



Zero Carbon

SCP's mission is to electrify everything and provide affordable, reliable renewable energy 24/7. This goes beyond California's current "net zero" concept, and ensures that all energy is carbon free, without needing to be supported by natural gas power plants or other climate-harming sources. The design will reflect these values.

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The David & Lucile Packard Foundation

Los Altos, California

Year Completed : 2012

Size : 49,000 SF

Certified Net Zero Energy Building (ILFI)

LEED Platinum certified (2009)

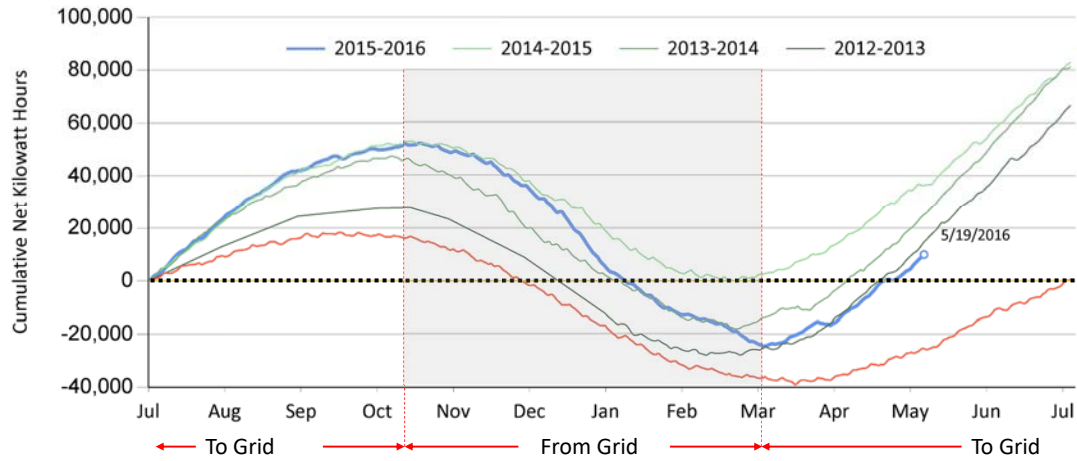
All Electric Building



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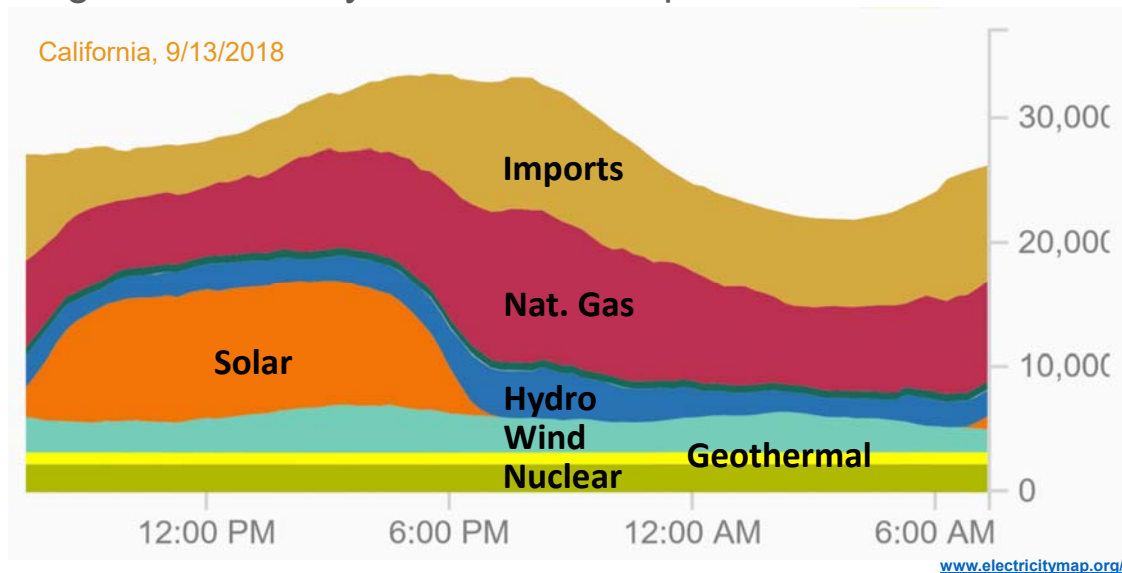
Net Zero Energy (i.e. Using the Grid As a Battery)



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Origin of Electricity over a 24 hour period

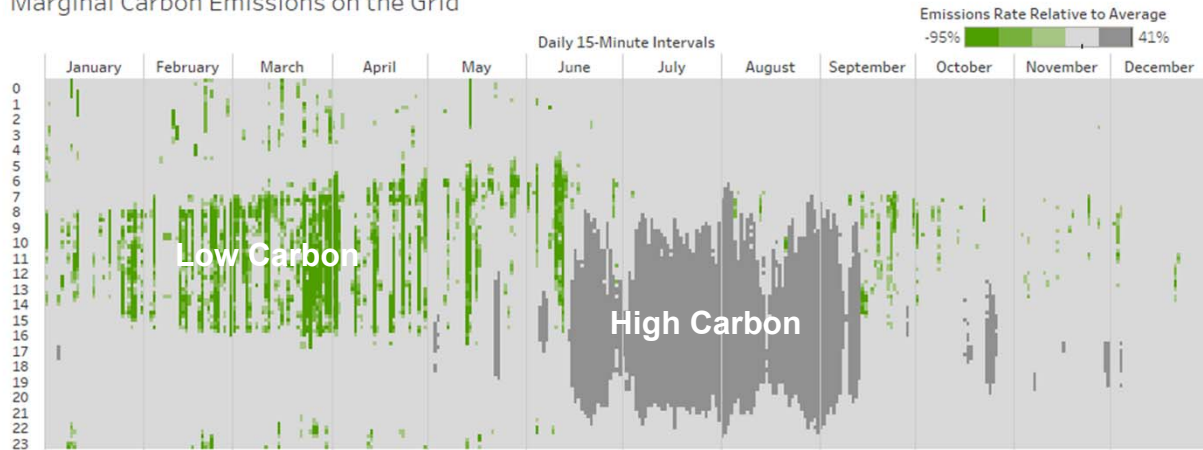


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Carbon Intensity of the Grid Varies Over Time

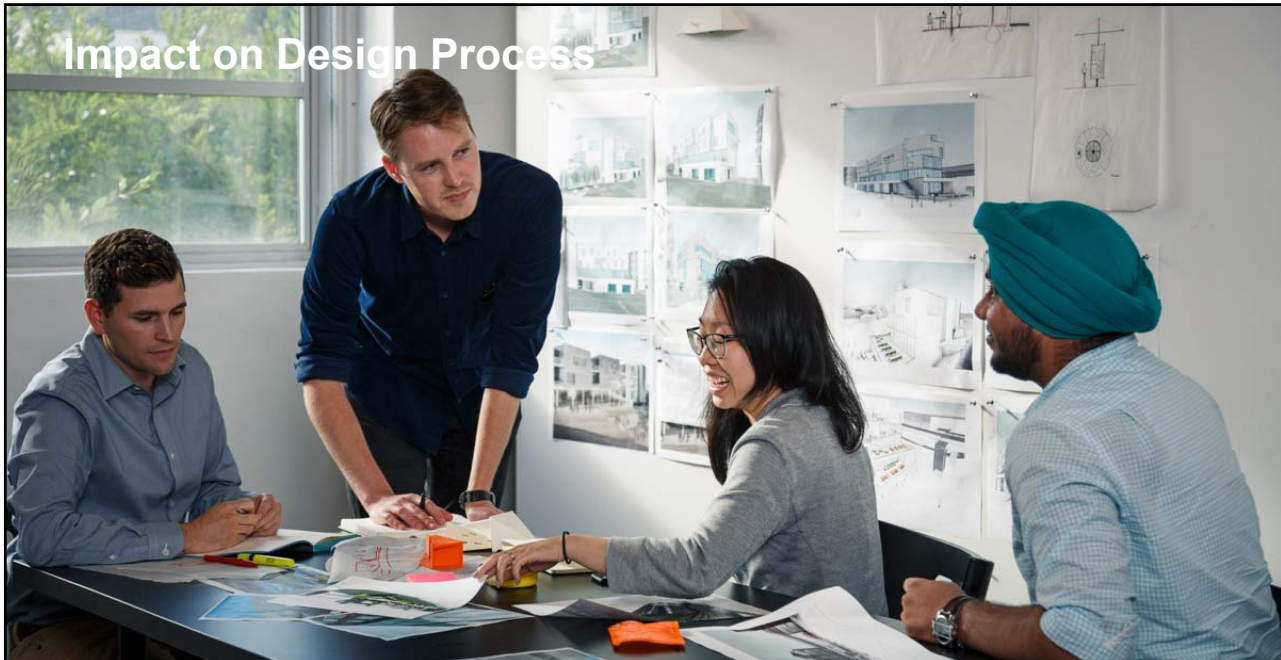
Marginal Carbon Emissions on the Grid



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Impact on Design Process



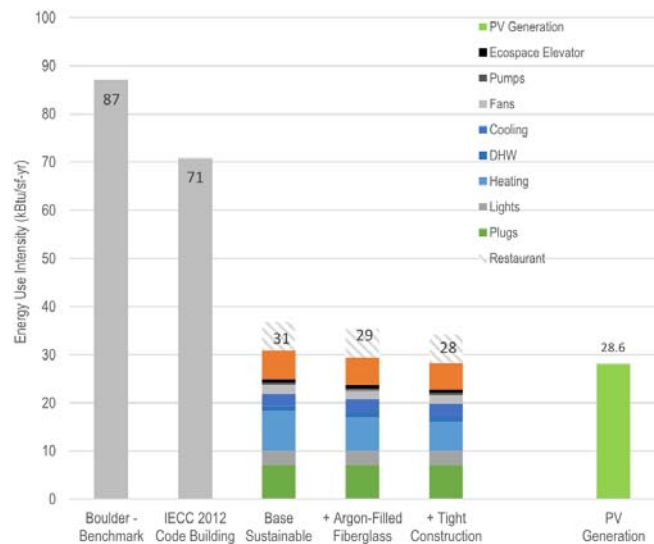
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Design for Net Zero Energy

Reduction in annual energy use

Efficiency measures that reduce energy cost

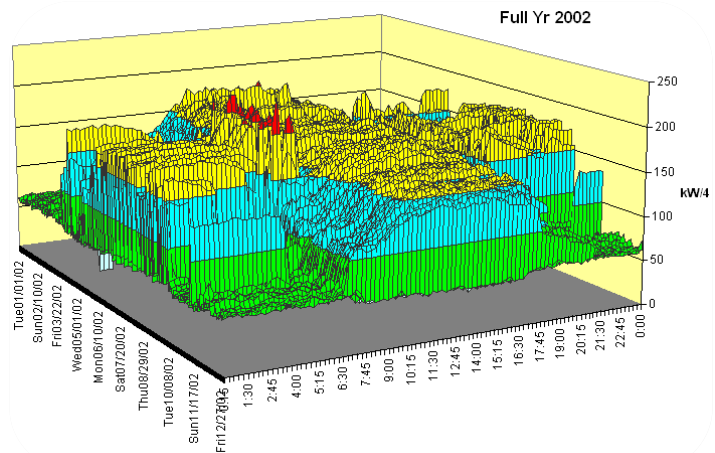


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Design for Carbon Neutral & Grid Optimal

Building design evaluation to include load shape predictions over 24 hour and 265 day periods

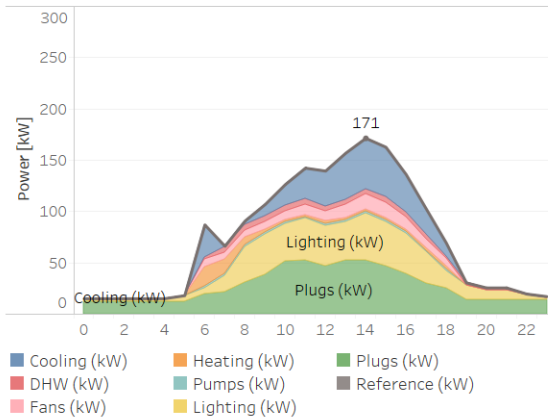


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Design Measures Can Change Load Shape

Code Compliant, San Francisco, CA - September



Courtesy of NBI

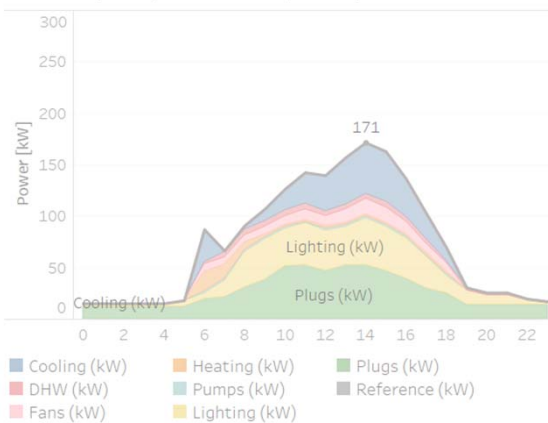
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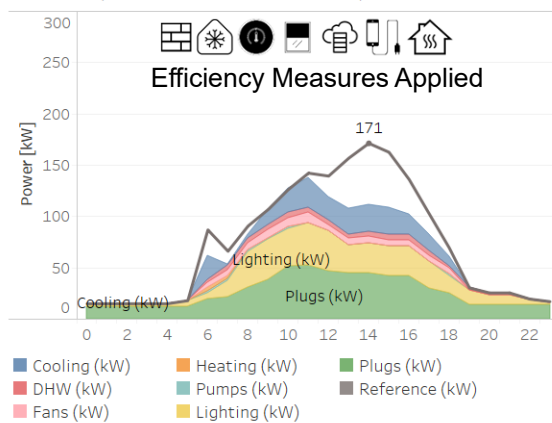
Design Measures Can Change Load Shape

Summer Extreme Potential Package, SF

Code Compliant, San Francisco, CA - September



Code Compliant, San Francisco, CA - September



Courtesy of NBI

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Case Study: Sunshading a Southwest Facade



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Occupant and Operator Engagement



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Sonoma Clean Power Headquarters The First Grid Optimal Pilot Project



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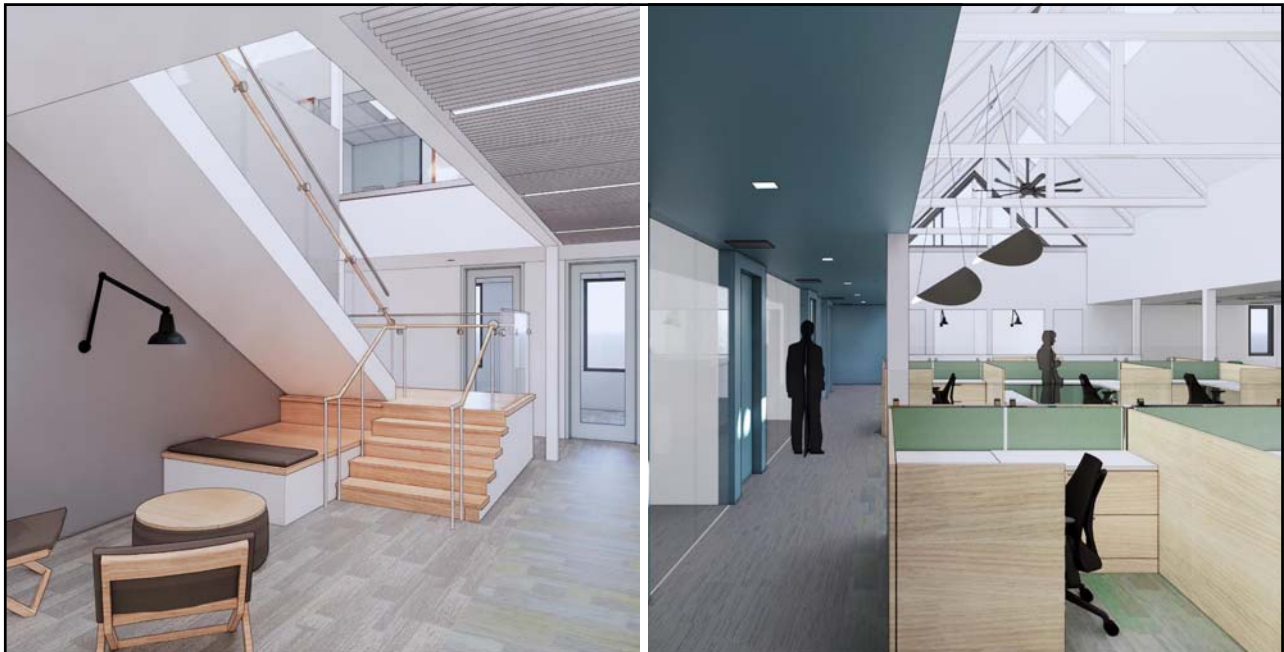
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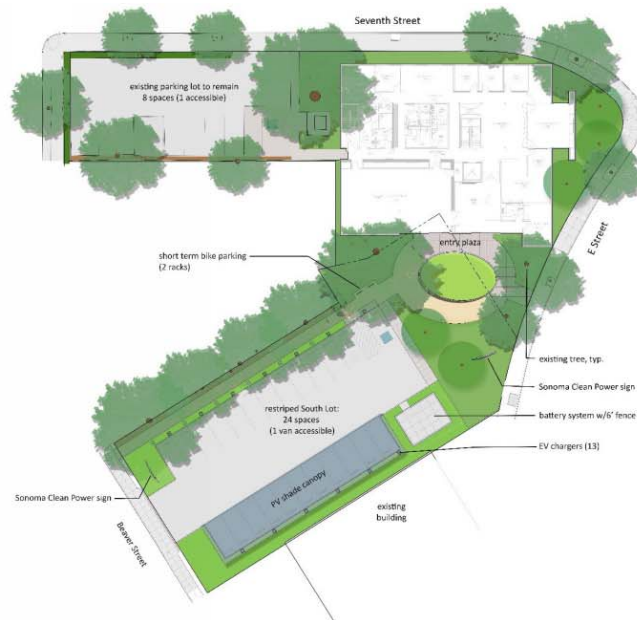


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Fundamental Energy Efficiency Measures

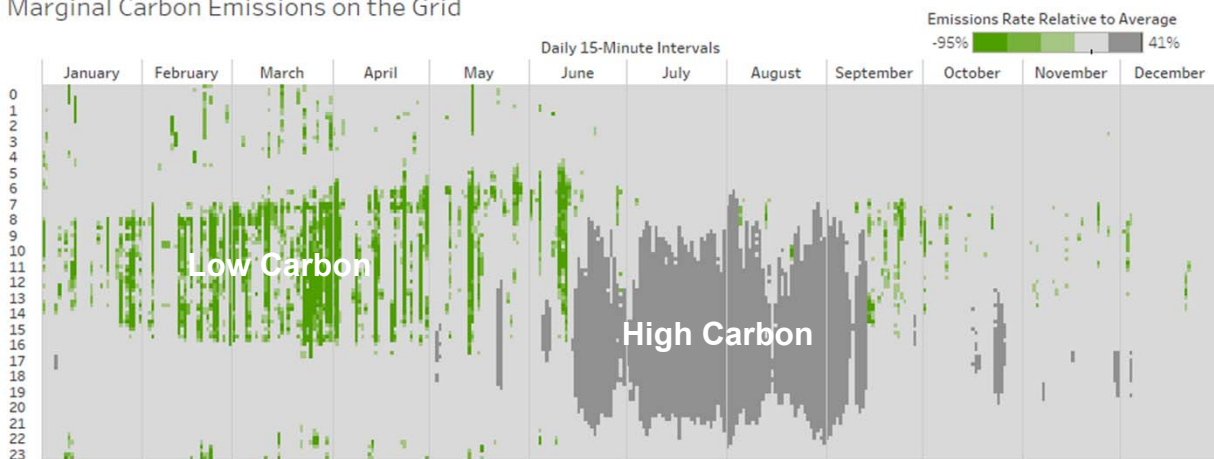
- All Electric: Remove all gas infrastructure
- Upgraded envelope: All new windows, insulation, air sealing
- Exceptional daylighting: add skylighting and increase north windows
- All electric heating, hot water with heat pumps
- Interoperable “smart” thermafusers
- Destratification fans for thermal comfort
- Induction cooking
- 30 kW Photovoltaic Array
- 150 kW battery
- Car charging

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Carbon Intensity of the Grid Varies Over Time

Marginal Carbon Emissions on the Grid

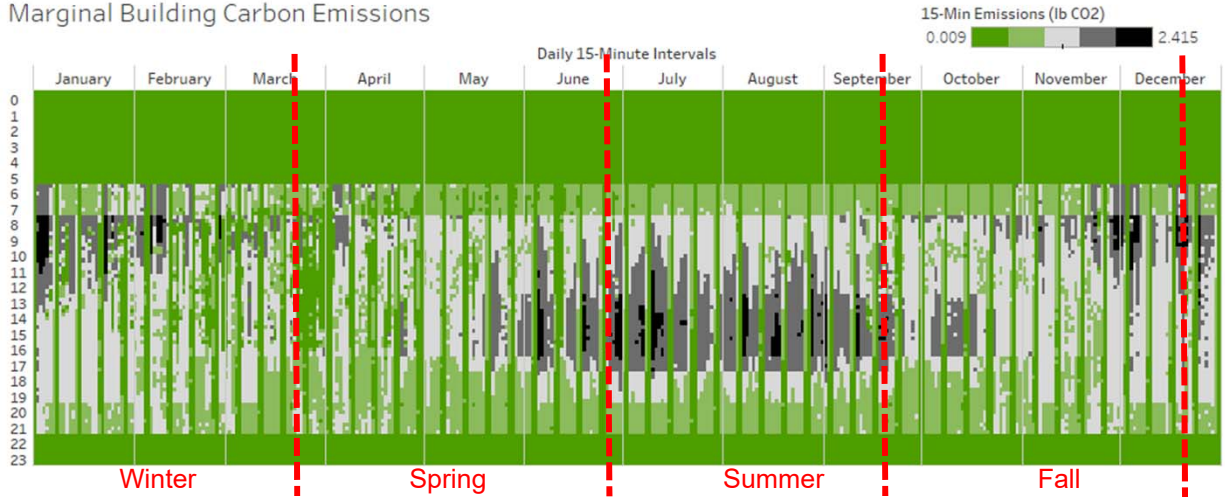


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Project Building Emissions Based on Time of Use

Marginal Building Carbon Emissions



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