

PG&E and Renewables

Finding the ROI in Green Programs



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Manager

Solar and Customer Generation
Integrated Demand-Side Management



Pacific Gas and Electric Company



Energy services to 15 MM people:

- 5.1 MM Electric customer accounts
- 4.3 MM Natural Gas accounts

70,000 square miles with diverse topography

20,000 employees

A regulated investor-owned utility

Serve 5% of U.S. population, but produce only 1% of utility sector CO₂ emissions

The most grid-connected PV systems in the U.S.



Ranked the greenest utility in the United States



Progressive Energy Policy

Long-standing State policies lower carbon footprint

30+ years of energy efficiency programs facilitated by “decoupling” of rates

California Energy Action Plan’s preferred loading order:

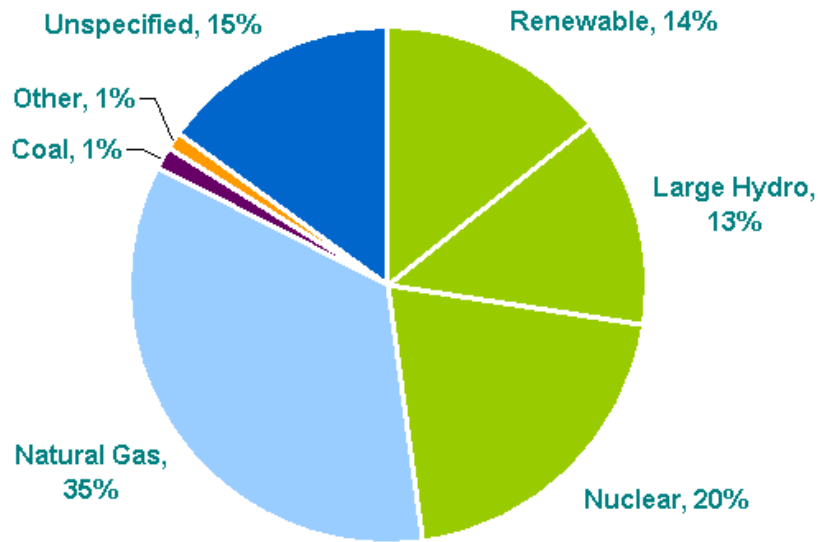
1. Customer Energy Efficiency and Demand Response
2. New Renewable and Distributed Generation
3. Clean gas-fired plants





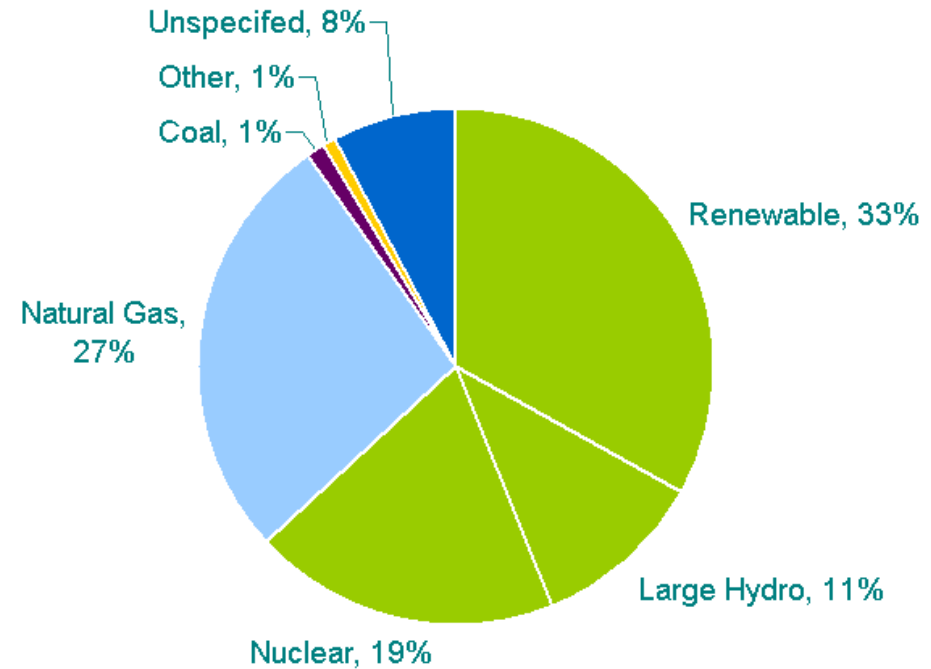
A Growing Reliance On Renewables

2009



47% Non-emitting

2020

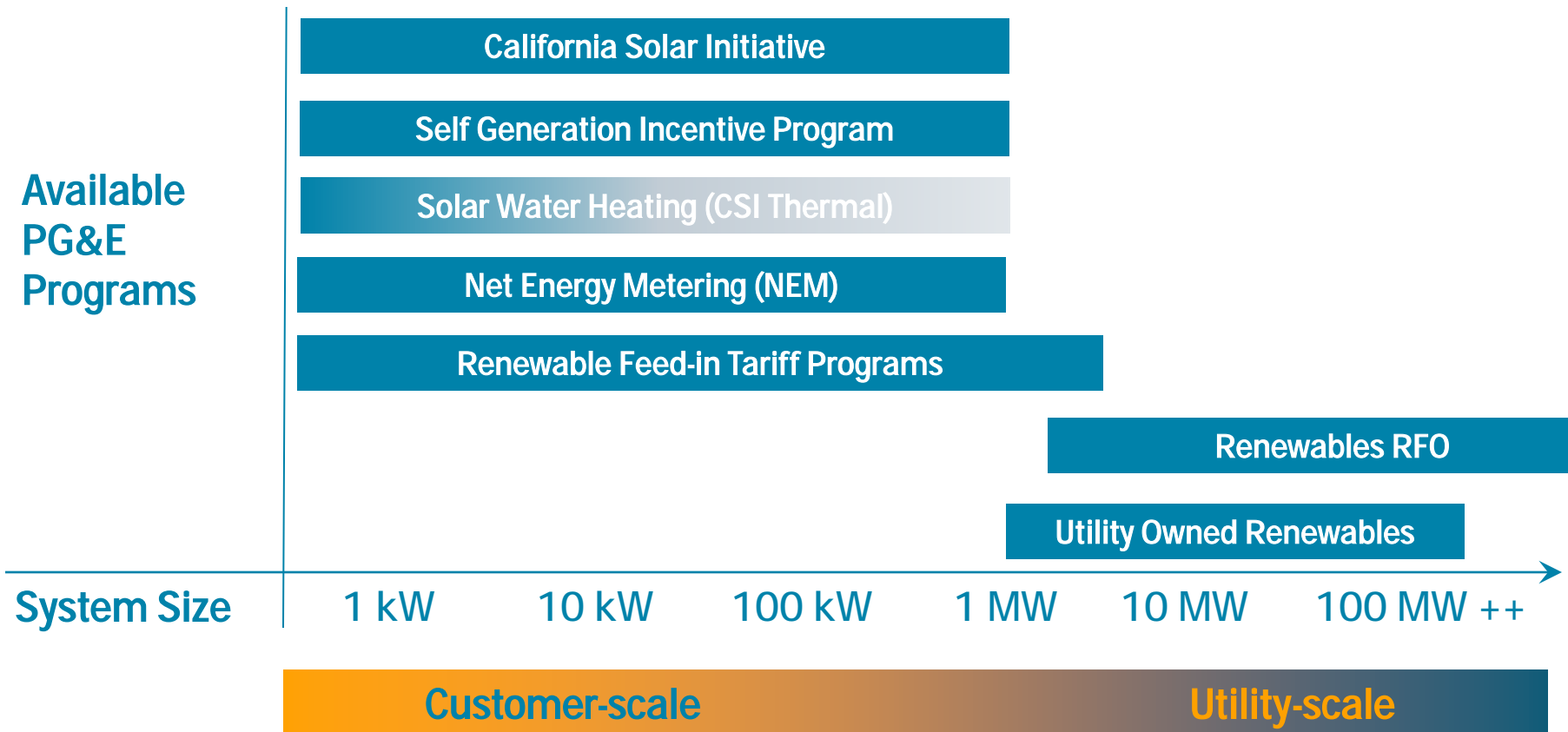


~63% Non-emitting



PG&E Renewable Programs

The Program Design Shifts as Generation Capacity Increases





Balancing Competing Priorities



**Environmental
Sustainability**

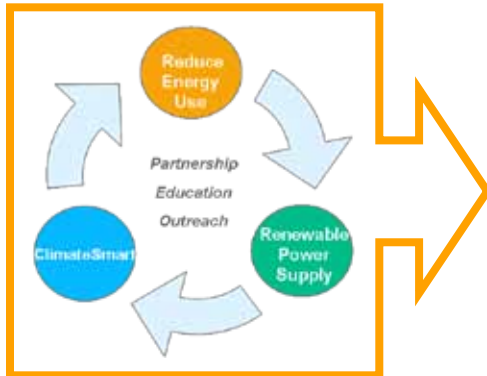


**Reasonable
Cost**

Reliable Service



Integration of EE and DG



EE should be considered prior to DG

Why?



EE is typically much more cost-effective than DG

California's loading order requires that EE be implemented prior to DG

Decreasing a facility's consumption with EE reduces the size (and cost) of DG system necessary to offset facility's load

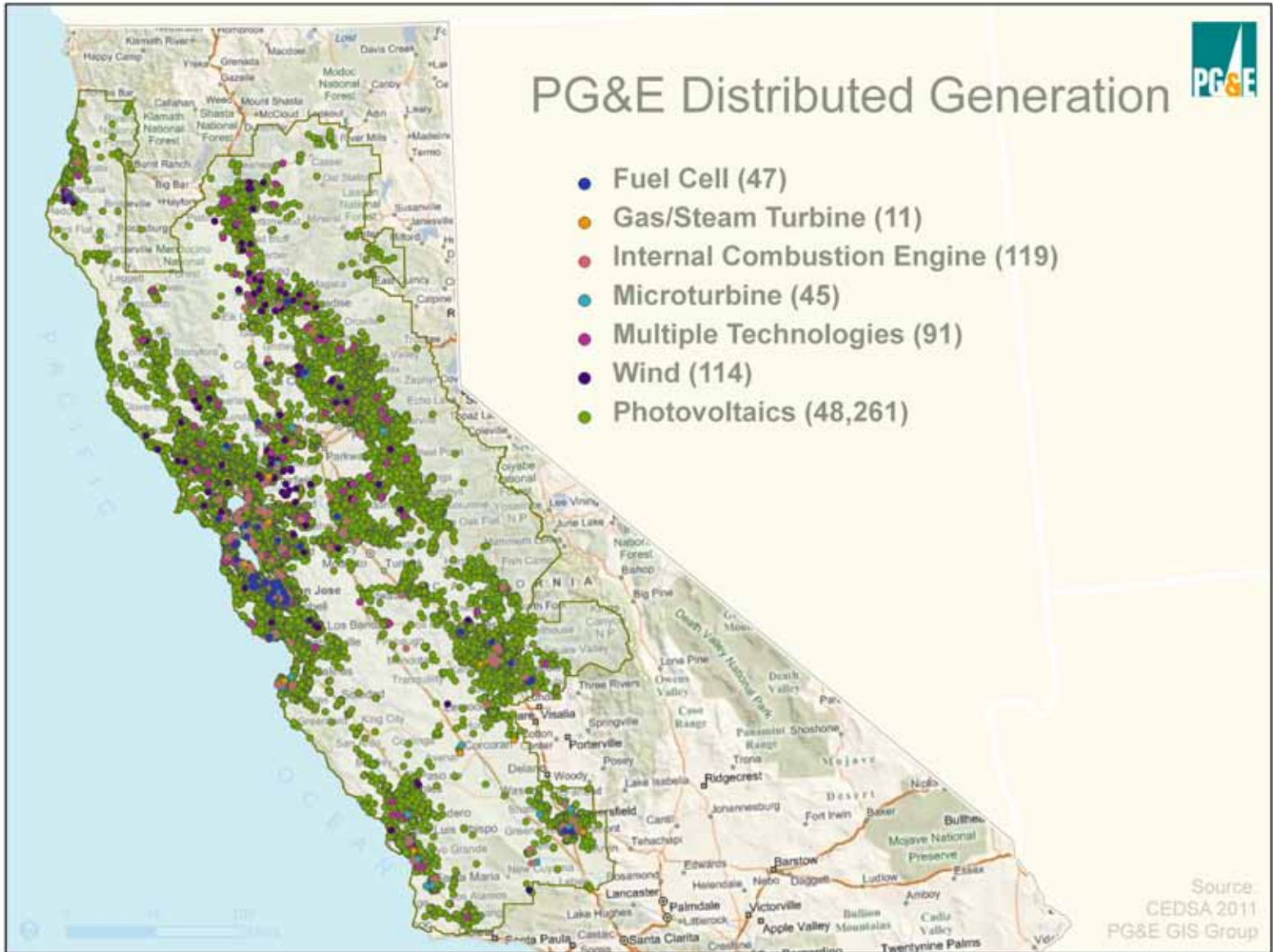


PG&E Customer-Side Renewable Energy Programs

PG&E Program	Solar Incentive Programs				Non-Solar Incentive Programs	Net Energy Metering
	California Solar Initiative (CSI)	Low-Income CSI Programs	New Solar Homes Partnership (NSHP)	California Solar Initiative (CS) - Thermal	Self Generation Incentive Program (SGIP)	
What is it?	An incentive program for customer-side solar, designed to help customers reduce on-site load	Incentive programs for customer-side solar, specifically for low-income applications	An incentive program for customer-side solar for new residential developments	An incentive program for the installation of solar water heating technologies	An incentive program for customer-side fuel cells, wind, and advanced energy storage (coupled with a wind or fuel cell)	A tariff that permits customers to “bank” solar electricity produced that is in excess of instantaneous consumption
Customer- or utility-side?	Customer-side	Customer-side	Customer-side	Customer side	Customer side	Customer-side
Eligible participants	PG&E customers	PG&E customers	Housing developers in PG&E territory	PG&E customers	PG&E customers	PG&E customers
Eligible system sizes	1 kW – 5 MW*	1 kW – 5 MW*	1 – 7.5 kW	Up to \$500,000 for gas customers and \$250,000 for electric customers	1 kW – 5 MW**	1 kW – 1 MW
Financial opportunity	Incentives from \$0.35 – 1.10/W (one-time, up-front payment) or \$0.05 – 0.15/kWh (paid monthly for 5 years)	Incentives vary; up to entire cost of PV system	\$2.50/W - \$3.60/W, depending on home’s efficiency	Incentives from \$12.82/therm displaced or \$0.37/kWh displaced	Incentives from \$1.50/W - \$4.50/W depending on technology and fuel type	Retail rate for electricity supplied to grid; annual true-up period (no net export)
References	www.pge.com/csi www.gosolarcalifornia.com	www.pge.com/lowincomesolar www.gridalternatives.org/sash	www.pge.com/nshp	www.pge.com/csithermal	www.pge.com/sgip	www.pge.com/gen

* Incentives available up to 1 MW

** Tiered Incentives available up to 3 MW

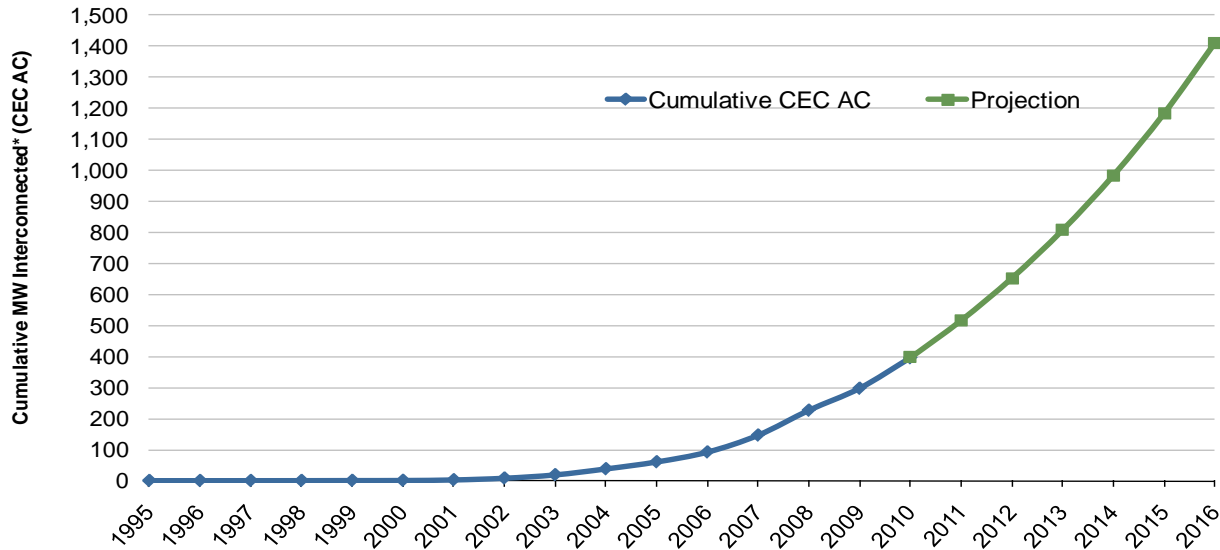




Customer Generation

More than 49,000 PG&E customers have onsite solar generation

Cumulative Capacity of NEM (MW, CEC AC)
Interconnected with PG&E Grid*



* Includes all PV and Wind NEM (and VNEM) projects, excludes Non-Export projects



~35% of US residential PV interconnections are in PG&E's service territory



The California Solar Initiative

PG&E began administering in 2007

\$950 million in PG&E solar incentives over the next decade

Statewide Objective: 3,000 MW by 2016

Customers must perform energy efficiency audit to be eligible for incentives

Includes retrofit, low income, and new homes elements



PG&E CSI

- *Received more than 35,000 applications in over 4 years*
- *Completed over 26,000 projects for a total of 247.7 MW (CEC AC)*



CSI Incentive Structure

The California Solar Initiative (CSI) Trigger Tracker shows how many CSI megawatts (MW) worth of rebates are available in the current incentive step level. The CSI Trigger Tracker gives an indication of whether incentive levels are expected to drop imminently by showing "MW Under Review". When the "MW Under Review" exceeds the "MW Remaining", the row is bolded. When this occurs, it is likely that any new applications will receive the next (i.e. lower) incentive step level. By comparing "MW Under Review" with "MW Remaining", users can make their own estimates of when the incentives are going to decline to the next step level. **The CSI Program will be offered until the Program Administrator territory megawatt targets have been reached or until the allocated incentive budget for each Program Administrator territory has been spent, whichever occurs first.**

Administrator	Customer Class *	Current Step	Initial MW in Step	Unused MW from Previous Steps	Revised Total MW in Step	Issued Conditional Reservation Letters (MW)	MW Remaining	MW Under Review
PGE	Residential	8	36.10	0.65	36.75	11.45	25.30	1.18
	Non-Residential ¹	8	73.20	5.84	79.04	46.21	32.84 ¹	0.74
SCE	Residential	6	28.80	0.08	28.88	2.24	26.64	1.74
	Non-Residential	8	77.10	5.03	82.13	5.35	76.78	18.02
CCSE	Residential	8	8.50	0.39	8.89	2.51	6.37	0.58
	Non-Residential ¹	8	17.30	2.35	19.65	0.19	19.46 ¹	5.04

1. Due to budgetary constraints, all un-confirmed CSI MW are not guaranteed a CSI incentive at this time. However, the Program Administrator is still accepting reservation request applications. The MW amount remaining will be incentivized as funding becomes available or as projects drop out. A waiting list for megawatts that become available can be found on the Program Administrator's website.

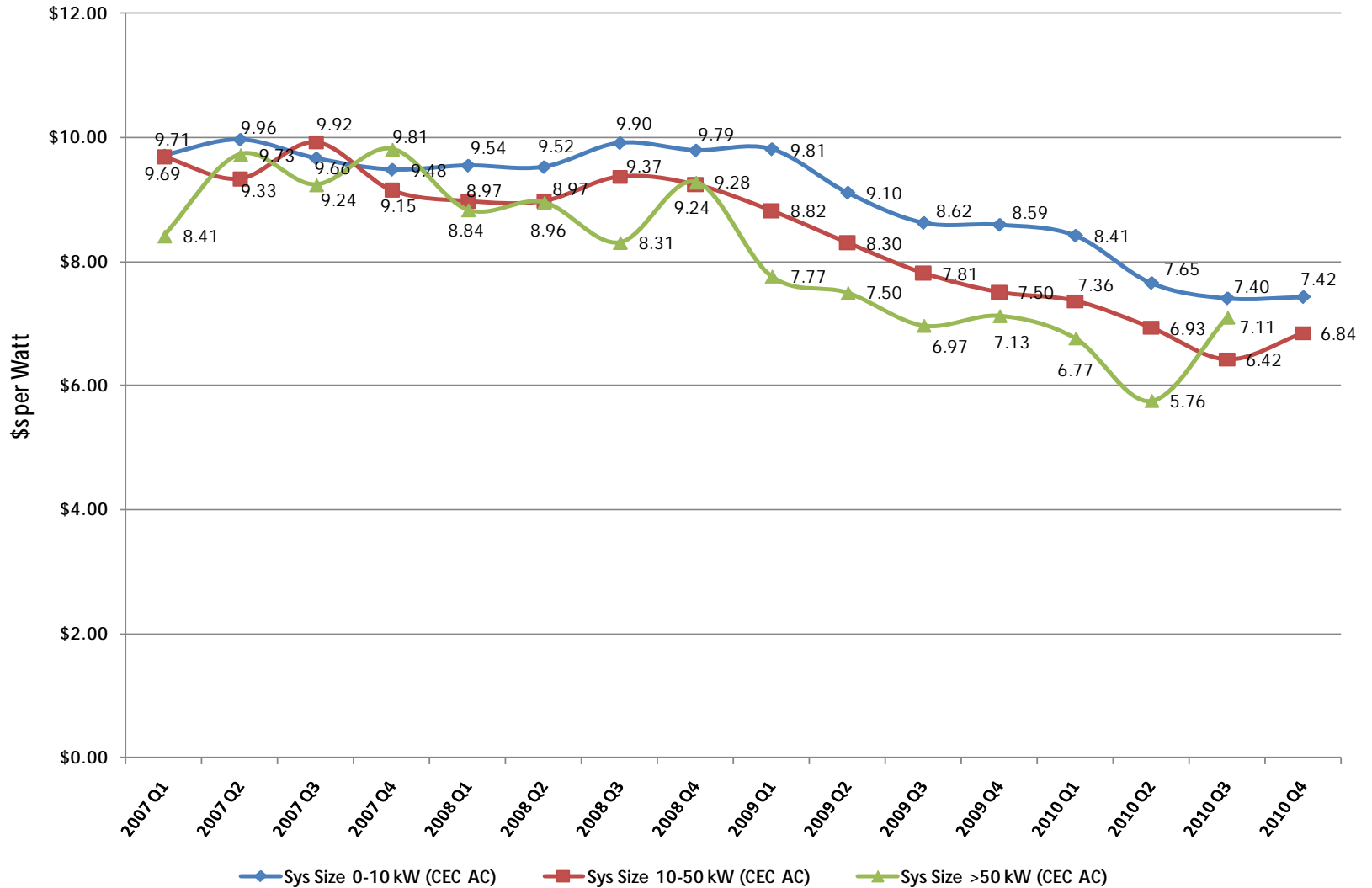
CSI Step table: CSI Rebate Levels by Incentive Step and Rebate Type

Step	Statewide MW in Step	EPBB Payments (per Watt)			PBI Payments (per kWh)		
		Residential	Non-Residential		Residential	Non-Residential	
			Commercial	Government/ Non-Profit		Commercial	Government/ Non-Profit
1	50	n/a	n/a	n/a	n/a	n/a	n/a
2	70	\$2.50	\$2.50	\$3.25	\$0.39	\$0.39	\$0.50
3	100	\$2.20	\$2.20	\$2.95	\$0.34	\$0.34	\$0.46
4	130	\$1.90	\$1.90	\$2.65	\$0.26	\$0.26	\$0.37
5	160	\$1.55	\$1.55	\$2.30	\$0.22	\$0.22	\$0.32
6	190	\$1.10	\$1.10	\$1.85	\$0.15	\$0.15	\$0.26
7	215	\$0.65	\$0.65	\$1.40	\$0.09	\$0.09	\$0.19
8	250	\$0.35	\$0.35	\$1.10	\$0.05	\$0.05	\$0.15
9	285	\$0.25	\$0.25	\$0.90	\$0.03	\$0.03	\$0.12
10	350	\$0.20	\$0.20	\$0.70	\$0.03	\$0.03	\$0.10

- As of December 24th, 2010 PG&E has received enough applications to exhaust remaining Non-Residential funds
- It is currently estimated these funds will satisfy approximately 65 to 75% of step 8 Non-Residential MW goals



CSI Total Installed Cost (CEC AC)

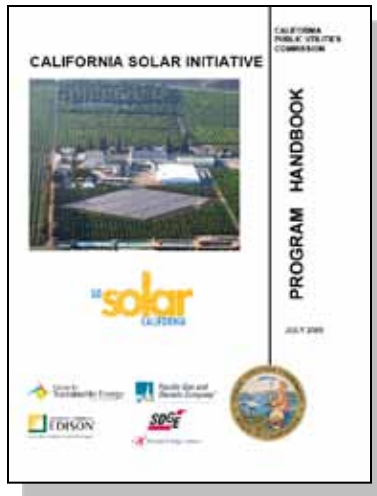


Data aggregated and assigned to the project's reserved quarter



CSI Low Income

- Designed to encourage solar adoption for low income housing residents



- **Multi-Family Affordable Solar Housing (MASH)**
 - Administered by PG&E
 - \$108MM available for incentives
 - Track 1a: \$3.30/Watt for systems that offset common load
 - Track 1b: \$4.00/Watt for systems that offset tenant load
 - Follows same application process as a 3-Step CSI application
 - Virtual Net Metering (VNM) available
 - No funds currently available
 - Waitlist Full
- **Single Family Affordable Solar Housing (SASH)**
 - Administered by Grid Alternatives
 - \$108MM available for incentives
 - Very low income customers may receive a 1kW fully subsidized (up to \$10,000) system
 - To apply visit: www.gridalternatives.org/sash



New Solar Homes Partnership (NSHP)

PG&E began administering in 2007

Statewide Objective: 400 MW of installed solar on new homes in California

Establish a self-sufficient solar industry where solar energy systems are a viable mainstream option for new homes by 2016

Place solar energy systems on 50% of the new homes by the end of program

Project must exceed the current Title 24 by 15%



PG&E NSHP

- *Received over 700 applications for over 5,000 sites*
- *Paid over \$10M for a total of 6.7 MW (CEC AC)*



NSHP Incentive Structure

Base Incentive (per watt, reference system)	Qualifying Residential Units <u>With Solar</u> as a Standard Feature Incentive* (per watt, reference system)	Reserved Volume** (MW-AC)
\$2.50	\$2.60	15
\$2.25	\$2.35	18
\$2.00	\$2.10	22
\$1.75	\$1.85	25
\$1.50	\$1.60	30
\$1.25	\$1.35	35
\$1.00	\$1.10	40
\$0.75	\$0.85	50
\$0.50	\$0.60	75
\$0.25	\$0.35	90
Total		400

- Incentives decline as megawatt targets are achieved
- Additional incentives for offering solar as a standard



CSI Thermal – Solar Water Heating (SWH)

Significantly increase the size of the SWH market in California

Displace 585 million therms

- (equivalent to 200,000 single family residential systems) over the 25 year life of the systems

Displace 275.7 million kilowatt hour (kWh) per year

- (equivalent to 100,800 single family residential systems)

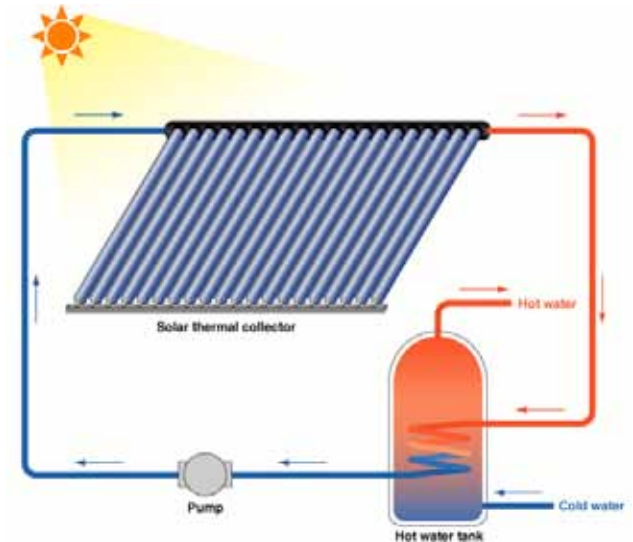
Support 16% reduction in the cost of SWH systems by 2018

Reduce market barriers to SWH adoption

1. high permitting costs
2. lack of trained installers
3. lack of consumer knowledge and confidence in SWH technology

Residential: Launched May 2010

Commercial/Multifamily: Launched October 2010



Pool and Spa Solar Water Heating: Not Eligible

Solar Space Heating and Cooling: not eligible at this time



SWH - Natural Gas Incentive table

- Steps decline as more projects are received and step budget allocations are fulfilled for each customer class
- Steps move independently by Customer Class and Program Administrator

Step	Customer Class	\$/ therm displaced	Incentive Cap	Total Program Budget Allocation	PG&E Budget Allocation
1	Residential Commercial/Multifamily	\$12.82	\$1,875 \$500,000	\$20 Million \$30 Million	7.8 Million 11.7 Million
2	Residential Commercial/Multifamily	\$10.26	\$1,500 \$500,000	\$18 Million \$27 Million	7.02 Million 10.53 Million
3	Residential Commercial/Multifamily	\$7.69	\$1,125 \$500,000	\$18 Million \$27 Million	7.02 Million 10.53 Million
4	Residential Commercial/Multifamily	\$4.70	687.5 \$500,000	\$16 Million \$24 Million	6.24 Million 9.36 Million



SWH - Electric Incentive table

Electric incentive steps change when natural gas steps change

Step	Customer Class	\$/kWh displaced	Max Incentive
1	Residential Commercial/Multifamily	0.37	\$1262.5 \$250,000
2	Residential Commercial/Multifamily	0.30	\$1,025 \$250,000
3	Residential Commercial/Multifamily	0.22	\$750 \$250,000
4	Residential Commercial/Multifamily	0.14	\$475 \$250,000

Trigger Tracker: www.csithermal.com/tracker



Commercial/Multi-family \leq 250kWth

Lump Sum Payment - One-time payment:

- Based on estimated therm of kWh savings provided by the OG-100 Calculator
- Paid after project is completed, approved, and inspected (if applicable)

70/30 True-Up Payment - Payment made in two parts:

- Commercial/Multi-family calculator estimates therm or kWh savings. PA pays 70 percent of that incentive after Incentive Claim and Inspection (if applicable) are approved
- System is then metered/monitored for 12 consecutive months. PA pays the true-up incentive amount by subtracting the initial 70 percent incentive payment from the final metered incentive amount.

***Program will pay no more than 110% of estimated incentive**



Self Generation Incentive Program (SGIP)



- California Public Utilities Commission (CPUC) rebate program initiated in 2001 to reduce peak demand on the grid
- Accepting applications through 2015
- Provides incentives for the installation of new, qualifying self-generation equipment installed to meet all or a portion of the electric energy needs of a facility (Large Wind, Fuel Cell, and Advanced Energy Storage Systems)
- Program Administrators:
 1. Pacific Gas & Electric Company (PG&E)
 2. Southern California Edison (SCE)
 3. Southern California Gas (SoCal Gas)
 4. California Center for Sustainable Energy (CCSE) for San Diego Gas & Electric (SDG&E)



SGIP Technologies and Incentive Rates

2010

- Level 2: Renewable Non-Solar: Fuel Cells, Wind
- Level 3: Non-Renewable Non-Solar: Fuel Cells
- Level 2 or Level 3: Advanced Energy Storage, Coupled with a new or existing SGIP funded Wind or Fuel Cell

Eligible customer projects must be within the service territory of and must receive retail level electric and/or gas service from their respective IOUs.

Incentive Levels	Eligible Technologies	Incentive Offered (\$/Watt)	Minimum System Size	Maximum System Size	Maximum Incentive Size
Level 2 Renewable	Wind turbines	\$1.50/W	30 kW	5 MW	1 MW
	Renewable fuel cells	\$4.50/W			
Level 3 Non-Renewable	Non-Renewable fuel cells	\$2.50/W	None	5 MW	1 MW
Advanced Energy Storage	Advanced Energy Storage	\$2.00/W	None	5 MW	1 MW

For projects larger than 1 MW (up to 3 MW) incentives identified above decline as follows:

Capacity	Incentive Rate (Pct. of Base)
0 – 1 MW	100%
>1 MW – 2 MW	50%
>2 MW – 3 MW	25%



SGIP Program Updates

Approved Budget 2010 & 2011

Budget for 2010 and 2011 is \$83 million annually

- PG&E's portion is \$36MM a year
- No funds have been approved after 2011
- Must use or carry over funds until program ends in 2015

SB412 extends sunset date from Jan 1, 2012 to Jan 1, 2011

- SB412 allows any new eligible technologies for SGIP be based on the requirement that they "achieve reductions of greenhouse gas emissions" (GHGs) pursuant to California Global Warming Solutions act of 2006.

Program Suspension

- Program Administrators (PAs) filed a motion to suspend SGIP as of Dec 22, 2010 until SB412 Decision is implemented.
- CPUC approved suspension of SGIP starting January 1, 2011

SB412 link: <http://docs.cpuc.ca.gov/efile/RULINGS/109738.pdf>



PG&E NEM Programs

Standard NEM

Solar and wind energy program for customers whose generator size is 30 kilowatts or less

Expanded NEM

Solar and wind energy program for customers whose generator capacity is over 30 kilowatts

NEMVNMA

Solar energy program for customers living in low income multi-family affordable housing.

NEMFC

For customers with eligible fuel cell generators.

Wind Energy Co-Metering

Wind energy program for customers whose generator capacity is over 50 kilowatts

www.pge.com/nem



Other Financial Benefits

- Federal Investment Tax Credits (Federal ITC)
 - i.e. 30% of project cost for Solar
- DG Purchasing Options and Renewable Energy Credits (RECs)

Payment Method	Upfront Cost to Property Owner	Ongoing Costs to Property Owner	System Ownership	REC Ownership	Maintenance Costs Paid by...
Cash	100%	Maintenance	Property Owner	Property Owner	Property Owner
Finance	None	Annual Fixed Payment + Maintenance	Property Owner	Property Owner	Property Owner
PPA	None	Payment per kWh produced by PV system	Third Party	Third Party*	Third Party
Lease	Small	Annual Fixed Lease Payments** + Maintenance	Third Party**	Property Owner or Third Party*	Property Owner?

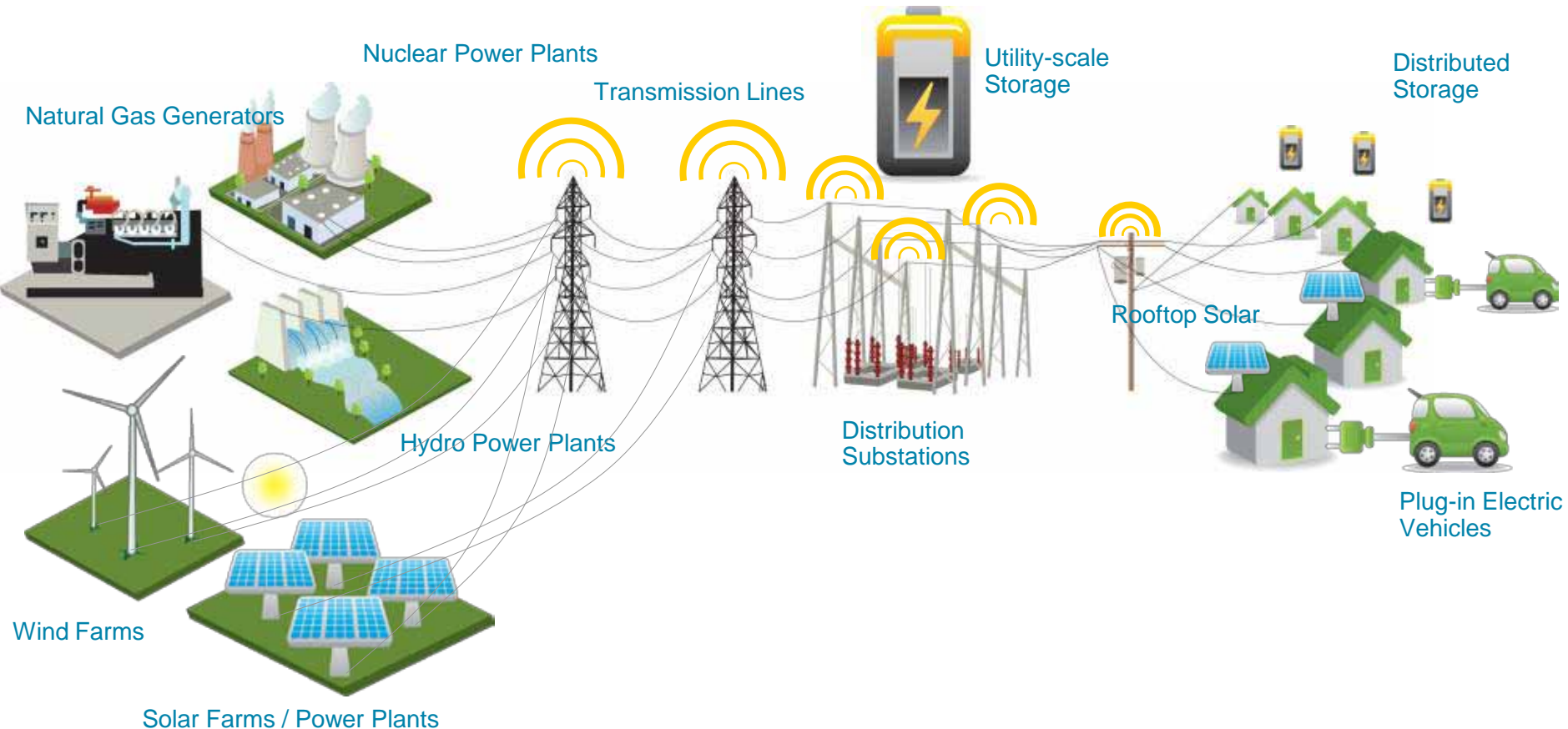


Building A Sustainable Electric System

Power Plants

Electric Grid

Customers





At PG&E, We Are Committed To Sustainability

