Preparatory Study on Ecodesign and Energy Labelling of rechargeable electrochemical batteries with internal storage under FWC ENER/C3/2015-619-Lot 1

TASK 7 Report

Policy Scenario Analysis

Annex C Stakeholder position papers

VITO, Fraunhofer, Viegand Maagøe

August 2019

Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs

Study team leader: Paul Van Tichelen
VITO/Energyville – paul.vantichelen@vito.be

Key technical expert: Grietus Mulder
VITO/Energyville – grietus.mulder@vito.be
Antoine Durand
Fraunhofer ISI – antoine.durand@isi.fraunhofer.de

Authors of Task 7: Paul Van Tichelen - VITO/Energyville
Grietus Mulder – VITO/Energyville
Antoine Durand – Fraunhofer ISI

Quality Review: Jan Viegand – Viegand Maagøe A/S

Project website: https://ecodesignbatteries.eu/

Version history:

Version 1: Draft for discussion in the stakeholder meeting of 2/5/2019

Version 2: Updated version taking into account the written feedback from the stakeholders and those of the stakeholder meeting.

Main changes in the policy analysis are:

Minimum criteria for auxiliary BMS power are shifted to information requirements

- In the carbon footprint requirements some recommendations are added to review/simplify the PEFCR to be used.

- Separate information requirements are added for battery cells to be used in the intended application.

- In the other minimum battery pack design and construction requirements a requirement has been added to provide a vehicle-to-grid(V2G) and complementary vehicle-to-test(V2test) interface.

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Directorate Directorate C – Industrial Transformation and Advanced Value Chains

Unit Directorate C1

Contact: Cesar Santos

E-mail: cesar.santos@ec.europa.eu

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Annex C1. Stakeholder ED Battery Comments - DEA

DG ENER Lot 37: Preparatory Study on Ecodesign and Energy Labelling of rechargeable electrochemical batteries with internal storage

Please note that the comments will be published and used for the work of this preparatory study. If you have useful data that can be disclosed in an aggregated form that requires an NDA please contact the study team.

Organization:	**Name:**	**Date:**
Danish Energy Agency	**Jesper Ditlefsen**	

Task#	Section#	Page#	Topic	Comment	Proposed change	Study team reply
7	7.1.2.1	18-19	Proof-reading comments	Table 7-2 If max. capacity fade (relative to declared value) is 90%, it would seem that minimum remaining capacity is only 10% ? Table 7-3 Capacity must be stated as “usable energy capacity in kWh x number of cycles”. (Capacity is not measured in kW). No space before %-sign, only before regular SI-units like kW, kWh, V, or A.	For automotive applications, leave out requirements on auxiliary power, cooling and heating needs.	

Task#	Section#	Page#	Topic	Comment	Proposed change	Study team reply
7	7.1.2.1	19	*Table 7-3* Total Functional Unit Warranty	A warranty limit related to lifetime information registered in the battery management system would be an invitation to have the system manipulate this information, so as to avoid warranty claims. Also, if the battery management system breaks down, the battery owner will no longer have the data necessary for a warranty claim. Last but not least, consumers may not easily understand the concepts of "Total Functional Unit" and energy throughput or how these translate, depending on a consumer's use profile, into a warranty cover expressed in more familiar terms like number of years or distance driven. Instead, the warranty limit should be expressed in parameters which are familiar, already registered for other purposes and not easily manipulated. For automotive applications, the most meaningful would be a warranty on a minimum number of km/miles and years in use (in the vehicle for which the battery was produced), whatever comes first, as is already the case for existing warranties on motor vehicles. A warranty of this kind, rather than on energy throughput, would in itself be an incentive to design EVs for battery use that maximizes	1) Change proposed minimum warranty on "Total Functional Unit" into a warranty on years in use and, for automotive applications, distance driven. 2) Include labelling-type requirement so as to foster competition on warranty extent. 3) Consider warranty extent to 80 % or 70 % capacity rather than 90 %.	Added to the position papers and discussed in the specific section

				battery lifetime. This would of course benefit consumers as well as the environment. In many cases, the lifetime warranty offered for an EV battery is already better (7-8 years) than most warranties for internal combustion engine vehicles. This can be an important argument in favour of an EV. Therefore, in so far as EVs are considered less environmentally harmful than ICE-vehicles, it would seem important to maintain that warranty extent for the two technologies can be compared directly, rather than introducing a new warranty format for EV batteries, which would hinder or complicate direct comparison. Also, knowing whether the warranty is still valid would be straightforward, because the distance driven and number of years in use are already registered for other purposes (e.g. tax, insurance and maintenance). Since authorities are not meant to test whether a battery performs as per the lifetime guarantee (as we understand it, this will be tested only by the market, because lab test cost and duration would be prohibitive), the warranty requirement could be extended to 80 % or 70 % of original capacity rather than to 90 %, as set out in Table 7-2. This would seem more in line with the 7-10 years warranties already offered for EVs.		

				For ESS, the warranty could simply cover a minimum number of years in use, but the extent might be linked to the type of application, cf. comments above to section 7.1.2.1 regarding test standard for such applications. For both types of application, a minimum warranty could be supplemented by a labelling-type requirement so as to foster competition on warranty extent between manufacturers.		

Task#	Section#	Page#	Topic	Comment	Proposed change	Study team reply
7	7.1.2.2	20	Requirements on auxiliary power, cooling and heating needs for automotive applications	For automotive applications, the energy efficiency effect of auxiliary power, cooling and heating needs is already included in the overall efficiency under test conditions as found in the WLTP test. It seems questionable whether specific requirements on these parameters would improve overall efficiency or reduce overall environmental impact. In particular, it would seem that manufacturers of EVs already have a powerful incentive to design vehicles and batteries in such a way that overall efficiency and, hence, vehicle range, is maximized. And this is also an incentive to minimize needs for auxiliary power etc. Also, it is not inconceivable that e.g. a new	For automotive applications, leave out requirements on auxiliary power, cooling and heating needs.	

				battery management system could consume more than existing solutions but nevertheless reduce overall energy consumption. Therefore, there is a risk that a requirement specifically on auxiliary power etc. could be counterproductive with regard to overall efficiency. Last but not least, no test method or standards exist for the evaluation of these parameters, so there is significant risk that it would delay adoption and effect of the regulation if they were to be included.		

Annex C2. Stakeholder ED Battery Comments – ACEA

DG ENER Lot 37: Preparatory Study on Ecodesign and Energy Labelling of rechargeable electrochemical batteries with internal storage

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Organization:	**Name:**	**Date:**
ACEA	**Jens Warsen**	**24/05/2019**

Task #	Section #	line #	Topic	Comment	Proposed change	Reply study team
7	7.1.3		Page 21, Objective	General comment: a multitude of aspects that are mentioned in this section are already covered under the scope of other legislation (e.g. Battery Directive, ELV Directive). Industry implemented several processes and measures to fulfil requirements stemming from these regulations. It is therefore imperative to make sure that there are no overlaps or even contradictions created under this initiative.	.	Agreed, Text added in the scope to highlight this issue.
7	7.1.3.2		Rationale	General comment: How will all this information be used by dismantlers/recyclers, i.e. how will it practically facilitate their processes?		Added to the challenges
7	7.1.3.2	8-10	Page 26, Responsible sourcing	How can such information promote sustainable sourcing? Sustainable sourcing is already part of OEMs sourcing strategies (see www.drivesustainability.org)	Delete the paragraph	Link https://drivesustainability.org/raw-materials/ added in a footnote but we do not want to conclude already in the study on how and where such information should be provided

Task #	Section #	line #	Topic	Comment	Proposed change	Reply study team
	7.1.3.2	9-11	Page 28, dismantling info	Information on disassembly/dismantling is already available and provided via IDIS. No additional datasource needed.		Thanks. Added to the text.
7	7.1.3.3	11-25	Page 31, requirement on Carbon footprint	Despite the Commission's activities to establish European battery production capabilities, it is economically vital to keep battery value chains global. A responsible regulation must therefore address sustainability requirements that apply to raw materials, components and batteries manufactured and recycled beyond the European boundaries. ACEA is concerned that ill-defined measures, like the prescriptive PEF methodology, could become a major trade barrier for the sourcing of automotive batteries. The automotive industry acknowledges the merits of LCA as a voluntary method to assess the environmental profile of a vehicle across its entire life cycle and to support target-oriented product development. However, LCA studies shall be based on ISO 14040/44 standard in order to guarantee a global level playing field	Refrain from prescribing usage of the PEF methodology	Noted. The proposal is for information requirement only. Added in challenges 'The PEF methodology reduces the flexibility of ISO 14040/44 standard and does therefore not provide as such a global level of playing field'.

Task #	Section #	line #	Topic	Comment	Proposed change	Reply study team
7	7.1.3.4	1-14	Page 34	The requirements shall be the same level as conventional ICE vehicle and/ or feasible.		Noted. Also reference was made to IDIS. Up to the EC to decide on how to maintain this.

Annex C3. Stakeholder ED Battery Comments - ANEC BEUC

Preparatory Study on Ecodesign and Energy Labelling of rechargeable electrochemical batteries with internal storage

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Organization:	**Name:**	**Date:**
ANEC / BEUC – European Consumer Organsiations	**Maigret Aline, Ecodesign project coordinator**	**May 2019**

Task #	Section #	line #	Topic	Comment	Proposed change	Reply study team
7	General		Proposed policy measures Requirements for battery management and requirements for battery information	Under Task 7, the study team puts forward the following policy options: Requirements for battery management and requirements for battery information Minimum battery pack/system lifetime requirements Maximum auxiliary power consumption of the battery system Requirements for carbon footprint information Minimum battery pack design and construction requirements to support reusability/recyclability/recoverability **Overall, we welcome the options proposed, and comment on them individually below.** **We strongly support the proposal to have requirements on battery management and battery information.** This is in line with the circular economy goals, and for consumers, such information can furthermore increase resale values of used vehicles and provide better and independent access to repair professionals. **We also support information on enabling fast and proper disassembly and recycling** (including detailed information on contained materials and for facilitating direct recycling instead of melting), SoH information, information for independent service professionals for diagnosis, maintenance, battery / cell replacement and repurposing of batteries.		Noted. Added to the position papers/

Task #	Section #	line #	Topic	Comment	Proposed change	Reply study team
7	7.1.2.1		Minimum battery pack/system life time requirements	**We support the definition of clear minimum performance requirements that must be achieved for a minimum lifetime**. While defining appropriate test standards will be of paramount importance, alternative instruments should also be considered, e.g. manufacturer information on expected lifetime and performance.		
7	7.1.3.4		Other minimum battery pack design and construction requirements to support reusability/recyclability/recoverability	We support the proposal to have **requirement on minimum battery pack design and construction to support reusability/recyclability/recoverability**		Noted FYI: this is not supported by any manufacturer.
7	Table 7-5		Table 7-5: Concept format on scoping enquiry (to be decided later)	We encourage the study team to **consider a scope extension** and necessary modifications in policy measures as indicated in Table 7-5.		Noted FYI: this is not supported by the Recharge battery manufacturers neither Applia as a federation of Appliance manufacturers.

Annex C4. Stakeholder ED Battery Comments – APPLiA

DG ENER Lot 37: Preparatory Study on Ecodesign and Energy Labelling of rechargeable electrochemical batteries with internal storage

Please note that the comments will be published and used for the work of this preparatory study. If you have useful data that can be disclosed in an aggregated form that requires an NDA please contact the study team.

Organization: APPLiA				**Name: Giulia Zilla**	**Date: 23 May 2019**	
Task #	**Section #**	**line #**	**Topic**	**Comment**	**Proposed change**	**Reply study team**

	7.1.4.	35	**Recommendations on opportunities to extend the scope of policy measures**	APPLiA strongly supports the recommendation given by the Consultants at page 35. Among the valid reasons provided already by the consultants, we would like to stress the need to exclude from the scope batteries < 2kWh and in particular batteries contained in cordless home appliances for the following reasons: **1.** Broadening the scope of the preparatory study would require a new preparatory study, including an examination of all existing low-capacity battery applications and life-cycle analyses in collaboration with relevant stakeholders. **2.** The draft tasks clearly show how the highest environmental and energy benefits rely on batteries above 2kWh and in particular to e-vehicles application. As it was displayed during the 2nd Stk meeting (here) in the Task 2, indeed, the largest energy savings and environmental benefits come from the production phase. Knowing that batteries produced in Europe are mainly the one meant for e-transport (above 2kWh), there would be no real benefit in regulating low capacity batteries which are mainly produced outside Europe. **3.** We do support the MEErP methodology and we invite the Consultants and/or the Commission to use a similar method in developing the future regulatory framework for this study.	***We do not recommend extending or review the scope relative to the proposal in Task 1.***	Noted; we will add this to the position papers

	7.1.4.	35	**Recommendations on opportunities to extend the scope of policy measures**	Other rational and technical reasons are the following: Small battery packs (< 2kWh) in cordless home appliances are already subject to regulation under the WEEE Directive (e.g. collection) Home appliances are subject to product-specific ecodesign regulations and should be regulated coherently; 'double regulation' must be avoided There are no standards to underpin policy proposal for low capacity batteries	***We do not recommend extending or review the scope relative to the proposal in Task 1.***	Noted we will add this to the position papers

Annex C5. Stakeholder ED Battery Comments - Nissan

From:	TAKEHANA, TOMOKO <takehanatomoko@mail.nissan.co.jp>
Sent:	Monday, 27 May 2019 05:22
To:	ZZ Email ED Batteries
Cc:	HASEGAWA, TETSUO; IKEDA, MAKOTO; YOSHIDA, MAKOTO; TSUZUKI, MIKIO; SUZUKI, YUKAKO; IWASAKI, MASAHIKO; UMETSU, MASAAKI
Subject:	Nissan comments for Task7

Dear Sirs or Madams,

My name is Tomoko Takehana and I am responsible for EV technical affairs at Nissan Motor Co.Ltd. We have no specific comments, however, we are herewith sending you the Nissan's general comments below;

Nissan supports the activity to study on battery sustainability.

In the era of widespread use of electric vehicles, battery reuse is the necessary efforts in order to prevent global warming on the carbon footprint and resource circulation. Nissan has been continuously working on battery 4R(Reuse, Resell, Refabricate and Recycle).

At the next stage of this activity, Nissan would like to focus on the following discussion for the implementation such as the FU (functional unit) from the viewpoint of the environmental impact and life cycle energy storage capacity, and requirements relating to the battery life time and BMS information, etc. And we would like to discuss with you if needed and contribute to EU market sustainability.

Best regards, Tomoko Takehana Senior Manager

Global Technical Affairs Department

Tetsuo Hasegawa General manager

Global Technical Affairs Department Nissan Motor Co. Ltd.

Annex C6. Stakeholder Position Paper – ECOS, EEB, Coolproducts, IFixit, RREUSE

Brussels, 17 May 2019

Europe needs an ambitious regulatory framework to guarantee sustainability of batteries

Adopting sustainability requirements for batteries is crucial, as the electrification and decarbonisation of various sectors, such as mobility and energy storage, depends on the rechargeable battery technology. Lithium-ion batteries represent a rapidly growing global market which warrants an EU level response to avoid lock in to linear sub-standard industrial patterns and give a competitive advantage to EU industry to compete on quality. To fully capture the benefits of decarbonising the economy through electrification we need to address the environmental impact of battery production in terms of CO_2 emissions, resource depletion and ethical sourcing.

Although batteries will be an essential product in the EU's pathway to decarbonization, their material composition and non-use phase impacts necessitates that they are viewed as highly valued and strategic products from the EU environmental policy point of view. In the context of sustainable production and consumption, this means accelerating the roll out of well-designed clean, circular and durable batteries, while avoiding stifling innovation or that unnecessary, wasteful and polluting products reach the market. If batteries are made easy to refurbish, re-use and maintain for as long as possible, there is also an occasion to create new local jobs in the EU.

Following the discussions at the stakeholder meeting on the preparatory study on Ecodesign and Energy Labelling which took place on 2nd May, we are concerned about the lack of a clear vision on what could be an ambitious, effective, and fit-for-purpose European regulatory framework for batteries.

A robust stand-alone European Regulation for sustainable batteries.

In that respect, we call for an ambitious set of rules regarding the sourcing of raw materials, the design and manufacturing stages of batteries, as well as the necessary information to be conveyed to end users and the supply chain actors to be set **in (a) European Regulation(s)**. Batteries put on the single market must have robust sustainability requirements ensuring, *inter alia*:

- A **reduced carbon footprint** over the whole product value chain and the full production cycle.
- An **ethical and responsible sourcing** of raw materials.

- A **circular design**, incorporating recycled material and facilitating the reuse, repurposing, remanufacturing and ultimately recycling.
- **Transparent communication and tracking of performance** across these criteria and on material/chemical contents to end users and supply chain actors.

Although it became increasingly clear that these rules will not be set under the framework of the Ecodesign Directive, we urge the Commission to keep a high level of ambition in terms of legal instruments and requirements to place batteries on the EU market. A Regulation has the potential to set harmonized rules across the single market, reduces the risks of fragmented national implementation, and will apply to all batteries placed on the EU market. Similarly high ambition should apply to the **revision of the Batteries Directive**, which we expect to set high collection and recycling targets for critical battery materials, clearly define the responsibilities of each actor in the value chain and drive the circularity of batteries. This would reinforce and complement the requirements to be set for the design stage and the placement on the market outlined in this letter.

Contact:
ECOS – European Environmental Citizens' Organisation for Standardisation
Mélissa Zill, *melissa.zill@ecostandard.org*

Annex C7. Stakeholder Position Paper – RECHARGE

Advanced Rechargeable and Lithium Batteries association

January 2019

Ecodesign Directive for Batteries

RECHARGE View on Criteria for Sustainable Batteries

Introduction

Over the next 15 years, a **significant and constant growth is expected in battery volumes** placed on the market, driven *inter alia* by the introduction of Battery Electric Vehicles (BEVs) which are expected to take a sizeable share of the Personal Car (PC) and Light Commercial Vehicle (LCV) markets.

Issues such as **sustainability** and **minimal environmental impact** of battery and its industry have been raised as **key aspects to be addressed**. In this context, the Ecodesign directive for batteries has been considered as a potential legislative tool to address most of these issues.

RECHARGE acknowledges this effort towards a sustainable industrial policy for batteries, however would like to stress that **the quality of the work should not be undermined in favor of a quicker legislative process**. Particularly, **the scope of the ECODESIGN for batteries should be enlarged to include the impacts from cradle to grave**, throughout all phases of a battery life from manufacturing (including the supply chain), use and to the end of life.

RECHARGE suggests some proposals, based on the key takeaways from RECHARGE's internal working groups, and the project for batteries within the Commission pilot "Product Environmental Footprint".

Key priorities for sustainability requirements for batteries

- **A result-oriented Ecodesign directive for batteries, focused on recognized and measurable impacts.**

As an overall recommendation, RECHARGE stresses that the Ecodesign directive **should not impose requirements on the very technical choices related to design and the process,** due to the infancy stage of batteries designs and industry processes for e-mobility, as many competing solutions are foreseen to increase the battery performance, and many more will be identified.

- **Raw materials:** Ensure the setup of take back and recycling systems.

Market projections for 2030 point to volumes up to 400 GWh or more[1]of batteries placed on the market per year, which equates to approx. 1.6 million tons a year. High performance Li-ion batteries require the use of some rare metals with a limited supply. It is therefore **necessary to establish take back and recycling systems, so that this source of secondary raw materials becomes available in Europe.**

[1] CEPS report No 2018/05, July 2018, Eleanor Drabik and Vasileios Rizos

It is however important to note that within the EU, an **Extended Producer Responsibility regime is already in place thanks to the battery directive**, whereby all used batteries must be taken back by Producers and recycled. This directive is currently undergoing a revision process, which could be used to further improve this instrument, should the need arise. For example, we recommend to recycle metals such as cobalt and nickel in Li-ion batteries *"to the highest degree that is technically feasible while avoiding excessive costs"*).

- **Climate change:** $CO_{2\,eq}$ content of finished e-mobility batteries as a criterion to discriminate across products placed on the EU market

Electrification of road vehicle transportation aims at improving air quality within urban areas and reducing CO2 emissions. The manufacturing of a battery, which weighs up to 40% of the vehicle for a BEV, is a new source of CO2 emissions, and should be a component of the assessment the European Commission lays out (see annex).

The DG Environment PEF, despite still in need of much improvement and simplification, highlighted that **batteries impact can differ significantly across models on this criterion**, and demonstrated that a large fraction of impacts arises from metals extraction and refining as well as in the manufacturing of other components, whereas actual manufacturing operations (under the roof of the battery maker) and use in the vehicle have relatively limited impacts (see annex).

$CO_{2\,eq}$ content of finished e-mobility batteries, normalized by total kWh output throughout the life of the battery, **should be a critical criterion to discriminate across products placed on the EU market**. Furthermore, low performing products should not be placed on the market, and identification should be implemented **to differentiate and incentivize higher performance products**.

- **CSR principles:** Encourage the industry to source from supply chains located in countries implementing the 8 ILO conventions and truly apply them within their facilities.

Much has been published on the way some supply chains either violate workers' rights or show disregard for the behavior of upstream operators. International bodies have created a legal framework to ensure a minimum set of standards be introduced in all national legislation, namely the 8 fundamental International Labor Organizations (ILO) Conventions.

To **avoid a possible trade-off between better environmental performance and degraded treatment of workers**, the legislative environment should encourage industry to source from supply chains located in countries, which fully implement these 8 ILO conventions and truly implement them within their facilities.

- **Implementation principles** in line with Understandable, Standardized, Accurate, Discriminating and Auditable Standards

These criteria should be implemented along with U.S.A.D.A. standards, which means they ought to be **Understandable**, **Standardized**, **Accurate**, **Discriminating** and **Auditable**. The complete PEF methodology is not fulfilling these criteria.

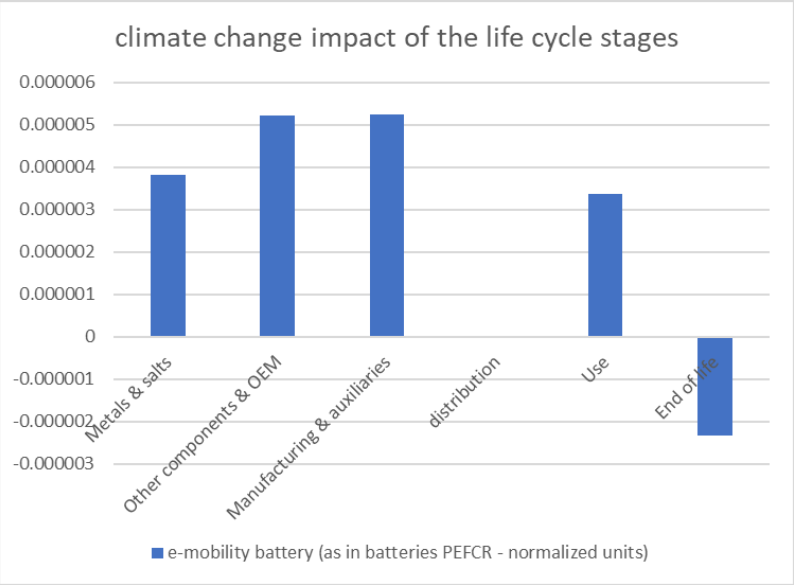
Comments of the proposed policy options of the inception impact assessment are presented in annex.

About

RECHARGE aisbl is the Advanced Rechargeable and Lithium Battery Association representing the specific interests of the Rechargeable Battery Industry in Europe. RECHARGE's mission is to promote the value of advanced rechargeable batteries through their life cycle. RECHARGE's Members include Rechargeable Battery Manufacturers, Original Equipment Manufacturers, Rechargeable Batteries Recyclers and Raw materials suppliers to the Battery Industry.

Contact: Mr Claude Chanson, General Manager | cchanson@rechargebatteries.org | + 32 2 777 05 60 | www.rechargebatteries.org

ANNEX: Batteries climate change impact (based on Batteries PEFCR)



Explanation of graph

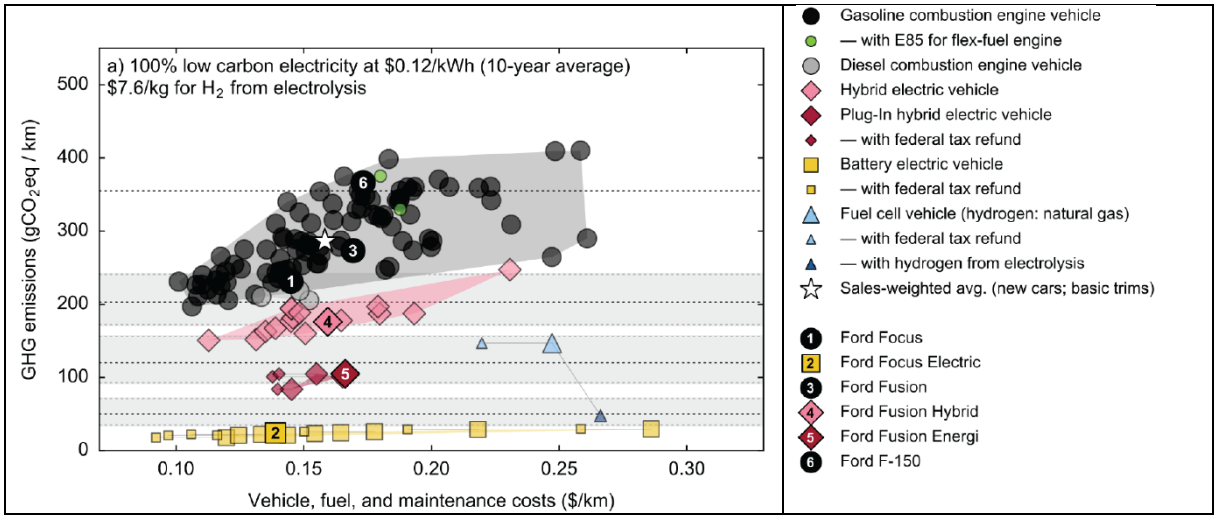
- The climate change impact is measured in "kg CO_2-equivalent", before normalization (according the batteries PEFCR).
- ***Metals and salts:*** impact of the acquisition of the raw materials and transformation as batteries active materials (batteries cells material).
- ***Other components and OEM*****:** impact of the batteries components such has electronics for safety protection and management, cooling systems as designed by the OEM (Original equipment manufacturer).
- ***Manufacturing and auxiliaries*****:** impact of the cells and batteries manufacturing and assembly
- ***Distribution:*** impact of the transport and distribution, including intercontinental transport for the active materials.
- ***Use:*** impact of the electrical energy used in the battery during the use phase. Only the electrical energy losses of the battery are taken into account: the electrical energy transmitted to the vehicle is used by the vehicle, not by the battery.
- ***End of life:*** net impact credit of the recycling operation, calculated according the circular economy formula of the PEFCR, after deduction of the impact due to the process of recycling itself.

Comments on Batteries climate change impact

- The impact of the use phase represents only around 20% of the total impact throughout the product life cycle.
- The main sources of impact are the materials and components acquisition, as well as the manufacturing phase.

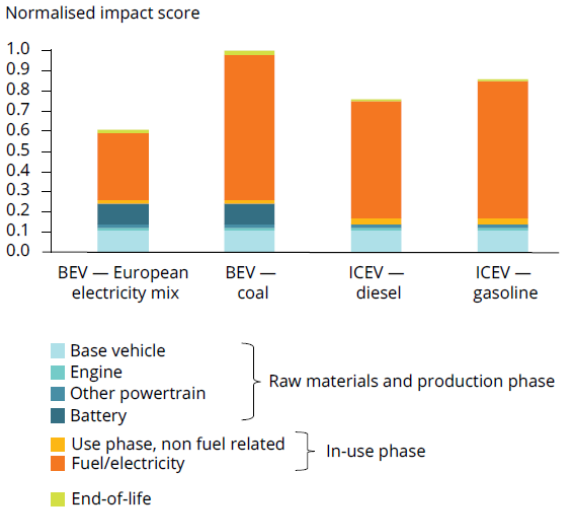
Vehicles climate change impact

On a full lifecycle basis and decarbonized grids (24 gCO2e/kWh), electrification is the THE ONLY known technology to meet the 2050 climate target of 80% reduction vs. 1990.[2] [3]



TODAY, on a full lifecycle basis, EV lifecycle emissions are better than all other options, at EU average mix (276 gCO2e/kWh).

Figure 6.1 Climate change impacts: example comparison of BEVs with ICEVs



Note: See footnote 8 for a description of the study system.

Source: Hawkins et al., 2013.

4

[2] Trancik, J.E. et.al, Personal Vehicles Evaluated against Climate Change Mitigation Targets, Environ. Sci. Technol. 2016, 50, 10795−10804

[3] European Environment Agency (EEA) 2018: https://www.eea.europa.eu/data-and-maps/indicators/overview-of-the-electricity-production-2/assessment

[4] https://www.eea.europa.eu/publications/electric-vehicles-from-life-cycle

Analysis and proposals for the policy options

As a general comment on sustainability requirements, RECHARGE stresses that the Ecodesign Directive should **avoid any overlaps with the Battery Directive** and any **specification of a technical solution**, but should rather focus on the criteria rewarding environmental and social performance of the product. Moreover, the selected **criteria should be evenly applicable to all batterie**s in the scope which are used in Europe, **including the imported products**.

Consequently, RECHARGE supports the implementation of a combination of targeted parts of the policy option outlined in the European Commission's Inception Impact Assessment:

Option 1 *No EU Action*

- RECHARGE does not consider option 1 is an efficient way to reach the objective, due to the high competition in battery manufacturing which does not leave room for a fair development of best social and environmental practices if not rewarded.

Option 2 *Self-regulation by industry on the performance and sustainability of batteries*

- RECHARGE considers crucial to only propose regulation whereby economical competition does not drive the product design and manufacturing in a 'sustainable direction'.

Option 3 *Minimum energy performance requirements*

- RECHARGE stresses the importance of a differentiated approach for the battery performances requirements: some of the suggested life duration measures are not applicable due to the different nature and combination of the performance criteria depending on the application.
- Requirements for energy efficiency performance can be considered, as long as they provide potential benefit for a recognized environmental impact: the climate change. In this case, RECHARGE recommends creating a criteria for climate change impact of the complete life cycle, based on CO2 eq content of finished e-mobility batteries, normalized by total kWh provided.

Option 4 *Minimum sustainability requirements*

- As in option 3, RECHARGE stresses the importance of a differentiated approach. In case of recyclability, there are already existing criteria in the Batteries Directive. To avoid any overlaps, RECHARGE suggests redefining the **criteria for recycling only in the Batteries Directive,** if changes are needed.

Option 5 *Criteria on ethical sourcing of raw materials for the production of batteries*

- RECHARGE supports the set-up of a criteria for Corporate Social Responsibility, such as the ILO standards, in particular for raw material sourcing but not limited to it.

Annex C8. Stakeholder Position Paper – HIU, ITAS

Comments on:

DG ENER Lot 37: Preparatory Study on Ecodesign and Energy Labelling of rechargeable electrochemical batteries with internal storage

- Position paper –

Jens Peters[1], Marcel Weil[1,2]

[1] Helmholtz Institute Ulm for Electrochemical Energy Storage (HIU),
Karlsruhe Institute of Technology (KIT), Karlsruhe, DE; j.peters@kit.edu
[2] Institute for Technology Assessment and System Analysis (ITAS),
Karlsruhe Institute of Technology (KIT), Karlsruhe, DE; marcel.weil@kit.edu

An eco-design and circular economy directive should consider all aspects of environmental sustainability. Thus, we consider the current scope of the study as problematic, with its very exclusive and, in our opinion, very one-sided focus on the carbon footprint (CF). While being the CF highly relevant, there are other potential environmental impacts that might me as least as relevant or critical [1,2]. Apart from the resource demand itself, we know of high environmental impacts from resource mining, especially cobalt, but also nickel and copper required for current lithium-ion batteries (LIB). These include toxic impacts for workers, but also acidic emissions from ore roasting (acidification) and leaching of toxic and acidic substances from mine tailings. The current knowledge base in this regard is admittedly weak, but a comprehensive Ecodesign should not disregard potential impacts simply because of missing information or higher uncertainties. Existing LCA studies indicate that the toxic impacts from battery manufacturing are very high and would lead to highly unfavourable lifetime results for EV in comparison to internal combustion engine vehicles (ICV) [1].
This might be a consequence of the comparably superficial literature review done in Task 5, which does not consider major studies and disregards relevant impact categories (as also addressed in the review comments). Here, a more comprehensive review would be helpful for providing a sound basis for the following tasks. This is surely a work intensive task and would probably affect the timing of the project, but we consider a thorough knowledge of the current state of the art as a key for providing further recommendations.

A second aspect little considered in the current draft of the study but essential under a circular economy paradigm is assuring the right fate for waste batteries. While talking a lot about second life options, a look into the current ICV market shows that, given a sufficiently high stock of vehicles within the economy, a second hand market might evolve where parts (and possibly also batteries) are traded as second hand products for automotive use until their very end of life. This also includes international trade and the export of used batteries and electric vehicles (EV) into non-EU countries (in 2016, approx. 6 Mio EoL vehicles were recycled in Europe, while 17 Mio were newly registered [3]). In these countries, a proper recycling cannot be assured, and we know the fatal recycling practices in the informal sector from waste electric and electronic equipment (WEEE) and waste lead-acid batteries, leading to severe environmental and toxic impacts, affecting especially the poorest and less informed [4,5]. Thus, again following precautionary principles, it should be assured as far as possible that recycling takes place only in premises following high environmental standards. As long as recycling of LIB under these standards is associated with a cost, there will be little incentive for e.g., scrapyard operators to bring the battery to the recycler, and he/she will rather sell it for export. Although not a technical issue, we consider this aspect as highly relevant under

sustainability aspects and ask for a mandatory deposit sufficiently high as to incentivise the return of used batteries to the OEM (the deposit return must be higher than the value an informal recycler could obtain from the raw materials). This would be a real step forward under circular economy aspects well worth considering in an eco-design directive.

Finally, we would like to comment on the questions raised regarding the scope of the study. As now, the scope is not properly defined from our point of view. The study neither covers a certain battery technology (lithium-ion), since it excludes relevant applications like mobile and handheld, toys, drones, robots and other (semi-) autonomous mobile applications. On the other hand, it neither covers all battery types potentially suitable for the considered applications (automotive and stationary). While for automotive applications LIB prevail (though solid state might become relevant in near term future), for stationary installations there is a competition between very different battery technologies (e.g., redox-flow, LIB, lead-acid, etc.). Applying eco-design requirements to just one of these battery technologies while disregarding the others or applying different eco-design requirements to different batteries seems odd under policy aspects and might even lead to market imbalance. As now, the study is limited to the eco-design of rechargeable lithium-ion batteries for automotive and stationary applications. We would urge extending the scope and applying an eco-design directive for lithium-ion batteries including all possible applications. Alternatively, the directive could be organised according to the application, resulting in a directive on automotive applications, one on stationary and one on mobile. This would allow considering better the specific requirements of the application, but requires finding a common base for defining requirements valid generically for all battery types.

References

[1] Bauer C, Hofer J, Althaus H-J, Del Duce A, Simons A. The environmental performance of current and future passenger vehicles: Life Cycle Assessment based on a novel scenario analysis framework. Appl Energy 2015;157:871–83. doi:10.1016/j.apenergy.2015.01.019.

[2] Peters JF, Baumann MJ, Zimmermann B, Braun J, Weil M. The environmental impact of Li-Ion batteries and the role of key parameters – A review. Renew Sustain Energy Rev 2017;67:491–506.

[3] Eurostat. End-of-life vehicle statistics 2019. https://ec.europa.eu/eurostat/statistics-explained/index.php/End-of-life_vehicle_statistics#Total_number_of_end-of-life_vehicles (accessed May 8, 2019).

[4] Huisman J, Botezatu I, Herreras L, Liddane M, Hintrsa J, Luda di Cortemiglia V, et al. Countering WEEE Illegal Trade (CWIT) Summary Report, Market Assessment, Legal Analysis, Crime Analysis and Recommendations Roadmap. Lyon, France: Interpol; 2015.

[5] Prajapati S. Lead Acid Battery Recycling In India. IOSR J Electr Electron Eng 2016;11:99–101.

Annex C9. Stakeholder Position Paper EPBA

Avenue de Tervueren 188A, Postbox 4
1150 Brussels, Belgium

Tel: +32 2 761 16 02
Fax: +32 2 761 16 99
Email: EPBA@kellencompany.com
Web: www.epbaeurope.net

EUROPEAN PORTABLE BATTERY ASSOCIATION

Brussels, 24 May 2019

EPBA's statement on

The preparatory study on eco-design and energy labelling of rechargeable electrochemical batteries with internal storage

The European Portable Battery Association (EPBA) is the leading voice of the portable power industry. The association supports the common interests of its members regarding portable primary and rechargeable batteries and battery chargers with European institutions and other leading international bodies to provide consumers with complete power solutions which are sustainable throughout their life-cycles.

EPBA has been following with great interest the discussions on eco-design and energy labelling of rechargeable batteries. Although the scope of this study – *high energy rechargeable batteries of high specific energy with lithium chemistries for e-mobility and stationary energy storage (if any)* - falls outside the remit of EPBA, we recognise that certain principles which are being discussed can also be of relevance towards the portable battery segment.

As a starting point, it is important to understand that various battery types have different technical specificities. This basically means that what can be applied to an industrial battery can very likely not be applied in the same manner as for portable batteries. For this reason, statements which have been made at the stakeholder workshop to include in its scope also portable batteries should be approached very carefully. So far, the eco-design discussions only looked into batteries for electric vehicles/stationary power. Any inclusion of portable primary and/or rechargeable batteries should therefore require a separate discussion.

This distinction is also reflected in the discussions concerning reusability, reparability and recyclability. The application of these *circular economy* principles can differ subject to the battery type. Again, what can work for a large industrial rechargeable battery does not necessarily work for a small consumer battery. The EPBA has developed a document which explains how the fundamental aspects of the circular economy apply to the portable battery sector. In the case of primary and rechargeable batteries, the reparability and reusability concepts are not applicable for the reasons outlined in the document however, resource efficiency, recyclability and resource management are well integrated in the practice of the battery industry (link to document).

Finally, this study is being developed in parallel to the revision of the Batteries Directive 2006/66/EC. In addition, guidelines will be developed on setting modular fees in the context of EPR which will be largely based on circular economy principles. It will therefore be important that all these discussions will lead up to a coherent policy framework. In order to have workable and efficient legislation, definitions should be aligned and coherent and inconsistent overlaps should be avoided.

We remain available for further discussion and can be reached via:

Hans Craen
Secretary General
EPBA
epba@kellencompany.com
Tel: +32 2 761 16 02