Grid Resilience

Batteries and Beyond

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2/23/24

Washington State Department of Commerce

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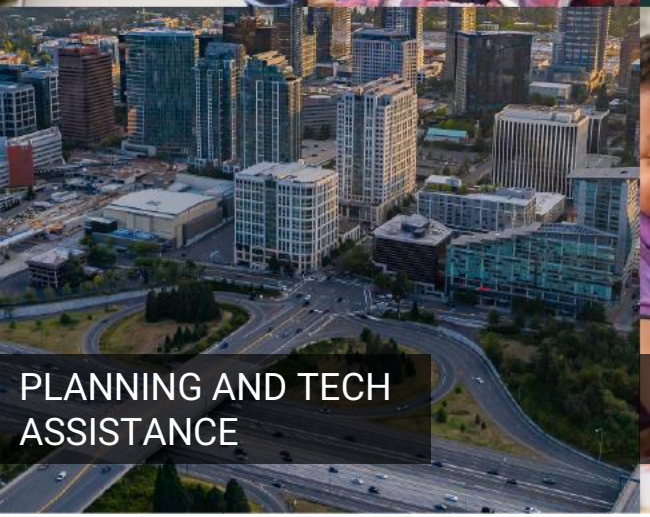
We strengthen communities



Energy Resilience & Emergency Management Office (EREMO)

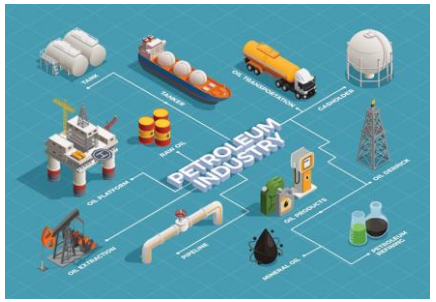
Mission

We are committed to delivering comprehensive and sustainable emergency management, resilience development, and cybersecurity services for the energy sector and residents of Washington State.

Areas of EREMO Responsibility

Electric Sector

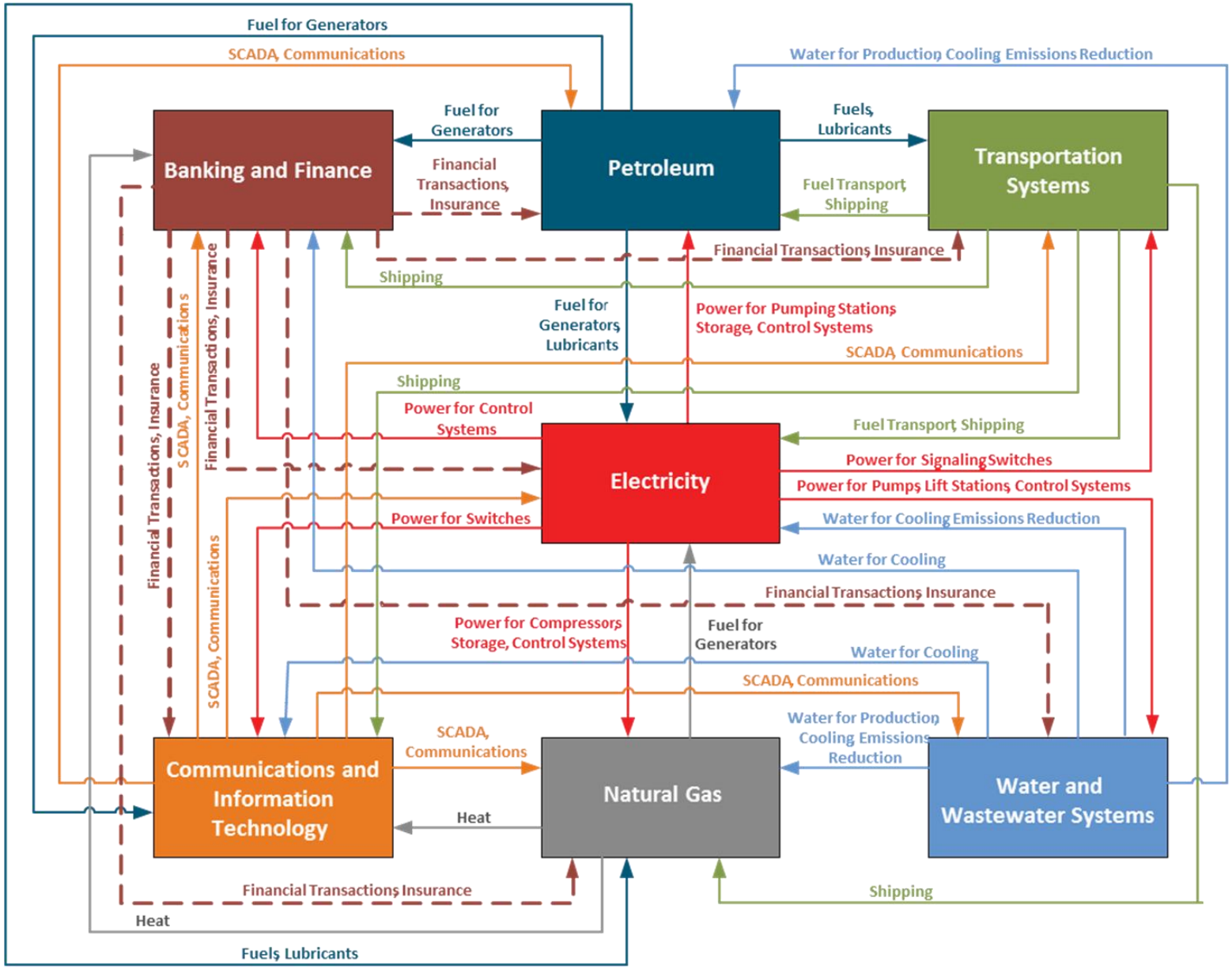
Petroleum Industry



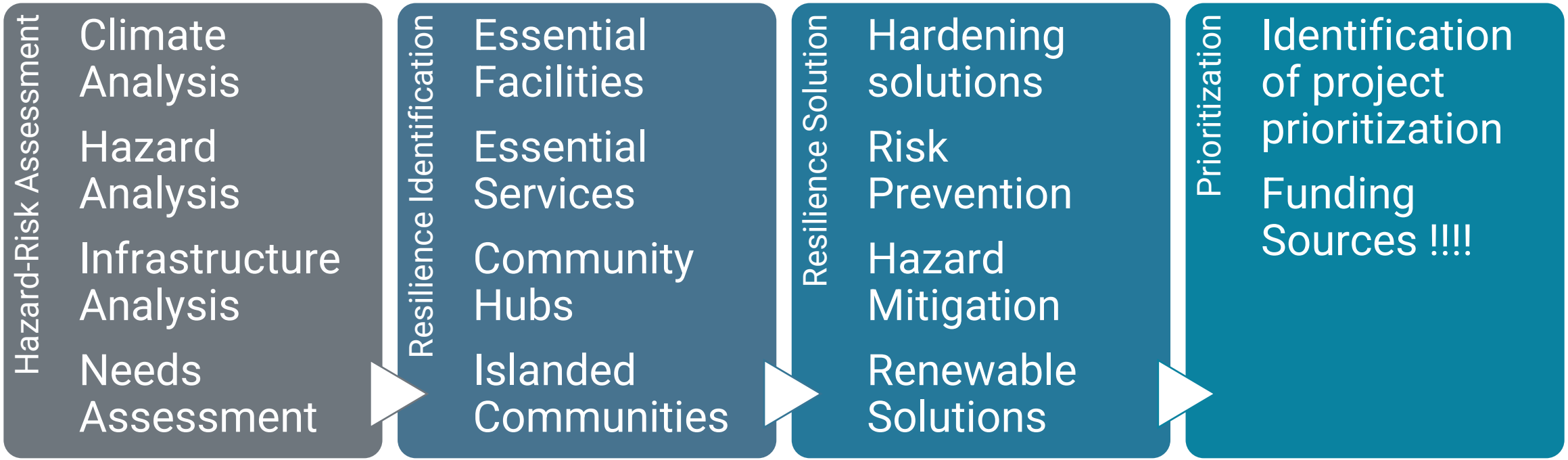
Natural Gas Sector

Alternative Fuels Sector

Benefits of Energy Resilient Systems



Integrated Resilience Planning



"Strengthening Washington: A Community Resilience Initiative"

Integrated Resilience Planning

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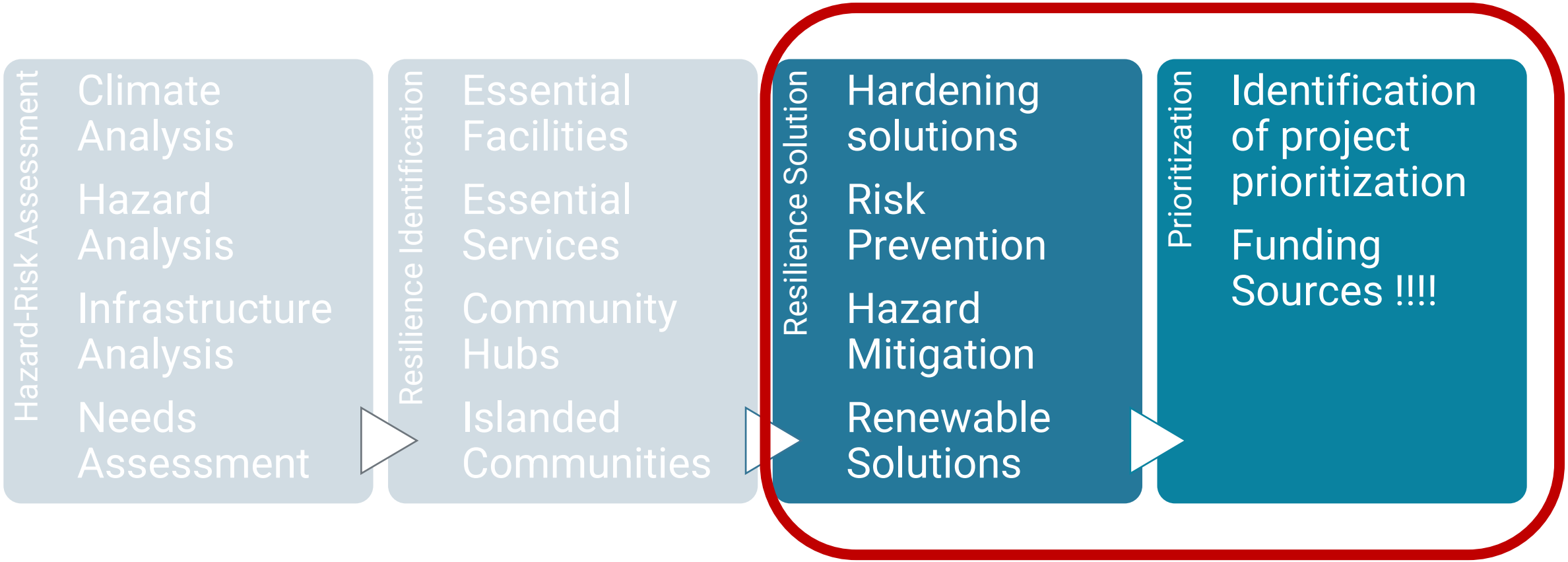
Integrated Resilience Planning



"Strengthening Washington: A Community Resilience Initiative"

Energy Storage Types

Types of Energy Storage

1. Battery Energy Storage System (ESS)

- Large battery banks often associated with solar/wind generation.
- Usually near high voltage infrastructure
- Banks are separated and may have integrated fire prevention tech

Types of Energy Storage

2. Electric Vehicles (EV) and EV Chargers

- Most rabidly developing market.
- Usually in urban centers.
- Sometimes Co-located with petroleum products.

Types of Energy Storage

3. Micro-mobility devices

- Electric scooters, bikes, wheelchairs, etc.
- Often carelessly recharged leading to battery failure and combustion
- Usually amassed in residential areas

Types of Energy Storage

4. Portable Devices

- Rechargeable tools, toys, computers, etc.
- Often carelessly recharged leading to battery failure and combustion
- Residential and commercial fire hazard

Fire Hazards

- Thermal run-away
- Rapid fire growth/hotter fire
- Rapid smoke and explosive flame front
- Toxic gasses during combustion
- Possibility of re-ignition up to 21 days later
- Fire under pressure may cause projectiles resulting in multiple fire locations
- Li (Lithium) burns without Oxygen requiring special fire fighting techniques.
- Li Batteries are everywhere

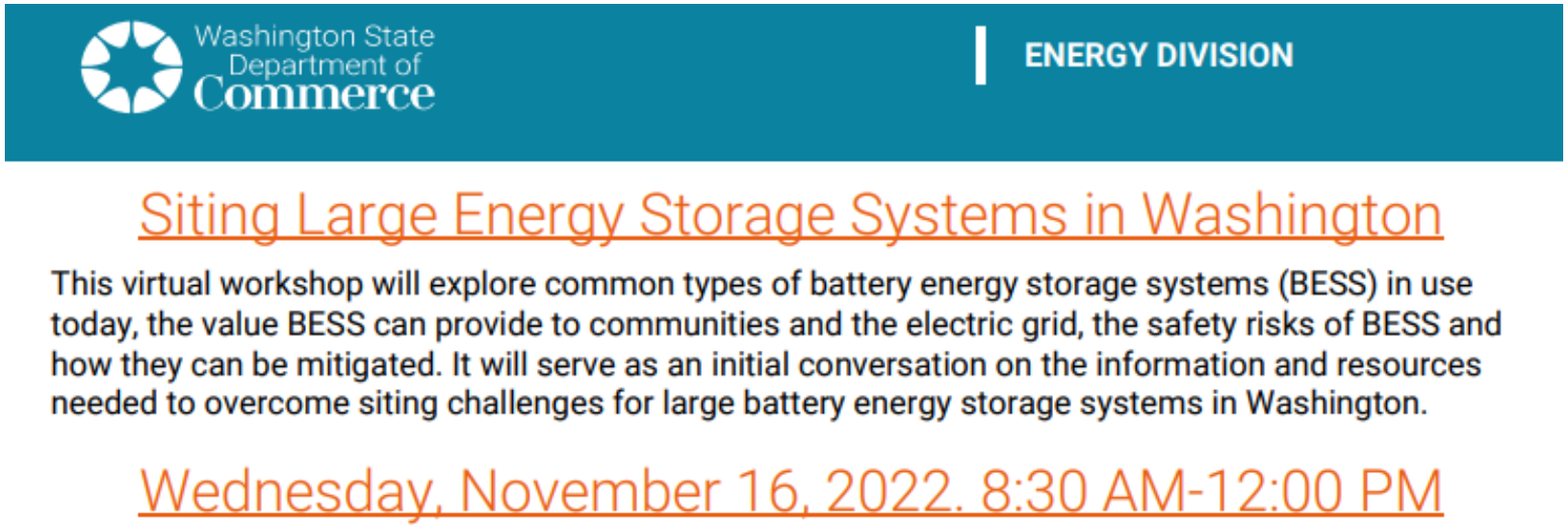
Commerce's Role, Responsibilities & Activity

Commerce's Role in ESS

- State Energy Strategy
  - Meeting the states clean energy goals and recommendations on alternative energy sources to meet those goals.
- Administer grant funding programs
  - Clean Energy Fund – Grid Modernization, Rural Clean Energy Innovation, Research, Development, & Demonstration (RD&D)
  - Solar plus Storage for Community Resilience - Deploy solar and battery energy storage systems so community buildings can provide essential services when the power goes out. Includes both planning and installation projects.
  - Electrification of transportation systems – Support local governments & utilities for charging infrastructure
- Monitor and engage on the work of the State Building Code Council (SBCC):
  - The SBCC is responsible for reviewing, developing and adopting the state building code which includes the International Fire Code.

Commerce's Role in ESS

- Policy staff advise Governor's Office and Legislature on ESS policy
- Facilitate workshops with electric utilities and local planners on utility-scale ESS siting and safety in 2022 and 2023. https://www.youtube.com/watch?v=18P_XOudlmA

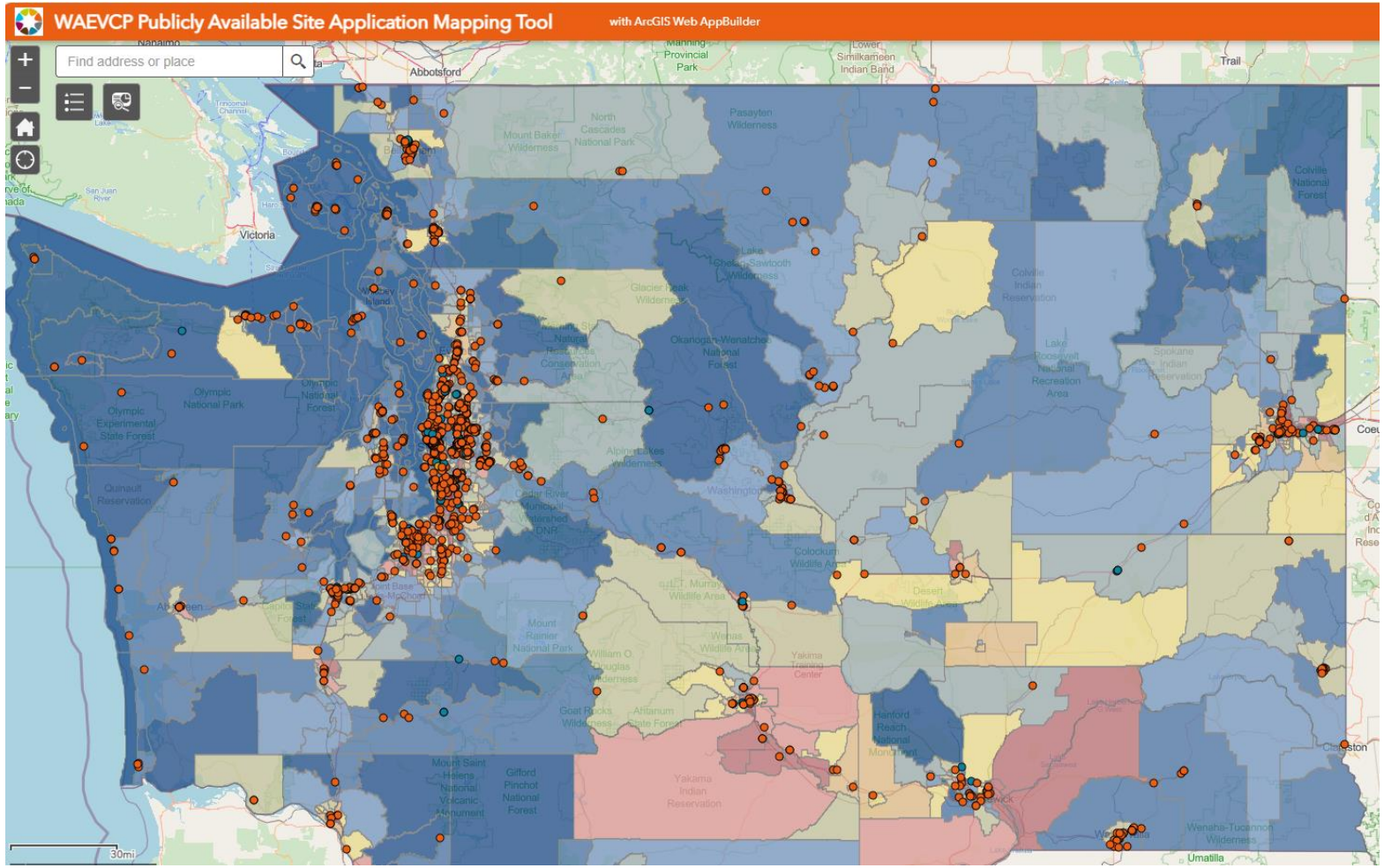


Commerce's Role in EV

- Administer two large funding programs
  - Community charging - $69 million a year for a mix of residential, public, and fleet depots
  - EV incentives –point-of-sale discount for income-qualifying consumers
- Co-chair and staff the Interagency EV Coordinating Council: 10 state agencies/offices coordinate various aspects of EV program work.
- Development of the state's Transportation Electrification Strategy, released January 2024.
- Policy staff advise Governor's Office and Legislature on EV policy
  - Examples:
    - Advising on pursuing standards for more fuel efficient tires
    - Made recommendations on improving EV charging reliability

Commerce's Role in EV

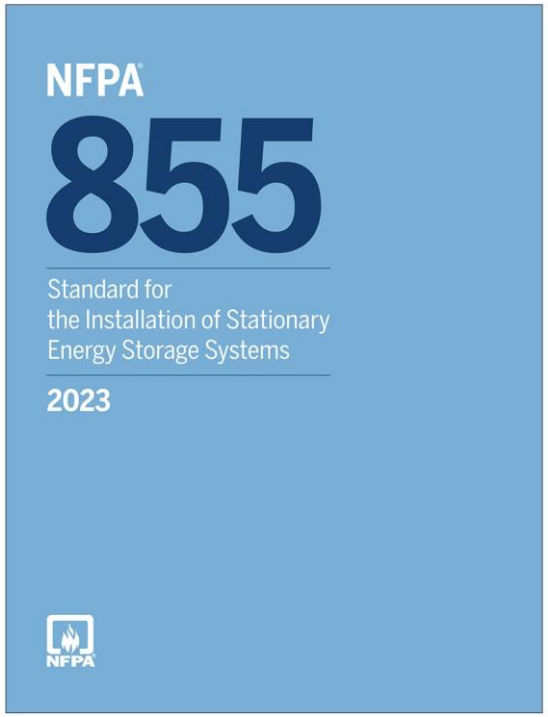
- Track EV charging installations and rate of use
- Host publically available mapping tool



Policy & Mitigation

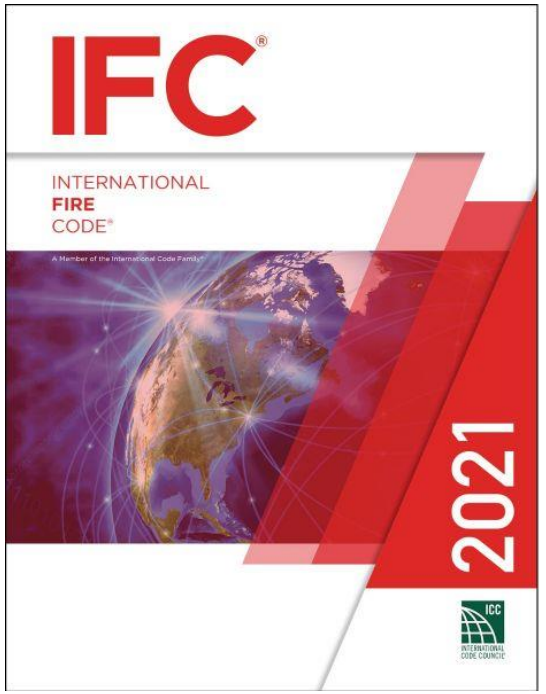
Codes and Standards are critical

- Seattle Fire worked with the State Building Code Council to adopt an emergency rule in January 2023 to add NFPA 855 as a referenced standard in the 2018 International Fire Code (what's in place today).
  - Standards for: fire detection, suppression, explosion control, exhaust ventilation, gas detection, thermal runaway, and mobile ESS equipment and operations.
  - Includes chapters on:
    - Operations and Maintenance
    - Decommissioning
    - Storage of lithium metal or lithium-ion batteries.



Codes and Standards continued

- 2021 International Fire Code has new sections specifically on lithium ion batteries:
  - Requires electrical energy storage systems to comply with NFPA 855
  - Requires at least 10 feet of separation between ESS containers
  - ESS may not be located not less than 20 feet from any building, lot line, public street, public alley, public way, or means of egress.
  - Requires a fire safety plan to be provided which must include emergency response actions to be taken upon detection of a fire or possible fire involving lithium-ion or lithium metal battery storage.
  - Requires explosion control.



WAC 51-54A-1207

Transportation Electrification Strategy

- Goal: Close the Greenhouse Gas Emissions Gap
- Recommends policy priorities
- States intention to create a circular battery recycling economy
- Prioritizes charging locations: hospitals, park-and-rides, airports, transportation hubs, parks, ports, libraries, municipal buildings
- Recommends training resources for firefighters/first responders
- Establishes metrics for tracking impact of electrification on carbon emissions and charging infrastructure

Transportation Electrification Strategy

2024 policy priorities (Commerce's responsibilities)

- Fund public information campaigns to incentivize adoption
- Pass legislation to extend/expand sales tax exemptions on EVs
- Conduct rulemaking related to clean fuels, vehicle efficiency, etc
- Expand community charging programs through formula funding
- Create a state-supported low-cost leasing program
- Support planning/building of utility-side grid infrastructure for charging

Progress moving forward

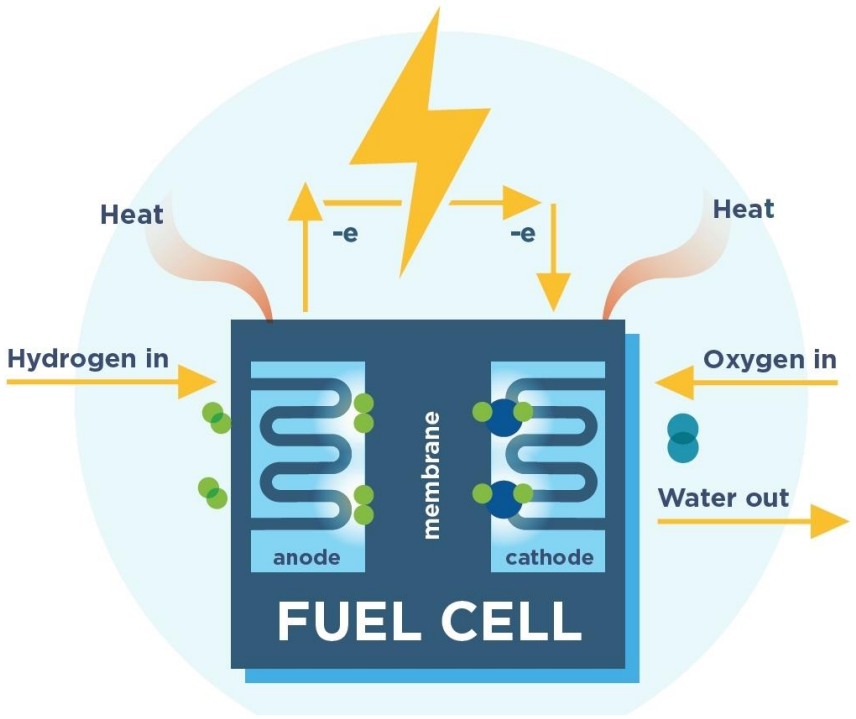
- Collect and/or develop responder guidance
- Collect and/or develop mitigation guidance for device owners
- Support development of training recommendations
- Develop the Renewable Energy Emergency Response Framework
- Identify legislative recommendations and work with partners
  - Example – E-Stops for level 3 chargers
  - Working jointly with L&I and SFMO as new technology is introduced in WA

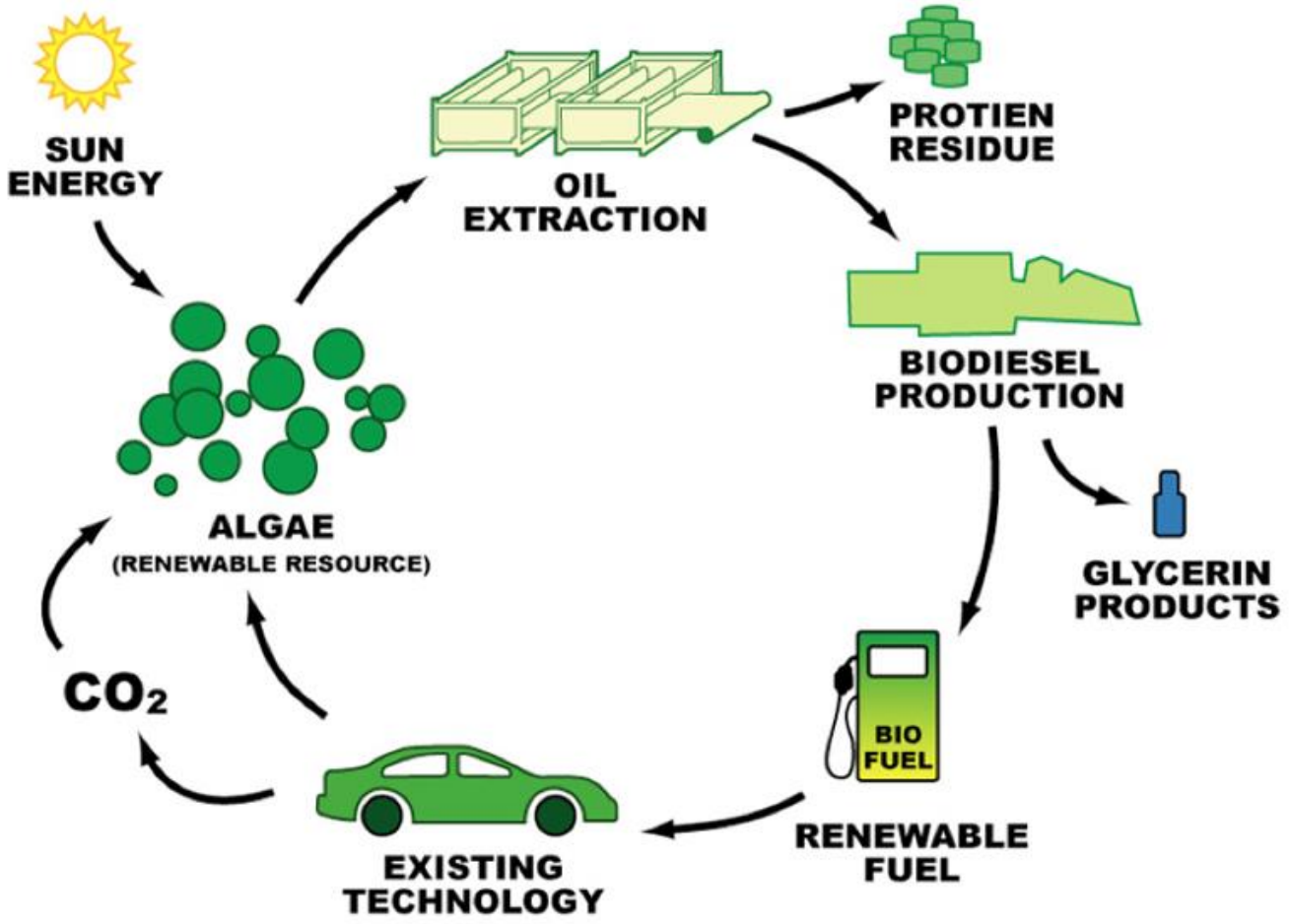
Technological Future

Batteries and beyond

Technological Future: Alt Fuels

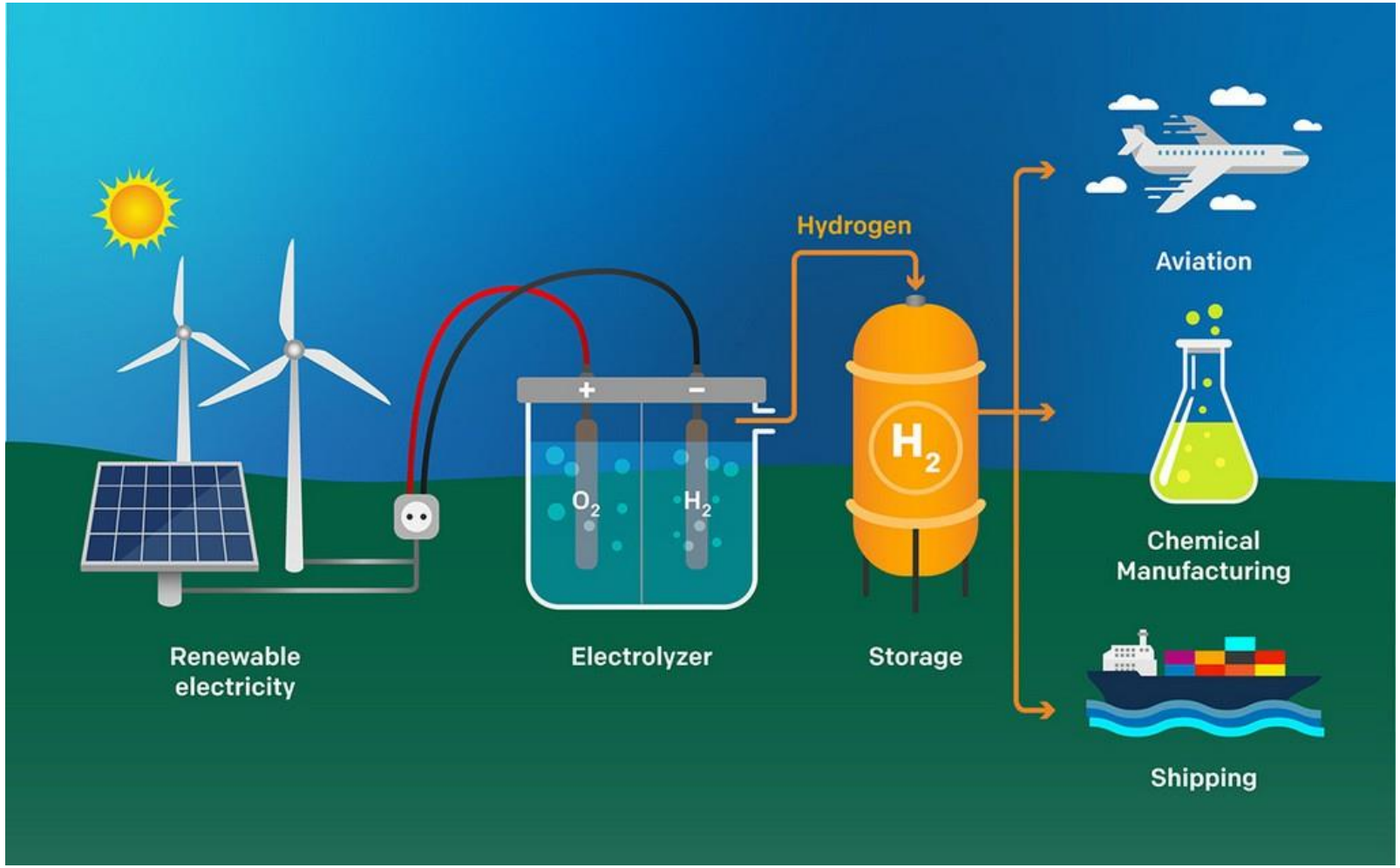
- Hydrogen Fuel Cells
- Bio fuels





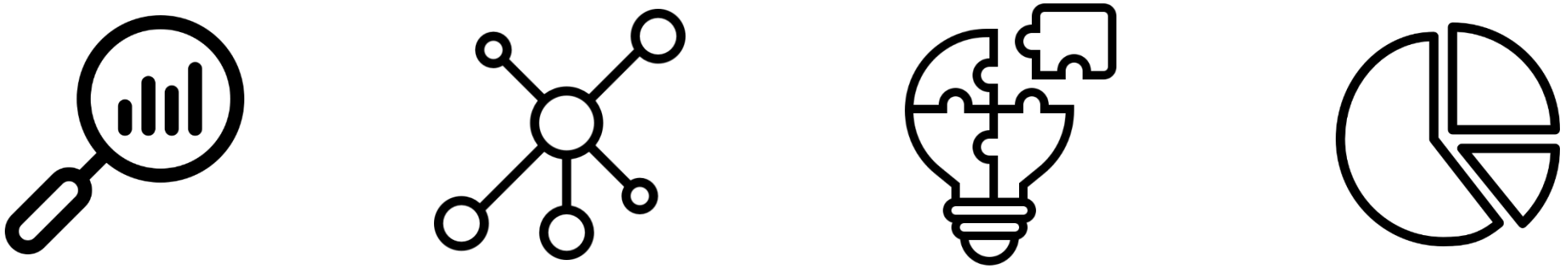
Technological Future: Generation

- Green Hydrogen
- Tidal
- Natural Gas
- Small Modular Reactors (SMR)
- Solar/microgrids
- Wind



Supportive Research

- Grid Analytics – understand demand to plan growth
- Grid Architecture – provide framework for grid modernization
- Cybersecurity – protection and information sharing
- Energy Storage – develop innovative solutions for storage
- Resilience & Decarbonization – research emerging tech



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Thank you!

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