

Environmental Sciences and Renewable Energy 2021

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The Sustainability Challenges of Scaling up to Terawatts of Photovoltaics

The broad electrification scenario of the recent International Technology Roadmap for Photovoltaics predicts that by 2050 we will need to have more than 60 TWp of photovoltaics installed and produce a further 4.5 TW annually if emissions are to be reduced to net zero by 2050. Given that at the end of 2020, we had just over 700 GWp installed and installed just 300 GWp that year, this represents an enormous manufacturing scaling task. Low carbon technologies are more mineral intensive than fossil fuels, consequently this projected growth path of, in particular, silicon photovoltaics introduces a number of sustainability challenges at the solar cell, module and balance of systems levels. This talk will discuss some of these challenges, highlighting critical issues regarding mineral reserve sufficiency, the global warming potential of primary production and economics of recycling.

Biography

Alison Lennon is a Professor at the School of Photovoltaics and Renewable Energy Engineering at UNSW Sydney, Australia. She holds PhDs in Biophysics (University of Sydney, Australia) and in Photovoltaic Engineering (UNSW). Her research interests include silicon solar cell metallisation and interconnection and optical and thermomechanical modelling for photovoltaic modules. Since 2010, she has held research projects in this field of research with large scale photovoltaic manufacturers Suntech Power, Trina Solar and LONGi Solar. She also conducts research into high-rate energy storage, with a focus on lithium ion batteries, and is working with battery manufacturers to develop new battery management systems

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