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Policy Brief

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Towards an EU Battery Regulation 2.0?

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Summary

The forthcoming EU Battery Regulation is one of several EU measures aimed at increasing the environmental performance of batteries, safeguard supplies, and build the competitiveness of the European battery and electric vehicles industries. A key challenge in the coming decades will be to produce battery materials fast enough without worsening environmental footprints as companies rush to quickly extract and refine more raw materials. This challenge is only partially addressed in the regulation. In this policy brief, we suggest that careful intervention in relation to demand for batteries may offer important additional solutions and further enhance security of material supplies. We suggest that working towards smaller batteries; extending the lifetime of batteries by encouraging replacement and reuse; encouraging a diversity of battery chemistries; focus more on recycling efficiency of materials; and lessening the need for individual car ownership should be considered as possible features in later revisions of the EU battery regulation or related policies at EU and member state level.

The need for speed: The rapid battery expansion creates environmental and supply challenges

European and global battery industries are booming, and thankfully so - abundant supply of batteries are essential if we are to succeed with decarbonising key sectors such as transport and avoid a climate breakdown. A major challenge in the coming decade, however, will be to produce battery materials at the rate that is needed without worsening environmental footprints as companies rush to quickly extract and refine more materials. Access to sufficient volumes of battery materials will also be a challenge. The European Union (EU) will soon finalise its comprehensive EU Battery Regulation (European Commission 2020). Does the regulation sufficiently address these challenges, or could other policies be envisioned? In this policy brief we take stock of the proposed regulation and explore elements that could feature in later legislative initiatives as potential supply challenges and environmental pressures increase in the course of the 2020s.

Status: Pioneering legislation soon to be adopted

A provisional agreement on the EU Battery Regulation has been reached between the EU Council and the EU Parliament. It is expected to be formally adopted early 2023 with the regulation entering into force shortly after. Subsequent delegated and implementing acts on more technical or methodological issues are stipulated to be issued between 2024 and 2028 (e.g., carbon footprint and recycled content methodology, performance and durability requirements, and electronic exchange of information).

The regulation is pioneering and wide-ranging. It serves as an early example of sustainable product legislation that the EU wants to introduce in a range of key sectors, and it enables a shift towards a more circular value chain. Moreover, the regulation, alongside the EU Strategic Action Plan has, overall, been received favourably by the European automotive industry and the regulation explicitly sets out to strengthen European competitiveness (see BATMAN policy brief 'The New EU battery regulation: Enabling sustainable competitiveness?' for a further discussion).

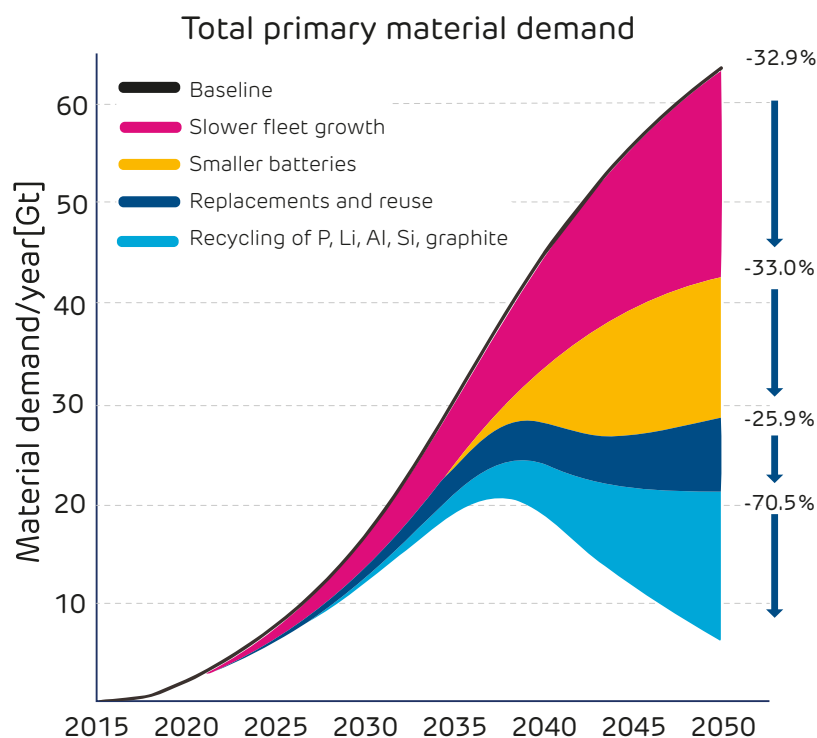
The current draft regulation: strengths and weaknesses

The environmental goals in the current draft regulation are notable. First, there will be a maximum allowed level of carbon emissions in place by 2027 and all batteries on the European market will be classified into higher or lower carbon emission performance categories. The carbon footprint of batteries will be calculated considering the full life cycle of the battery value chain. Second, and as noted above, mandatory material-specific minimum levels of recycled content from manufacturing and consumer waste will be introduced (16 % cobalt, 6 % lithium, 6 % nickel, and 85 % lead). Third, companies placing batteries on the European market will need to demonstrate that they have rigorous and third-party verified social and environmental due diligence procedures for the entire supply chain of their batteries. Finally, it will become mandatory to equip batteries with a digital passport that carries information of social and environmental performance as well as information relevant for reuse and recycling phases. Other provisions include specific recovery targets, recycling efficiency goals and tougher goals for the collection of spent batteries. It is notable, however, that the recovery targets relate only to valuable materials that are already recovered with high efficiencies today - nickel, copper, cobalt, and lead. Lithium also features, albeit with lower efficiency requirements.

The regulation serves as one important element in the EU's overall efforts to secure access to batteries in Europe and to build a new and competitive European battery industry (EU Strategic Action Plan 2018). The regulation is geared towards regulating the entire battery value chain, from facilitating European battery production to handling end-of-life batteries. However, there is little attention to the different ways the demand for batteries and different battery types could be regulated. Model simulation results in the BATMAN project indicate a high risk for supply shortages that cannot be mitigated sufficiently with technological measures alone. It is therefore important to consider additional measures that include how to electrify the vehicle fleet using less critical materials. Additional and select demand reduction strategies could offer important benefits, including better safeguarding battery materials supply. Such reduction in demand would lead to reducing the need for mining thereby lessening potential negative social and environmental impacts both within and outside the EU. These issues are, however, largely ignored in the current draft regulation.

The EU, alongside other actors, wants more recycling of battery materials to alleviate some of the pressures associated with primary production. However, large quantities of recyclable batteries will only become available two decades from now. In figure 1 we illustrate the role recycling could play and at what time recycling could offer a solution. We also indicate what role other potential initiatives related to shaping the demand for batteries could play. It is worth noting that in the calculations featuring in figure 1 smaller EV batteries were assumed to be more widely adopted from 2035 onwards, but under the right regulatory environment this intervention could have an immediate effect.

Table 1



Lifestyle, behaviour, and consumer demand - growing attention to the need for change

There is increasing attention to the influence of behaviour, lifestyles, and culture - including consumption patterns and dietary changes - on climate change (IPCC 2014, Nordic Energy Research 2021). In a landmark assessment Sitra (2019) demonstrated that changing our lifestyles and altering demand for key products would significantly lower carbon emissions. These insights have been complemented by studies that problematise the exceptionally high environmental footprint of consumers in the global north – with one study demonstrating that the richest 10 percent of the world population is responsible for around 50 percent of the global greenhouse gas emissions (Karthä et al. 2020).

The EU's broad sustainable products agenda increasingly situates consumer choices at the heart of policy making. A key aim is to provide consumers with the information needed to make their own more sustainable decisions. The recent proposal for Ecodesign for Sustainable Products Regulation stresses the need to enhance product durability, resource efficiency, and recycled content – although it does not explicitly call for changes to consumption patterns or volumes. Moving forward we can expect that consumer and demand-related issues will grow in importance. Below we discuss how these concerns may become part of future battery policies in Europe.

What could demand-side provisions in EU battery policies look like?

Efforts to reduce demand for battery materials could come in later revisions of the EU battery regulation or in other transport-related policies and regulations at either EU or member state level. Below we put forward four suggestions that may inspire future policy making.

Small is beautiful: promote smaller vehicles with smaller batteries

Our assessment indicates that encouraging the use of smaller vehicles with smaller batteries would greatly reduce overall material demand. Smaller batteries would typically, by way of illustration, mean more 30-40 kWh (Nissan Leaf type) batteries instead of the 60–100 kWh we find in most Tesla vehicles and larger electric SUVs. If the vehicle size remains unchanged, this shift would cut the battery size by more than 50%, and the driving range roughly in half due to gains in efficiency – from around 500-600 km to 250-300 km. With lighter cars, the range would be larger. The everyday use of most drivers is far less than the 200 km and so the user would not perceive any limitation in their driving habits. Further advances in reduced charging times and the availability of charging infrastructure could also increase the attractiveness of cars with smaller battery packs by enabling longer trips with smaller batteries. Both measures in the US Inflation Reduction Act as well as recently suggested adjustments to the Norwegian tax code incorporate clearer distinctions between larger and smaller EVs – with smaller EVs being subject to a more favourable duty regime. These types of measures could serve as inspiration for additional member state or EU level measures.

Make replacing and reusing batteries easy

Enabling easy reuse and replacement of batteries in vehicles could also help avoid cars becoming obsolete at an early stage, thereby reducing demand for new EVs and batteries (Aguilar Lopez et al. 2022). Future regulations would need to build better compatibility across vehicle and battery types and annual cohorts. The battery passport provision in the new EU battery regulation could also be further expanded to encompass information that would make battery reuse more attractive and simpler. Moreover, new regulations could strengthen consumer's rights to repair and incentivise service points that offer battery changes. Ideally, some of these batteries come from used EV batteries, provided that a legal framework to regulate and limit the producer's liability is implemented. This measure could also be further strengthened if battery warranties are prolonged. Batteries have typically shown to last longer than the originally expected 8-10 years.

Rethink and expand recycled content requirements

A novel element in the proposed battery regulation is the mandatory requirement for recycled content in the production of new batteries and the recycling efficiencies at end of life. However, the current draft

battery regulation only stipulates minimum recycling efficiency levels for nickel, cobalt, lead and lithium. In addition, phosphorus, aluminum, silicon, and graphite should also be targeted in the new battery regulation. The recovery and eventual recycling of all these materials can be highly effective in reducing the risk of bottlenecks in the transition to EVs, and it can also reduce negative environmental and social impacts if recycling contributes to reduced levels of mining. We caution, however, that there is a risk that overly high recycled content requirements might promote recycling at the expense of reuse and extending the useful life of batteries. This would be unfortunate as keeping batteries in use for as long as possible usually offers superior environmental performance and reduce the need for new batteries and materials. Instead, directing new provisions to the demanding high material recovery rates, that is, simply demanding that the materials must be recovered once a battery is finally and naturally at the recycling stage, could help safeguard long reuse phases of batteries.

Sharing is caring: why own a car?

Finally, and as a broader point beyond the EU battery regulation, building smart cities with reliable public transport can reduce the overall size of the vehicle fleet. Efforts along these lines need to continue. Given future climate and materials projections, the current European consumer preference for private car ownership may prove unsustainable in the long run. While it is likely beyond the scope of EU institutions to challenge this directly, nudging and facilitation of car sharing services as well as further increasing availability of public transportation should be high on European policy makers' agenda.

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This policy brief draws on insights generated by the three-year research project BATMAN (Lithium ion BATteries - Norwegian opportunities within sustainable end-of-life MANAgement, reuse and new material streams) which has been jointly conducted by NTNU, IFE, UiA, TØI, Hydro, Elkem, Eyde Cluster, Glencore Nikkelverk, Agder Energi, and Fiven. These research partners have mapped emerging battery chemistries and the evolution of the European EV-fleet. They have assessed issues such as how we may balance reuse vs recycling of batteries, bottlenecks in supply of battery materials and possible increases in carbon emissions. The project has also analysed how new regulatory and policy directions may shape the sector, for example through carbon leakage, technology lock-ins, or other problem shifts.



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