# FIRE + RESCUE

# LITHIUM-ION BATTERY INCIDENTS

2022 - 2023
Version 1.4 – 21 March 2024

Prepared by the SARET Research Team
research@fire.nsw.gov.au

# OVERVIEW

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# 1. INTRODUCTION

## BACKGROUND

Lithium-ion battery (LiB) fires are a growing issue for fire services around the world. The rise in the number of products and applications utilising the battery technology has been met with a steady increase in battery failures resulting in thermal runaway events and fires that are challenging for fire and emergency services, and sometimes tragic for fire victims.

About one in every 100 fires attended by Fire and Rescue New South Wales (FRNSW) involves a lithium-ion battery or battery device.

To better understand the issues, it is necessary to examine the incident and investigation data and capture any trends or insights available. This data will help to inform and prioritise research, prevention and education activities, fire safety advice and guidance, capability investment, operational practices, and firefighter training.

Data from FRNSW's incident reporting system has been presented in this publication in the interest of public safety and may be reproduced with permission (please contact research@fire.nsw.gov.au).

### FRNSW in context

FRNSW is one of the world's largest urban fire and rescue services and is the busiest in Australia, responding to over 130,000 incidents per year including around 20,000 fire or explosion incidents.

FRNSW has a network of 336 fire stations, over 6,800 firefighters, approximately 4666 Community Fire Unit Members, 515 Administrative and Trades Staff, and a fleet of over 700 firefighting and support vehicles covering 179 fire districts, spanning an area of approximately 7,200 sq. km (720,000 ha) across NSW.

The state of NSW has a current population of approximately 8.4 million, with a population density of approximately 10.5 persons per sq. km. Sydney, the capital city of NSW and Australia's most populous city, has a current population of approximately 6.8 million and a population density of about 550 per sq. km.

# 1. INTRODUCTION

## DATA SOURCES

The data presented herein is a collation of a number of Fire and Rescue NSW data sources and may differ from previously reported data, which was derived from a single source (the eAIRS database only). It may also be subject to future updates, revisions and amendments. The analysis was conducted in February 2024 and is limited to completed incident reports from 1st January 2022 to 31st December 2023, inclusive. The following data sources were accessed:

**FRNSW eAIRS database**

FRNSW utilises an electronic incident reporting system referred to as *eAIRS*. The eAIRS database is a modified version of the Australian Incident Reporting System (AIRS or AIRSNAT) coding scheme as defined in the AIRS Manual, developed by the Australasian Fire and Emergency Services Authorities Council (AFAC). While the current eAIRS has some commonalities with the AIRSNAT coding, it is a standalone version unique to FRNSW.

In August 2020, AFAC recommended a number of changes to AIRS to capture battery fires. This included a number of new categories under "Form of Heat of Ignition" and some modifications to a number of categories under "Equipment Involved in Ignition". As these fields were not available in eAIRS, and the suggested categories were inconsistent with eAIRS conventions, FRNSW conducted a review of existing categories and developed a set of 40 new codes to aid reporting of battery-related incidents. The changes were included in the "Material Ignited First", "Ignition Source" and "Cause Determination" fields, and were implemented in September 2021 following a period of user acceptance testing.

**NSW Fair Trading Notifications**

FRNSW reports incidents involving faulty electrical or gas-powered products to the NSW Department of Fair Trading (NSWFT). Information regarding the circumstances of the incident, photographs, information regarding the product(s) involved, and contact details of the owner are supplied to NSWFT via a separate form that is completed by reporting officers.

**Fire Investigation and Research Data**

Specialist Fire Investigators from the FRNSW Fire Investigation and Research Unit (FIRU), and/or SARET Research Officers attend select incidents where there has been significant injury or loss of life from fire, where the fire is considered major, unusual, suspicious or deliberate, or on request. Data has been updated where a specialist has been in attendance and/or has recorded further information.

# 1. INTRODUCTION

## ASSUMPTIONS AND LIMITATIONS

**Quality and accuracy of data**

In analysing fire incident data captured in the eAIRS system, it is assumed that reporting officers have entered information accurately and have made reasonable and educated determinations as to the origin and cause of the fire based on their training, experience, and the information available to them at the scene. As lithium-ion batteries are a relatively new fire risk and the levels of awareness and experience vary across the workforce, the quality of data also varies widely. Efforts have been made by the eAIRS Support team to verify the coding of data against free text descriptions provided and directly with reporting officers. Additional data from specialist investigators and researchers have been used where available.

**Completeness of data**

Data was extracted from eAIRS based on the assumption that at least one of the battery-related categories under "Material Ignited First", "Ignition Source" or "Cause Determination" was used. There may be incidents where the reporting officer selected surrounding materials ignited first (e.g. bedding materials or soft furnishings), and could not determine the ignition source or cause with confidence, however a LiB or LiB-powered device was within the area of origin. Such incidents were not included in the analysis. Additionally, fire incidents where the LiB or LiB-powered device was not involved in the ignition, but became involved and contributed to the severity of the event are not captured in this analysis. Included in the analysis were a number of incidents in which a LiB-powered device was reported to have been involved in an incident (through a NSW Fair Trading Notification) in which FRNSW was called to manage the aftermath rather than the fire ("Other assistance" calls). Also included are waste management related fires where a LiB or LiB-powered device was identified or reported by witnesses to be the source.

**Casualty information**

eAIRS captures the consequences of fires as reported by the reporting officer at the completion of each incident. Fatalities may occur some time after an incident report has been completed and eAIRS is manually updated when a fatality is identified during the fire investigation process. Fatalities that occur after long periods of time may not be captured. Further, data on injured persons is captured when an injury is apparent at the time of the incident. It is therefore more likely to include severe injuries and/or those requiring ambulance attendance and/or transportation. Minor injuries and injuries which are not immediately apparent, or which manifest later, may not be included in the statistics. This analysis is limited to casualty data reported in eAIRS only. Detail of injuries or severity is not captured by FRNSW.

# 2. LIB INCIDENT DATA

## INCIDENTS ATTENDED AND CASUALTIES

|  | 2022 | 2023 | Total |
|---|---|---|---|
| LiB incidents | 171 | 285 | 456 |
| Injured persons | 14 | 38 | 52 |
| Fatalities | 0 | 0 | 0 |
| Evacuations | 829 | 1320 | 2149 |
| Rescues | 3 | 3 | 6 |

## AVERAGE RESPONSE TIMES AND DURATION

| Average Time (minutes) | 2022 | 2023 | Overall |
|---|---|---|---|
| Response | 9.3 | 9.0 | 9.1 |
| Duration | 72.9 | 122.3 | 103.8 |

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# 2. LIB INCIDENT DATA

## TIME OF CALL
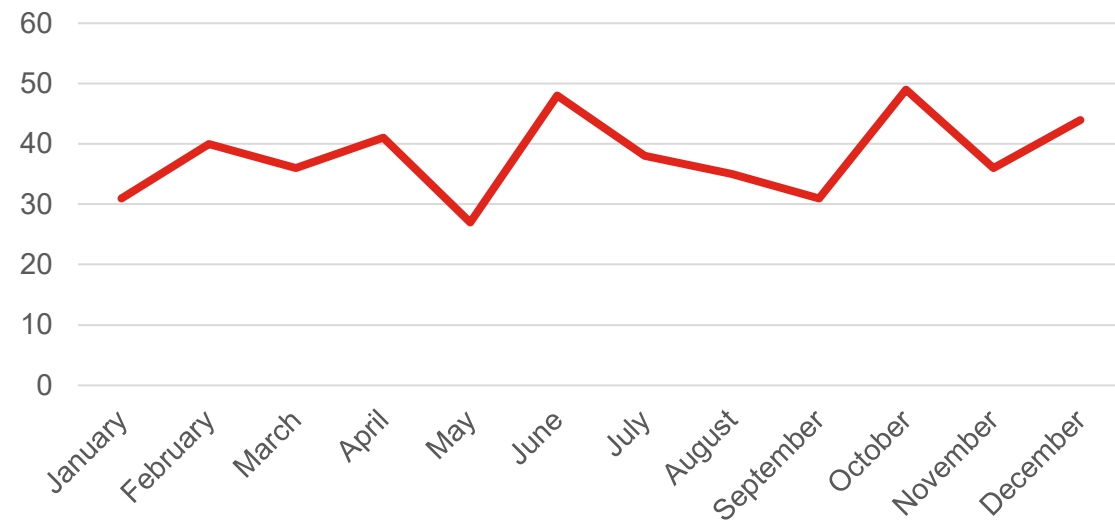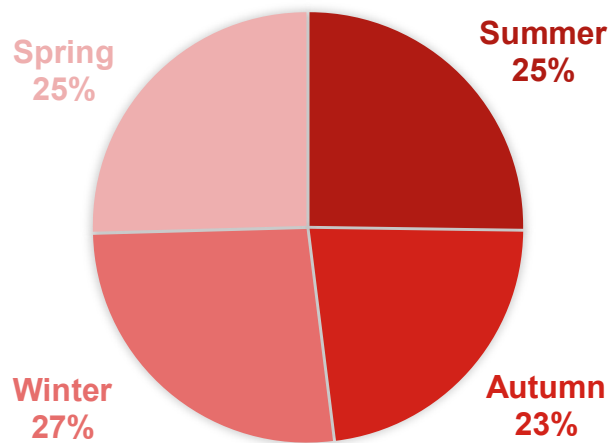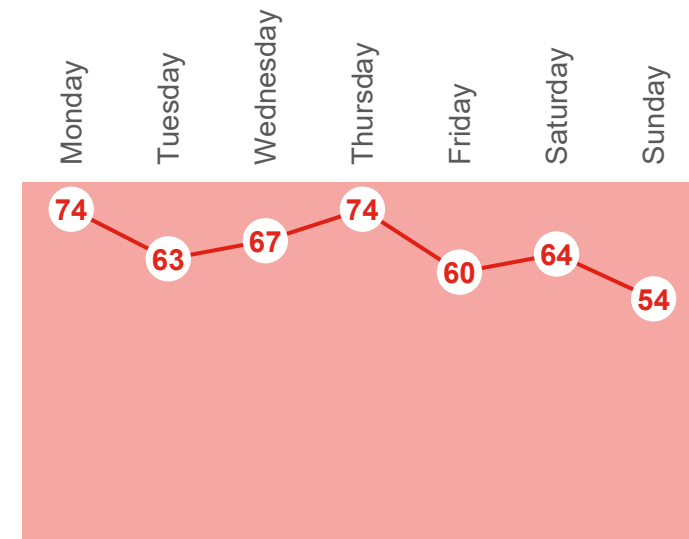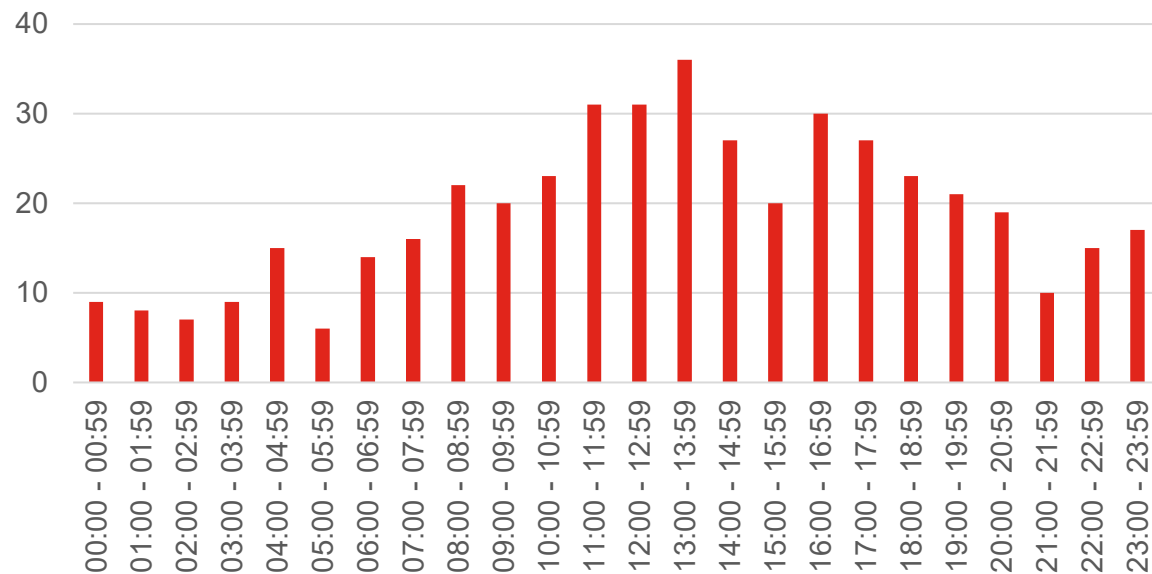
## INCIDENTS BY LOCAL GOVERNMENT AREA
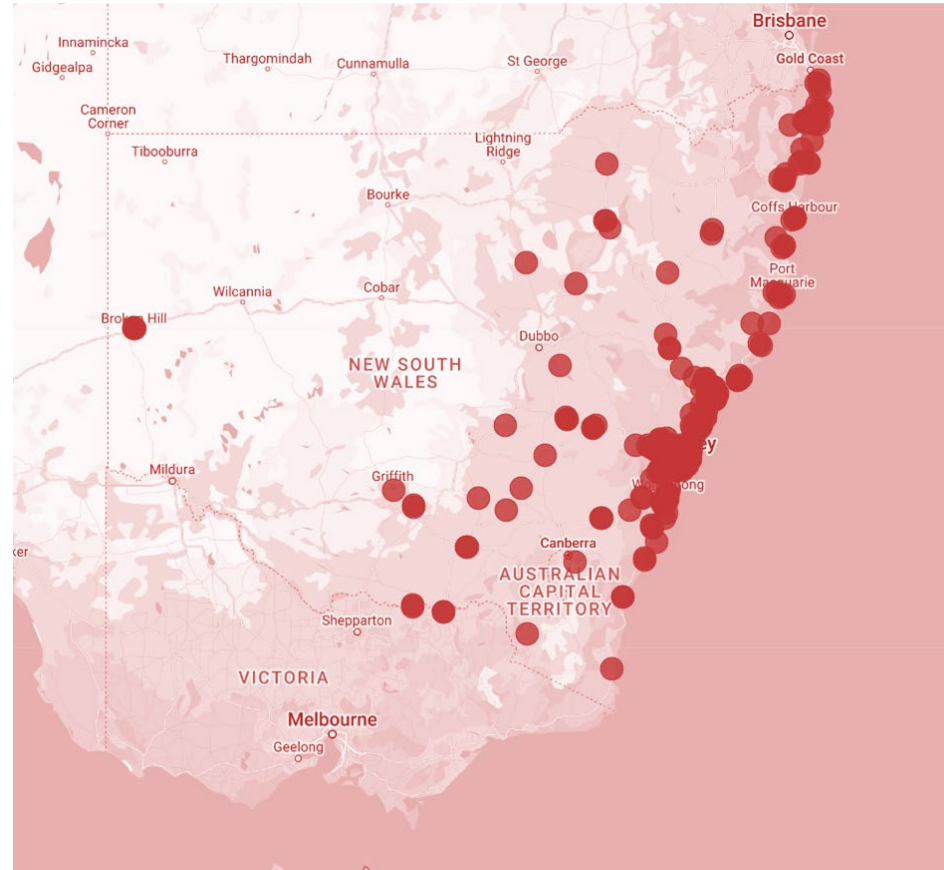


| TOP LGAs | 2022 | 2023 | Total |
|---|---|---|---|
| Sydney | 16 | 25 | 41 |
| Cumberland | 7 | 16 | 23 |
| Bayside | 6 | 15 | 21 |
| Central Coast | 9 | 11 | 20 |
| Blacktown | 10 | 9 | 19 |
| Sutherland Shire | 7 | 11 | 18 |
| Canterbury-Bankstown | 3 | 15 | 18 |
| Northern Beaches | 6 | 9 | 15 |
| Fairfield | 8 | 7 | 15 |
| Lake Macquarie | 6 | 8 | 14 |
| Inner West | 3 | 11 | 14 |
| Parramatta | 7 | 6 | 13 |
| Newcastle | 5 | 7 | 12 |
| Liverpool | 1 | 11 | 12 |
| Campbelltown | 3 | 8 | 11 |
| Wollongong | 3 | 7 | 10 |

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## INCIDENTS BY BUILDING TYPE/LOCATION USE

| Building classification / Property location use | 2022 | 2023 | Total |
|---|---|---|---|
| Class 1a (detached) Residential detached house | 42 | 89 | 131 |
| Class 1a (attached) Residential attached dwelling (e.g. unit, terrace house, town house or villa unit) | 20 | 28 | 48 |
| Class 1b | 2 | 3 | 5 |
| *4 or more single dwellings located on one allotment for short-term holiday accommodation* | *1* | *2* | *3* |
| *Boarding house, guest house, hostel or the like, not exceeding 300 m$^2$* | *1* | *1* | *2* |
| Class 2 | 12 | 16 | 28 |
| *Building containing 2 or more sole-occupancy units each being a separate dwelling* | *8* | *14* | *22* |
| *Mixed Commercial/Residential* | *3* | *1* | *4* |
| *Secondary dwelling (e.g.granny flat, garage or shed being used as residence)* | *1* | *1* | *2* |
| Class 3 | 6 | 6 | 12 |
| *Boarding house, guest house, hostel, lodging house or backpackers accommodation greater than 200 m$^2$* | *3* | *3* | *6* |
| *Hotel or motel residence* | *1* | *2* | *3* |
| *Hospital Residence* | *1* | | *1* |
| *Assisted care accommodation* | | *1* | *1* |
| *Detention Centre* | *1* | | *1* |
| Class 5 Office building used for professional or commercial purposes | 3 | 7 | 10 |
| Class 6 | 12 | 15 | 27 |
| *Business/Commercial - Other* | *8* | *8* | *16* |
| *Shopping complex* | *3* | *7* | *10* |
| *Service Station* | *1* | | *1* |
| Class 7a Vehicle storage, carpark (not open or uncovered) including carstacking | 2 | | 2 |
| Class 7b | 4 | 10 | 14 |
| *Carpark (open or uncovered)* | *2* | *4* | *6* |
| *Storage property: Unclassified* | | *4* | *4* |
| *General storage facility* | *2* | *1* | *3* |
| *Metal or electrical related storage* | | *1* | *1* |
| Class 8 | 4 | 3 | 7 |
| *Factory* | *3* | *2* | *5* |
| *Laboratory other than a health care or hospital facility* | *1* | | *1* |
| *Electrical network substation* | | *1* | *1* |

## INCIDENTS BY BUILDING TYPE/LOCATION USE – cont.

| Building classification / Property location use | 2022 | 2023 | Total |
|---|---|---|---|
| Class 9a Health care or hospital facility | 5 | 6 | 11 |
| Class 9b | 5 | 5 | 10 |
| *Sports stadium, sporting or other club* | 3 | | 3 |
| *Educational related building (e.g. school, early childhood centre, preschool)* | 1 | 2 | 3 |
| *Transit related building (e.g. bus, railway, rail, airport or ferry terminal)* | | 1 | 1 |
| *University* | | 1 | 1 |
| *Cinema, Theatre or Studios* | 1 | | 1 |
| *Public gathering related building (e.g. library, theatre, place of worship)* | | 1 | 1 |
| Class 9c Aged care related facility | 1 | 5 | 6 |
| Class 10a | 14 | 10 | 24 |
| *Garage, carport or shed* | 13 | 10 | 23 |
| *Boat used as residence* | 1 | | 1 |
| Non-structural | 39 | 82 | 121 |
| *Road, Street, Highway or Motorway (Public or Private)* | 22 | 54 | 76 |
| *Industrial plant yard area* | 3 | 4 | 7 |
| *Open land* | 4 | 2 | 6 |
| *Yards, non-residential (not primarily for storage)* | 1 | 3 | 4 |
| *Yards, residential* | | 4 | 4 |
| *Electric transmission, distribution system (excluding substations)* | 2 | 1 | 3 |
| *Managed non-hazardous rubbish disposal site* | 1 | 2 | 3 |
| *Railway property, excluding buildings* | | 2 | 2 |
| *Vacant allotment* | 2 | | 2 |
| *Uncovered parking area* | | 2 | 2 |
| *Public utility infrastructure (public mailbox, outdoor telephone booth, etc)* | 1 | | 1 |
| *Cemetery* | 1 | | 1 |
| *Forest, hunting or fishing related area* | | 1 | 1 |
| *Caravan used as residence* | | 1 | 1 |
| *Sanitary service. Garbage and sewerage disposal.* | | 1 | 1 |
| *Managed hazardous materials waste disposal site* | | 1 | 1 |
| *Boat used as residence* | | 1 | 1 |
| *Contractor's shed* | 1 | | 1 |
| *Yards, non-residential (primarily for storage)* | | 1 | 1 |
| *Coastline* | | 1 | 1 |
| *Playground, Park or Parklands* | | 1 | 1 |
| *Port, channel or anchorage* | 1 | | 1 |
| Total | 171 | 285 | 456 |

## STRUCTURE FIRES - SPREAD OF FIRE

| Location | 2022 | 2023 | Total |
|---|---|---|---|
| Structure | 77% | 71% | 73% |
| Non-structure | 23% | 29% | 27% |

| Fire spread | % of structure fires |
|---|---|
| Confined to the object of origin | 30% |
| Confined to the room of origin | 30% |
| Confined to the floor/level of origin | 4% |
| Confined to structure of origin | 9% |
| Extended beyond structure of origin | 2% |
| Not reported | 25% |
| Total | 100% |

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# 2. LIB INCIDENT DATA

## STRUCTURE FIRES – SMOKE ALARM FUNCTION

| | Smoke alarm/detector present | Smoke alarm/detector not present | Not reported |
|---|---|---|---|
| Class 1a (detached) | 64% | 21% | 15% |
| Class 1a (attached) | 90% | 0% | 10% |
| Class 1b | 60% | 0% | 40% |
| Class 2 | 79% | 11% | 11% |
| Class 3 | 42% | 0% | 58% |
| Class 5 | 70% | 0% | 30% |
| Class 6 | 30% | 22% | 48% |
| Class 7a | 0% | 50% | 50% |
| Class 7b | 0% | 29% | 71% |
| Class 8 | 43% | 14% | 43% |
| Class 9a | 64% | 0% | 36% |
| Class 9b | 60% | 0% | 40% |
| Class 9c | 33% | 0% | 67% |
| Class 10a | 25% | 63% | 13% |
| **Total** | **15%** | **38%** | **47%** |

| | Smoke alarm/detector operating (where present) | Smoke alarm/detector not operating (where present) |
|---|---|---|
| Class 1a (detached) | 76% | 24% |
| Class 1a (attached) | 86% | 14% |
| Class 1b | 100% | 0% |
| Class 2 | 82% | 18% |
| Class 3 | 100% | 0% |
| Class 5 | 86% | 14% |
| Class 6 | 88% | 13% |
| Class 8 | 100% | 0% |
| Class 9a | 100% | 0% |
| Class 9b | 67% | 33% |
| Class 9c | 100% | 0% |
| Class 10a | 50% | 50% |
| **Total** | **86%** | **14%** |

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# 2. LIB INCIDENT DATA

## INCIDENTS BY DEVICE INVOLVED

| Material Ignited First | 2022 | 2023 | Total |
|---|---|---|---|
| Electric bike, mobility scooter, ride-on toy | 23 | 67 | 90 |
| Charger (device), battery charger | 19 | 27 | 46 |
| Energy storage - battery, power supply, UPS | 16 | 21 | 37 |
| Hand tool, power tool (battery powered) | 15 | 10 | 25 |
| Mobile phone | 10 | 13 | 23 |
| Powerpack / portable charging device | 8 | 10 | 18 |
| E-cigarettes, vape pens | 4 | 12 | 16 |
| Laptop / Tablet | 7 | 6 | 13 |
| Lamps, lights, torches (battery powered) | 5 | 7 | 12 |
| Remote control toy / craft - cars, drones, robots, watercraft | 4 | 7 | 11 |
| Vacuum cleaners - handheld, robotic (battery powered) | 4 | 5 | 9 |
| Audio devices, speakers (battery powered) | 3 | 5 | 8 |
| Battery pack, battery system (hybrid vehicle, electric vehicle) | 4 | 3 | 7 |
| Rubbish, trash, waste, chimney waste, vent waste | 2 | 4 | 6 |
| Personal care device - toothbrush, shaver, epilator (battery powered) | | 4 | 4 |
| Sensor / control device (battery powered) | 2 | 1 | 3 |
| Phone handset, two-way radio, microphone (battery powered) | 1 | 2 | 3 |
| Automated / robotic equipment (battery powered) | 2 | 1 | 3 |
| Camera, camcorder, photographic equipment (battery powered) | 2 | | 2 |
| Gaming devices (battery powered) | 1 | | 1 |
| Personal device - watch, tracker, medical aid | 1 | | 1 |
| Other battery, unspecified | 38 | 80 | 118 |
| **Total** | **171** | **285** | **456** |

# 3. MICROMOBILITY INCIDENTS

## DEVICE TYPE AND CHARGING STATUS

| Type | 2022 | 2023 | Total |
|------|------|------|-------|
| E-bike | 11 | 41 | 52 |
| E-scooter | 7 | 17 | 24 |
| Hoverboard | 1 | 2 | 3 |
| Toy car | 1 | 1 | 2 |
| Mobility scooter | | 1 | 1 |
| E-motorscooter | | 1 | 1 |
| E-skateboard | 1 | | 1 |
| E-wheelchair | 1 | | 1 |
| E-surfboard | | 1 | 1 |
| Unspecified | 1 | 3 | 4 |
| **Total** | **23** | **67** | **90** |

| | 2022 | 2023 | Total |
|------|------|------|-------|
| Actively charging | 8 (34.8%) | 30 (44.8%) | 38 (42.2%) |
| Recently off-charger | 1 (4.3%) | 1 (1.5%) | 2 (2.2%) |
| Not charging | 2 (8.7%) | 13 (19.4%) | 15 (16.7%) |
| Unconfirmed | 12 (52.2%) | 23 (34.3%) | 35 (38.9%) |
| **Total** | 23 (100.0%) | 67 (100.0%) | 90 (100.0%) |

# 3. MICROMOBILITY INCIDENTS

## INCIDENT LOCATIONS

| | 2022 | 2023 | Total |
|---|---|---|---|
| Residential detached house | 6 | 22 | 28 |
| Residential attached dwelling (e.g. unit, terrace house, town house or villa unit) | 8 | 14 | 22 |
| Building containing 2 or more sole-occupancy units each being a separate dwelling | 3 | 9 | 12 |
| Road, Street, Highway or Motorway (Public or Private) | | 7 | 7 |
| Business/Commercial - Other | 1 | 4 | 5 |
| Garage, carport or shed | 1 | 2 | 3 |
| Aged care related facility | 1 | 1 | 2 |
| Boarding house, guest house, hostel, lodging house or backpackers accommodation greater than 200 m$^2$ | 1 | 1 | 2 |
| Open land | 1 | 1 | 2 |
| Office building used for professional or commercial purposes | | 1 | 1 |
| Secondary dwelling (e.g.granny flat, garage or shed being used as residence) | 1 | | 1 |
| Coastline | | 1 | 1 |
| Railway property, excluding buildings | | 1 | 1 |
| Storage property: Unclassified | | 1 | 1 |
| 4 or more single dwellings located on one allotment for short-term holiday accommodation | | 1 | 1 |
| Hotel or motel residence | | 1 | 1 |
| **Total** | **23** | **67** | **90** |

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# 3. MICROMOBILITY INCIDENTS
## BRANDS AND MODELS

| E-bike brand/model | Incidents |
|---|---|
| Airbike | 1 |
| Bafang | 1 |
| Barletta | 1 |
| Dillenger | 1 |
| Dirodi | 1 |
| Dyu VIP | 1 |
| Earth | 1 |
| EB-E144 (www.ebikesworld.com.au) | 1 |
| E-Runner Cargo bike | 1 |
| Freestyler 3rd Gen | 1 |
| Huachi | 1 |
| Ji'anyjie | 3 |
| Liitokala | 1 |
| Lithium Bicycle | 1 |
| LW-135/200/672/014 | 1 |
| Marlin Havoline | 1 |
| Mono Maxiss | 1 |
| NCM Moscow Plus | 1 |
| Ninebot | 1 |
| Pirez | 1 |
| Starbikes Becrux | 1 |
| Sur-Ron 60V 32Ah | 1 |
| Vinxs EW-2032 | 1 |
| Vinxs Fashion bike | 1 |
| Volt | 1 |
| Zoomo | 1 |
| Zuma | 1 |
| Unknown | 23 |
| **Total** | **52** |

| E-scooter brand/model | Incidents |
|---|---|
| Assassin | 2 |
| Daxys | 1 |
| Dragon | 1 |
| Dragon GTR v2 | 3 |
| Elektro Rad | 1 |
| e-Runner F-1 33V | 1 |
| Fivemor | 1 |
| Kaabo Mantis Pro | 1 |
| Minimotors Dualtron 66.4V 1.75A | 1 |
| Ninebot | 1 |
| Segway | 1 |
| Yayama | 1 |
| Zero 10 | 1 |
| Unknown | 8 |
| **Total** | **24** |

Note: Brand names and models have been reported where they can be identified by the reporting officer. Not all devices are deemed at fault – failures can occur due to abuse or misuse. Where an electrical product (e.g. charger) has been deemed faulty, this has been reported to NSW Fair Trading for further investigation.

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# 4. LIBS IN WASTE

## WASTE/RECYCLING FIRES ATTENDED BY FRNSW

|  | 2022 | 2023 | Total |
|---|---|---|---|
| Waste receptacles or dedicated collection | 34 | 55 | 89 |
| Waste trucks | 56 | 71 | 127 |
| Waste facilities | 34 | 51 | 85 |
| **Total** | **124** | **177** | **301** |

Excludes abandoned rubbish and yard fires

## LIBS IN WASTE/RECYCLING FIRES

|  | 2022 | 2023 | Total |
|---|---|---|---|
| LiB* in waste receptacle | 2 (6%) | 3 (5%) | 5 (6%) |
| LiB* in waste truck | 3 (5%) | 17 (24%) | 20 (16%) |
| LiB* in waste facility | 4 (12%) | 2 (4%) | 6 (7%) |
| **Total** | **9 (7%)** | **22 (12%)** | **31 (10%)** |

*Where lithium-ion batteries or LiB-devices were identified as the cause

# 5. ENERGY STORAGE SYSTEMS

## ESS FIRES ATTENDED BY FRNSW
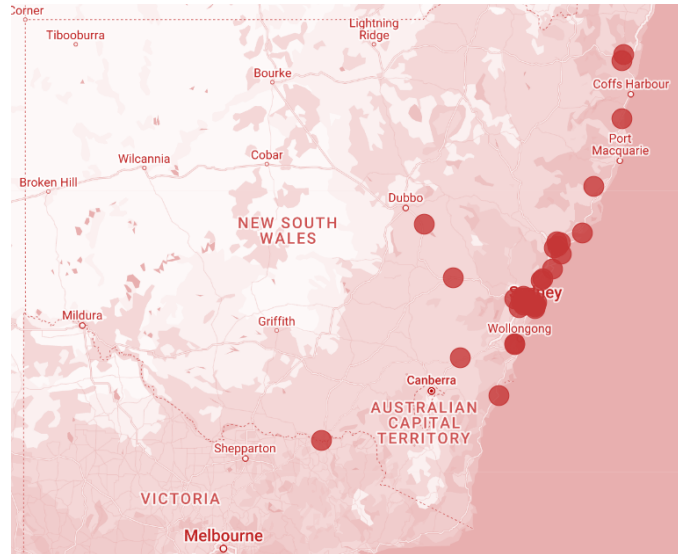


|  | 2022 | 2023 | Total |
|---|---|---|---|
| Energy storage - battery, power supply, UPS |  |  |  |
| Residential battery energy storage system (R-BESS) | 1 | 3 | 4 |
| Uninterruptible power supply | 7 | 7 | 14 |
| Other, unspecified | 8 | 11 | 19 |
| **Total** | **16** | **21** | **37** |

## R-BESS INCIDENTS

| Residential BESS brand / model | LIB chemistry | Recalled model? | CEC listed? | Registered in AEMO DER? |
|---|---|---|---|---|
| Zenaji Aeon A48-40 1.93kWh | LTO | No | Yes | No |
| Solax T63 6.3kWh | LFP | No | No | Yes, address listed but no device details available |
| PowerPlus ECO4840P 4kWh | LFP | No | No | No |
| Unknown | Unknown | - | - | - |

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# 6. ELECTRIC AND HYBRID VEHICLES

## EV FIRE INCIDENTS ATTENDED

|  | 2022 | 2023 | Total |
|---|---|---|---|
| Battery pack, battery system (hybrid vehicle, electric vehicle) | | | |
| Hybrid vehicle | 4 | 0 | 4 |
| Battery electric vehicle | 0 | 3 | 3 |
| **Total** | **4** | **3** | **7** |

## EV BATTERY INCIDENT CAUSES

- September 2023: A faulty MG ZS high voltage battery had been removed from the vehicle and placed on the ground underneath the front end of the vehicle in a car yard amongst other vehicles. After a number of weeks exposed to the elements, the battery entered thermal runaway. The fire spread to the vehicle and an additional four vehicles surrounding it before being extinguished.

- September 2023: A Tesla Model 3 hit some road debris on a highway causing the high voltage battery to become compromised and ignite. The driver and passenger were able to escape injury.

- September 2023: The high-voltage battery from an Audi RS e-tron had been removed from the vehicle and started smouldering whilst in a workshop.

Note: FRNSW has attended additional incidents involving electric vehicles or hybrid vehicles where lithium-ion batteries were involved and/or the vehicles had to be managed with caution due to the potential for battery failure. Only incidents where the origin of the fire was determined to be the high voltage lithium-ion battery are reported here.

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# 7. SUMMARY OF MAIN FINDINGS

- An analysis of available incident data revealed that FRNSW attended 171 incidents in 2022, and 285 in 2023 where lithium-ion batteries (LiBs) or LiB devices were involved in ignition or failure.

- This represents a 66% increase in incidents year-on-year, and a rise in frequency from about 1 in every 100 fires attended in 2022 to 1 in every 76 fires in 2023.

- 76% of incidents occurred during normal waking hours (between 7am and 9pm). There were no significant trends seen in the day of the week, month or season.

- While no fatalities were reported in this period, incidents involving LiBs were 4 times more likely to result in injury than all fire and explosion incidents attended, with a rate of 11.4 injured persons reported per 100 incidents compared with 2.8 injured persons reported per 100 fire and explosion incidents overall in 2022-23.

- The duration of incidents involving LiBs increased by 67% from an average of 73 minutes in 2022 to 122 minutes in 2023.

- FRNSW attended LiB incidents spread across the state in 80 different local government areas. In 2023, the areas with the most incidents included the Sydney, Cumberland, Bayside and Canterbury-Bankstown LGAs.

- About half (49%) of LiB incidents occurred in a residential setting.

- 60% of structure fires were confined to the object (30%) or room (30%) of origin. In nine incidents (2%), the fire extended beyond the structure of origin.

- Where a smoke alarm or detector was present, it was operating 86% of the time.

- 90 (20%) incidents involved micromobility devices or their batteries. Of these, 44% of incidents were related to charging (including two incidents where the item was just taken off charging), 17% were not related to charging, and in 39% of these incidents the charging status was not reported.

- Micromobility device incidents mainly involved e-bikes (58%) and e-scooters (27%). In 6 of the e-bike incidents, there was evidence of tampering, or modification of the e-bike batteries. In 2 of the e-scooter incidents, there were multiple devices in storage within a residential setting.

- FRNSW attended 177 fire incidents in 2023 involving waste trucks, waste collection and waste management, representing an increase of 43% from 2022. Due to mixed loads, compaction and fire damage it is often difficult to determine the exact cause of fires in waste receptacles and sites. Of the 301 waste management related fires in the period, 31 (10%) were reported to have been caused or likely to have been caused by incorrect disposal of LiBs or LiB devices.

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# CONTACT US

| | |
|---|---|
| Research enquiries: | research@fire.nsw.gov.au |
| Operational enquiries: | aret@fire.nsw.gov.au |
| Fire investigation: | firu@fire.nsw.gov.au |

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