



Confederation of the European Bicycle Industry

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CONEBI Position Paper on LMT Common Charging

This position paper by CONEBI, the Confederation of the European Bicycle Industry, builds on the Stakeholder Consultation initiated by the European Commission regarding a common charger for light means of transport (LMT) and power & garden tools, as part of the Review clause of Battery Regulation (EU) 2023/1542. The Commission has been tasked with assessing by 1 January 2025 how best to introduce harmonized standards for a common charger¹. To this end, the Commission has engaged Öko-Institut to conduct a study that includes gathering input from industry stakeholders.

Focusing on LMT, our association has actively participated in this process, offering insights into existing and emerging technologies. However, the journey towards an optimal solution is ongoing, and building expertise is crucial for ensuring that the next steps are taken on a pre-competitive and sustainable basis.

The Light Means of Transport (LMTs) sector, which includes e-bikes², stands at the forefront of innovation, yet it is still a dynamic portfolio of industries, ranging from small enterprises to large corporations. We believe that allowing this sector to flourish without premature regulatory constraints on common charging is essential for fostering innovation and technological advancement. Considering this, CONEBI has established a dedicated Task Force to expand our understanding and build a unified stance on the matter of common charging.

By "common charging" we refer to achieving charging interoperability for a certain product group. This could involve standardising various components of the charging setup, including the plug, AC/DC conversion, cable(s), connector(s), regulator, communication protocol or battery management systems, to ensure compatibility and meet specific requirements.

We have investigated the use cases of e-bike charging today and have come to the following conclusions: the majority of charging is conducted by end-consumers at home (hereafter: private charging case). In a minority of cases, charging is conducted in public (hereafter: public charging case).

¹ Review clause of Battery Regulation (EU) 2023/1542 reads:

By 1 January 2025, the Commission shall assess how best to introduce harmonised standards for a common charger for, respectively, rechargeable batteries designed for light means of transport, as well as for rechargeable batteries incorporated into specific categories of electrical and electronic equipment covered by Directive 2012/19/EU.

² E-bikes is used in this text synonymously for EPAC (electrically power assisted cycles), L1e-A (powered cycles) and L1e-B (S-EPAC).

Lithium-ion batteries, which are typically used in e-bikes, are intricate, finely calibrated systems with a high energy capacity, containing potentially flammable ingredients. It is crucial to recognise that these batteries are classified as dangerous goods class 9 according to the UN Transport Regulation³ and are typically stored and charged in private residences when not in use. As bicycle industry, we take our responsibility seriously when it comes to the associated risks. This is why we give careful consideration to the matter of battery safety from a comprehensive perspective – including the design of the electric system and the usage of the e-bike – with respect to applicable safety standards. Particular attention is being paid to the charging and discharging phases of the battery, including the hardware and software of the battery, as well as the charger. It is noteworthy to mention that charge control is a particularly important aspect when it comes to charging high-energy capacity batteries at home. This should be taken into account by a common charging solution.

Whether consumers buy their bikes in a physical shop or an online storefront, e-bikes are currently sold with an adequate charger. High-quality chargers will have a long lifespan, which often exceeds that of the battery due to the battery's natural calendric and cyclical aging processes. As e-bikes have a much longer lifecycle compared to IT equipment, like e.g. smartphones, a cost-benefit analysis should evaluate whether there are sustainability gains by a common charging solution for the private charging case. Depending on the design, chargers may need to fulfil specific requirements to be used for e-bike charging. Their power demand may also be higher compared to common IT devices.

Private charging case:

The electric-assisted range of e-bikes is typically adequate for most users' daily commutes or sports activities. As a result, the majority of charging occurs at home, either by removing the battery pack from the e-bike and charging it indoors, or by charging it directly on the bike, usually in a garage, rather than in public spaces. That being said, the batteries and the overall e-bike need a robust charging port/interface due to potential exposure to wet, dusty, muddy, sometimes even salty conditions and significant vibrations during riding, which should be even more robust if the charging port is also used as the discharging port.

Significant R&D resources and investments are being made by e-bike manufacturers and component suppliers in Europe and beyond to realise safe battery charging for e-bikes. It may seem questionable that plugs are designed differently by various component manufacturers. However, due to the potential risk associated with the charging process, this design choice actually ensures that the right charger is connected to the right battery for full compatibility. This point is strongly emphasised by organisations such as the London Fire Brigade: "Always use the correct charger for your batteries and buy any replacements from a reputable seller."⁴

One argument in favour of common charging is its potential link to sustainability. While it may appear as if the approach of the European Union to mandating a standardised charging plug for consumer electronics would bring similar benefits if transferred to e-bikes, this is in fact not the case. The main difference from e-bikes lies in the nature of these products. Consumer electronic devices in our homes, like smartphones, tablets, and other gadgets, typically have similar batteries and charging needs. Since consumers frequently replace these devices, surplus chargers accumulate over time. By using a single standard, like USB-C, for such devices, significant sustainability gains were achieved by reducing the number of chargers required. However, the e-bike use case differs substantially. Most households own a few, if any, devices with similar battery and charging needs as e-bikes. As a result, the potential for sustainability gains through mandatory standardized charging interfaces is much

³ ST/SG/AC.10/1/Rev.23 (Vol.I), Chapter 2.9.4 Class 9 – Lithium batteries

⁴ <https://www.london-fire.gov.uk/safety/the-home/e-scooters-and-e-bikes/>

lower. To ensure a balanced approach, any potential sustainability gains from mandatory charging interfaces should be thoroughly assessed through a comprehensive cost-benefit analysis.

Any decision by the European Commission towards a common battery charger for the private charging case (using portable chargers) in the near term could negatively impact the European e-bike ecosystem. Such a decision could jeopardize significant developments undertaken to ensure battery and therefore consumer safety and stifle innovation, including sustainability benefits.

There is no adequate standard or technical specification currently available for use. While the industry does not identify an immediate need for a standard for private charging, we remain open to discussions on investigating potential benefits and developing a potential standardized charging procedure, based on a new standardisation request, that takes into consideration all relevant safety conditions.

Public charging case:

Since the majority of e-bike charging is done at home, there are only a few fringe use cases where public charging infrastructure and possibly an interoperable charging interface are beneficial for e-bike users. These fringe use cases include charging at hotels, charging during bike tours at restaurants, or charging services by employers encouraging commuting by bike.

The bicycle industry has acknowledged that this use case exists. Currently, various charging solutions are in different stages of development, with some already on the market or in the final stages of development.

One charging solution proposed in the Öko-Institut study (2024) is described in the technical specifications IEC TS 61851-3-x and IEC TS 62196-4 series. These technical specifications failed to gain enough support by e-bike industry, e-bike sharing industry and other stakeholders to be adopted as a standard. Additionally, they show little acceptance by economic operators in terms of adoption rate. In addition, it is important to highlight in this context that the mere existence of such technical specifications neither obligates manufacturers to implement this solution nor prohibits them from using other interoperable solutions. The IEC TS 61851-3-x and IEC TS 62196-4 series are not legally binding.⁵

CONEBI believes that, in this phase, it is crucial to emphasise the specific framework conditions of a common public charging infrastructure to start on a solid foundation. A well-established market is essential for the successful adoption of public charging solutions. Therefore, the first step that the industry is working on at this point in time, is to come up with a solution that allows different charging and plug systems by different manufacturers to safely communicate within a public charging context regardless of brand or model year. The emphasis is on ensuring that millions of e-bike systems already on the market can be ridden and charged at public charging infrastructure and not to make them prematurely redundant. While it may be a long-term vision for a public charging solution to potentially become a common standard also for the private charging use case, the viability of any solution must first be demonstrated in the market. Notwithstanding, public charging remains a relatively minor use case for e-bike charging.

⁵ For further information on this please refer to the CONEBI paper at this [link](#).

Executive Summary:

1. While the industry does not identify an immediate need for a standard for private e-bike charging, it remains open to discussions on investigating potential benefits and developing a standardized charging procedure, based on a new standardisation request, that takes into consideration all relevant safety conditions.
2. Any common charging solution must adequately address the same level of safety already implemented in current proprietary solutions.
3. There is no evidence of significant sustainability gains. To ensure a balanced approach, any potential sustainability gains from mandatory charging interfaces should be thoroughly assessed through a comprehensive cost-benefit analysis.
4. IEC TS 61851-3-x and IEC TS 62196-4 are inadequate for the e-bike industry and are therefore not supported by our members.
5. The e-bike industry is committed to finding solutions for public charging scenarios and some joint solutions are currently in development.
6. Therefore, the e-bike industry does not identify an immediate need for European legislative action on LMT common charging.

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