

The Safety of Electric-Powered Micromobility Vehicles and Lithium Batteries Bill

Equalities Impact Assessment

1. Purpose of this Document

To comply with Section 149 of the Equality Act 2010, it is necessary to assess the impact of the proposed legislation on individuals with relevant protected characteristics as specified in the 2010 Act and ensure that the proposed legislation takes due regard to eliminating discrimination.

2. The problem

Electric micromobility, namely e-bikes and e-scooters powered by lithium-ion batteries, has gained popularity in the UK, with an expected increase in purchases. Incidents of fires caused by these batteries have increased fourfold since 2020, leading to deaths, injuries, homelessness, and substantial financial losses. The UK is projected to experience nearly one e-bike or e-scooter fire daily in 2023, primarily due to thermal runaway¹ risks associated with lithium-ion batteries. Substandard components, manufacturing issues, misuse, and improper charging can all render these batteries unstable, often leading to uncontrollable fires which are extremely challenging to extinguish.

2.1 Fires caused by e-bikes and e-scooters

In 2020, Electrical Safety First estimates there were 77 fires from e-bikes and e-scooters in homes across the UK, increasing to 102 by April 2023. If this trend continues, we could witness over 300 fires in 2023 alone. Many UK Fire and Rescue Services anticipate that this upward trend is likely to persist in 2024.

2.2 Fires at waste disposal sites

In 2020 alone, there were 201 fires at UK waste disposal sites, according to research by Eunomia and the Environmental Services Association. Research from Material Focus, and estimates by charity, Electrical Safety First suggest that the number of fires in the

¹ The process of thermal runaway starts when a battery cell overheats, perhaps due to an internal fault, physical or electrical abuse, or extreme temperatures. This elevated cell temperature results in exothermic reactions, which produce more heat than can be dissipated to surroundings. Eventually the internal structure of the cell begins to become unstable and collapse, resulting in the venting of flammable and toxic gases, fire, and explosion. The heat spreads to nearby cells, causing them also to enter an uncontrollable and irreversible state of thermal runaway.

year 2022 may be as high as 350. It is assumed that this upward trend will persist into 2024.

2.3 Other issues

Furthermore, there are additional concerns related to the absence of safety standards for conversion kits² and the use of non-compliant charging systems for e-bikes and e-scooters. These are significant contributing factors to many fires.

3. Economic cost

According to Electrical Safety First estimates, based on recent Home Office figures, these incidents are expected to cost the economy £342 million in 2023 and a total of £1 Billion over the four-year period from 2020 to 2023.

4. Conclusion

In conclusion, there are three problems that require attention: the rising number of fires, some of which are fatal, the increasing cost associated with these fires, and the inadequate safety requirements and standards for e-bikes and e-scooters, conversion kits and charging systems. The proposed legislation addresses all of these issues, as will be explained.

5. The policy intent of the proposed legislation – ‘The Safety of Electric-Powered Micromobility Vehicles and Lithium Batteries Bill’

5.1 Currently, e-bike and e-scooter manufacturers can self-declare safety compliance before their products enter the UK market, which is not the case for other high-risk items such as fireworks or medical devices. Clause 1 of the bill proposes third-party safety certifications for these products, aiming to enhance product and consumer safety.

5.2 Clause 2 of the bill aims to enhance the safety of lithium battery disposal due to their documented role in causing fires at waste disposal and recycling sites. These regulations can apply to all types of lithium batteries, not just those used for e-bikes and e-scooters.

5.3 Clause 3 of the bill requires the Secretary of State to make regulations specifying the safety standards for micromobility conversion kits and requiring that all micromobility vehicles have either a non-proprietary charging system³ with a communications protocol⁴ or a proprietary charging system⁵ with a matched charger.

² A conversion kit is the electrical drive train, battery and charging system, which is fitted to a regular pedal bicycle to convert it to an electric bike. A conversion kit is usually sold unassembled and typically includes a motor, a motor controller, and interconnecting components. The battery is usually sold separately.

³ A non-manufacturer specified plug and socket system consisting of a standardized plug and socket and a communications protocol.

⁴ A set of formal rules describing how to transmit or exchange data.

⁵ A manufacturer specified plug and socket system designed only to operate in combination with each other.

- 5.4** The absence of dedicated safety standards for conversion kits creates risks, exacerbated by the fact that they are widely used by people with low incomes to access e-bikes and e-scooters. The cost of a conversion kit which can be used to convert a traditional bicycle into an e-bike, is typically significantly cheaper than an e-bike. Unsafe conversion kits can compromise the bike's original design and intended use, posing dangers to users and pedestrians. We deal with the cost issue further in the table below.
- 5.5** Implementing charger standards, whether proprietary or non-proprietary, ensures compatibility with the battery. A proprietary system restricts charging to the dedicated e-bike charger, while a non-proprietary charger incorporates safety measures in the charger-battery communication. These standards prevent overcharging and safeguard against overcurrent, overtemperature, short-circuit, and accidental misconnection, reducing the risk of fire.
- 5.6** During the development of these regulations, this clause would also introduce a temporary ban on the sale of universal chargers⁶ for e-bikes and e-scooters. Such chargers have caused numerous fires and explosions due to their potential for overcharging at higher voltages than intended.
- 5.7** The remaining clauses of the Bill deal with definitions and procedural matters. Specifically, Clause 7 sets the commencement date as the day on which it is passed but requires that the Devolved Administrations must pass motions before the Bill applies to them. This is to uphold the devolution settlement.

6. The Equalities Impact of the Bill

Question	Response
Name of policy being assessed?	The Safety of Electric-Powered Micromobility Vehicles and Lithium Batteries Bill
Summary of aims and objectives of the policy.	The Bill proposes policies to regulate the safety standards for e-bikes and e-scooters, lithium batteries, and their safe disposal. Ultimately, this Bill seeks to save lives, and help prevent injuries caused by lithium-ion batteries.
What involvement and consultation has been in relation to the policy?	Electrical Safety First, a UK charity dedicated to reducing electricity-related deaths, injuries, and incidents, recently

⁶ Universal charger refers to various projects to standardise the connectors of power supplies, particularly for battery-powered devices.

	<p>released the comprehensive report titled "Battery Breakdown." This report assesses safety concerns associated with e-bikes and e-scooters.</p> <p>During the investigation and the subsequent report, the charity collaborated with various stakeholders in the product safety sector, as well as subject matter experts. Additionally, extensive primary and secondary research was conducted, including a nationwide survey of e-bike and e-scooter users and a survey of individuals who use these vehicles for employment, such as app-based delivery drivers.</p> <p>A variety of specific industry experts were also engaged, including those from fire and rescue, the insurance sector, housing, environmental services, and waste disposal services, whose services are all impacted by lithium battery fires.</p>
<p>Who is affected by the policy?</p>	<p>The users, manufacturers, retailers and regulators of electric-powered micro-mobility vehicles, lithium batteries, and the secondary equipment (such as chargers and conversion kits), as well as public bodies and agencies involved in incidents caused by these devices, such as the NHS, or Fire Services.</p>
<p>What are the arrangements for the monitoring and reviewing the actual impact of the policy?</p>	<p>If the bill were enacted, standard government measures and mechanisms would be employed to monitor the policy's impact. Additionally, Electrical Safety First would monitor the impact of the proposed new law in several ways.</p> <p>For example, Fire and Rescue Services across the UK record and publish every fire incident they attend, documenting them through the Incident Recording System (IRS). Data related to dwelling fires could be monitored and assessed</p>

	during the implementation and ongoing operation of the policies to assess their effectiveness.
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Protected characteristic group	Is there a potential for a positive, negative, or neutral impact?	Please explain and give examples of any evidence/data used?	Action to address negative impact (e.g., adjustment to the policy)
Disability	Positive	Disabled people may face increased challenges in evacuating during fires.	The policy aims to improve product safety standards, reducing the risk of fire in all instances.
Gender reassignment	Neutral	N/A	N/A
Marriage or civil partnership	Neutral	N/A	N/A
Pregnancy and maternity	Positive	Pregnant women, infants, and small children, who often have limited mobility, are at increased risk from fire, particularly rapidly igniting lithium battery fires that release toxic gases. Research reveals that 42% of e-bike users reside with partners and young children. ⁷	The policy aims to improve product safety standards, reducing the risk of fire in all instances. Implementing safer product standards would mitigate risks for pregnant individuals.
Race	Neutral	N/A	N/A
Religion or belief	Neutral	N/A	N/A

⁷ Statista Consumer Insights Report, 'Electric Bike (e-bike) Owners in the UK,' March 2023.

Sexual orientation	Neutral	N/A	N/A
Sex (gender)	Neutral	Research indicates that 63% of e-bike owners are male. ⁸ While this is just over half, it still represents a significant demographic.	Implementing stricter products safety standards will improve the safety of both e-bike and e-scooters users and those living with them.
Age	Positive	<p>Research shows e-bike ownership is predominantly among younger individuals, with 40% falling in the 30-39 age group. This trend aligns with the primary demographic of app-based delivery riders, as seen in a survey by Electrical Safety First, where those aged 25-34 and 35-44 are most commonly using e-bikes for work.</p> <p>However, older individuals face challenges escaping fires due to reduced mobility, particularly in densely populated areas. They might not commonly own e-bikes or scooters, but may live near someone who</p>	Implementing stricter products safety standards will safeguard both users and those in proximity, regardless of their age. The disposal policy (clause two) addresses the risk of unintended contact with lithium batteries, even for older individuals who may not possess an e-bike or e-scooter.

⁸ Ibid

		does, with increasing fire spread risk in high-rise flats.	
Other: Low-income individuals	Clause 2: Safe disposal: Positive Clauses 3: Safety standards: Neutral	<p>The policy for safer disposal standards will enhance the safety of low-paid public sector workers, particularly in communal waste disposal areas in flats, by ensuring safer handling of lithium batteries, reducing fire risks.</p> <p>Electrical Safety First's survey of 1,000 e-bike owners revealed that 38% had incompatible aftermarket chargers, with 20% unsure about compatibility. In a sperate survey of 253 app-based delivery drivers, 84% had converted their traditional bicycles into e-bikes.</p> <p>Mandating specific charging measures will temporarily affect low-income individuals by</p>	<p>In the medium to long term, the policy measures outlined in the Bill, such as higher safety standards, will incentivise manufacturers to compete in producing safer goods, ultimately benefiting individuals in this demographic.</p> <p>Two strategies can counter the potential short-term negative effects on this group:</p> <p>(i) Encourage manufacturers to proactively invest in developing products that meet safety standards.</p> <p>(ii) Consideration for amending the policy to set a later commencement date providing for more time for mitigations to be implemented.</p>

		making easily accessible universal chargers unavailable.	
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Decision	Explanation/justification
There is limited evidence to show that this Bill could discriminate or unfairly disadvantage people, given mitigating actions taken above.	<p>In conclusion, we believe that the Bill will promote safety equality among individuals, regardless of whether they share a protected characteristic.</p> <p>Electrical Safety First is committed to raising awareness about the Bill's provisions and the benefits it will deliver.</p> <p>Pairing the policy with consumer-focused educational information is crucial to raise awareness about the importance of safety standards for e-bikes, e-scooters, and lithium batteries, as well as promoting safe usage of these devices.</p>
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