



SDG&E's Solar Projects

Overview and Status

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San Diego Gas & Electric Company



Presentation Overview



- About SDG&E and Customer Innovations
- Solar Demonstration Projects at SDG&E
 - Strategy
 - Current Projects
- Customer Solar Programs
- Utility Solar Programs

About SDG&E



- A regulated public utility that provides service in San Diego and south Orange County
- 1.4 million residential and commercial accounts
- Service area spans 2 counties and 25 communities
- From a solar standpoint through Sept 2010...

Customer Side PV	YTD 2010	Cumulative
No. PV Systems	~ 2000	~ 10,500
MW of PV Capacity Installed	20 MW	80 MW



Who is Customer Innovations?



- The Customer Innovations team is responsible for areas key to the growth of our Company which include:
 - Clean Transportation
 - Customer distributed generation
 - Electric RD&D
 - Project Development



SDG&E Long-Term Renewables/DER Strategy



- Selectively host demonstration of new technologies
- Develop strategic approach for integrating promising solar and other renewable technologies with storage and smart grid concepts
- Encourage commercialization of promising concepts

Concentrated Solar Demonstration Projects



Four Solar Demonstration Projects

- **Sunlight Direct**
 - Daylight harvesting dish
 - Two 0.5 kW CPV dishes
- **Pyron Solar System**
 - Low profile dual axis tracking, Fresnel lenses system floating on water
 - 20 kW CPV prototype
- **Infinia Stirling Engine System**
 - Dish collector providing heat to Stirling engine/generator
 - 3 kW
- **SolFocus System**
 - 8.4 kW rectangular CPV array with reflective optics focusing on triple-junction cells



Infinia



- Dish Stirling
- Solar-thermal-electric (not PV)
- Reflective concentration
- 3 kW AC output
- Cost target of \$3 per watt in commercial maturity
- Solar to electric efficiency target of 24%
- Two-axis tracking
- Potential for thermal energy storage



SolFocus



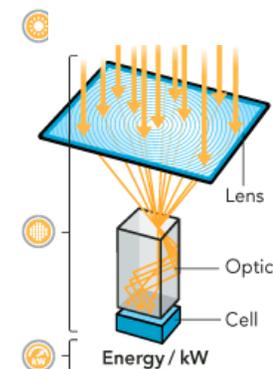
- Two-stage reflective concentration
- Concentration of 500 suns on cell surface
- 8.4 kW AC
- Cost target of \$1-2 per watt in commercial maturity
- Solar to electric efficiency target of 25%
- Two-axis tracking



Pyron



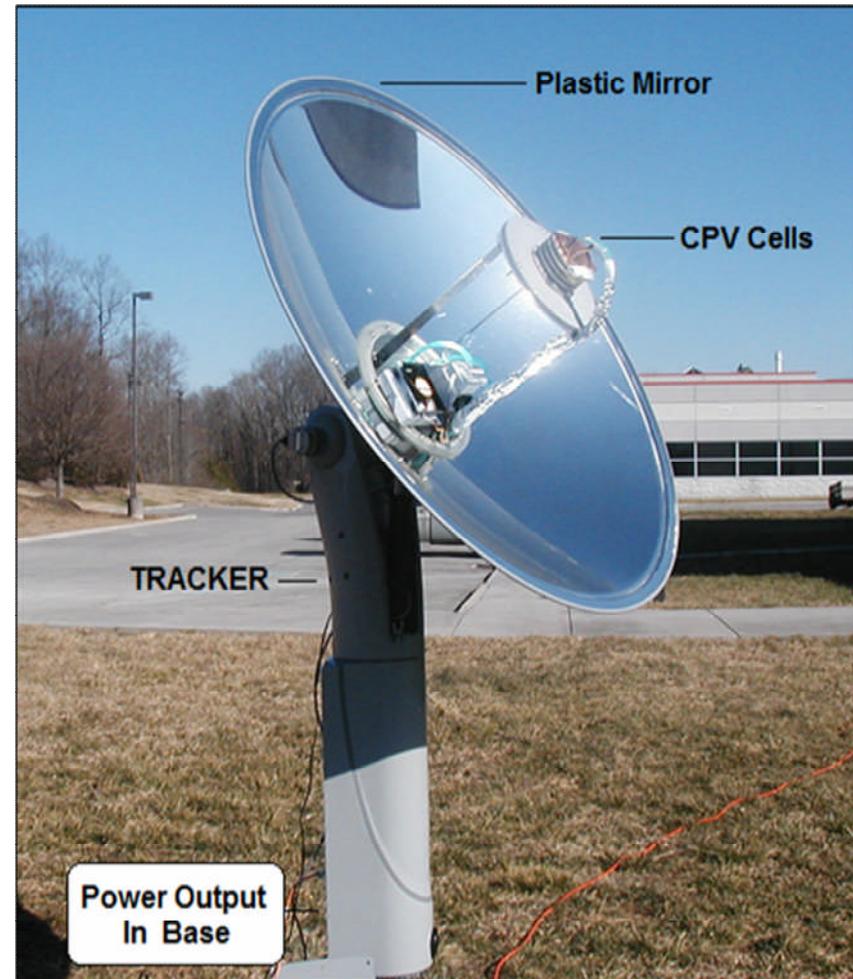
- Two-stage refractive concentration
- Concentration of 500 suns on cell surface
- 20 kW DC output
- Cost target of \$1-2 per watt in commercial maturity
- Solar to electric efficiency target of 25%-30%
- Two-axis tracking



Sunlight Direct



- Direct lighting via fiber optics
- Or concentrating photovoltaics
- Both being tried at SDG&E facility



SDGE

A  Sempra Energy utility™

Basis for SDG&E Interest in Concentrating Photovoltaics (CPV)



- Paths to unsubsidized viability for grid-connected PV
 - High-concentration PV (HCPV)
 - Thin-film flat-plate PV
- San Diego is blessed with abundant direct normal sunlight, which is required for HCPV
- Resurgence of interest in HCPV due to emergence of multi-junction (non-silicon) photovoltaic cells
- SDG&E commitment to meeting the CPUC Renewable Portfolio Standard

CSI & SGIP Programs- Customer Side Incentive Programs



California Solar Initiative (CSI) – SB1

- Install 3000 MW of Solar PV throughout California by 2016
- Over 80 MWs of installed and active projects in SDG&E territory
- \$2.1 billion funded by customers of the three Investor Owned Utilities
- Programs: Retrofit and commercial new construction, Multi-Family Affordable Housing (MASH), Single-Family Affordable Housing (SASH), New Solar Homes, Solar Water Heating

Self Generation Incentive Program (SGIP) - AB970

- Solar PV over 30 kW in SGIP from 2001-2006- now installed through CSI
- Approximately 150 MW installed statewide- 14 MW in SDG&E territory
- Budget currently \$11 million per year through 2011
- Technologies: Wind Turbines, Fuel Cells, Energy Storage with either technology

Sustainable Communities Program



Goal: Create showcase, energy efficient, sustainably designed or operated projects in the San Diego area

Description:

- Integrate utility-owned clean generation systems within sustainable buildings
- Installed, owned, maintained & operated by SDG&E
- Interconnected on utility side of the meter
- No effect on customer utility bill

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Debbie Agnew, 9/20/2007

Participant Benefits



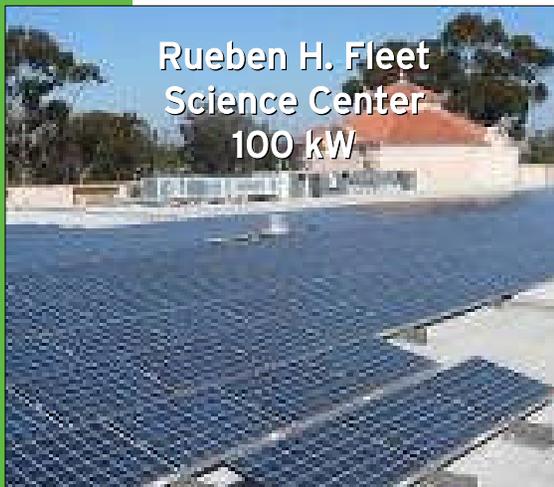
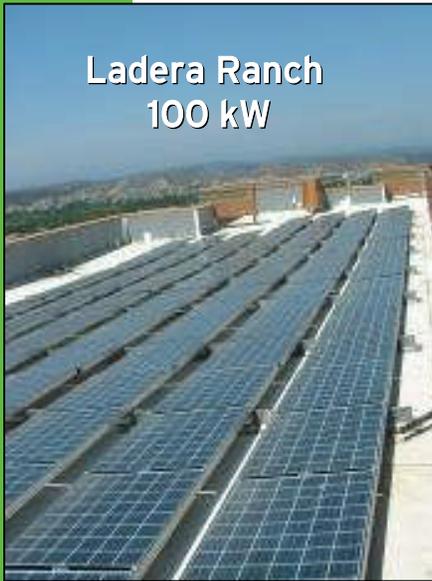
Benefits:

- Community partner to help provide locally generated clean power
- Potential marketing opportunities and educational value
- Payment for space occupied by photovoltaics system
- Possible LEED[®] and CHPS points
- Public Recognition – website, case studies, publicity

SCP Projects



Installed projects – 2.0 MW
Over 1.5 MW more planned (as May '10)



SDG&E's Solar Energy Initiative



- SDG&E's Solar Energy Initiative is intended to complement other renewable programs in the state and helps meet SDG&E's 20 % Renewable Portfolio Standard
 - Applies to niche not covered by CSI
 - Intended to attract smaller projects not bid in to RPS solicitations
- SDG&E's Solar Energy Initiative Team would work with the community and solar industry to help achieve the goals of the program
- Utility owned and power purchase agreements for solar photovoltaic generation in San Diego load areas
- Multiple distributed generation projects connected to distribution system not exceeding 5 - 10 MW individually so as to minimize any impacts
- All photovoltaic system technologies evaluated
- Minimum of 1 to 2 MW per site, tied to distribution system
- Multiple projects totaling no more than 26 MW (direct current) of PV on utility land

Potential Locations...in San Diego



- Strategic Siting
 - Requires large areas
 - 1 MW (alternating current) requires 7 acres +/-
 - Utility-owned vacant sites
 - Power Purchase Agreements
 - Closed Landfills
 - Visitor serving facilities
 - Parking lots
 - Rooftop

Questions?



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