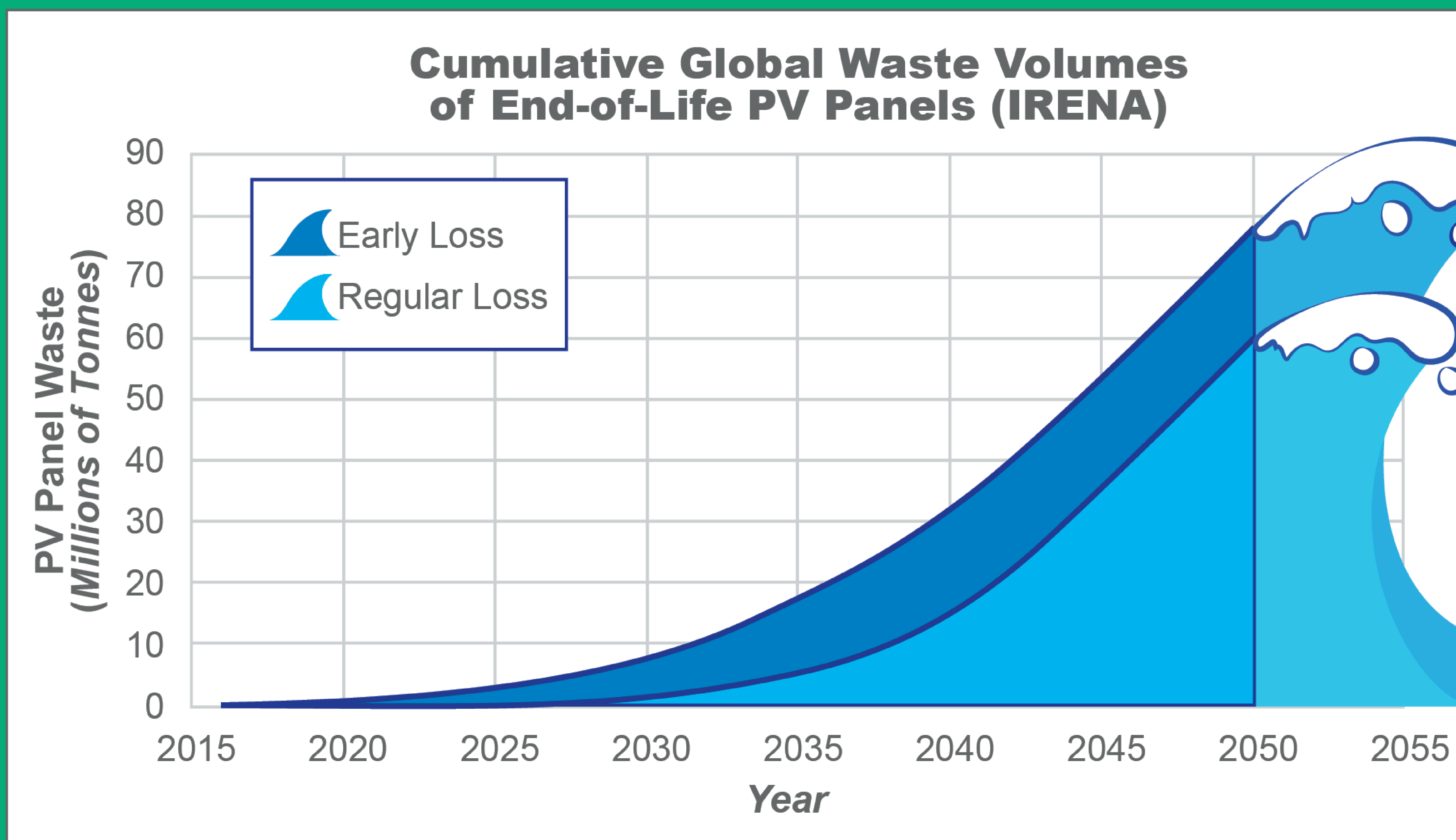


Solar Replacement Planning

The Importance of Sustainable Decommissioning Practices

Introduction and Objective

As solar assets reach retirement age, the solar industry risks finding itself in a debilitating, and avoidable, reputational crisis. Without a comprehensive, sustainable decommissioning solution, we will soon see megatons of solar equipment heading to landfills, abandoned solar plants, and/or frustrated solar owners maintaining decrepit equipment. This poster aims to shed light on this often-overlooked aspect of the solar lifecycle and illustrate how a multifaceted approach can benefit both business leaders and the planet.



PV Waste Problem

The Status Quo:

By 2040, the IREA expects landfills to absorb 30 megatons of solar waste, equivalent to trashing 1.7M 18-wheelers.¹

Landfill Burden

90% of solar waste is landfilled, posing environmental and health risks due to the leaching of toxics like lead and cadmium.²

Lost Carbon Offset Potential

Since 80-90% of retired panels are reusable, we're on track to landfill ~300 megatons of carbon offset capacity.³

Why are systems being replaced?



Re-Roofing:

Some solar systems were installed partway through their supporting roof's 20-year warranty. Before re-roofing operations begin, solar arrays must be removed. In the process, it may make financial sense to upgrade the existing solar technology to increase efficiency, safety, and project economics.



Weather:

Solar systems are damaged during severe weather events such as hurricanes, and require removal, replacement, and responsible disposal. Experts expect more extreme weather events as our planet warms, resulting in more damaged solar arrays.



Equipment Failure:

As our industry has evolved and technology advances, several inverter, racking, and module manufacturers have gone out of business. The result is a lack of replacement parts for legacy systems, which are not compatible with new technology.



Repowering:

As systems age and incentive periods expire, asset owners are exploring opportunities to reinvigorate their project economics, often through repowering. Maintaining system size, but replacing components helps the owner re-realize incentives, boost project economics, extend the project lifespan, and lower future maintenance costs.



End-Of-Life:

Our industry is still relatively young, so we rarely find systems that have reached their expected 30-year lifespan. In the coming decades, however, we must have mechanisms in place to remove and dispose of such systems sustainably to ensure that no material from our industry winds up in landfills.

Conclusions

The solar industry is at the beginning of a wave of equipment retirements. Working with decommissioning experts and planning early can turn this problem into a massive opportunity for asset owners, the industry, and the planet.

Best Practices

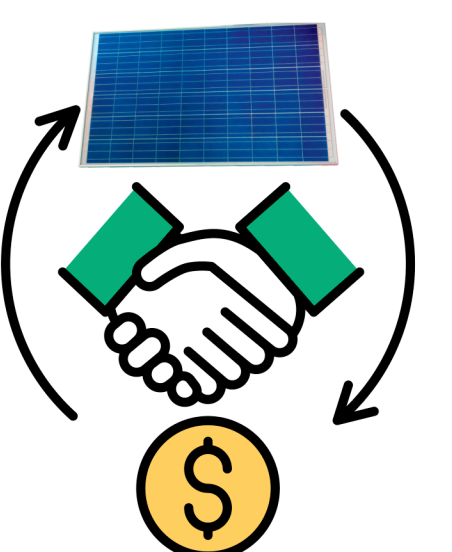
Decommissioning Planning:

Start planning for decommissioning early! Often, removal costs were excluded from a project's financial planning. This pushes asset owners to find cheap solutions, which can lead to landfilling of material. Through proper planning, asset owners can make informed decisions around optimal timing for removal to minimize these costs.



Repurposing:

Strategically choosing the optimal time to remove solar arrays can help to offset a large portion of the labor cost associated with decommissioning. There is currently a strong resale and refurbishment market, and understanding this market is a key determinant for decommissioning decisions.



Donating:

Donating functional solar modules provides societal and environmental benefits, and enhances corporate social responsibility. Working with vetted non-profit organizations is crucial to ensuring your donated equipment ends up providing free power to less-fortunate schools or hospitals (to name two of many potential beneficiaries) instead of in landfills.



Recycling:

When a solar system reaches the true end of its useful life, recycling is the most sustainable option. Working with SEIA approved recyclers will ensure that we are maximizing the amount of glass, copper, silver, and silicon re-entering the solar manufacturing value chain and create a true circular economy within the industry.



References

- 1) International Renewable Energy Agency, 2016
- 2) Zhang, et al. 2019, "Toward a sustainable future for solar photovoltaic power generation: An environmental and techno-economic perspective"
- 3) Decom Solar Internal Estimates

