

EV batteries pose big risks — and new figures reveal how much hazardous waste they could create

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Materials from dead batteries can be processed for reuse. (ABC News: Emilia Terzon)

As Australia passes the milestone of 100,000 electric vehicles on our roads, an environmental downside to reducing carbon emissions is looming sooner than many would expect: huge numbers of batteries that could end up in landfill.

Research from the University of Technology Sydney (UTS) suggests 30,000 tonnes of EV batteries will reach their end-of-life in Australia by as soon as 2030. This is forecast to blow out to 360,000 tonnes by 2040, and 1.6 million tonnes by 2050.

Experts are warning of a "huge waste stream" that poses a triple threat: fire risks in landfill, environmental impacts, and health hazards caused if toxic chemicals leech into land and waterways.

"We need to take action now," said Libby Chaplin, CEO of the Battery Stewardship Council (BSC), the government-backed body set up to plan for battery waste in Australia.

The BSC has long been warning about the risks of lithium batteries combusting in landfill if they are damaged or crushed, despite bans on e-waste in landfill in some jurisdictions in Australia

"Right now, with the smaller [lithium] batteries in the general waste and recycling stream, they're seeing fires in waste tracks on a pretty regular basis," Ms Chaplin said.



EV batteries are processed at facilities like EcoBatt, a recycler in Melbourne. (ABC News: Emilia Terzon)

"Electric vehicles are just going to take that to another level.

"The impact on the community, in terms of financial resources, to put out fires is one thing, but the impact on the local community from a health perspective will also be significant."

Key points:

- Australia will need to deal with an estimated 30,000 tonnes of old EV batteries by 2030
- Experts warn the large volume of e-waste could pose health, environmental and fire threats
- The national body set up to deal with battery waste says the industry needs to take urgent action

For years, the World Health Organization has been warning about the health risks of e-waste, including batteries, in areas where it is dumped. Toxic chemicals, if released into the environment in large volumes, are thought to pose health risks that could lead to respiratory issues, infertility, congenital disorders and cancer.

Early dumping of batteries means forecasts could be optimistic

EVs still make up less than 4 per cent of new vehicle sales in Australia, according to the national industry body, the EV Council.

But it estimates there are now 100,000 EVs on Australian roads, and that uptake will take off if a fuel efficiency standard is implemented as expected.

Most EV batteries weigh around half a tonne. As well as plastic, aluminium, wires and casings, the battery cells inside them include many precious and finite metals, such as lithium and copper.

Manufacturers generally guarantee EV batteries for at least a decade, but researchers at UTS believe they could end up lasting for an average of 16 years each.

Using that assumption, the university modelled the looming waste stream.

"I was particularly surprised about the numbers," UTS senior research consultant Rusty Langdon said.

Ms Chaplin said it represented a "massive increase".

"We need to take action now to ensure that we have the capacity and the infrastructure built up, to be able to manage that waste responsibly, when the time comes," she said.



Libby Chaplin warns a "massive number of batteries" will need to be dealt with. (ABC News: Luke Bowden)

Griffith University Professor Rodney Stewart, who researches how the renewable energy industry can deal with its own waste, backed the UTS modelling as "reasonable" but was worried it could be too conservative.

That's because he believes many EV batteries might not live up to performance expectations for drivers and will be dumped earlier than 16 years into their lives.

"Lithium ion battery effectiveness gets reduced over time," he said.

"It's definitely an issue that really hasn't been tested."

He's already voiced concerns about solar panels going into landfill, and believes the lithium batteries that come inside electric cars, household solar storage and e-bikes now pose a similar threat.

"We're going to have a huge waste stream," he said.

Recycling dead batteries to give materials a new life

The ABC approached some of the biggest car manufacturers selling EVs in Australia about their long-term policies on dealing with batteries when they reach end of life.

Few had concrete plans to share, but many said they engage waste processors and recyclers in Australia to deal with their EV batteries when cars are recalled or damaged.

EcoBatt in Melbourne's outer north is one of these recyclers.

"These are very big, very powerful batteries," EcoBatt's Hamish Lee said.

To transport EV batteries into the factory, EcoBatt has designed what Mr Lee dubs "an explosion box". These transportation devices include cases lined in fire-retardant vermiculite and fire blankets.

"If there is any explosion or fire, it's going to maintain or control that," he said.



Hamish Lee wants to see batteries reused. (ABC News: Emilia Terzon)

After extracting a 1.5m EV battery from its outer hard case, workers at EcoBatt typically strip its metal casings, nuts and bolts, and plastic casings and wiring, to reveal the battery cells.

Some of these materials can be sold off quickly by EcoBatt, including some of the metals. But other components, including cobalt and lithium, need to be sent offshore for processing.

Carmakers like Volkswagen are talking about a so-called circular economy, in which the materials pulled from old car batteries could be turned into new ones. But this industry is still in its infancy.

"We want to reuse [these batteries] for future generations," Mr Lee said.

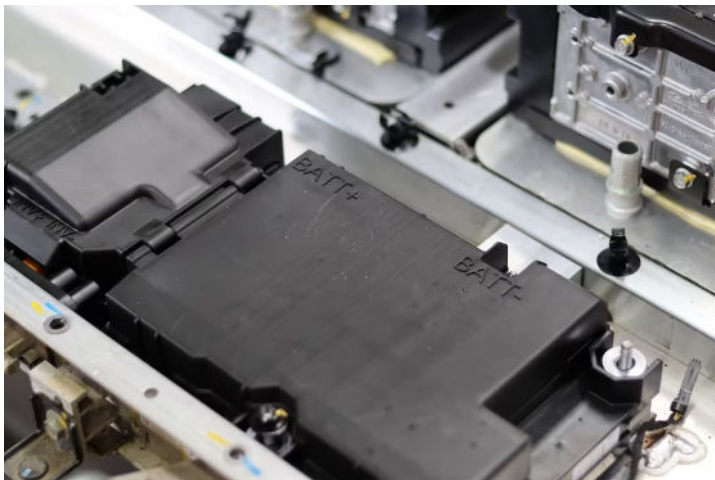
The \$30b benefits of a circular economy

The establishment of a circular economy is also a top concern of the Battery Stewardship Council.

Already, there have been concerns raised about the new wave of mining required for the renewable energy transition. The BSC's Ms Chaplin is urging the car manufacturing industry not to squander finite resources.

"It's very important that we recover those precious resources," she said.

"If we're going to have a renewable future, we need to figure out how to deal with these batteries."



Battery components like cobalt and lithium need to be sent offshore for processing. (ABC News: Emilia Terzon)

A report commissioned by the CSIRO in 2020 also warned about the looming waste stream from lithium ion batteries, including those in EVs. Its projections, which it confirmed still stand today, had it at 180,000 tonnes by 2036.

Its researchers concluded there was an upside: money.

It found that if Australia could figure out how to recycle and then re-use all of the projected battery waste through a circular economy, it could lead to an economic windfall of up to \$30 billion by 2036.

The BSC believes the next step is engaging carmakers.

It has already implemented a so-called product stewardship scheme for small batteries in Australia, funded by levies on imported batteries.

Ms Chaplin isn't sure what a scheme could look like for EV manufacturers. Like small batteries, the industry selling into Australia is complex and involves global brands and supply chains.

"There's issues of scale and the logistics will be quite different," she said

"Obviously, if the industry doesn't step up, I've no doubt that government would regulate in this space — just because of the massive number of batteries that are going to be coming to end of life in the not too distant future."

In a statement, the Department of Climate Change, Energy, the Environment and Water said the government was working with industry to reduce waste from all products, including EVs and their batteries.

It said a fuel efficiency standard would encourage more fuel-efficient internal combustion engine vehicles and uptake of low and zero emissions vehicles, and the National Battery Strategy was considering actions for an "end-to-end battery industry, including battery recycling".

That strategy, being developed by the Department of Industry, Science and Resources, is due for release later this year.