

Batteries

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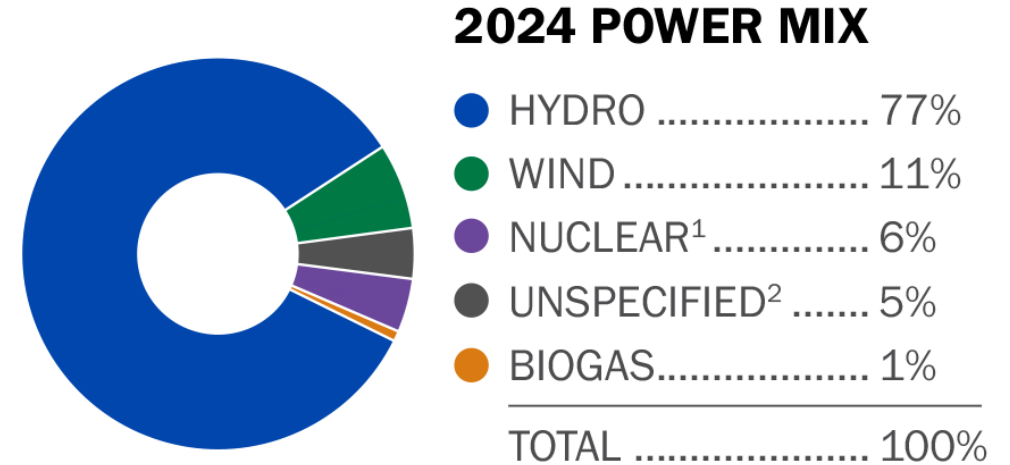


Seattle City Light

WE POWER SEATTLE

About Seattle City Light

- We deliver carbon-neutral electricity, generated primarily from hydropower.
- We have maintained net zero greenhouse gas emissions since 2005.
- We have provided energy conservation programs since 1977.



¹ This fuel represents a portion of the power purchased from Bonneville Power Administration.

² Fuels from wholesale market purchases are unspecified because current power market practices don't require the identification of the specific generating source at the time of sale.

Note: This power mix is based on 2024 data.

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- Types of Batteries
 - Purchasing
 - Handling
 - Disposal



Types of Batteries

- Primary

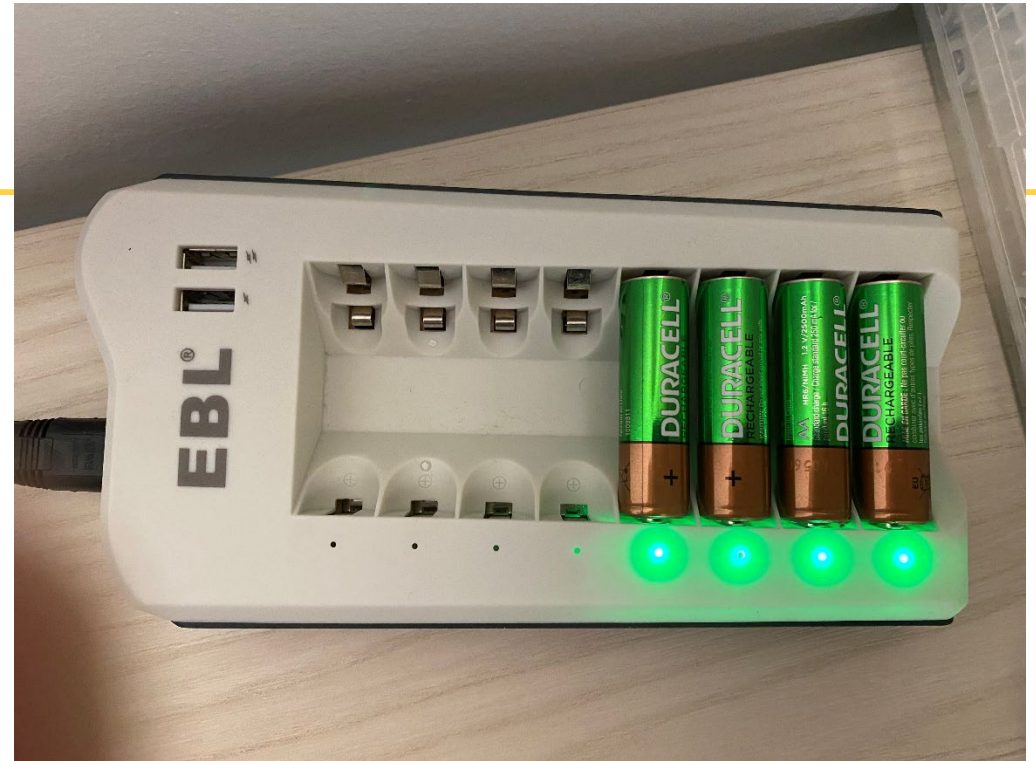
- Carbon Zinc
- Zinc-Chloride - heavy duty
- Alkaline
- Lithium
- Mercury Oxide
- Silver Oxide – button
- Zinc-air – hearing aids

- Rechargeable

- Nickel Metal Hydride
- Lithium Ion
 - Lithium Iron Phosphate
 - Solid State?
- Nickel Cadmium – NiCad
- Lead acid
- Sodium
- Zinc
- Iron – air/flow

Purchasing

- Depends on the use
- Preferably Rechargeables
 - Waste reduction
 - Less expensive
- Avoid introducing hazard
- Avoid disposal costs
- Avoid Unnecessary uses



Is it necessary to use a battery powered device



VS



Where do I find them?

- Cars
- Scooters
- E-bikes
- Hoverboards
- Lawnmowers
- Hedge Trimmers
- Drills
- Smoke alarms
- Toys
- Laptops
- Tablets
- Smartphones
- E-cigarettes
- Toothbrush

Do I really need a battery operated device?

Do I really need the energy density of Li-Ion?

Hazard

- Varies drastically by battery size
- All non-solid state Lilon batteries have inherent fire hazard
- <https://fsri.org/research/examining-fire-safety-hazards-lithium-ion-battery-powered-e-mobility-devices-homes>
- Physical damage
- Water exposure
- Overcharging
- Wrong battery for the device
- High heat (car in sun)
- Product defect (e.g. Ryobi 40V lawn mower)

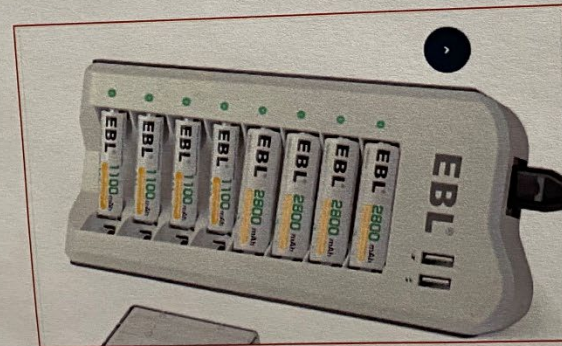
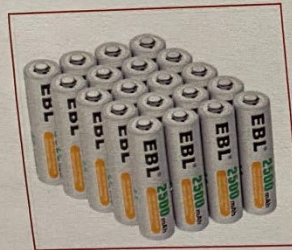
Handling



Rechargeable batteries for use by ELL Division staff

When returning a dead rechargeable battery add it to the charger as a courtesy

All charged batteries should be in the plastic cases.



9900mAh

TR 18650 3.7V Li-Ion

No Memory effect.

Low temperature operation available.

Environmental friendliness



DO NOT dispose in fire or heat.

DO NOT puncture, damage and disassemble.

DO NOT mix fresh batteries with used batteries.

Rechargeable Battery With

Re-Discharging Protection Circuit



Disposal

SPENT BATTERIES ONLY NO LAMPS / BALLASTS ACCEPTED

SPENT MIXED BATTERIES <9V

DO NOT PLACE LITHIUM BATTERIES IN THIS BUCKET

There is no need to tape mixed <9V batteries

COMMON MIXED <9V BATTERIES

Includes:

- Alkaline
- NiMH
- NiCd
- Carbon Zinc
- Any battery below or equal to 9V, except for lithium!



COMMON BATTERIES THAT ARE NOT <9V



SPENT LITHIUM BATTERIES

COMMON LITHIUM BATTERIES

Watch Batteries



Rechargeable Tool Batteries



DISPOSAL PROCEDURE

1. Double check – Is this a lithium battery?
2. Tape positive (+) terminals of batteries (if exposed)
 - If the positive terminal is recessed, there is no need to tape.
3. If you cannot identify which terminal is positive, tape both terminals.



SPENT MIXED BATTERIES

GREATER THAN 9V

COMMON >9V MIXED BATTERIES



Rechargeable
Battery Packs

Single-Use
Batteries



NO LITHIUM BATTERIES

DISPOSAL PROCEDURE

1. Double check – Is this a >9V battery?
 - If your battery is lithium, dispose in a lithium bucket!
2. Tape positive (+) terminals of batteries (if exposed)
 - If the positive terminal is recessed, there is no need to tape.
3. If you cannot identify which terminal is positive, tape both terminals.



Disposal



Recycling

- No batteries in trash
- Recycle
 - Tape terminals to avoid accidental discharge



<https://www.youtube.com/watch?v=WsUjSE-ibKo>

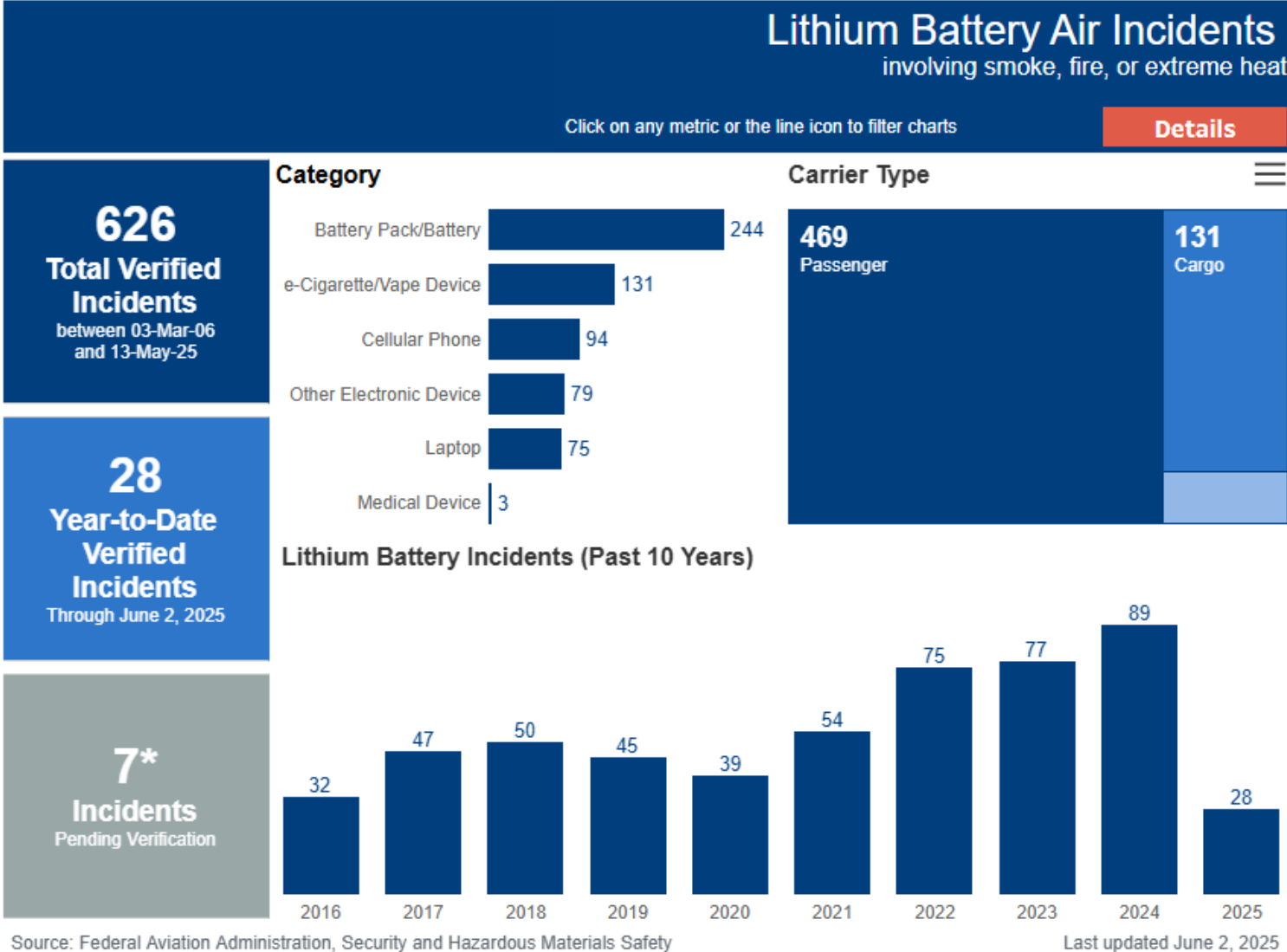
From WSP – Eastside Fire and Rescue on I-90
Recycling truck fire – lithium ion batteries

Utility Scale Batteries

- Hillsboro, OR Data Center May 2025
- Moss Landing, CA, Power Plant January 2025
- Escondido, CA Substation Sept. 2024
- San Diego, CA May 2024
- Kearny Mesa, CA Substation LFP April 2024
- Valley Center, CA September 2023
- Surprise, AZ April 2019

https://storagewiki.epri.com/index.php/BESS_Failure_Incident_Database

Lithium Battery Incidents



Note: These are verified lithium battery related events involving smoke, fire, or extreme heat that the FAA is aware of and should not be considered a complete listing of all such incidents. The methods of collecting and recording these incidents and the data involved has changed over the life span of this chart as the FAA's Office of Hazardous Materials Safety has evolved. The incident summaries included here are intended to be brief and objective. They do not represent all information the FAA has collected, nor do they include all investigative or enforcement action taken. Verified incidents will be uploaded by the fifth of the month. Processing time varies.

* Data for incidents pending verification are not available for inclusion in the charts.

THANK YOU



Seattle City Light