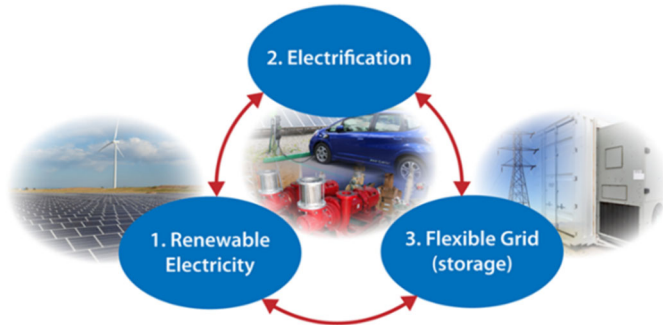


## **PV at Multi-Terawatt Scale: Today's Choices, Tomorrow's Role**

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Global installed photovoltaic (PV) capacity has reached the milestone of 1 TW, marking the first step in what must be a continuing rapid growth to significant multi-TW scale to achieve the world's greenhouse gas reduction goals. Studies applying increasingly sophisticated modeling from multiple sources predict that PV can and will provide a majority of electricity generation and even total energy contribution in a future sustainable energy economy. In this presentation, we will review recent growth rates and predictions for PV and identify timely and critical choices to be made, particularly in managing sector coupling and supply and demand, that will determine the global impact of PV by 2050.

The reinforcing triad of decreasing cost, increasing performance and increasing reliability that led to sustained rapid growth of PV over the past



decade is now driving a new reinforcing cycle of renewable generation, storage, and electrification. Similar potential exists for coupling renewable generation, carbon-free fuels, and transformation of the industrial sector.

A majority power and energy role for PV will create new opportunities and challenges for performance and reliability, global manufacturing and supply chains, and sustainability and circularity. Recent work on identification of critical materials for PV and a vision for PV in the circular economy will be presented. Finally, we will review associated R&D agendas and opportunities in these areas with priorities for global collaboration.