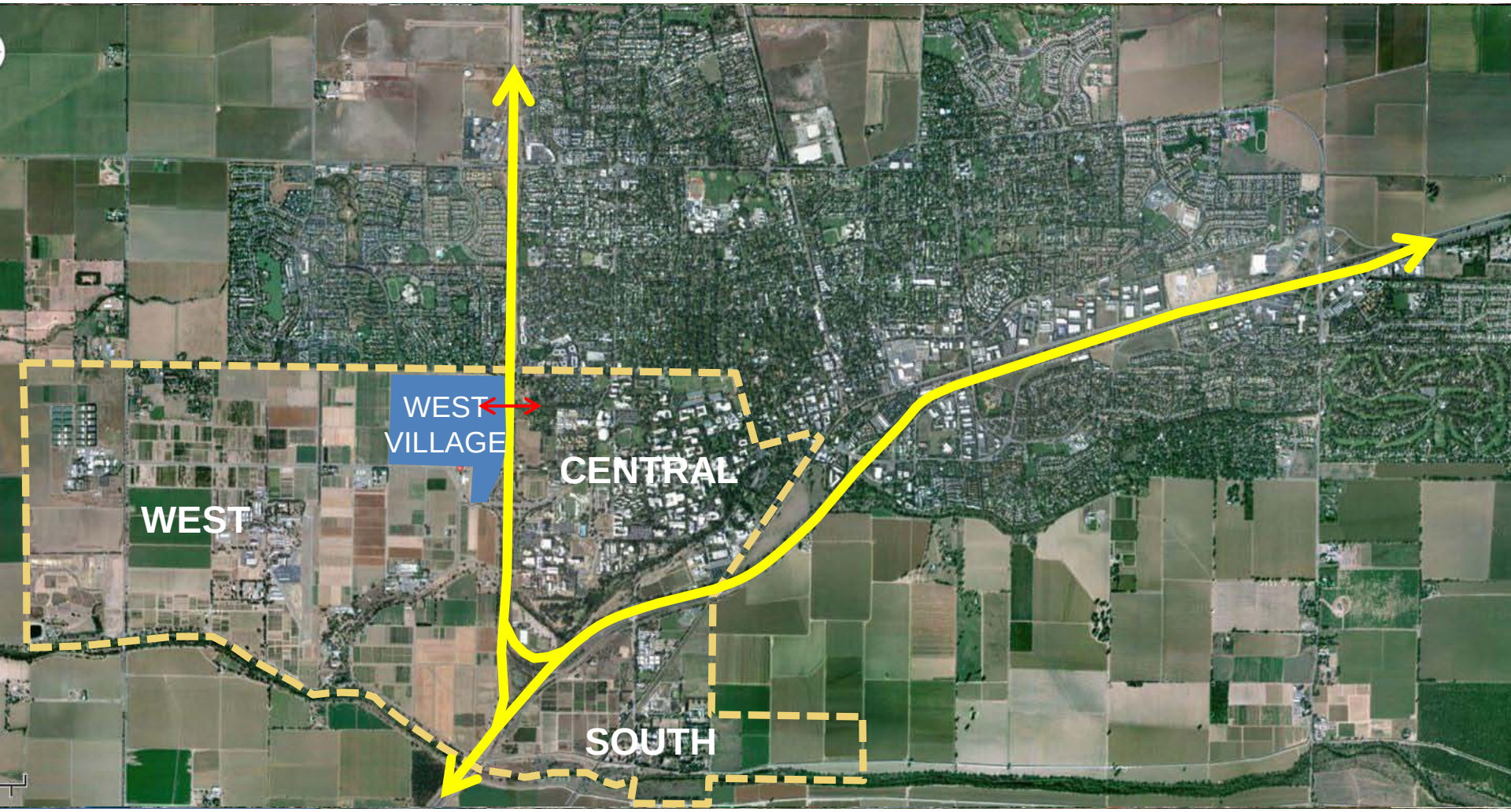
UC Davis West Village

The largest planned "zero net energy" community in the United States

CRED Webinar
October 16, 2012


WEST VILLAGE
CENTRAL
WEST
SOUTH

Phasing Plan

Program	Phase 1	Phase 2	Total
Acres	130 acres	75 acres	205 acres
Faculty/Staff Housing	343 units	132 units	475 units
Student Housing Beds ***(including beds over mixed use)***	1,980 beds	1,158 beds	3,000 beds
Retail/Office Space	up to 42,500 sf	0	up to 45,000 sf
Los Rios Community College District	20,000 sf	0	60,000 sf
Recreation Fields	7.61 acres	14.29 acres	21.90 acres

CAMPUS PLANNING

Site Plan

- Village Square
- Mixed-Use (45,000 sf retail + apartment units above)
- Community College (60,000 sf)
- For-sale Faculty/Staff Housing (343 homes)
- Site for Day Care/Preschool
- Student Housing (1,980 beds)
- Water management & open space
- Recreation fields and parks

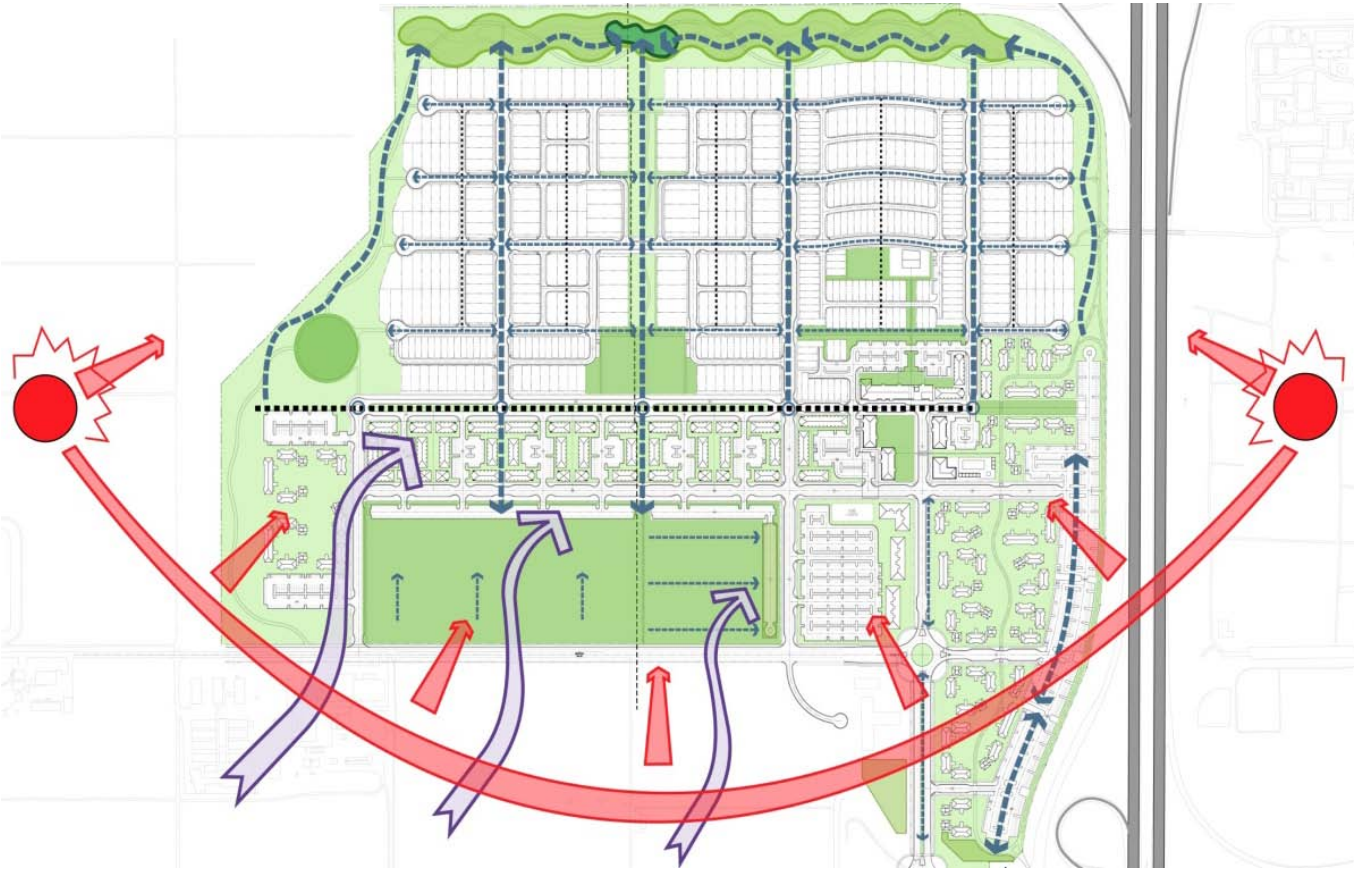

662 apartments
343 single family homes
42,500 square feet of commercial space
60,000 square feet Community College

Project Goals

- Livable
- Affordable
- Environmentally responsive

Bicycles and Buses

Site Environmental Responsiveness



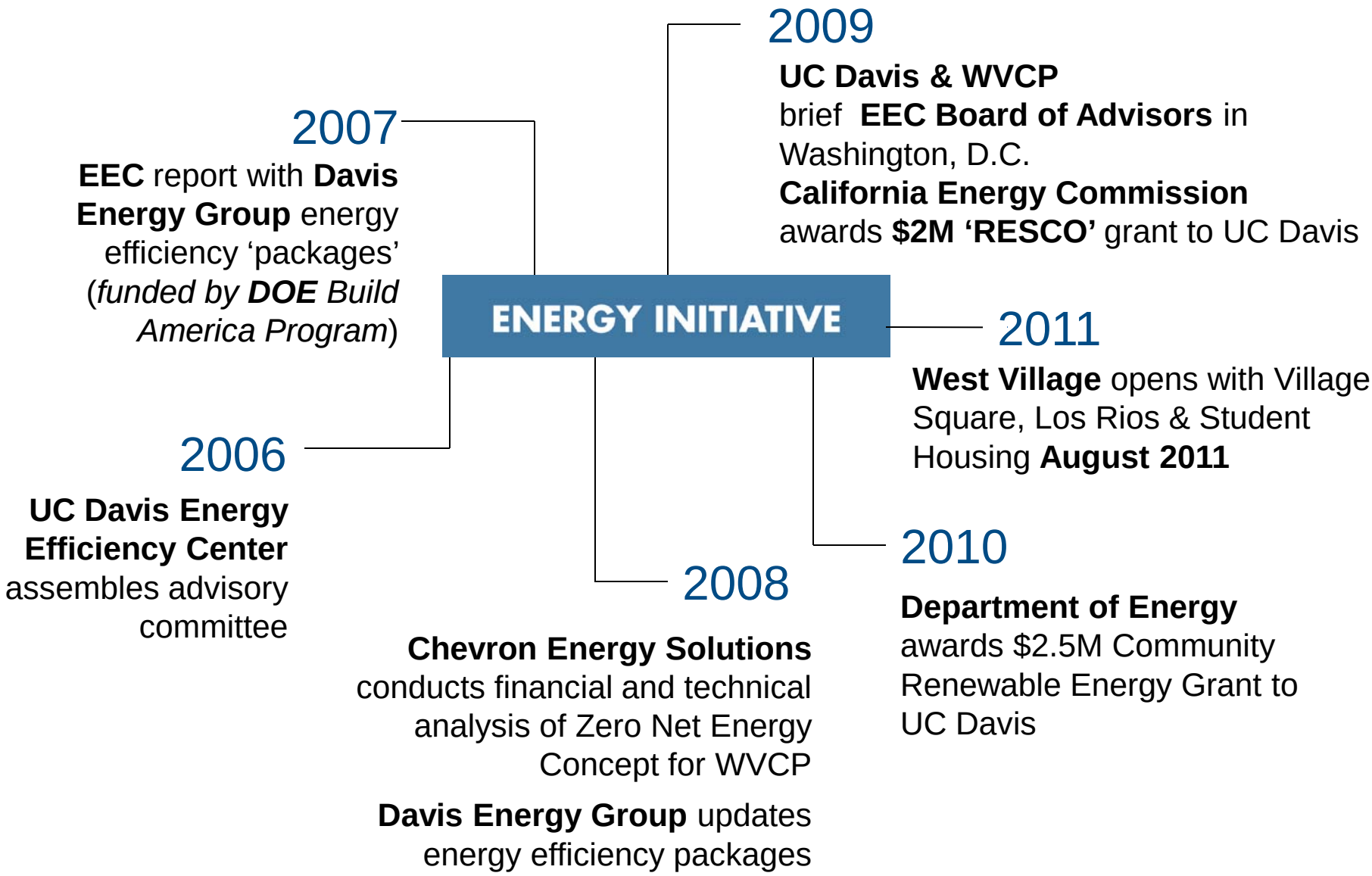
Energy Goals

- Zero Net Energy Use

West Village Energy Initiative
Program Goals

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

WV Energy Initiative Timeline




Reduce

Energy Efficient Design

BUILDING ENVELOPE

Walls (Exterior)	2x6 16” o.c. R-21 batt w/ ½” exterior foam Quality Insulation Inspection
Roof (Attic)	R-49 blown insulation Radiant barrier roof sheathing
Roofing Products	Aged solar reflectance ≥ 0.2 Thermal emittance ≥ 0.75 (Cool Roofing products)
Glazing U-Factor/ SHGC	Average U ≤ 0.33 / SHGC ≤ 0.21
Distributed Thermal Mass	Additional 1/2" gypcrete on Floors 2 and 3

Energy Efficient Design

HEATING, VENTILATION & AIR CONDITIONING

Cooling	15 SEER / 12.5 EER Heat Pump
Heating	8.5 HSPF Heat Pump
Ducts	R-6.0 ducts in conditioned space
Fresh Air Mechanical Ventilation	*Per ASHRAE 62.2*
Ceiling Fans	In bedrooms

WATER HEATING

Type	Central high performance water heater in each building

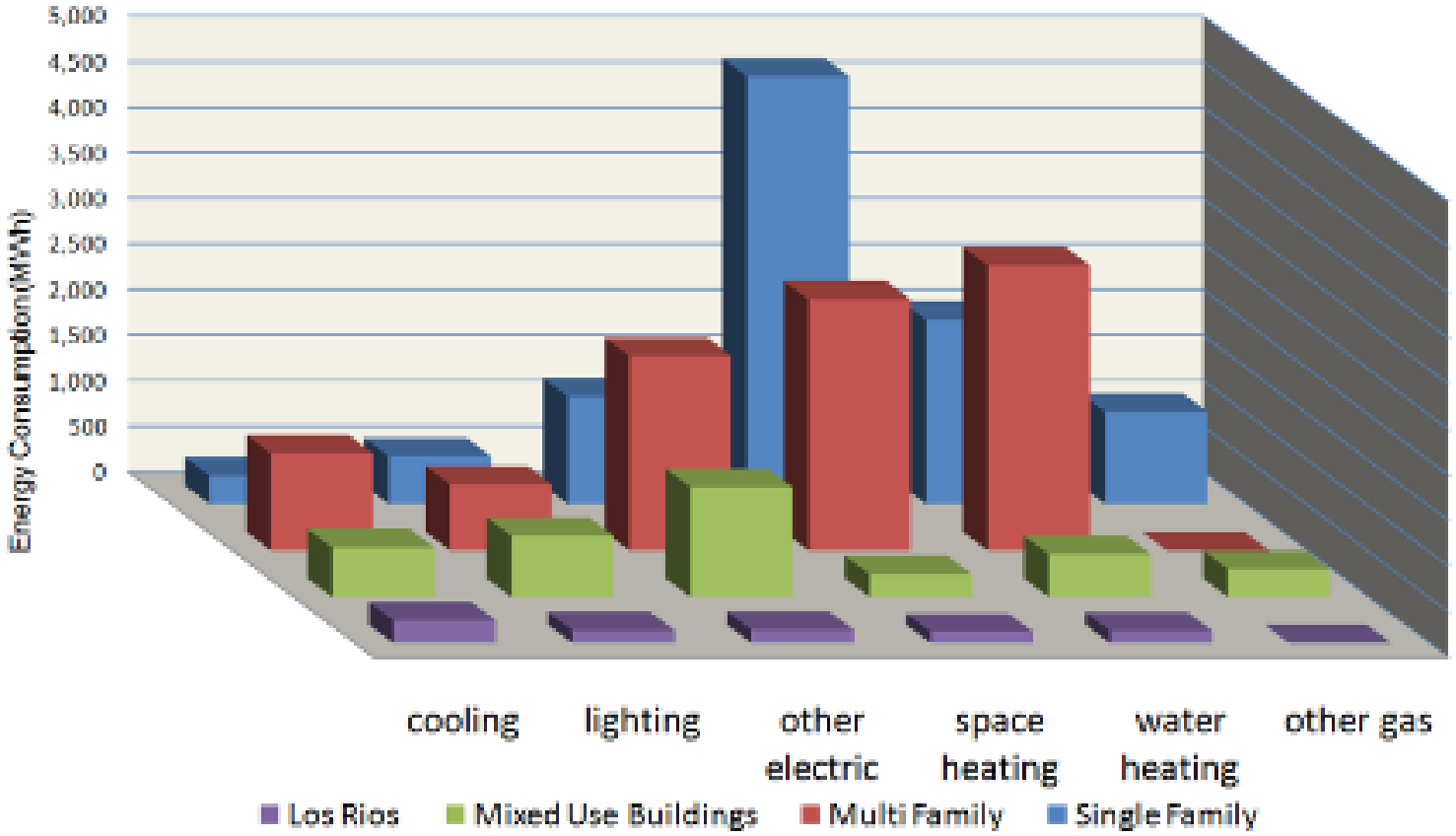
Energy Efficient Design

LIGHTING / APPLIANCES

High Efficacy Lighting	Hard-wired lighting fluorescent or LED Assume 80% hardwired lighting Lighting controls / Vacancy sensors
Energy Star Appliances	Dishwasher, Refrigerator, Washer
Cooktop / Oven	Standard Electric
Miscellaneous Load Control	Energy usage displays

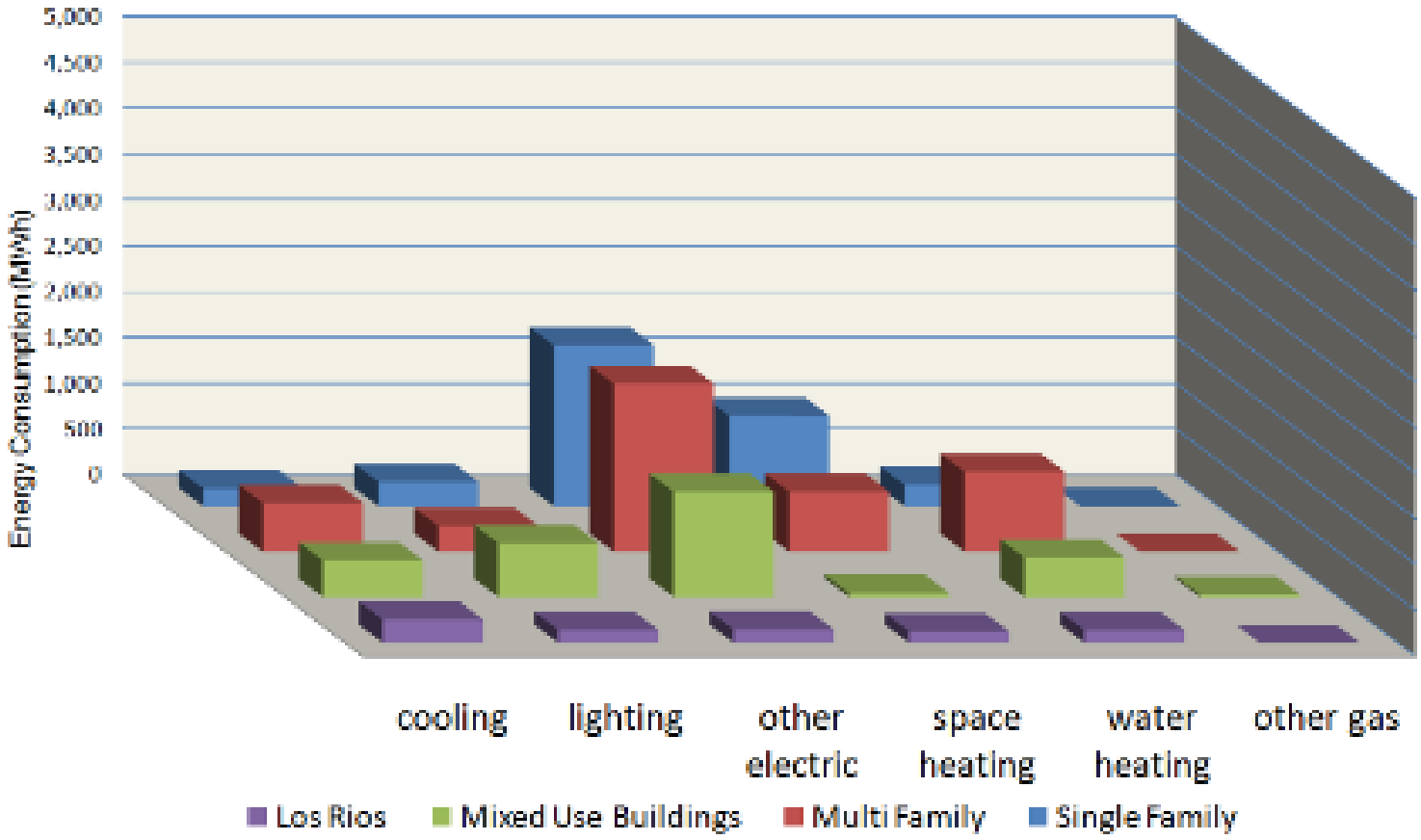
Projected Energy Load

Title 24 2008 Baseline
May 2010 – 22 million kWh/year



Projected Energy Load

Deep Energy Conservation Measures
May 2010 – 10 million kWh/year




Produce


Reduce
Produce
ZERO NET ENERGY

Solar Panels

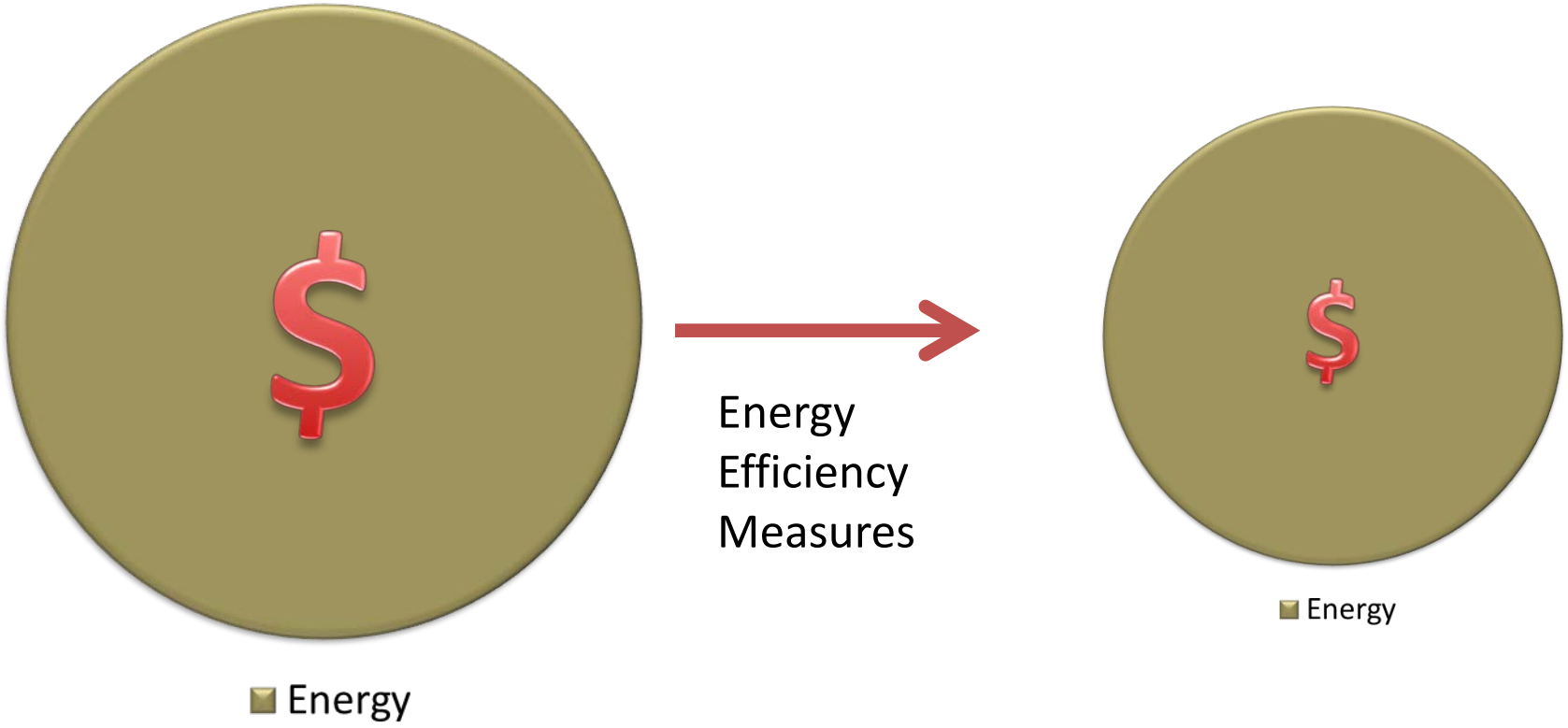
- **Multifamily housing**
  - 4 megawatts to be installed
  - Power purchase agreement between WVCP & SunPower
- **Single family homes**
  - Still under evaluation
  - Roof top and community (?)
  - Preparing for high penetration PEV


Village
Square

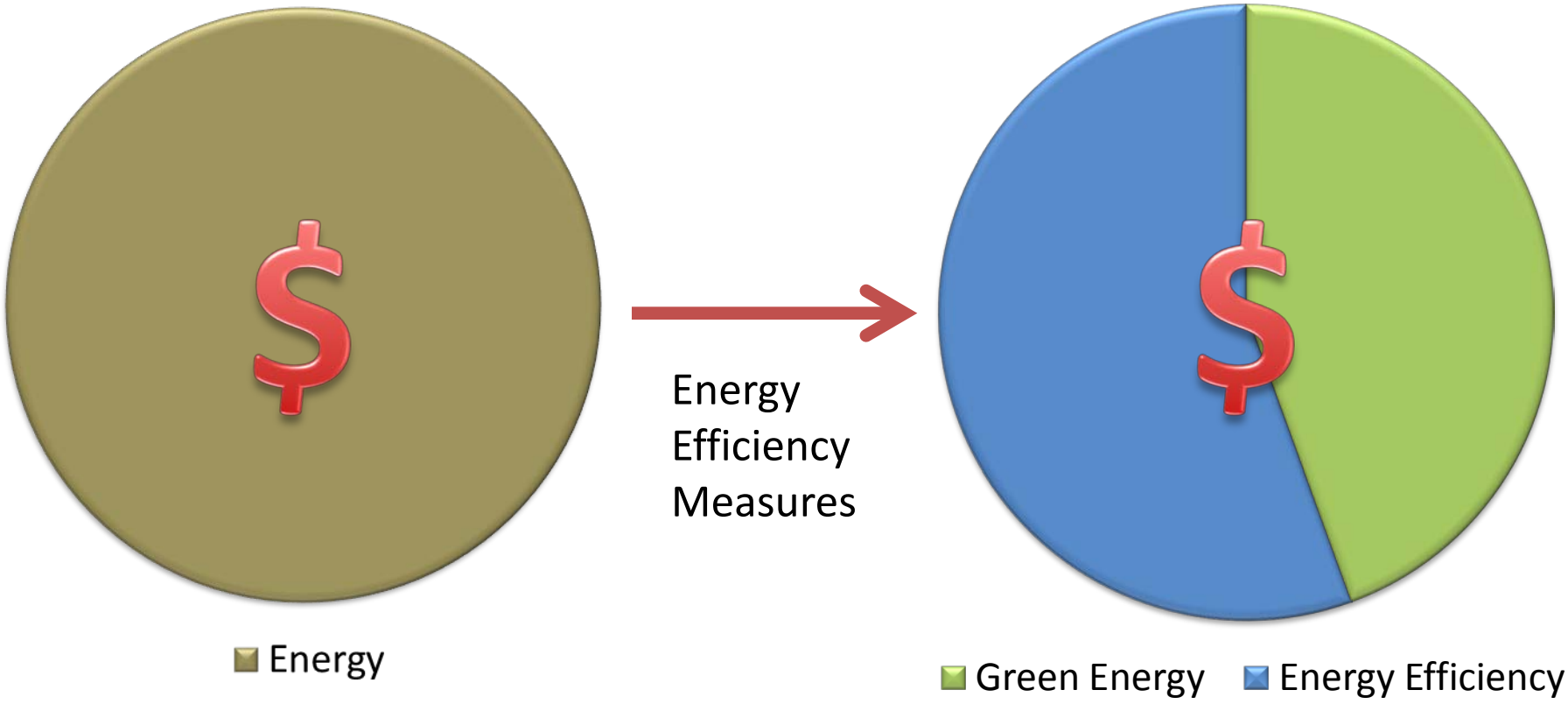
Campus Biodigester

- **Feed stocks**
  - 25 tons per day from campus and West Village
  - Food waste
  - Animal waste and bedding
- **Gas Production**
  - 32.9 million standard cubic feet per year
  - 21,000 million BTU per year
- **Energy Generation**
  - 250 kw microturbine/ICE
  - 2.0 million kWh per year
  - Tied to campus grid

Energy Spend - Typical



Energy Spend – West Village



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URBAN VILLAGES

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U.S. DEPARTMENT OF ENERGY

California Public Utilities Commission

STATE OF CALIFORNIA ENERGY COMMISSION

Questions?