FLORIDA SOLAR ENERGY CENTER

Creating Energy Independence Since 1975

The Latest Developments in Photovoltaics

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A Research Institute of the University of Central Florida

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Florida Solar Energy Center

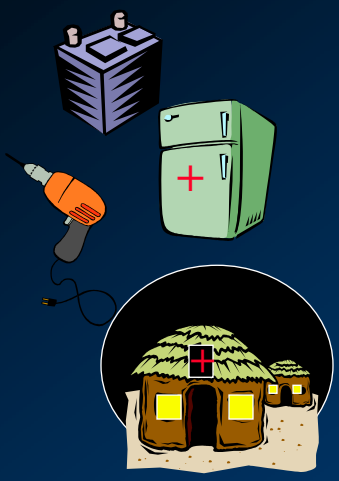
- Created by the Florida Legislature in 1975
- **The** energy research institute of the state of Florida
- A mission of research, testing and education
- The experience, staff and capabilities to help solve our energy problems and help the U.S. meet our energy needs
- Began as a “solar energy” center but grew into many new research and development areas.

Photovoltaic Modules

Stand-Alone PV Applications

- Consumer electronics
  - calculators, watches, radios, etc.
  - small battery charging
- Earth-orbiting satellites
- Cathodic protection
- Telecommunications

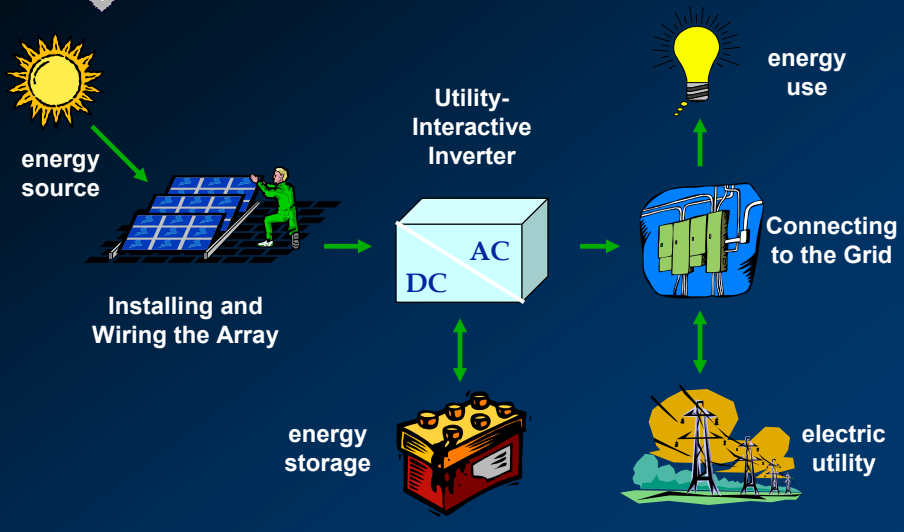
Stand-Alone PV Applications



- Village power
  - small machines, lighting, pumping
  - clinics and community centers
- Health care facilities
  - vaccine refrigerators, lighting, medical equipment

PV Lighting

Grid-Connected PV Systems



Solar for Schools Program

BIPV Modules

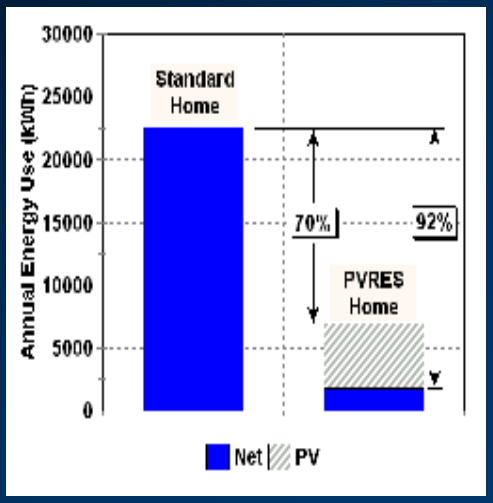
Building Integrated Photovoltaics: Sharp Solar
Ladera Beach, CA

BIPV Modules

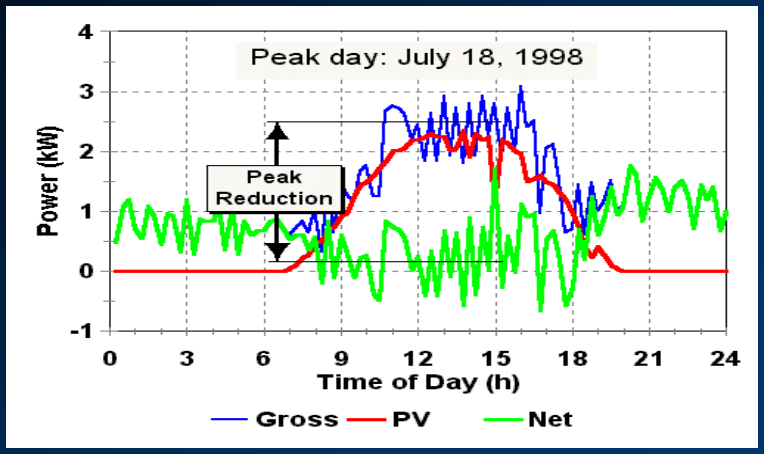
Building Integrated Modules: GE Gecko Modules

Commercial Systems

Zero Energy Homes



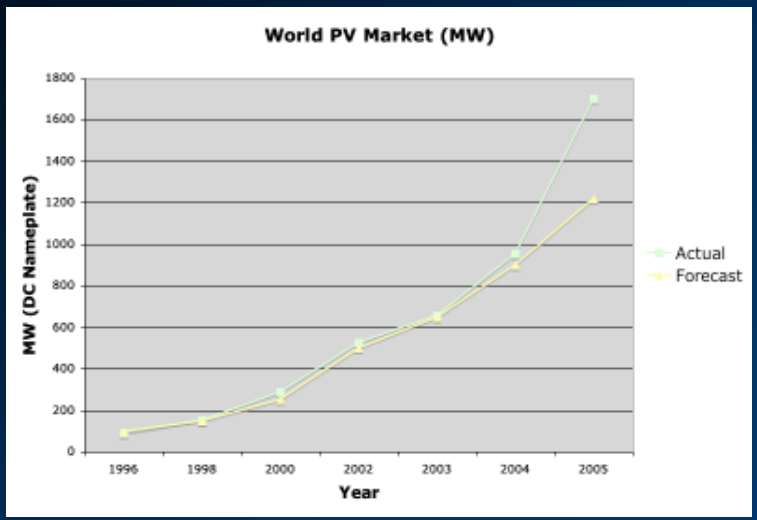
Zero Energy Homes



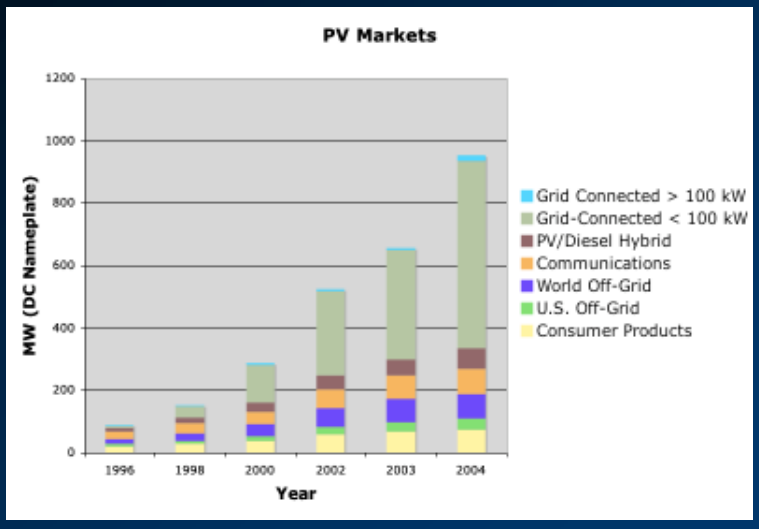
World Markets

- "Thanks largely to growth of the subsidized grid-connected market in Japan, Germany, and United State of California, 2004 saw global production of photovoltaics."
  - Paul Maycock, PV News

World PV Market



PV Markets



World Markets: Japan

- Japanese PV Systems Dissemination Program: 1994-2004
  - Goal: Create sustainable markets in Japan through initial government subsidy
  - Subsidy in 1994: 50%
  - Subsidy in 2004: 6%
  - 200,000 systems installed in 10 years
  - No subsidy in 2005 and market continues
  - Installed cost: $6/watt

World Markets: Germany

- Energy Subsidy: € 0.45 - 0.62 /kWh produced
- Around 300 MW installed in 2004, around 360 MW in 2005

US Markets: California

- The California Public Utilities Commission unveiled their new Program: California Solar Initiative
  - $3.2 billion incentive program
  - Install 3,000 MW of solar on 1 million buildings
  - Eleven-year program due to start in early 2007
  - Average Installed costs: $8/watt
  - Currently around 4000 systems installed

California PV Costs

CEC: Average annual reduction of $0.70/W$_{AC}$ (7.3%/yr)

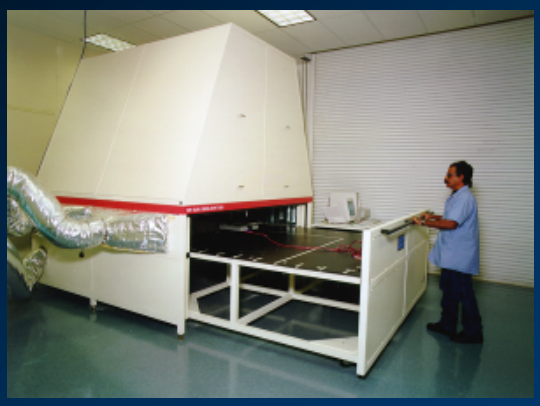
CPUC: Average annual reduction of $0.36/W$_{AC}$ (4.1%/yr)

Letting the Sun Shine on Solar Costs: Wiser, Bolinger, Cappers, Margolis, Jan 2006.

FSEC Capabilities

- Product Testing
  - PV Module Performance Ratings
  - Inverter Testing
- Design Review and Approval
- Training
  - For Contractors and Installers
  - For Code Officials

Module Testing



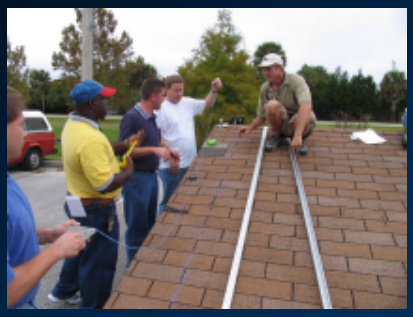
Spire 660 Sun-Simulator

Inverter Test Facility

Design Review and Approval

- Packaged System includes
  - Complete Documentation
  - Diagrams
  - Electrical Schematics
  - P.E. Approved Mechanical Installation
  - Appropriately Rated Components
- Results in simplified and cost-effective system installation

PV Training



PV Installer's Class at FSEC

Code Official Course in Idaho

Thank You

Bailey the Solar Lab