

Silicon Valley Power 100% carbon neutral by 2035

Silicon Valley Power currently procures, produces and delivers a diverse portfolio of energy resources that is based on the customer load shape as per utility best practices. This practice optimizes utility resources and the energy markets to deliver safe, reliable energy to the City and has achieved rates that are 27% to 53% lower than the surrounding utilities.

Silicon Valley Power is building the foundation of resources to achieve the 2045 100% carbon neutral goal per Senate Bill 100. In the original analysis for the CAP, it was expected that SVP electricity would be 70% carbon free as of 2035. In response to the suggestion to accelerated City's CAP goal faster than the State's requirement which can be achieved in one scenario if SVP reaches 100% carbon neutral by 2035, SVP has done a cursory examination a simple procurement scenario to achieve the accelerated goal. The scenario does not factor in other costs such as:

- transmission upgrades
- resource adequacy
- grid stability
- future technology changes

The scenario is simply the resource procurement costs that are based on California's current carbon accounting requirements. This is the only realistic approach that can be taken within the limitations of a CAP analysis.

The simple scenario reflects the cost to customers to cover energy emissions on the basis of total annual energy load or the remaining 30% of the energy load that was not expected to be carbon-neutral in 2035 (to go from the expected 70% of the annual energy volume being carbon-neutral to the proposed 100% goal). This volumetric energy approach means that SVP would need to buy energy beyond what it will use. In simple terms, SVP would purchase a total of 130% of the energy it actually needs with 100% being carbon free and 30% not carbon free. SVP could at then claim to be 100% carbon-neutral since it has purchased enough carbon free energy to serve 100% of it needs. However, this doesn't change that the actual energy delivered to customers will likely include sources that are not carbon free. While this approach might seem unusual, this strategy is similar to what many surrounding utilities do to make a claim of carbon-neutrality now or in published future plans.

This strategy does not account for carbon used when carbon-free resources are not available and generally allows continued use of fossil fuel generations for reliability purposes. The current accounting practices allows utilities to cover emission hours with carbon-free resources which occur at a different time or season. Based on the 2031 projected load of 8,293 Giga-Watthours (GWWhs) – the farthest out year for which a forecast load has been developed -- SVP would need to acquire an additional 2,488 GWWhs annually of eligible carbon-free energy to meet the volumetric requirement. Assumptions were made based on current uninflated contract pricing for solar or wind and transactional energy markets. Using the simple volumetric process, the net cost of additional resources to meet the 100% carbon neutral accounting would cause rates to be 17% to 27% higher than the base case depending on the source of carbon-free resources.

Current available technology to store electricity produced by intermittent generation such as solar and wind, namely batteries or bulk electric storage systems would be an additional cost. It is important to

recognize that batteries do not produce electricity themselves but just holds the electricity otherwise produced, at the loss of some volume, until the electricity is needed. Enough battery storage must be installed to cover all hours of need, which by example if using only solar generated electricity would require enough storage to provide power all night. However, most batteries in use to date have a discharge period of four hours or less than a full night. First, based on recent procurement requests by SVP and other utilities indicative current pricing to procure and install these bulk electric storage systems and, secondly, making a simplified assumption that only 75% of the additional procured renewable power would need to be shifted to different times (mostly from day to evening and through the night) via a bulk electric storage system that in total would add an additional 28% increase to rates above the simple procurement scenario.

Thus rates 44% to 55% higher than the original scenario in the CAP analysis would be required in order to meet a combined renewable electricity purchase and time-shifting storage carbon-neutral target in 2035. Staff had anticipated that rates would continue to increase by approximately 3% a year (typical yearly increases). The below table provides a summary of rate differences between current rates, and the possible future rates:

	2021	Theoretical Rate 2035 Typical Increase	Theoretical Rate 100% Carbon Free Goal
Low User	\$ 38.20	\$ 57.78	\$ 89.56
Average User	\$ 55.30	\$ 83.65	\$ 129.65
High Users	\$ 130.50	\$ 197.39	\$ 305.96

SVP's next Integrated Resource Plan, due to council in late 2023, will examine the various resource scenarios to achieve carbon neutrality 2035 in comparison to the roadmap to carbon free 2045 using more sophisticated analysis, latest generation and storage resource options and with fuller analysis of achieving hourly clean energy goals, impacts on affordability and economic development, and state reliability requirements.