Discussions about Level 1 (L1) and Level 2 (L2) electric vehicle charging generally posit a simple tradeoff: L2 (which requires a dedicated high-capacity electrical hookup) offers greater speed and convenience, while L1 (which can run on a standard 120V outlet) offers broader scale and affordability. L1's benefits find particular traction in residential charging spaces–where drivers parking overnight may not need high-speed charging, and lower-power equipment can help multifamily buildings overcome complex installation barriers. New project data affirms these L1 advantages while assuaging some legitimate concerns about income-differentiated charging convenience among single- and multifamily residential EV drivers.

Following the publication of our case study analysis of equitable strategies to advance multifamily charging, CLEE connected with Peninsula Clean Energy (PCE), the San Mateo County community choice aggregator, about the use of L1 in its various EV charging installation projects. Throughout its projects, PCE has accumulated data insights that reveal how L1 and L2 charging decisions unfold when met with consumer preferences and budget constraints. Here are some of their findings:

- **PCE's average project cost per L1 port ($2,300) is roughly one third of the average cost per L2 port ($7,300)**. This L1 cost advantage holds even when considering the most cost-effective L2 ports.
- **The cost-mitigating benefits of L1 ports persist even when L1 installations require electrical upgrades.** Fewer labor hours, simpler installation procedures, and easier bulk installations keep L1 project costs significantly lower than L2 projects of comparable sizes and panel upgrade requirements.
- **On average, multifamily properties are willing to increase the overall scope of their projects by about 150% after PCE's technical evaluation introduces the possibilities of L1 charging.** For example, building managers may alter their initial request for four L2 chargers to ten L1 chargers after receiving technical assistance. PCE suggests that building managers' initial L2 requests stem from L2's dominance in public perceptions of "standard" residential charging.
- **Single-family household drivers are more willing to accept low-power charging than you might expect.** Among PCE's single-family residential charging installations, almost half have opted for either L1 or low-power L2 charging.

What does this mean for equity?

An equitable clean mobility transition should not leave multifamily housing residents with an inferior charging experience, relative to single-family household residents; a charging convenience gap (or higher costs) between renters and homeowners would be a downgrade from the status quo. Considering PCE's recent data alongside many states' rapidly approaching EV sales requirements, those seeking to secure an equitable and rapid EV transition should encourage multifamily building owners' consideration of L1 charging where appropriate.

The large proportion of single-family household PCE clients who opt for low-power charging narrows the impression of a preference-driven charging gap between renters and homeowners. Furthermore, in financially and electrically constrained buildings that require electrical upgrades to add charging, L1 can mean the difference between zero charging availability and several available units. L1's widened project scope is consequential; ten chargers instead of four could replace competitive L2 scheduling burdens with abundant overnight access that meets the majority of driving needs. In a mobility transition that elevates reliable, passive residential charging as a central benefit, scale may sometimes yield more equitable outcomes than faster charging speed.

L1 and L2 EV chargers each serve key roles in the clean mobility transition, and their distinct qualities evoke a tradeoff between convenience and affordability. PCE's project data suggests that in practice, this tradeoff is less pronounced than people may think.

This blog post is based on conversation with and a September 2024 presentation by Phillip Kobernick, Associate Director of Energy Programs at Peninsula Clean Energy. The findings expand on recommendations made in CLEE's August 2024 report on multifamily charging strategies and by national groups such as the EV Charging for All Coalition.