Submission: Battery Breakthrough Initiative

Australian Renewable Energy Agency

7 October 2024

Introduction

The Australian Renewable Energy Agency (ARENA) state that, 'In the 2024-2025 Federal Budget, the Australian Government announced the $523.2 million Battery Breakthrough Initiative (BBI) to promote the development of battery manufacturing capabilities in Australia.'

The Advanced Materials and Battery Council (AMBC) is a not-for-profit member organisation focused on growing the industry at this time of historic opportunity and need. This is achieved by collaboration, identifying and addressing sector gaps and opportunities and driving policy change directed towards rapid sector growth.

ARENA have developed the Battery Breakthrough Consultation Paper and opened consultation to seek feedback on program design for the BBI, specifically program outcomes, focus areas, financing mechanisms as well as readiness of the market to develop projects.

Below is a copy of the AMBC response to the consultation paper and questions provided online.

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Consultation Paper Submission Form

Question 1.1: Are the Program Outcomes relevant and appropriate for supporting the needs of battery manufacturing in Australia?

The consultation paper references the National Battery Strategy. This strategy identifies four high value opportunities for Australian battery manufacturing including supply to global markets. The current program outcomes could better align with the strategy and define the opportunity if these intended global markets were acknowledged.

Recommendation 1.1: ARENA to change wording of Program Outcomes to:

- Enhance Australia's battery manufacturing capability to improve local and global supply chain resilience and support local and global emissions reduction; and
- Commercialise battery manufacturing processes/technologies to scale for domestic and export opportunities to contribute to local and global emissions reductions.

Question 2.1: Are the elements of the battery manufacturing value chain prioritised in the Focus Areas appropriate and defined with sufficient clarity? If so, which Focus Areas would you identify as presenting the highest value opportunities?

Definition of Focus Areas

Production of Active Materials:

- Current wording implies only flow battery electrolytes will be considered. This excludes other important battery electrolyte products including lithium ion and lead acid electrolytes and should be broadened to be more inclusive of all battery electrolytes.
- Active materials are important, however there are other battery components that are equally important to battery manufacture and capable of manufacture in Australia. There are two important areas where additions could be considered.
    - recognition of "advanced materials and components" like high purity alumina, lithium and copper foils, membranes, separators, electrode coatings and supercapacitors for battery applications could be locally manufactured for input to cell manufacturing and contribute to the high value opportunities identified in the National Battery Strategy.
    - recognition of 'precursor materials' without which the active materials could not be manufactured like high purity graphite, nickel sulfate, cobalt sulfate, high purity phosphoric acid, lithium hydroxide, lithium carbonate.

Battery Pack Assembly:

- Using the term assembly implies that no manufacturing in Australia is required. It is important to recognise that Australia can and does manufacture battery pack components such as battery management systems, connectors and housings. This Focus Area needs to reflect the goal to increase manufacturing capability, rather than importing for assembly.
- For example, battery cells are currently not being mass manufactured in Australia. However, battery management systems, housings and some connectors are manufactured in Australia. Funding should be directed to projects that source locally manufactured parts for the battery pack.
- This clarification and constraint on the focus area could be effected in the merit criteria, see response 8.1.

Value of Focus Areas:

- Cell manufacturing provides the highest value-add opportunity, but initially the lowest volume.
- Active materials and cell component manufacturing offers immediate access to global markets and the highest volume.
- Battery pack manufacturing and assembly from local components is the simplest entry point for Australian manufacturing and therefore an ability to grow quickly.

All areas have significant value and favouring one over the other risks not meeting the defined program outcomes in full.

Recommendation 2.1:

- Production of Active Materials:
  - ARENA to change the wording of the Focus Area to 'Production of Precursors, Active Battery Materials and cell Components'.
  - In the descriptor, ARENA change the words 'flow battery electrolytes' to 'all relevant battery electrolytes', i.e. 'This Focus Area includes production of active materials, cathodes, anodes and all relevant battery electrolytes'.
- Battery Pack Assembly:
  - ARENA to change the wording of 'Assembly' to 'Manufacturing or Assembly from locally manufactured components', i.e. 'Battery Pack Manufacturing or Battery pack assembly from locally manufactured components'.
  - In the description, ARENA to add 'Australian made' into the descriptor, i.e. '…. includes connection of battery cells (or modules and flow battery stacks) into Australian made battery packs'.

Question 2.2: What is your view and experience with the market readiness of manufacturing projects across different stages of the value chain?

Companies in the Australian battery ecosystem are at various Technology Readiness Levels (TRL) including some ready for manufacturing. This includes:

- Production of Precursors, Active Battery Materials and Battery Components: The Advanced Materials and Battery Council makes the distinction that projects may have two parts, mining and processing and active material/cell component manufacture. Here we talk about active material/cell component manufacture. Project proponents are at scoping study stage through to detailed feasibility studies. For example, some Flow Battery manufacturing projects are underway and other electrolyte projects are at pilot and demonstration level. Other projects are at the economic study phase where they are relying on cost inputs from mining feasibility studies.
- Battery Cell Manufacturing: Project proponents in this Focus Area are continually scaling up. Some manufacturers are at pre-pilot, some at pilot and some at demonstration. All are planning to scale up over the next 2 years with significant investment required. Projects are in general at TRL 4-6.
- Battery Pack Manufacturing or Assembly from locally manufactured components: Project proponents in this Focus Area are already manufacturing and looking to efficiency gains from scale and automation to lower costs and increase competitiveness. Manufacturing readiness is high. Refer to response 2.6.

Question 2.3: Which stages of the battery manufacturing value chain do you have an interest in developing or expanding? What are the timelines to deliver this (e.g. for receiving funding certainty from ARENA, Final Investment Decision, construction, operation)?

The Advanced Materials and Battery Council (AMBC) has interest in supporting the development/expansion of local battery manufacturing at all stages of the value chain. As an industry representative body, AMBC would not be the direct recipient of funds, however timeliness of funding to AMBC members has a direct impact on market success. The program administration therefore should not be overly burdensome, and funding expedited to worthy applicants.

Question 2.4: Should certain stages of the value chain be progressed before others (e.g. do some parts enable others)? To what extent do certain stages of the value chain need to be progressed in parallel (or jointly in integrated projects) to be successful?

The three focus areas can be progressed in parallel.

The Battery Breakthrough Initiative should align with the Critical Minerals Strategy to collaborate on projects across the value chain by integrating with the Critical Minerals Office. That is, some mining projects are enablers of Focus Area 1 and therefore funding could be coordinated to support such projects together.

While some integration is occurring where proponents are working towards connecting mining, refining and manufacturing operations, access to processed raw materials for active material manufacture can be expensive for proponents piloting and scaling new active material and cell technology.

Battery pack manufacturers are seeking locally made cells. Accelerating local cell manufacture may have a large positive impact on manufacturing capability and program outcomes.

Question 2.5: Do you think there is a need for the Program to support feasibility studies (or other development expenditure)?

The Advanced Materials and Battery Council supports the inclusion of feasibility studies (or other development expenditure) in the program.

Technical feasibility studies to shift from Technology Readiness Level (TRL) 3 and beyond to TRL 4 should be included as this is an enabling step for cell manufacture which is the highest value-add segment of the manufacturing value chain.

Economic feasibility studies across the Focus Areas - for example, studies for scale up, piloting or demonstration plants, should be included because these types of projects are typically first of a kind and therefore most challenging to access private capital. By supporting these projects, the ecosystem can grow faster.

Recommendation: 2.5. ARENA include feasibility studies in the Battery Breakthrough Initiative Program.

Question 2.6: Where there is an existing manufacturing ecosystem (e.g. lithium-ion pack assembly), what could be done to ensure funding support through BBI retains competition between suppliers?

The Objectives and Outcomes of the Program are to enhance Australian manufacturing capability and commercialise Australian processes/technologies. Currently, international suppliers have an unfair advantage due to economic conditions such as international subsidies. That is manufacturing has historically been better supported in other countries. Supporting assemblers of imported products does not meet the Program Objectives and Outcomes.

Attention should be given to increasing the competitiveness of products manufactured from a high level of local content. Focusing on supporting locally manufactured product to reach scale will increase competitiveness in the sector and meet the Program Objectives and Outcomes.

The success of the Battery Breakthrough Initiative should be measured on how much local manufacturing has been generated.

Recommendation 2.6:

- ARENA include a target threshold of local content in the merit criteria to achieve funding, especially for Focus Area 3 Battery Pack Manufacturing or Assembly from locally manufactured components. (This threshold could increase over time).
- ARENA include a key performance indicator to measure success of the Battery Breakthrough Initiative Program that results in batteries made in Australia with locally manufactured products.

Question 3.1: Please provide any feedback on the proposed funding mechanisms

Certain funding mechanisms proposed lend themselves more favourably to particular focus areas. Early-stage projects benefit from grants whereas later stage projects benefit from grants and production incentives.

For example:

- Battery pack manufacturing projects are already producing and able to take advantage of both capital grants for scale up projects and production incentives.
- Cell manufacturing projects at lower Technology Readiness Levels (TRL) are likely to benefit most from a grant or recoupable grant.
- Active material projects are at various stages of TRL, with high volume and could benefit from all types of funding mechanisms proposed.

Most projects are a first of their kind, therefore there is more risk for private investors and challenges in raising capital. Advanced Materials and Battery Council members advise that grants and recoupable grants are more effective in mobilising private capital than production incentives.

Similarly, the one-to-one funding may limit access for small organisations to apply. A flexible approach including binding funding agreements that are conditional on the organisation raising a co-contribution and the flexibility to lower or raise the co-contribution amount.

Recommendation 3.1:

- ARENA prioritise grants and recoupable grants over the development of production incentives.
- ARENA to build into the funding guidelines provision for negotiation on the amount of the co-contribution for successful applicants.
- ARENA to allow time for successful applicants to raise an agreed co-contribution.

Question 3.2: What is your preliminary view of the required production incentive value (range) for your project?

Not applicable for the Advanced Materials and Battery Council as an industry representative body.

Question 3.3: In what kinds of projects will production incentives be the most effective form of funding? In what projects might capital grants be more suitable? In what projects might a combination of capital grants and production incentives be suitable?

A combination of capital grants and production incentives may be suitable for battery pack manufacturing.

Given the Technology Readiness Level of 4-6 for the other focus areas, capital grants would be the most effective form of funding for projects that include active materials, advanced battery materials, cell components and cell manufacturing.

Question 3.4: ARENA has proposed that applicants design the production incentive support model as part of their applications. Would it be more productive if ARENA designed a fixed production incentive model to be used for all projects?

The largest proportion of the local battery eco-system is at Technology Readiness Level (TRL) 4-6 and is not able to take advantage of production incentives. For projects at TRL 4-6 grants and recoupable grants are more applicable. A flexible design on a case-by-case basis using recoupable grants should be considered.

To ensure successful implementation of any production incentive it is imperative that the process is practical. This may also require negotiation on a case-by-case basis. Any design of production incentives should consider pre-production projects and not consume a high proportion of Battery Breakthrough Initiative funding.

Recommendation 3.4:

- ARENA prioritise recoupable grants over production incentives to better support the current level of readiness of the battery manufacturing sector.
- If ARENA implements a production incentive, that the model takes a flexible approach where agreement is negotiated with eligible manufacturers on a case-by-case basis.
- Production incentives should be tightly applied to projects with the highest local content in each focus area.

Question 3.5: What evidence could be provided to ARENA to ensure production incentives are only paid for outputs that are successfully delivered to the end customer? How might ARENA ensure that outputs meet quality standards and are fit for purpose?

No comment.

Question 3.6: What other policies or support could Government consider that would complement the Program?

Policies or support that the Government could consider complementing the Battery Breakthrough Initiative (BBI) Program include:

- Development of a regulatory and testing framework and infrastructure so that local batteries can be more cheaply and quickly developed and better compete against imports.

The funding of the Australian Battery Precinct will achieve this goal and aligns with the merit criteria for BBI.

- Policy mechanisms that seek to advance installation of locally manufactured batteries and energy storage. The Future Made in Australia plan, the Net Zero Emissions Plan and the Energy Industry and Jobs plan don't specify locally manufactured batteries over imported batteries.
- The success of BBI is dependent on being seen to be successful and therefore funding transparency is recommended. The public needs to be able to see how the funding has been allocated, on what criteria the projects were assessed and an annual review (including spreadsheet of details) of who has received funding, progress made towards meeting each project's objectives and percentage of local content deployed through each project.

Recommendation 3.6:

- The Commonwealth Government work with the Queensland Government to ensure the delivery of the Australian Battery Precinct.
- The Commonwealth Government insert a local content manufacturing target for battery manufacturing into the
    - Battery Breakthrough Initiative merit criteria and
    - Evaluation of the Future Made in Australia, Net Zero Emissions plan and the Energy Industry and Jobs Plan.
- The Commonwealth Government provide detail on funding allocation through the Battery Breakthrough Initiative and other schemes where funding is available for battery manufacturers including percentage of local content manufactured in Australia, recipients of funds and amounts provided.
- The Commonwealth Government facilitate access to cheaper raw materials where mined and processed in Australia for Australian customers.

Question 4.1: Are the proposed maximum and minimum funding limits appropriate, given the draft Program Outcomes? How might these limits constrain your Project?

The main concerns are:

- Two or more projects of $200 million each risks exhausting the Battery Breakthrough Initiative (BBI) with only 2-3 large projects, possibly in 1 segment of the supply chain.
- One focus area may consume a disproportionate amount of the funding. Allocation of funding to each Focus Area ensures that benefit can be more evenly spread across the supply chain.
- That funding may be disproportionately allocated to projects with higher Technology Readiness Levels (TRL) to the exclusion of lower TRL projects that promise greater and longer-term benefits. For example, developing cell manufacturing is of highest value opportunity, and can feed into pack manufacture. The BBI should ensure that funds are available for these projects.

- That technology developed in Australia risks going offshore if it is not supported through the BBI. This may include lower TRL projects.
- The funding pool is limited and production incentives on high volume production will potentially consume a large proportion of the available resource. This disadvantages access to funds for feasibility and development projects.
- The BBI work within a framework of government programs to ensure funding overlap from other projects (For example Production tax credits under the Future Made in Australia Act) does not stifle program outcomes.
- Should the requirement for co-contribution be inflexible, it is recommended to reduce the minimum funding amount.

Recommendation 4.1:

- ARENA to ensure a spread of investment by quarantining funding amounts for:
    - each of the focus areas
    - projects at Technology Readiness Level 4-6
- ARENA to reduce the top of the range from $200 million to $100 million thus reducing the risk of funding being too concentrated in one focus area and with one beneficiary.
- ARENA to reduce the bottom range to $1 million.
- ARENA evaluate funding limits 12 months after launch to assess progress, consult with industry on outcomes and update the Battery Breakthrough Initiative if required.
- ARENA to integrate with other funding programs to ensure any funding overlap does not stifle program outcomes.

Question 5.1: Do you think there is merit in the Program supporting projects through this demand-side model (in addition to supply-side support)?

The Advanced Materials and Battery Council understands that the model proposed is to establish conditional funding contracts with buyers and installers of batteries, with the buyers and installer engaging local manufacturers to supply components or batteries. This way local manufacturing is incentivised with the potential to win contracts. This approach is not targeted to specific projects, allowing “customers” to ask for bids from many suppliers for their contract.

Question 5.2: Please provide examples (in any) where this demand-side model would effectively contribute to the Program Outcomes.

This is unknown.

Question 7.1: Do the Eligibility Criteria seem reasonable? Are there any additional criteria you would add to the list, or are there any criteria that may be challenging to achieve?

In general, the eligibility criteria for applicants appear reasonable and comprehensive. There is considerable administrative burden in providing evidence across all these elements and there may be room for misinterpretation. ARENA could provide support for applicants with definitions and examples of acceptable organisational policies.

Question 8.1: Do the Merit Criteria seem reasonable? Are there any additional criteria you would add to the list, or are there any criteria that may be challenging to achieve?

There is some uncertainty on whether some of the merit criteria are reasonable:

- Program Outcome #1: Adjust to 'Enhance Australia's battery manufacturing capability to improve local and global supply chain resilience and support local and global emissions reduction.
- Program Outcome #2: Adjust to reflect AMBC recommendation in question 2, i.e. Commercialise battery manufacturing processes/technologies to scale for domestic and export opportunities to contribute to local and global emissions reductions.
- Focus area alignment:
    - Third parties need to demonstrate that their inputs are manufactured locally or have a clear strategy to manufacture locally within a reasonable timeframe.
- Development pathways for sustainability:
    - may be challenging to demonstrate with certainty as battery related projects require a workforce with specialist skills including chemists, electro-chemists and nano-technologists. Not many of these professionals are located in regional, rural or remote areas or in First Nations communities. It is also unknown what ARENA envisage as 'outcomes for local communities including First Nations'.
    - high levels of heat are sometimes required for the manufacture of active materials. Currently, gas is a cost-effective source of energy for this process and should be eligible as a transition fuel, for example a project proposing to use gas for heat might be asked to demonstrate that a switch to hydrogen in the future is technically feasible. Renewable energy is prohibitively expensive and until price level declines, flexibility needs to be built into the BBI to enable competitiveness.
- Capability and capacity:
    - Currently, demonstrated expertise and capacity for manufacturing battery and battery materials is in short supply globally. Agree in principle but with current maturity of the sector, existing expertise is often not available. This has also been noted above in response to Development pathways.
- Merit Criteria General:

- Merit criteria are heavily weighted to shovel ready projects and may limit access by companies at lower Technology Readiness Levels to contribute to the ecosystem growth.
- Manufacturers have had limited time to understand the opportunities and challenges and allocate resource towards development of projects. This means they may not be able to provide a detailed response to Appendix D.
- Merit criteria should favour assembly where it can be demonstrated that manufactured components are sourced locally. Production incentives in this area may be appropriate providing they reward local content. Supporting projects with higher local content helps to make these products more competitive compared to those with a high overseas content. The outcome is generation of jobs Australians, building towards the establishment of a sustainable industry and reduction of sovereign risk.
- The one-to-one funding may limit access for small organisations to apply. A flexible approach including binding funding agreements that are conditional on the organisation raising a co-contribution and the flexibility to lower or raise the co-contribution amount.

Recommendation 8.1: ARENA:

- adjust Program Outcome #1 to 'Enhance Australia's battery manufacturing capability to improve local and global supply chain resilience and support local and global emissions reduction.'
- adjust Program Outcome #2 Merit Criteria to reflect AMBC recommendation in question 2, i.e. Commercialise battery manufacturing processes/technologies to scale for domestic and export opportunities to contribute to local and global emissions reductions.
- require proponents to identify the value of their product that is sourced locally, including labour, and apply a threshold for qualification for each focus area, and then support those with the highest local content.
- provide clarity on expectations on outcomes for local communities including First Nations.
- be flexibly in assessment on experience and expertise when projects are the first of their kind.
- accept gas as a transition fuel for projects until renewable energy becomes cost effective.

Question 10.1: What are the highest value knowledge sharing benefits that could be gained from this Program?

Each of these projects is likely to be first-of-a-kind in Australia, with the learning steepest for the first projects assessed. Therefore, the lessons learned will be many for the growth of the manufacturing ecosystem and it is difficult to determine at this stage which will be the highest value for knowledge sharing. These lessons may include:

- Understanding of realistic timeframes
- Understanding barriers and enablers of success

- Accuracy of cost estimates
- Understanding of available skill levels in Australia
- Regulatory burden for small entities
- Human resource constraints
- Importance of links to international knowledge networks
- Industrial precinct readiness for production
- Technology gaps to reach commercialisation

Additional feedback on the Program design

It would be useful to understand how the Battery Breakthrough Initiative (BBI) is going to be evaluated and what measures of success will be utilized.

Ensure that BBI is integrated with other strategies and programs such as the Critical Minerals Strategy.

Additional fields in the online survey

1. Do you have any other questions about the Program or Consultation Paper? (Which have not been covered in the Consultation Paper or Webinar). – No
2. Do you have a project you consider may form the basis of an Application under the Program? Please use the following link to submit responses to Appendix D of the Consultation Paper: https://forms.office.com/r/rAavgn8tDG . – No
3. Do you consent to ARENA contacting you about the BBI? - Yes