Electra

Following our initial submission, we would like to address some of the concerns raised by other stakeholders and offer additional context, counterpoints, and actionable recommendations.

Lack of Participation by Manufacturers Should Not Justify a Delay

It has been noted by the Department of Ecology and other stakeholders that only a limited number of manufacturers have submitted stewardship plans by the July 1, 2024 deadline, threatening solar panel availability in Washington. However, this does not warrant delaying the law. The Department of Ecology and WASEIA have held six open "solar workgroup" meetings since October 2023 for manufacturers, installers, and agencies. Still, we've consistently only seen participation from the same handful of manufacturers.

Despite these opportunities for engagement, 12 manufacturers (an estimated 50% of those sold by distributors) have either submitted a plan or expressed their intent to do so. Delaying the mandate to 2029 will not guarantee more participation. In fact, it could further encourage inaction. Manufacturers have had 7 years to develop a plan since the law passed in 2017. Another delay would send the wrong message by rewarding those who have avoided compliance.

Moreover, forming a new advisory committee, as proposed, is unlikely to compel participation from manufacturers who have not engaged thus far. Electra has been in direct contact with all 12 of these manufacturers, offering open collaboration and seeking feedback to work together on creating a functional plan. Some have shown clear interest, while others remain silent. Without mandatory compliance measures, a delay will not likely to motivate the absent manufacturers to act.

Early Panel Retirement is Already Increasing Waste

While some stakeholders cite that solar panels have a 20-30-year life span, data shows that panels are increasingly being retired much earlier than their warranty expiration—between 10 and 15 years—due to technological advancements, storm damage, or the need for roof replacements. This shortens the window for action and underscores the urgency of implementing a stewardship program now.

Using local data, we estimate that by 2027, between 100,000 and 200,000 panels will enter the waste stream in Washington, with an additional 200,000 to 350,000 panels annually. This translates to 4,000 tons of panel waste by 2027, increasing by an additional 4,000 to 8,000 tons annually thereafter. These panels cannot simply be dropped off at central locations like other waste—due to their size, weight, and fragility, they require special handling, palletization, and transport protocols. Currently, we know of only one e-waste location in Seattle, that will accept panels in WA state.

Landfill Costs vs. Recycling Benefits

Currently, landfill disposal fees in Washington range from $44 to $198 per ton, meaning that the cost of dumping 100,000 panels (about 2,273 tons of waste) in 2027 alone will range from $100,000 to $450,000. These costs will fall on local municipalities and residents, not

manufacturers. Moreover, these fees don't account for the long-term environmental costs of landfilling solar panels, which contain valuable recoverable materials like silver, copper, and silicon.

By not recycling these panels, we miss the opportunity to recover valuable materials and reduce the 3,400 metric tons of CO_2 embodied in those panels. The social cost of carbon associated with this missed recycling opportunity is an estimated $170,000 for 100,000 panels. This underscores the environmental and financial burden that Washington would face by delaying the program.

Utilities: Strong Support for EOL Stewardship Plans

We recently spoke with a utility provider in Seattle, which has been inquiring about EOL stewardship plans for solar panels from manufacturers. They shared that they have never seen a project proposal using a panel manufacturer that includes an EOL plan, despite their clear preference for both EPEAT certification and EOL stewardship plans. They would prioritize projects from manufacturers that include such a plan, further demonstrating the demand for manufacturers to take responsibility for their panels beyond installation.

This presents a market opportunity for manufacturers willing to comply with EOL responsibilities and adopt stewardship programs like Electra's. If the mandate is delayed, Washington risks stalling this market-driven adoption of sustainability, which is already gaining traction with utility companies and customers.

Challenges of Tracking Solar Panels: The Solution Exists

Some have expressed concerns about the decentralized nature of the solar supply chain, citing difficulties in tracking panels sold through distributors. While this is undoubtedly a challenge, it is not insurmountable. It is precisely this lack of transparency and traceability that Electra's solar panel registry was designed to solve.
Electra's platform allows manufacturers to upload serial numbers of panels into the system, and panel owners or installers input the installation address, creating a checks-and-balances mechanism that surfaces the location of panels throughout their lifecycle. This system ensures manufacturers can track where their panels are installed, overcoming the distribution gap.

Without a registry like Electra's, this fundamental problem will persist, making it difficult for manufacturers to meet their recycling obligations. The notion that manufacturers are not set up to handle recycling is exactly why an external stewardship program, such as Electra's, provides value. Collection hubs would be established across the state to manage the logistics of gathering panels, and vetted recyclers would handle processing. Installers and developers could drop off panels at these hubs, and Electra would facilitate direct trips to recyclers for larger projects, ensuring efficient management for all sizes of projects.

Addressing the Issue of Competitive Disadvantage

Concerns have also been raised about the potential for competitive disadvantage if domestic manufacturers are required to comply while foreign manufacturers evade enforcement. While this is a legitimate concern, delaying the law further will not resolve this imbalance. Instead, enforcing the law with clear compliance mechanisms—and allowing manufacturers to participate in a third-party

stewardship plan—will create a more level playing field. Electra's plan, which distributes costs fairly between manufacturers and panel owners, ensures that compliance is affordable and accessible, reducing the likelihood of companies avoiding their responsibilities.

Additionally, the registry system ensures that panels from all manufacturers—whether foreign or domestic—are tracked, holding all accountable for their EOL responsibilities. Without this accountability framework, those concerns will persist, regardless of when the mandate is enforced.

The Market Opportunity of Responsible EOL Management

It's important to note that the market is already signaling a shift toward sustainability, as evidenced by utility preference for projects that include EOL stewardship plans. While some manufacturers may be reluctant to adopt these practices, the demand for environmentally responsible solutions is growing. End customers, utilities, and large-scale developers are increasingly looking for manufacturers who can demonstrate commitment to sustainability throughout the product lifecycle.

This is not only an environmental necessity but also a market opportunity for OEMs to differentiate themselves and gain preference in a competitive market. By delaying the program, we risk missing this opportunity and stalling adoption of EOL solutions across the industry.

Delaying the Law Will Not Address Overcapacity or Market Pressures

We recognize concerns over overcapacity in the solar market and price drops in PV modules as reasons for delaying the mandate. However, delaying the implementation of the Solar Panel Stewardship Program will do nothing to address these underlying economic issues. The solar industry has always been subject to fluctuations in supply and demand, price variability, and shifts in global production capacity. These challenges will exist regardless of whether the law goes into effect in 2025 or 2029.

In fact, by delaying the law, Washington risks facing an even greater influx of panels reaching end-of-life, driving up the cost of managing waste due to increased panel volume and lack of early planning. Electra's program is designed to mitigate these issues by creating a cost-sharing model between manufacturers and panel owners, ensuring that no one party bears the entire financial burden. At $0.02/Watt, the costs of recycling are a small fraction of overall module pricing and will not significantly affect the economics of solar deployment, even during periods of price pressure. The cost of compliance via collaboration is far outweighed by the potential long-term costs of mismanaging solar panel waste OR developing, funding, and managing in-house plans.

Providing a Solution for Manufacturers Out of Business

Another concern raised is the lack of participation by manufacturers that are no longer in business, which creates a gap in funding for recycling those panels. This is a real issue, but it is not one that will be resolved by delaying the law. The challenge of orphaned panels will only grow over time as more panels are installed, and more manufacturers inevitably face financial difficulties or exit the market.

Electra's innovative model directly addresses this issue by allowing panel owners to pay the full registration cost for panels from manufacturers that are no longer in business or who choose not to

participate in a stewardship plan. This ensures that panel owners still have a viable, affordable path to responsibly recycle their panels, even if the original manufacturer is not contributing to the cost (although those manufacturers would be out of compliance). In this way, Electra's solution helps prevent these orphaned panels from ending up in landfills, which would ultimately cost the state more in terms of environmental damage and waste management.

By implementing the stewardship law in 2025, Washington can establish a framework that manages these challenges early on, rather than allowing the problem to grow in size and complexity over the next four years.

Recommendations if the Delay is Approved

While we strongly oppose any further delay, should the Department of Ecology decide to move forward with the extension, we propose two key measures to ensure Washington remains prepared for the influx of solar panel waste:

Include one or more PV Stewardship Organizations in the Advisory Committee:
The proposal to form an advisory committee lacks representation from stewardship organizations, which are central to the success of a recycling program. If the delay moves forward, stewardship organizations should be included in the advisory committee to provide expertise in building viable, scalable solutions. Electra's stewardship plan is already in place and, if approved, could be operational in 2025. This offers a clear path forward and can help shape legislation and mitigate repetitive efforts and additional delays.

Ban Solar Panels from Landfills:
If the delay is approved, a statewide ban on solar panels in landfills should be implemented. This would require all panels to be sorted, handled, and disposed of through recycling or responsible stewardship programs, preventing further environmental damage and reducing the burden on local waste management systems. Landfills and Collection stations willing to participate could seamlessly be incorporated into Electra's Network as collection hubs.

Require Proof of an Approved EOL Plan in Permitting and Solar Inspections:
We propose modifying city and county permitting and solar installation inspection protocols to include proof that the panel manufacturer has an approved EOL plan. This could be achieved through registration with a stewardship organization like Electra or verification that the manufacturer has an approved in-house takeback plan. By including this requirement in all solar inspections, the state would ensure that panels are responsibly managed, capturing the majority of Washington's solar panel waste stream.

Conclusion
Delaying the Solar Panel Stewardship Program to 2029 will only increase the financial and environmental burden on Washington's municipalities and residents, while further postponing necessary infrastructure to handle solar panel waste. Manufacturers have had ample time to comply since the law was passed in 2017, and many have already shown a willingness to participate in a third-party stewardship plan.

Electra has developed a viable and affordable solution that, with the state's support, could be operational in time to comply with the existing law, offering Washington a clear path forward. We

strongly urge the Department of Ecology to maintain the 2025 deadline or, at the very least, incorporate the recommended landfill ban and EOL plan requirements into any revised legislation.

Thank you for considering our comments.