

Greening San Diego's Affordable Housing: Solar Project Considerations

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Greening Your World... **PRESENTED BY JON FORTUNE, P.E.**



Center for
Sustainable Energy
CALIFORNIA

Overview

- Introduction
- Terms
- Photovoltaics
- The Steps
- Tariffs
- Tools



California Center for Sustainable Energy

OUR VISION IS SIMPLE.

Creating a sustainable energy future.

OUR MISSION IS FOCUSED.

To foster public policies and provide programs, services, information and forums that facilitate the adoption of clean, reliable, renewable, sustainable and efficient energy technologies and practices.

CCSE's Energy Advisory Service

Goal: Empower clients with objective information such that they can make educated and confident decisions about sustainability

Service Offerings

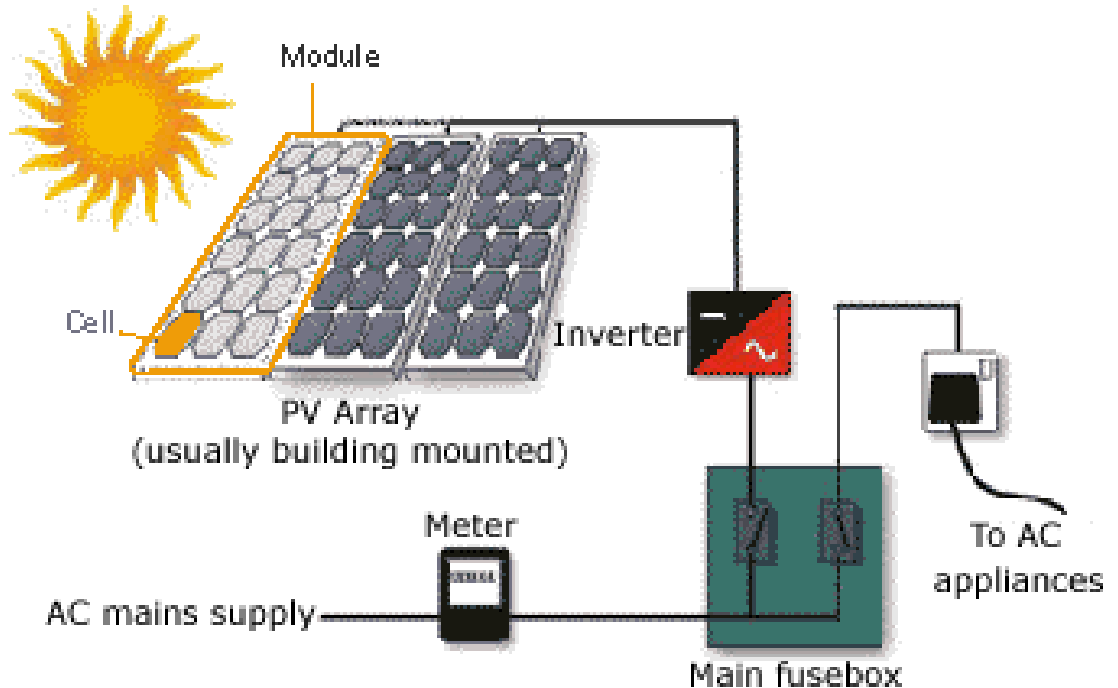
- Energy Efficiency Auditing and Solutions Development
- Renewable Energy Solutions Development (Wind, Solar, Fuel Cells)
- Carbon Impact Quantification as Associated with Climate Change
- Sustainable Incentive and Outreach Program Development
- Management and Green Building Solutions Consulting

Terms

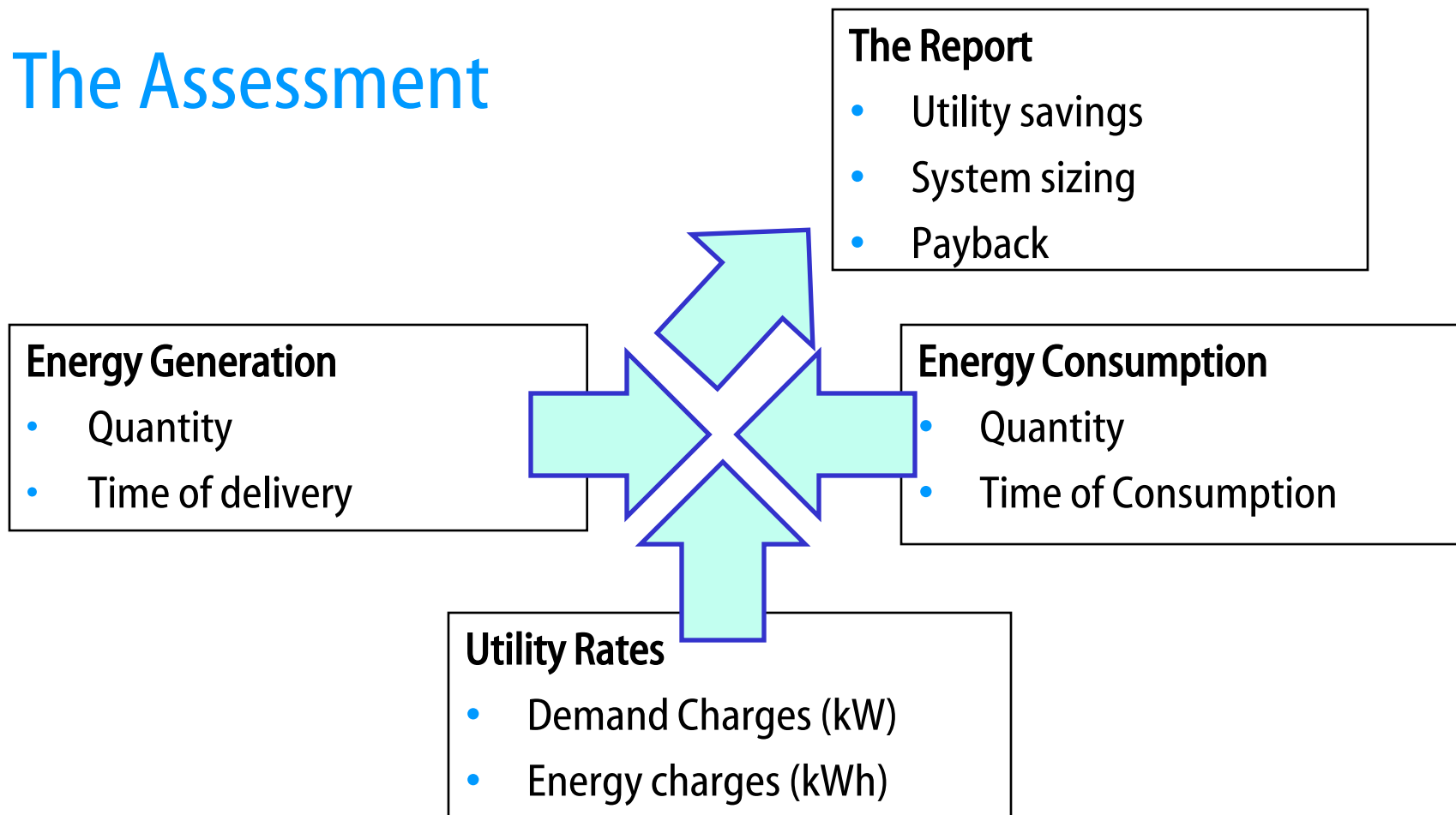
- **kW:** kilowatt = 1000 watts. Unit of power.
- **kWh:** kilowatt hour = 1000 watt hours. Unit of energy. If you use 1000 watts for 1 hour, that is 1000 watt hours or 1 kilowatt hour or 1 kWh
- **Tariff:** utility rate schedule.
- **PV:** Photovoltaics. Technical term for solar. Useful in distinguishing electricity generation from thermal generation (aka solar water heating)

PV (solar electricity) Explained

- When some materials are exposed to sunlight, they release small amounts of electricity giving off what is known as the "photovoltaic effect."



The Assessment



Why Assessments?

- Most organizations have their core competencies and do not have time to become experts
 - Energy costs are just one component of providing the main service your organization provides
- Value of Renewable Energy systems is unique per application
 - No “one size fits all” answers
 - Value differs by site, load, tariff, etc.
- Same terminology does not mean the same performance/value
 - 100 kW of Wind \neq 100 kW of PV \neq 100 kW Fuel Cell
 - kW may be Alternating Current (AC) or Direct Current (DC)

The Steps

- Collect data
 - Available square footage for installation (shading, structural integrity, aesthetics)
 - Energy consumption data of any meter solar will be installed behind
- Design system
 - Calculate system size and kWh output using tools
- Analyze financial impact on utility tariffs

Things to Note

- Residential Units
 - Develop monthly kWh consumption profile for each type of unit
 - Independently sub-meter each unit
 - Request data from occupants
- Common areas
 - Solar will not reduce demand (kW), only kWh
- Approximately 1kW of solar per 100 square foot area

Tariff Lowdown

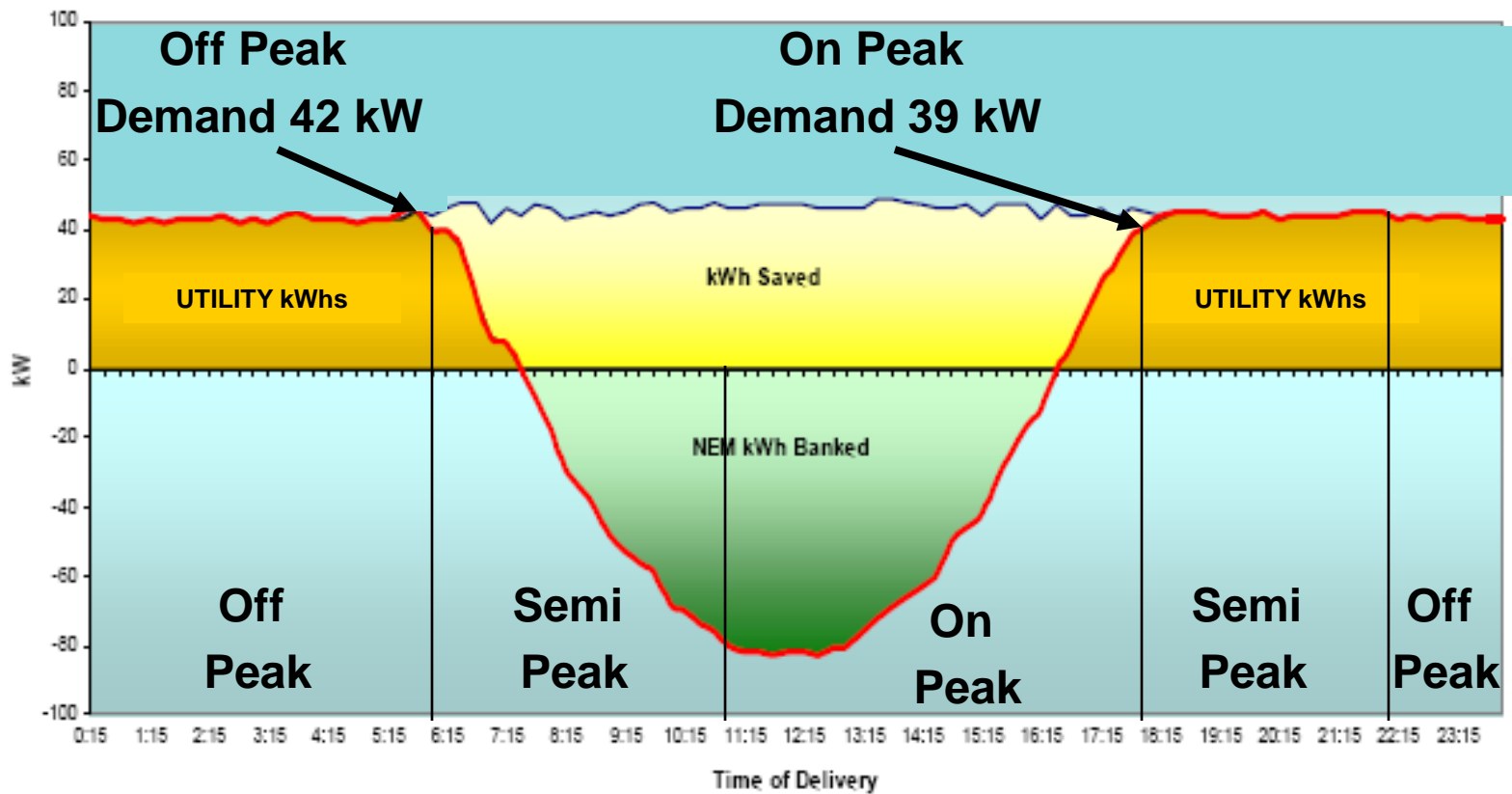
- All tariffs are NOT created equal
- One tariff does NOT fit all customers
- Time-of-use and time-of-production are key to commercial savings
- Net-metering works because you charge the utility at practically the same rate they charge you at the time you produce it:

$(\text{Utility energy rate}) * (\text{kWh Meter Load}) = \text{Utility Bill}$

$(\text{Utility energy rate}) * (\text{DG kWh Production}) = \text{Utility Bill Offset}$

- Net-metering is better than the currently available feed-in tariff
- Design systems to offset your bill costs, not your energy use

Utility Charges with PV – A visual



Relevant SDG&E Tariffs

- Commercial (common areas)
 - A, AL-TOU, DG-R
- Residential (individually metered units)
 - DR, DR-TOU, DR-SES
- Virtual Net Metering (affordable housing only)
 - VNM-A (DR-SES not eligible)

The Toolkit

- Collect utility data for each affected meter
 - SDG&E Energy Waves (Account #, Meter #, Zip Code)
- Evaluate available footprint for solar
 - Google Earth, RoofRay, etc.
- Develop performance output
 - PVWatts
- Evaluate financial impact on tariffs
 - <http://www.sdge.com/regulatory/currentEffectiveTariffs.shtml>

Fundamental Questions

- Are there energy efficiency measures I should explore before examining distributed generation?
- What technology will work best for me?
- What tariff am I on now?
 - What tariff will provide me with the most savings when the project is complete?
- Where will the equipment be installed?
 - How will that impact future facility maintenance?
- How much energy in kWh do I use?
 - Do I expect to use more/less in the future?
- What is my peak kW demand?
 - Do I expect to use more in the future?

Fundamental Questions

- How will I finance this project?
 - What incentives are available and for how long?
- Can I lease to own?
- What are the maintenance requirements of this equipment?
- What is the life-cycle of this equipment?
 - Will the performance degrade and by how much?



Thank You!

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