

Overview of Preliminary EV Charger Needs Assessment Results

This document summarizes key findings from the draft EV Charger Needs Assessment conducted by Energy and Environmental Economics (E3) for the City of Palo Alto. The report models the level of EV charging infrastructure needed to meet the City's "80x30" climate goal—reducing greenhouse gas (GHG) emissions 80% below 1990 levels by 2030—and assesses the costs and business models that could support this infrastructure buildout.

Overview and Key Findings

Palo Alto will need to electrify a large share of its vehicle fleet to meet emissions reduction targets. The City's electrification goals, combined with State mandates, suggest that at least 42,000 to 50,000 light-duty electric vehicles (EVs) could be on the road by 2040, along with commuter and visitor EVs and medium-duty and heavy-duty fleet EVs.

To support this transition, the City will need between 35,000 and 60,000 EV chargers across all use cases (home, workplace, public, and fleet). Two charging scenarios were modeled to illustrate the opposite ends of that range: a "Light EV Charging" scenario with limited public charging and lower adoption rates, and a "Robust EV Charging" scenario with higher EV adoption and substantial public infrastructure investment. Under the robust scenario, Palo Alto would act as a regional "charging hub" for commuters and visitors. Up-front charger costs rise substantially in the robust scenario but are offset by increased utilization and charging revenues if care is taken to ensure charging capacity aligns with demand. The Robust EV Charging scenario assumes high demand.

Business Models and Cost Recovery

The analysis examines multiple business models for charger deployment, including City-owned, third-party owned, and Charging-as-a-Service (CaaS). Public chargers—particularly DC fast chargers—are substantially more expensive than home chargers, but can serve more vehicles and are necessary to support drivers without home access. A key finding is that prioritizing home charging for multifamily residents can offer a lower-cost path than investing heavily in public chargers, especially through a combination of individual L1 chargers and shared on-site L2 chargers or nearby public charging to supplement.

Commuter, Visitor, and E-Bike Considerations

Palo Alto's strategy must also consider how much charging infrastructure will serve non-resident commuters and visitors. A low-support strategy serving 25% of this population's charging would require about 3,000 public and workplace chargers. Supporting 75% of commuter/visitor charging would require about 16,000 chargers, a level that would require that public charging in Palo Alto be significantly cheaper than home charging or that many commuters and visitors buy EVs even if they do not have access to adequate home charging and charge them in Palo Alto. It would require charging costs of approximately \$0.42/kWh to recover the costs of up-front capital investment. This is comparable to PG&E home charging rates in surrounding jurisdictions, meaning that careful evaluation will need to be done site by site to ensure chargers are fully utilized and overbuilding does not occur.

The report also evaluates the role of e-bikes in reducing vehicle miles traveled and GHG emissions. Incentivizing e-bike use for commuting and errands can provide cost-effective emissions abatement, especially if paired with supportive infrastructure, but in many cases does not represent a cost savings over driving, unlike conventional bicycling, unless the e bike is used for 2,500 to 3,000 miles per year (about 6.8 – 8.2 miles per day if used every day or 12.5 – 15 miles per day if used only for work trips). But these numbers are highly dependent on assumptions about the cost of the bicycle, which ranges widely, and annual maintenance, which can also vary significantly.

Policy Considerations

The assessment surfaced the following policy considerations:

- Certain customer segments have higher barriers to adoption, such as renters and multifamily residents. Creative business models (such as CaaS) will be critical to helping landlords serve the former, while policy decisions about whether to pursue a public-focused or home-focused charging strategy are critical for the latter.
- Investment decisions in public charging should account for charger utilization and alignment with customer preferences (e.g., preference for DC fast charging). Mapping of nearby uses and staged investments may help avoid overbuilding.
- Business models should be tailored to customer type and ownership model, with flexibility to combine public, private, and CaaS approaches.
- Public funding may be needed in locations the private market will not serve, such as low-income multifamily buildings.