

New EU regulatory framework for batteries

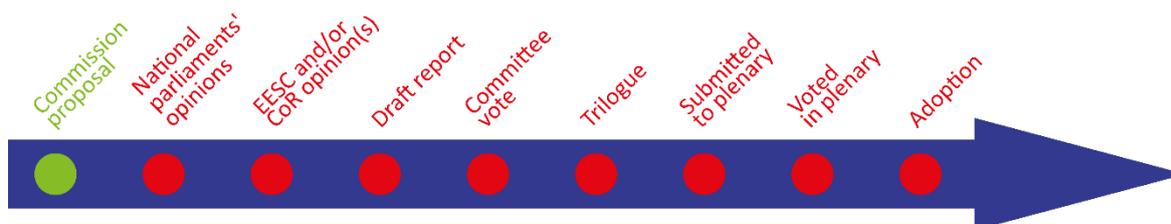
Setting sustainability requirements

OVERVIEW

Given the important role they play in the rollout of zero-emission mobility and the storage of intermittent renewable energy, batteries are a crucial element in the EU's transition to a climate neutral economy. Global battery demand is expected to increase 14-fold by 2030, making this market an increasingly strategic one. The proposal presented by the European Commission is designed to modernise the EU's regulatory framework for batteries in order to secure the sustainability and competitiveness of battery value chains. It would introduce mandatory requirements on sustainability (such as carbon footprint rules, minimum recycled content, performance and durability criteria), safety and labelling for the marketing and putting into service of batteries, and requirements for end-of-life management. The proposal also includes due diligence obligations for economic operators as regards the sourcing of raw materials.

The legislative process is in its early stages. In the Council, the proposal is being examined by the Working Party on the Environment. In Parliament, the file has been referred to the Committee on Internal Market and Consumer Protection, which appointed Antonius Manders as rapporteur.

Proposal for a Regulation of the European Parliament and the Council concerning batteries and waste batteries, repealing Directive 2006/66/EC and amending Regulation (EU) No 2019/1020		
<i>Committee responsible:</i>	Internal Market and Consumer Protection (IMCO)	COM(2020) 798 10.12.2020
<i>Rapporteur:</i>	Antonius Manders (EPP, the Netherlands)	2020/0353(COD)
<i>Shadow rapporteurs:</i>	Adriana Maldonado López (S&D, Spain) Claudia Gamon (Renew Europe, Austria)	Ordinary legislative procedure (COD) (Parliament and Council on equal footing – formerly 'co-decision')
<i>Next steps expected:</i>	Publication of draft report	



Introduction

The issue of batteries is [relevant](#) to many policy areas, from transport, climate action and energy to waste and resources. The development, production and use of batteries are key to the EU's transition to a climate neutral economy, given the important role they play in the rollout of zero emission mobility and the storage of intermittent renewable energy. Batteries are also instrumental in helping power the rising digital economy and an [ever-growing number](#) of portable electronics. Driven by the electrification of transportation and the deployment of batteries in electricity grids, global battery demand is expected to increase [14 fold by 2030](#). The EU could account for [17 %](#) of that demand. According to some forecasts, the battery market could be worth of [€250 billion](#) a year by 2025. Batteries' manufacturing, use and end-of-life handling, however, raise a number of environmental and social challenges. As the market grows, so does the importance of the sustainability and environmental and energy performance of batteries.

Owing to the strategic importance of batteries for the EU, in October 2017 the European Commission set up the [European Battery Alliance](#) to support the scaling up of innovative solutions and manufacturing capacity in Europe. In May 2018, as part of the third 'Europe on the move' mobility package, it adopted a dedicated [strategic action plan on batteries](#), with a range of measures covering raw materials extraction, sourcing and processing, battery materials, cell production, battery systems, re-use and recycling.

Building on this, the [proposal for a regulation on batteries and waste batteries](#) adopted on 10 December 2020 is geared towards [modernising](#) EU legislation on batteries in order to ensure the sustainability and competitiveness of EU battery value chains. The proposal is part of the [European Green Deal](#) and related initiatives, including the [new circular economy action plan](#) and the [new industrial strategy](#). The circular economy action plan identified batteries among resource-intensive sectors with high potential for circularity to be addressed as a matter of priority.

Context

Batteries can be either primary (non-rechargeable) or secondary (rechargeable) (see box). They can also be classified according to use, technology or size. The most common differentiation, also used in the Batteries Directive, is between portable batteries (used mainly in consumer electronics, communication and computing, known as '3C'); automotive batteries (used for automotive starter, lighting or ignition power and traction batteries used in electric and plug-in hybrids); and industrial batteries. There are major variations in chemical composition and construction between different battery types. Batteries contain a wide variety of materials, such as base metals, [critical raw materials](#) and chemicals, which can raise issues in terms of resource availability, toxicity, safety, production and recycling or disposal impacts.

Raw materials

[Critical raw materials](#) embedded in batteries include for instance antimony in lead-acid batteries; rare earth elements in nickel-metal hydride batteries; and cobalt and natural graphite in lithium-ion batteries. For [electric vehicle \(EV\)](#)

Rechargeable batteries

Rechargeable battery types include lead-acid, lithium-ion, nickel-metal hydride, and nickel-cadmium batteries. In 2018, lead-acid batteries (LABs) provided approximately 72 % of global rechargeable battery capacity (in GWh). LABs are used mainly in automotive applications (around 65 % of global demand), mobile industrial applications (e.g. forklifts and other automated guided vehicles) and stationary power storage. According to [some forecasts](#), at global and EU level, lead-acid technologies would still prevail in 2025 in terms of volume, but the lithium-ion market would become greater in terms of value from 2018 onwards. Between 2018 and 2030, global lead-acid battery demand [would grow](#) by a factor of around 1.1.

Offering a better power and energy performance than LABs, lithium-ion batteries (LIBs) are the fastest growing technology on the market. Used for some time in portable electronics, and the preferred technology for e-mobility, they also frequently operate in stationary energy storage applications. Demand for LIBs is expected to sky-rocket ([yearly by more than 30 %](#)) for the next decade. While the EU has a [strong presence](#) in downstream segments of the value chain (battery pack assembly, recycling and re-purposing), cell manufacturing capacity lies mainly in Asia.

[batteries and energy storage](#), the EU will need up to 18 times more lithium and 5 times more [cobalt](#) by 2030, and nearly 60 times more lithium and 15 times more cobalt by 2050, compared with the current supply to the whole EU economy. Mining and exploitation of some battery minerals can be associated with adverse environmental impacts (e.g. local water, soil and air pollution; ecosystem and landscape degradation), human rights violations and poor worker protection.¹ Cobalt is a case in point. Nearly half of the world's cobalt reserves lie in the Democratic Republic of Congo (DRC), which accounts for over two-thirds of global cobalt production. Around [20 % of the cobalt](#) sourced from the DRC comes from artisanal mines, where child labour and human rights issues have been documented. While risks, especially concerning conflict, child labour, forced labour and governance, are highest in the DRC, a recent [report](#) by the European Commission Joint Research Centre identified other EU [suppliers of one or more materials](#) for batteries raising concerns in terms of responsible sourcing. Examples include China (which accounts for 47 % of the EU's supplies of both natural graphite and nickel), South Africa and Brazil (which provide 26 % and 17 % of EU manganese supply respectively).

Carbon footprint

According to World Economic Forum and Global Battery Alliance [calculations](#), the most greenhouse gas (GHG) emission-intense steps in the [battery value chain](#) are the manufacturing of active materials and other components, and the manufacturing of cells. The carbon footprint of batteries very much depends on the energy source used in manufacturing. Production of lithium-ion batteries, or at least the cells they contain, generally takes place in Asian countries, with an energy mix relying on more polluting sources. Research² shows, for instance, that NMC³ lithium-ion cells for electric vehicles manufactured in South Korea with an electricity mix dominated by coal, nuclear and gas, have a global warming potential that is 60 % higher than if they were manufactured using electricity based on hydroelectric power.

End-of-life handling

More than [1.9 million tonnes](#) of waste batteries are generated annually in Europe. The collection and recycling rates, the profitability of recycling and the environmental and health impacts depend heavily on the battery technology or type. The highest collection and recycling rates are achieved for automotive lead-acid batteries (99 %, according to a [study](#) by Eurobat). [Between 90 % and 100 %](#) of lead is recovered, with most Member States reporting rates of 97 % and higher.

The average collection rate for portable batteries in the EU is much lower. In 2018, [nearly 48 %](#) of portable batteries sold in the EU were collected for recycling. This means that large amounts of valuable resources are lost. Of these, [some 35 kilotonnes](#) of portable batteries end up in municipal waste annually (with possible leaching of hazardous substances).⁴ The remainder is either stored in consumers' homes, exported outside the EU in used products or ends up in e-waste recycling.

Collection rates for Li-ion batteries are [low](#), and recycling is [technologically challenging](#) and costly. Today, [almost no lithium](#) is recovered in the EU because it is deemed not cost-effective compared with primary supplies. Recycling is geared towards recovering cobalt, nickel and copper, considered more economically valuable. [Recycling efficiencies](#) are estimated at about [95 %](#) for cobalt and nickel, and 80 % for copper, depending on the specific process. Graphite is not recovered.

While closing the material loops as much as possible would help reduce raw material supply risks, within the EU, the [volume of recovered metals](#) that are used in battery manufacturing is currently low. Only 12 % of aluminium, 22 % of cobalt, 8 % of manganese, and 16 % of nickel used within the EU is recycled.

Existing situation

[Directive 2006/66/EC on batteries and accumulators](#) (the Batteries Directive), last amended in [2018](#), is the main legal act regulating batteries at EU level.⁵ With some exceptions,⁶ the directive applies

to all types of batteries, no matter their chemical nature, size or design, and classifies them according to their use. [Categories of battery](#) include:

- portable batteries (e.g. those used in laptops or smartphones, or typical cylindrical AAA or AA-size batteries);
- automotive batteries (excluding traction batteries for electric cars); and
- industrial batteries (e.g. for energy storage or for mobilising electric vehicles or bikes).

The primary objective of the directive was to minimise the negative impact of batteries and waste batteries on the environment, while ensuring the smooth functioning of the internal market. To cut the amount of hazardous substances (in particular mercury, cadmium and lead) entering the environment, the directive laid down rules to:

- 1 reduce the use of such substances in batteries. In particular, it prohibited the marketing of certain batteries with a mercury or cadmium content above a fixed threshold (0.0005 % by weight for mercury; and 0.002 % by weight for cadmium).⁷
- 2 ensure the proper management of waste batteries.

It also sought to improve the environmental performance of batteries and the activities of those involved in their lifecycle (producers, distributors and end-users), including their treatment and recycling.

To ensure a high level of collection and recycling, [the directive](#) required Member States to ensure that appropriate collection schemes were in place for waste portable batteries and set targets for collection rates (25 % in weight of the amount placed on the market by September 2012, rising to 45 % by September 2016). Member States were also required to set up collection schemes for waste automotive batteries and to ensure that producers of industrial batteries did not refuse to take back waste industrial batteries from end-users. Under the extended producer responsibility (EPR) principle, producers of batteries and producers of other products that incorporate a battery became responsible for the waste management of batteries that they placed on the market, in particular the financing of collection and recycling schemes.

In order to attain a high level of material recovery, the directive also established obligations in relation to the [efficiencies](#) of the recycling processes to which batteries are subject, depending on their chemical composition (i.e. recycling of 65 % by average weight of lead-acid batteries; 75 % by average weight of nickel-cadmium batteries; 50 % by average weight of other batteries).

The directive also set out requirements for the labelling of batteries and their removability from equipment, and regarding information for end-users.

The Commission was required to draw up a report assessing the implementation of the directive and its impact on the environment and the functioning of the internal market by the end of 2018, and to submit proposals for revision if necessary. Released in April 2019, [the implementation report](#) and the [ex-post evaluation](#) of the directive that fed into it identified a number of [shortcomings](#). They related in particular to its incapacity to incorporate technological novelties and new usages of batteries, the unsatisfactory collection of waste batteries and the insufficient recovery of materials.

Parliament's starting position

In its [resolution](#) of 10 February 2021 on the new circular economy action plan, the European Parliament called for the creation of competitive and resilient value chains for battery production, reuse and recycling in the EU. It stressed that the new EU regulatory framework for batteries should cover at least sustainable, ethical and safe sourcing, ecodesign including measures to address recycled content, substitution of hazardous and harmful substances where possible, improved separate collection, reuse, refurbishment, remanufacturing, repurposing and recycling – including higher recycling targets, the recovery of valuable materials, extended producer responsibility, and consumer information. The framework should tackle the full lifecycle environmental impacts, with dedicated provisions on batteries relating to mobility and energy storage.

In its July 2020 [resolution](#) on a comprehensive European approach to energy storage, Parliament urged the Commission to address the EU's dependence on imports of raw materials for battery production, including from sources where their extraction involves environmental degradation, violation of labour standards and local conflicts over natural resources. As regards future legislation on batteries, Parliament called for lifecycle analysis of batteries, the introduction of circular design, safe management and handling during the treatment of hazardous substances in cell manufacturing, and the introduction of a carbon footprint label declaring the environmental impact of all battery value chains placed on the EU market. It specifically asked the Commission to propose eco-design requirements for batteries in order to enhance their recyclability by design; and to propose ambitious collection and recycling targets for batteries based on critical metal fractions when revising the Batteries Directive, based on an impact assessment. It also called on the Commission to develop guidelines and/or standards for repurposing batteries from electric vehicles, including testing and grading processes, as well as safety guidelines.

In its January 2020 [resolution](#) on the Green Deal, Parliament endorsed the Commission's plans for legislative proposals to ensure a safe, circular and sustainable battery value chain for all batteries. It expressed the expectation that the proposal include at the very least measures on ecodesign, targets for reuse and recycling, and sustainable, as well as socially responsible, sourcing. It also stressed the need to create a strong and sustainable battery and storage cluster in Europe.

Council starting position

In its conclusions from October 2019 on '[More circularity – Transition to a sustainable society](#)', Council called for the transition to electro-mobility to be accompanied by coherent policies supporting the development of technologies that improve the sustainability and circularity of batteries. It called for urgent revision of the Batteries Directive with a special focus on improving the definitions of different types of batteries; enhancing separate collection and recycling of all types of batteries; and stimulating the replacement of single-use batteries with rechargeable ones and the reuse of batteries. It also noted that the revision should include all relevant battery materials and consider, in particular, specific requirements for lithium and cobalt, as well as a mechanism to adapt the directive to future changes in battery technologies.

In its conclusions on '[Making the recovery circular and green](#)', adopted on 17 December 2020, the Council welcomed the Commission proposal for a new regulatory framework for batteries.

Preparation of the proposal

The proposal builds in part on the European Commission [ex-post evaluation](#) on the Batteries Directive; the [report](#) on the implementation and impacts of the Batteries Directive on the environment and the functioning of the internal market; and the [report](#) on the implementation of the strategic action plan on batteries, all published in April 2019. The [implementation appraisal on the Batteries Directive](#) issued by the European Parliamentary Research Service (EPRS) provides an overview of the content and findings of those [reports](#) and their respective supporting studies.

The Commission carried out a series of [public and stakeholder consultations](#), and commissioned several external studies to support [preparation](#) of the impact assessment for the new regulatory framework for batteries. The three-part [impact assessment](#) accompanying the legislative proposal looked at [four main policy options](#). On 18 September 2020, it received a '[positive opinion with reservations](#)' from the Commission's regulatory scrutiny board. EPRS is preparing an initial appraisal of this impact assessment.

The changes the proposal would bring

The [proposed regulation concerning batteries and waste batteries](#) would replace the Batteries Directive. It has three interlinked objectives: strengthening the functioning of the internal market (including products, processes, waste batteries and recyclates), by ensuring a level playing field

through a common set of rules; promoting a circular economy; and reducing environmental and social impacts throughout all stages of the battery lifecycle. It would establish requirements for sustainability, safety and labelling to allow the placing on the market and putting into service of batteries, as well as requirements for their end-of-life management.

The main innovations envisaged by the Commission proposal include:

- the introduction, in the battery classification, of a **new category** of electric vehicle batteries, alongside the existing portable, automotive and industrial battery classes;
- progressive requirements to minimise the **carbon footprint** of EV batteries and rechargeable industrial batteries: a carbon footprint declaration requirement, applying as of 1 July 2024, complemented by classification in a carbon footprint performance category and related labelling (as of 1 January 2026); and a requirement to comply with maximum lifecycle carbon footprint thresholds (as of 1 July 2027);
- a **recycled content** declaration requirement, which would apply from 1 January 2027 to industrial batteries, EV batteries and automotive batteries containing cobalt, lead, lithium or nickel in active materials. **Mandatory minimum levels** of recycled content would be set for 2030 and 2035 (i.e. 12 % cobalt; 85 % lead, 4 % lithium and 4 % nickel as of 1 January 2030, increasing to 20 % cobalt, 10 % lithium and 12 % nickel from 1 January 2035, the share for lead being unchanged);
- minimum **electrochemical performance and durability** requirements for portable batteries of general use (applying from 1 January 2027), as well as for rechargeable industrial batteries (from 1 January 2026). The Commission would assess the feasibility of phasing out non-rechargeable portable batteries of general use by the end of 2030;
- a new obligation of **battery replaceability** for portable batteries;
- **safety requirements** for stationary battery energy storage systems;
- supply chain **due diligence** obligations for economic operators that place rechargeable industrial batteries and EV batteries on the market. For this requirement on responsible raw material sourcing (as well as for those related to the carbon footprint and the recycled content levels), the Commission proposal envisages mandatory third-party verification through notified bodies;
- increased **collection rate targets** for waste portable batteries, excluding waste batteries from light means of transport (65 % by the end of 2025, rising to 70 % by the end of 2030);
- as regards **recycling efficiencies**, increased targets for lead-acid batteries (recycling of 75 % by average weight of LABs by 2025, rising to 80 % by 2030) and new targets for lithium-based batteries (65 % by 2025, 70 % by 2030). The proposed regulation also envisages specific **material recovery targets**, namely 90 % for cobalt, copper, lead and nickel, and 35 % for lithium, to be achieved by the end of 2025. By 2030, the recovery levels should reach 95 % for cobalt, copper, lead and nickel, and 70 % for lithium.
- requirements relating to the operations of repurposing and remanufacturing for a **second life** of industrial and EV batteries;
- **labelling and information** requirements. From 1 January 2027, batteries should be marked with a label with information necessary for the identification of batteries and of their main characteristics. Various labels on the battery or the battery packaging would also provide information on lifetime, charging capacity, separate collection requirements, the presence of hazardous substances and safety risks. Depending on the type of battery, a quick response (QR) code would give access to the information relevant for the battery in question. Rechargeable industrial batteries and EV batteries should contain a **battery management system** storing the information and data needed to determine the state of health and expected lifetime of batteries. This system should be accessible to battery owners and independent operators acting on their behalf (e.g. to facilitate the reuse, repurposing or remanufacturing of the battery);

- the setting up, by 1 January 2026, of an electronic exchange system for battery information, with the creation of a **battery passport** (i.e. electronic record) for each industrial battery and EV battery placed on the market or put into service.

The proposal also envisages the development of minimum **mandatory green public procurement** criteria or targets. The chapters on conformity assessment, notification of conformity assessment bodies and market surveillance are, according to the Commission, made up mainly of standard provisions.

Advisory committees

The European Economic and Social Committee is preparing an [opinion](#) on the proposal (rapporteur: Bruno Choix, Employers - Group I / France; co-rapporteur: Frank Uhlig, CCMI, Group II – Workers / France). The text is scheduled for adoption at the Committee plenary session of 24-25 March 2021.

The European Committee of the Regions decided not to draw up an opinion.

National parliaments

The [deadline](#) for submitting reasoned opinions on the grounds of subsidiarity is 11 March 2021.

Stakeholder views⁸

[Eurobat](#), representing European automotive and industrial battery manufacturers, has expressed concern regarding the high number of delegated and implementing acts included in the proposal. It suggests streamlining labelling provisions (e.g. through a colour coding of batteries) and refraining from setting recycled content targets at this stage. [RECHARGE](#), for the advanced rechargeable and lithium batteries industry, fears that the high level of complexity of the proposed measures might translate into over-regulating fast-paced, innovative industries. [Eucobat](#), the association of national collection schemes for batteries, stresses that the collection target should relate to the quantities of waste batteries available for collection, not to the volume placed on the market. It warns against the cost linked to double recycling targets (general target + target for specific materials). [FEAD](#), for the waste management sector, welcomes the mandatory recycled content rules, new recycling targets, and increase in portable battery collection targets. It calls for effective control and enforcement mechanisms for exports of used batteries to avoid illegal shipments.

On the NGO side, the [European Environmental Bureau](#) welcomes the proposal as the way forward to reduce the environmental impact and downside risks of Europe's increasingly electrified economy. They will, however, follow closely the work of standardisation organisations on the technical aspects that will make these ambitions a reality. [Transport & Environment](#) welcome the due diligence obligations for raw material sourcing. They warn that the requirement to recover only 70 % of lithium from used batteries will not be sufficient to drive the investment and innovation Europe's battery recycling sector needs. The consumer organisation [ANEC](#) stresses the need to have a single uniform size/shape for each battery voltage; and to address issues such as child-appealing batteries; and the temperature limits of surfaces likely to be touched. The date set by the Commission for feedback on the proposal following its adoption is [1 March 2021](#).

Legislative process

The legislative process is in its early stages. In Council, the proposal is being examined by the Working Party on the Environment. In Parliament, the file has been referred to the Committee on Internal Market and Consumer Protection (IMCO), which appointed Antonius Manders (EPP, the Netherlands) as rapporteur on 11 February 2021.

EP SUPPORTING ANALYSIS

[EPRS Implementation Appraisal on the Batteries Directive](#), October 2020.

EPRS Briefing on [Critical raw materials for the EU: Enablers of the green and digital recovery](#), December 2020.

OTHER SOURCES

[Batteries and waste batteries](#), European Parliament, Legislative Observatory (OEIL).

ENDNOTES

- ¹ For a comprehensive overview, see United Nations Conference on Trade and Development, [Commodities at a glance. Special issue on strategic battery raw materials](#), July 2020.
- ² L. Ager-Wick Ellingsen et al, [Life Cycle Assessment of a Lithium-Ion Battery Vehicle Pack](#), Journal of industrial ecology, February 2014.
- ³ Nickel-manganese-cobalt oxide-based cathodes.
- ⁴ From ashes and slags (incinerated waste batteries) or, where relevant, from landfilled waste batteries.
- ⁵ The directive interacts with several other pieces of legislation, including the Waste Framework Directive; the Waste Shipment Directive ([scheduled for revision](#) in the second quarter of this year); the Waste Electric and Electronic Equipment Directive; the Restriction of Hazardous Substances Directive; the End-of-life Vehicles Directive ([scheduled for revision](#) in 2022); and the Regulation on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH).
- ⁶ The directive does not cover batteries used in equipment to protect EU countries' security or for military purposes, or in equipment designed to be sent into space.
- ⁷ With some exceptions for portable batteries used in emergency and alarm systems or medical equipment.
- ⁸ This section aims to provide a flavour of the debate and is not intended to be an exhaustive account of all different views on the proposal.

DISCLAIMER AND COPYRIGHT

This document is prepared for, and addressed to, the Members and staff of the European Parliament as background material to assist them in their parliamentary work. The content of the document is the sole responsibility of its author(s) and any opinions expressed herein should not be taken to represent an official position of the Parliament.

Reproduction and translation for non-commercial purposes are authorised, provided the source is acknowledged and the European Parliament is given prior notice and sent a copy.

© European Union, 2021.

ep@ep.europa.eu (contact)

www.eprs.ep.parl.union.eu (intranet)

www.europarl.europa.eu/thinktank (internet)

<http://epthinktank.eu> (blog)



First edition. The 'EU Legislation in Progress' briefings are updated at key stages throughout the legislative procedure.