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Standards Australia

Energy Storage Standards
Discussion Paper 2

19 July 2016

Please send all responses to:
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No later than **5pm AEST, Monday 22 August**

Australia's Member of ISO and IEC
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INTRODUCTION

This is the second consultation paper in Standards Australia's Energy Storage roadmap. The purpose of the first paper was to gather initial feedback, identify stakeholders, and initiate the many conversations necessary in a consensus based process. This paper will present the outcomes of that first round of consultations, including identified priorities and proposed next steps.

The purpose of this paper is to confirm the consensus on priorities and initiate discussion on clear scopes for any Standards Australia documents identified as urgent. Specific next activities, such as project proposals, will be discussed on page 6 under Submissions and Next Steps.

Standards Australia is the nation's peak standards body and Australia's representative to the International Electrotechnical Commission (IEC) and International Organization for Standardization (ISO).

Standards are written by members of technical committees, who represent nominating organisations which include industry associations, government bodies, and universities.

Australian Standards are voluntary documents when published which can then be called up in regulation.

Standards Australia publishes additional lower consensus documents, including Technical Specifications and Handbooks.

BACKGROUND

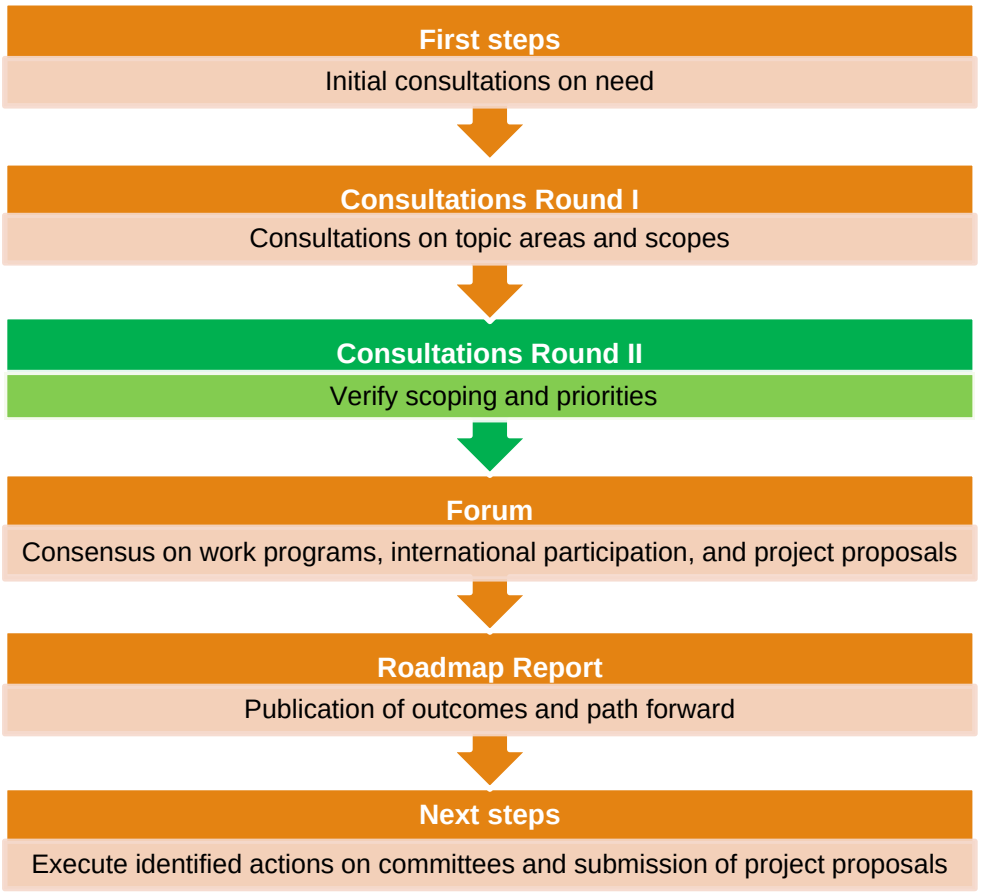
The Standards Australia Energy Storage roadmap is being undertaken in partnership with the COAG Energy Council. Energy storage is being rapidly deployed in Australia, with constant innovations in technology. Industry and government identified a gap in standards for battery storage systems, and the COAG Energy Council asked Standards Australia to conduct stakeholder consultations and produce a roadmap for potential documents. Australian Standards documents can help provide clarity, support interconnectivity, and encourage safety.

The identified need focused on grid integrated and independent storage being purchased and installed on a residential and small-scale commercial level, and thus that is the focus of this roadmap process. However, it is understood that there will need to be standards for all aspects of electrical energy storage, on different scales and different technologies, and that some of the outcomes of this roadmap may apply to a large scope. This will be more thoroughly discussed in each topic area.

PROCESS

Standards Australia is driven by adding to the net benefit of Australia and directed by the agendas of its stakeholders, which include government, consumers, industry, academia, and others.

Standards documents and work are consensus based, and thus the process of this roadmap has been focused on developing consensus on a path forward. It has been iterative, with multiple rounds of consultations before, between, and during the publication of discussion papers.



FIRST DISCUSSION PAPER

The first discussion paper was published 19 May 2016 – 8 June 2016. Its purpose was to clarify the dialogue occurring around energy storage standards and begin to identify how these needs could become actions.

Submissions were received from a broad range of stakeholders across industry, government, research organisations, and consumer advocacy groups. As will be outlined in the next section, certain topic areas began to emerge as high priorities for standards development.

SECOND DISCUSSION PAPER

This paper will follow a similar format to the first paper, in laying out the scopes and topic areas. It will include the compiled outcomes of the first paper and a suggested path forward for each of those based on the feedback received, in addition to directly addressing the below questions.

The outcomes of this process are to gather answers to the following questions:

Outcomes

1) What are the areas in which standards documents are appropriate or needed to support the rollout of energy storage?
2) What are the top 2-3 priorities for documents in the coming year?
3) What should the committee structure look like for this work?
4) Should Australia be active in the international standardisation work on this topic?

As all activities at Standards Australia are consensus based, it is important to bring together all key stakeholders to find where agreement can be reached on the above questions.

CURRENT STATUS OF OUTCOME QUESTIONS

This section will give a brief overview of the currently identified answers to each outcome question, along with potential next steps. These were compiled from the responses submitted to the first discussion paper in addition to information gathered through interviews and discussions with relevant Standards Australia committees.

The first two questions are addressed in the following graphic. Further details on each topic area are in their respective sections in the next section of the paper.

1) What are the areas in which Standard Australia documents are appropriate or needed to support the rollout of energy storage?

2) What are the top 2-3 priorities for documents in the coming year?

Safety of Installation

- Highest priority, with document in process: AS/NZS 5139.

Grid Integration and Demand Response Management

- Demand response management specifically is mid-to-high priority for certain stakeholders (networks, retailers, and battery manufacturers). It may be in need of a new Technical Specification to provide for new non-DRED enabled technologies

Product Standards

- Performance measurement is mid-to-high priority for certain stakeholders (consumer advocacy groups and government).

Recycling

- Mid-to-high priority for some stakeholders, but no clear consensus on path forward for recycling.

Handling and Transport

- General consensus is that this is most appropriately handled by other bodies at this time.

Training

- Standards development of the above topics will support training, but no identified need for Standards Australia activity in this area.

3) What should the committee structure look like for this work?

At this point in time, there are 4 committees which have been identified as relevant to this work. They should be fully active, with clear scope delineation. These are further discussed on page 11.

4) Should Australia be active in the international standardisation work on this topic?

The answer to this question is a resounding yes – Standards Australia should facilitate active participation of Australian experts in IEC TC 120, the IEC committee currently working on Energy Storage Systems. This is addressed in further detail on page 12.

SUBMISSIONS AND NEXT STEPS

This paper will be published for approximately 1 month, during which Standards Australia will continue to connect stakeholders, gather feedback, and prepare for next steps.

Specific questions are not identified throughout the paper in this round. Instead, we would ask for submissions to identify points with which they are in agreement or have alternative suggested courses of action. We do ask you to consider the scope, found in the next section, when drafting your submissions.

Feedback from stakeholders will contribute to scoping and support for project proposals and the roadmap to be published in the coming months.

When submitting your feedback, please identify the company or organisation you represent (if any), and consider compiling the responses from others within that organisation. Additionally, please inform us if we can publicise the name of your organisation/company as a participant in this process, and if we can publish your submission in its entirety.

Unless you notify us otherwise in your submission, anonymised quotes may be used in the final roadmap publication.

The closing date for submissions in **Monday 22 August 2016.** Submissions should be sent to NSM@standards.org.au.

The key **next steps** will be for stakeholders to draft and submit project proposals to Standards Australia for the documents which need to be drafted. This process will identify which proposals are appropriate to submit at this time and which stakeholders need to provide their support for that work.

TOPIC AREAS

SCOPE

The scope of this work in the first discussion paper was as follows: **Stationary electrical energy storage systems of greater than 1 kWh and less than 200 kWh.**

Following feedback, some clarification and slight modifications are as follows:

Purpose: The purpose behind this work, as requested by the COAG Energy Council, is to support the safe and effective rollout of energy storage technologies to **residential and small-scale commercial size customers in Australia.** This is largely due to the fact that these consumers have lower access to professional evaluations and information than large companies undertaking installations.

If documents or workplans resulting from this work can support a broader range of interests, then that will certainly be supported, but it is not the focus of the work.

Size: The size in the previous scope came from work previously done by the CEC and CSIRO. However, stakeholder submissions suggested that it may not be appropriate for the broad range of topic areas being addressed by this work. Thus, following the feedback on the first discussion paper, there is not a specific kWh or voltage specified for this roadmap – those decisions will be made by the technical committees for the relevant specific documents.

For the sized scope of this work, please refer to the above paragraph on ‘purpose’.

Grid vs non-grid: This energy storage roadmap is considering storage for both grid connected installations and off-grid installations.

Systems or batteries: Some submissions raised the question of if this work is examining specifically batteries or overall energy storage systems. As the work is focused on supporting both the consumer and the industry, it is appropriate to consider the need for standards across an energy storage system/installation. This does not necessitate that there will be standards for an entire system, or each piece of the system, just simply that we are asking the question about the full installation. When considering what documents are urgently needed, please keep this in mind.

Technologies: The technologies mentioned in the original paper were as follows (with an estimation of the state of their current standards):

- Lead acid: Well established standards
- Lithium ion: In need of relevant standards
- Nickel-based: Well established standards
- Flow: In need of relevant standards
- Sodium-ion: In need of relevant standards

Submissions agreed with the estimations of the current state of standards. They also identified some additional technologies which could be considered, including sub-divisions of the above and types other than electrochemical (such as fuel cell, flywheel, and others).

There appeared to be a general consensus that **lithium ion** is the highest priority technology, with a need for watching briefs across other technologies, and an acknowledgement that this process may provide a pattern to ease this standardisation in the future.

When examining what is currently being identified as highest priority work items for new proposals (demand response management and performance measurement), it may be possible to take a technology neutral approach to these documents.

For future documents which by their nature cannot be technology neutral, it may be possible to write a technology neutral introduction or framework followed by an appendix for each technology as appropriate. This will need to be determined by the relevant technical committee as they take on each proposal.

The focus of this document is to find a solution for the most urgent needs while also determining the best method for future standards development in energy storage in order to support continued innovation in the field. Although we will not be able to directly mention or cover each technology in this specific roadmap, a key outcome will be to create appropriate stakeholder connections within and across each committee to ensure they are appraised of watching briefs on new technologies and structure any future documents to support the evolution of technology.

SAFETY OF INSTALLATION

Comments received on the current drafting of **AS/NZS 5139** will be shared with the committee as appropriate. The feedback from this process made clear the interest in broader and more in depth opportunities for reviewing the standard. This will be provided through a Standards Australia pilot program on the Sharing of Committee Drafts.

Each organisation on the committee (the list can be found on the Standards Development Public Portal) will have the opportunity to form an internal working group of individuals who can review the draft and provide input to that organisation to help guide their input on the standard. Please contact the organisation most relevant to you if you are interested in participating in this process.

The compiled feedback indicated this is by far the highest priority for publication.

GRID CONNECTION

Submissions from the first round of consultations clarified some issues in relation to the grid connection of batteries and energy storage.

The first is what is appropriate to be within scope of this roadmap. The broad questions of network operation/management as affected by batteries is not within scope.

The specific issue which was identified as most relevant is the **technology for remote demand** management. The issue that has been raised is that the technology specified in the recently published AS/NZS 4755.3.5 *Demand response capabilities and supporting technologies for electrical products – Interaction of demand response enabling devices and electrical products – Operational instructions and connections for grid-connected electrical energy storage (EES) systems* may not cover all technologies currently being incorporated into batteries for remote demand management, but there is an interest in a standardised document to be used to outline requirements for these technologies. Thus, there is a potential gap between 4755.3.5 and the 4777 series.

However, there are widely differing viewpoints on how this may best be addressed. While this paper is out for publication there will be additional discussions to attempt to further identify if there is a need for a Technical Specification on demand management, and if so, what the appropriate scope for this document may be.

The need for an overall handbook, as discussed in the previous paper with the concept demonstrated below, did not receive broad support as an urgent need. If there is interest in the future, any interested party, including technical committees, would be welcome to submit a proposal.

Australian Standards Handbook providing overview and direction to:			
AS/NZS 4755.3.5	AS/NZS 4777.1	New Technical Specification for other connection technologies	Other?

RECYCLING

Following feedback from the first paper, recycling has been split from handling and transport, and placed as its own topic area.

Although there is active interest in recycling and product stewardship as related to batteries, there was not an identified need to standardise a specific process, and significant hurdles in doing so considering the technology dependent nature of those activities.

However, it was highlighted that the standards process should support recycling however possible. A key identified need in recycling is the **appropriate labelling of battery technologies.** This is within scope of AS/NZS 5139, and thus relevant comments received will be provided to the appropriate committee.

Although the outcome of this roadmap may not identify a Standards Australia recycling document as the most appropriate next step, this does not minimise the importance of the matter or limit the possibilities of future document development.

It often occurs that industry or government guidelines are developed prior to Standards Australia document development, which may be the case in this area. Standardisation is only appropriate when there is clear consensus which can be reached.

However, this process has identified stakeholders, including the Australian Battery Recycling Initiative (ABRI), the Australia and New Zealand Recycling Platform, manufacturers, and others. Future proposals on this topic will be welcome, and Standards Australia will continue working closely with these and other relevant stakeholders.

HANDLING AND TRANSPORT

Responses on the questions of handling and transport of battery technologies were aligned in that other organisations and documents, such as the Australian Dangerous Goods Code and the United Nations Recommendations on the Transport of Dangerous Goods Model Regulations are more appropriate than the standards process due to previous experience and the processes for updating those codes.

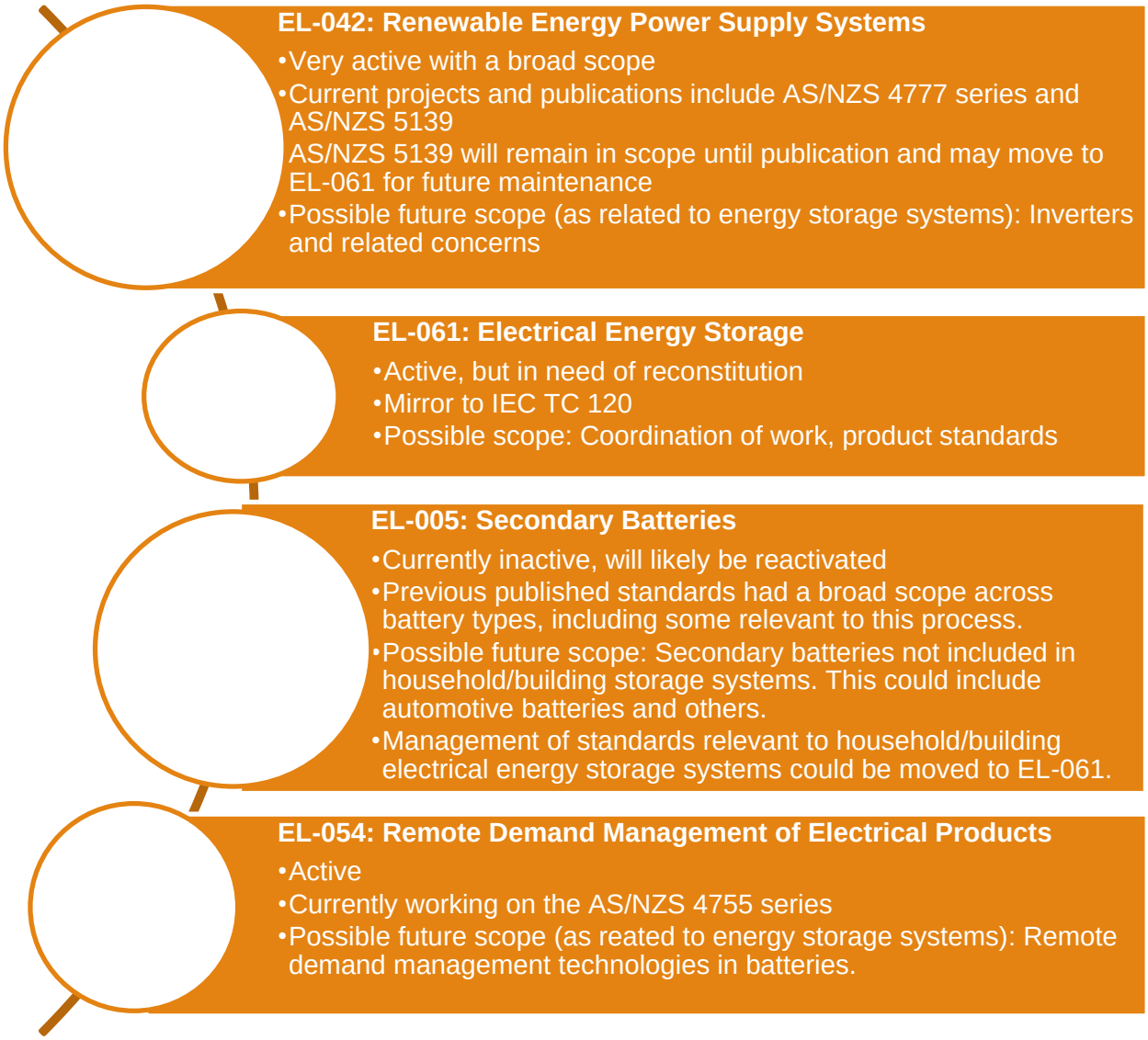
Standards Australia will remain open to further conversations on this topic and will ensure relevant committees such as CH-009 (Safe Handling of Chemicals) and others are connected with battery storage committees for ongoing coordination.

TRAINING

Submissions to the first discussion paper confirmed that Standards Australia can best support training needs through the publication of relevant standards such as AS/NZS 5139.

COMMITTEE STRUCTURE

Four committees were identified as central to the work being undertaken. Their current status and relevant notes, including possible future scopes, are as follows.



A need identified from the first discussion paper was the clear delineation of scopes between the committees. Rough proposals from the feedback gathered are included above.

Next steps will be as follows:

- Standards Australia has agreed to initiate the process of reactivating technical committee EL-005.
- Standards Australia will guide the reconstitution (assigning of new nominating organisations) of committee EL-061.

- Standards Australia will facilitate discussions on the scopes of each committee's work as related to energy storage systems.

Suggested scopes for these committees' work on relevant energy storage systems would be welcome in submissions.

- We ask for **expressions of interest** from organisations for participation in committees, especially those which are to be reconstituted.

INTERNATIONAL

As discussed earlier in the paper, there was resounding support for active Australian participation in the international standardisation process (IEC TC 120). This will be facilitated through the soon to be reconstituted committee EL-061.

The additional issue for consideration was the balance between waiting for the publication of IEC standards and continuing to work on Australian or Australian and New Zealand standards.

Consensus exists around the continuation of work on AS/NZS 5139.

As to the other topic areas, consensus appears to be that work should be started, but Australia should have an active presence on IEC TC 120 to attempt to align any Australian standards with the work being done on that committee (and ensure Australian interests are being considered in the drafting of IEC standards). This will allow for easier transition to the potential adoption of IEC standards when they are published in the coming years.