
California's PV Market: Opportunity for Growth

California-German Solar Day, November 7, 2005
German America Chamber of Commerce

Scott J. Anders
Energy Policy Initiatives Center
University of San Diego School of Law



Presentation Overview

- PV Potential
 - California
 - San Diego
- Current Market Overview
 - CEC ERP Data
 - SGIP Data
- Factors for Future

Energy Policy Initiatives Center

- Academic and Research Center
 - University of San Diego School of Law
- EPIC Activities
 - Research and Analysis
 - Law School Courses/Clinics
 - Public Education

Potential for PV in California

■ California Energy Commission Study

□ New/Existing Commercial	38,000 MW
□ <u>Existing Residential</u>	<u>36,000 MW</u>
Total	74,000 MW
□ New Residential (2005)	436 MW

Source: *California Solar Resources*, CEC April 2005 (CEC-500-2005-072-D)

Potential for PV in San Diego

Table 2.1: Technical Potential of PV Systems in San Diego County

	Capacity (MWAC) ¹			Energy (GWh)		
	2005	2010	2020	Today	2010	2020
Potential PV:						
Residential	2,539	2,772	2,965	5,782	6,310	6,756
Commercial	1,575	1,624	1,726	3,165	3,263	3,468
Total Technical Potential for PV	4,114	4,396	4,691	8,947	9,573	10,224
Potential PV Market Penetration:						
1%	41	44	47	89	96	102
5%	206 ³	220	235	447 ⁴	479	511
10%	411	440	469	895	957	1,022

¹ Capacity is defined as nameplate peak power rating

² May 2005 SDG&E's existing PV grid-connected installation is 12.6 MW which equates 0.31% of SDG&E's peak demand

³ 5.1% of SDG&E's peak demand using a 2004 peak of 4,065 MW

⁴ 2.4% of SDG&E's 2004 total energy sales of 19,000 GWh

Source: *Potential for Renewable Energy in the San Diego Region*, August 2005. See www.renewables.org.

As of September 30, 2005 there are 2744 systems representing 16.9 MW

California Totals

- 2 Incentive Programs
 - CEC Emerging Renewables Program (ERP)
 - 0-30kW
 - \$2.80/watt
 - Pilot performance-based incentive
 - \$0.50/kWh for 3 years
 - CPUC Self-Generation Incentive Program
 - 30 kW – 1 MW
 - \$3.50/watt
 - Currently fully subscribed with wait lists

California Totals

- CEC Emerging Renewables Program (ERP)

Total CEC ERP Data 1998-2005*

	# Systems	kW	Incentives	Total Project Cost
1999-2004 Completed	11,732	47,000	\$ 180,300,000	\$ 399,500,000
2005 Completed	3,070	13,361	\$ 37,410,749	\$ 114,555,758
In Process	4,923	24,222	\$ 67,820,981	\$ 206,300,852
Total	19,725	84,583	\$ 285,531,730	\$ 720,356,610

*Data through 10-3-05

Source: California Energy Commission

California Totals

- CEC Emerging Renewables Program
 - Systems Installed

<i>Year</i>	<i>Number</i>	<i>MW</i>	<i>Amount (\$MM)</i>
1998	41	0.2	\$0.5
1999	197	1.1	\$2.9
2000	235	0.8	\$2.2
2001	1,292	4.3	\$16.9
2002	2,331	8.5	\$36.3
2003	3,021	12.9	\$52.1
<u>2004</u>	<u>4,615</u>	<u>19.2</u>	<u>\$69.4</u>
Grand Total	11,732	47.0	\$180.3

Source: California Energy Commission

California Totals

- CEC Emerging Renewables Program
 - Systems in the Program for 2005*

Data Category	Completed	In-Process	Total
Total Number	3,070	4,923	7,993
Total Capacity (MW)	13	24	37
Total Incentives	\$37,410,748	\$67,820,981	\$105,231,729
Total Project Cost	\$114,555,757	\$206,300,852	\$320,856,609
Av. System Cost (\$/W)	\$8.57	\$8.50	\$8.54
Av. System Size (kW)	4.35	4.93	4.71

*Data through 10-3-05

Source: California Energy Commission

California Totals

- CEC ERP Completed Systems
 - As of 10-3-05

<i>Year</i>	<i>Number</i>	<i>MW</i>	<i>Amount (\$MM)</i>
1998	41	0.2	\$0.5
1999	197	1.1	\$2.9
2000	235	0.8	\$2.2
2001	1,292	4.3	\$16.9
2002	2,331	8.5	\$36.3
2003	3,021	12.9	\$52.1
<u>2004</u>	<u>4,615</u>	<u>19.2</u>	<u>\$69.4</u>
Grand Total	11,732	47.0	\$180.3
<u>2005</u>	<u>3,070</u>	<u>13.3</u>	<u>\$37.4</u>
Totals	14,802	60.3	\$217.7

California Totals

■ Self-Generation Incentive Program

SGIP Program Data 2001-2005

	# Systems	kW	Incentive \$	Total Project Coast
Completed	428	49,998	\$ 175,060,841	\$ 404,707,211
In Process	410	72,164	\$ 213,398,294	\$ 527,391,191
<i>Wait List</i>	<i>285</i>	<i>68,885</i>	<i>\$ 222,716,482</i>	<i>\$ 553,635,113</i>
Total	1,123	191,048	\$ 611,175,616	\$ 1,485,733,515

California Totals

■ Total PV Market 1998-2005

1998-2005 Total Combined SGIP and CEC Data

	# systems	kW	Incentive \$	Total Project Cost*
Completed	15,230	110,359	\$ 392,771,590	\$ 918,762,969
Active	5,333	96,386	\$ 281,219,275	\$ 733,692,043
Totals	20,563	206,746	\$ 673,990,865	\$ 1,652,455,012
<i>SGIP Wait List</i>	<i>285</i>	<i>68,885</i>	<i>\$ 222,716,482</i>	<i>\$ 553,635,113</i>
Theoretical Total	20,848	275,631	\$ 896,707,346	\$ 2,206,090,125

*Includes Estimate for total project cost for completed CEC ERP projects from 1998-2004 (@\$8.50/watt).

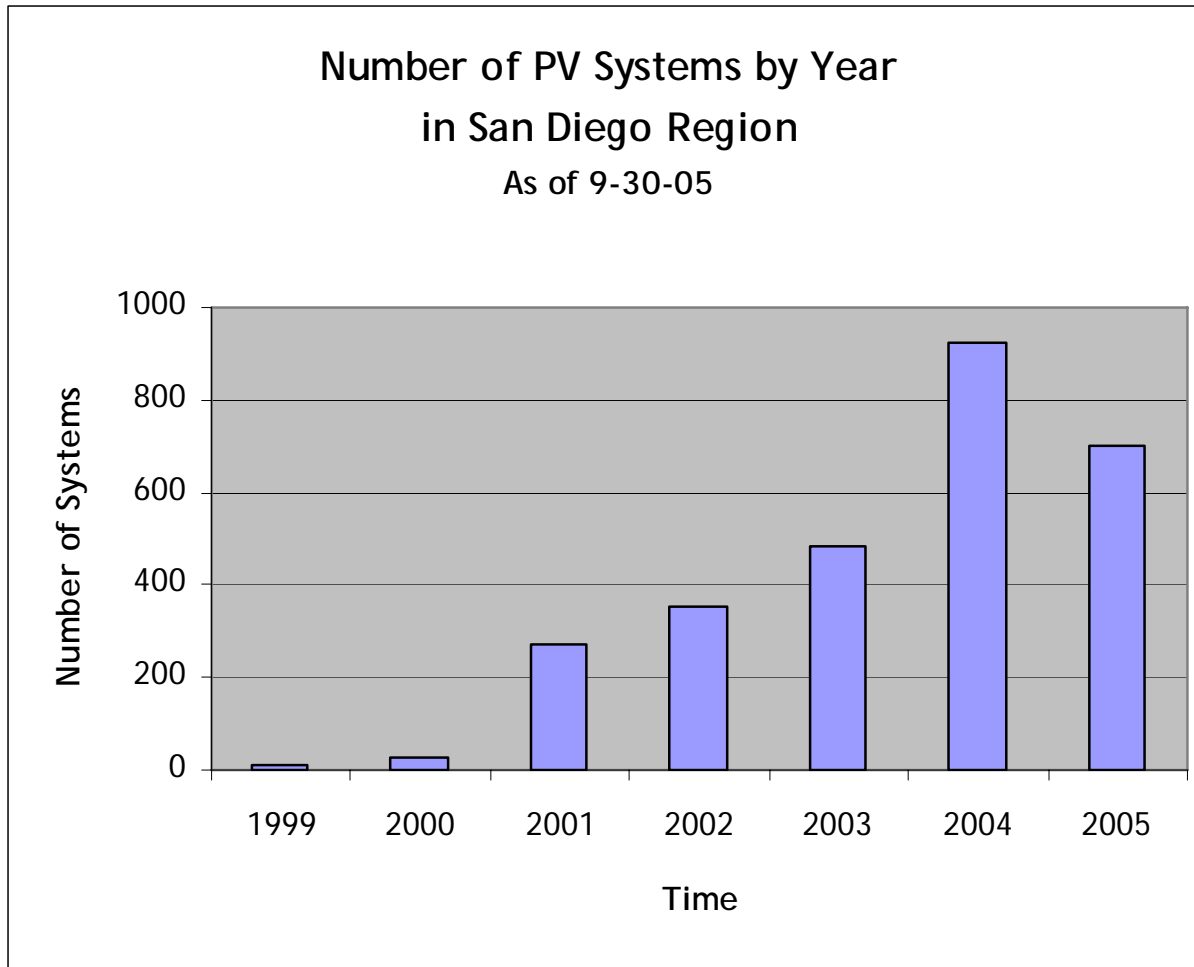
Focus on San Diego Region

- San Diego is Poster/Problem Child!
 - The SD region has more PV as % of Peak demand than any other IOU territory in CA!

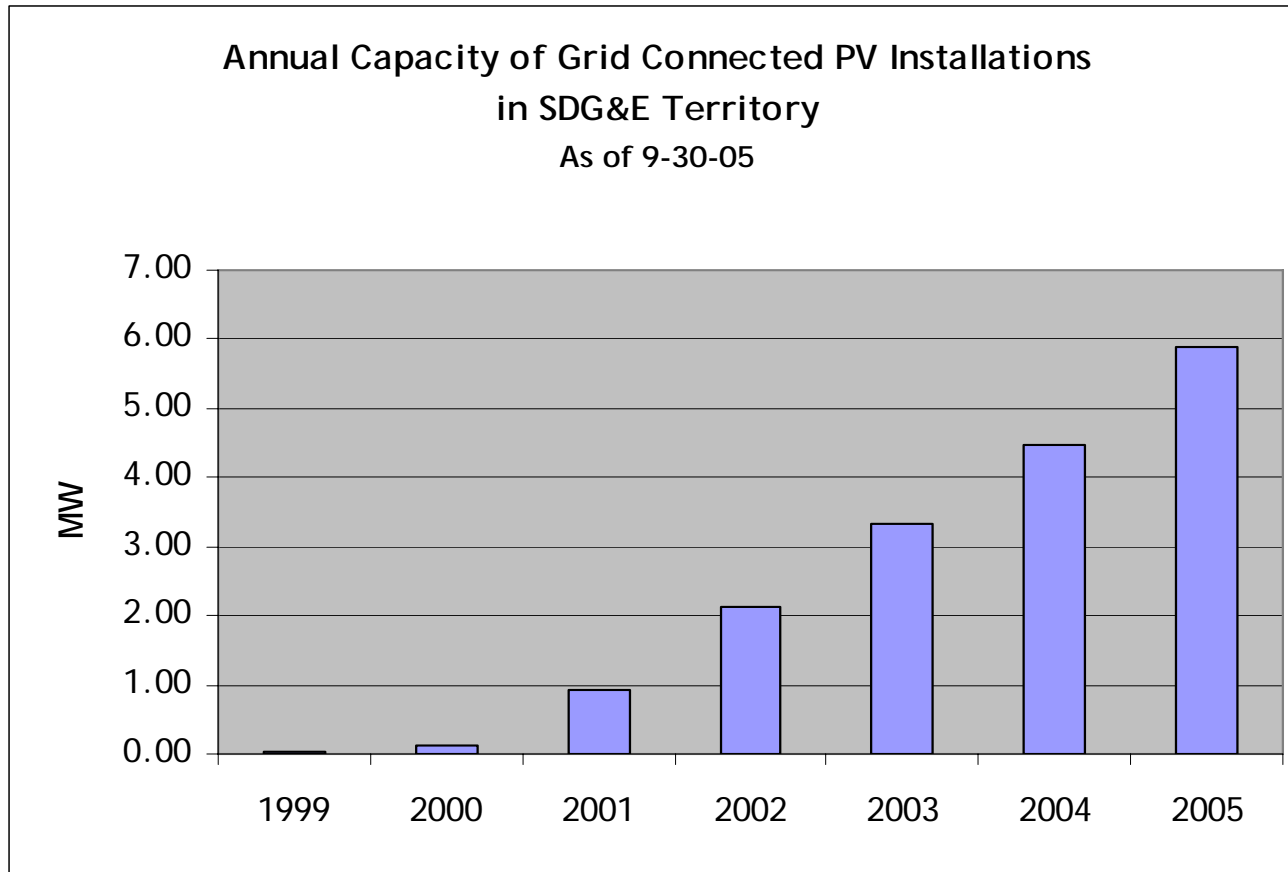
	# Systems	MW
Installed	2,744	16.9
<i>Pending</i>	459	3.8
Total	3,203	20.7

Source: SDG&E, Date through September 31, 2005

PV Installations in San Diego



PV Installations in San Diego



PV in San Diego

- Many more residential systems
- Commercial is largest sector
 - Recently overtook residential sector

Sector	Systems	Capacity (MW)
Residential	2,628	8.2
Commercial*	146	8.7
Total	2,774	16.9

*Commercial sector includes systems >10 kW

A Few Factors for the Future

- CA Solar Initiative
 - SB 1 taken up by the CPUC
- Manufacturing Capacity
 - Module Availability
 - Silicon supply
- Advanced Meters
 - Dynamic pricing
 - Opportunities for dispatching power
 - Possible changes to net metering

Thank You!

Scott J. Anders

Energy Policy Initiatives Center

University of San Diego School of Law

619-260-4589

scottanders@sandiego.edu