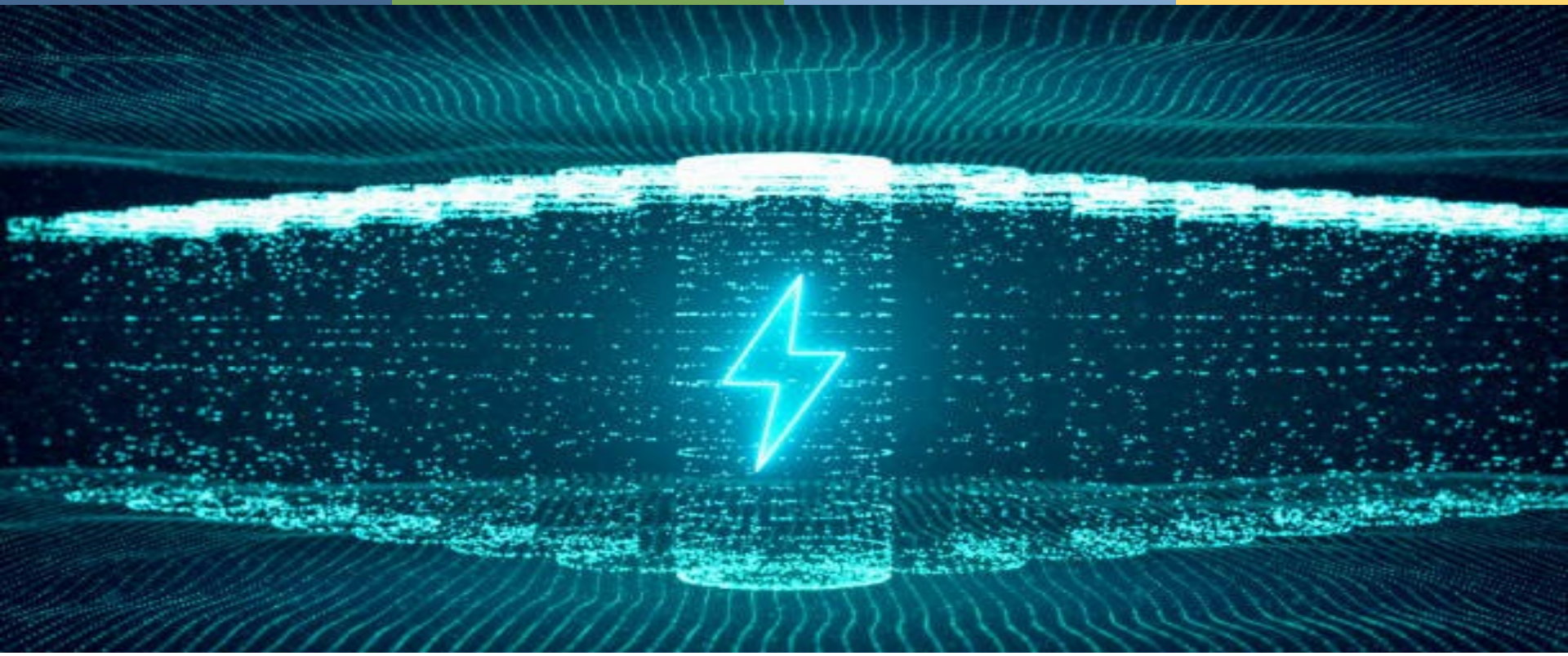


DEPARTMENT OF ECOLOGY
State of Washington

Leading the Charge
Battery Stewardship in Washington

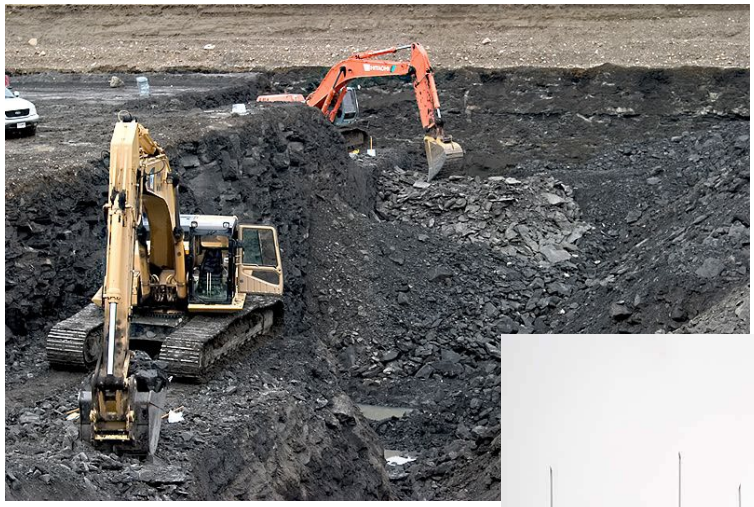
Megan Warfield

Solid Waste Management Program

February 2024

DEPARTMENT OF ECOLOGY
State of Washington

Every day we each use hundreds of products




0.5
1.5
2
2.5
ml

DEPARTMENT OF ECOLOGY
State of Washington

An alternate model:

Product Stewardship

(aka Extended Producer Responsibility)

Producers, not government, assume responsibility for the end-of-life management of their products

Product Stewardship in Washington

DEPARTMENT OF ECOLOGY
State of Washington

2007

E-CYCLE washington

RCW 70A.500

2010

LightRecycle WASHINGTON

RCW 70A.505

2017

RCW 70A.510

2018

RCW 69.48

2019

PaintCare™
RECYCLING MADE EASY

RCW 70A.515

2023

RCW 70A.555

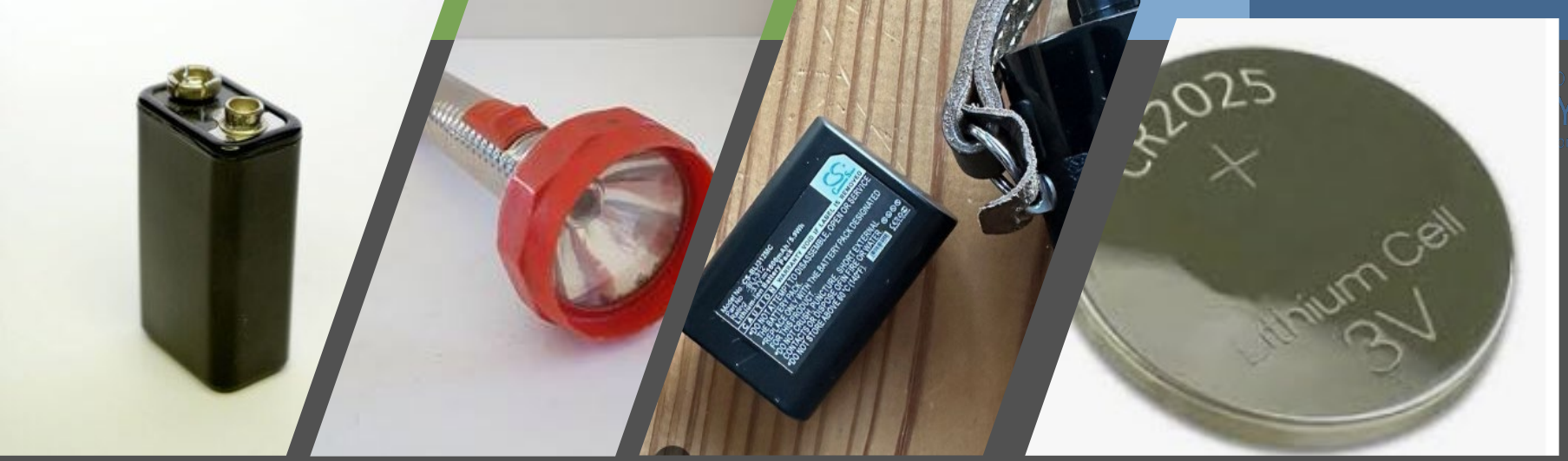
How It Works

- List of Producers
- Financing
- Outreach
- Collection
- Handling/processing
- Goals & Targets
- Annual Reporting

It Starts with a Plan!

Battery Product Stewardship

- E2SSB 5144 – Providing for responsible environmental management of batteries
- Codified as Chapter 70A.555RCW
- Create a statewide system for the collection and recycling of batteries
  - FREE
  - Open to households & businesses
  - Many types of batteries covered



What Batteries Are Covered?

- Portable batteries:
  - Rechargeable no more than 11 pounds and a rating of no more than 300 watt-hours;
  - Primary no more than 4.4 pounds

Must be removed from device!

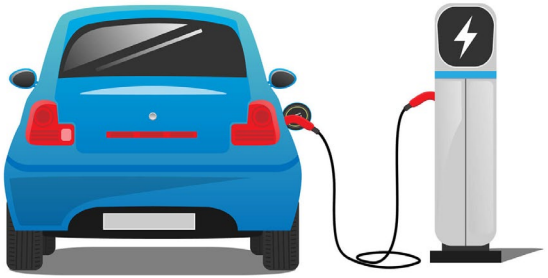
What Batteries Are Covered?

- **Medium batteries:**
  - Rechargeable weighing more than 11 pounds or a rating of more than 300 watt-hours, or both; but no more than 25 pounds and no more than 2,000 watt-hours;
  - Primary more than 4.4 pounds but less than 25

Must be removed from device!

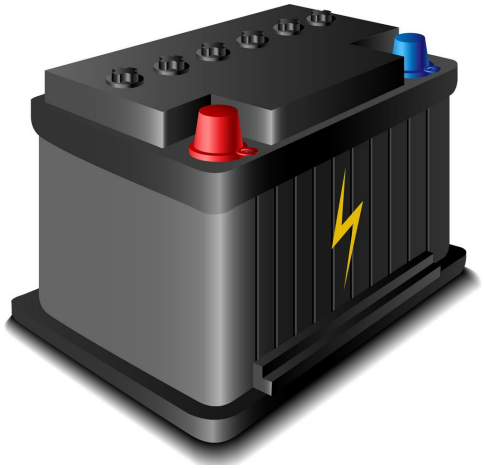
What Batteries Aren't Covered?

- Large format
  - Rechargeable weighing more than 25 pounds or has a rating more than 2,000 watt-hours
  - Primary weighing more than 25 pounds
- Subject of study only



What Batteries Are Excluded?

- Batteries contained in a medical device
- Battery with electrolyte as a free liquid
- Batteries in an electronic device covered by the E-Cycle program
- Lead acid battery weighing more than 11 pounds
- Lead acid batteries covered by RCW 70A.205.505
- Embedded batteries
- Large format batteries



What about damaged batteries?

- Includes batteries damaged or identified by the manufacturer as being defective for safety reasons
- Must provide collection opportunities in each county (site or event)
- Collected only at sites with specially trained personnel

Where will they be collected?

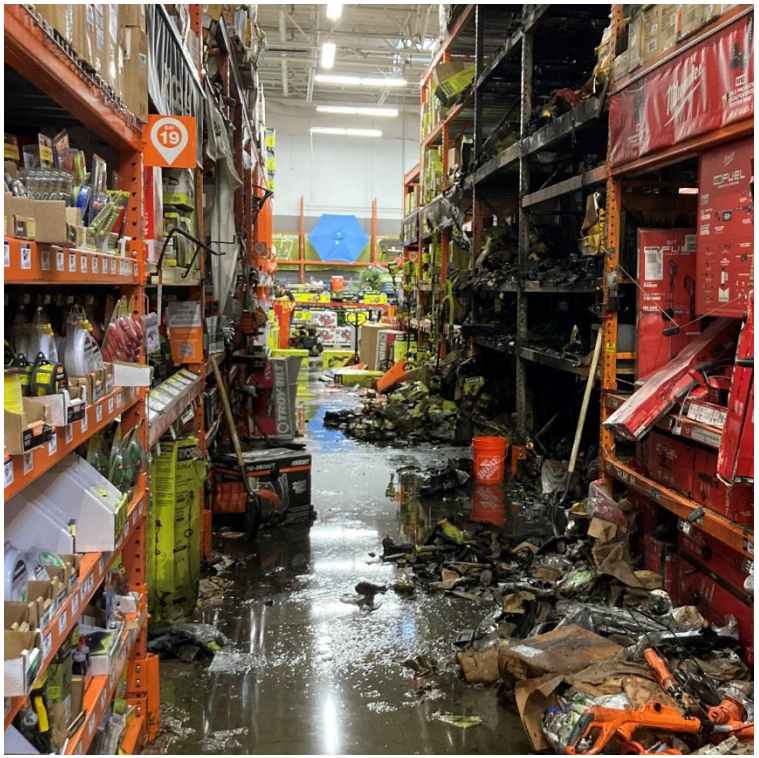
- Portable batteries:
  - 95% of residents must have 1 permanent collection site within 15 miles
  - 1 additional site for every 30,000 residents of in an urban area
  - Consideration given to overburdened populations and vulnerable communities
- Medium format batteries:
  - At least 25 permanent collection sites
  - Must have 1 in each county with more than 200,000
  - Only at HHW facilities or other sites with certified staff

Why the Bill Passed

- Unprecedented fires and damage to solid waste infrastructure
- Increasingly difficult for solid waste facilities to obtain/afford insurance
- Valuable resources are wasted when batteries are not recycled
- Patchwork of access to recycling services

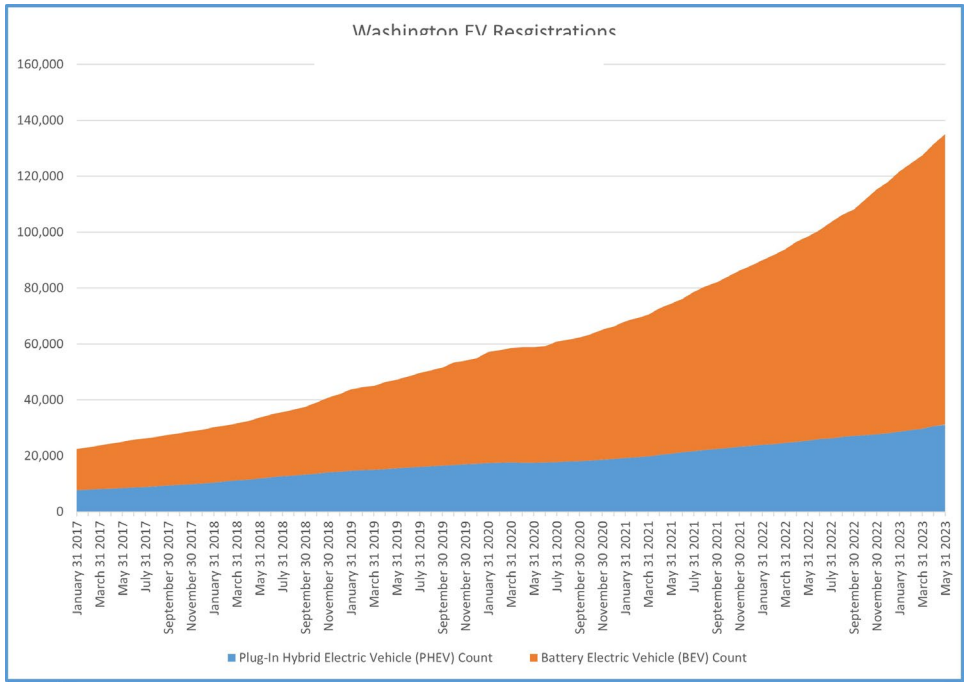
Source: The Columbian, November 21, 2019. Photo courtesy of Vancouver Fire Department.

Extreme Hazard Posed by Lithium-ion Batteries



EVs in Washington

- Currently 135,038 EVs in WA
- EV market share of 16.9% in Q1 2023
  - +7.2% increase over 2022
  - Washington: 14% BEV, 2.9% PHEV
  - National: 8.6%
- 97 ZEV models available in Washington in all vehicle classes



Monthly EV and PHEV registrations in Washington

Source: Ecology's Climate Pollution Reduction Program

EV Battery Study & Report

- Recommendations for the collection and management of EV batteries. Study included:
  - Current practices in WA
  - Best practices in other jurisdictions
  - Volume and projections
  - Potential pathways for EV batteries
  - Regulatory landscape
  - Economics of battery management
  - Battery chemistries and value

Interested Parties and Partners

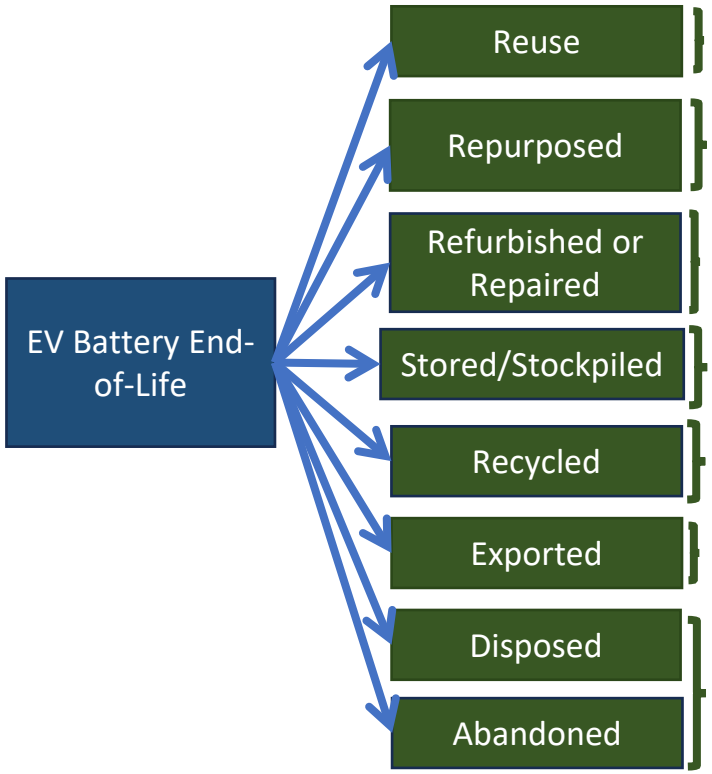
Interviews, surveys, and webinars with:

- Wrecking and salvage
- Local governments
- Environmental organizations
- EV manufacturers
- Battery manufacturers
- Battery recyclers
- DIY community
- Emergency responders

Emerging Themes

- Industry players are refining procedures to meet federal & state regulation – harmonization is desired
- EV battery recycling is a nascent industry undergoing rapid growth & change
- An active market exists for used EV batteries
- Access to EV battery information would support safe collection, management and safety
- Training on best practices for EV incident response would help first responders
- Varying opinions regarding responsibility for end-of-life management

Simplified Potential Pathways



Use in another electric vehicle.

Battery still in good condition and is used directly in other applications such as electric grid storage, small-scale storage, RVs/Boats, and other uses.

Partial repair of a functioning battery.

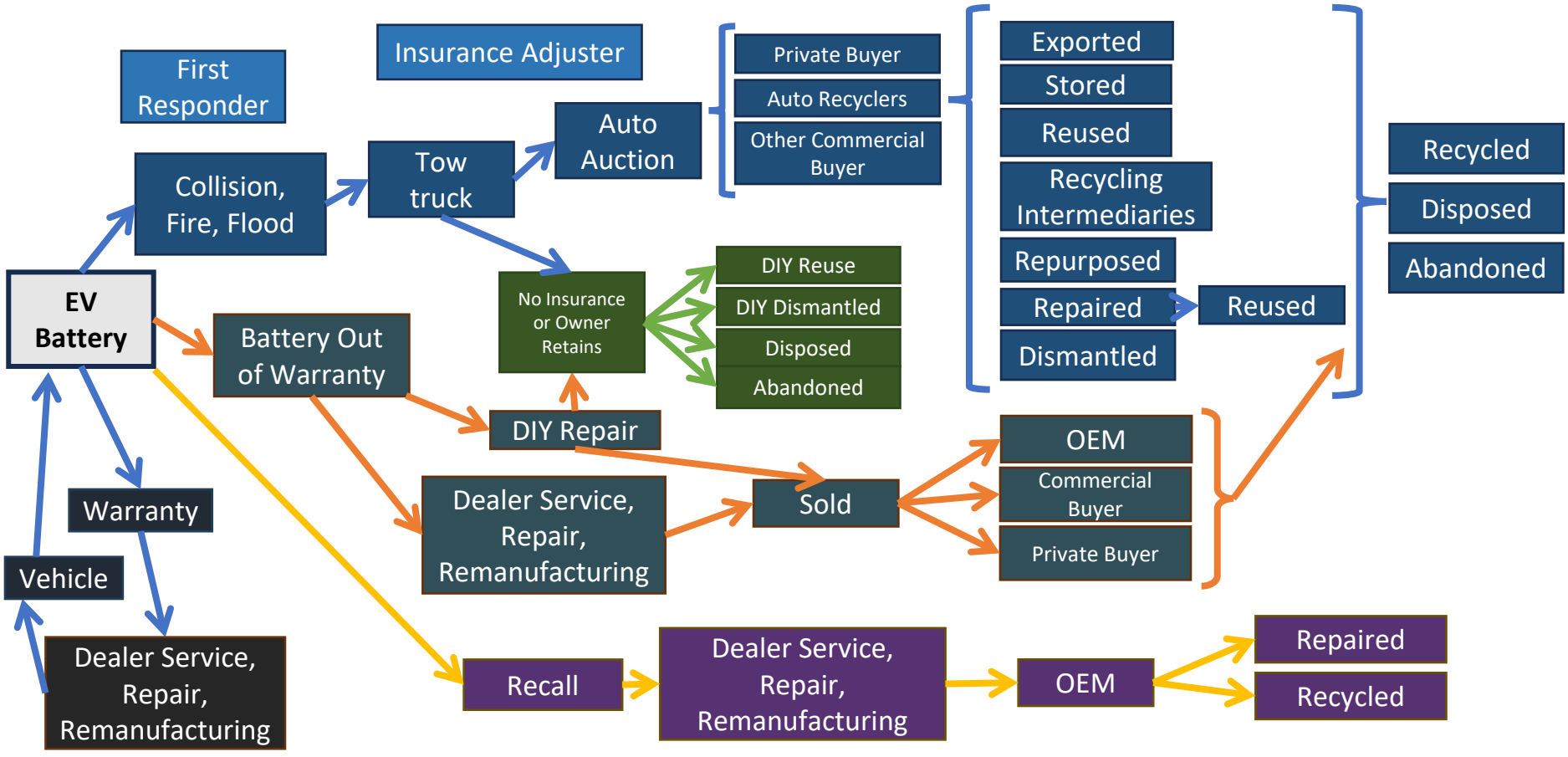
Potentially a temporary stage where a battery flows to another pathway. The duration is currently undefined.

Transported to a recycling facility where the battery is dismantled and key components are recovered.

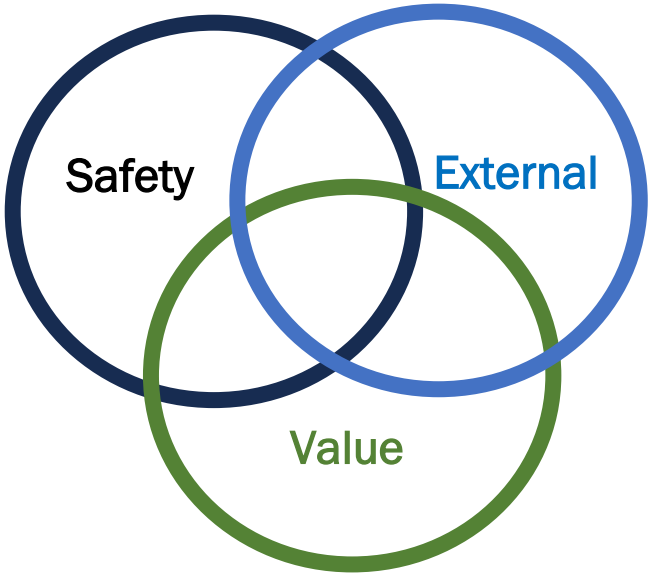
Shipped outside the U.S.

The paths for disposal and abandonment are unknown to the research team.

Overview of Potential Pathways



Potential Factors Determining EOL EV Battery Pathways



Safety Factors

- Visible battery characteristics
  - Physical damages or absence of damage
- Non-visible battery characteristics
  - State of health
  - Internal damage
- Battery chemistry
- Regulatory

External Factors

- Battery Handler
  - Ability/authority to test battery
- Insured Vehicle
- Warranty
- Regulatory

Value Factors

- Visible battery characteristics
  - Physical damages or absence of damage
- Non-visible battery characteristics: battery health
- Battery chemistry
- Battery history
  - Manufacture recall
  - Vehicle history: collision, flood, other damage


Task Force
goal
people
project
duty
target
objective
direct
focus
united
unity
problem
team
tactics
activity
specify
setting
insignia
smart
strategy
marker
work
measurable
corporate
employees
plan
leader
communication
unique
relevant
business
explicit
precision
army
special
unit
military
teamwork
teaching
objectives
combat
training
specific
resources
success
aim
school

Education, Training & Resources

- Create a clearing house
- First responders
  - Need information on how to respond in a variety of situations involving different Evs
  - Facility for testing and training
  - Ways to mitigate or deenergize Li-ion batteries
  - Reduce hazards of thermal runaway
- Second responders
  - Safe transport
- Recyclers
  - Safe dismantling and storage
  - Safe reuse

Financial Responsibility & Liability

- Pathway informs who may bear responsibility
  - Insurers
  - Vehicle Owner/consumer
  - Battery manufacturer
  - Vehicle manufacturer
  - EV Dismantler
- Potential models
  - Core exchange
  - Extended producer responsibility
  - Insurance requirements (financial assurance)
  - Others?

Legislative Proposals

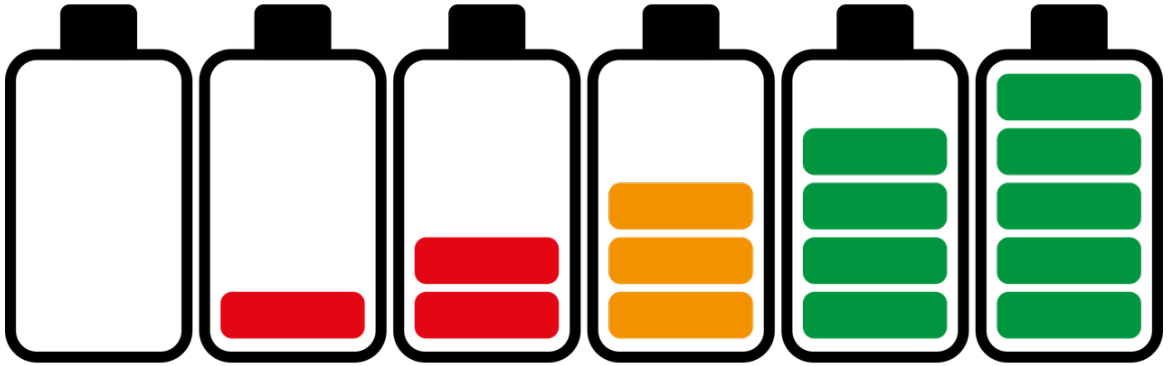
SSB 5812 – An act relating to responding to EV fires

- WSP must study the following elements of EV fires:
  - Impacts to environment and proximate residential areas
  - Best practices for fire response
  - Best practices regarding clean-up and disposal efforts
- WSP must work with:
  - Ecology
  - Local fire protection districts
  - Towing and recovery industry
  - Other entities
- Legislative report due January 1, 2025

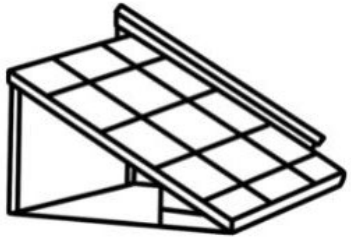
Photo credit: KTVL TV, Denver, CO

Program Milestones

- Rulemaking begins 2024
- Plans due July 1, 2026
- Program start July 1, 2027
- Medium format batteries included July 1, 2029
- Other tasks:
  - Research and legislative report on EV batteries 2023 & 2024
  - Assessment on excluded battery types in 2027
  - Legislative report in 2027






Thank you

https://ecology.wa.gov/Waste-Toxics/Reducing-recycling-waste/Our-recycling-programs

DEPARTMENT OF ECOLOGY
State of Washington

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