

Community Partner

Clallam County Sheriff's Office
 Port Angeles City Light
 Community Liaison: Diane Harvey



Co-Design Goals

Motivated by Clallam County's 2023 Climate Action Plan

- > Explore vehicle electrification options to meet emission reduction goals, reducing the largest source of carbon emissions.
- > Estimate impacts of EV implementation, building improvements, and other energy upgrades on total energy costs and capital investment needs.
- > Ensure peak demand falls within utility's existing 1000 kVA capacity.



Methodology

- > Weekly team meetings, a site visit, and multiple utility info exchanges ensured data-gathering and understanding of the systems needed to set design requirements under realistic constraints.
- > Building and vehicle energy models were created using monthly electricity bills, vehicle fuel & mileage data, drawings and site maps, prior technical reports, and HVAC site-visit data.
- > Scheduling energy resources and financial analysis relied heavily on the use of hourly load profiles developed from building and vehicle models, entered into NREL's REopt software tool.
- > Results of co-design were reported in a manner to easily inform decision-makers about options and help grant-writers pursue capital funds to enact the county's priorities.

Outcomes

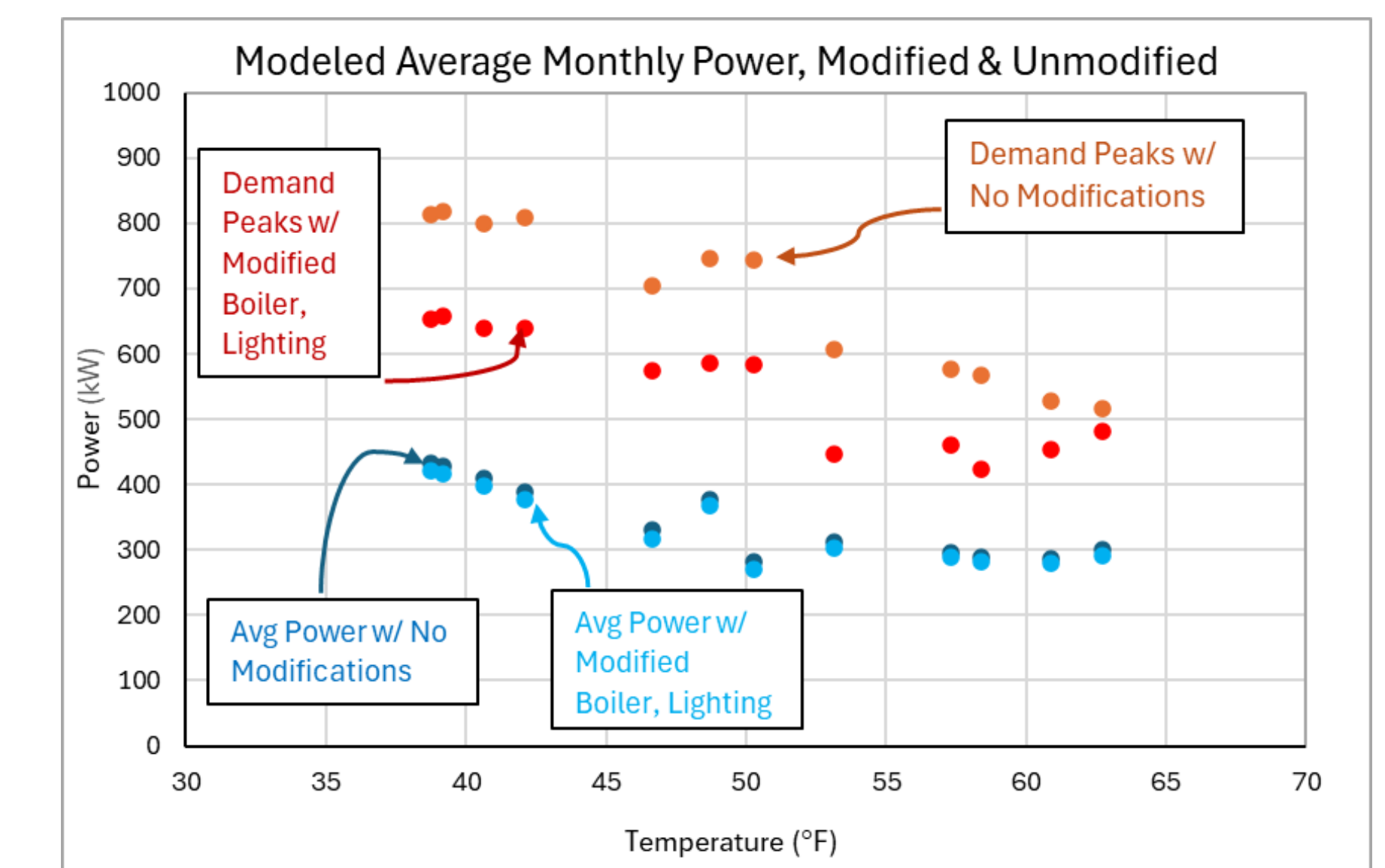
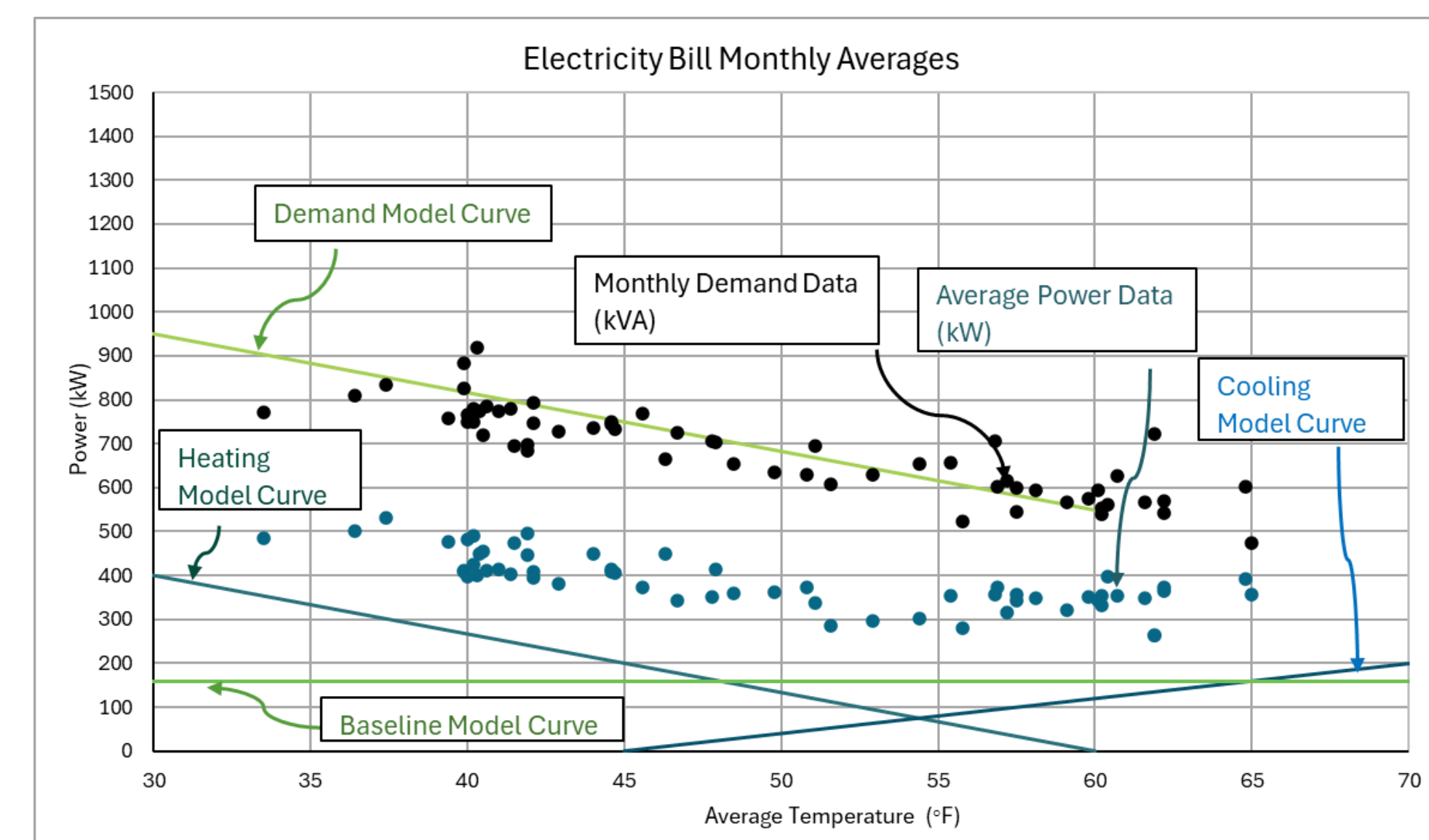
- > Transitioning 20 light-duty vehicles to EV alternatives (32% of fleet) reduces travel-based carbon emissions by 59%, saving 1700 metric tons of CO₂ over 10 years.
- > Vehicle electrification can save \$400,000 over 10 years in transportation energy costs.
- > Vehicle electrification is easily scheduled into the 1000 kVA capacity of existing utility infrastructure, with capacity to allow for future EV expansion.
- > Building upgrades and behind-the-meter generation improve the energy efficiency of the site and provide additional resiliency benefits.
- > Capital investment in the courthouse boiler has an unsubsidized payback under 10 years. The lighting plan, solar, and battery storage will require grant subsidy to achieve 10-year payback.

Next steps

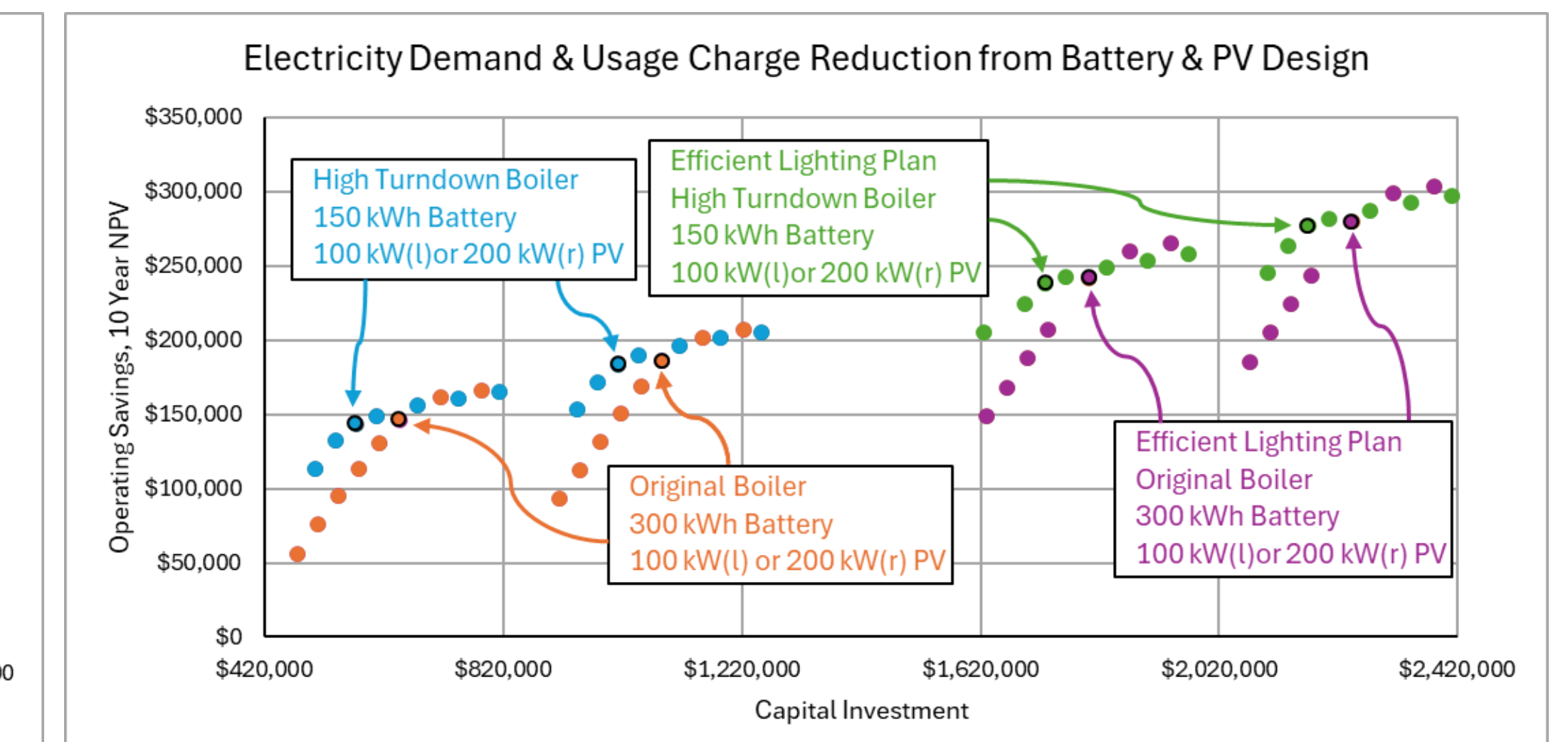
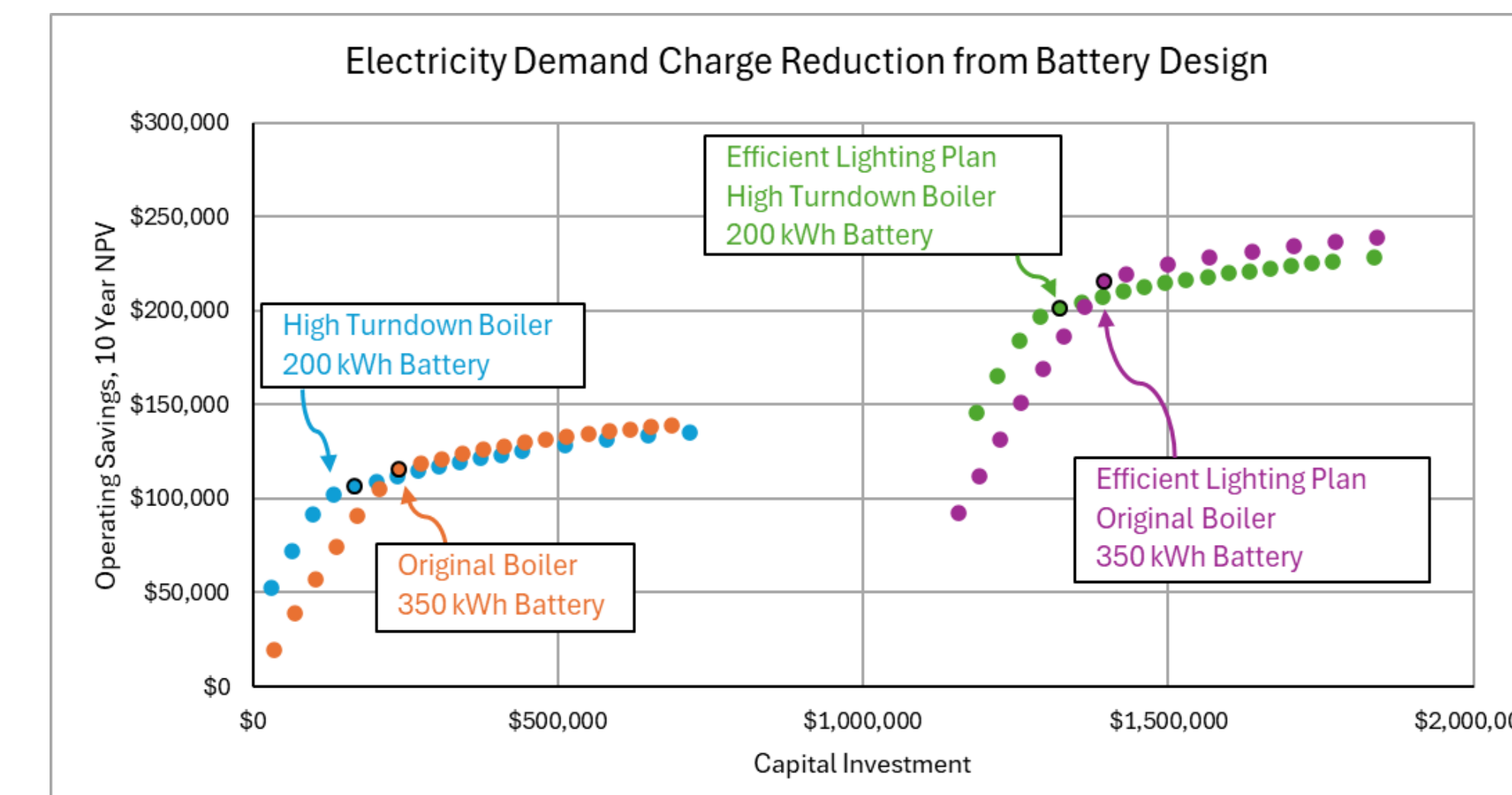
- > Present to Clallam County Board the proposed design outcomes and recommend future scoping of energy efficiency modifications, electricity charges (usage & demand), and additional resiliency provided.
- > Recommend professional analysis of transportation patterns to optimize EV transition.

Design Process

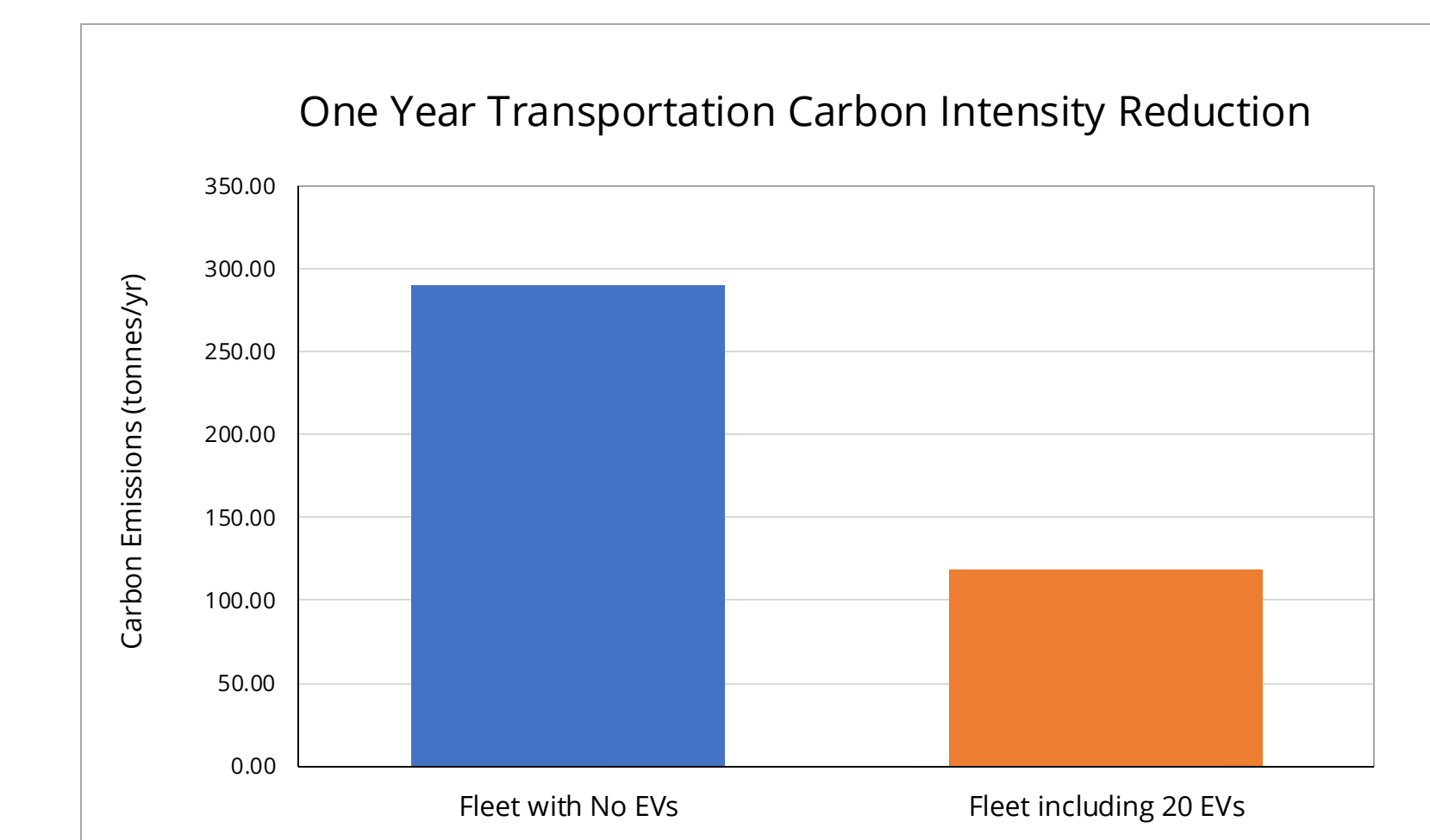
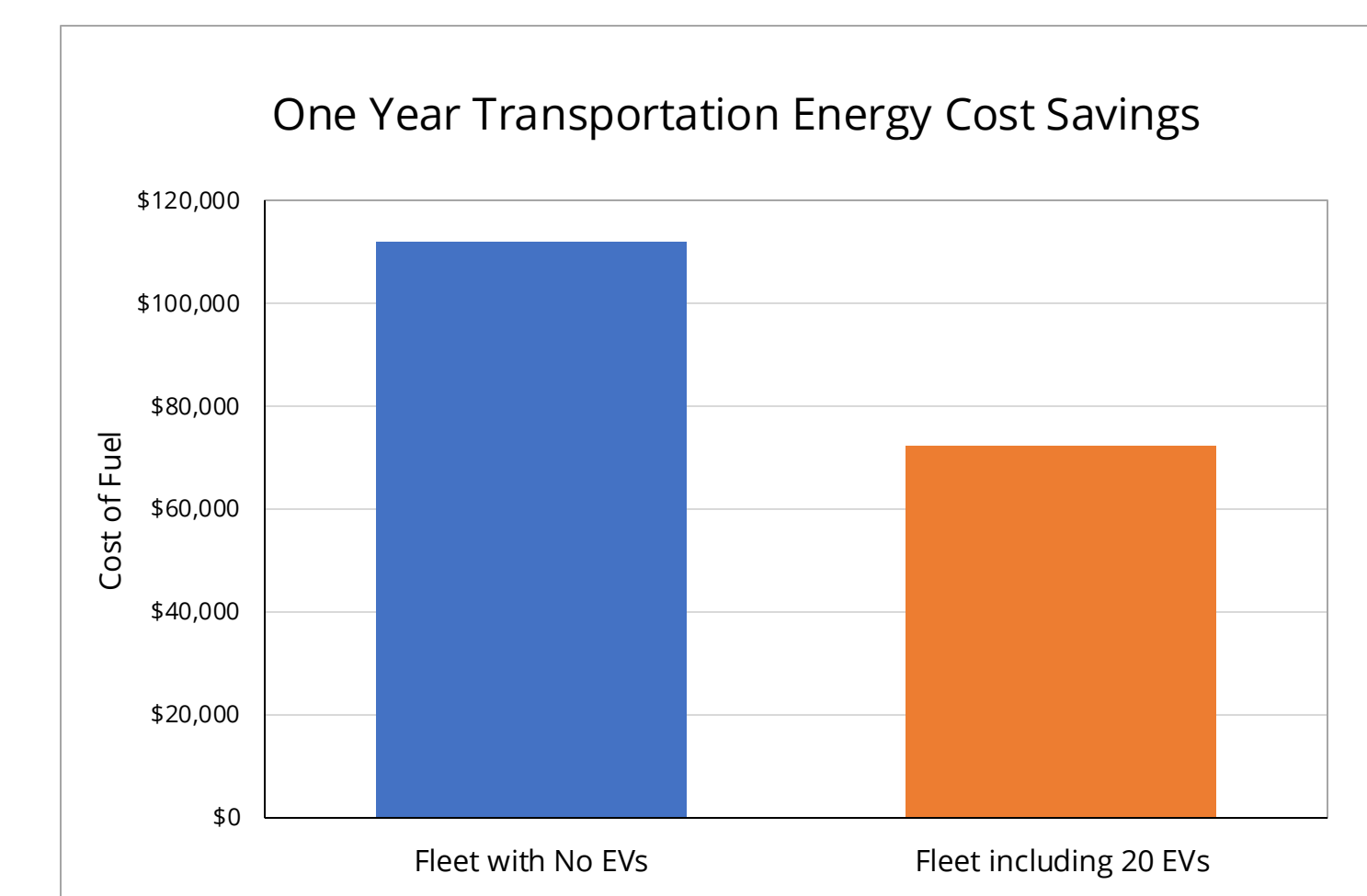
Electricity bill data to monthly power and demand models



10-Year Net Present Values (NPVs) show operating savings and capital investments needed for various design options. Any designs where capital expense exceeds 10-year NPV will require grant subsidy to achieve payback in that period.



Fleet EV transition: Fuel cost savings and CO₂ intensity reductions from transitioning 20 vehicles to EV



Impacts of EV schedules on hourly loads under typical winter operations (higher average and peak building loads) and summer operations (lower average and peak loads)

