

UNITED KINGDOM

British Standards Institution (BSI)

Faraday Battery Challenge Standards Programme

Overview

There is a growing demand for batteries for electrification, with the market across Europe alone estimated to be worth GBP 50 billion by 2025. The Faraday Battery Challenge, backed by the UK government, is investing in research and innovation projects and new facilities to scale up and advance the production, use and recycling of batteries. Standards and best practice have a key role to play in supporting the growth of the industry.

The British Standards Institution (BSI) has been leading the standards programme, sponsored by Innovate UK and the Faraday Battery Challenge (FBC), to capture and respond to the challenges and standardization gaps within the battery manufacturing industry. In addition to the initial three standards and the publication of a long-term *Battery manufacturing and technology standards roadmap*, engagement and outreach (via learning materials, video events, etc.) were seen as essential elements for raising awareness and market confidence.

A five-part approach has underpinned the programme and helped achieve its objectives and deliver market benefits:

1. It was essential to convene a neutral forum to support the delivery of the Faraday Battery Challenge (FBC). Innovate UK drew together stakeholders from the UK's knowledge infrastructure community (Health and Safety Executive, National Physical Laboratory, BSI, FBC bodies and regulators) to create a battery manufacturing customer journey map (CJM). BSI then convened stakeholders and industry experts to prioritize and address the immediate codification needs identified in the CJM, involving the UK's innovation community, government, regulators, representatives of the automotive industry and trade associations, technology developers, academia and research.
2. Agreement was needed on the objectives, the purpose and the desired outcomes of the programme. The agreed purpose was to ensure that the research and innovation conditions required to deliver the UK's net-zero target are in place, enabling the deployment of battery technology to decarbonize the UK's transport sector and build consumer confidence in electric

vehicles (EVs). Successful outcomes of the programme would be to develop initial best practice and guidance to enable EV battery manufacturing and the safe deployment of EVs at scale in the UK, draw up a standardization roadmap in support of the FBC's next phases, and capture the wider battery manufacturing and technology development ambitions of the UK FBC community.

3. It was vital to map the existing market framework of standards and regulation. This helped give an idea of all the standards and regulatory research built on the CJM, which identified initial standards gaps and priorities for immediate development.
4. Alongside the mapping described in item 3 above, agreement on ethical principles, standards and rules, and how they will work together, was needed. This was reflected in the multi-stakeholder, collaborative approach captured in the programme's governance and delivery structures, via the establishment of a technical advisory group, creation of steering groups and review panels for publicly available specifications (PAS), and building in engagement and dissemination work. Wide, ongoing stakeholder engagement and industry contributions were strongly prioritized.
5. Standards development and coordination started around identified immediate codification gaps, deploying a consensus-based, fast-track, iterative standards solutions mechanism (three PAS documents were developed and published). Long-term standardization needs were also identified, alongside dissemination and uptake actions, including opportunities for internationalization of UK-led best practice – these are captured in the *Battery manufacturing and technology standards roadmap* (developed and validated with the wide FBC stakeholder community). Videos have been developed and published on BSI's YouTube channel, and the standardization programme was represented at relevant conferences and events, including those organized by BSI, Innovate UK and related organizations and CENEX (Low Carbon and Fuel Cells Centre of Excellence).

Outcomes and benefits

The FBC Standards Programme has advanced good practice (in the UK) for battery manufacture through:

1. The development of the PAS 706X series focusing on health, safety and environmental considerations
2. A multi-stakeholder, agile standards development process in a rapidly evolving area of innovation, and continued amplification and dissemination activity to widen the reach of the programme
3. The *Battery manufacturing and technology standards roadmap* developed throughout the programme to set out further challenges, knowledge gaps and a plan for addressing them
4. A network of over a hundred organizations with whom BSI has engaged throughout the programme with a focus on technical roles and engineers

Partners involved

Sponsored by Innovate UK through the Faraday Battery Challenge, BSI launched a standards programme in 2019 to develop and codify good practice and build public confidence in batteries and electric vehicles.

Timeline

By August 2021, BSI had published three PASs under the programme, which started in 2019.

References

- Faraday Battery Challenge – Standards, guidelines, research and viewpoints ([general information](#))
- Faraday Battery Challenge [videos](#)
- Faraday Battery Challenge, Download Standards Landscape [Report](#)
- Faraday Battery Challenge: standards programme ([summary](#)) [PDF]
- *Battery manufacturing and technology standards roadmap* ([report](#))
- [PAS 7060:2021](#), *Electric vehicles – Safe and environmentally conscious design and use of batteries – Guide*
- [PAS 7061:2021](#), *Batteries for vehicle propulsion electrification – Safe and environmentally conscious handling of battery packs and modules – Code of practice*
- [PAS 7062:2021](#), *Electric vehicle battery cells – Health and safety, environmental and quality management considerations in cell manufacturing and finished cell – Code of practice*
- Reference to PAS 7061:2021 in *Securing Technology-Critical Metals for Britain* ([report](#)), Birmingham University, April 2021, p. 125