

FACT SHEET

Safe and sustainable: debunking myths about solar panels



Solar photovoltaic (PV) technology plays a critical role in Australia's transition to renewable energy. While questions are often raised about solar panel materials, waste, and recyclability, research shows that PV modules have long lifespans, low toxicity, and contain valuable, recoverable materials. Compared with the vast waste streams from fossil fuels, solar panels generate only a fraction of the environmental impact.

How does solar panel waste compare with other sources?

Recent studies have compared projected solar photovoltaic (PV) module waste with other major waste streams, including municipal waste, coal ash, plastic waste, e-waste, and oily sludge from crude oil production. Even under worst-case assumptions, global PV waste is expected to remain a fraction of the waste produced by fossil fuels. In fact, the world generates as much coal ash in **one month** as is expected from **all PV module waste produced over the next 35 years**.

What is the lifespan of a solar panel?

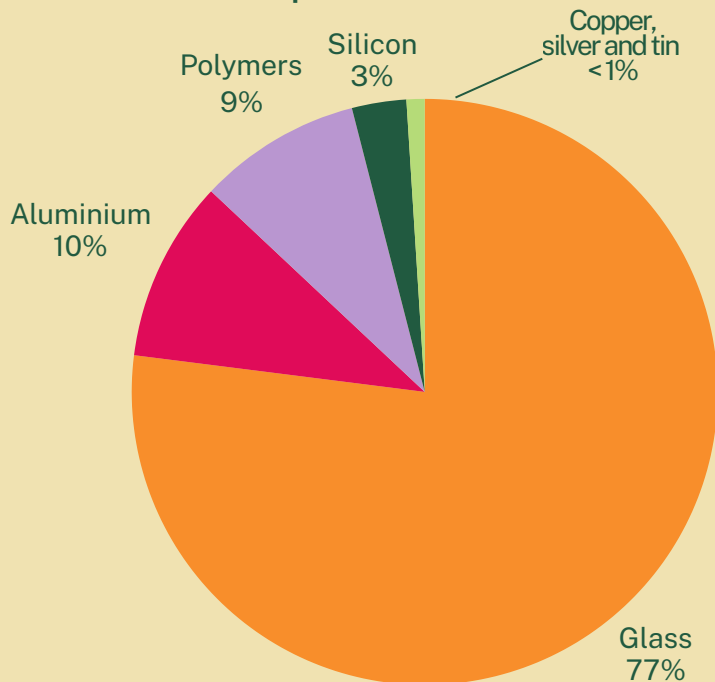
Large-scale photovoltaic panels are designed to last **25–30 years** and gradually lose efficiency over time. By the end of this period, most panels still generate around 85% of their original capacity, **continuing to produce clean electricity well beyond their nominal design life**. Advances in cell design and encapsulation materials are extending this lifespan even further, reducing replacement frequency and total waste volumes.



95%

of a solar panel is
recyclable

Solar panels are made of:



Are solar panels recyclable?

Yes — PV panels are mostly made from recyclable materials like aluminium, glass, silicon, and metals such as silver and copper. About 95% of a panel's materials can be recovered, though in Australia currently only around 17% (mainly frames and junction boxes) is recycled locally. Expanding domestic recycling would reduce exports and support a circular economy. As domestic recycling capacity grows, Australia has an opportunity to develop local PV waste management and resource recovery industries, reducing dependence on exports and supporting circular economy goals.

Are there any Australian facilities recycling solar PV modules?

There are now several solar PV recycling facilities that work to recycle end-of-life solar PV modules. This includes all associated materials such as cables, inverters, mounting structures and optimisers while using no chemicals.

Are there health or environmental concerns?

The International Energy Agency (IEA) confirms that commercially produced PV modules pose no significant human or environmental health risks. The only trace concern is the small amount of lead used in solder to connect cells. However, manufacturers are increasingly shifting toward lead-free solder and more sustainable manufacturing processes.

Compared with fossil fuels, solar PV systems produce negligible emissions and toxic waste during operation and at end of life.

Solar PV systems are long-lasting, largely recyclable, and low-toxicity, offering one of the most environmentally sustainable energy technologies available. While managing end-of-life panels is an emerging challenge, it also presents a significant opportunity for Australia to lead in renewable resource recovery, create green jobs, and close the loop in the clean energy supply chain.



Sources

- Fact sheet - Safe and sustainable: debunking myths about solar panels | Clean Energy Council | August 2025: <https://cleanenergycouncil.org.au/for-consumers/fact-sheets>
- Source (p1376): Unfounded concerns about photovoltaic module toxicity and waste are slowing decarbonization | Nature Physics



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