

WEST VILLAGE

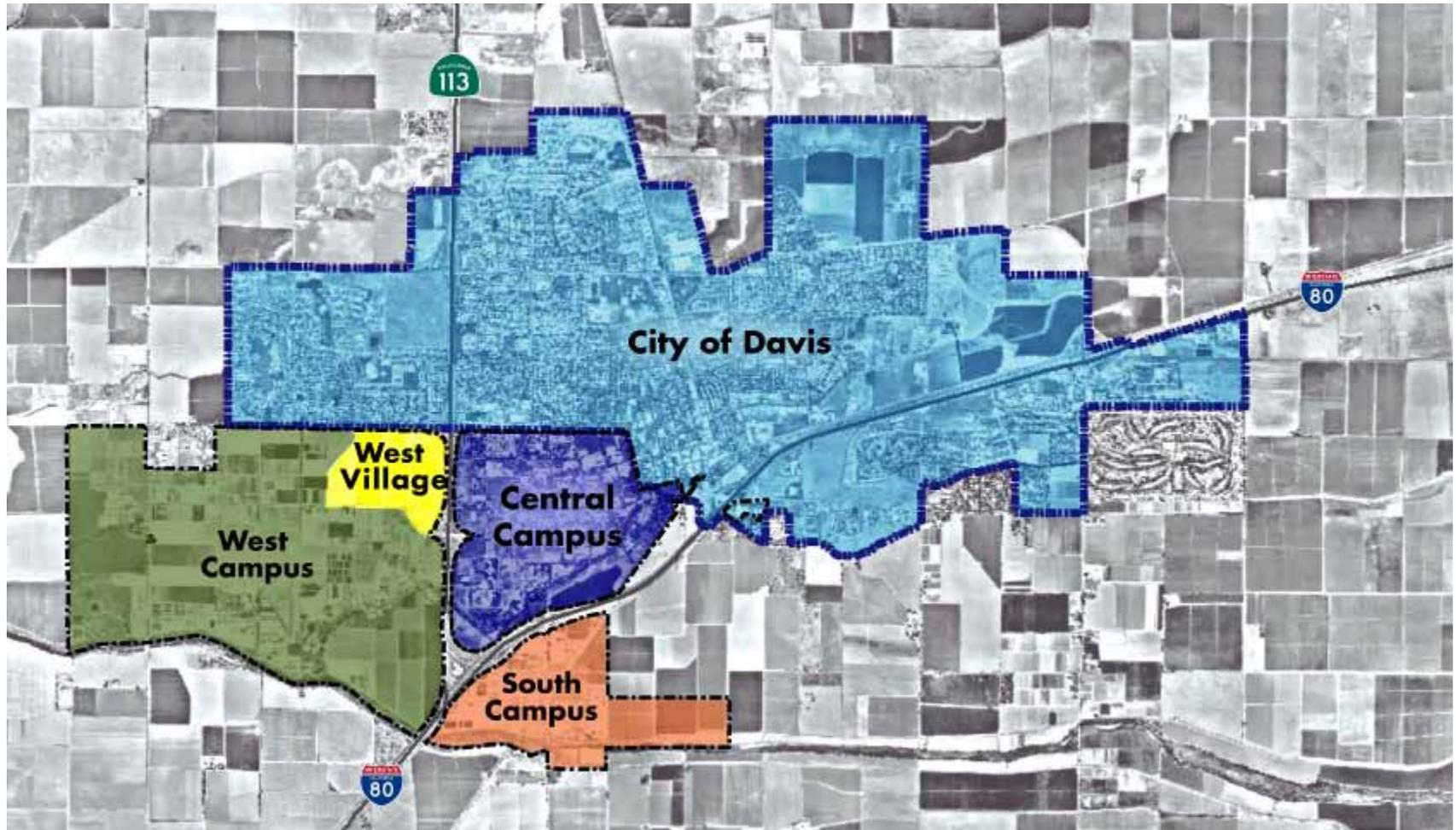
A Zero Net Energy Community

February 10, 2011

*CSI RD&D Program
Coordination and IOU Outreach
Meeting for Solicitation #2
Grants*

CAMPUS PLANNING

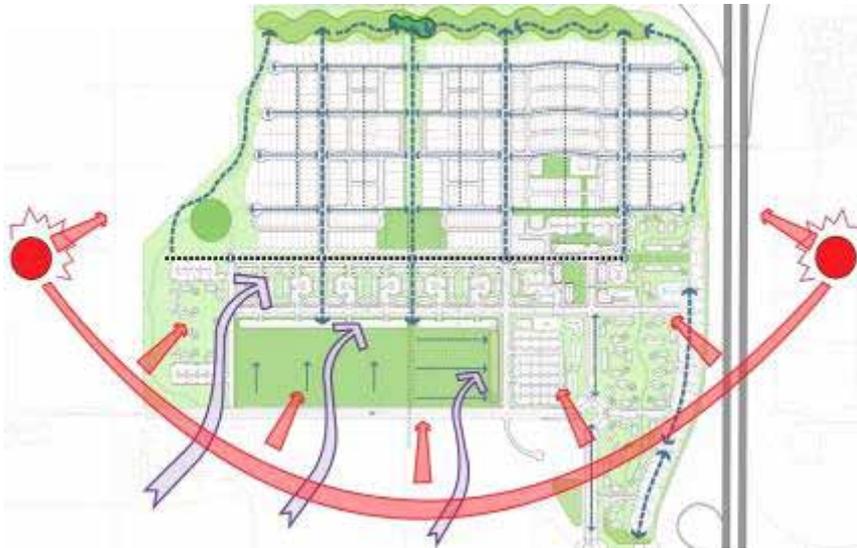
Local Context



CAMPUS PLANNING

Core Principles

- ÿ Housing Affordability
- ÿ Environmental Responsiveness
- ÿ Quality of Place



CAMPUS PLANNING

Land Use Plan

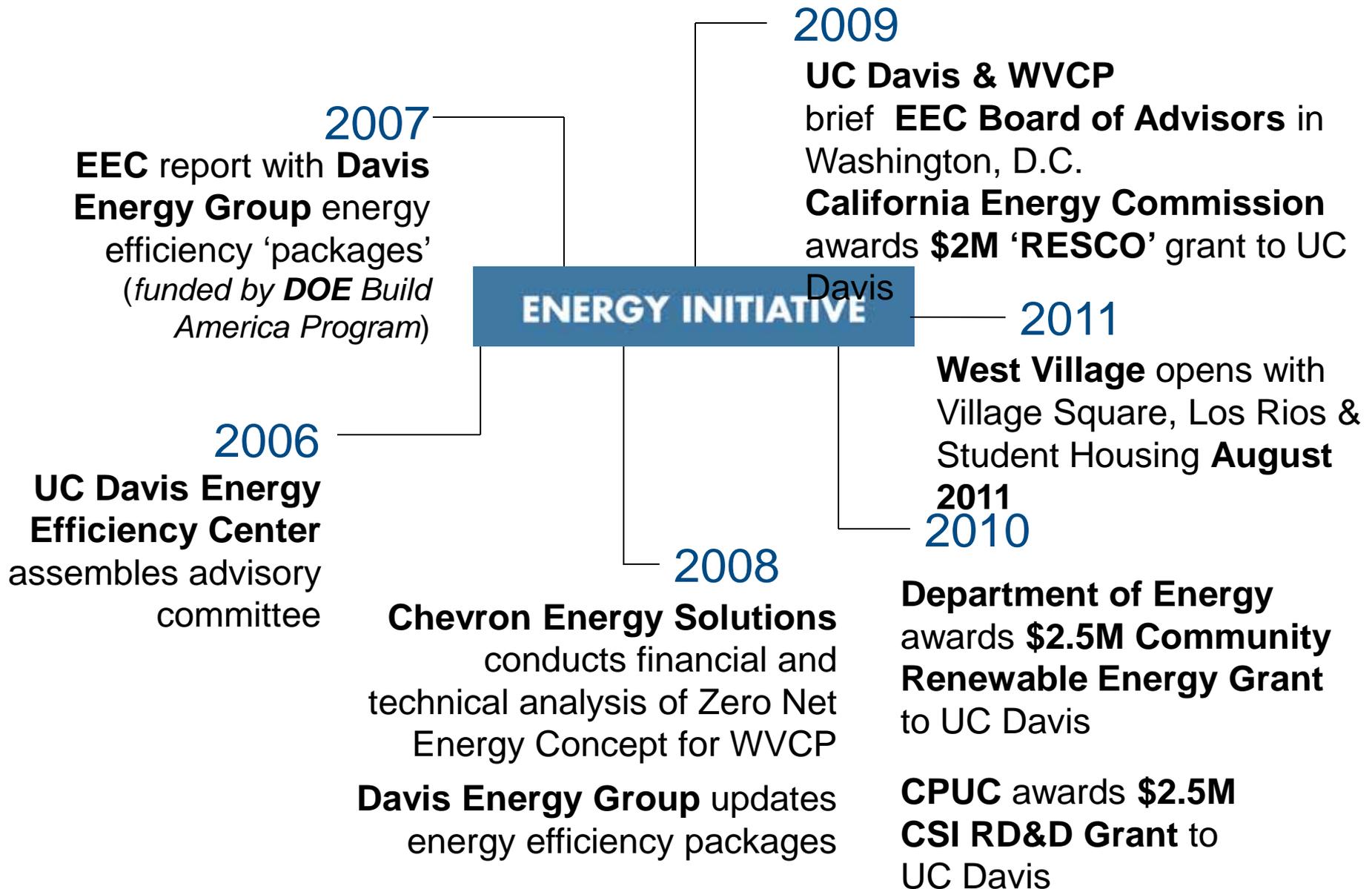


-  Village Square
-  Community College
-  Mixed-Use
-  Student Housing
-  For-sale Faculty/Staff Housing

2004-2006 Implementation Plan

CAMPUS PLANNING

2000-2003 LRDP Process



ENERGY INITIATIVE

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

REDUCE

Radiant Barrier Roof Sheathing

Passive Solar Design

Exterior Building Shades Tight Building Envelope

Solar Water Heating **Upgraded Insulation**

DUCTS IN CONDITIONED SPACES High Efficacy Lighting

Energy Efficient Appliances

Fresh Air Mechanical Ventilation

LIGHTING CONTROL VACANCY SENSORS

Distributed Thermal Mass

Induction Cooktops One Switch Technology Natural Light and Ventilation

Thick Exterior Walls with Extra Insulation **Cool Roofing Materials** *Upgraded Insulation*

Increased Thermal Mass **COMPACT FLUORESCENT LAMPS** *Low U-factor Windows*

Operable Windows Capture Delta Breeze

Light Colored Roof and Walls *LED Lighting*

Efficient Heating and Cooling Systems

EXTERIOR FOAM SHEATHING

High Performance Low-E Glass

Solar Thermal Water Heating

WHOLE HOUSE FAN

Cross Ventilation

Shade Devices

CFLs

PRODUCE

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



West Village Energy Initiative Program Goals

- Zero Net Energy from the Grid on an annual basis
- Hyper-Energy Conservation Measures
- Multiple integrated renewable resources at a community scale
- SmartGrid
- No higher cost to the developer
- No higher cost to the consumer

CSI RD&D Solicitation #2 Grant – Target Area One

Task 1: Energy Storage Technologies

Subtask 1.1 *Review and evaluate existing and emerging storage technologies that complement solar PV assets in community-wide installations.*

- Report -- Storage functional specification and vendor evaluation
- RFQ and/or vendor qualifications

Subtask 1.2 *Use of solar forecasting in multiple operations scenarios*

- Report -- Solar forecasting model and benefits evaluation

Subtask 1.3 *Report on key findings for energy storage element of WVEI and generate best practices guidelines.*

- Final Report -- Simulation results, key findings and best practices and guidelines

Task 2: Integration of AMI with Solar PV and other DER Technologies

Subtask 2.1 *Integration and optimization of AMI to assist in maximizing on-site generation*

- Report -- AMI upgrade solar integration; optimization and functional specification

Subtask 2.2 *Develop "Smart Grid" solutions that enable integration of AMI and solar electricity*

- AMI/DER interface specifications (design and procurement)

Subtask 2.3 *Develop guidelines and best practices for AMI integration in community-wide projects*

- Summary report on workshop(s) including participants, agenda and outcomes
- Final Report -- Guidelines for AMI applications in net zero communities relying on solar energy

Task 3: Hybrid Solar (Thermal/PV) innovative development

Subtask 3.1 *Integration of Solar Thermal with Solar PV and DER technologies*

- Report -- Integrated Solar Thermal Design Concept including functional specification for metering and monitoring

Subtask 3.2 *Develop guidelines and best practices for Solar Thermal integration*

- Final Report -- Net Zero Solar Thermal Control Guidelines and Best Practices

Task 4: Modeling and Trade-off analysis

- Final Report-- Solar Electric Design Optimization and Operational Performance Forecasting

Task 5: Develop Research Plan and Data Collection Plan for West Village

- Final Report – WVEI research and data collection plan

CSI RD&D Solicitation #2 Grant – Target Area

Two

Task 1: Complete Financial Modeling of Business Models

- Final Report summarizing the financial aspects of alternative Business Models including an appendix with financial runs generated from the financial modeling program

Task 2: Demonstrate role for IOU in business model

- Summary of meetings and negotiations with IOU

Task 3: Identify regulatory barriers to adopting business model

- Report on the regulatory barriers summarizing existing regulatory barriers to wide-scale installation of solar photovoltaic and recommendations for regulatory change
- Advice Filing (or a Report explaining why an Advice Filing was not necessary)

Task 4: Develop offering material including a financial pro forma and draft term sheet to attract third party investors

- Offering Memorandum including financial pro forma and draft term sheet
- Report Summarizing Results of Offering Efforts

Task 5: Negotiate and Document business transaction

- Report summarizing legal documents for business transaction
- Redacted Legal Documents as executed

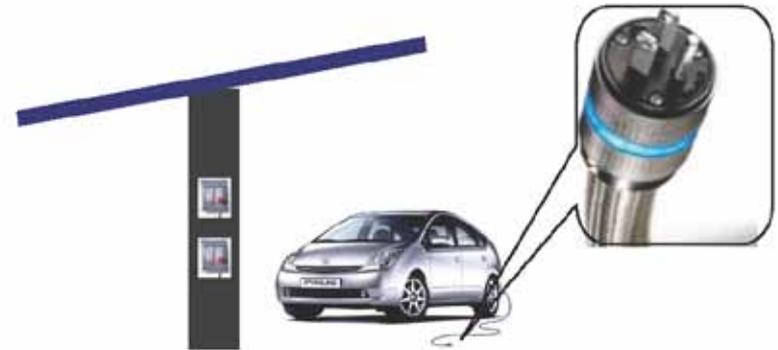
Task 6: Develop metrics to measure success of business model

- Report outlining metrics of success (Part 1)
- Report identifying success and continuing barriers to further adoption (Part 2)

Task 7: Strategies and Economic Model for Storage Dispatch

- Economic model for storage dispatch & results of simulated virtual net metering operation
- Storage dispatch strategies – development and field evaluation plan

A Living Laboratory



UC DAVIS

WEST VILLAGE

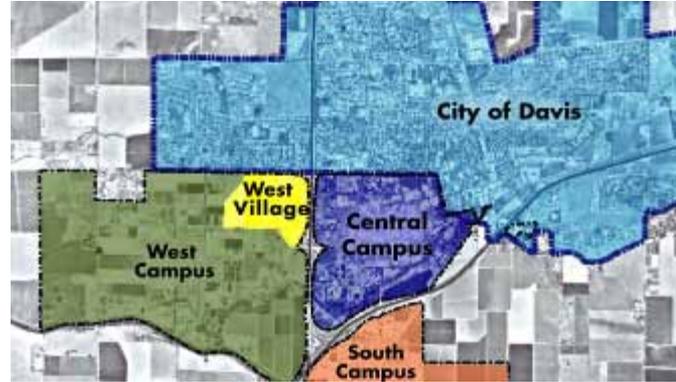
UC DAVIS

UNIVERSITY OF CALIFORNIA



URBAN VILLAGES





WEST VILLAGE

A Zero Net Energy Community