

PV Module Stewardship and Takeback Program



DEPARTMENT OF
ECOLOGY
State of Washington



Current Status

- The statewide collection program is not currently operational.
- No sites (that I've heard of) in WA recycling PV modules.
- Some of the recycling locations across US:
 - Ohio
 - Wisconsin
 - California
 - Arizona
 - Texas
 - Nevada
- Program collection begins July 2025.
- Ecology developed a guidance document for manufacturers to use for development of their plans.

Stakeholder Advisory Group

Bill Angel — Whatcom County Health	Evan Bush — Itek Energy
David Thompson — Panasonic Corporation of North America	Kirk Haffner — South Sound Solar
Dean Van Vleet — Solar Washington	Matthew Garamone — First Solar, Inc.
Evelyn Butler — Solar Energy Industries Association	Rick Matheson — Silicon 2 Solar
Garvin Heath — National Renewable Energy Laboratory	Rod Whittaker — Washington Refuse and Recycling Association
Heather Trim — Zero Waste Washington	Sego Jackson — Seattle Public Utilities
Jake Walters — CED Greentech	



History and What Does the Law Say?

- SB 5939 passed in 2017
 - Primarily a tax incentive bill.
- Created Chapter 70A.510 RCW, Photovoltaic Module Stewardship and Takeback Program
 - PV module manufacturers responsible for financing the takeback and recycling system.
- Collection covers PV modules sold after July 1, 2017.



History and What Does the Law Say?

HB 2645 adopted in 2020 changed the law in the following ways:

- Added PV Modules from utility scale projects
- Allowed manufacturers to use a PSO
- Delayed implementation of the program until July 2023
- Established a task force and study to quantify the PV Modules covered by the program (this provision was vetoed by the Governor)

HB1393 adopted in 2021 delayed implementation of the program until July 2025

Examples Covered in Program

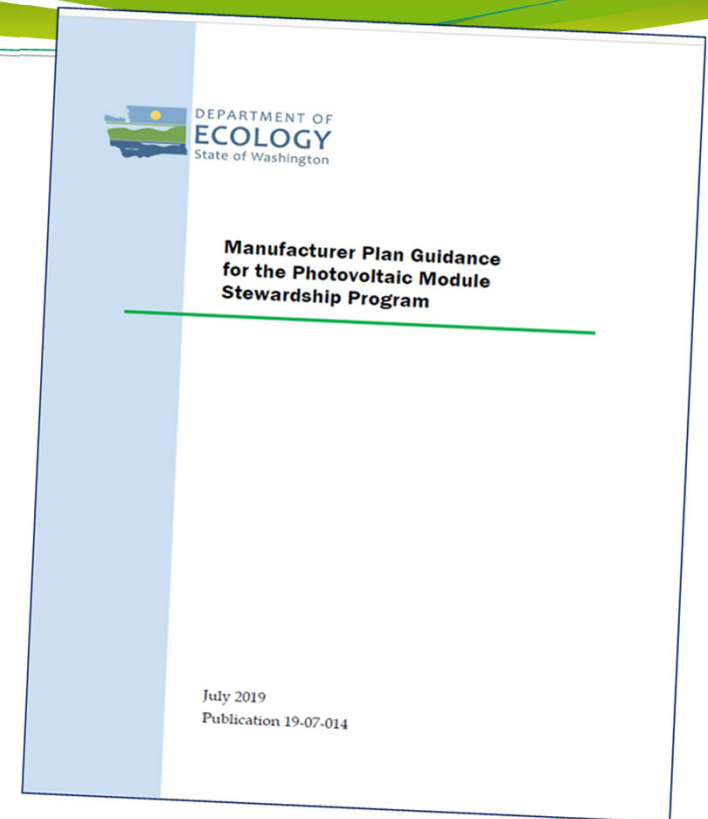


Examples NOT Covered in Program



Ecology's Role

- Create guidance document that manufacturers will follow when:
 - Creating stewardship (recycling) plan
 - Preparing annual report
 - Listing downstream vendors
 - Creating collection network
- Review and approve plans that meet all requirements.
- Ensure manufacturers selling in Washington are participating in an approved plan.



Enforcement

Process - Beginning July 1, 2025, manufacturers selling in the state must participate in an approved plan.

- Ecology sends a warning letter to the manufacturer(s) not participating in a plan.
- Manufacturer(s) have 30 days from notice to participate in or submit an approved plan.

Penalties – Up to \$10,000 for each sale of a PV module in or into the state that occurs after the initial written warning.



Manufacturers' Role

- Create their own recycling plan or join stewardship organization.
- Finance a convenient takeback and recycling system at no cost to the owner of the PV module.
- Ensure collection, transportation, and recycling follow the *Interim Enforcement Policy, Conditional Exclusion for Electronic Wastes*.
- Submit annual report.
- Update plan every five years.

End-of-Life Solar PV Modules in WA State Study

Key Findings

WA State Solar PV Market:

- As of 2020, 264 MW installed in WA (.26% total installed in U.S.)
- SEIA expects WA State to install an additional 834 MW in next 5 years
- 42 manufacturers have sold into WA State
- Most of WA State solar capacity is in smaller roof top installations

Material Composition:

- 70% glass
- 19% aluminum
- 11% (polymer, copper, lead, tin, polyvinyl fluoride (earlier panels), silicon and silver)

End-of-Life Solar PV Modules in WA State Study

Key Findings Cont.

PV Modules Covered by Legislation:

- Total modules sold to date (2020) more than half would not be covered by the program (132.5 MW)
- Modules sold from 2020-2025 approximately 87% would be covered by the program

Recommended Next Steps:

- Economic review (estimate cost of recycling)
- Necessary infrastructure development (timing and cost)
- Stakeholder engagement
- Determine current end-of-life path and parties involved
- Enhanced data gathering

Thank You

Al Salvi

Technical Services Unit Supervisor

Solid Waste Management

(360) 280-6389

Asal461@ecy.wa.gov



DEPARTMENT OF
ECOLOGY
State of Washington