

Solar waste problem looms following rooftop panel boom, with batteries to add to the pile

By business reporter **Rhiana Whitson**

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Battery subsidy schemes are expected to drive the next wave of rooftop solar — and more resulting waste. (ABC News: John Gunn)

In short:

With no mandatory scheme, only about 10 per cent of solar panels are recycled, leading to many being shipped offshore or ending up in landfills.

The industry is calling for a national product stewardship scheme to reduce costs and manage decommissioned panels.

What's next?

The International Energy Agency predicts that without action, there will be a 30 per cent global shortfall in copper by 2035, and it recommends countries regulate recycling to help bridge the gap.

Australia's rooftop solar revolution has slashed power bills and emissions, but behind the good news story is a growing waste problem in need of an urgent solution.

The industry is sounding the alarm, warning Australia is about to be hit with a tsunami of solar waste as more households take up batteries thanks to the federal government's new subsidies.

Currently, about 4 million homes across the nation have installed solar, equating to more than 150 million panels nationwide when commercial and large-scale systems are included.



Government subsidies for batteries are expected to accelerate the existing rooftop solar boom. (ABC News: John Gunn)

But as households upgrade to newer systems, an estimated 4 million individual panels are decommissioned every year.

That figure is expected to double to 8 million panels a year due to increased solar uptake alone — even before accounting for the forecast wave of system upgrades driven by battery installation.

Currently, there is no mandatory recycling scheme for solar panels.

As a result, only about 10 per cent of panels are recycled. The rest are stockpiled, sent overseas or end up in landfill.

A system stuck in limbo

The solar industry has been waiting since 2016 for a national product stewardship scheme—a mandatory system that would fund recycling through an up-front levy on imported or manufactured panels.



The Smart Energy Council's Darren Johannesen warns government intervention is needed in the solar recycling industry. (ABC News: Peter Drought)

Instead, recyclers and investors are being left in limbo.

"There's been investor fatigue," says Darren Johannesen, executive general manager of sustainability at the Smart Energy Council.

While there are seven active solar panel recyclers in Australia, they face steep economic and logistical hurdles.

"Right now, it can cost up to \$38 per panel just to get it from a house to a landfill or recycler," Mr Johannesen says.

"Even then, the cost of extracting valuable metals like silver and copper outweighs the resale value of those materials."

Trading away Australia's solar divide



For all Australia's success in adopting rooftop solar, millions of people are missing out. Now a new trial is aiming to overcome that divide through trading.

"Recyclers can't make it work on their own."

Without government intervention, there is concern the sector could collapse under its own weight.

Local recyclers competing with exporters who pay for panels

In Western Sydney, recycler James Petesic has seen competitors come and go.

"Seven years since we've been in operation, I think we've seen at least two or three businesses come and go."

He has managed to hang on, largely thanks to federal government grants.

He says the real challenge is not competition from other recyclers, but from exporters and scrap dealers who offer to take old panels for free or pay cash.



James Petesic says the local industry is competing with exporters who do not guarantee panels are recycled. (ABC News: John Gunn)

"They are able to pay customers — being the installer themselves — to move that system from their warehouse, put it into a container and ship it overseas.

"Unfortunately, we're not able to compete with that. We can't pay customers for their panels."

Some of those panels may be reused, he says. But many will not be.

"At the end of its life, whenever that may be, if it's immediate or not, it'll be left in a field or in a landfill, and those resources will be lost forever."

New laws regulating the export of solar panels have stopped some of the leakage of panels out of Australia but it has not solved the broader problem.

Without certainty around the raw materials needed — that is, the solar panel to recycle — Mr Petesic says "it's really hard to give an investor confidence to invest in our business".



Recycling turns solar panels that have reached the end of their life into other products. (ABC News: John Gunn)

Infrastructure not prepared to cope with wave of batteries

About 20 per cent of solar installer Jake Warner's current jobs include replacing old panels.

"Sometimes it can be workmanship, maybe an older system can fail.

"It's also increased technology, we now have battery systems, we've got integrated inverters and more-efficient solar panels."



Jake Warner runs a solar company based in Penrith, on the western edge of Greater Sydney (ABC News: John Gunn)

On a job in St Clair, New South Wales, his crew is ripping out a decade-old solar array to make way for a more efficient set-up, complete with battery storage and smarter inverters.

Mr Warner says it is common to be approached by scrap metal dealers and other operators offering cash for removed panels — some of whom ship them offshore with little oversight.

"We've had people pull up mid-job asking to take the panels," he says.

"They end up overseas sometimes, maybe on a hobby farm or in a developing country, which isn't the worst outcome.

"But we've got no guarantee — and some of them just go to landfill."

Currently, Mr Warner's business takes retired panels back to base and passes them on to approved recyclers or second-life users.

But the costs — anywhere from \$250 to \$650 per household, depending on panel numbers — are worn by customers.

He says while some reputable solar wholesalers offer recycling drop-off points, the infrastructure is not ready to cope with what is coming.

As solar feed-in tariffs plunge, batteries surge



Battery take-up is surging as plunging solar feed-in tariffs improve the economics of installing electricity storage at home.

"We can actually recycle up to 85 per cent of the raw materials inside solar panels, but right now the challenge is that we don't really have these recycling facilities ready at scale like what we're going to need in the next 10 years or so," Mr Warner says.

Panels a source of crucial metals

It is not just an environmental problem — it is an economic one. Experts warn the world is running short on critical minerals.

"The opportunity in front of us is quite exciting in a solar module — there are metals that are in short supply — copper and silver," the Smart Energy Council's Mr Johannesen says.

"In fact, the silver that's contained inside solar modules equates to, in its totality, Australia's biggest silver mine."

[The International Energy Agency has forecast](#) a potential 30 per cent supply shortfall in copper globally, without action.

"The IEA is recommending that all countries adopt a regulatory policy framework that encourages recycling ... so that we can use urban mining to bridge that 30 per cent gap," Mr Johannesen notes.

Industry says national stewardship scheme overdue

Everyone in the sector agrees the solution is simple — and long overdue.

"A national product stewardship scheme will cut costs to consumers, improve efficiency in the industry and birth an important materials recovery industry, which is good for jobs and growth," Mr Johannesen argues.

"That system we expect will be 50 per cent, at least, cheaper for consumers than doing it in the hodgepodge way we're doing it right now."

There has been plenty of talk about implementing a mandatory national recycling scheme for solar panels from both sides of politics.

But after nearly a decade of inaction, the industry says time is running out.

"Nine years is a long time ... and with the growth in the module volumes, the time to act is now."

Mr Petesic says if we do not act now, we will be throwing away the very resources we need to power Australia's energy future.

"We need some kind of government push to encourage and facilitate the industry, to be able to participate in the recycling of their solar panels, rather than leave it up to their good conscience."