MARYLAND COMMISSION ON CLIMATE CHANGE

The Solar Photovoltaic Systems Recovery, Reuse, and Recycling Working Group

Meeting Minutes

Monday, September 16, 2024, 1:00pm-3:00pm E.T.

Meeting Location: Online via Google Video

Attendees

Member Names	**Affiliation**	*Present*
Sen. Benjamin Brooks	Senate of Maryland	X
Del. Mike Rogers	Maryland House of Delegates	
Tyler Abbott, Chair	Maryland Department of the Environment, designee	X, Bradley Baker
Evie Schwartz	Maryland Energy Administration, designee	X
Josh Kurtz	Maryland Department of Natural Resources, designee	
David Chy	Public Service Commission	X
Diana Menendez	Chesapeake Climate Action Network	
Pearl Donohoo-Vallett	Pepco Holdings	X
David Beugelmans	Gordon Feinblatt, LLC	X
Stacey Onoh/Oriaifo	Exelon	X
Scott Elias	CleanCapital	X
Bob Sadzinski	Maryland Department of Natural Resources	X

Non-members: Stephanie Vo, Mike Easterbrook, Bradley Phelps, David Comis, Shannon McDonald, Victoria Nellis, Sabrina Fu

Meeting Overview and Roll Call

- Bradley Baker introduced the meeting and took roll of members

R2 Standards for Solar Panels - Mike Easterbrook, Chief of Global Standards at SERI

- SERI: Nonprofit focused on electronics sustainability, ANSI accredited
- Standards help drive sustainability and circularity, promoting reuse and recycling
- R2 Standard - integrates waste hierarchy within it
    - Requirements apply to stakeholders throughout the value chain

- Independent, accredited certification bodies
    - Primarily in the US
- Regulations can help drive companies to certification
- R2v3
    - 10 core requirements that apply to all R2 facilities
    - Process requirements for certain processes
    - Appendix G
        - Make PV modules applicable to all of R2
        - Process for evaluating modules for reuse and recycling
        - Categorization for PV modules
        - Added definitions
- All facilities that handle PV modules that are R2 certified must add Appendix G into their standards by 2027 (which allows for some transition time)
- Bradley Baker: How have some other states or countries thought about incorporating recycling certification into their laws or policies?
    - Mike Easterbrook: Some example states: IL and WA and DC, EPR for batteries. In Canada, in order to participate in EPR, there is a requirement to be R2 certified. In India, certification is being considered for regulation. In Europe, requirement for alignment with certification. Mostly attached to EPR participation.
- Sen. Benjamin Brooks: Does this deal with installation and recycling?
    - Easterbrook: No installation. Only focused on used electronics. SEIA has installation standards.
- Robert Nicholson: SEIA is an ANSI development organization and is developing a recycling standard focused on process, 3rd party validation (likely R2), audits on every recycler that participates in our program
    - Easterbrook: ISO standard that is a technical guideline. There are standards coming out all over the world that will help home best practices for PV module recycling
- Baker: Some installers are requiring plans for decommissioning at the purchase of panels (commercial and residential), how effective is that? How do you make sure that the commitment for proper decommissioning remains with mergers and acquisitions?
    - Easterbrook: Some of that comes down to legislation, like EPR, to ensure funds are there. SEIA is much more involved at that level.
    - Nicholson: No installers that I know of requiring that. Typically those with decommissioning plans are coupled with a funding mechanism for decommissioning.
    - Bob Sadzinski: We have decommissioning recommendations that we send to PSC. The plan is thorough and a funding mechanism is always included, but there are caveats.
    - Scott Elias: Even when it's not required through a CPCN, they have effectively a decommissioning plan in the land lease agreement–that's a norm or should be. These agreements are transferred to the next owner.
- Baker: What are some lessons learned from other types of electronics, like CRT, that help inform the new standards for PV modules and what is something that is distinct?
    - Easterbrook: there is a correlation between CRTs and PV modules, which is one reason why we wanted to get ahead. There is a difference because technology changed and CRTs aren't needed anymore and I don't think that'll be the case for PV panels. The materials might change but I think most can be reused.
- Pearl Doonoohoo-Vallett: Lessons learned from any recyclers that have gone and executed this?
    - Easterbrook: We're just at the beginning of this, and no one has fully gone through the audit process, but facilities have til 2027 to transition fully and trends show that people wait until the last minute. Not costly to add this if they're already R2 certified, might have some operational costs. If not r2 certified, it could be $20,000-40,000 investment in terms of consulting license fee, and audit costs
- CENELEC is the European standard for solar modules

Policy Discussion

The purpose of this discussion is to get a start on ideas to include in recommendations to the MCCC

Extended Producer Responsibility

- David Comis: How would that be implemented? Similar to WA EPR? Manufacturer or project distributor?
- Baker: The concept is to shift the financial burden of recycling from taxpayers/users to manufacturers and producers.
    - For example: Maryland is doing needs assessment for EPR for packaging and other types of goods.
- Evie Schwartz: Do we have a sense of the impact of pricing and cost of materials?
- Elias: Right now, it's not about pricing, it's about whether the manufacturer is in compliance. WA state approach and Niagara approach is not the way to go. Needs to be on the project owner, rather than manufacturer
- Sen. Brooks: if that's set on the manufacturer wouldn't promote eco friendly design?
    - Baker: Good point, there could be requirements to help promote that. There could be put into law that costs can't be passed onto consumers
    - Elias: Maryland specific laws don't affect international module manufacturers. There is a risk of manufacturers not compiling in the way we'd want it. Some manufacturers are doing different programs. In Niagara County, NY, manufacturers would have to submit compliance plans to the county, and international companies are not getting that certification or are interested in stewardship programs, as a result companies are prohibited from new installations. Both residential and commercial.
    - Nicholson: SEIA does not support EPR, because it's not designed for things designed for 30-40 years. We do support an advance recovery fee, a fee paid at purchase. Manufacturers are caught between making something recyclable and something that sits outside for decades. Exponential growth of new recyclers entering the space or preparing to enter which will help with recycling costs.
- Sen. Brooks: What recycling process would be best?
    - Nicholson: I've seen all the approaches. The key is creating clean downstreams. There's nothing in a solar panel that doesn't have a mature recycling market (except for maybe silicon)
- David Beugelmans: The concept of EPR for solar panels seems like a solution in search of a problem. It could be used for consumer oriented and easily discarded, but solar is more complex. Decommission plans have worked and this process could be improved. Look towards existing processes and acceptable to developers and producers.
    - Residential solar?
        - There's a difference but there is a process in place that works well for larger projects.
- Baker: Strategy for paint cans, which led to creation of nonprofit recycling for recycling and proper disposal. Is there an opportunity to set up an organization to help handle the EoL materials?
    - Nicholson: In CA has advance recovery fee–a similar structure, whether state or nonprofit, could work. Conceptually for consumer volumes, an ARF could work.
- Shannon McDonald (chat box): Scott Elias. Based on your comment, how would that work for smaller installation projects long term vs large scale installation
- David Comis (chat box):I would be concerned that with solar panel manufacturers being huge, with worldwide sales, it may be to the manufacturer's benefit to simply not sell in Maryland.
- Elias (chat box): SEIA can speak better to smaller-scale since we don't do it, but you could collect advance fees from customer-owned distributed solar systems that provides for EoL drop-off (or allow to be included in a maintenance contract), and to pay recyclers. which would be distinct from non-customer owned solar, where we could create and manage a process that acknowledges the financial assurances in decommissioning plans (as required by SEIA 601 and 603) or other contracted arrangements, and submit those plans for EOL

    - A few reasons EPR doesn't work for solar: Creates enormous uncertainty and liability for solar module manufacturers; Leads to UNKNOWN costs that are passed down value chain and ultimately to consumers.; Some manufacturers will decline to make future sales into the state.

Landfill ban

- Market must adjust
- Elias: My company doesn't landfill. A ban may help but it also might encourage shipments of panels out of state. Could pair this with a broader proposal to make it more effective
- Nicholson: Many companies are choosing to recycle panels even if landfilling is an option. Timing is important - not beneficial to implement ban until there is sufficient recycling capacity that exists (and I expect that recycling capacity to exist in the next 1-2 years)

Policy approaches to incentivize reuse

- Beugelmans: Decommissioning plans: PSC allows developers to offset costs of removal with scrap value and resale value estimates. This allows developers to see the value of resale.
- Elias (chat box): I do not know if it would be easy to tweak elements of COMAR to do this, but it may make sense to provide tax and investment incentives to establish third party service providers who will accept solar and/or battery products for collection, transfer, reuse, recycling, and refurbishment. But if something like this already exists for other tech, perhaps we can add solar to it
- Baker: As one approach, figuring out a way to provide incentives for providers to come to Maryland.

Other ideas

- Sadzinski: In the decommissioning plan there is an agreement with a third party to buy panels at a certain price. Recyclers in the state and 30-40 coming to the US over the next few years.
- Beugelmans: Non utility recommendation: something with training of second hand organizations that can help create a resale market
- Nicholson: CA has a good program for smaller scale. We have 12 recyclers in the SEIA program, and all start with resale and refurbish options first. Not much incentive needed.
- Sabrina Fu: We saw that some places were able to resale panels to other residents. How do we encourage such a market?
- Baker: Opportunity to help disadvantaged and overburdened communities because panels can be expensive. Is this an opportunity for reuse to help with capital costs?
- Elias: One thing to look at is what CA is wanting to do, overarching structure where everyone would submit EoL plan to agency, and for residential the ARF. This had the backing of various trade associations.
- Baker: we could do a phased approach
- Beugelmans: CPCNs are a good foundation for larger projects…at county level, decommissioning requirements that are different and potential conflicts between county and state. Look at PPRPs and Commission as a guide for model ordinance across counties. Would help developers.
- McDonald: If we set up or recommend, how would that residential piece come into play without putting burden on the residents?
    - Elias: When looking at residential we are looking at two different processes - resident owns or company still owns.
    - Schwartz: The Maryland Rooftop Solar Coalition represents the residential solar segment
- McDonald: Any incentives in supporting collection and redistribution of panels?
    - Nicholson: One challenge with reuse is that the panels need to be up to code (residential code, electrical code, etc.). Companies need to be well versed in refurbishing. EnergyBin helps with the resale market, as well as Decom Solar, Revive and Fabtech

Public comment

- No public comment