

Strengthening resilience upstream in the EU battery value chain: the case of black mass/ Batteries Active Materials Mixture

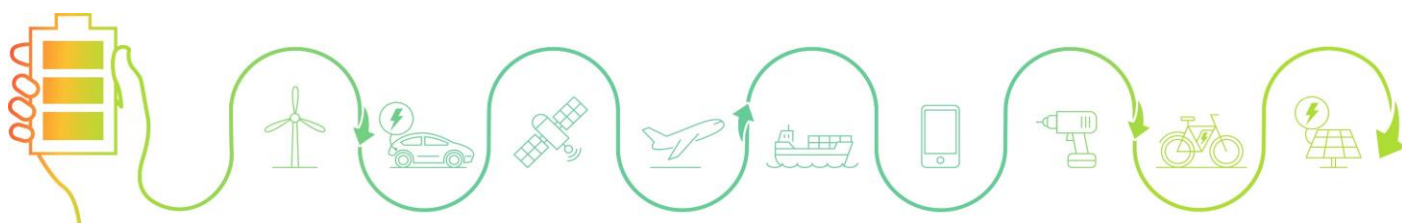
RECHARGE position paper
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Advanced rechargeable batteries are a key enabler for the transition towards low-emission mobility and decarbonised energy generation. Without them, the target of a climate-neutral economy by 2050 cannot conceivably be reached. In the context of the REPowerEU plan aiming at an accelerated electrification and move to renewables, and given the need for Europe to increase resilience in its energy transition value chains, RECHARGE – the leading voice of the European advanced rechargeable and lithium batteries value chain in Europe – strives to constantly improve the legislative framework, which regulates the battery industry. **The batteries sector’s potential has to be well understood by decision-makers in order not to leave loopholes, which will hamper the development of a homegrown sustainable, competitive and resilient battery value chain.**

The recent study, conducted by KU Leuven and commissioned by Eurometaux, *Metals for Clean Energy*, provides valuable information in relation to the metals needs for the EU’s twin transition until 2050 and also focuses on battery specific needs: Europe will require significant new supplies of nickel, lithium and cobalt for its battery manufacturing plans.¹ To ensure a certain strategic autonomy, **the EU needs to combine the development of recycling facilities with new primary metals supply**, as global metals markets are at risk of supply constraints as well cost increases that could slow the pace of the energy transition.

With the upcoming EU Critical Raw Materials (CRM) Act, the European Commission has rightfully identified the challenge of supply of batteries materials, as Europe’s reliance on global markets could cause supply constraints. In its Communications on the Critical Raw Materials (CRMs) Act, the European Commission has stressed the importance of certain raw materials for the EU economy. RECHARGE expects the Act to urgently push forward its European mining, refining and recycling projects to establish a minimum level of strategic autonomy of the EU, while establishing key partnerships with resource-rich countries, which comply with the EU’s environmental, social, and governance (ESG) standards.

¹ By 2050, the demand for production of European batteries will be reaching up to 3500% of Europe’s lithium consumption today, 330% of cobalt and more than 100% of nickel. Source: KU Leuven & Eurometaux, *Metals for Clean Energy*



Ensuring battery materials availability – both through the responsible use of primary raw materials and an increased share of secondary raw materials in the supply mix – is critical to meeting the steadily increasing demand for battery power. With the new targets defined under the REPowerEU for the acceleration of electrification in transport and the roll-out of renewables, **the demand for batteries will increase significantly in the coming years** – and the demand increase for batteries and by extension for battery materials will not happen only in Europe but in a global context in which other regions are equally transforming their transport and energy systems.

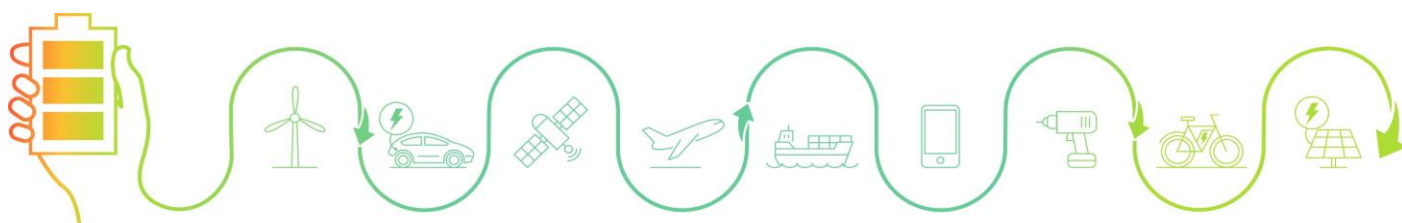
Battery recycling is one of the most effective ways towards an efficient use of resources in the battery industry. Battery recycling can play a key role in mitigating the risk for critical raw materials scarcity in the EU via secondary materials supply. In fact, recycling can cover 40-70% of the metals needed for batteries from 2040 onwards, but investments are needed now to establish a European battery recycling industry.

RECHARGE recommendations

In this paper, **we provide our recommendations on how to strengthen European resilience upstream in the battery value chain with the domestic recycling of black mass/Batteries Active Materials Mixture (BAMM) and production waste.** Black mass/BAMM is the intermediate waste stream, containing valuable metals such as lithium, cobalt and nickel. When it comes to regulations concerning battery recycling, the current EU legislative framework does not yet provide sufficient guidance on the rules governing the classification and shipment of the materials in the battery recycling loop. Currently, it is unclear whether the '(hazardous) waste' classification is applicable or not to intermediates of recycling such as black mass/BAMM, which creates significant uncertainty for EU recyclers across Europe.

In summary, in this paper we call for:

- **A regulatory classification of black mass/Batteries Active Materials Mixture (BAMM) and battery production waste as 'waste'.**
- **A regulatory classification of black mass/Batteries Active Materials Mixture (BAMM) as 'hazardous waste', based on the assessment of the hazard-bearing chemical properties of the components of this material.**



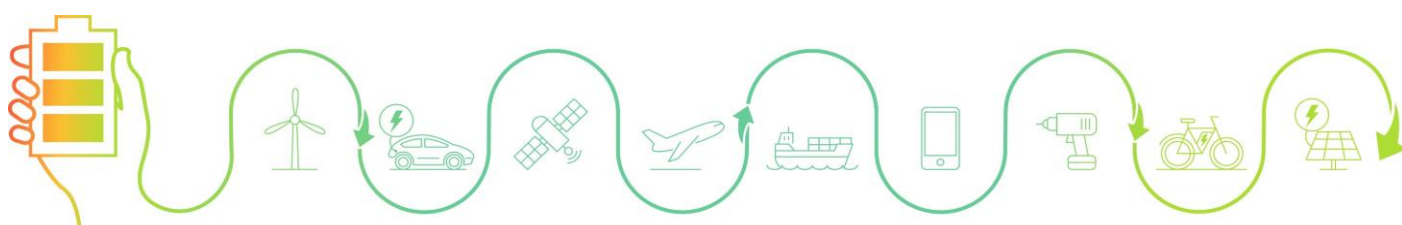
1. Incentivising domestic battery recycling in Europe

RECHARGE sees unique opportunities in the upcoming EU Critical Raw Materials Act, as well as in the implementing procedure of the EU Batteries Regulation, to create strong incentives for domestic recycling of black mass/BAMM as well as battery production waste.

The European batteries industry expects the European Commission **to address the case of black mass/BAMM and clarify its regulatory status**. The black mass/BAMM is an intermediary mixture of components obtained after the crushing of end-of-life batteries or of battery production waste and during the recycling or recovery process of batteries, possibly containing contaminants. The multiple compositions and treatments of black mass/BAMM create a complex field for the application of the Batteries Regulation and related laws such as the Waste Framework Directive, the Waste Shipments Regulation and REACH. A general approach is needed to provide for flexibility, which enables the recycling industry to develop (combinations of the multiple recycling processes), and as an incentive of the circular economy.

The EU's regulatory framework on waste should therefore clarify that black mass/BAMM is an intermediate waste stream within the full battery recycling value chain, and not a product. RECHARGE further urges a harmonised approach within the EU to classify the black mass/BAMM as hazardous waste. RECHARGE believes that such classification is well justified first and foremost due to the hazardous properties of the materials in question (see the Annex to this paper for a more detailed explanation). In addition, such classification would uphold high European standards on safe, sustainable and ecological recycling of batteries and support the establishment of a flourishing EU recycling industry based on a level playing field.

It is also important to consider that Europe's battery production waste volumes will start increasing as EV battery gigafactories ramp up production. To incentivise keeping valuable critical/strategic raw materials contained in the battery production waste in Europe, and in the context of battery materials not being made available in the EU in sufficient quantities to cover rising demand, RECHARGE calls on the EU to establish regulatory conditions enabling the development of an EU battery recycling and processing industry today, which is needed to absorb the volumes of waste batteries returning for recycling in 10-15 years from now. **RECHARGE therefore stresses the need to include pre-consumer waste (i.e. battery**



production waste) in the calculation of recycled content targets, mandated by the EU Batteries Regulation and welcomes the decision to follow this industry advice in the agreed Regulation.²

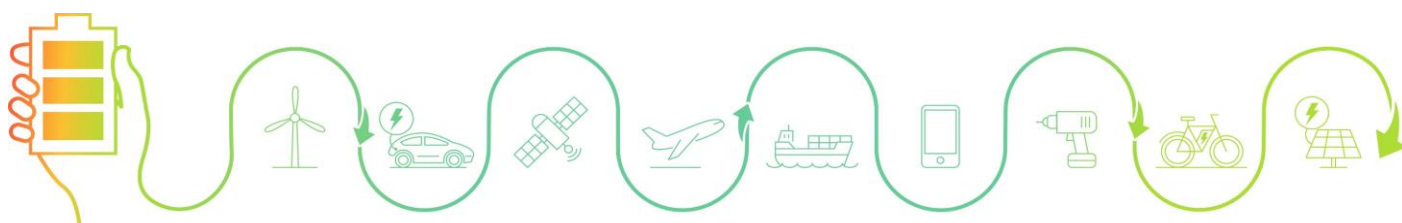
Further to the regulatory clarification of black mass/BAMM as hazardous waste to reduce uncertainty for EU recyclers, the **EU needs to prioritise quality recycling and circularity** (so that secondary material can be returned to batteries).

Strengthening resilience upstream in the EU battery value chain will also require **dedicated investment incentives and financing tools for European recyclers to support establishing a competitive position**. In some black mass/BAMM destination countries, battery recycling is happening since over a decade now and at large scale (e.g. these sites have access to larger volumes of production waste) while the EU battery recycling and battery material processing industry is still nascent in Europe.

If exported and when the recycled black mass/BAMM is not returned to the EU value chain, it risks jeopardising Europe's raw materials security of supply. Currently such battery waste material can be shipped to countries outside of the EU where recycling may be cheaper due to a combination of factors – depending on the third country – in some due to less strict environmental, health and safety (EHS) standards for recycling, lower energy prices, lower labour costs, but most importantly due to a highly competitive established large-scale recycling industry. The material, containing valuable metals such as cobalt, nickel, lithium and manganese, could either be lost completely and never re-used in batteries, or be imported back to Europe as part of new batteries, creating an unfair competitive advantage for non-EU recyclers, materials producers and battery manufacturers.

Considering the arguments described above, **RECHARGE strongly recommends creating incentives to make these valuable recycling resources – black mass/BAMM as well as battery production waste – available for the battery value chain in Europe**. This would make it easier for EU recyclers to secure reliable access to valuable battery recycling resources in Europe (justifying envisioned multi-billion-dollar EU investments), to up-scale and develop the capacity and operational excellence that is needed to recycle massive volumes of EV end-of-life batteries starting in the mid-2030s.

² See a recent RECHARGE paper addressing this specific topic: [The essential role of manufacturing scrap for the European batteries value chain](#). In this position paper, RECHARGE recommendation is to follow the ISO definition of 'recycled content' (as defined by ISO 14021).



2. Battery recycling outside of the EU under equivalent conditions and with secured return to the domestic EU value chain

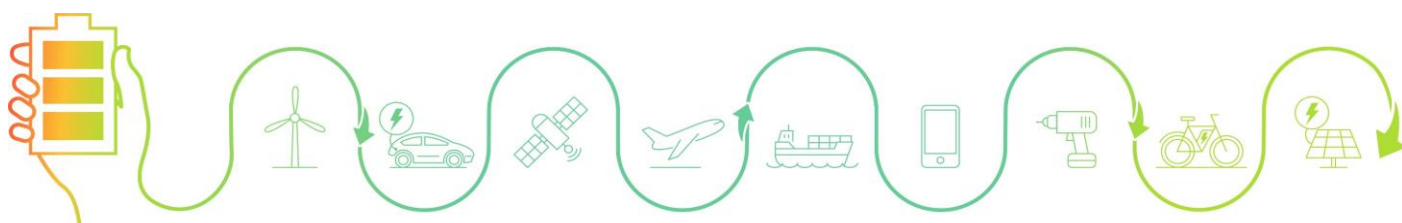
Based on the hazardous waste classification of black mass/BAMM, an export of these materials to non-OECD countries should be prohibited (according to the EU Waste Shipments Regulation), and such export ban to non-OECD countries should be strictly enforced. A risk that recycling will then happen without strict supervision of high European EHS (environmental, health and safety) standards in the destination countries would however prevail. High EHS standards are essential, given that these materials contain substances with a certain hazard potential, and therefore recycling must be done with appropriate precautions for the workers as well as the environment. In addition to the EHS as well as social and sustainability impacts of battery recycling in destination countries, this situation creates a competitive disadvantage for EU-based recyclers with their (costly) best-in-class, high EHS standards-abiding recycling principles.

RECHARGE supports the Waste Shipments Regulation Revision proposal, which requires that exported European production waste is recycled under conditions equivalent to EU environmental and social standards. The EU authorities should be in a position to effectively control the equivalency of battery recycling conditions in foreign countries, and not simply rely on local certification. This needs to be supported by strong enforcement mechanisms to ensure that recycling outside the EU meets the same level of environmental and social standards as domestic recycling in the EU.

To reduce unnecessary delays and the associated safety risks, we propose that the hazardous waste classification is accompanied by an accelerated (fast-track) notification procedure, as provided for in the revision of the Waste Shipments Regulation.

Ultimately, RECHARGE calls for a clear definition and enforcement of 'equivalent conditions' for recycling waste batteries and the intermediates of recycling outside of the EU, based on European EHS as well as social, labour and due diligence standards that are required from recyclers operating in Europe.

Even with a successful domestic investment strategy, it is well understood that Europe will remain reliant on imports for battery materials – also of secondary materials. **The Critical Raw Materials Act must include an ambitious strategy for securing responsible and diversified imports of primary or recycled materials, avoiding an overdependence on supplies from one or few countries.** Strategic partnerships are key to secure the supply of valuable materials and such partnerships will be efficient only if they include meaningful provisions that can trigger CRM supply into Europe, either from existing producers that should be incentivised (financially, de-risking financing tools, tax or otherwise) to direct their production into the





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EU or from new project developments that dedicate their material supply to the EU, as long as these projects are in line with European environmental and social standards.

Black mass/BAMM can well be processed/recycled outside the EU – in an OECD country under equivalent conditions, if it eventually contributes to EU security of supply, and remains in the limit of contracts to secure the return of the secondary material to the European battery manufacturing sector. Industrial players may be interested to have the option to recycle all or part of the waste outside the EU to access capacity or technology not (yet) available in EU.

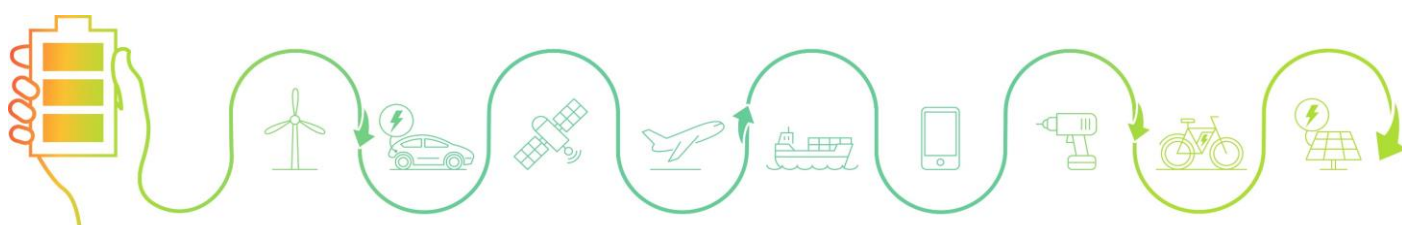
Conclusion: the time to act is now!

Time is of the essence in establishing a sustainable and competitive batteries value chain in Europe. The European battery recycling and material processing industry must be developed now to be ready for the larger volumes of end-of-life batteries that can be expected beginning in 2035, for the recycling and processing battery material which can be returned into batteries.

The EU must act now to set the right investment incentives to grow its battery material mining, refining and recycling industry into a leadership position amidst global competition. The context and objectives of the upcoming EU Critical Raw Materials Act create a unique opportunity to ensure that effective investments and the ramp up of the battery recycling and material processing industry in the EU are enabled. The EU CRM Act should go beyond the EU Battery Regulation in securing access to valuable battery recycling resources and creating a level playing field for the EU battery recycling and material processing industry.

In a changed geopolitical context, the EU must increase its autonomy in strategic value chains to ensure that potential future crises are not detrimental to the bloc's ambitious climate objectives and its crucial strategic industries. Batteries are a key technology for the energy and digital transitions, yet Europe is particularly dependent on imported batteries and battery metals from non-EU countries, while today the European battery value chain is still nascent.

The window of opportunity is short, as the next three to five years will be vital for developing a resilient and competitive European batteries value chain enabling meeting EU's climate objectives and contributing to the EU energy security and strategic autonomy.



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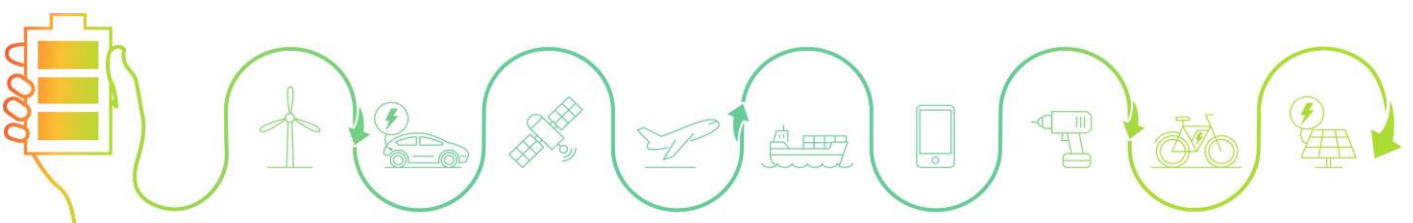
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ABOUT RECHARGE



RECHARGE is the European industry association for advanced rechargeable and lithium batteries. Founded in 1998, it is our mission to promote advanced rechargeable batteries as a key technology that will contribute to a more empowered, sustainable and circular economy. RECHARGE's unique membership covers all aspects of the advanced rechargeable battery value chain in Europe: from suppliers of primary and secondary raw materials, to battery, equipment and original equipment manufacturers (OEMs), to logistic partners and battery recyclers. www.rechargebatteries.org

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ANNEX: CLASSIFICATION OF BLACK MASS AS “HAZARDOUS WASTE”

The end-of-waste status is regulated by the Article 6 of the Waste Framework Directive 2008/98/EC (WFD). According to the Article 6 of the WFD:

“...waste which has undergone a recycling or other recovery operation is considered to have ceased to be waste if it complies with the following conditions:

- (a) the substance or object is to be used for specific purposes;
- (b) a market or demand exists for such a substance or object;
- (c) the substance or object fulfils the technical requirements for the specific purposes and meets the existing legislation and standards applicable to products; and
- (d) the use of the substance or object will not lead to overall adverse environmental or human health impacts.”

In our view, black mass/BAMM as a result of an initial treatment process of waste batteries does not comply with all the criteria listed in the Article 6 of the WFD due to the following reasons:

- a) The substance is not commonly used for the production of nickel, cobalt, manganese and lithium or of their compositions. We are not aware of any facilities that are able to use black mass as a common raw material or another specific purpose without prior treatment within the EU (as a rule, black mass/BAMM needs to undergo additional industrial recycling processes to become a finished product).
- b) With respect to the last clause of point a), no market for the black mass/BAMM as a product exists within the EU.
- c) Black mass/BAMM is a mixture of cathode and anode materials. The composition varies and depends on the types of batteries and the treatment process. No industrial product specification or REACH-registration for black mass/BAMM is known to us.
- d) Due to the non-existent industrial product specification and REACH-registration for black mass/BAMM, adverse environmental or health impacts cannot be ruled out. A final recovery process is needed to generate substances with specific product properties.

According to Article 3 of the WFD, hazardous waste refers to waste which displays one or more of the hazardous properties listed in the Annex III of the WFD. The hazardous properties of a mixture like black mass/BAMM depend on the properties and concentrations of the contained hazardous substances.

As mentioned above, the composition of black mass/BAMM varies significantly. Various hazardous properties such as harmful, toxic, carcinogenic, toxic for reproduction, mutagenic, sensitizing and ecotoxic apply to black mass/BAMM, and as such we are convinced that black mass/BAMM should be classified as ‘hazardous waste’.

