

DavisFREE

A project initiated in Davis, California three years ago points instead to opportunities for unprecedented collaboration between cities and energy utilities. The project, entitled Davis Future Renewable Energy and Efficiency, aka DavisFREE, mined city databases for permitting and housing statistics that could be used in tailoring net zero retrofit programs to individual neighborhoods. In parallel, information in utility databases was used to analyze trends in energy usage and on-site solar deployment. The [final project report](#) was released by the California Energy Commission in April, 2016.

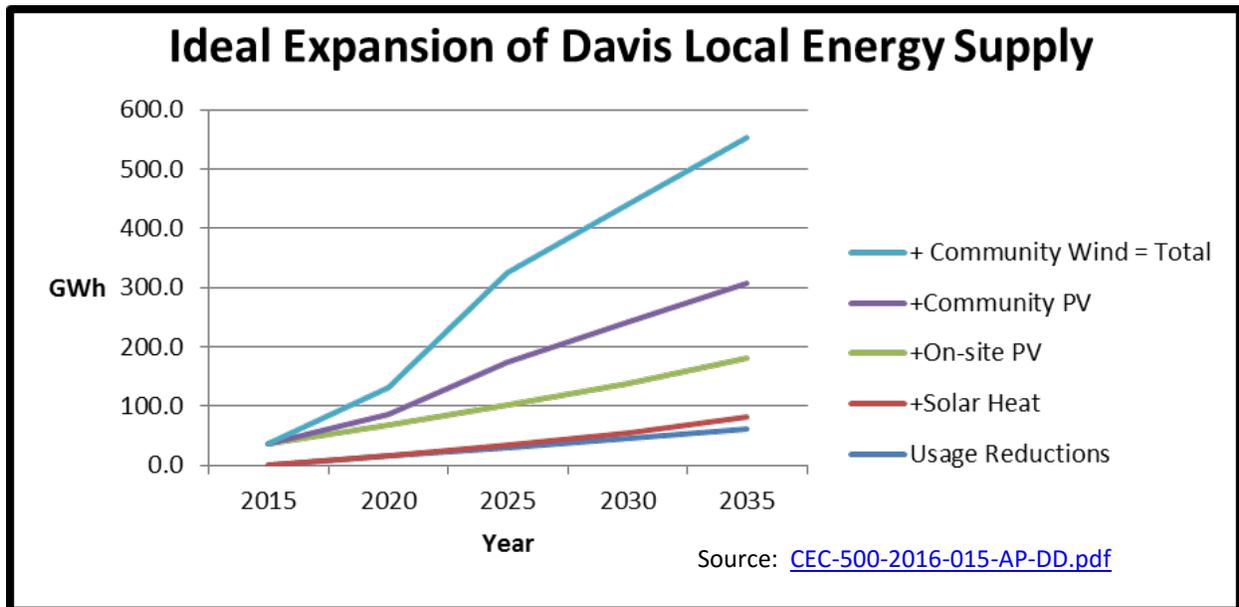
Davis is a settled, low-growth community that is bounded by zoned prime agricultural lands. It therefore cannot expect community-scale zero net carbon and energy goals to be strongly influenced through new high-performance building construction. Rather, Davis must focus on available energy retrofit opportunities for existing building stock. They will dwarf the impacts of net zero new construction in the years to come.

Significant renewable energy capacity (on-site solar thermal water heating and photovoltaics) can be employed almost immediately. Indeed, in the past four years, the percentage of single family homes in Davis served by rooftop solar electricity arrays increased from 10% to 25%, on the way to a target of 50% by 2020. Meanwhile, through programs offered by a local community choice energy service, incremental “deep” energy efficiency improvements can proceed using the [Near Zero Energy Neighborhood Volume Marketing Approach](#) developed by [BIRA Energy](#) and applied to Davis building stock under DavisFREE. Likewise, community choice will open a pathway for development of local community-scale renewable energy systems that will offset utility grid energy usage for groups of residents or businesses that, for whatever reason, are not able, or prefer not to, install on-site generation.

The success of California’s “efficiency first” policy is largely dependent on what incumbent utilities offer in terms of incentives and programs, and therefore essentially places and keeps one community on the same limited track as every other community. Davis intends to move more aggressively forward with renewable energy as its best path to achieving net zero carbon goals.

The DavisFREE project evaluated alternative electricity service scenarios as well as scenarios for substitution of electricity for heating and powering vehicles and substitution of solar heat for natural gas. Likewise, the project evaluated the potential of electricity storage in resident-owned vehicles to be employed in demand response and load shifting in order to minimize electricity imports from the regional grid. The related “integrated energy analysis” is covered in a [separate report](#). It shows that the level of zero carbon local electricity production enabled by

community choice could, within twenty years, meet the community's entire energy requirement, including the bulk of its transportation usage.



In summary, DavisFREE investigated a pragmatic approach to the development of community-based renewable energy resources as well as building-integrated, cost-effective renewable energy technology options that can be owned and operated by individual homeowners, businesses, and institutions.