



Industry survey: Battery fires in waste & recycling

June 2024



ACOR

The Australian Council of Recycling (ACOR) is Australia's peak body for resource recovery, recycling & remanufacturing, focused on policy, advocacy, thought leadership and championing the role of recycling in leading the transition to a circular economy.

WCRA

The Waste Contractors and Recyclers Association (est. 1948), represents waste and recycling industry employers across NSW & ACT. WCRA advocates on behalf of its members to government and stakeholders, promoting best practice across the industry.

Pragmatic Research & Advisory

Pragmatic Research is an independent market and social research agency that conducts quantitative and qualitative projects across a range of sectors. Principal Pete Wilson has over 25 years experience and is a full member of The Research Society.



Survey process

Objective

- Obtain representative and defensible data to demonstrate the scale of the problem caused by fires from batteries in waste and recycling facilities, to inform policy reform.

Methodology

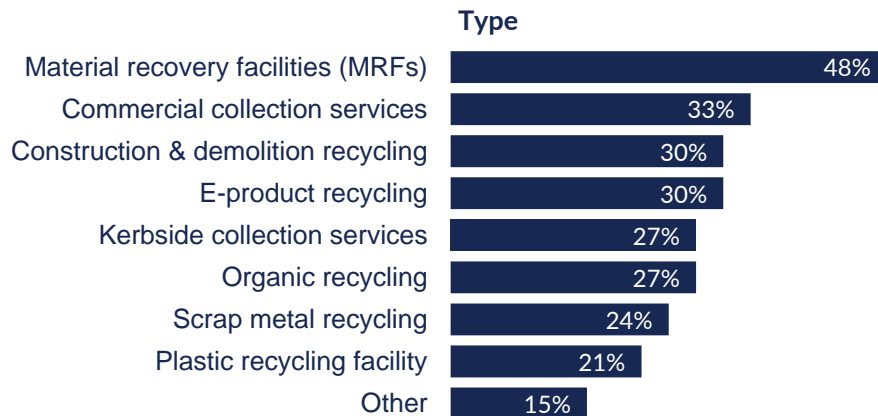
- Survey addressing the number, type and impact of fires and heat events that have resulted from batteries in the last 12 months.
- Distributed to a broad range of waste and recycling organisations across Australia, via a secure online platform.
- Fieldwork took place from April 2 to 26, 2024.

Sample notes

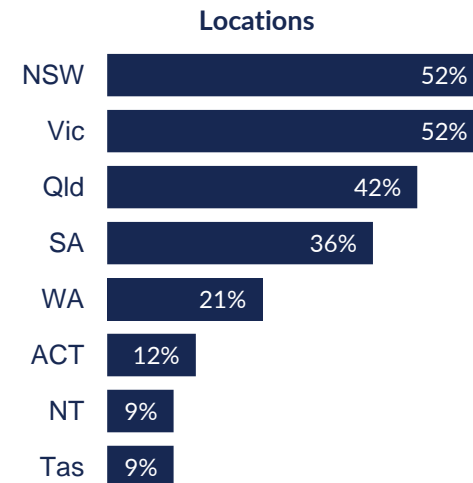
- Collectively, survey respondents:
 - Operate around 576 waste and resource recovery collection and processing facilities, representing around 26% of these types of facilities.
 - Process around 20.4 million tonnes of material every year, comprising around 27% of the national total.
- Some data inconsistency in the format and completeness of responses, with particular variability among different organisational sizes.



Sample profile (ownership)



- Other
 - Glass crushing
 - Local government with in-house waste & collection facilities
 - Transfer stations
 - Baling facilities
 - Landfills
 - Tyre recycling
 - Alternative fuels

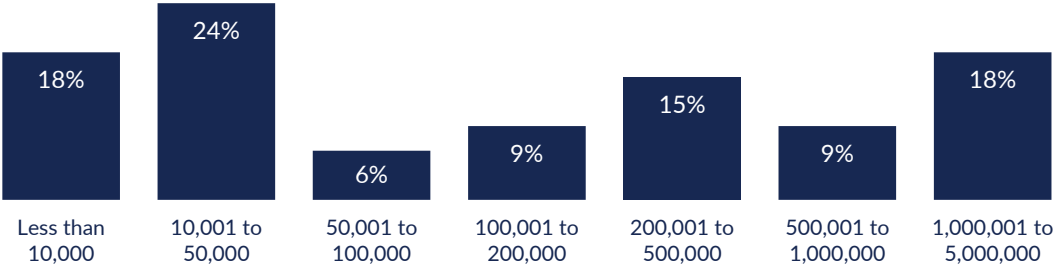


Geographic spread is generally reflective of population numbers and the locations of recycling and waste services as a whole.



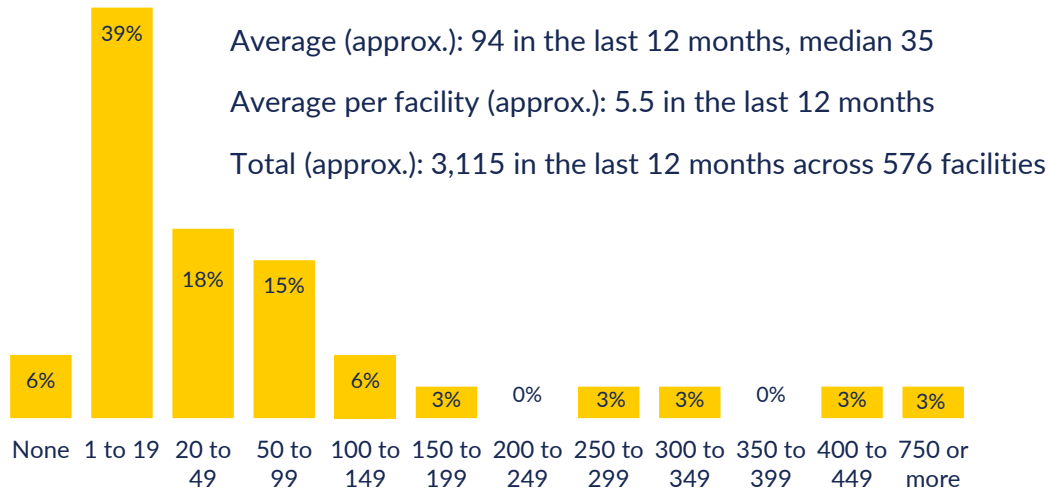
Tonnes processed annually across survey respondents

Collectively, respondents processed 20.4 million tonnes annually, with an average of 619,000 and a median of 140,000, across 576 facilities.



Battery-related fire and heat events

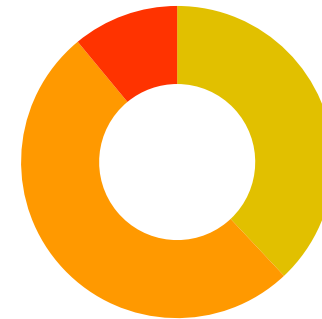
Annual battery fires and heat events resulting from batteries in loose and embedded form



Types of fires

Fires handled by fire & rescue services, 11%

Heat events (e.g. battery kick offs, thermal runaways, discovered through thermal imaging cameras), 38%



Fires handled by internal resources (i.e. flames, smouldering, smoke, or explosion), 51%

- Approximately 3,115 battery-related fires in the last 12 months, average 5.5 per facility.
- Half the fires handled using internal resources (51%), 38% were heat events and 11% handled by fire and rescue services.



Calculations

Based on the analysis and assumptions, it is estimated that there are between 10,000 and 12,000 battery-related fires a year across waste and recycling streams in Australia.

Industry size

- Survey respondents collectively operate around 576 waste and resource recovery collection and processing facilities. The Australian Waste and Resource Recovery Infrastructure database lists 2,228 of these types of facilities. Our sample therefore represents around 26% of total number of these facilities.
- Survey respondents collectively process around 20.4 million tonnes of material every year. The 2022 National Waste Report identifies that Australia generates an estimated 75.8 million tonnes per year. Our sample therefore comprises around 27% of this national total.

Calculations

- The consistency of the percentages for number of facilities (26%) and tonnes processed (27%) indicates that our sample (and the total number of 3,115 fires) represents around one quarter of all the annual battery-related fires in the sector. In other words, an estimate of around 12,000 fires per year.
- This figure can be cross-checked with data from state and territory fires services who report 'more than 1,000 battery fires across jurisdictions'. In our sample, 11% report using fire and rescue services to deal with fires. If this 11% represents the 1,000 or more, then we could extrapolate a figure of around 10,000 fires or more per year based on these figures (broadly consistent with the 12,000 figure above).



It is estimated there are between 10,000 and 12,000 battery-related fires a year across waste and recycling streams in Australia.



Cost impacts of battery-related fire and heat events

Estimated cost increases for the following across business assets/facilities combined as a result of the fires, over the last 12 months.

Cost increases	Average
Damage, rebuilding, and replacement costs, including vehicles	\$173,988
Insurance increases	\$114,200
Clean-up costs	\$94,500
Legal costs	\$18,800
Feedstock losses	\$15,260
Workplace compensation	\$800
Fines and penalties	\$0
Total	\$417,548

- On average these fires had increased costs by over \$400,000 across business.
- Average damage, rebuilding and replacement costs (including vehicles) were the highest (around \$174,000), followed by insurance (\$114,000) and clean-up costs (\$95,000).
- Responses relate to costs accrued over the last 12 months. Costs before or after this window are not captured. This includes the cost of rebuilding a new MRF (estimated at \$60m), or fire management systems installed outside this timeframe.



Other cost increases

- **Upfront costs:**
 - Fire detection/prevention/suppression systems, including thermal cameras and water cannons (between approx. \$75k to \$800k per facility)
 - Battery-safe bins
 - Lithium-ion fire extinguishers
- **Ongoing costs:**
 - Staff training, safety protocols, and admin for fire events (estimated over \$20k/year)
 - Fire system monitoring (between \$5k and \$13k/month per facility)
 - Fire watcher security (approx. \$15k/month per facility)
 - Disposal of damaged batteries (around \$20/kg)
 - Truck fires (cleanup cost average \$24k; vehicle replacement cost approx. \$250k)
 - Increased landlord insurance premiums
- **Further impacts:**
 - Business interruption, reputational damage and loss of social license
 - Downtime from fire response & cleanup
 - Lost revenue by refusing high-risk jobs
 - Worker injury and illness (7% of respondents identified that these types of fires had resulted in worker injury or illness)



Insurance premiums have skyrocketed due to battery fires, making it increasingly impossible for our essential industry to secure the necessary coverage.

This crisis threatens our operations and underscores the urgent need for supply-chain-wide measures and industry support.



Many loose & embedded batteries are not covered by stewardship schemes



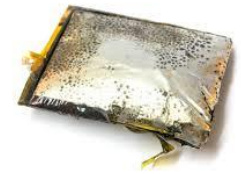
Flashing wristbands



Electric toothbrush



Toys



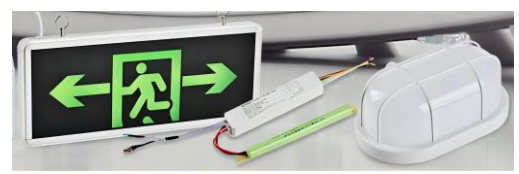
Damaged batteries



Hoverboard



Shoes and skates



Emergency lights



Scrunchies



Digital pregnancy test



Polymer Li-ion batteries



Vapes



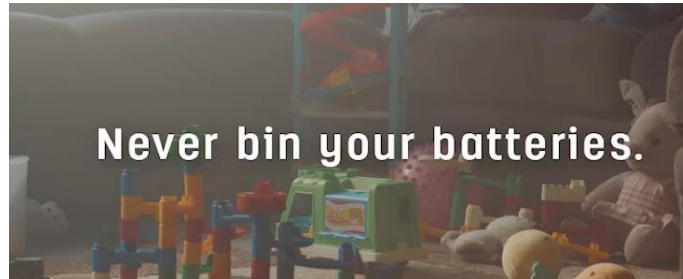
Community education

USED BATTERIES!

Collect used batteries in here and take them to your nearest office supply shop, supermarket, library or council drop-off point. Find your nearest at wasteorled.wa.gov.au/batteries

OLD ELECTRONIC DEVICES WITH BATTERIES

Collect old phones and rechargeable devices in here and take them to your nearest mobile phone shop, office supply shop or drop-off point. Find your nearest at wasteorled.wa.gov.au/batteries



B-cycle
Battery Recycling

Battery Recycling Council

Never bin your batteries

Binning your batteries is harmful to the planet and a fire risk. Recycle with B-cycle.

Tape it. Bag it. Drop it.

Tape battery terminals **OR** Place in a small zip lock bag **Drop into a battery recycle box or provided carton**

Find a battery drop off location near you!

BATTERIES MUST NOT BE PLACED IN ANY OF YOUR KERBSIDE BINS

Never bin your batteries

BATTERYCENTRAL
You Won't Buy Better

Did you know?
Batteries cannot be disposed of in the bin?

We offer **FREE** battery disposal

DON'T BIN BATTERIES

It only takes one battery to spark a fire

First drop off at over 60 Canberra locations

Learn more

ACT



There is no point telling the community not to 'bin' their batteries if there are no available alternative disposal options.



There are no comprehensively accessible 'safe disposal' options for many items with loose and embedded batteries.

Recycling information

Please do not dispose
in your kerbside bins



Vape

Don't put these in any kerbside bin

Alternative Disposal Locations

Unavailable for this item



Lives are at risk.

Action must be taken before a worker is killed in a battery fire.

Many workers have already been injured.



When lithium-ion batteries catch fire, many hazardous gases are released, including highly toxic hydrogen fluoride.

Hydrogen fluoride gas poisoning destroys skin and bone tissue, and can cause permanent injury and death.



Urgent action required by States

1. Conduct a detailed **gap analysis** of disposal options for all loose and embedded batteries in every jurisdiction.
2. Urgently roll out a network of '**safe disposal**' **collection points**, filling in identified gaps, to ensure there is always an easily accessible option for the community. This should be supported by the Australian Government, working together with relevant stakeholders.
3. Launch a national, comprehensive awareness-raising and **education campaign**, supported by the Australian Government, to ensure that batteries are not disposed of in conventional waste and recycling streams.
4. Support industry and **underwrite insurance** for the waste and recycling sectors to mitigate immediate risks, and prioritise regulatory reform to address the dangers posed by batteries.



Urgent action required from the Australian Government

1. Expedite the delivery of **extended producer responsibility (EPR) regulation** for all consumer electronic products to fully fund safe collection and, where possible, recycling. Regulation must deliver an integrated scheme covering all consumer e-products, including batteries and items containing batteries (i.e., vapes), and leaving no gaps in relevant product categories.
2. Establish a **deposit scheme** to incentivise safe disposal of batteries and products containing batteries, providing a tangible reward for safe disposal behaviour.



With over 10,000 fires per year across Australia's waste and recycling systems, our sectors cannot afford to wait.

