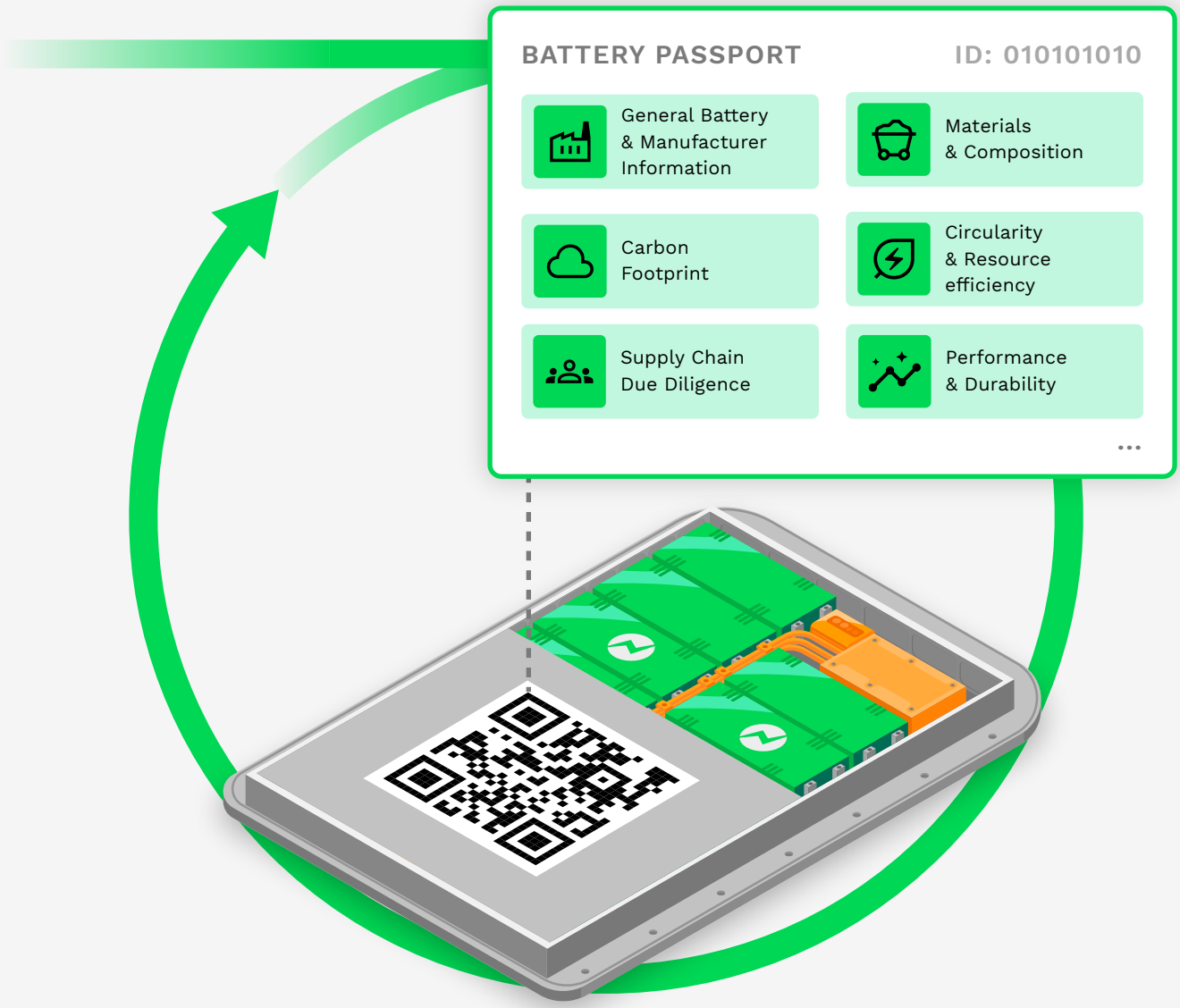
Battery Pass




# Position Paper on content requirements of the EU Battery Passport

## Recommendations to the European Commission by the Battery Pass Consortium

Version 1.0 / July 2023

Supported by:

Federal Ministry for Economic Affairs and Climate Action

on the basis of a decision by the German Bundestag

# The Battery Pass consortium

CONSORTIUM LEAD

SYSTEMIQ

CONSORTIUM PARTNERS

acatech · Audi · BASF We create chemistry · BMW GROUP · Circulor

FIWARE FOUNDATION · Fraunhofer IPK · TWAICE · umicore · VDE RENEWABLES *under subcontract

ASSOCIATED PARTNERS

Global Battery Alliance · GS1 in Europe · Mercedes-Benz · RWE · SAP

Co-funded by the German Federal Ministry for Economic Affairs and Climate Action (BMWK), the Battery Pass consortium project aims to advance the implementation of the battery passport based on requirements of the EU Battery Regulation and beyond. Led by system change company Systemiq GmbH, the consortium comprises eleven partners and a broad network of associated and supporting organisations to draft content and technical standards for a digital battery passport, demonstrate them in a pilot application and assess its potential value.

# Contents

This document is based on the draft version of the EU Battery Regulation published in June 2023 following the vote of the European Parliament.

# Introduction

This document addresses clarification needs and presents recommendations by the Battery Pass consortium on battery passport content requirements as laid out in Article 77 as well as further articles relevant to the required content as of the EU Battery Regulation text adopted by the European Parliament and Council as of 28 June 2023. While this document builds on insights developed for the Battery Passport Content Guidance, additional positions and recommendations (e.g., on the technical requirements of the battery passport) might follow in the course of the Battery Pass project. The positions and recommendations are directed towards the European Commission including related institutions such as the Joint Research Centre (JRC) and parties involved in the secondary legislation process (delegated and implementing acts). It aims to raise awareness about relevant aspects of the policy to reconsider and explore further to enable a smooth implementation of the battery passport and ensure reaching the desired impact.

The document is structured in two parts: A) general battery passport specifications, and B) requirements relating to specific content requirements / data attributes. A summary of selected positions and recommendations is included first, with further details being elaborated later in the document.

For further information on the background of this document as well as legal aspects such as copyright requirements, please refer to the DISCLAIMER on page 27.

# Executive Summary

Below topics are listed in the order of overarching to more specific for A) general battery passport specifications and by Battery Regulation chapter numbers for B) specific battery passport content requirements. Further information on each topic can directly be accessed via the links embedded in the text.

**A) General battery passport specifications**

- Voluntary information

  Besides the mandatory scope of data attributes for the battery passport, availability of **additional voluntary information could add significant value** as this would extend the focus from pure regulatory compliance to business purposes, which in turn would increase acceptance and effectiveness.

- Battery passport data availability level

  While availability of data is only requested on a battery level for now (which most often would be the battery pack), **there is a clear need and value add for the availability of the battery pack information on a removed battery module** (e.g., to enable recycling companies to access important information on the composition of the battery module). At the same time, reporting data attributes specific to modules and cell groups (beyond the mandatory battery pack information) should be enabled on a **voluntary basis** by the technical system of the digital battery passport.

- Responsibility for the battery passport

  With uncertainty on the specific responsibility for the battery passport and its transfer cases remaining, the **responsible economic operator(s) should be added as data attribute on the battery passport and further guidance on the responsibilities should be provided**. Furthermore, uniform regulations across EU Member States are needed which address the consequences of a potential non-compliance of the responsible economic operator with the battery passport requirements.

- Access rights to different information

  Role-based **access rights to data attributes of the battery passport need to be further specified urgently**, particularly with respect to the category "interested persons". While an implementing act on access rights is scheduled, access control is a major aspect of the technical system of the passport. We encourage appropriate balancing of data confidentiality concerns with circularity and sustainability impacts.

- Definition of ‘up to date’

  The **term ‘up to date’ leaves room for interpretation and therefore requires urgent clarification** as this crucially determines the amount of data transfer during the use phase and the corresponding technical design requirements. The need for ‘up-to-dateness' should be considered based on the use case of the individual data attributes. In addition, any definition must consider different connectivity of batteries and potential confidentiality or privacy concerns regarding use patterns. Such specification should be harmonized with requirements in Articles 10 and 14 of the Battery Regulation.

- Implications of repair

  In the case a **non-waste battery undergoes repair** (which does not require a new battery passport to be issued), **the data history should be kept available,** clearly differentiated from up-to-date information. With non-defective batteries which are intended for recycling currently being treated as waste batteries in the context of transportation, unnecessary logistics costs might be caused. We therefore recommend distinguishing based on the individual conditions of the battery for transport to recycling.

- Definition of the term ‘cease to exist’

  **The provision that the ‘battery passport shall cease to exist after the battery has been recycled’ at the end of a battery’s life is undefined and therefore calls for additional guidance,** particularly which step of the recycling process qualifies a battery as recycled. We propose that expired battery passports including their data should be archived by the economic operator, recycler or other third parties tasked with the data service for an extended period after the battery is recycled to track recycling steps, retain a record for future validation action (e.g., compliance checks) and support traceability of recycled materials.

**B) Specific battery passport content requirements**

- Article 7: Battery carbon footprint

  We **recommend incorporating incentives for using primary (company-specific) data in calculating the battery carbon footprint** to address the underestimation that can occur with current methodologies and default values based on secondary data, and to incentivize the operational realization of lower carbon footprints through supply chain decarbonization. For instance, using **the cut-off approach for the end-of-life (EOL) and recycling allocation yields an accurate representation of emissions that have occurred until placement on the market**, while the Circular Footprint Formula (CFF) as proposed by the PEF methodology models the footprint of the entire battery lifecycle based on assumptions of the EOL. Furthermore, we **recommend a capacity-based approach for defining the functional unit**. Future preparations for data aggregation and exchange systems are necessary, along with harmonizing the PEF[1] methodology with global Life Cycle Assessment (LCA) initiatives. In addition, clear requirements for the carbon footprint declaration of second-life batteries should be provided.

- Article 8: Recycled content

  The **mandatory technical documentation on recycled content must be determined before the introduction of the battery passport** (which includes recycled content information) to ensure verifiability and traceability. Furthermore, the **battery categories in scope should be clarified**, especially whether industrial batteries with exclusively external storage will be included. We also **recommend the separate calculation and reporting of recycled content from pre-consumer** (manufacturing waste, excluding run-around scrap) **and post-consumer waste** to enhance data transparency and validation and to enable observing a development over time.

- Annex XIII: Battery passport information requirements

  Most **performance and durability data attributes to be reported in the battery passport** (Annex XIII (4) incl. Articles 10 and 14) **require more elaboration on methods** to ensure comparability and data accuracy or adjustments for a feasible implementation. We recommend e.g., revising the definition of State of Charge (SoC), replacing the capacity threshold for exhaustion with a State of Certified Energy (SOCE) threshold for EV batteries, and providing more detailed information on how temperature and accidents in the battery passport can be reported.

- Article 10/Annex IV: Performance and durability requirements

  **Clear specifications are urgently needed for the required document containing performance and durability data attributes for batteries, including the reporting of dynamic data.** We encourage providing timely guidelines or scheduling a delegated act to address specifications before requirements are due 12 months after entry into force of the Battery Regulation.

[1] Product Environmental Footprint, see https://green-business.ec.europa.eu/environmental-footprint-methods_en

- Article 14/Annex VII: SoH and expected lifetime of batteries using a

  The **methods for the measurement of data to be provided via the battery management system require more detailed specifications** (see above Annex XIII). In addition, defining the term of ‘up to date’ data attributes is crucial, taking into account the different battery categories and designs. Timely guidelines or scheduling of a delegated act to address specifications are desirable before requirements are due 12 months after entry into force of the Battery Regulation.

- Article 17: Conformity assessment procedures

  We **recommend detailing a market conformity assessment procedure specifically for re-used/repurposed/remanufactured batteries**, including those imported from outside the EU. Furthermore, the verification requirements for content-related data attributes (such as carbon footprint) are unclear and should be specified and aligned with the market conformity assessment procedure, since this could otherwise potentially lead to double-verification processes.

- Articles 47-53 Supply chain due diligence

  We **recommend publishing currently missing guidelines for companies on the implementation of due diligence requirements**, including those of the Battery Regulation and other applicable EU regulations, taking into account harmonization and industry consultation.

# Battery Pass positions and recommendations

## Part A: General battery passport specifications

### Article 77: Battery passport

#### Voluntary information

There is uncertainty surrounding the addition of voluntary information in the context of the battery passport. Both market conformity organisations and industry representatives would encourage additional information being allowed since this would extend the focus from pure regulatory compliance to business purposes, thereby increasing acceptance and effectiveness. A static setup would prevent companies from leveraging circularity and sustainability potentials which might not have been considered by the Battery Regulation so far. Therefore, we recommend formulating approaches on how additional information can be made available keeping the interoperable architecture, a clear separation from mandatory elements as well as managing access rights in mind.

#### Battery passport data availability level

Currently, the Battery Regulation specifies most data attributes on the battery level, i.e., the highest level available, which usually refers to the battery pack. We see a clear need and value-add that battery passport information of the pack (e.g., on safety measures or the composition of the battery) should also be available for modules and cell groups, when removed from the pack, to convey important information to e.g., battery handling companies as well as recyclers. Furthermore, it is considered necessary e.g., in cases where modules are exchanged due to repair, to require a subset of the information in the battery passport to be updated. While this should not apply to data with complex calculations such as the carbon footprint, other information, e.g., ESG information, should be updated, if applicable. Since batteries are serialized on cell level during manufacturing, this is considered feasible by industrial consortium members.

This recommendation does not necessarily include reporting data attributes specific to modules and cell (groups). However, this should be enabled on a voluntary basis by the technical system of the battery passport and be assessed in the context of the review and next iteration of the Battery Regulation. Such reporting may significantly increase the amount of data to be handled, which should be weighed against the added value that originates from conveying varying information within a battery pack (e.g., different ageing of modules or combination of different cell chemistries) to improve the allocation after the first life regarding reuse, repurpose or recycling and economic viability for specific participants in the European recycling value chain.

#### Responsibility for the battery passport

There are uncertainties regarding the responsibility for the battery passport and the indicated transfer cases. This refers particularly to the questions 1) whether economic operators remain responsible for information they have included before a transfer of responsibility has taken place, and 2) who will be responsible for fulfilling implicit requirements such as making sure the battery passport ceases to exist after the battery has been recycled. Furthermore, in some cases it is

unclear how required information can be retrieved, e.g., how to retrieve data from the end-user if not having access to the battery management system. We recommend that the respective responsible economic operator(s) should be added as a data attribute on the battery passport and processes should be defined to update information in cases without transfer of responsibility e.g., repair. Furthermore, detailed guidance is needed on how to fulfil the responsibilities as well as manage the transfer of responsibility. For further details, please refer to chapter 5.2.2. in the Battery Passport Content Guidance.

### Scope of 'placing on the market' and 'putting into service'

Based on the regulatory text, it is currently unclear, whether the terms 'placing on the market' or 'putting into service' also entail replacement batteries used as a spare part in products that have originally been placed on the market or put into service before the battery passport became mandatory. Since it could be challenging to obtain the required battery passport information, we ask for further clarification on this specific case.

### Applicability for test and research batteries

It is not clearly specified whether the activity of 'putting into service', which results in the requirement for a battery passport, also applies to test and research batteries. We recommend describing provisions that exclude test and research batteries (depends on definition of respective term, include e.g., prototype batteries and sample phase batteries) from battery passport requirements in order not to slow down battery development. We request an analogy to PPORD (Product and Process Oriented Research and Development), which is applied in chemical regulation.

### Consequences in the case of non-compliance

As the Battery Regulation does not specifically define consequences for non-compliance with the battery passport requirements, the public-legal consequences depend on the respective Member States and their market surveillance authorities as regulated in EU2019/1020 and no Europe-wide consequence is defined.

To avoid different legal consequences, it will be crucial that all EU Member States implement uniform regulations addressing the consequences of a potential non-compliance with clear provisions to be established for appropriate sanctions in case of violation. We recommend establishing a clear provision for the event of the violation of the battery passport requirements that apply in all EU Member States.

### Legal basis for liability claims under civil law

The Battery Regulation mentions civil liability only in relation to the supply chain due diligence requirements (Recital 70) stating that EU legislative instruments may address civil liability of companies or damages caused and refer to national rules in case they are not addressed. E.g., the German Supply Chain Due Diligence Act explicitly states that the breach of obligations does not establish any civil liability, whereby this exclusion shall not affect any civil liability established independently from it (German Supply Chain Act, Division 2, Section 3).

This co-existence of public law and civil law could be conceivable for the battery passport as well. Therefore, we recommend a clear statement on the matter such as given in the German Supply Chain Act.

### Access rights to different information

The Battery Regulation states that within a role-based access model ‘any natural or legal person with a legitimate interest in accessing and processing that information’ will have access to 1) individual battery information (performance and durability, state of health, battery status, use information); 2) battery model information only accessible to interested persons and the Commission (Annex XIII (2,4)). Based on this, a clear understanding of the actors to be part of the “interested persons” group is missing including the exact access rights of each group.

We recommend specifying ‘legitimate interest’ in the context of the upcoming implementing act much earlier than the mentioned maximum time (at the latest 36 months after entry into force of the Battery Regulation). An earlier adoption of the implementing act is urgently needed as the battery passport is required by 42 months after entry into force of the Battery Regulation and access control is a major aspect for setting up the technical system.

We encourage appropriate balancing of data confidentiality concerns with circularity and sustainability impacts for determining the access rights. Furthermore, ‘legitimate interest’ should emerge from a verifiable and qualified need for the data requested for the purpose of conducting economic activities related to the battery, which may require the definition of distinct actor roles. For instance, sorters and dismantlers could obtain access to the information on materials in the cathode, anode, and electrolyte since they need to assess a battery’s state and value when deciding on the subsequent handling route and approach (reuse, repurposing or recycling). In addition, such approach must specify a process for verification of an actor’s role and rules for vertically integrated companies that may have several roles. The access rules for performance and durability data should be harmonized with the different reporting tools mandated through Articles 10 (document accompanying the battery) and 14 (information in the Battery Management System).

### Definition of ‘up to date’

Article 77 includes that data shall be kept ‘up to date’, which is not specified further therein. We therefore recommend clarifying details on this requirement as soon as possible, because it has significant impact on the technical implementation of the battery passport and the volume of data transfer. Sufficient lead-time is especially important as the development of battery management systems may have to be adjusted to requirements. This clarification should include considerations in the context of the EU Data Act that is discussed in EU institutions.

‘Up-to-dateness’ of dynamic data in particular should consider the use case of the individual data attributes. An update may be triggered by an economic event such as a repair or an intention to sell the battery, or by an actual change in the data attribute, which in either case requires clear definitions on how to fulfil the obligated up-to-dateness of data. As an example, an automated daily update would result in significant amounts of additional technical assets as well as data to be transferred and potentially stored via the battery passport but would not add value for several data attributes, e.g., for remaining capacity or remaining energy of a battery, which do not change in short periods of time.

The specification should consider available connectivity of different battery applications and designs to make the implementation feasible. Confidentiality or privacy issues regarding the end-user (e.g., GDPR) or employees using battery-powered devices must also be weighed up for implementation since use patterns may be derived from detailed data, providing access to personal or commercially sensitive information. The Battery Passport Content Guidance (chapter 6.7) includes several recommendations on the update interval of individual data attributes.

Performance and durability ‘parameters referred to in Article 10(1)’ are included in the battery passport ‘and must be made available when the battery is placed on the market and when it is subject to changes in its status’ (Annex XIII (4)). The reference to the change of the battery status is not specified further. We recommend elaborating details on the concrete responsibilities for making data available upon a battery status change. Crucially, for the battery passport to support circular economic activities, the data would need to be made available before a change in the battery status occurs, as actors need the information for their decision on whether to e.g., purchase a battery for repurposing or to remanufacture a battery.

### Implications of repair

The consequences of repair for the battery passport are not entirely clear and require further elaboration, as repair is not defined in the Battery Regulation. The Proposal for Ecodesign for Sustainable Products Regulation (ESPR) describes repair as operation on either a defective (non-waste) or waste battery. Repair can thus be part of both, the definition of re-use, and preparing for re-use which are distinguished through the (non-)waste status of the battery. The provisions of the EU Battery Regulation do not include the case of repair of non-waste batteries during the use phase, leaving open how data changes resulting from such operations should be handled. This could also include significant changes during repair, due to an exchange of a battery module for example.

We suggest to clearly define 'repair' in relation to batteries and to distinguish it from the different cases of reuse. Accordingly, a battery should not be considered as waste before repair (as there is no will to discard). We further recommend keeping the data history available in the battery passport in cases of repair, while ensuring that the ‘up to date’ data is clearly discernible.

### Distinction between waste and non-waste status of batteries

The provisions in the EU Battery Regulation in Annex XIV includes an option to provide information on the actual battery state to distinguish between actual waste and non-waste batteries for transport. However, the wording of the provisions only covers batteries subject to an ‘intent for re-use’ and ‘defective’ batteries. In lieu of a definition of the term ‘defective’ in the Battery Regulation, we recommend that the scope of these provisions should also include batteries that are not defective and have no further use and thus are intended for recycling. Without such further elaboration, the broad definition of waste, which is drawn from the EU Waste Directive, could indicate that all batteries intended for recycling must be designated waste. We advise to clarify the wording used in Annex XIV to avoid costly logistics for batteries that may otherwise unnecessarily be declared as waste.

### Definition of the term ‘cease to exist’

The term ‘cease to exist’ that is used with regard to the end-of life of a battery and its passport is not further defined in the Battery Regulation but leaves room for interpretation. Further guidance and elaboration on the term and its implications for the responsibilities is therefore needed. We propose that the passport and relevant data should not cease to exist immediately after the battery is recycled, but rather be archived by the economic operator, recycler or other third party tasked with the data service for an extended period that should be determined in discussion with relevant stakeholders (10 years may be a reasonable period, which applies to other business documents). Only a small set of battery passport data needs to be archived for the purpose of traceability, which should be determined together with relevant stakeholders.

Additional information on the different steps during the end-of-life can thus be attributed to the battery passport and allow for tracking adequate battery recycling. This could be used by

economic operators as verifiable information to prove the origin of recycled content for the next life cycle of the recycled material – and its next battery passport. Ensuring adequate recycling processes and realizing a high quality of recycling could be a key use case to enable authorities to trace back information on the recycling of a battery after they entered the process of recycling. Additionally, it would provide an opportunity to incorporate details about successful end-of-life management. This would involve registering and validating the 'recycled' status of batteries, offering a valuable tool in mitigating the issue of illicit battery export that currently affects end-of-life vehicles.

### Definition and scope of the term 'recycled'

In the EU Battery Regulation, it remains unclear at which point in the multi-step recycling process a battery counts as 'recycled', how the 'ceasing to exist' of the battery passport will proceed in practice, and who must be involved. If the battery passport ceased to exist upon dismantling of the battery, further tracking of the whereabouts of the battery material would not be possible, leaving the door open for material leakage towards inadequate recycling. The tracking of recycling steps could contribute to responsible recycling back to battery grade materials, although any implementation requires that material flows after extraction from batteries can be attributed back to single battery entities. Further guidance and elaboration on the definition of 'recycled' as well as the end-of-life information to be included in the battery passport is therefore required. We recommend following the scope of 'recycling' proposed by the Circular Economy Initiative Germany[2], covering all steps of recycling from start of disassembly to availability of metals or metal salts, ready for industrial use.

## Annex XIII: Battery passport information requirements

### 'Results of test reports'

The 'results of test reports proving compliance with the requirements set out in this Regulation or any implementing or delegated act adopted on its basis' shall be accessible via the battery passport to notified bodies, market surveillance authorities and the Commission (Annex XIII (3)). However, the format or specific contents of the test reports are not further elaborated. We recommend that contents of the market conformity assessment procedure including the audit of the technical documentation are clearly specified. In addition, format and process to be used for reporting and including the information in the battery passport should be defined in detail.

### Specification on performance and durability parameters

There are similarities, overlap and, in few cases, inconsistencies between the data attributes mentioned in Annexes XIII, IV and VII regarding performance and durability, all of which are content of the battery passport. Most data attributes lack detailed description in the EU Battery Regulation. Guidance on the data attributes including reference to relevant (international) standardization efforts, e.g., UNECE GTR 22 for state of certified energy (SOCE) of EV batteries, is urgently needed to make implementation of the requirements feasible (see also Articles 10 and 14). Sufficient lead time for the development of the BMS renders this issue particularly urgent, as – in addition to the reporting in the battery passport – the data referred to in Articles 10 and 14 and listed in their respective Annexes shall be made available through a document accompanying the battery and/or the BMS 12 months after entry into force of the regulation.

[2] https://en.acatech.de/publication/resource-efficient-battery-life-cycles/

Besides referring to already ongoing standardisation efforts, a short-term clarification on conditions for the evaluation of the data attributes is needed to ensure feasible implementation. We recommend that the data specification should be harmonized across different reporting tools, i.e. the battery passport, the document accompanying the battery (Art. 10) and the BMS data (Art. 14). The Battery Passport Content Guidance contains considerations on all performance and durability parameters. We provide some of these in Part B) 'Individual performance and durability data attributes'.

Clarification may potentially be provided through a delegated act as mentioned in Article 77(2) and in Articles 10(6) and 14(4). The specifications should take into account the different battery categories and applications, including but not limited to stationary vs. mobile batteries, cycle vs. non-cycle applications (e.g., uninterruptible power supply), as well as all battery designs including high-temperature batteries and redox-flow batteries. Dynamic data and system requirements for keeping data up to date particularly depend on the definition of this requirement. See section Article 77 'definition of up to date'. We further recommend integrating several voluntary data attributes, such as reporting of remaining capacity for all battery categories, and, if applicable, resistance on module level in addition to pack and cell level.

# Part B: Specific battery passport content requirements

## Article 7: Battery carbon footprint

### Primary (company-specific) data usage

Primary data are needed for accurate and transparent Carbon Footprints (CF) in order to enable informed decisions that steer operational measures for life cycle decarbonization (real-world optimization). The Battery Regulation mandates primary activity data only in the manufacturing stage which leads to >50% of the CF being based on secondary data[3]. Current Product Environmental Footprint (PEF)-related methodologies and Environmental Footprint (EF)-compliant datasets might lead to a disincentivization of primary data usage as specifications (e.g., default recycling scenarios, CFF default values for key parameters) risk resulting in lower carbon footprints than when using primary data. Additionally, secondary datasets provided via the EF-node potentially underestimate environmental burdens compared to primary data (e.g., graphite). If companies base their carbon footprint declarations mostly on secondary data, the carbon footprint declaration risks losing the potential to differentiate between batteries (e.g., as guidance to customers). Consequently, the carbon footprint instruments of performance classes and maximum thresholds lose their potential to enable battery supply chain decarbonization.

We recommend reviewing the EF-compliant secondary datasets that are most relevant for the battery carbon footprint (i.e., hotspots such as anode and cathode materials). Furthermore, we recommend specifying the carbon footprint methodology via the delegated act in a way that incentivises for the use of company-specific data. For example, this could be done by:

- re-evaluating and adjusting default scenarios, default values, and secondary datasets that have substantial impact on the battery carbon footprint (e.g., synthetic graphite),
- disclosing the share of secondary data used and including confidence intervals in the appropriateness,
- providing additional certificates for high shares of primary data used in the carbon footprint calculation.

[3] Based on the 2018 PECFR for batteries hotspot analysis (page 43).

### Functional unit

The functional unit is currently defined by the Battery Regulation and the JRC draft rules as one kWh (kilowatt-hour) of the total energy provided over the service life by the battery system, measured in kWh. This definition leads to several risks of diluting actual carbon emissions occurred:

- Specifying the service life requires harmonised test procedures across battery applications – these procedures currently do not exist in a multitude of battery applications, e.g., heavy-duty vehicles, industrial batteries, LMT batteries. In lack of these procedures, manufacturers will be able to declare the service life based on proprietary test specifications and procedures, which ultimately leads to incomparable carbon footprints declared.
- Specifying the service life in terms of existing application-specific procedures – as has been proposed for light-duty EVs by the JRC via the Worldwide Harmonized Light-Duty Vehicles Test Procedure (WLTP) procedure – risks providing unintended incentives where less efficient (in terms of energy consumption per km), heavier cars bear a better battery carbon footprint with a similar battery capacity. This is the result of the per km energy consumption being proposed as a means to determine the energy provided over the service life.

We recommend taking a capacity-based and battery-specific[4] approach to the functional unit, enabling the comparison of actual supply chain emissions via a tested function provided by all batteries: the capacity to provide energy (at rated capacity of the battery model). This would yield comparable and accurate battery carbon footprints with a reduced risk for biasing the results via tested "application service life" parameters. Furthermore, it would be more understandable for consumers.

### End-of-life allocation

The cut-off approach is the most suitable method for calculating and allocating EOL emissions of batteries at the point of placing the battery on the market as required by the EU Battery Regulation. With the cut-off approach, actually occurred recycling emissions can be attributed to the product, with recyclers being incentivized to improve the carbon balance of their operations as low-emissive recycled content will be a value proposition to manufacturers. In contrast, the Circular Footprint Formula (CFF) as required by the Battery Regulation in its current specification incorporates parameters that lead to unverifiable credits for the EOL recovery of secondary materials, increasing the risk of underestimating carbon footprints. The current CFF specifications are based on assumptions of the EOL fate that cannot be verified at placement on the market. They are also based on default values and secondary data that inherently disincentivize primary data usage and therefore counteracts the goals of the carbon footprint declaration: accurate and comparable carbon footprints. In addition, as per the CFF specification, the secondary materials supplied from the battery's first lifecycle will have to carry burdens of primary materials when reused in the next lifecycle. This would effectively increase the secondary materials' carbon footprint and therefore reduce the incentive to produce low carbon secondary materials due to the EOL credits given to the battery manufacturer responsible for the carbon footprint declaration in the first lifecycle.

The CFF inherently aims to incentivize the supply of secondary materials. This is seen controversially by the battery recycling industry as EOL credits are claimed by battery manufacturers responsible for declaring the carbon footprint, and because of the low impact on the carbon footprint (due to the A factor) of providing low carbon recycled content. For immature and/or long-lasting product lifetimes such as batteries, the CFF carries a high risk of incorrect carbon balances (loss of carbon), which is not in line with the precautionary principles followed in environmental and chemical legislations. For a comparative analysis, please refer to the Battery Pass EOL allocation assessment.

[4] Hence, the functional unit should be independent from the application.

We recommend incorporating the cut-off approach as the EOL allocation for the Carbon Footprint declaration as it focuses on emissions as they have occurred until placement on the market and thereby provides an accurate measurement framework. If this is politically not possible, we recommend changing the current specification of the Circular Footprint Formula in the following way:

- give more weight to recycled content (where primary data is available) by specifying A = 0.8 for the main battery metals (cathode and anode),
- require recyclability statement by manufacturer no matter whether R2 default values are applied,
- specify secondary datasets / recycling default scenarios such that primary data usage is incentivized[5],
- revisit conditions for EOL primary data – traceability of EOL recovery is required ('at own premises' does not guarantee collection),
- provide suitable default data for R3 for battery materials (and waste materials),
- provide guidance on using EF-compliant datasets for recycling, incineration and landfilling per material and material composites / material group,
- specify that manufacturer/economic operator shall perform the CFF EOL allocation (there is a risk that "CFF-compliant" data will be requested from supply chain).

In addition, as the CFF is also applicable per the PEF methodology where company-specific data are collected and used for the CF calculation, the application of the CFF in supply chains needs to be clarified as currently no guidance exists:

- provide guidance on waste modelling via the CFF
- clarify the application of the CFF for intermediate products in case the PEF methodology is applied to final products (i.e., batteries).

In both cases, the application of the CFF risks reducing the practical application and feasibility of data collection and CF calculation in (global) supply chains. This is due to the PEF methodology not being applied in a global context and CFF parameters and EF compliant datasets for the materials potentially occurring as waste or intermediate products (i.e., aggregation of materials into complex components and products) not being available yet.

### Data collection and exchange

Current methodologies take on a single actor life cycle assessment view. We support the vision of the Global Battery Alliance and other initiatives such as Catena-X and PACT of company-specific data aggregation and exchange along the value chain and recommend considering future company-specific data aggregation and exchange systems and align with methodological choices, e.g., in the PEF methodology.

### Harmonisation of PEF methodology with global LCA initiatives

The PEF methodology, required as per the Battery Regulation, is an important methodology to calculate the lifecycle impact of products. At the same time, it does not provide sufficient specificity for companies to apply the methodology in practice, e.g., the allocation approaches per process step. To this end, sector-specific approaches such as the Global Battery Alliance or the UNECE global vehicle LCA standard provide important value add, that the PEF-methodology and their application in the PEFCRs should consider. If the EU PEF methodology is not open for international harmonization, there is a clear risk that a global patchwork of applicable standards emerges.

[5] PEFCR Table 27 default values are the representative recycling process, JRC recycling scenario underestimates energy activity data compared to Table 27, hydro potentially underestimating chemical usage, pre-treatment scenarios not included – in sum, favoring secondary data usage and disincentivizing the primary data reporting

Companies with global supply chains will face significant Carbon Footprint reporting challenges, especially when collecting regional company-specific data that do not apply the PEF methodology.

Additionally, we recommend that the PEF methodology is updated in light of global LCA initiatives and industry-led Product Carbon Footprint methodologies that move towards attributional principles (i.e., collecting and aggregating primary data along value chains to account for emissions as they have occurred). The EU institutions should strive for global harmonization of LCA standards and PCF methodologies, e.g., via UN-institutions such as UNECE. A patchwork of applicable standards and methodologies per region should be avoided in light of global supply chains.

### Inclusion of other environmental impact categories

While carbon emissions are rightly in the centre of attention, other environmental aspects such as resource depletion, land use etc. should not be neglected considering that humanity is already overshooting several planetary boundaries. Environmental footprinting would provide companies with insights on product-related environmental hotspots. In essence, the activity data collected for the carbon footprint declaration can be coupled with other impact categories beyond carbon emissions. Additionally, the Critical Raw Materials Act (CRMA) proposes, pending an impact evaluation, environmental footprinting for critical raw materials, of which several end up in batteries.

We recommend providing guidance and incentives for reporting other environmental indicators in order to comprehensively quantify and optimise the environmental burdens of batteries. We suggest a sequenced approach – once the carbon footprint declaration processes are implemented and functional, other environmental impact factors should be included in declarations. These approaches should be aligned with other regulations, such as the ESPR or the CRMA.

### Carbon footprint of re-used/repurposed/remanufactured batteries

Article 7 states that the requirements laid down in paragraphs 1, 2 and 3 shall not apply to a battery that has been subject to preparing for re-use, preparing for repurpose or repurposing, or remanufacturing, if the battery had already been placed on the market or put into service before undergoing such operations. It is unclear, whether re-used, repurposed or remanufactured batteries that have been previously placed on markets outside of the EU but imported for preparation for re-use / repurposing / remanufacturing should comply with the market assessment conformity requirements such as the Carbon Footprint (and e.g., the recycled content requirements).

The Commission must specify whether second life batteries that have been previously placed on markets outside the EU but imported for preparation for re-use / remanufacturing / refurbishing must declare the Carbon Footprint and fulfil other sustainability and market assessment-related requirements. In general, the market assessment procedure for second life batteries should be specified taking into consideration the potential of imports of such batteries as well as second life batteries that do not yet bear battery passport information as the first life batteries have been placed on the market prior to the Battery Regulation requirements. Not specifying this procedure would otherwise jeopardise a level playing field.

## Article 8: Recycled content

### Technical documentation timeline

The recycled content documentation is requested 60 months after entry into force of the EU Battery Regulation or 24 months after entry into force of the delegated act that establishes the recycled content calculation methodology (whichever is later). This means that the technical documentation

verifying the recycled content shares declared in the battery passport will only become mandatory 18 months after the battery passport has already been introduced. The verifiability and traceability of the recycled content data is therefore not guaranteed when the battery passport is introduced.

We recommend addressing the timeline for the technical documentation before the introduction of the battery passport. The process for the elaboration of the contents of the recycled content documentation should be started as soon as possible to be able to make them known before the introduction of the battery passport.

### Battery categories in scope

It is uncertain which battery categories are affected by the recycled content provisions: industrial batteries with exclusively external storage are explicitly exempt from the legal requirements for recycled content but require a battery passport if the capacity is above 2 kWh. Although these batteries usually do not use chemistries including Li, Ni, Co or Pb, this raises the question of whether industrial batteries with a capacity above 2 kWh and exclusively external storage are generally exempt from the requirement to provide information on the recycled content in the battery passport. This may become relevant as the scope of recycled content could be widened in the future. We therefore recommend clarifying which batteries are affected by the recycled content provisions.

### Calculation methodology and reporting

The recycled content calculation methodology will be defined by a delegated act. We recommend thereby considering the separate calculation and reporting of recycled content originating from pre-consumer battery waste (defined here as manufacturing waste, excluding run-around scrap) and from post-consumer waste (end-of-life battery waste). We base our recommendation of separate reporting of pre- and post-consumer recycled content on the potential to observe the development of the different recyclate shares over time. Should post-consumer shares, against current expectations and forecasts, not increase over time, problems in the end-of-life will be unveiled. Also, data transparency and the ability to compare with forecasts will reduce opportunities for misuse and facilitate a realistic validation of the declared recycled content. While the inclusion of recycled content originating from pre-consumer waste might be necessary during the ramp-up of battery production capabilities, the situation should be re-examined and re-evaluated in a few years. We advocate in favour of a separate calculation of pre- and post-consumer shares right from the beginning since introducing a separate declaration or exclusion of pre-consumer recycled content shares later on will be difficult to implement and will involve considerable additional resources. Separating the quantities of recycled metals by origin (pre-/post-consumer battery waste) should require little additional effort for organizations, since they should be aware of the origin of their batteries for recycling. If this is not the case, separate reporting will raise the threshold for professional and compliant battery handling, which is desirable under the conditions of a circular economy and level playing field.

The delegated act defining the calculation methodology will be established three years after the Battery Regulation comes into force (at the latest) – half a year before the battery passport becomes mandatory. Economic operators (in particular smaller ones) may face difficulties in obtaining and processing all relevant data for the calculation of recycling content shares in the short time between the definition of the methodology and the introduction of the battery passport. Experience shows that implementation requires at least one year, once the calculation methodology is defined. We thus recommend adjusting and harmonising the timeline.

## Article 10/Annex IV: Performance and durability requirements

### Data attributes in a document accompanying the battery

The required document containing values for the electrochemical performance and durability parameters laid down in Part A of Annex IV is not further specified. The nature of the required document (electronic and/or physical) is thus unclear as are details regarding how to include data attributes, particularly dynamic data that are mentioned in Annex IV. With the implementation required 12 months after entry into force of the regulation, further specifications are urgently needed. We recommend providing the specifications as soon as possible in a delegated act as mentioned in Article 10 (6), which has no timetable attached.

The specifications for each data attribute should reflect the respective relevant use case(s) for the different battery categories and designs concerned by Article 10 to optimise the added value of data. It is particularly relevant for in-use dynamic data to consider available connectivity of different battery applications.

The Battery Passport Content Guidance (chapter 6.7) includes several recommendations on individual data attributes. Considerations on data attributes concerning Article 10 as well as the battery passport are described exemplarily in below section, 'Individual performance and durability data attributes'.

## Article 14/Annex VII: SoH and expected lifetime of batteries using a BMS

### Short lead time and definition of 'Up to date' for data in the BMS

The regulation requires reporting on data in the BMS already required 12 months after entry into force of the regulation. The lead time for implementation of this requires short, considering that all batteries with a BMS must be evaluated according to new test protocols, e.g. the SOCE for EV batteries and the list of data attributes for LMT batteries and stationary energy storage systems.

For the data to be stored in the BMS, the term 'up to date' and the data attributes in Annex VII urgently require further elaboration and definitions, respectively. These are decisive for economic operators to determine system requirements for implementation Up-to-dateness of dynamic data is a particularly urgent topic addressed above in section Article 77/Definition of 'up to date'. We recommend specifying requirements as soon as possible in a delegated act mentioned in Article 14 (4), which has no timetable attached.

These specifications should reflect the respective relevant use case(s) of each data attribute for different battery categories and designs to optimise the added value of data. The Battery Passport Content Guidance (chapter 6.7) includes several recommendations on the update interval of individual data attributes. Considerations on some data attributes are described exemplarily in section Annex XIII, 'Examples for considerations on individual performance and durability data attributes'.

## Individual performance and durability data attributes

The considerations on the data attributes below concern the battery passport as well as Article 10/Annex IV and Article 14/Annex VII, which are referred to Annex XIII (4). Generally, wording such as 'where possible' or 'where applicable', which is used in Annexes IV and VII for several data attributes without elaboration, requires distinct definition.

### Definition of State of Charge (SoC)

The definition of State of Charge (SoC) in Art. 3 (27) refers to rated capacity, while in practice remaining capacity is the reference point. The current definition in the Battery Regulation would create confusion for economic operators that all rely on the different SoC definition in current practice. Furthermore, the proposed definition in the Battery Regulation would cause the SoC data attribute to never approach 100 % for batteries with reduced remaining capacity in the use phase, irritating end-users during charging and with significant consequences for data read-out for energy storage applications. Therefore, we urgently recommend changing or amending the definition of SoC accordingly for application in the battery passport for consistent use of SoC with currently applied definition in the context of upcoming delegated acts as mentioned in Article 77(2). A timely change of the definition is also important as BMS development for implementation needs lead time and must consider the appropriate definition.

### Measurement of power capability

The power capability shall be determined at two different State of Charge (SoC) values: 80% and 20% (Annex IV, Part A and B). This specification of SoC, however, may be ill-defined for dynamic data because a SoC of 80% will differ for individual batteries depending on their ageing and reduced capacity, because it is usually defined in practice as a percentage of remaining energy or capacity[6]. Likewise, batteries in some stationary applications, such as peak shaving, may seldomly reach low values of SoC. We recommend reconsidering the specification, potentially to a single value of SoC that varies for different applications to prevent the problems described above.

Furthermore, the point of measurement needs to be considered in the procedure, because batteries, and large stationary battery energy storage systems in particular, will include electrical circuits of different voltage and thus have several potential points of measurements with varying characteristics. These aspects should be considered in the context of upcoming delegated acts regarding performance and durability parameters as mentioned in Article 10 (6) or on data in the battery passport in Article 77(2).

### Definition of capacity (energy) threshold for exhaustion

The Battery Regulation mandates "capacity threshold for exhaustion" for EV batteries only (Annex XIII, 1(m)) and lacks further definition on this provision. We interpret the intended data attribute as the value of remaining capacity in percent, below which the EV battery is deemed no longer permissible for further use in its current life. This appears related to the current practice by the battery manufacturer of tying the commercial warranty to a battery's use patterns. If battery usage or aging exceeds a given threshold, the warranty is voided, and the battery will not be used further. Additional context, however, is required for a correct understanding of this data attribute.

Based on the interpretation, this data attribute should preferentially be aligned with the choice of SOCE as specific State of Health (SoH) data attribute for EV batteries (see chapter 6.7.2 of the Battery Passport Content Guidance) in order to emphasize that the SOCE is the major data attribute to consider. Therefore, we recommend adding descriptive details and replacing the capacity threshold for EV batteries by a SOCE threshold for exhaustion in a delegated act as mentioned in Article 77(2).

[6] If the SoC definition would remain based on rated capacity, a similar issue would arise. Battery ageing, i.e. lower remaining capacity, can cause the SoC to not reach 80 % of the rated capacity anymore.

### Difficulties in reporting temperature

The measurement of temperatures in the use phase in idle state or during charging is mandatory for several battery categories (Annex XIII (4c), Annex VII, Part B). The implementation requires more detailed information and is subject to concerns on the value added by these data attributes due to different issues in the physical measurement. Specifically, the location of temperature sensors will decide upon the merit of values provided in temperature measurements and their applicability to the entire battery, in which temperature gradients may occur. Furthermore, the measurement of the battery temperature, particularly in idle state, may cause significant data traffic and continuous energy consumption, as the BMS and, in case of an EV battery the 12V electrical circuit, would need to operate constantly to power the instrumentation monitoring the battery temperature.

In addition, 'extreme' temperatures (Annex VII, Part B) lack definition in the EU Battery Regulation. With regard to 'time the battery spends in extreme temperatures' the range of (safe) operating temperature as required per Annex XIII (1) could be considered to set the boundaries. This safe operating temperature would reflect safety limits that the BMS will usually not allow to exceed, by limiting the battery performance for example. In order to reduce unwanted energy consumption due to monitoring systems that must be online to capture extreme temperatures at all time, one option is to record the battery temperature periodically. This approach, however, is also not desirable as it would potentially miss high temperature events, rendering the value provided incomplete and potentially misleading.

We consider the overall added value of the data attributes regarding temperature measurement unclear, pending more context on their intended definition. Due to the abovementioned challenges to the measurement of the data attributes on in-use temperature, we recommend providing more detailed elaboration on how valuable data could be provided in delegated acts mentioned in Article 14 (4) or Art. 77 (2).

### Difficulties in reporting accidents

In addition to environmental conditions, negative events such as accidents have been added to the list of mandatory battery passport data attributes (Annex XIII, 4(d)) without further specification. An added value of the availability of an accident history is increased work safety during dismantling of the battery pack and module. The reporting of negative events such as accidents requires much more detailed information for implementation and to prove added value by the data attributes. In particular, the definition of an accident is required, particularly also for industrial or stationary uses.

The monitoring of accidents generally raises the question on the quality of information that is provided, because information about an accident does not allow a specific conclusion on a potential damage to the battery, which depends on type and intensity of an accident. A recording of a minor accident, which does not affect the battery, could wrongly imply that the battery is damaged, and unnecessarily diminish its second life potential.

Thus, the implementation of monitoring accidents is crucial for the added value of the data attribute, but complicated: for EV batteries the recording of an accident in the battery passport could be required after activation of an airbag, which could rule out the recording of most minor and irrelevant accidents, but may not cover all relevant accidents, e.g. an underbody impact by a rising pillar. For other battery categories, implementation is unclear, as there is usually no adequate sensor available. In addition, relevant accidents are followed up by a professional check of the battery assessing potential damage. To include valuable information on accidents and battery assessment would thus likely mean manual recording. That in turn requires standardization of

reporting on the accident and effects on the battery to make it machine-readable, which would need to be developed first and cover all potential effects from accidents.

The abovementioned limitations and issues regarding the process of recording accidents make it doubtful, whether the history on accidents, and most importantly their effects on the battery, can be complete and contribute to improve safety of battery handling. Based on the lack of elaboration, we are sceptical whether the data attribute can provide useful information due to likely incomplete data and its difficult interpretation. As the data attribute is required to be included in the battery passport, we recommend providing more details and considerations on the intended scope, recording process and interpretation of the data attribute in a delegated act as mentioned in Article 77 (2).

## Article 17: Conformity assessment procedures

### Market conformity procedure for re-used/repurposed/remanufactured batteries

Market conformity assessment with a focus on compliance to the Battery Regulation data attributes and metrics is currently not specified for second life batteries. As of today, and as per Article 17 (3), re-used / repurposed / remanufactured batteries undergo the same procedure as newly produced batteries, therefore, facing problems in type declaration and related content requirements (e.g. performance). We recommend specifying the market conformity assessment procedure for all re-used / repurposed / remanufactured batteries placed on the EU market referring to the specific characteristics of re-used / repurposed / remanufactured batteries. Additionally, it should be specified whether batteries that have been previously placed on markets outside of the EU but imported for preparation for reuse / remanufacturing / refurbishing should comply with market assessment conformity content requirements such as the Carbon Footprint (Article 7) and Recycled Content Targets (Article 8).

### Verification requirements

Currently, it is unclear whether third party verified data, such as company-specific carbon footprint data, are subject to verification in the market assessment conformity procedure again. If so, this would lead to double-verification and thus inefficient verification processes. We recommend specifying the verification requirements for data attributes, that require prior assessment or calculation such as the carbon footprint and align third party verification procedures with the market conformity assessment procedure.

## Articles 47-53 Supply chain due diligence

### Supply chain due diligence requirements

Companies are lacking guidance on the implementation of the due diligence requirements of the Battery Regulation, but also of other upcoming regulations such as the EU CSDDD. 18 months after entry into force of the regulation, the Commission shall publish guidelines regards the application of the due diligence requirements (Article 48 (5)). For the development of these guidelines, we recommend taking into account and harmonise the due diligence requirements of the different applicable EU regulations. Secondly, to consult industry to end at actionable recommendations.

### Scope of the battery passport due diligence requirements (due diligence report)

The Battery Regulation limits the scope of the due diligence obligations, including the due diligence report, to those materials listed in Annex X (1), being: cobalt, natural graphite, lithium, nickel, and

chemical compounds based on these raw materials being necessary for manufacturing battery active materials. Both the EU CSDDD and the German Supply Chain Act do not specify material restrictions or exclusions. According to these regulations, due diligence ought to be a risk-based process. As a result, it should span all materials with significant human rights and associated risks associated with them.

We therefore recommend a material-agnostic approach since battery raw material compositions, technology, and innovation change quickly and human rights and environmental risks extend beyond the listed materials. To ease the implementation of the requirements for companies initially, we recommend ideally applying due diligence requirements to all battery materials; or at least regularly re-assess the inclusion of additional materials in the major components of the battery.

### Provenance information

For provenance information, the Battery Regulation does not explicitly require making them accessible via the battery passport. Still, Recital 123 lists the 'origin of the materials used' in the context of information to be provided via the battery passport. This unclear reference to the origin of the material in the context of the battery passport creates confusion on reporting requirements. We recommend excluding or clarifying this reference to avoid confusion. In the future, in case of upcoming regulatory requirements (e.g., US Inflation Reduction Act or European Critical Raw Materials Act), as well as progress made on traceability systems, we could envision reporting the origin of a material via the battery passport (see discussion in the Battery Passport Content Guidance).

### Recognition of supply chain due diligence schemes

Due diligence schemes enabling economic operators to fulfil the due diligence requirements of the Battery Regulation shall be granted recognition of equivalence to those requirements. A register of recognized due diligence schemes shall be publicly made available. Also, other regulations such as the Proposal for a European Critical Raw Materials Act and the Conflict Minerals Regulation introduce such recognition of schemes. However, today, schemes are not yet recognized since processes are still outstanding (e.g., for the Conflict Minerals Regulation, which is applicable since January 2021, tenders asking for technical work to advance the recognition of schemes, were only launched in September 2022). Compared to the Battery Regulation, the Proposal for a European Critical Raw Materials Act already lists generic criteria schemes shall meet to be recognized.

The criteria and methodology to determine if schemes can ensure that economic operators fulfil the due diligence requirements of the Battery Regulation will be defined in delegated acts (Article. 53 (3)). We recommend adopting such delegated act timely to provide guidance both to scheme owners as well as companies choosing schemes to follow. We recommend aligning the criteria and methodology across regulations posing due diligence obligations. Further, implementing acts shall be established with the information requirements for the application; implementing acts shall grant the schemes recognition; and the OECD Centre for Responsible Business Conduct shall be consulted prior to the adoption of such implementing acts (Article 53(3)). We also recommend establishing such implementing acts outlining the application requirements timely to provide guidance to scheme owners.

## Annex VI: General information about batteries on the label

### Definition and classification for ‘battery chemistry’

The term battery chemistry is mentioned but not defined in the EU Battery Regulation. While today, Li-ion batteries are mostly classified by the cathode active material, the anode active material is equally important for other battery chemistries and new technologies. With next-generation solid state batteries the electrolyte also increasingly differentiates batteries. Therefore, we suggest defining battery chemistry as the cathode and anode active material as well as electrolyte material, classifying the composition of a battery in general terms and serving as an indication for battery differences, e.g., in safety, lifespan, performance, recycling, or re-use. We suggest reporting the cathode, anode, and electrolyte active material on a high level only, e.g., ‘Li-NMC/Carbon/LiPF6’ or ‘Lithium-Nickel-Manganese-Cobalt/Carbon/Lithium hexafluorophosphate’ or its respective acronym. ‘SSB’ can be added in the case of solid-state batteries. Another even less detailed alternative would be to focus on the battery technology only, e.g., Lithium-ion (Liquid electrolyte, Semi-Solid-State, Solid-State), Redox-Flow, Nickel-Metal Hydride (NiMH). While the stoichiometry (e.g., Li-NMC 811 describing a ratio of nickel, manganese and cobalt of 8:1:1), as well as the type of carbon used (e.g., natural or artificial graphite), would be of little interest to the public, second-life operators will have access to this more detailed level via the datapoint ‘materials used in…’. However, this definition is not stated in the Battery Regulation. Today no suitable battery classification for all battery passport use cases regarding the battery chemistry is available. Standardisation requests (mandates) can initiate the development of required standards.

### Critical raw materials reporting

The Battery Regulation refers to the critical raw material list of 2020 and with that is not up to date. The Proposal for a European Critical Raw Materials Act (Annex II) of March 2023 introduced a new list of 34 materials to be considered critical. This list can also already be found on the RMIS. Compared to the list of 2020, borate, indium, and natural rubber are not included anymore, while 7 materials were added. We therefore suggest referring to the new list of critical raw materials of 2023, or to the Raw Materials Information System (RMIS) of the EU Science Hub, where the latest list is being made available.

In addition to ‘critical raw materials’, the Proposal for a European Critical Raw Materials Act (Annex II) of March 2023 introduced the term strategic raw materials as ‘the raw materials that score among the highest in terms of strategic importance, forecasted demand growth and difficulty of increasing production’ (Article 2(2)). For these strategic raw materials, the Act sets benchmarks of percentages to be extracted, processed, or recycled in the European Union. Since this raw material categorization is not yet considered in the Battery Regulation, we suggest introducing it.

### Regulatory requirements for hazardous substances

In Recital 21, the EU Battery Regulation narrows the reporting on hazardous substances to those falling under defined hazard classes and categories of the Classification, Labelling and Packaging (CLP) Regulation. In comparison, the ESPR requires ‘the tracking of all substances of concern throughout the life cycle of products, unless such tracking is already enabled by another implementing act’. In addition, within the classification of substances of concern sits the group of substances of very high concern (SVHC). This term is introduced in the REACH Regulation (EC 1907/2006). While SVHC are subject to additional requirements (e.g., registration and authorisation), the reporting differences between substances of concern and hazardous substances are not distinct. We recommend streamlining the reporting requirements as well as terminology used

between the Battery Regulation and the ESPR. More specifically, we recommend using the terms ‘hazardous substances’ or SVHC (for those with requirements under REACH). A required distinction between hazardous substances and substances of concern would need to be clearly defined.

Many compositions and hazard information to be made accessible via the battery passport are already reported via Safety Data Sheets (SDSs), which are provided to downstream users. For batteries, not considered manufactured items, SDSs are not required, though some battery manufacturers provide them. Upstream suppliers in battery (material) manufacturing will need to complete SDSs. Passed through the supply chain, these can serve as input for the battery passport. However, information requirements between the battery passport and SDSs are not yet streamlined and harmonized.

Information in the SCIP database can be utilised to provide the hazardous substances information for the battery passport. Here, companies are required to submit detailed information for SVHCs. However, reporting requirements between the battery passport and REACH are not yet streamlined and harmonized.

We recommend linking the different reporting requirements, especially on (hazardous/ concerning) substances, such as SDSs and the battery passport. Furthermore, we suggest linking the different reporting databases, especially on (hazardous/ concerning) substances, such as the SCIP database with battery passport reporting.

### Battery passport information on hazardous substances and battery materials

The Battery Regulation requires information on the materials used in the cathode, anode, and electrolyte as well as information on hazardous substances to be made available via the battery passport. However, it is not further specified which related information is required (e.g., simple list of materials or substances vs. also specifying the weight/ concentration or specifying the location of the material or substance). Therefore, companies lack reporting guidance by the Commission. We recommend further specifying the required reporting for the materials and substances. As part of that, we recommend defining the standards to base this reporting on, e.g., type of related identifiers (we recommend CAS numbers), or public standards for material names. These standards should be based on commonly used standards in other reporting such as SCIP, SDSs, or the IMDS.

### Battery and manufacturer identification

The battery passport requires identifying the battery, manufacturer, manufacturing place, and manufacturing date. While for the battery identification, both the Battery Regulation and the ESPR require a ‘unique identifier’, only the ESPR requires the usage of unique identifiers (namely the ‘unique operator identifier’ and ‘unique facility identifier’) for the manufacturer and manufacturing place. In addition, the Battery Regulation lists the specific information to be reported for the manufacturer’s identification, while for the manufacturing place only the ‘geographical location of the battery manufacturing facility’ is indicated, without specifying the required granularity. Hence, on the one hand there is no alignment on the recommendation of the usage of unique identifiers. Second, the Battery Regulation does not specify the reporting format and the reporting details/granularity for the manufacturer, manufacturing place, and manufacturing date.

To harmonise the requirements of the regulations, the Battery Regulation should also require the usage of a unique operator and unique facility identifier for the identification of the manufacturer and manufacturing place. Battery components, cells etc. may be manufactured at different places and by different manufacturers. An indication should be added when a battery has reached the status "manufactured" to clarify the manufacturer identity and the manufacturing location. For stating the manufacturing date, it should require the usage of date codes and specify the type of

date codes to be used. To allow for harmonised reporting, the granularity of the geographical location should be specified (country, city, street, or even building if several facilities operate under one address).

### Battery weight

The ‘weight’ of the battery (physically correct is ‘mass’) is mandatory to be accessible by the public via the battery passport. To allow for a harmonised and precise reporting of the weight via the battery passport, the weighing approach (e.g., weighed or calculated based on production information), the tolerated accuracy, and the resolution (number of decimal places) shall be further specified.

# DISCLAIMER

This document (the 'Document') is for informational purposes only and is being made available to you by the Battery Pass consortium.

This Document is published by the Battery Pass consortium and contains information that has been or may have been provided by a number of sources. The findings, interpretations and conclusions expressed herein are a result of a collaborative process facilitated and endorsed by the Battery Pass consortium. The Battery Pass consortium partners (the partners as set out on page 2 of this Document) endorse the overall project approach and findings and the Battery Pass consortium has made efforts to accurately capture stakeholder positions set out by organisations (including supporting partners and further experts), although the results may not necessarily represent the views of all individuals or the organisations they represent. The Battery Pass consortium has not separately verified the information provided from outside sources and cannot take responsibility if any of these statements misrepresent a stakeholder position or if positions evolve over time.

To the extent permitted by law, nothing contained herein shall constitute any representation or warranty and no responsibility or liability is accepted by the Battery Pass consortium as to the accuracy or completeness of any information supplied herein. Recipients of this Document are advised to perform independent verification of information and conduct their own analysis in relation to any of the material set out.

The statements contained herein are made as at the date of the Document. The Battery Pass consortium or any member, employee, counsel, offer, director, representative, agent, or affiliate of the Battery Pass consortium does not have any obligation to update or otherwise revise any statements reflecting circumstances arising after the date of this Document.

This Document shall not be treated as tax, regulatory, accounting, legal, investment or any other advice in relation to the recipient of this information and this information should not and cannot be relied upon as such.

If you are in any doubt about the potential purpose to which this communication relates you should consult an authorised person who specialises in advising on business to which it relates.

Battery Pass

**Have a look at our Website** EXPLORE

**Follow us on LinkedIn** FOLLOW

**Subscribe to our Newsletter** REGISTER

**Drop a line for more information** CONTACT US

CONSORTIUM LEAD

SYSTEMIQ

CONSORTIUM PARTNERS

acatech · Audi · BASF We create chemistry · BMW GROUP · Circulor · FIWARE FOUNDATION · Fraunhofer IPK · TWAICE · umicore · VDE RENEWABLES

* under subcontract

This project receives funding from the German Federal Ministry for Economic Affairs and Climate Action by resolution of the German Bundestag under grant agreement No 16BZF335.



Supported by:

Federal Ministry for Economic Affairs and Climate Action

on the basis of a decision by the German Bundestag