

Committee Secretary
Standing Committee on Climate Change, Energy, Environment and Water
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26 March 2026

Dear Committee Secretary,

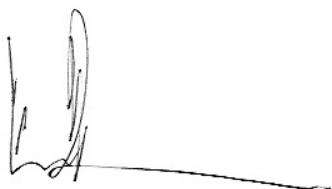
Subject: Inquiry into solar panel reuse and recycling in Australia

Thank you for the opportunity to make a submission to the House of Representatives Standing Committee on Climate Change, Energy, Environment and Water in relation to its inquiry into solar panel reuse and recycling in Australia.

Business Council for Sustainable Development Australia (BCSDA) submits that end-of-life solar panel management should now be treated as a strategic circular-economy, industrial-policy and business-transition issue. While the detailed design of future national arrangements should continue to be informed by current pilots, trials and consultation, the evidence already supports clearer national direction on stewardship, collection, reuse, recycling and end-market development.

BCSDA would welcome the opportunity to provide any further information that may assist the Committee.

Yours faithfully



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Executive summary

BCSDA welcomes the Committee's inquiry into solar panel reuse and recycling in Australia. In BCSDA's view, this is no longer a niche waste-management issue. It is now a material circular-economy, industrial-policy and business-transition issue that sits at the intersection of climate, resource productivity, energy security, product stewardship and market design.

Australia's solar fleet is now large enough that end-of-life management must be treated as an operational policy and investment priority. The available evidence indicates that solar-panel waste volumes are already material and are likely to grow substantially over the next decade. However, BCSDA notes that waste projections remain sensitive to assumptions about panel lifetime, repowering decisions, early replacement, damage rates and collection behaviour. For that reason, the available figures should be treated as planning estimates rather than precise forecasts. On the current evidence, annual solar panel waste appears to be in the order of 50,000–60,000 tonnes today, could rise materially by 2030, and may reach around 1 million tonnes cumulatively by 2035.

BCSDA does not suggest that every element of the future policy architecture is already settled. The evidence base is still developing, including through current pilots and collection trials. However, the evidence is already sufficient to show that the status quo is unlikely to deliver an efficient or durable circular-economy outcome at scale. In BCSDA's view, this supports a staged policy pathway: strengthen data and system design now, while moving in a clear direction toward nationally consistent stewardship, better collection economics, and stronger accountability across the product life cycle.

BCSDA therefore supports a policy response centred on:

1. **progress toward a mandatory national product stewardship scheme for solar PV through a staged, evidence-based pathway**, with clear producer responsibility and eco-modulated fees.
2. **treatment of collection and logistics as enabling infrastructure**, not an afterthought.
3. **a regulated reuse pathway** supported by testing, certification and fit-for-purpose standards.
4. **measures to develop domestic end-markets** for recovered materials, especially glass and aluminium.
5. **nationally consistent data, traceability and performance metrics**; and
6. **a staged pathway to stronger landfill restrictions**, once collection and processing capacity is in place.

For business, the issue is broader than waste. It concerns regulatory certainty, decommissioning liability, supply-chain resilience, operational planning, market development and reputation. For government, it is an opportunity to avoid a growing waste problem while building domestic circular capability in a strategically important clean-energy value chain.

Key recommendations

BCSDA recommends that the Australian Government, working with states and territories:

1. **Progress toward a mandatory national product stewardship scheme for solar PV through a staged, evidence-based pathway.** The Australian Government should use current pilots and consultation processes to settle the detailed scheme design, while making clear that the policy direction is toward nationally consistent producer responsibility for end-of-life solar PV. The scheme should include clear roles and obligations across importers, manufacturers, retailers, installers and system owners; eco-modulated fees; separate pathways for reuse and recycling; and measurable targets that distinguish mass recovery from higher-value material recovery.
2. **Build a national collection and logistics system.** Policy should recognise that logistics is the main cost driver. Collection points, aggregation rules, transport protocols and installer-led return pathways should be designed as core system infrastructure.
3. **Create a formal reuse market.** A national testing, grading and certification framework is needed for second-hand panels, alongside clear liability and warranty settings and fit-for-purpose deployment pathways, including controlled off-grid and community uses where appropriate.
4. **Support domestic recycling and end-markets.** Government should use procurement, standards reform, certification and offtake support to build demand for recovered materials, especially PV glass, aluminium and other strategically relevant material streams.

5. Improve data and traceability. Australia needs nationally consistent definitions, better reporting on waste volumes and outcomes, and stronger product- and end-of-life data to support policy design, investment and compliance.

6. Align energy policy, waste policy and product policy. Solar uptake incentives, technical standards, stewardship settings and waste rules should work together rather than at cross-purposes.

7. Stage stronger landfill restrictions once capacity exists. A future nationally consistent restriction on landfilling solar panels should be considered once collection, testing and recycling systems are sufficiently mature and accessible.

BCSDA perspective

BCSDA approaches this issue from both a sustainable development and business-competitiveness perspective. Australia's clean-energy transition should not create an avoidable downstream waste and liability problem. Equally, businesses need practical, proportionate and investment-supportive policy settings.

In BCSDA's assessment, the current system is not yet operating at the standard required for a mature circular-economy response. Policy settings remain fragmented, data remains incomplete, commercial signals are weak, and voluntary approaches have not yet delivered sufficient scale or stability. At the same time, the inquiry presents an opportunity to move from fragmented pilot activity to a more coherent national framework. That approach is consistent with OECD-style policy design principles that emphasise institutionalisation, quality, impact, evidence use and follow-up mechanisms, as well as with the Australian Government's fit-for-purpose regulatory approach of being targeted, evidence-based and continuously improved.

Unless otherwise indicated, the quantitative estimates and policy examples in this submission are drawn from BCSDA's supporting research synthesis, which in turn consolidates public Australian and international source material relevant to solar-panel reuse and recycling.

Response to the Terms of Reference

a. Current and projected waste volumes from end-of-life solar panels in Australia

BCSDA considers the evidence base sufficient to conclude that solar PV waste is already material and is likely to increase significantly over the next decade. At the same time, BCSDA notes that forecast ranges should be interpreted with caution. Waste projections are sensitive to assumptions about module lifespan, early replacement, repowering, storm and damage losses, consumer behaviour and collection patterns. On the available evidence, the broad direction of travel is clear even if exact future volumes remain uncertain: Australia is moving toward a much larger end-of-life PV stream, and policy should be designed on that basis.

BCSDA also notes that practical panel lifetime is often shorter than nameplate expectations. Early replacement driven by repowering, technology upgrades, roof works and consumer economics means that waste forecasts based only on nominal 25–30-year lifetimes may understate near-term volumes. Policy design should therefore plan for both uncertainty and acceleration in decommissioning rates.

b. Current disposal practices and trends

The current disposal landscape remains misaligned with circular-economy objectives. The dominant pathways today are landfill, stockpiling and export, with compliant recycling still the exception rather than the norm. Available evidence indicates that many panels are removed before true end of technical life, and that handling and collection pathways materially affect whether a panel can still be reused. Installer-led collection appears to preserve reuse potential far better than resident-led drop-off arrangements.

BCSDA is concerned that the absence of a consistent national system creates avoidable leakage into the cheapest pathways. It also creates ambiguity around whether export is functioning as genuine reuse or as deferred waste disposal. In this context, export controls and documentation matter, especially given the tightening of Basel-related requirements from 1 January 2025.

c. Comparative costs of reuse, recycling and landfill disposal

The Committee's inquiry correctly focuses on cost. In BCSDA's view, cost is the central barrier to scale under current policy settings.

The most detailed Australian evidence available indicates total collection, logistics and recycling costs in the Queensland pilot ranged from **\$43-\$58 per panel in metropolitan areas, \$60.5-\$75.5 in regional areas, and \$70.5-\$90.5 in remote areas**, while the recycling process itself was relatively stable at **\$10-\$20 per panel**. This means the system challenge is overwhelmingly logistical. By contrast, landfill commonly remains the lower-cost option, particularly where charges are mass-based and do not reflect the broader externalities of disposal or lost material value.

This is why BCSDA considers it misleading to frame the problem only as one of recycling technology. The economics will remain weak unless policy addresses collection density, aggregation, transport efficiency, safe handling, and the demand side for recovered material.

BCSDA also notes that reuse can, where safe and compliant, deliver materially greater value retention than recycling. Evidence cited in the research base suggests the value of a reused panel may be substantially higher than the value recovered through material recycling alone. This supports a policy hierarchy of **reuse first where feasible, recycling where reuse is not appropriate, and landfill only as a last resort**.

d. Potential benefits to Australia of expanding onshore reuse and recycling

BCSDA sees four broad benefit categories:

- **First, resource productivity and environmental benefit.** Solar panels contain recoverable glass, aluminium, silicon, copper, silver and other material fractions. Based on available recovery assumptions, each 1 million tonnes of PV waste could yield approximately 712,500 tonnes of glass, 98,000 tonnes of aluminium, 21,250 tonnes of silicon, 1,900 tonnes of copper, and 27 tonnes of silver. Even allowing for technology change over time, this indicates a substantial urban-mining opportunity.
- **Second, energy security and supply-chain resilience.** Closed-loop modelling cited in the evidence base indicates recycled PV silver and aluminium could meet a material share of future PV demand over time, strengthening domestic resilience and reducing exposure to upstream concentration risks. In BCSDA's view, this makes solar circularity not only a waste issue but also a strategic industry and resilience issue.
- **Third, economic and market-development benefit.** Expanding collection, testing, refurbishment, sorting, logistics and materials processing can support jobs, regional service capability and innovation in circular manufacturing and secondary materials markets.
- **Fourth, household and community benefit.** A credible second-hand market may support more affordable energy access in some use cases, especially where reuse can be safely directed to appropriate applications rather than defaulting to landfill. Evidence from NSW trials suggests meaningful shares of collected panels may still be functional.

BCSDA also emphasises that these benefits are potential rather than automatic. They depend on viable collection systems, quality-preserving handling, fit-for-purpose reuse pathways, and stronger end-markets for recovered materials. High-volume but low-value fractions such as glass may continue to constrain economics unless policy and market development address demand-side barriers. For that reason, the case for onshore reuse and recycling should be framed not as guaranteed commercial value, but as a strategic opportunity that requires deliberate system design.

e. State of development of Australia's capabilities, domestic markets and policy frameworks

BCSDA's assessment is that capability is emerging, but the system is not yet mature.

There are positive signs of local processing investment and growing policy attention. The Australian Government has announced **\$24.7 million over three years** for a national pilot involving up to **100 collection sites** and a target of collecting up to **250,000 panels**, with the stated aim of generating evidence for a future stewardship proposal. The Productivity Commission has also recommended progressing a national stewardship scheme for small-scale solar PV systems.

BCSDA also notes that the current Commonwealth approach remains partly developmental. Existing pilots and collection programs are important because they are generating evidence on costs, logistics, material flows and system design.

In BCSDA's view, that should not delay reform indefinitely, but it does mean that the detailed architecture of a future national scheme should be informed by pilot findings rather than assumed to be fully settled in advance.

BCSDA understands that domestic commercial capacity is beginning to form, including through investment in panel-processing capability. That is encouraging. However, it also points to structural fragility in the market, including recent business failures and administration processes, which underline the reality that capability without stable policy and feedstock is not enough.

In relation to frameworks, state-based measures and pilots are helpful but uneven. Victoria's landfill ban provides a stronger regulatory signal than exists elsewhere, but Australia still lacks a nationally consistent framework that links collection, reuse, recycling, market development and accountability.

f. Barriers to reusing and recycling solar panels at scale

BCSDA considers the barriers to be mutually reinforcing rather than isolated:

- **Logistics and geography.** Panels are bulky, fragile and geographically dispersed. Distance, breakage and poor aggregation sharply increase system costs.
- **Weak commercial incentives.** Without funded stewardship and market certainty, landfill remains cheaper and recyclers face unstable feedstock.
- **Reuse standards, liability and market-confidence gaps.** Second-hand markets remain informal and under-developed. Testing, certification, warranty, consumer protection and legal settings are not yet mature enough to support confident participation at scale, particularly in grid-connected applications. This means reuse should not be assumed to scale quickly simply because it is higher on the waste hierarchy. A credible reuse market will require deliberate regulatory design, quality assurance, and clearer allocation of responsibility across sellers, installers and end users.
- **End-market weakness.** Glass is the largest mass fraction and a make-or-break issue for economics. If there is no reliable outlet for recovered glass, overall recovery value remains constrained.
- **Data and governance gaps.** Scheme design remains hampered by incomplete national data on flows, costs and outcomes.
- **Fragmentation across jurisdictions and policy silos.** Waste, energy, product stewardship, standards and procurement settings are not yet sufficiently integrated. OECD evidence on effective policymaking points to the importance of institutionalised co-ordination, cross-sector evidence uses and clear articulation of policy problems. That lesson is directly relevant here.

g. Alternative policy options for governments to help overcome these challenges

BCSDA supports a layered policy package. BCSDA also recognises the argument that governments should wait for pilot results before moving toward stronger national regulation.

In BCSDA's view, the better approach is not to choose between pilots and reform, but to sequence them properly. Pilot evidence should inform the detailed design of the system, especially on logistics, collection density, cost allocation and reuse protocols.

But the broader policy direction should already be clear: absent stronger national coordination and clearer accountability, the existing system is unlikely to deliver scale, consistency or investment confidence:

- **Sequenced reform based on pilot evidence.** BCSDA supports a sequenced pathway in which current pilots, trials and consultations are used to refine the design of future national arrangements. This includes testing assumptions about collection logistics, regional service models, cost-sharing, safe handling, reuse screening and material recovery pathways. However, sequencing should not become a reason for policy drift. The purpose of pilot activity should be to improve the design of a stronger national framework, not to postpone the underlying question of accountability.
- **Mandatory national product stewardship / EPR.** A national product stewardship scheme should be the likely long-term centrepiece of reform, with the detailed design informed by pilot evidence, consultation and implementation experience. Eco-modulated fees would encourage better product design and durability, while performance targets should distinguish between simple mass diversion and higher-value material recovery. Reuse and recycling should be separately defined and separately regulated.

- **National logistics and collection architecture.** Government should treat collection and transport as enabling infrastructure. This includes dense collection nodes, installer-led return obligations or incentives, standardised packaging and transport protocols, and aggregation models that minimise damage and cost.
- **Certified reuse pathway.** Australia should establish a national test-and-certification protocol for second-hand panels, with clear grading, traceability, warranty rules and approved deployment lanes. This would help shift reuse from informal practice to a regulated market.
- **End-market development.** Public procurement, construction specifications, certification and offtake support should be used to build demand for recovered PV glass and other materials. This is where circular-economy and industry policy need to connect.
- **Better data and measurement.** BCSDA supports nationally consistent data collection, performance reporting and digital traceability. This is also where WBCSD's circularity work is relevant. The [Global Circularity Protocol for Business](#) and associated data-exchange work point to the value of harmonised metrics, clear semantics, structured reporting rules and better data models. That kind of measurement architecture would improve policy design, corporate reporting and investor confidence in Australia's solar circularity system.
- **Staged landfill restrictions.** BCSDA supports consideration of a future nationally consistent restriction on landfilling solar panels, but only alongside stewardship funding and demonstrated access to collection and processing pathways. In this regard, Victoria's model provides a useful reference point.
- **Ongoing review and evaluation.** Given technology change and lifetime uncertainty, the policy framework should include review cycles, transparent performance reporting and mechanisms to respond to evidence. This is consistent with OECD guidance on follow-up, dissemination and evaluation impact, and with the Australian Government's emphasis on continuous improvement and regulatory stewardship.

h. Any other relevant matter

BCSDA offers four additional observations.

- **First, policy should not assume that voluntary arrangements alone will deliver scale.** Voluntary efforts have helped build knowledge and pilot activity, but they have not yet overcome the core economic and coordination barriers.
- **Second, terminology matters.** "Recycling rate" can mean different things depending on whether it refers to panel numbers, tonnage, partial dismantling, or full material recovery. Scheme design should therefore use clear and transparent definitions.
- **Third, this is a business-transition issue as much as an environmental one.** BCSDA members increasingly need clarity on decommissioning assumptions, contractor standards, liability, traceability, procurement choices and reporting expectations. Better policy settings can reduce both business risk and implementation uncertainty.
- **Fourth, solar circularity should be treated as part of a broader clean-energy stewardship agenda.** Australia's transition objectives will be stronger if deployment policy is connected from the outset to circular design, product accountability, material recovery and end-of-life system planning.

Conclusion

BCSDA welcomes the inquiry and encourages the Committee to recommend a practical, nationally coordinated framework for solar panel reuse and recycling in Australia.

The policy question is no longer whether a solar-panel waste stream exists at meaningful scale. It does. The more important question is how Australia should sequence the transition from fragmented and uneven arrangements to a more coordinated and durable circular-economy system.

In BCSDA's view, the evidence already supports clearer national direction, even though some aspects of detailed scheme design should continue to be informed by pilot results and practical implementation experience.

BCSDA's position is that Australia should move now to create the market conditions for reuse, high-quality recycling and domestic value recovery, while using current pilots and consultation processes to refine the detailed design of future national arrangements. The strongest policy package is likely to be one that combines stewardship, logistics infrastructure, certified reuse, end-market development, better data, and phased

regulatory tightening. Done well, this would support households, reduce waste, strengthen supply-chain resilience, provide greater certainty for business, and better align Australia's clean-energy transition with sustainable development objectives.