

PV End-of-Life Management

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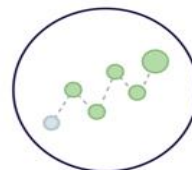
SEIA's PV Recycling Initiative

Member
working
group

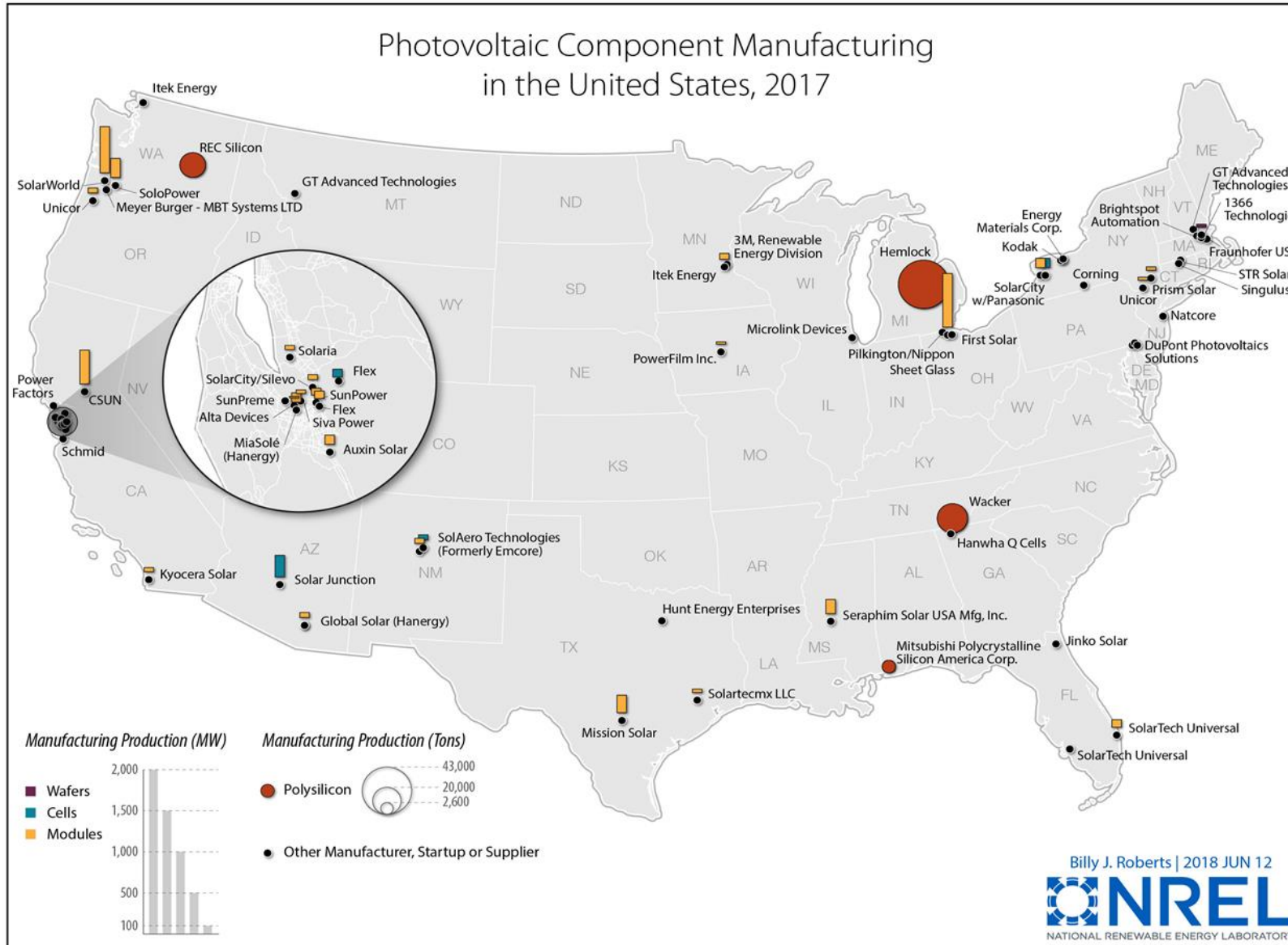
Working
proactively
to develop
end-of-life
solutions

Collaborate
early with
stakeholders

Build reuse
and
recycling
resources



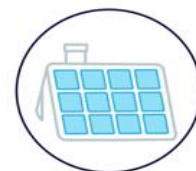
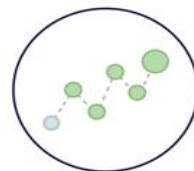
Where is the waste coming from?



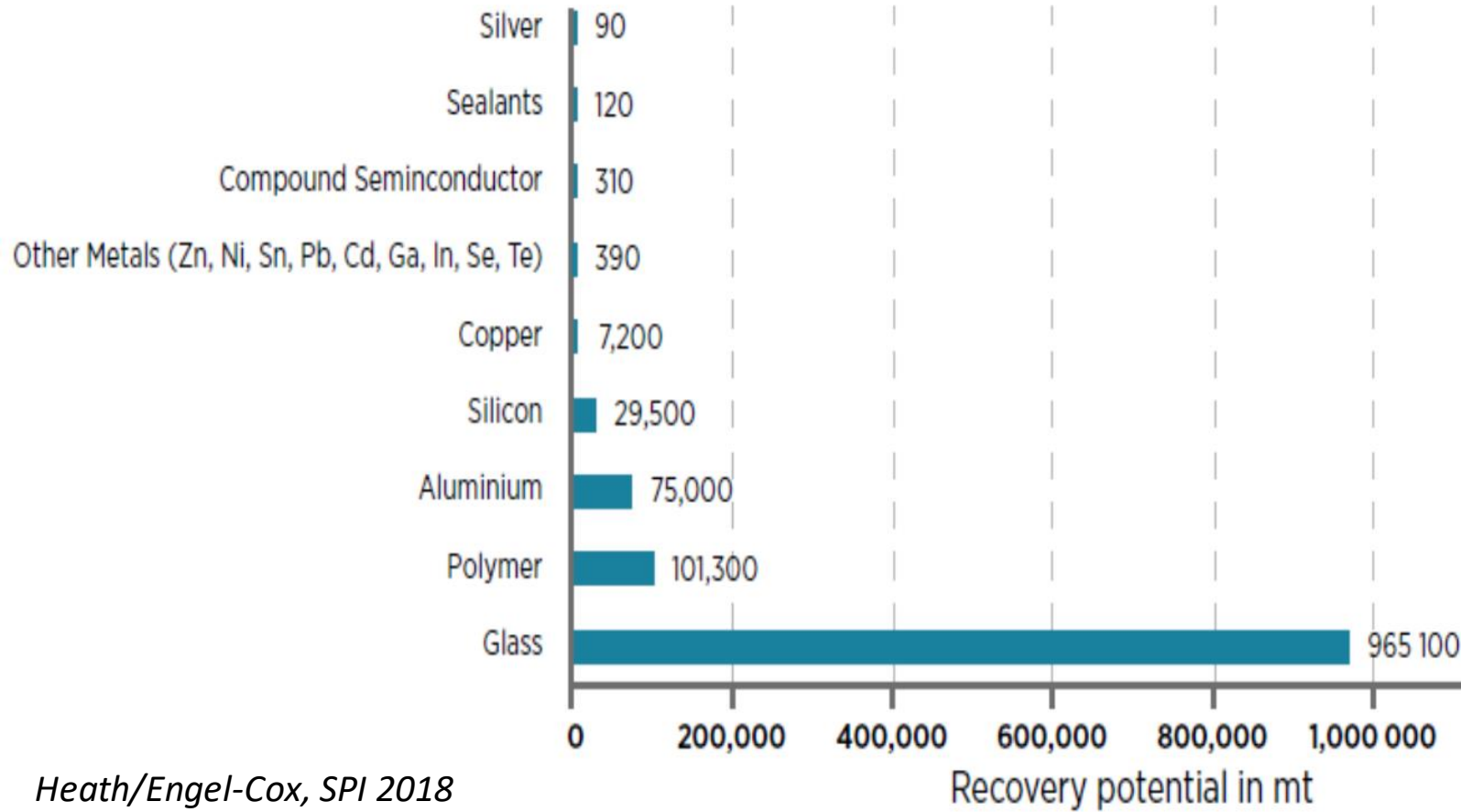
- Manufacturing scrap
- Warranty-related
- Broken during logistics or handling
- Extreme weather events
- Technology upgrades

Products recycled

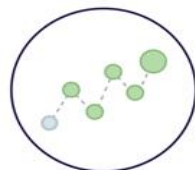
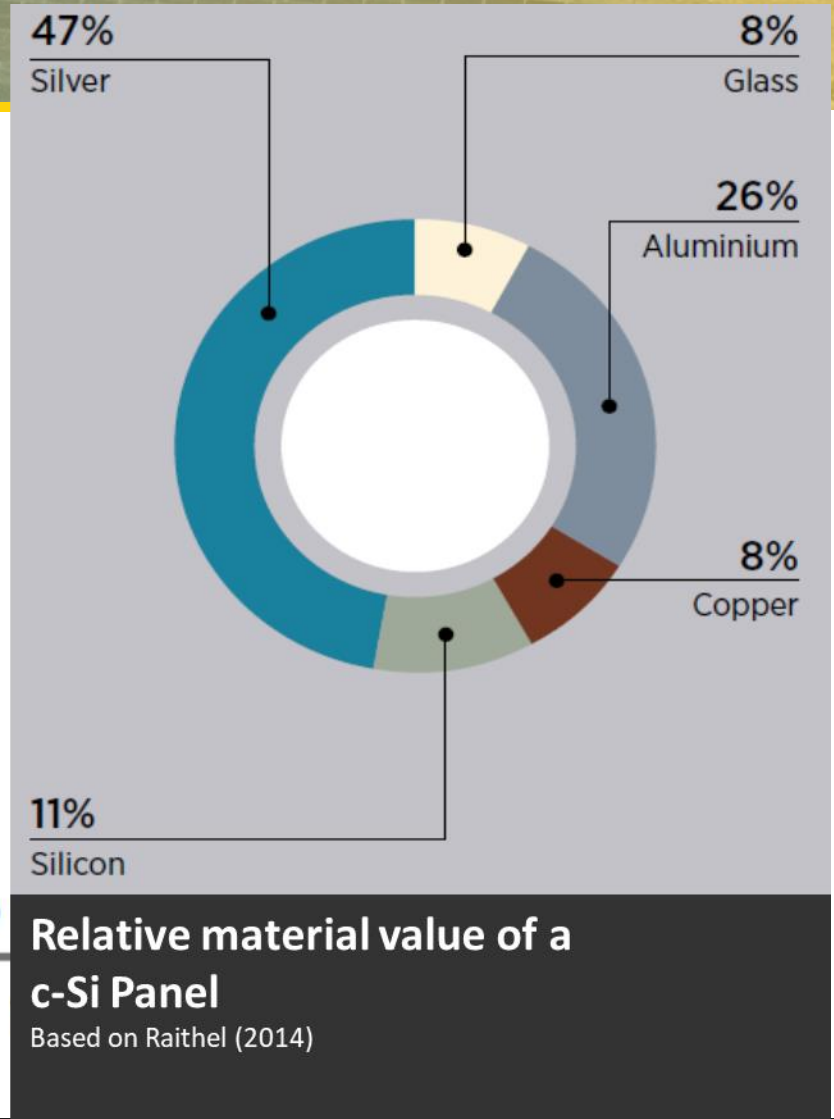
- PV Modules
 - Crystalline
 - Thin-film
- Inverters
- Mounting / racking systems



Why recycle PV modules?



Heath/Engel-Cox, SPI 2018



Cooperation throughout the value chain

R&D Organisations

- Public and private institutions
- Producers

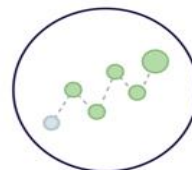
Repair/Re-use services industry

- Producers
- Independent services partners
- Producer-dependent contract and service partners (e.g. installation and construction companies)
- Waste collectors and companies
- Pre-treatment companies

Recycling treatment industry

- Public waste utilities and regulators
- Waste management companies
- Pre-treatment companies
- Producers

Source: [IEA/IRENA, 2016](#)



SEIA's PV Recycling Program



Member-based program

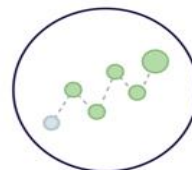
- Evaluate service capabilities
- Downstream capabilities
- **Anyone** can use these recyclers

Evaluate and develop recyclers

- Members help develop process
- Members help with technology
- Site visit, samples

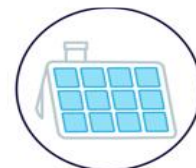
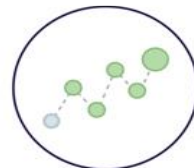
Collect data

- Weight and volume (est. annually)
- Recovered materials (modeled)



SEIA Recycling Partners

📍 Adding +2 partners in 2019



Challenges and Opportunities

Manufacture

Solutions for manufacturing scrap

Design innovation for ease of reuse, refurbishment or recycling

Work with suppliers
Improve purity of recovered minerals

Reuse

Create and prioritize reuse above other channels to ensure viable product is utilized

Expand beyond off-grid or charitable / second-market solutions

Potential conflicts with state waste regulations

Remanufacture or Refurbishment

Identify treatments that don't affect module certification

Minimize / eliminate expensive retesting

Training, staffing

Codes and standards

Recycle

Develop collection in key markets

Minimize costs to encourage recycling

R&D PV recycling equipment to maximize material recovery

Maximize communication to minimize environmental impacts



Thank you!

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