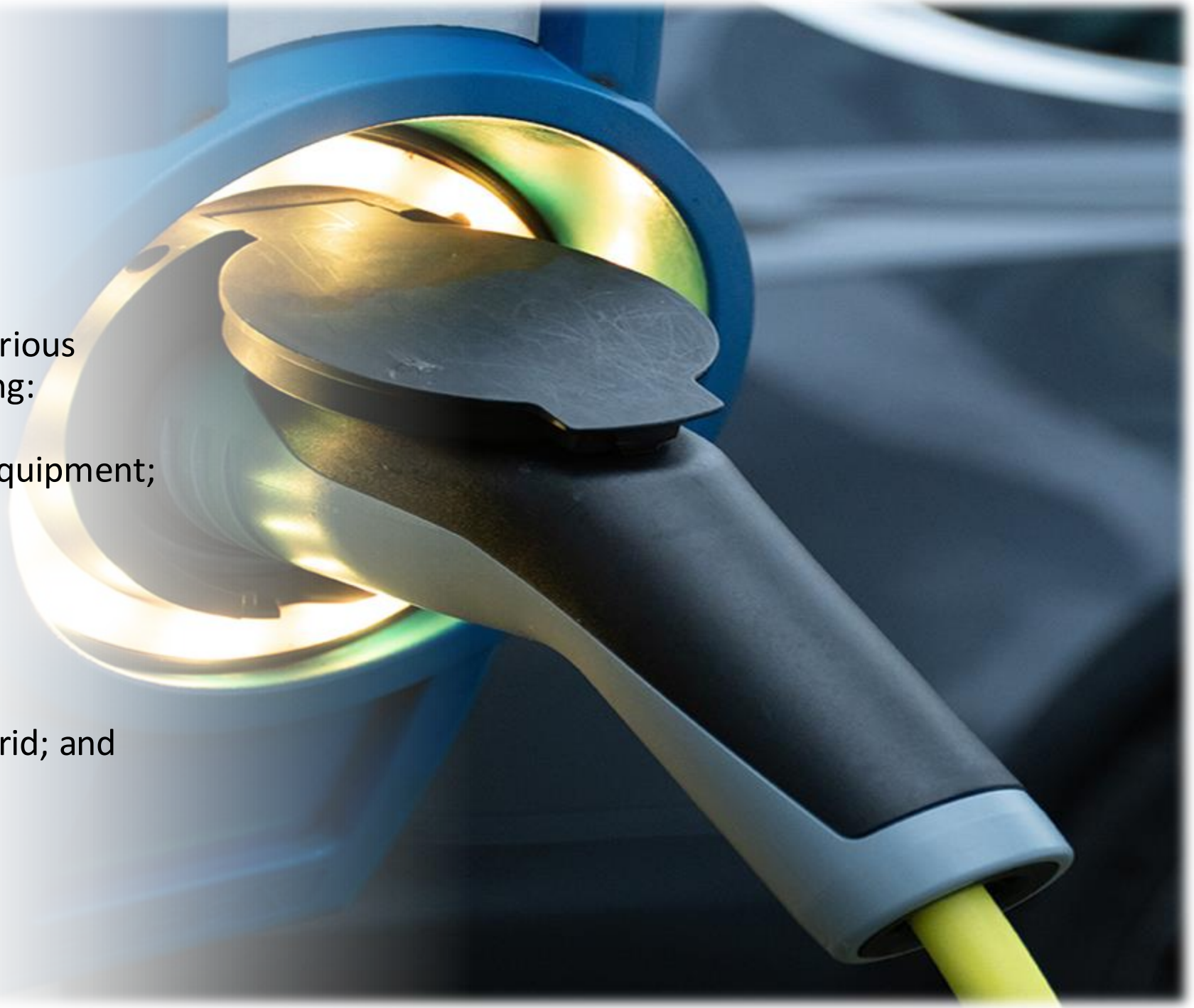
Why do batteries matter?

Batteries are widely used in various industries and sectors, including:

- Electrical and electronic equipment;
- Toys;
- Medical devices;
- Electric vehicles and the grid; and
- Solar power



Batteries of the future

- Batteries are one of the key enablers for sustainable development, green mobility, clean energy and climate neutrality
- Demand for batteries is set to increase 14-fold globally by 2030, primarily by the electrification of transport
- Such exponential growth will lead to an equivalent increase in demand for raw materials
- These circumstances have resulted in a renewed focus on battery regulations, particularly on minimization of their environmental impact
- Many of these regulations are unique and uniquely *stringent*

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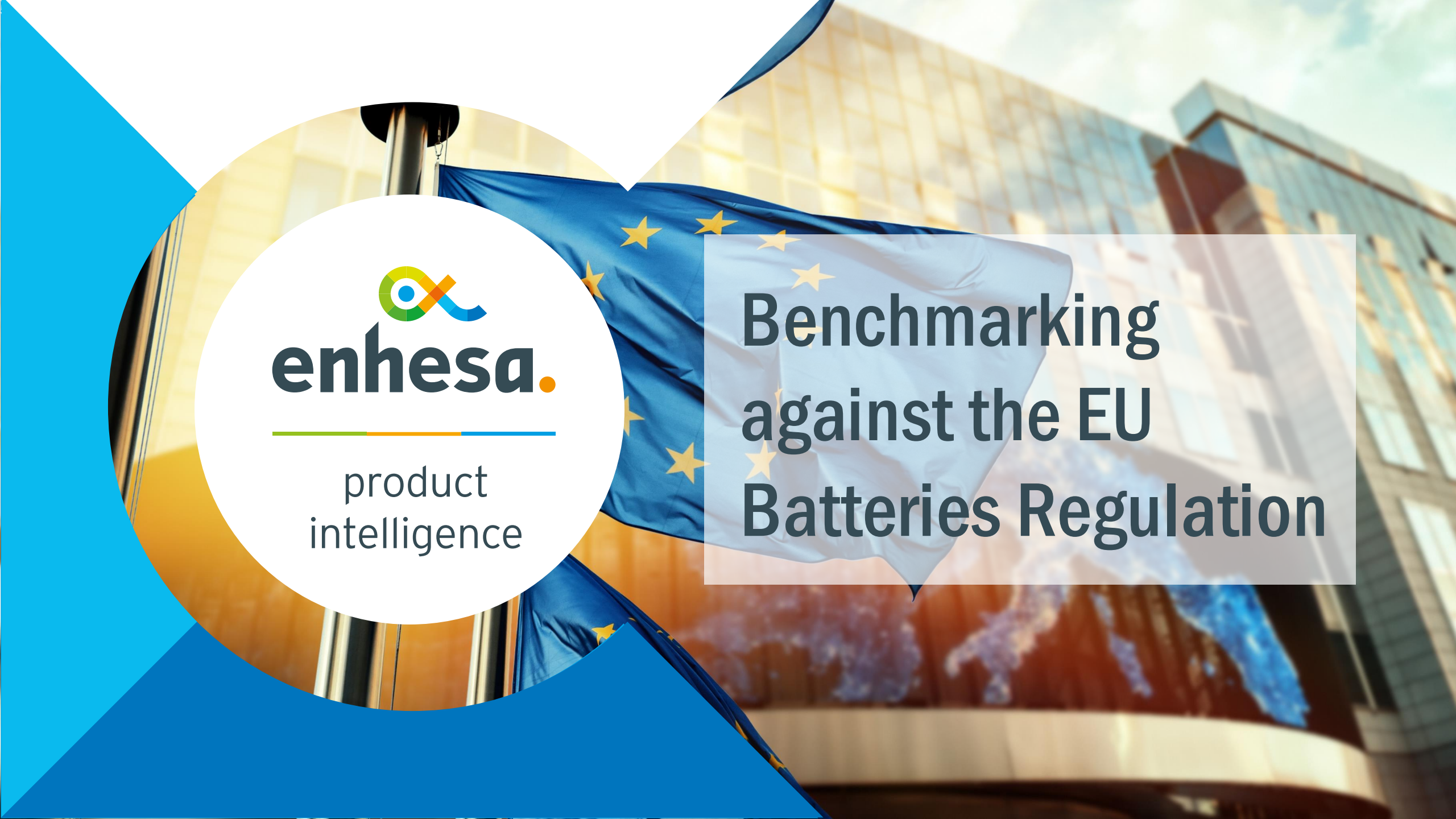

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Benchmarking against the EU Batteries Regulation

Introducing the EU Batteries Regulation

- In August 2023, the EU enacted Regulation (EU) 2023/1542
- The Batteries Regulation - which replaced a 2006 Directive - is the first piece of EU legislation taking a full life-cycle approach
  - Because these requirements were enacted as a Regulation, they applied automatically to all 27 EU Member States as soon as they entered into force
- Further, it is the first *global* regulation to address the entire life-cycle of batteries
  - For this reason, many companies are benchmarking their battery approach against the EU's requirements

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Applicability & exemptions

The Regulation applies to all categories of batteries, regardless of their shape, volume, weight, design, material composition, chemistry, use or purpose

It also applies to batteries that are incorporated into or added to products

It exempts:

Equipment connected with the protection of Member States' essential security interests, arms, munitions and war material	Equipment designed to be sent into space

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New battery classifications

- **Portable battery**: Sealed, 5 kg or less, not designed for industrial use and neither an electric vehicle battery, an LMT battery, nor an SLI battery
- **Electric vehicle battery**: Provides electric power for traction in hybrid or electric vehicles of category L, weighs more than 25 kg, or designed to provide electric power for traction in hybrid or electric vehicles of categories M, N or O
- **Starting, lighting and ignition battery (SLI battery)**: Supplies electric power for starting, lighting or ignition and can also be used for auxiliary or backup purposes in vehicles, other means of transport or machinery

New battery classifications, *cont.*

- **Light means of transport battery (LMT battery):** Sealed, weighs 25 kg or less and provides electric power for the traction of wheeled vehicles, including type-approved vehicles of category L, and that is not an electric vehicle battery

- **Industrial battery:** Designed for industrial uses, intended for industrial uses after having been subject to preparation for repurposing or repurposing, or any other battery weighing more than 5 kg that is neither an electric vehicle battery, an LMT battery, nor an SLI battery

Design & manufacturing

- Batteries must be designed and manufactured to optimize their performance, durability and safety and to minimize their environmental footprint
- There are also specific sustainability requirements for rechargeable industrial batteries with a capacity greater than 2 kWh, LMT batteries and electric vehicle batteries
  - These batteries represent the market segment which is expected to increase the most

Restrictions on heavy metals

- Batteries must continue to comply with restrictions on:
  - Mercury and its compounds: Batteries, whether incorporated into appliances, light means of transport or other vehicles, shall not contain more than 0.0005% of mercury (expressed as mercury metal) by weight
  - Cadmium and its compounds: Portable batteries, whether incorporated into appliances, light means of transport or other vehicles, shall not contain more than 0.002% of cadmium (expressed as cadmium metal) by weight
  - Lead and its compounds: Portable batteries, whether incorporated into appliances, shall not contain more than 0.01% of lead (expressed as lead metal) by weight
    - This limit will apply to portable zinc-air button cells on 18 August 2028

Carbon footprint declarations

- Electric vehicle batteries, rechargeable industrial batteries with a capacity greater than 2 kWh and LMT batteries must be accompanied by a carbon footprint declaration
- The declaration must include:
  - The carbon footprint of the battery, calculated as kg of carbon dioxide equivalent per one kWh of the total energy provided by the battery over its expected service life; and
  - The carbon footprint of the battery differentiated according to life cycle stage
- These requirements take effect 18 February 2025, starting with electric vehicle batteries
  - The EU is considering a Delegated Regulation on carbon footprint for EV batteries; the consultation ended 5/28

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Recycled content

There are new requirements for recycled content in industrial batteries with a capacity greater than 2 kWh, electric vehicle batteries and SLI batteries

Covered batteries that contain cobalt, lead, lithium or nickel in active materials must be accompanied by:

Documentation containing information about the percentage share of these materials recovered from battery manufacturing waste or post-consumer waste ***and***

The percentage share of lead present in the battery and that has been recovered from waste, for each battery model per year and per manufacturing plant

These requirements begin taking effect 18 August 2028, with increasing minimum percentage shares at each deadline, through 18 August 2036

Performance & durability of portable batteries

- From 18 August 2028, portable batteries of general use must meet electrochemical performance and durability parameters in Annex III
- These include:
  - Minimum average duration;
  - Rated capacity;
  - Charge (capacity) retention; and
  - Resistance to leakage
- Button cells are excluded from these requirements

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Performance & durability of other batteries

- Staring 18 August 2024, rechargeable industrial batteries with a capacity greater than 2 kWh, LMT batteries and electric vehicle batteries have been required to be accompanied by a document containing the electrochemical performance and durability parameters in Annex IV
- These include:
  - Rated capacity (in Ah) and capacity fade (in %);
  - Power (in W) and power fade (in %);
  - Internal resistance (in Ω) and internal resistance increase (in %); and
  - The expected life-time of the battery under the reference conditions for which it has been designed

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Removability & replaceability requirements

To ensure portable batteries incorporated into appliances are subject to separate collection, treatment and high quality recycling once appliances become waste, new provisions to ensure their removability and by consumers apply

Portable batteries incorporated in products must be readily removable and replaceable by the end-user at any time during the lifetime of the product

A portable battery is "readily removable" where it can be removed from a product with the use of commercially available tools, without specialized tools, unless provided free of charge with the product, proprietary tools, thermal energy or solvents to disassemble the product

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Safety of stationary battery energy storage systems

- Stationary battery energy storage systems placed on the market or put into service shall be safe during their normal operation and use
- Since 18 August 2024, the technical documentation has been required to:
  - Demonstrate compliance and include evidence of successful testing for applicable safety parameters;
  - Include an assessment of possible safety hazards addressed in Annex V, as well as evidence that these hazards have been successfully mitigated and tested; and
  - Include mitigation instructions, in case the identified hazards could occur, for example a fire or explosion

Labeling

- All batteries must continue to bear the symbol for separate collection of batteries, i.e., the crossed-out wheeled bin
- All batteries containing more than 0.002% cadmium or more than 0.004% lead, shall be marked with the chemical symbol for the metal concerned - Cd or Pb - beneath the separate collection symbol

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Labeling, *cont.*

- As with the 2006 Directive, Manufacturers must continue to affix the CE marking to compliant batteries

- From 18 August 2026, batteries must also bear a label containing:
  - Battery category;
  - Place and date of manufacture;
  - Weight, capacity and chemistry; and
  - Hazardous substances present in the battery, other than mercury, cadmium or lead

QR code

- The Regulation established a new requirement whereby all batteries shall be marked with a QR code which provides access to specified information, such as:
  - A battery passport,
  - The EU declaration of conformity,
  - A report demonstrating evidence with the due diligence scheme and
  - Information regarding the prevention and management of waste batteries and the amount of cobalt, lead, lithium or nickel recovered from waste and present in active materials in the battery
- These requirements take effect 18 February 2027

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Due diligence requirements

From 18 August 2025, economic operators must fulfill due diligence obligations, including:

A policy concerning raw materials, such as cobalt, natural graphite, lithium and nickel, and associated social and environmental risk categories	Assigning responsibility to its top management level to oversee its battery due diligence policy	Incorporating battery due diligence policy into contracts and agreements with suppliers

Economic operators must have their due diligence policies verified and periodically audited by a notified body

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Extended producer responsibility (EPR) requirements

Producers continue to have extended producer responsibility (EPR) for the management of their batteries at the end-of-life stage

They will continue finance the costs of collecting, treating and recycling all collected batteries, carrying out compositional surveys of municipal waste, reporting on batteries and waste batteries, and providing information to end-users and waste operators about batteries and waste batteries

Targets for the efficiency of the recycling processes and recovery of materials have been established to ensure high quality of recovery of materials for the battery industry

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Spotlight on other global battery regulations

Canada

- Health Canada recently listed batteries on Table 1 of the Canada Consumer Product Safety Act (CCPSA)
  - Lithium-ion batteries and consumer products that contain lithium-ion batteries and
  - Products containing button batteries
- The Table cites standards which may be sufficient to mitigate hazards:
  - CSA C22.2 No. 62133-2:2020; or
  - UL 1642, 6th edition; or
  - UL 2054, 3rd edition; or
  - The equivalent

Canada, *cont.*

- Health Canada and Transport Canada have advised consumers to ensure e-mobility batteries comply with:
  - ANSI/CAN/UL 2272, on electrical systems for personal e-mobility devices, or
  - ANSI/CAN/UL 2849, on electrical systems for e-bikes
- Several Canadian provinces have enacted battery EPR, including:
  - Manitoba,
  - Ontario,
  - Prince Edward Island and
  - Quebec
- Call2Recycle is a PRO working throughout Canada to facilitate battery EPR

China

- Lithium ion cells and batteries used in portable electronic equipment must comply with CNCA-C09-01:2023, which cites GB 31241
- Lithium ion battery cells and packs for electric bicycles must comply with CNCA-C11-21:2024, which cites GB 43854:2024
  - Compliance must be certified by a designated certification body (DCB), including the CCC mark
- China has also enacted several other mandatory safety standards for additional battery types

India

- India's Battery Waste Management Rules, 2022 give producers EPR for the batteries, to ensure recycling or refurbishing obligations
- India's Government has also enacted certification requirements for multipurpose dry batteries, secondary cells and batteries containing alkaline or other non-acid electrolytes, and secondary cells and batteries for solar photovoltaic application
  - Batteries must bear the BIS Standard Mark

Saudi Arabia

- Saudi Arabia's Technical Regulation for Electric Batteries lays out health and safety requirements for batteries, including:
  - Restrictions on heavy metals and
  - Labeling requirements, such as recommendations and notices required to ensure proper battery waste recycling or management
- The Regulation appears to be based on the EU's 2006 Batteries Directive; however, it does not address battery EPR

The United States (US)

- The Mercury-Containing and Rechargeable Battery Management Act of 1996 prohibited the use of mercury in:
  - Alkaline-manganese batteries,
  - Zinc-carbon batteries,
  - Button cell mercuric-oxide batteries and
  - Other mercuric-oxide batteries
- The Act exempts alkaline-manganese button cells, which may contain up to 25 mg of intentionally introduced mercury per button cell

The United States (US), *cont.*

- In 2022, the US enacted Reese's Law, to protect children and other consumers against hazards associated with the accidental ingestion of button cell or coin batteries
  - The Consumer Product Safety Commission (CPSC) requires consumer products containing button cell or coin batteries to comply with ANSI/UL 4200A:2023, Standard for Safety for Products Incorporating Button Batteries or Coin Cell Batteries
- Meanwhile, the federal Congress is considering H.R. 1797/ S.1008, to require CPSC to promulgate a consumer product safety standard for rechargeable lithium-ion batteries used in micromobility devices

California

- California enacted the Responsible Battery Recycling Act of 2022 to require producers, either individually or through the creation of one or more stewardship organizations, to establish a stewardship program for the collection and recycling of covered batteries
- Within 24 months after the effective date of the regulations, a program operator must have a complete stewardship plan approved by the Department
- On and after the date that a stewardship plan is approved, retailers and distributors will be prohibited from selling, distributing, offering for sale or importing a covered battery unless the producer is listed on a newly-created Internet list of producers in compliance with the Act

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Illinois

- On 12 August 2024, Illinois enacted the Portable and Medium-Format Battery Stewardship Act
- Beginning 1 January 2026, producers of covered batteries or battery-containing products must participate in an approved Illinois State battery stewardship plan through participation in and funding of a battery stewardship organization
- By 1 July 2027, covered batteries, including those contained in products, must be marked with an identification of the producer of the battery and by 1 January 2029, must be marked with proper labeling to ensure proper collection and recycling

New York State

- New York State's law on Lead-acid Battery Recycling took effect 1 January 1991
- The law requires retailers and distributors who sell lead-acid batteries to accept used batteries from customers
- The 2010 Rechargeable Battery Recycling law requires:
  - Manufacturers of covered rechargeable batteries who sell in or into NYS to fund the collection and recycling of rechargeable batteries, and
  - Retailers that sell rechargeable batteries OR rechargeable battery containing products to accept used rechargeable batteries from NYS consumers
- While the law does not require manufacturers to work with PROs, most manufacturers work with Call2Recycle

New York State, *cont.*

- On 11 July 2024, New York State's Governor Kathy Hochul signed a legislative package aimed at making e-bikes and micromobility devices, including lithium-ion batteries, safer for New Yorkers
- Chapter 195, 2024 (formerly S.154F/A.4938) requires:
  - Compliance with battery standards, such as UL 2849, UL 2271 or EN 15194, as certified by an accredited testing laboratory, and
  - The application of the logo, wordmark or name of the laboratory on the packaging or documentation at the time of sale and directly on the product itself
- This law took effect 9 October 2024

New York State, *cont.*

- Chapter 201 (formerly S.7503B/A.01910) applies to retailers of micromobility devices, bicycles with electric assist and limited use motorcycles powered with lithium-ion batteries, and lithium-ion batteries intended for use in such devices or bicycles
- Retailers must provide customers with an operating manual including instructions on:
  - How to store and charge the battery;
  - When and where to charge the battery; and
  - What to do if the battery overheats or leaks, there is a strange odor or noise associated with the battery, or there is a change in the shape or color of the battery
- This law takes effect 7 January 2025

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Vermont

- In 1991, Vermont enacted 10 V.S.A. § 6621b, which established labeling requirements, restrictions on mercury and removability requirements for certain dry cell batteries
- In 1993, the state enacted 10 V.S.A. § 6621c, to require retailers and wholesalers selling replacement lead-acid batteries to accept spent lead-acid batteries in return for those that they sell and to require that collected batteries be recycled
- In 2014, Vermont became the first state to require manufacturers to fund recycling of single-use batteries, with the passage of the Vermont Primary Battery Stewardship Program

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Vermont, *cont.*

- In June 2024, the state enacted Act No. 152 (S.254), which expanded the scope to include rechargeable batteries and battery-containing products
- Newly in-scope producers are now required to implement their own battery stewardship plan or to join an existing battery stewardship organization
- The act took effect 1 July 2024; however, it includes implementation dates based upon the requirements of the act, the battery types in question (including, often, their weight) and the dates the batteries were placed on the market in Vermont

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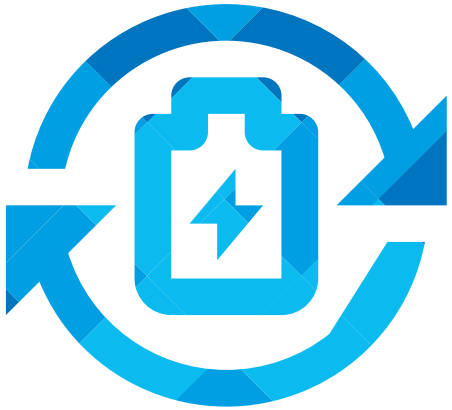

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In addition to our Batteries Compliance tool, we offer tools covering other key topics, including:

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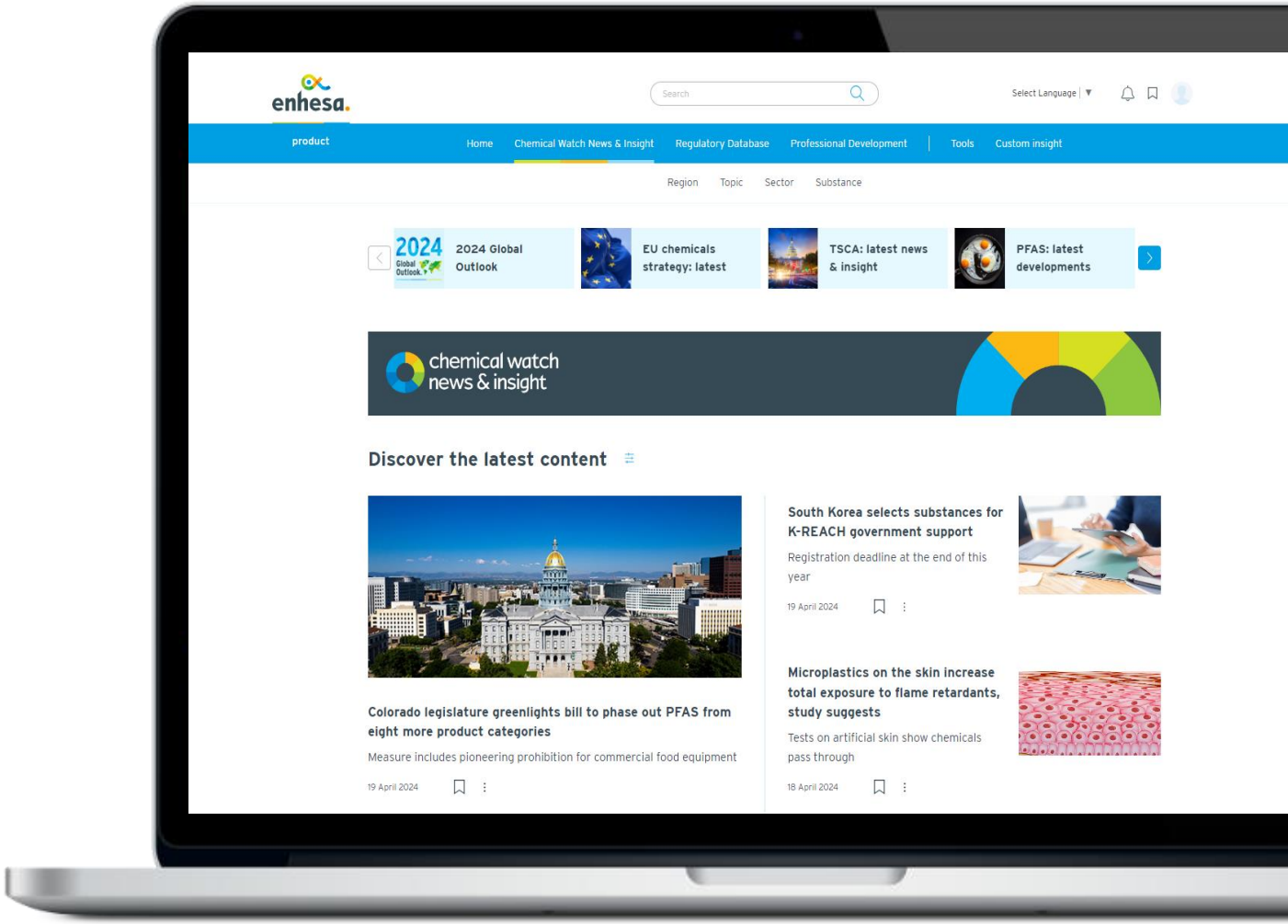

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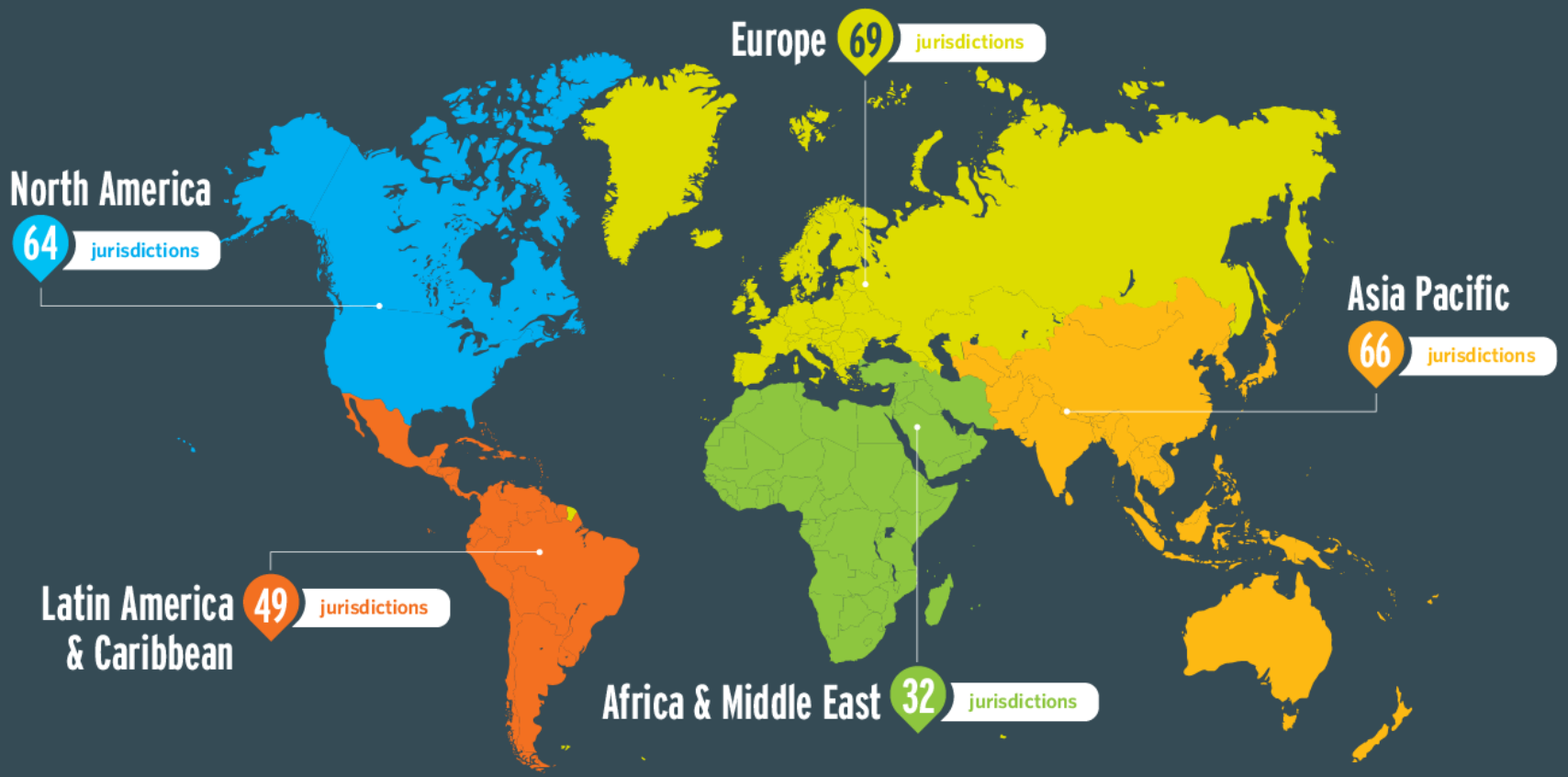

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