



FLORIDA SOLAR ENERGY CENTER

Creating Energy Independence Since 1975

The New RESNET HERS Index

The Path to Zero Energy Homes

Philip Fairey

A Research Institute of the University of Central Florida





How Ratings Are Used?



- ❖ Energy Efficient Mortgages
- ❖ ENERGY STAR Home qualification
- ❖ Code compliance performance option in 16 states
- ❖ Federal tax credit (quasi), and
- ❖ Coming soon to a venue near you . . .
 - Energy Efficiency Portfolio Standards
 - Carbon and capacity trading
 - Zero Energy Home qualification



Major Changes in 2006



- ❖ NAECA heat pump and air conditioner standard changed to SEER-13 / HSPF-7.7
- ❖ Reference Home now based on 2004 IECC
- ❖ All home energy uses considered in ratings
- ❖ On-site power production now included in rating calculations
- ❖ Insulation inspections and grading (I, II & III) now required (or take the worst grade)
- ❖ Software verification testing now required
- ❖ New HERS Index implemented.



Whole-Home Energy Use



Code Energy Uses:

- ❖ Space Heating
- ❖ Space Cooling
- ❖ Water Heating

- ❖ Only 40-60% of total home energy use
- ❖ Pushing the limits of acceptable efficiency

Other Energy Uses:

- ❖ Rated Uses:
 - Lighting
 - Refrigerators
 - Ceiling fans
 - Dishwashers
- ❖ Non-rated Uses:
 - All other typical miscellaneous loads

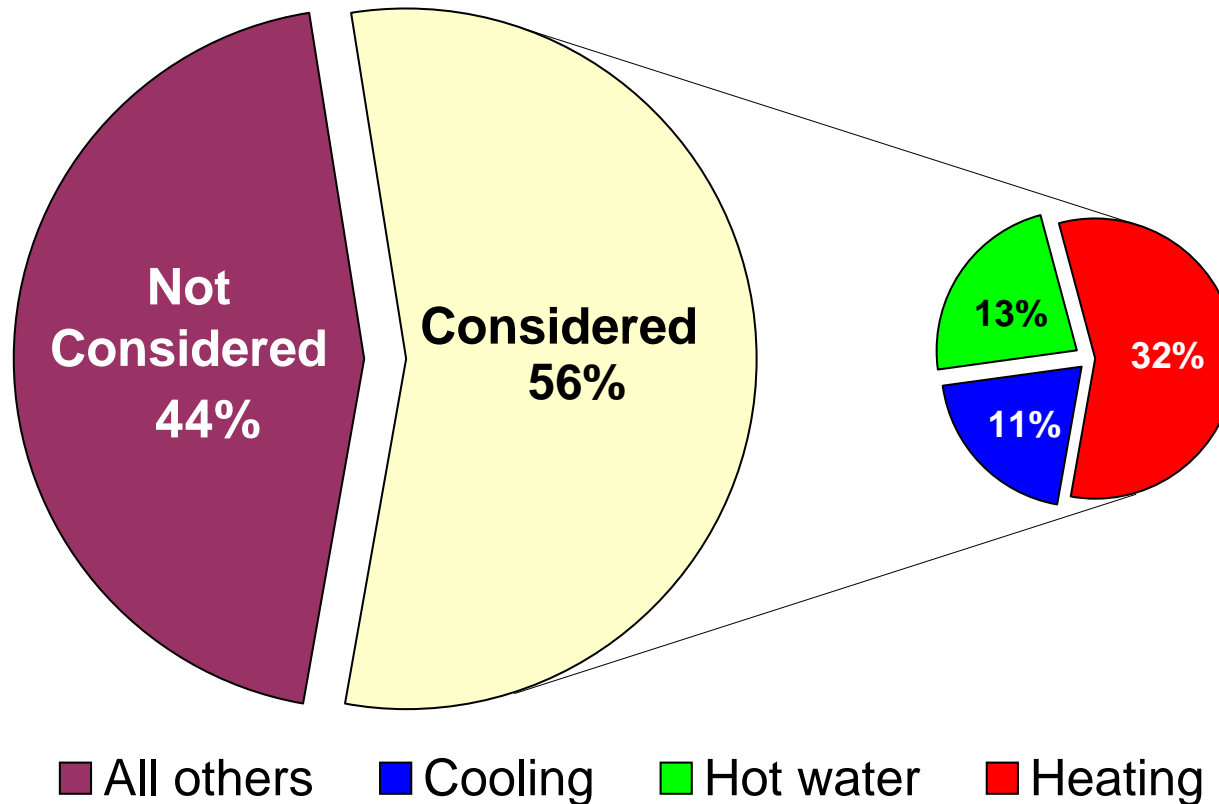


Old HERS Score



National average typical home

44% is Not Considerd by Old HERS Score





Long-Term Strategy



- ❖ Over time, increase the percentage of total home energy use that is “rated” by the system
- ❖ Philosophy – for each new rated device:
 - There must be an accepted reference energy use
 - There must be an equitable means of comparing alternative devices to the reference device
- ❖ Add reference energy use and comparison methodology for new device to standards
- ❖ Remove reference energy use for the device from the non-rated loads category.



On-Site Power Production



- ❖ On-site power production now included in the HERS Index calculation
- ❖ Fossil fuel uses (e.g. gas heating) converted to equivalent electricity at 40% efficiency (e.g. 100 Btu of gas = 40 Btu of electricity)
- ❖ Purchased Energy fraction (PEfrac) =
$$\frac{(\text{Total Energy Use}) - (\text{On-site Power Production})}{(\text{Total Energy Use})}$$
- ❖ PEfrac used as a multiplier in the calculation of the HERS Index.



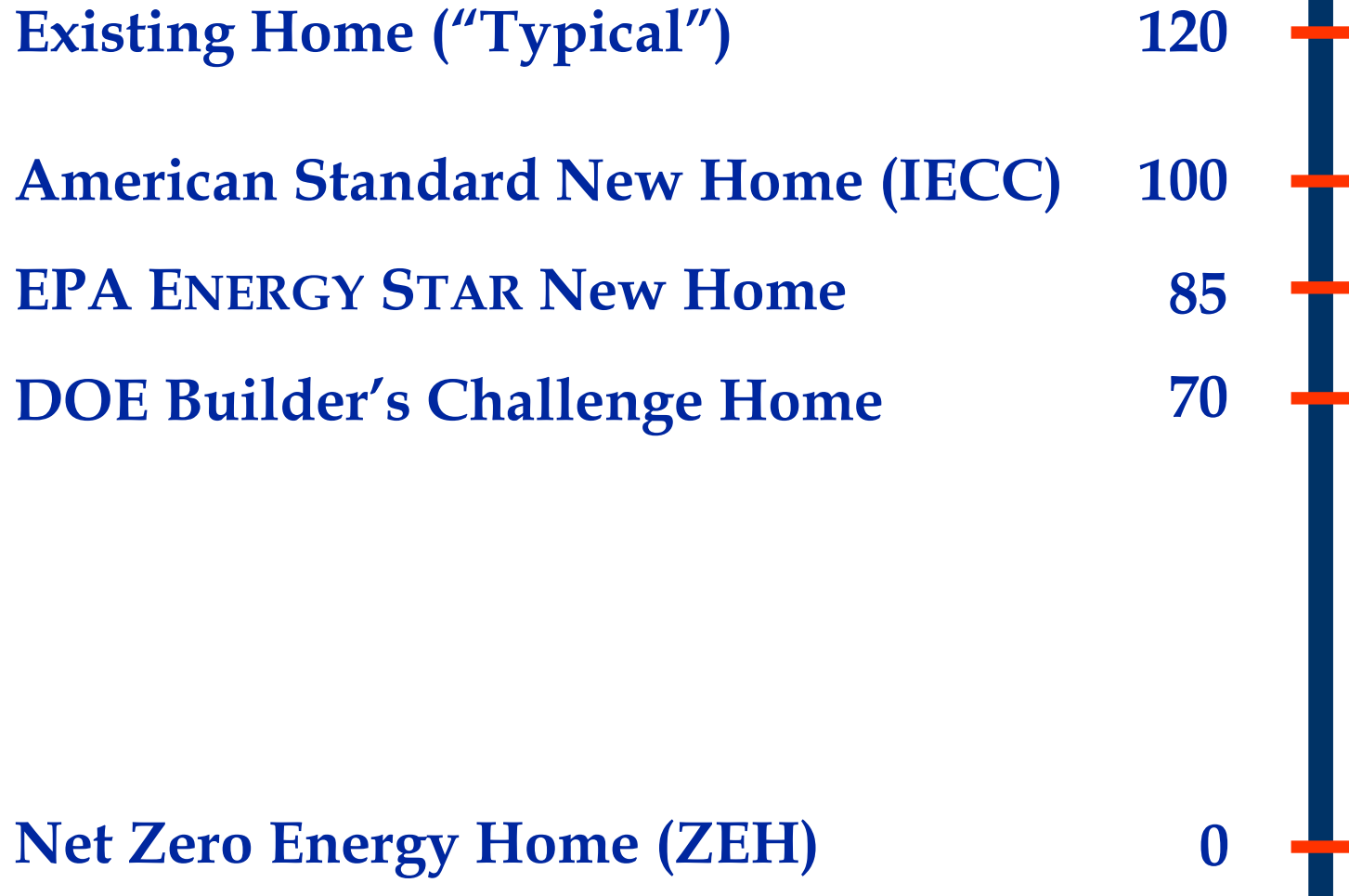
The New HERS Index



- ❖ 100 = American Standard New Home
 - Model energy code standard (IECC 2004) for envelope components
 - NAECA standard heating, cooling and hot water equipment
 - **Plus . . .** RESNET standard lighting, appliance and miscellaneous loads
- ❖ 0 = A home that consumes zero net annual purchased energy
- ❖ In other words . . . Zero really means zero.



Zero Energy “Yardstick”





Yes, It Can be Done



Projected Rating Based on Plans
Field Performance Tests Required for Rating Confirmation

Energy Gauge
Anyplace
Miami, FL

Title: Miami_ZEH
CZ1 - Zero Energy Home Potential

Design: Miami, FL
TMY: MIAMI, FL

BUILDING ENERGY RATING GUIDE

\$0 **\$-4**³ Reference
\$1314

0 MBtu **-0.2 MBtu** 54 MBtu

▼ Proposed Home
Savings = \$1318

Cost Basis:
EnergyGauge Default
EnergyGauge Default
Statewide Prices

Electric Rate: \$0.083 /kWh
Gas Rate: \$1.040 /Therm
Oil: \$1.50/gal LP Gas: \$1.75/gal

This Home may Qualify for EPA's Energy Star Label¹
This Home Qualifies for an Energy Efficient Mortgage (EEM)

Cooling	\$157
Heating	
Hot Water	\$18
Ceiling Fan	\$27
Dishwash	\$9
Dryer	\$74
Lighting	\$78
Misc	\$221
Pumps	
Range	\$37
Refrig	\$50
PV	(\$675)

HERS Index²: 0
★★★★★+

NOTES:
¹The home builder must have signed a Memorandum of Understanding with EPA as an Energy Star Homes partner.
²HERS Index calculated in accordance with 2006 RESNET standard, Section 303.2 (Reference home = 100, Zero energy use = 0).
³PV production assumes net metering.

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Robert Certified
Certified Rater

000000
I.D. Number

Signature _____ Date _____

This Rating Guide is provided to you by a Home Energy Rater who is trained and certified to perform Ratings in accordance with the RESNET standard. Questions or complaints regarding this Rating may be directed to:
EnergyGauge Program Office
1670 Clearlake Road
Cocoa, FL 32922-5703
(321)638-1492
engauge@fsec.ucf.edu



Efficiency + Solar = ZEH



- ❖ Excellent partners
- ❖ Old wisdom still true:
- ❖ “First efficiency, then solar”
- ❖ Together, they can make a big difference
- ❖ First house in Florida to nearly eliminate site energy use.
- ❖ *Super-efficient* + solar = ZEH

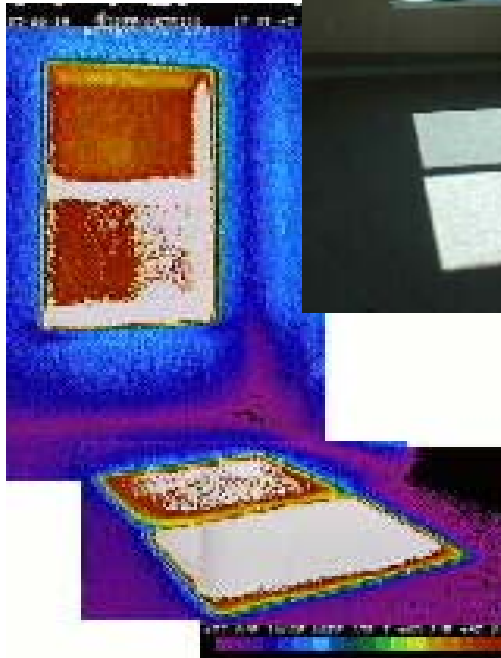




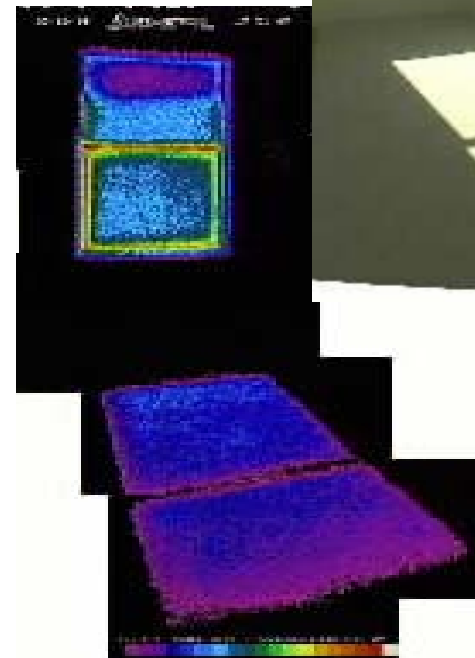
Could Windows be Important?



Control
House



ZEH

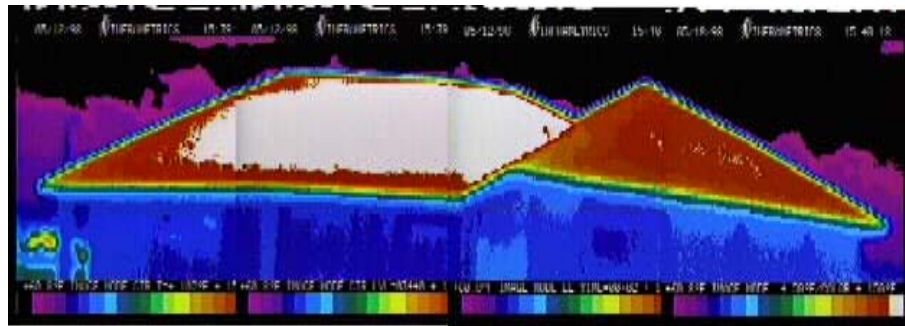




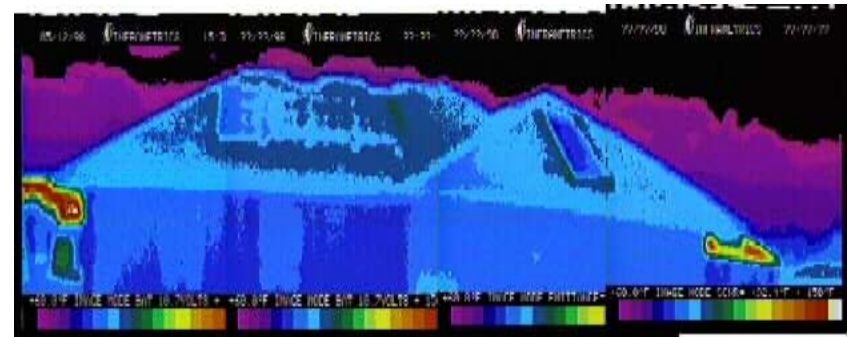
Are Roofs Important?



Control House



ZEH

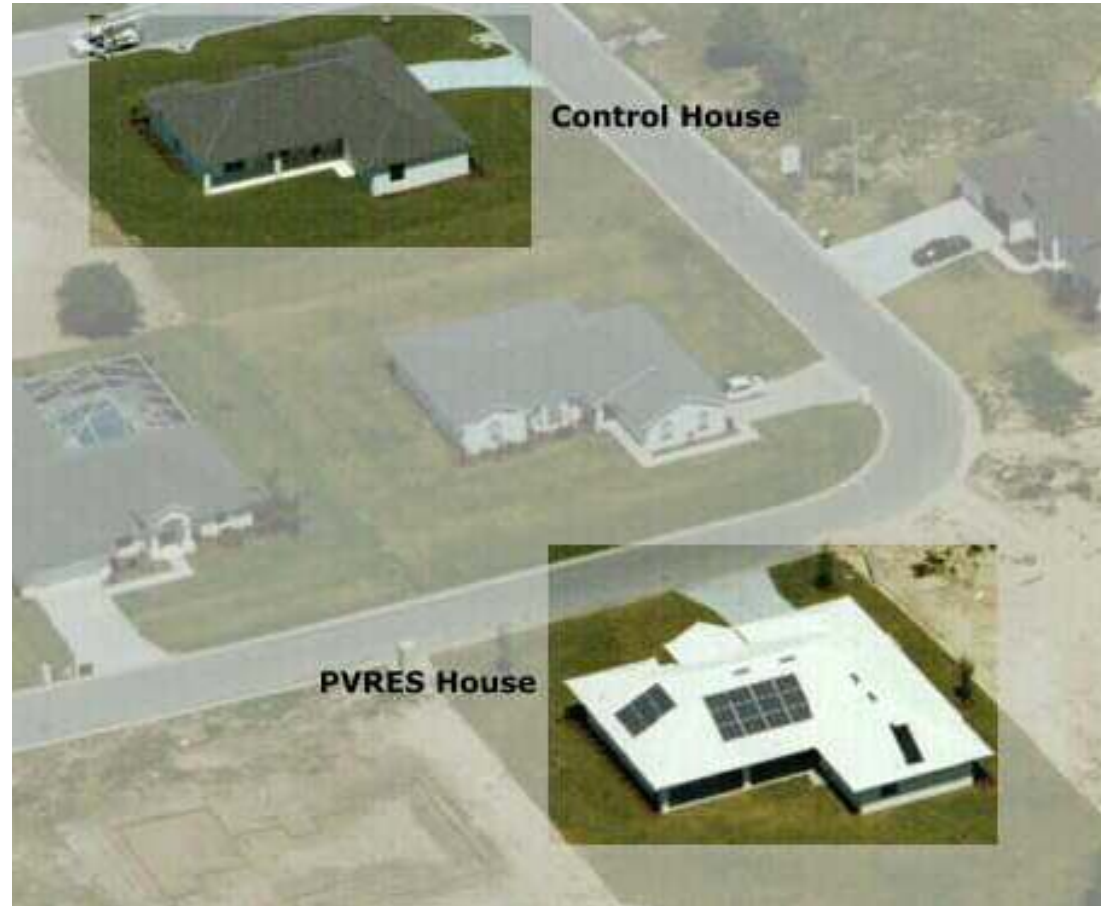




Lakeland ZEH

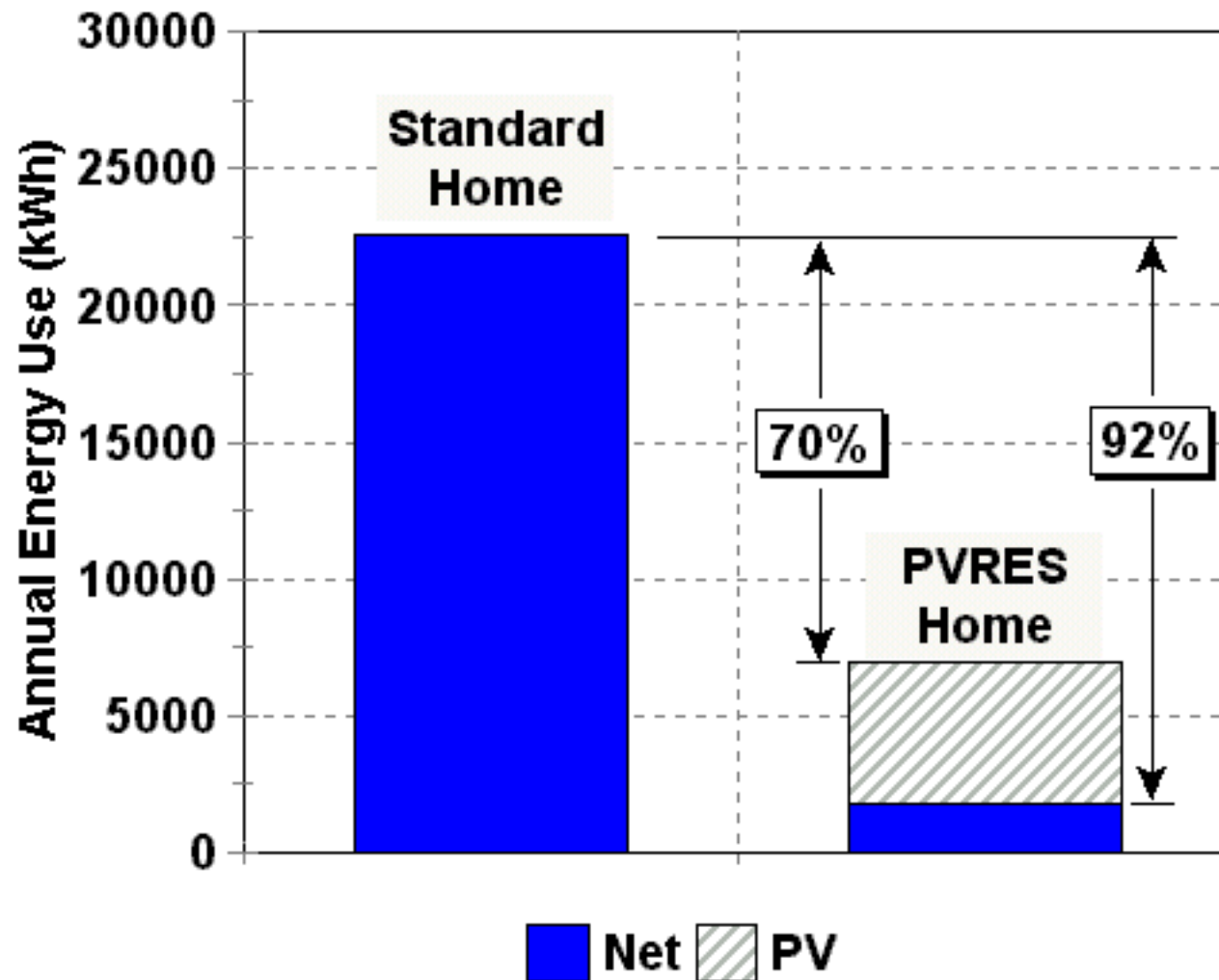


- ❖ Seeing is believing!
- ❖ Side-by-side test
- ❖ ZEH used 80% less measured cooling!
- ❖ 92% of energy use generated
- ❖ No peak demand when solar included
- ❖ First FL ZEH home still active in Lakeland, FL



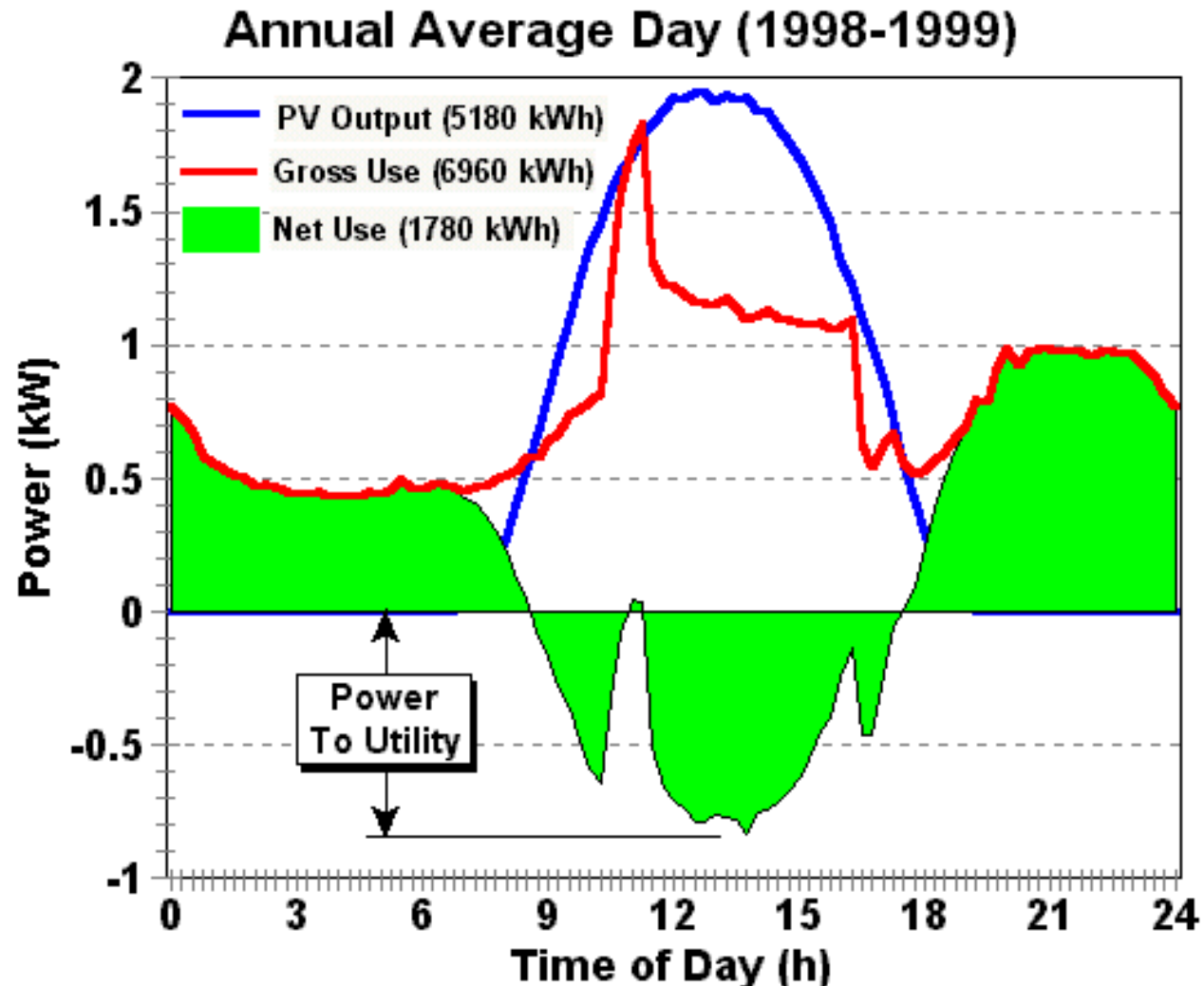


Efficiency First



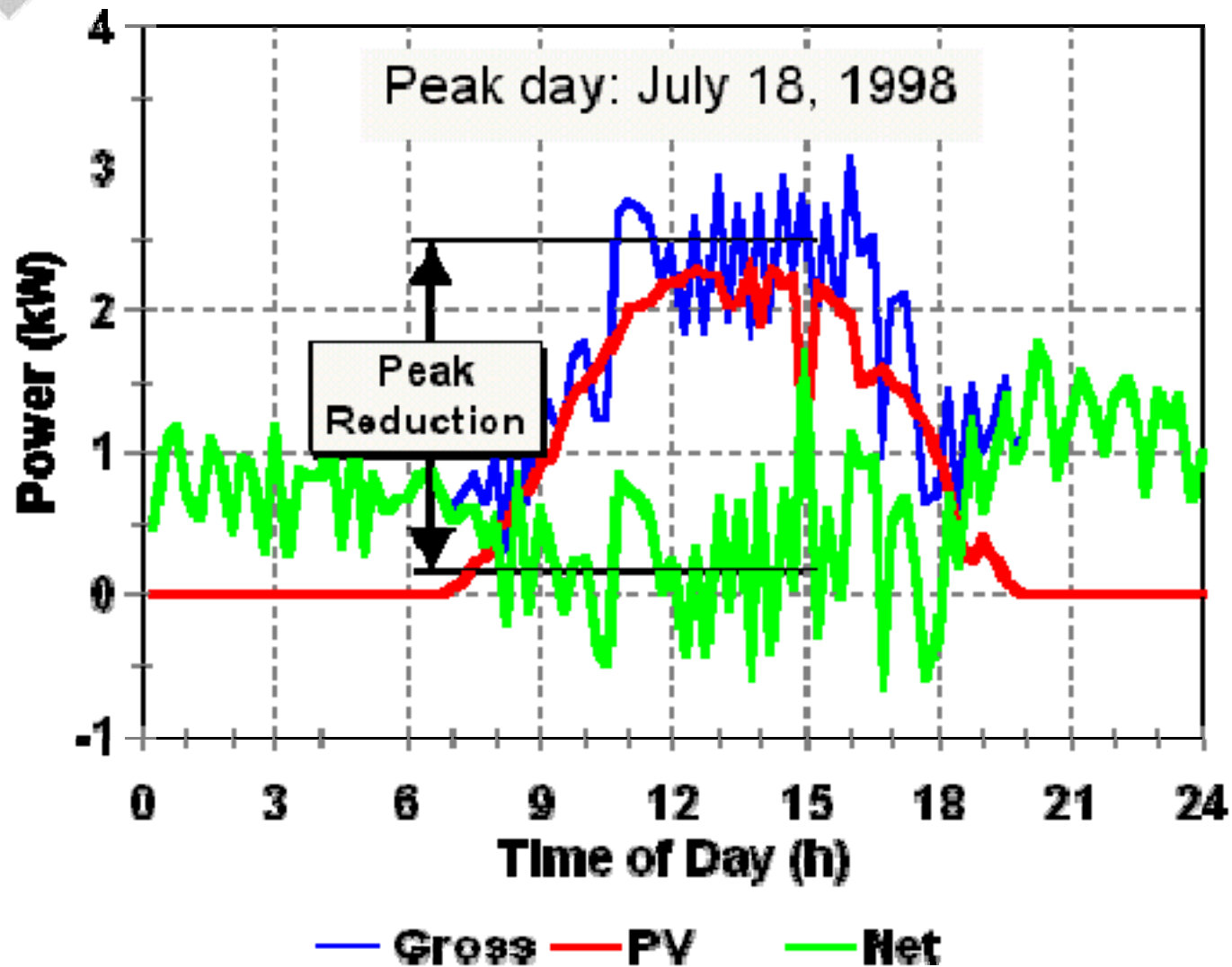


Net Energy Use





Hottest Day - Ever!





Thank You