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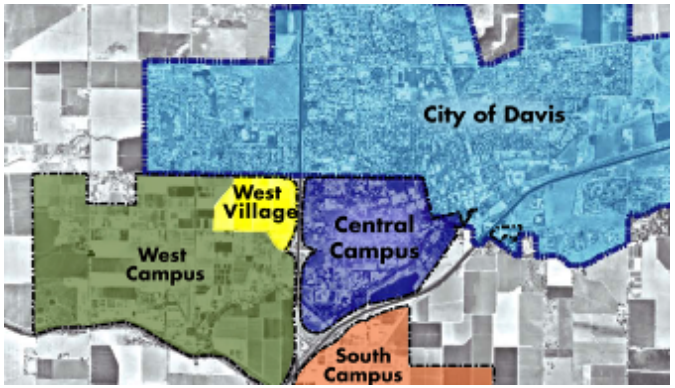


WEST VILLAGE

Zero-Net Energy Community: Moving Beyond Political, Financial, and Operational Challenges

October 18, 2011 | **21st Annual UCLA Lake Arrowhead Symposium**

Benjamin Finkelor

Case Study on 1st US Zero Net Energy Community

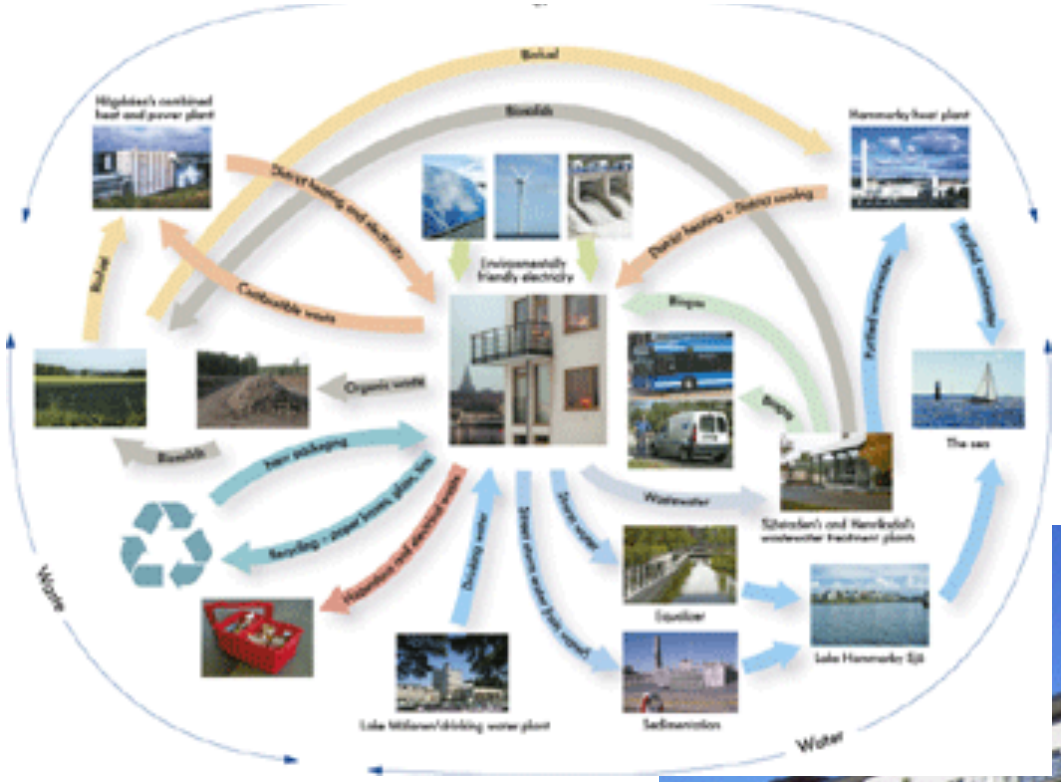
- Zero Net Energy at the Community-Scale
- West Village
  - Large Low Cost Mixed Use Community
  - Learning Laboratory, Striving for ZNE
- Political, Financial, & Organizational Barriers

There are plenty of examples of demonstration ZNE Buildings…

Very few examples of demonstration ZNE Buildings at the Community Scale…

Does this mean ZNE doesn't scale well?

Hammarby Sjöstad, City of Stockholm, Sweden



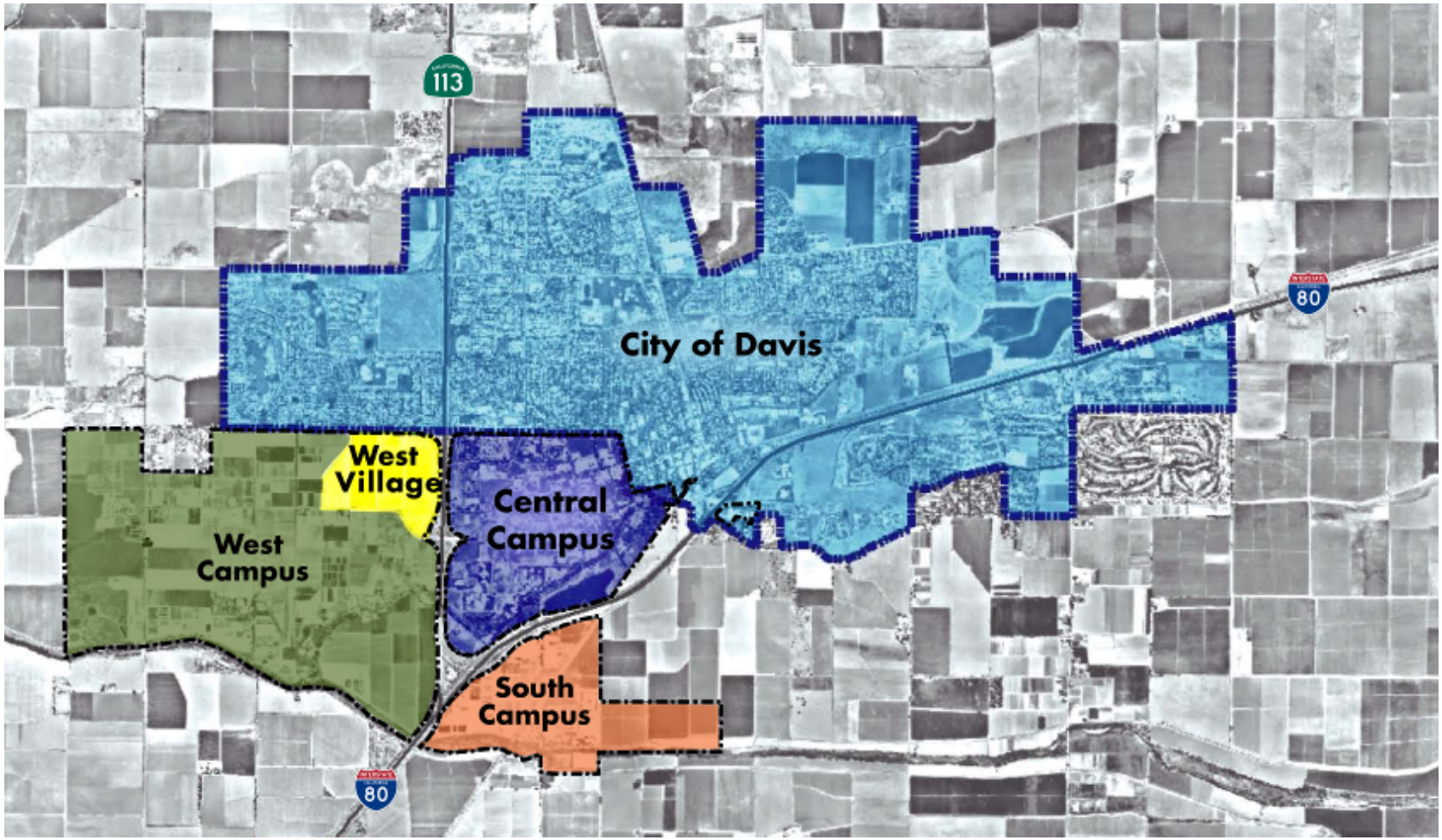
Beddington Zero Energy Development (BedZED), UK

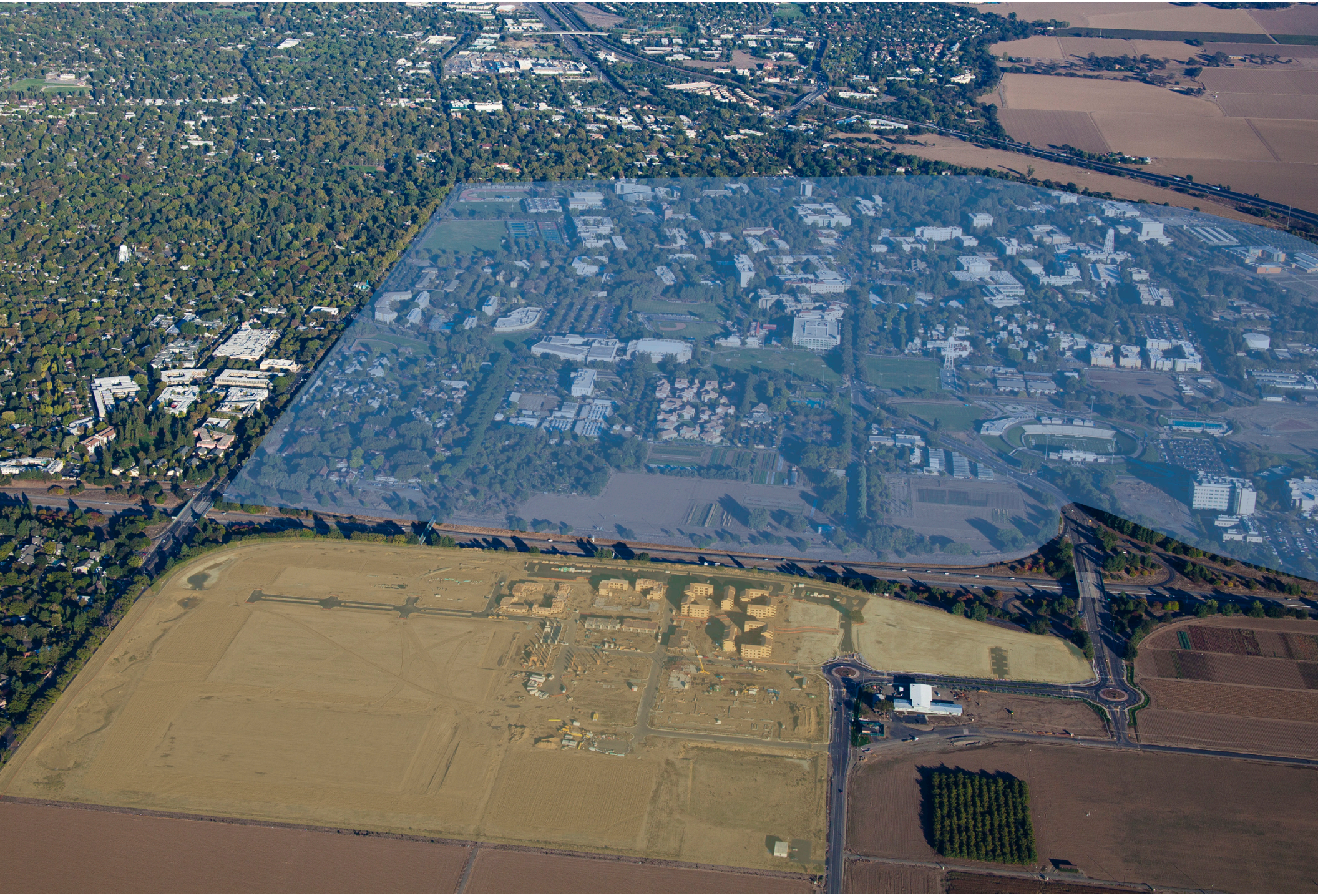
zHome Multifamily Project, Issaquah, Washington

West Village Energy Goals

1. Zero New Additional Cost to the Developer
2. Zero New Annual Utility Cost to the Resident
3. Grid-Connected Zero Net Energy on an Annual Basis
4. Utilize 100% On-Site Renewable Energy

Large Mixed Used Community





Land Use Plan

- Village Square
- Community College (60,000 sf)
- Mixed-Use
  (42,500 sf retail and
  apartment units above)

Land Use Plan

- Village Square
- Community College (60,000 sf)
- Mixed-Use (42,500 sf retail and apartment units above)
- Student Housing (1,980 beds, 663 units)

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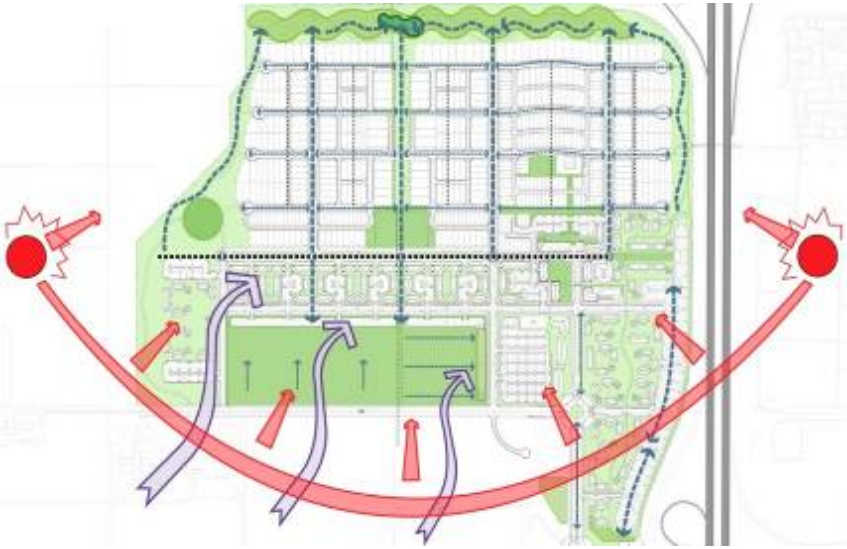
CAMPUS PLANNING

Land Use Plan

- Village Square
- Community College (60,000 sf)
- Mixed-Use (42,500 sf retail and apartment units above)
- Student Housing (1,980 beds, 663 units)
- For-sale Faculty/Staff Housing (343 homes)

Core Principles

- Housing Affordability
- Environmental Responsiveness
- Quality of Place



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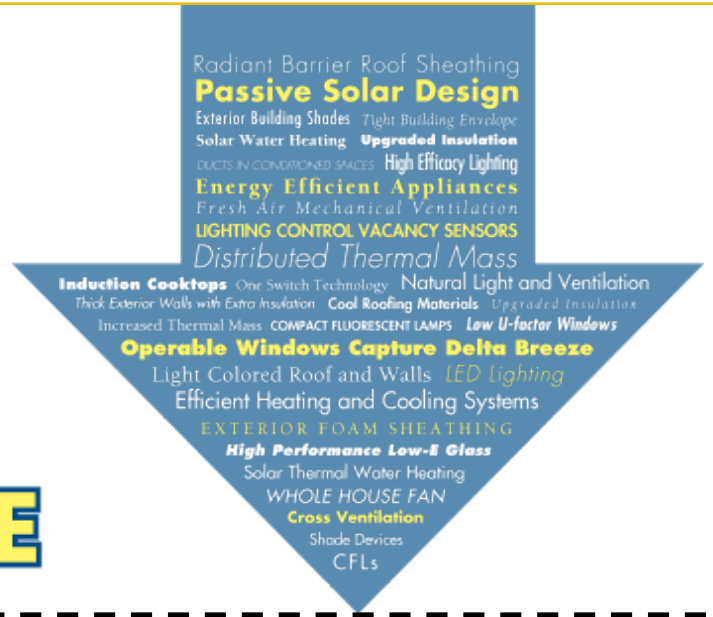
ZNE Model

Incorporate energy efficient building design and technologies to decrease community energy consumption.

REDUCE



PRODUCE

Convert locally-available renewable resources from sun and food waste into energy to power the community.

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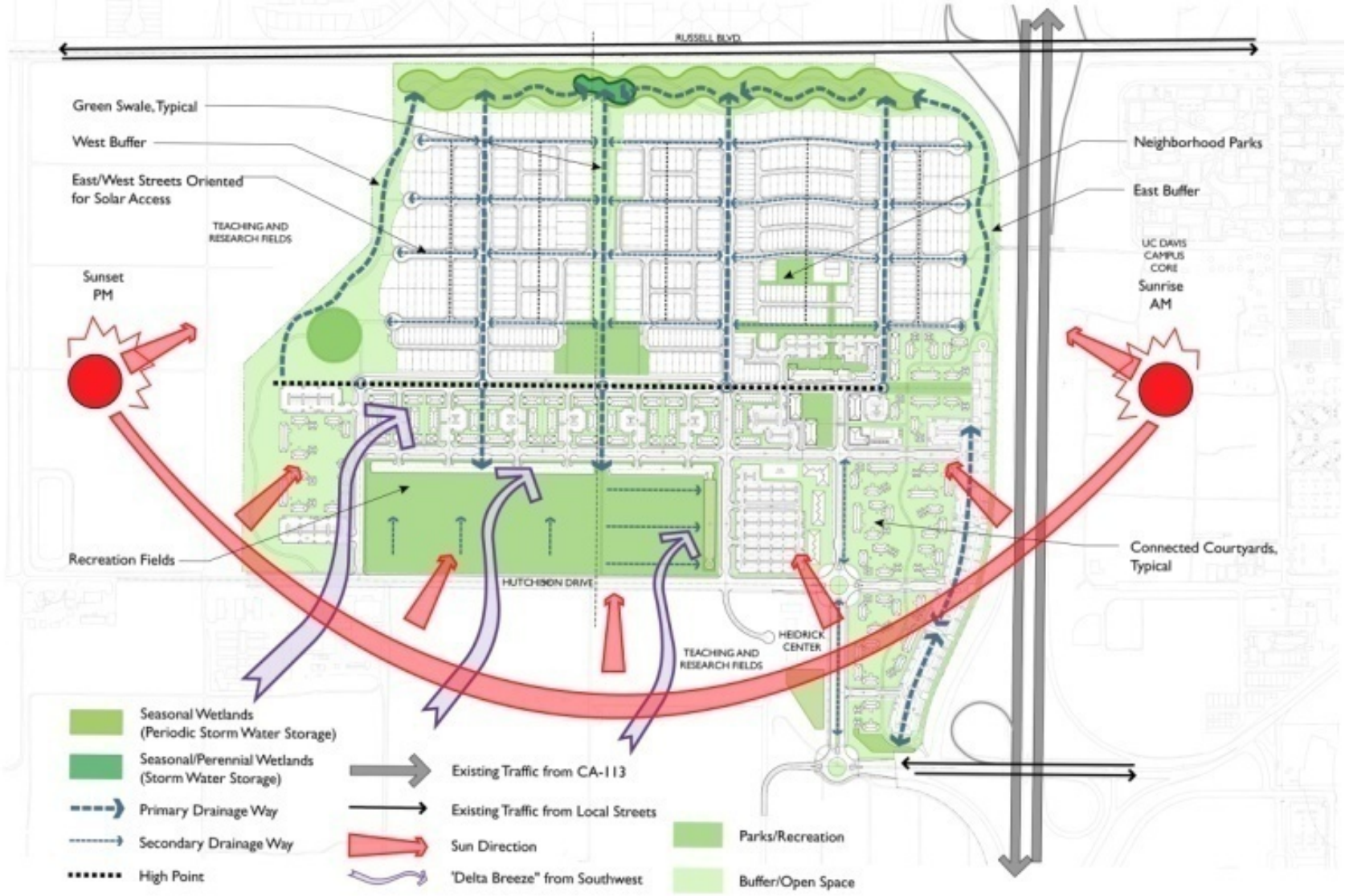

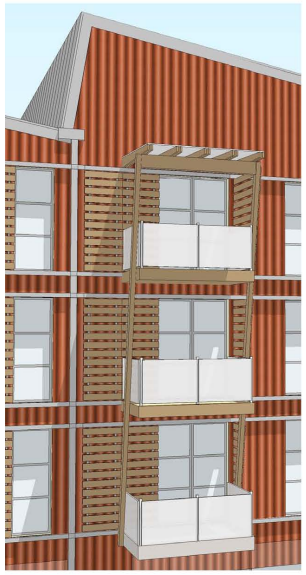

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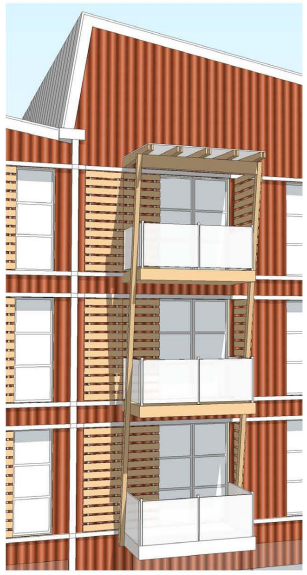

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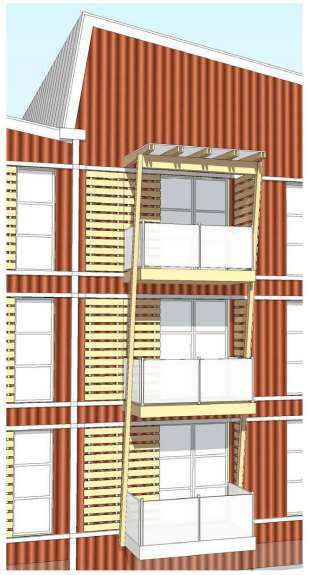

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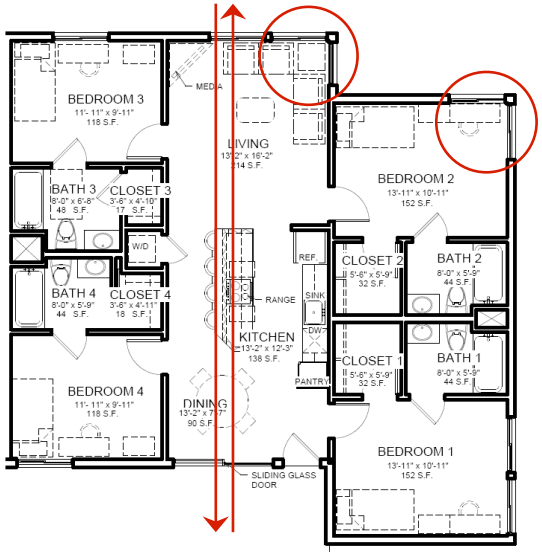
Passive Environmental Responsiveness



ZNE Model: Reducing Energy Demand at the Building Scale

Community-Wide Consumption Estimates

Total Site Energy

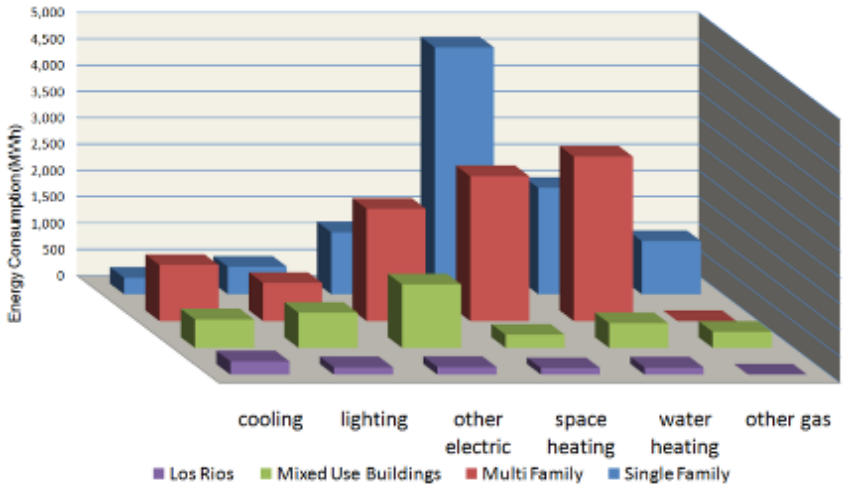
Building Type	2008 T24 (kWh/yr_{equiv})[1]	Proposed Package (kWh/yr_{equiv})[1]
Single Family	9,863,104	3,484,461
Multifamily (Ramble/Townhouse)	9,781,505	4,067,899
Commercial / Mixed Use	1,818,964	1,188,483
Community College	785,423	785,423
Common Area Lighting	299,500	149,750
Total	22,548,496	9,676,017

1. Natural Gas use conversion of 29.3 kwh/therm

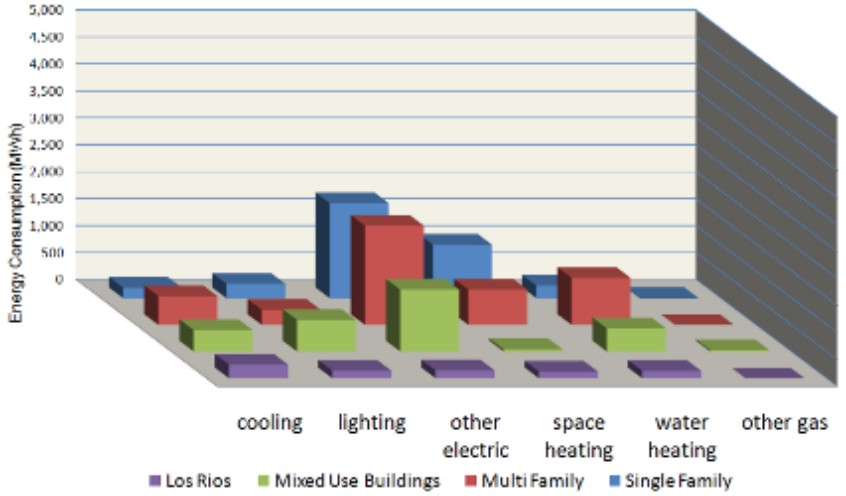
ZNE Model: Reducing Energy Demand at the Building Scale

Projected Energy Load

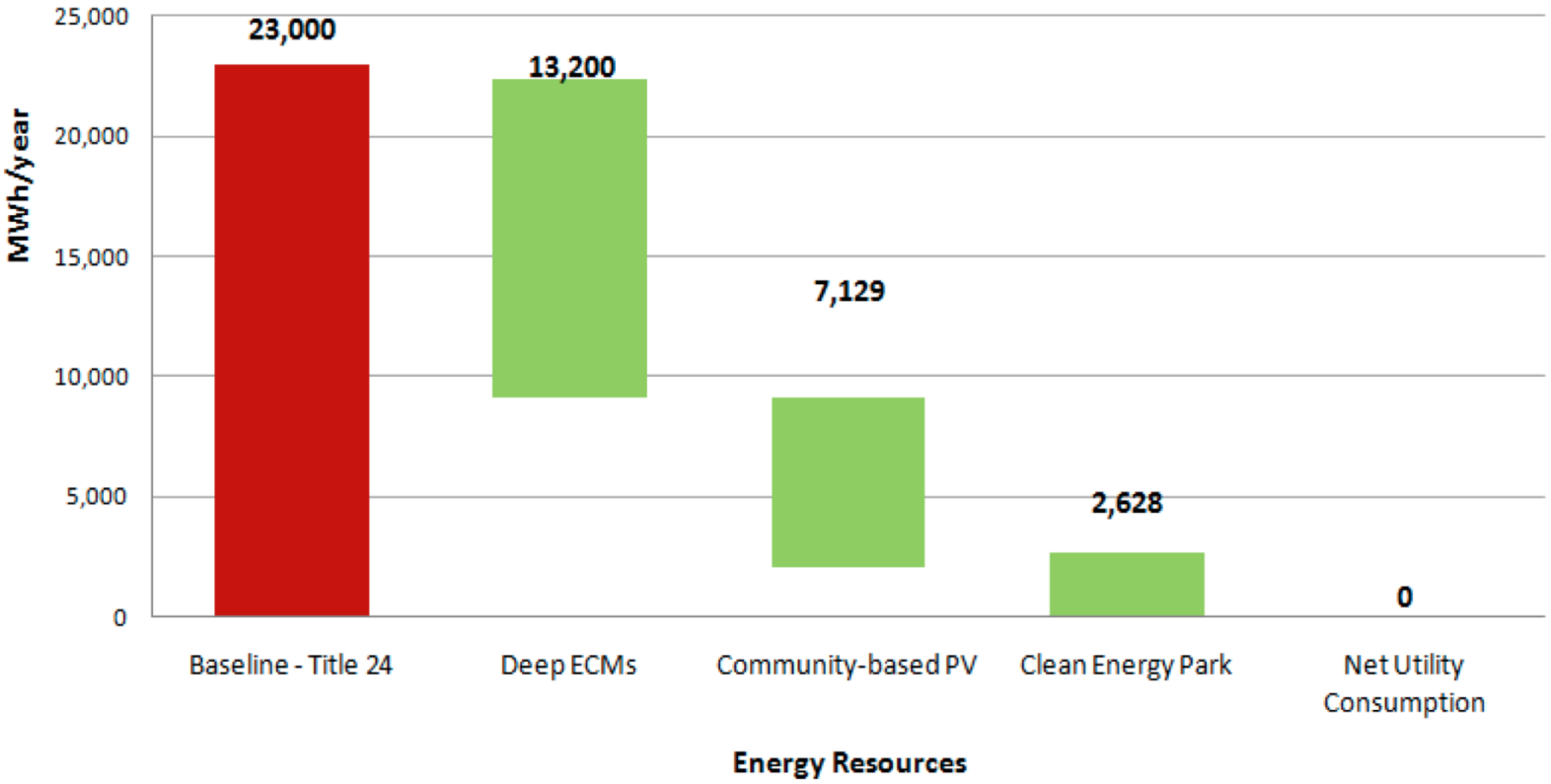
Title 24 2008 Baseline



Energy Conservation Measures



Path to Achieving ZNE Model includes Addressing Supply



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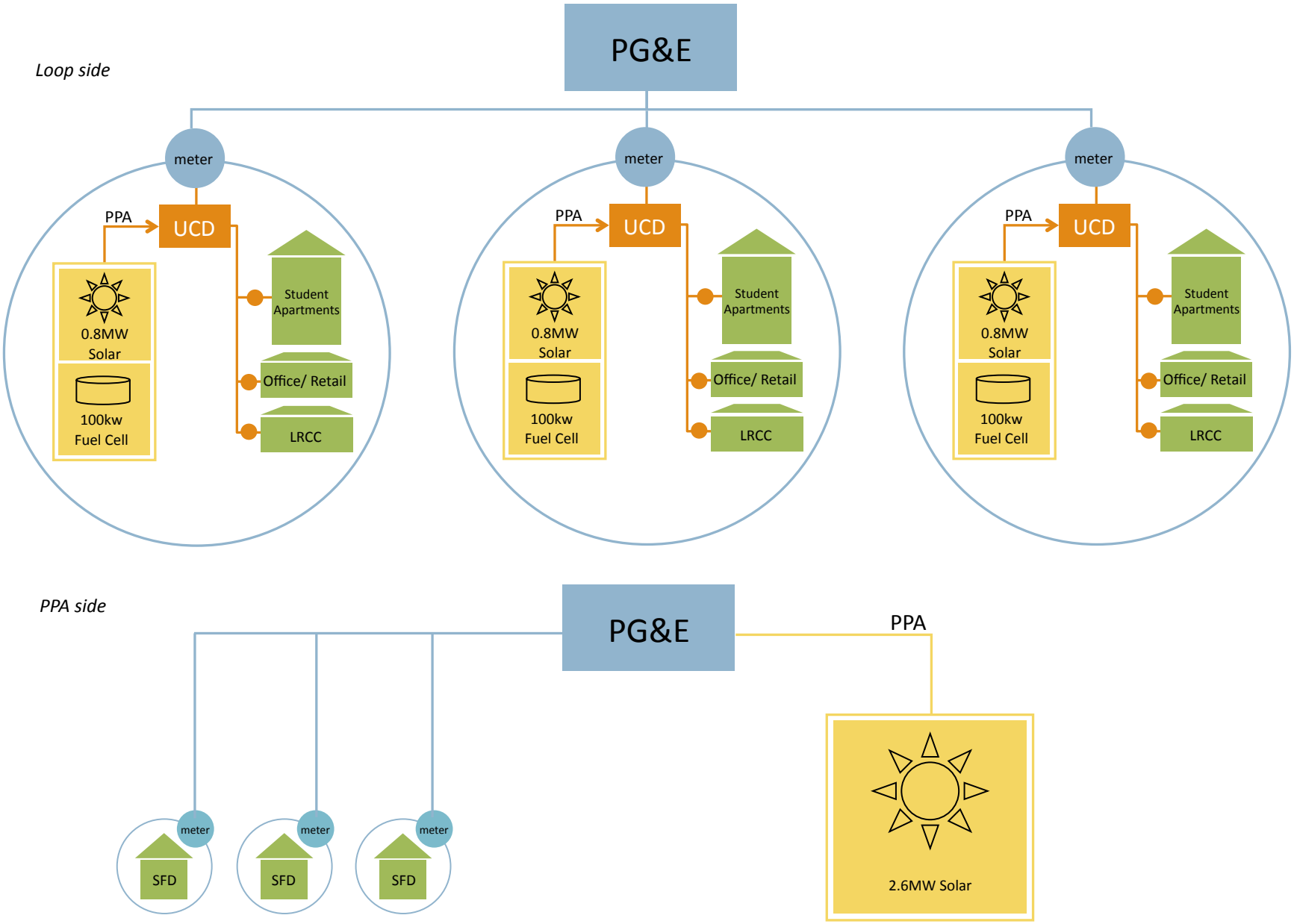
Regulatory Environment Not Designed for Community Scale



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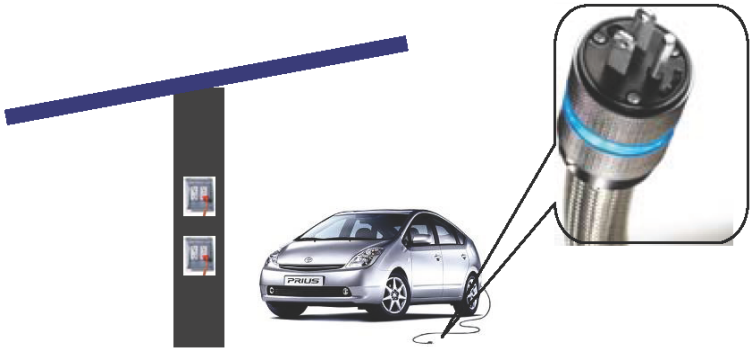
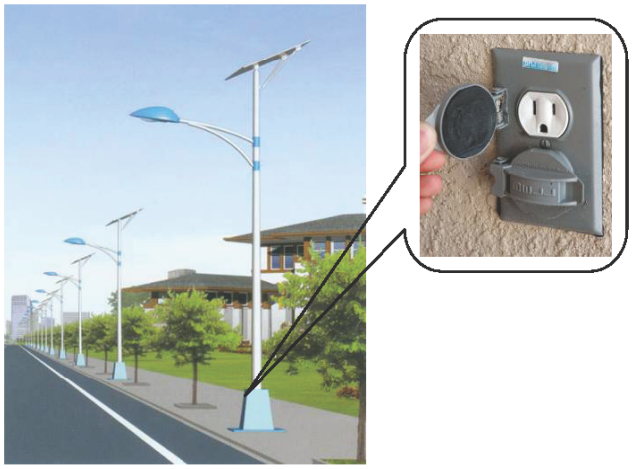
A Future Living Laboratory





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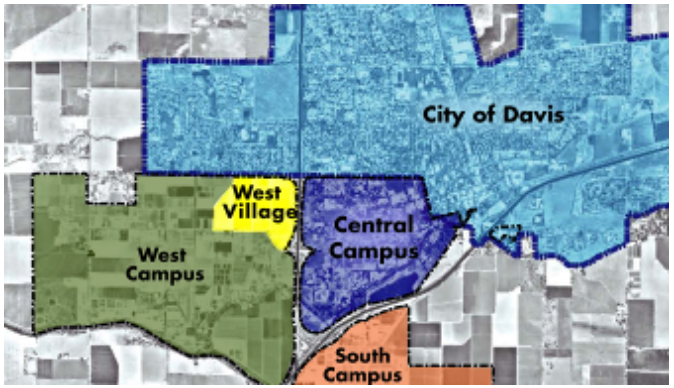

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