Electrical safety requirements for lithium-ion battery powered e-transport devices
Energy Safe Victoria Consultation Paper, August 2025

Submission by Bicycle Network

Summary

Bicycle Network welcomes the intention of Energy Safe Victoria to review electrical safety requirements for battery powered e-bikes.

Although Australia did adopt the best practice standards for e-bike safety in 2012, the standards were not updated and more recently have not been enforced.

Consequently, the marketplace now comprises both high-quality and standards-compliant e-bikes as well as many products that do not comply with, or are out of scope of, any applicable standards.

This has greatly increased the risk of lithium-ion battery fires, placing individuals and property in danger.

Electric power-assisted bicycles are set to play a major role in the transformation of transport in Australia. For this development to occur there needs to be strong public confidence in the products, the brands, the safety standards, and the public administration of those standards.

We are however concerned that a response by multiple independent state and federal regulatory agencies that is not tightly coordinated, and does not align with the approach and evolution of international and bike industry standards will damage the prospects of this new emerging transport sector, with its promise of low emission, high efficiency, health enhancing travel

Background

Bicycle Network has an extended history of involvement with the introduction of e-bikes into Australia. We recognised their potential to provide an attractive transport option for many people who made longer than typical bicycle trips, benefited from assistance to tackle more difficult terrain or the need to carry heavier loads.

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We undertook consumer testing and reporting of many of the early models and provided feedback to brands on the development of the technology and likely market acceptance.

We recognised the important of electrical safety and supportive regulation, and advocated strongly to government for Australian adoption of the then leading regulatory standard, EN15194.

The adoption in Australia of these standards immediately accelerated the rapid adoption of this new mode of transport across the nation.

To be successful, consumers needed confidence that the leading bike brands would provide reliable, safe products that were supported by pre- and post-sales information and guidance, spare parts and specialised mechanical support.

Without the expectation of serviceability, durability, insurability and resale value, customers would not have made the substantial investment required for owners of these new machines.

The industry sector which has established itself on the basis of these internationally recognised standards has been a remarkably successful, both in a commercial sense and in a product development sense.

E-bikes built to appropriate standards by major brands and distributed through authorised sales channels do not have a record of spontaneous battery fires. Some leading, longstanding manufacturers claim that not a single instance involving their products has come to light.

Regulatory Failure

Regrettably, after almost a decade of successful expansion this successful expansion of the industry has come under a threat as the updating and enforcement of the adopted standards came into neglect.

There has been an explosion of direct imports of substandard e-bikes into Australia. Poorly designed and manufactured, with faulty batteries and unsophisticated chargers, little or no retail chain for support, maintenance or spare parts, no trained mechanics, overpowered motors and easily defeated speed controls, and often assembled by consumers from kits, these machines have become high risk to people and property from battery fires.

There have been some rare incidents in trains, but fires in houses, at apartments and whilst being charged at workplaces and educational institutions have rightly become a major community concern.

Unfortunately, this has now resulted in bans of e-bikes in workplace bike parking facilities, and in e-bike bans now being included in leasing agreements.

An appropriate regulation environment

To resolve these issues and restore an appropriate regulatory environment Bicycle Network proposes that re-regulation coalesces around the existing (and future evolution of EN 1594) excellent and it's linked Australian versions.

EN15194 is a standard for the entire bike system including the frame and components, battery, controller, and charger. Systems thinking is important because, for example, regenerative charging while braking involves the battery as well as components out of the battery. And the anti-tampering requirements involve battery and non-battery elements of the power-system.

Within EN 15194 there is a battery standard, EN 5060401–1. It covers many aspects of battery safety, including those of concern to Energy Safe Victoria.

These include electrical testing for overload short circuit and various operating conditions, thermal testing for resistance and environmental temperatures, vibration and shock, ageing and durability, drop and crush situations, and waterproofing.

There has been well over a decade of design development, testing, and feedback from the field that has required major investment from the brands and their components suppliers. This work continues, for example, the recent for battery management systems (BMS) in removable batteries.

In the medium-term future, we expect the industry to develop even more sophisticated and effective technologies to manage the performance and the risks of e-bike power, battery and charger components.

There is a target period of about three years within which these standards will be recognised within the ISO4210 system for world-wide application.

Australia needs to align itself with this development.

We should be aiming at a regulatory system that is unified from importation and vehicle classification at the Federal level, to electrical regulation, state and federal, to consumer regulation, and to vehicle and road rules by the states.

It should also be understood that EN15194 performance standards were established to ensure that where bicycles and pedestrians shared infrastructure that the performance of e-bikes would fit within the performance envelope of normal bicycles and people on foot. This not only allows for the safety standards in relation to stopping distances and site lines to be conformed with, but it also ensures that the safe system principles of homogeneity of user types are met.

Questions for consultation

1. Do you agree with our proposal to declare e-transport devices and associated lithium-ion batteries as "controlled electrical equipment" under the Act? Why or why not?

If this can be done while not impinging on the full operation of the EN15194 as intended, then yes. Electric safety regulators could 'deem' compliant EN 5060401–1 (and its successors) batteries to so declared.

2. Are there alternative approaches you believe would effectively manage the electrical safety risks associated with lithium-ion battery powered e-transport devices?

Familiarise with, align with, and formally recognise the EN15194.

3. If you are a user or potential user of e-transport devices, would knowing the product is independently safety certified impact your purchasing decisions?

Yes. But it would be more powerful if it was an endorsement of an industry standard, and/or was encapsulated in a bundle of aligned certifications

4. Do you agree with our draft definition for e-scooters, e-skateboards, and other e-transport devices?

Their use in transport is minimal and is not growing as predicted.

5. Do you agree with our draft definition for e-bikes and e-bike conversion kits?

No. There should be a single, unified definition based on EN 15194.

6. Do you have any other suggestions for defining e-transport devices, including whether we need to clarify exclusions?

If the device does not comply with EN 15194 then it is excluded by definition.

7. If you are a supplier/manufacturer/importer, what standards are your e-transport devices currently complying with?

Not applicable.

8. Do you have any comments on the electrical safety shortcomings of AS 15194? How do you think these shortcomings can be best addressed?

The alleged electrical safety shortcomings of AS 15194 may apply to the original version of the standard but does not apply to the current version EN15194:2017+A1:2023, nor to EN 5060401–1.

9. What would be the impact of certification to different standards in different jurisdictions of Australia (e.g. different standards in VIC and NSW)?

Extremely negative. A standards compliant e-bike that has reached a consumer has emerged from a complicated chain of interlinked activity: standards development and agreement, model cycle planning, product design, testing, supply chain management, manufacture, distribution, retailer training, product literature, and finally, safety certification in each market.

For e-bikes this is a lengthy, complex and expensive process. Where risks are introduced by fragmented regulation, costs rapidly escalate resulting in brands shrinking from such markets, damaging consumer choice and segment growth.

10. What type of guidance would you need, if any, to clarify how to comply with the technical construction requirements of AS/NZS 3820?

Not applicable

11. What would be the costs and operational impacts to your business of certifying and marking e-transport devices to meet safety standards? Please provide approximate figures or ranges, including any testing, labelling, or administrative costs, and how many product lines you would need to certify.

Will be answered by industry representatives.

12. What factors should we consider when assessing the timing of new electrical safety requirements for e-transport devices?

Will be answered by industry representatives. But should also take account of timing of changes to other regulatory environments, especially at the Federal level.

13. If you are a supplier/manufacturer/importer, how much time do you estimate is needed to achieve compliance with new certification and marking requirements for e-transport devices and associated batteries? Please provide as much information and evidence as possible.

Will be answered by industry representatives.

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