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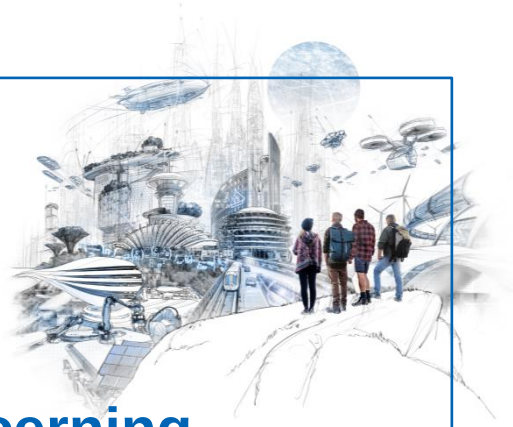

DKE position paper
on EU Regulation proposal concerning batteries and waste batteries - COM(2020) 798/3

March 2021

EXECUTIVE SUMMARY

DKE, the German Commission for Electrical, Electronic & Information Technologies of DIN and VDE, welcomes the new EU proposal of Regulation on batteries and waste batteries that should allow to position EU industry leadership as frontrunner in terms of green and technologically advanced batteries.

However, within the standardization community and the European industry, the proposed Article 16 raises some concerns as the European Commission gives itself the right to draft implementing acts instead of commissioning the European Standardization Organizations (CEN, CENELEC, ETSI) as required by the EU Regulation 1025/2012. The use of Harmonized Standards should be prioritised over delegated and implemented acts (cf. Article 15). This important piece of legislation should follow the New Legislative Framework (NLF). In our view it is a sine qua non to reach the objectives of the Green Deal. As we speak about the EU economic recovery and achieving a circular economy, it is important that the development of standards remains flexible as laid out in the NLF principles, which define the roles of each actor in the process (including the role of technology experts from all around Europe), and whose implementation have proven to be successful all these years.

The proposed Regulation shows great standardization potential to be taken into consideration to avoid upcoming fragmentation in the European Single Market for batteries and waste batteries. Under Articles 13, 59, 64 and 65 new standardization areas for labelling and “Battery Passport” or the remanufacturing and repurposing of batteries should be taken on board.

The Batteries Regulation is still lacking some important definitions. Specific terms and concepts should be reviewed in a consistent and coherent way or the standardization work to be carried out will suffer of different interpretations and misunderstanding.

Article 12 should be revised to better ensure that electrical safety is also taken on board. As should be Article 59 in which test requirements for remanufactured and repurposed batteries are underestimated and which should tackle the role of “type tests" to ensure product safety.

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1. Introduction

Until now the Directive 2006/66/EC on “batteries and accumulators and waste batteries and accumulators” has proved beneficial for minimizing the negative impact of batteries on the environment, however it was focusing mainly on the management of hazardous substances in batteries while recent technological developments, the impact of climate change, and resources consumption demand yet not only a revision of the Directive but also to widen the scope of EU legislation to the complete battery life cycle. Electrotechnical standardization at European (CENELEC) and international level (IEC) has an important role to play and allows to make sure that Europe is compliant with WTO principles and Code of Good Practice for the Preparation, Adoption and Application of Standards (Annex 3 of the WTO Agreement on Technical Barriers to Trade). The German industry being one of the European frontrunners in the field of batteries, DKE as the German Member of both CENELEC and IEC, is extremely committed to developing standards that will support this new legislation and make sure that the EU remains a leader in the batteries production value chain, in line with the EU Green Deal ambitions, while always keeping a maximum reliability and safety in the production and use of batteries.

2. Article 16 of the Batteries’ Regulation – Misuse of EU Regulation 1025/2012 and the New Legislative Framework by foreseeing the use of implementing acts for Common Specifications

European Standards play an important role to support the implementation of the Single Market of goods and services. They are implemented across 34 countries, withdrawing national conflicting standards, hence fostering market access, and are developed following the World Trade Organization (WTO) Technical Barriers to Trade (TBT) principles to overcome technical barriers to trade in a non-discriminatory way and making sure not to create unnecessary obstacles to trade.

Since decades European Standards have helped the implementation of European policies and legislation to ensure common levels of safety, security, interoperability, and sustainability of goods in the market. The European Standardization System has proven to be efficient and essential in the consolidation of the European Single Market and in ensuring the protection of European consumers.

As from 1985 the EU legislation has framed the role of standards in support of EU products harmonization legislation through the **New Approach** model first, later complemented by the **New Legislative Framework (NLF)** by means of EC Regulation 765/2008, and recognizing three European standardization players CEN, CENELEC and ETSI (known as the European Standardization Organizations – ESOs) in its **EU Regulation 1025/2012 on European standardization**.

Concretely, European Standards which are accepted to support the EU legislation are called Harmonized Standards and are published in the Official Journal of the European Union (OJEU) granting presumption of conformity to the companies who decide to use them, as European Standards remain voluntary. The strength of the EU New Legislative Framework (NLF) lies in the interaction between legal requirements and harmonised European standards, i.e., the EU institutions lay down the basic requirements for products in directives and regulations while the ESOs develop the standards. The ESOs CEN, CENELEC and ETSI serve in the process as moderation platforms **open to all interested stakeholders**. The process of standardisation is

transparent and inclusive for all, so that there is a high degree of predictability, reliability, and trustworthiness on all sides. The technical content is then defined by experts in the standardisation committees, for example from the public sector, industry, research and consumer, environmental and occupational health, and safety organisations. These draw up technical standards that are harmonised throughout Europe. Decisions are made by consensus, enjoy broad acceptance, and have relevance for the entire internal market. **This division of work relieves the European legislator of the burden of drafting detailed regulations. The legal framework is kept flexible and the resulting standards are practical and thus easy to implement by companies.**

For this reason, DKE is strongly **supporting Article 15 on the "Presumption of conformity of batteries" of the EU regulation on batteries and waste batteries which mentions the role of Harmonized Standards**.

However, **we regret that Article 16 foresees the use of implementing acts laying down common specifications instead of sticking to Harmonized Standards. The Approach foreseen in Article 16 makes it possible to bypass the ESOs in the preparation of Harmonized Standards, which is not in line with the EU products harmonization legislation.**

This concerns the definition of common specifications for requirements or tests on which Articles 9, 10, 12 and 13 as well as Article 59 (5)(a) are based. The Article 16 gives to the European Commission the right to regulate requirements or tests by means of implementing acts if there are delays in the preparation and adoption of mandated Harmonised Standards.

Even more worrying in our opinion is that the same applies if, in the view of the EU Commission, requirements or tests in mandated Harmonised Standards are not sufficiently formulated:

Article 16

*(b) the Commission observes undue delays in the adoption of requested harmonised standards or **considers that relevant harmonised standards are not sufficient**.*

From a legal point of view this opens a vast area of uncertainties. How and on what grounds will it be possible to judge what is sufficient or not? No criteria is given in the Batteries' Regulation. The current text gives the European Commission full power to act and goes against the principles of the NLF, a trend noted since the James Elliott Court Case despite the calls from the industry to stop hindering the well-established European Standardization System (Cf. the latest "Joint letter on Industry competitiveness heavily relies on effective harmonised standardisation" to the Portuguese EU Council Presidency from European Industry stakeholders).

The EU Commission's approach in the proposed Article 16 of the EU Regulation on batteries and waste batteries **offers no legal basis**; a legal opinion on the European system of Harmonized Standards commissioned by the German Federal Ministry for Economic Affairs and Energy (BMWi) (Redeker, 08/2020) came with the outcome that the EU Commission cannot commission other rule makers or organizations to develop Harmonized Standards:

"As already explained on several occasions, the Commission may mandate one or more European standardisation organisation to draw up a European standard within a given period

(Article 10 (1) of the Standardisation Regulation; cf. also, for example, Article 17 (1) of the Construction Products Regulation). Subject to an amendment to Annex I of the Standardisation Regulation, which lists the - currently three - European standardisation organisations exhaustively, this ***shows clearly that it is not permitted to mandate other organisations with the task of setting technical standards. The procedures laid down by the Standardisation Regulation are mandatory and are not at the discretion of the Commission.*** *The Union legislator has deliberately chosen to place European standardisation in the hands of the European standardisation organisations, whose activities are regulated, inter alia, by the Standardisation Regulation. Moreover,* ***under the relevant harmonisation instruments, standards drawn up by a European standardisation body alone can regularly give rise to a presumption of conformity which is important for the free movement of goods. Any standards set by alternative bodies would not have such an effect.****",* as stated in the Legal Opinion on the European System of Harmonized Standards, page 51.

In the 'Explanatory Memorandum' accompanying the Batteries' Regulation it appears clear that it is the European Commission intention to commission the Joint Research Centre (JRC) with the task of drafting "common specifications":

The JRC will play a key role in supporting the Commission with some of the technical work required. Around EUR 6.2 million will finance the necessary studies and an administrative agreement with the JRC to support the Commission in a number of workstreams set out in the bullet points below.

- ***Developing common specifications*** *on: (i) performance and durability for general use portable batteries; (ii) performance and durability for rechargeable industrial and electric-vehicle batteries and (iii) for safety for stationary battery energy storage systems.*

While we see no problems in JRC drawing up harmonized rules, we can however doubt on its ability to draft technical specifications (common specifications). To ensure the market uptake Europe needs companies'' trust. Companies support the last decades of collaboration with the European legislator based on the NLF principles. To lay down technical requirements they put their confidence in the technical expertise by highly experienced technical experts that are part of the European Standardization System.

DKE demands "Article 16 on common specifications" to be deleted or amended in such a way to ensure the transparency and inclusiveness in the development of Harmonized Standards in the areas foreseen by the proposed Batteries Regulation. Consequently, paragraph (31), Articles, 9, 10, 12, 13 and 59(5)(a) should also be amended.

We call to respect the NLF and New Approach model that have proved efficient, and to follow EU Regulation 1025/2012 by using the established and well-functioning European Standardization System that makes sure European values are kept high in the development of standards.

3. Misleading terms and definitions in the proposed Batteries Regulation

Some terms and definitions related to battery technology in the text of the proposed new Batteries Regulation are not consistent with other EU legal acts and the state-of the-art. Confusion and misunderstanding will achieve the contrary of what standards are meant to bring: reliability and safety.

It is also essential that the same meaning to the terms and definitions are given throughout the European legislation and the corresponding Standardization request on Harmonized Standards. Incoherent and inconsistent terms and definitions are also an obstacle in writing standards per Article 15 of the proposed Batteries Regulation.

Some examples of these misleading terms and definitions are:

- The definition of **"battery with internal storage" in Article 2 point (6)** seems to have the same intention as the definition of "Battery cell" in point (2), where it says "… and containing the active materials …". The term "with internal storage" is therefore, in conjunction with point (1), redundant. It is also not used in battery technology, where batteries other than with "internal storage" are known as "flow batteries" or "redox-flow batteries".
- **The term "stationary battery energy storage system" in Article 2 (13) should be replaced by with "stationary energy storage battery"**. Indeed, an energy storage system is not a battery. Nor is a battery energy storage system the same as a battery. A battery energy storage system consists of one or more batteries and an electric power conversion system which converts the energy to the form which is compatible with the grid.
- **A definition of rated capacity is in our view missing in Article 2 (24**). It is an essential definition as the "rated capacity" is used to define "state of health". An acceptable definition for rated capacity can be found in the UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria.
- **The term "minimum average duration" used in paragraph (29) and Article 13** can only be defined for non-rechargeable portable batteries of general use. It cannot meaningfully be applied to other portable batteries and automotive batteries.
- **The use of "capacity above 2 kWh" is a contradiction in itself** as capacity is expressed in Ah while energy is expressed in Wh or kWh in the proposed Regulation (e.g., in Articles 7, 8, 10, 13, 14, 39, 59, 64). A correct notion can be found in the UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria, where the term "nominal energy" is used. We can also refer for this to the EU Regulation 1103/2010 on Capacity labelling. Furthermore, in Annex IV of the Batteries Regulation, capacity is rightly expressed in Ah and energy is expressed in Wh. Hence, **we suggest replacing "capacity" with "nominal energy"** wherever the term "capacity above 2 kWh" appears in the document and to add a definition for "Nominal energy".
- **The term "remanufacturing" in Article 59 are not defined**, which leaves too much room for interpretation. A clear definition is then needed to allow standardizers to work efficiently, avoiding debates, loss of time and uncertainties that can hinder the expected outcome.

- The terms of **"Energy round trip efficiency" and "fade" in Annex IV** as well as "**Remaining power capability" and "power fade" in Annex VII** would also need to be better defined as not currently in use in the batteries' industry and are application dependent.

See Annex 1 of the position paper for the list of our "terms and definitions" suggestions.

DKE standardization experts are ready to help cross-checking the definitions and terms in the Regulation to make sure that the understanding will be the same for everyone, and the wording used coherent with the technology and already existing definitions in the field of electrochemistry as well as standardization.

4. Request for an extension of the parameters for safety tests to include electrical safety (Article 12)

In paragraph (27) of the Batteries Regulation it is highlighted that "*batteries should be designed and manufactured to ensure their safe operation and use*". This aspect is considered particularly relevant for batteries for stationary energy storage systems.

Consequently, parameters for safety tests for batteries for stationary energy storage systems are laid down in Article 12 and the corresponding Annex V. However, these tests **focus primarily on the safety of battery cells** but completely **neglect the aspect of electrical safety – a fundamental safety objectives of all electrical equipment.**

Electrical safety comprises safety objectives for the adequate protection of people, animals and property against all hazards arising from electrical equipment when used as intended. This includes **protection against electric shock, electric arcs, heat, radiation, and sound**.

DKE believes it is indispensable to include the electrical safety in the parameters for safety tests also in view of an upcoming Standardization Request regarding to Article 12.

Furthermore, we would like to draw the attention to the fact that a reference to the EU Low Voltage Directive 2014/35 (LVD) is missing unlike other EU products' legislation in which electric current flows and or electric voltage is present. A reference to the Low Voltage Directive would prevent non-compliance with its safety objectives.

5. A standardized analogue and digital nameplate (digital product passport) to help implementing the objectives of a battery labelling and/or "Battery passport" (Articles 13, 64 and 65)

A standardization request for European Standards concerning Articles 9, 10, 12, and 59 (5)(a) of the proposed Batteries Regulation is already **in the drafting phase**, and we see in the regulation proposal other areas for standardization work such as in the field of the foreseen battery labelling and battery passport.

The Batteries' Regulation under its paragraph (50) states:

"The manufacturer should provide sufficiently detailed information on the intended use of the battery so as to allow its correct and safe placing on the market, putting into service, use and end-of-life management, including possible repurposing."

Batteries have, like almost all products, **human-readable – analogue – labels**, which are applied as stickers, metal plates or as imprints on the battery. These labels identify the battery manufacturer clearly, provide important information on **their main characteristics** such as energy content and **ensure safe handling and disposal of the batteries**.

However, they are **limited in their information content by the available space on the product**. The challenge for manufacturers is to provide in a user-friendly and legally compliant manner the growing amount of essential information for batteries, considering all the requirements for labelling in global markets.

To meet the rising information requirements, a **digital labelling system** will become increasingly important. Therefore, to ensure the availability of transparent, reliable, and clear information over time, **standardization of labelling is needed**.

5.1. Standards for analogue labels

The marking of the chemistry is an especially important information relevant for the installation, operation, and decommissioning phase of a battery life. Many recycling processes are chemistry specific, thus undesired events can occur when a battery which is not of the stated chemistry enters a given recycling process. The sorting of battery waste streams is often carried out manually, therefore the battery chemistry **must be quickly and easily identifiable**. A high recycling efficiency also depends on neatly separated waste streams according to battery chemistry.

Uniform standardized labels provide safe and easy handling of batteries during collection, sorting, storage, and the recycling process. There are already **existing international standards for the marking of batteries** according to their chemistry, which could **serve as a basis for adaption to the requirements in Article 13** of the proposed Batteries Regulation.

5.2. The concept of the digital nameplate (digital product passport)

The **"digital nameplate"** is a concept developed by industry and already transferred into international standardisation **to bring analogue information on the battery to the digital world**. It can include all legally required information and markings for the safe use, performance and sustainability assessment and end-of-life treatment in digital and standardized form. This gives the manufacturer the opportunity to pass all the necessary information on along the entire life cycle accessible for all stakeholders – in other words **it paves the way for digital twins for batteries**. For the user of a battery, this information is available worldwide, in a **human- and machine-readable form**, in multiple languages and always up to date. Access to the digital nameplate can be enabled **via digital identifiers** (e.g., via QR codes, data matrix codes or RFID tags), which are applied to the product and can be read directly on site at any time using any smartphone, tablet, or computer device.

In view of the wealth of information requirements in the proposed Batteries Regulation, DKE considers it essential to **create a uniform, universally valid and digital form of storing and passing on product data and information based on standardisation**. We strongly believe that the digital nameplate and the corresponding complete digital form of product identification and product documentation could be a model for this and would lead to a successful implementation of Articles 13, 64 and 65.

DKE would welcome a standardization request for Harmonized Standards to support Article 13 of the Regulation as well as Article 64 and Article 65. Thanks to already existing international standards on battery labelling, standards on the "digital nameplate", European standardization is ready to kick-off the work also on these aspects to offer the technical implementation of the requirements from the above-mentioned Articles 13, 64 and 65 of the Batteries Regulation.

DKE suggests to the EU Commission to use standardization as a powerful tool to set broadly recognized and accepted guidelines to comply with legal requirements.

6.Standards for remanufacturing and repurposing (Article 59)

In line with the EU Green Deal and a circular economy, the concepts of "remanufacturing" and "repurposing" are possible approaches to extend the life cycle and to enhance the resource efficiency of batteries.

However, it should not be forgotten that **remanufactured or repurposed batteries** must be subject to the **same safety, testing and product design requirements** as new batteries and consequently **must comply with the same strict regulations and standards**. Repurposed or remanufactured batteries can be subject to modifications and/or be altered and may pose a major safety hazard.

6.1. Type tests as a cornerstone of product safety

All current batteries' safety standards are based on 'type tests' which involve testing of a number of **equally made 'test specimen' representative for the series product**. These type tests are designed for (new) batteries or battery sub-units with a well-defined status and quality. A certain number of equally built test specimen of the same type are required to fulfil all test requirements. In the case of batteries, this also includes tests in which the test specimen is purposely damaged and thus becomes unusable. In this specific case, **type tests cannot be applied to repaired or remanufactured single systems** which have been modified, e.g., by exchanging single components in modules or reassembling of second-life cells, **and are only limited for repurposed batteries**. Consequently, remanufactured batteries and batteries assembled out of second life cells **cannot be tested according to today's safety standards and established test procedures** and therefore **cannot be placed on the European market**.

Remanufacturing by exchanging or modifying components inside of these original units, which had all tests thoroughly performed originally, **can cause major safety issues** with possible large damage to consumers or property.

6.2. Underestimated test requirements and disclosure of proprietary manufacturer know-how

Type tests as described in safety standards are part of well-proven product tests procedures in accordance with the **European concept of product safety,** which is applicable for most of **CE-marked products** – not only for batteries. For **type tests of Li-ion batteries a detailed knowledge of the product specific hardware is required** including wiring diagrams, bill of materials and components, construction drawings and in most cases at least the source code of the battery management system, which know-how is the detailed proprietary of manufacturers.

Therefore, implementing such **type tests for repurposed complete batteries is only feasible for the manufacturer and not for an independent operator** as foreseen in Article 59 of the proposed Batteries Regulation.

Existing standards, which mention the repurposing and evaluation of batteries (e.g., UL 1974) are often mistaken to be feasible for placing repurposed batteries on the market, even though they are not intended for this purpose.

DKE would like to emphasise that remanufactured or repurposed batteries must comply with the same strict regulations and standards as new batteries do.

All current batteries' safety standards are based on type tests which are an important part of the European concept of product safety. Since type tests cannot be applied to remanufactured batteries and their application is also only limited for repurposed batteries, the proposed Batteries Regulation should take this into account.

7. Conclusion

The proposal for a Regulation on batteries and waste batteries was awaited and needed. While European standardization work is already foreseen under Articles 9, 10, 12, and 59 (5)(a), the Regulation will certainly offer wider standardization potential in the coming years such as in the frame of the battery labelling and battery passport, remanufacturing and repurposing. Such standardization work will give a strategic advantage to our European companies and will help consolidating the European Single Market for a new generation of batteries and waste batteries. Although it is necessary to remain cautious, given that some areas where potential standardization activities can be identified in the Batteries' Regulation are still object of scientific research and therefore not ready for standardization or would need funding.

At this stage it is also essential to check the terms and definitions used in the proposed Batteries Regulation to ensure that work around batteries gets the same understanding and respects the common language already in use in the sector.

German standardizers are eager to start the work to help achieving the objectives of such an important piece of legislation. However, the experts from the European Standardization Organizations CEN, CENELEC and ETSI should remain free to define the appropriate standardization work.

Overall, we are looking forward to collaborating with the European Commission in the coming months and years to make the Batteries Regulation one of the European flagships also thanks to the necessary contribution of European standardization.

About DKE

The DKE German Commission for Electrical, Electronic & Information Technologies of DIN and VDE as a joint organization of VDE and DIN (VDE DKE) is the national platform for about 9 000 experts from industry, science, and public administration to elaborate standards and safety specifications for electrical engineering, electronics, and information technology. Standards support global trade and, among other things, the safety, interoperability and functionality of products and systems. As a competence center for electrotechnical standardization, the DKE represents the interests of German industry in European (CENELEC, ETSI) and international standardization organizations (IEC). In addition, the DKE provides comprehensive services in the field of standardization and VDE specifications. More information available at www.dke.de

Annex

Our suggestions for terms and definitions

Article	Comments	Proposed change
Recital 11	Definitions should appear in Article 2, Definitions, not in a recital. However, the term “battery pack” is not used elsewhere in the text. Nor is the term “battery module”.	Delete recital 11
Recital 12	The terms “category” and “type” seem to be used interchangeably. They are not defined in Art. 2. The term “category” (for batteries) is only used in the Explanatory Memorandum and in the recitals, not in the Regulation itself. See also definition of “type” integrated in Art. 46 (2)(d).	Clarify the difference between “category” and “type” or use the same word, namely “type”.
Recital 29	The term “minimum average duration” can only be defined for non-rechargeable portable batteries of general use. It cannot meaningfully be applied to other portable batteries and automotive batteries.	Replace “minimum average duration” with “capacity”
Art. 2 Point (6)	The definition of “battery with internal storage” seems to have the same intention as the definition of “Battery cell” in point (2), where it says “… and containing the active materials…”. The term “with internal storage” is therefore, in conjunction with point (1), redundant. It is also not used in battery technology, where batteries other than with “internal storage” are known as “flow batteries” or “redox-flow batteries”..	Delete point (6) as well as reference to “with internal storage” throughout the document.
Art. 2 Point (9)	The definition of “light means of transport” is not consistent with recital (12) where scooters are included.	Delete “on which travellers are seated when the vehicle is moving”.
Art. 2 Point (9)	The definition of “light means of transport” is not meaningful since scooters with demountable seats exist where the same battery is used to power them whether the seat is mounted or not. Note: An example is “Steereon” from PLEV Technologies.	Delete “on which travellers are seated when the vehicle is moving”.
Art. 2 Point (13)	An energy storage system is not a battery. Nor is a battery energy storage system the same as a battery. A battery energy storage system consists of one or more batteries and an electric power conversion system which converts the energy to the form which is compatible with the grid.	Replace the term “stationary battery energy storage system” with “stationary energy storage battery”.
Art. 2 Point (21)	A “QR-code” is not a bar code. It does not comprise bars but only squares.	Delete “bar”. Matrix code is sufficient.
Art. 2 Point (22)	The main purpose of a battery management system is to ensure that all components operate safely within their specified ranges of parameters including voltage, temperature and current. Safety needs to be mentioned above function. The safety aspect must not be disregarded by picking the definition from a safety standard without mentioning safety. See IEC 62619, *Secondary cells and batteries containing alkaline or other non-acid electrolytes - Safety requirements for secondary lithium cells and batteries, for use in industrial applications*.	“battery management system” means an electronic system associated with a battery which has functions to control current in case of overcharge, overcurrent, overdischarge, and overheating and which monitors and/or manages its state, calculates secondary data, reports that data and/or controls its environment to influence the battery’s safety, performance and/or service life
Art. 2 Point (24)	Rated capacity is used to define “state of health”. However, a definition of rated capacity is missing. An acceptable definition for rated capacity can be found in	Add the following term and definition: *‘rated capacity’* means the capacity, in ampere-hours or milliampere-hours, of a cell or battery as

	the UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria	measured by subjecting it to a load, temperature and voltage cut-off point specified by the manufacturer. NOTE: The following IEC standards provide guidance and methodology for determining the rated capacity: (1) IEC 61960 (1 Ed. 2003-12): Secondary cells and batteries containing alkaline or other non-acid electrolytes – Secondary lithium cells and batteries for portable applications; (2) IEC 62133 (1 Ed. 2002-10): Secondary cells and batteries containing alkaline or other non-acid electrolytes – Safety requirements for portable sealed secondary cells, and for batteries made from them, for use in portable applications; (3) IEC 62660-1 (1 Ed. 2011-01): Secondary lithium-ion cells for the propulsion of electric road vehicles – Part 1: Performance testing.
Art. 2 Point (40)	Reuse is used for different objects in the document, not only for batteries but also for secondary raw materials.	Add “of a battery” after “reuse” so that the term reads: ‘*reuse of a battery*’
Art. 2 Point (40)	Is reuse the same as re-use? Why then is it spelled differently, even within the definition?	Spell reuse or re-use, but consistently throughout the document.
Art. 7 (1)	“capacity above 2 kWh” is a contradiction in itself as capacity is expressed in Ah while energy is expressed in Wh or kWh. A correct notion can be found in the UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria, where the term “nominal energy” is used. Also refer to Commission Regulation (EU) No 1103/2010 on Capacity labelling. Also refer to Annex II (2) where the functional unit is defined as 1 kWh of the total energy. Also refer to Annex IV, where it is required that capacity is expressed in Ah and energy is expressed in Wh.	Replace “capacity” with “nominal energy” wherever the term “capacity above 2 kWh” appears in the document. Add a definition for “Nominal energy”: ‘nominal energy’ means the energy of a battery determined under specified conditions and declared by the manufacturer, expressed in Wh. The nominal energy is calculated by multiplying nominal voltage expressed in V by rated capacity expressed in Ah.
Art. 13 (2)	The term “minimum average duration” can only be defined for non-rechargeable portable batteries of general use. It cannot meaningfully be applied to rechargeable portable batteries where the term capacity is defined. See also comments on Annex III.	Add “rechargeable” before the first appearance of “portable”. Add “non-rechargeable” before the second appearance of “portable” so that the paragraph reads: From 1 January 2027, <u>rechargeable</u> portable and automotive batteries shall be marked with a label containing information on their capacity and <u>non-rechargeable</u> portable batteries shall be marked with a label containing information on their minimum average duration when used in specific applications.
1. Framework of the proposal / initiative	capacity storage is not the right word	energy storage

Chapter1.5.4		
Annex IV Part A Point (1)	capacity fade is defined as a decrease over time.It is therefore not correct to measure it in % without referring to a time interval.	Replace “(in %)” with one of the following: “(in % per year)” or “(in % per time unit)” or “(in % after a specified time interval)” Applies also to points 3 and 4.
Annex IV Part A Definition of ‘Internal resistance’	“opposition to the flow of current” is not a definition but an explanation of the etymological origin of the word. It has no value in terms of battery technology and metrology. Resistance is defined in IEC 80000-6, *Quantities, and units - Part 6: Electromagnetism*: ‘resistance’ means, for a resistive component, the quotient of instantaneous voltage and instantaneous electric current. Internal resistance of a fuel cell is defined in IEC 60050-485, *International Electrotechnical Vocabulary (IEV) - Part 485: Fuel cell technologies,* in paragraph 485-15-04: ‘internal resistance’ means the ohmic resistance inside a fuel cell, measured between the current collectors, caused by the electronic and ionic resistances of the different components (electrodes, electrolyte, bipolar plates and current collectors). Internal resistance is usually not defined for rechargeable batteries because it is a multi-parameter multi-dimensional function for which no single value can be determined, and which does not contribute anything to the description of the battery that cannot be expressed in terms of current rate and voltage or capacity or energy or power.	Delete the definition. Leave a definition to the standardisation organisations (article 15) and/or the organisation(s) responsible for the common specifications (article 16).
Annex VI Part C	A QR code that is 100 % black and easily readable by a commonly available QR reader is a contradiction in itself. The reader would read nothing but a single “code”.	Either delete “100 % black and of a size that is” as it does not contribute anything or add “and white” after “black”.