



EPRI Washington Seminar: End-of-Life Management for Renewable Energy and Battery Storage

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EPRI Washington Office

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As the power industry increasingly transitions from traditional base-load generation to renewable energy and energy storage technologies, new classes of waste materials are being generated. Over 500 GW of solar photovoltaic (PV) capacity was deployed globally at the end of 2018, and that number is expected to grow to roughly 4,500 GW by 2050. Cumulative global wind energy capacity in 2017 was just over 500 GW and is projected to increase to as much as 2,000 GW by 2030. Global grid-connected battery energy storage (BES) systems are expected to increase from 220 GWh to 1,100 GWh over the next ten years. While waste volumes associated with these technologies are currently small, they are expected to grow dramatically as existing systems reach end of life (EoL) and are decommissioned. For example, the global cumulative volume of waste PV modules is estimated to rise from 1.7 million metric tons in 2030 to more than 60 million metric tons by 2050.

Proper management of renewable and BES waste products will grow in importance as project owners are faced with managing higher volumes of EoL material. The primary options for managing wastes associated with renewables and energy storage are disposal, recycling, and reuse. Recycling and reuse are preferred options from a long-term liability and sustainability perspective. However, availability of recycling and reuse is limited, primarily due to slow technology development, high cost, and lack of infrastructure for transportation, storage and separation. As a result, disposal is often the path of least resistance and lowest cost. The regulatory/policy landscape is an additional uncertainty; unlike Europe, there is no federal regulatory framework governing disposal of these technologies in the US.

In order to address this emerging issue, basic research is needed now to develop new and modified recycling and reuse technologies in advance of large-scale decommissioning. Developing sustainable and economic solutions will require research collaboratives with government entities, researchers, manufacturers, and recyclers.

This workshop, held under EPRI's Washington Seminar Series, will discuss the current and future outlook for EoL management for solar modules, wind turbine blades, and utility-scale lithium ion batteries. Speakers from the Department of Energy and EPRI will present expected waste volumes in coming decades, current management options, barriers to developing comprehensive management programs, ongoing research to address these barriers, and future research needs.

[Click here to view meeting agenda](#)

Presentations:

[Stephanie Shaw](#), Principal Technical Leader, EPRI

[Samm Gillard](#), Technology Manager, Vehicle Technologies Office, US Dept. of Energy

[Brittany Westlake](#), Technical Leader for Energy Storage, EPRI



[David Solan](#), Deputy Assistant Secretary for Renewable Energy, **US Dept. of Energy**

[Ron Schoff](#), Senior Program Manager, Renewable Energy, **EPRI**