California and Distributed Generation

NARUC

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What is Distributed Generation?

- Generation connected at the distribution, rather than transmission, level
- Covers a broad range of technologies, both renewable and non-renewable
- Policy support has generally been focused on “behind the meter”, rather than wholesale, applications
  - Self Generation Incentive Program
  - California Solar Initiative
  - Net Energy Metering
  - Rule 21 Interconnection
  - REC Ownership
- Increasing interest in wholesale DG

The Policy Role Anticipated for DG has Evolved Over Time

- Post energy crisis, California adopted the Self Generation Incentive Program
  - *Offers incentives to support behind the meter distributed applications as an alternative to grid-based energy and reduce peak demand.*
- State passes SB1 in 2006, creating a set aside program for Solar
  - *Seeks to deploy 3000 MW statewide by EOY 2016*
- SGIP modified in 2007 by Assembly Bill 2778 to reflect increasing focus on renewable generation
  - *Removed all combustion technologies out of the program leaving wind and fuel cells.*
- *State passes AB1470 adopting a solar water heating program*
  - *Seeks to deploy 250,000 SWH systems by EOY 2016.*
- SGIP to be modified by Senate Bill 412, which authorizes inclusion of technologies provide they are GHG reducing
  - *Reflects focus on GHG mitigation, not renewables per se.*

SGIP Technology Eligibility

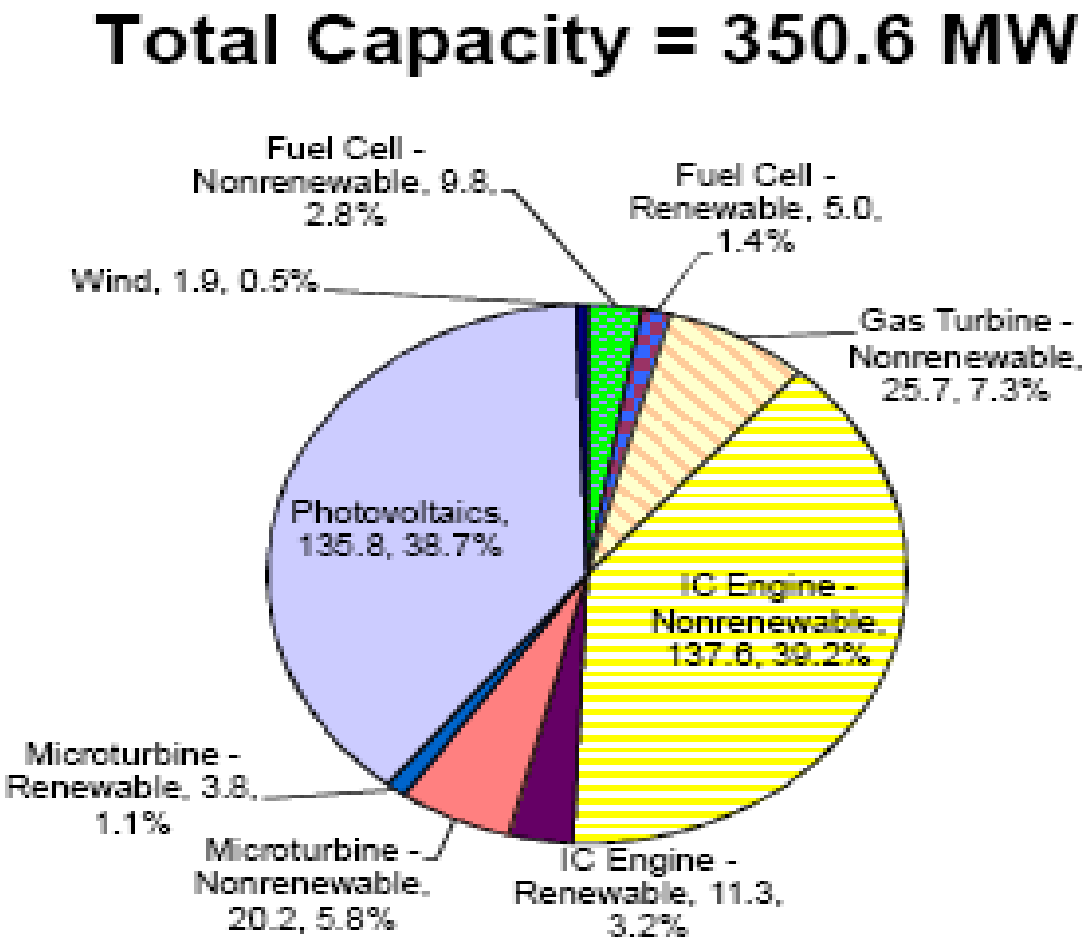
SGIP Technology	Fuel Type	Eligibility Status
Fuel cell	Natural Gas/ Biogas	Currently Eligible
Wind turbines	Wind	Currently Eligible
Internal-combustion engines	Natural Gas/ Biogas	Removed from SGIP 1/1/2008
Microturbines	Natural Gas/ Biogas	Removed from SGIP 1/1/2008
Small gas turbines	Natural Gas/ Biogas	Removed from SGIP 1/1/2008
Solar	Sun	Moved from SGIP to CSI 1/1/2007

CPUC staff, working in consultation with the California Energy Commission and the California Air Resources Board, is developing a staff proposal to modify the program pursuant to Senate Bill 412.

SGIP Incentives

Incentive Levels	Eligible Technologies	Minimum System Size	Maximum System Size	Maximum Incentive Size	Incentive Offered ($/watt)		
					0 - 1 MW	1 - 2 MW	2 -3 MW
Level 2 Renewable	Wind Turbines	30 kW	5 MW	3 MW	**$1.50**	$0.75	$0.375
	Renewable Fuel Cells	30 kW			**$4.50**	$2.25	$1.125
Level 3 Non-Renewable	Non-Renewable Fuel Cells	None	5 MW	3 MW	**$2.50**	$1.25	$0.625

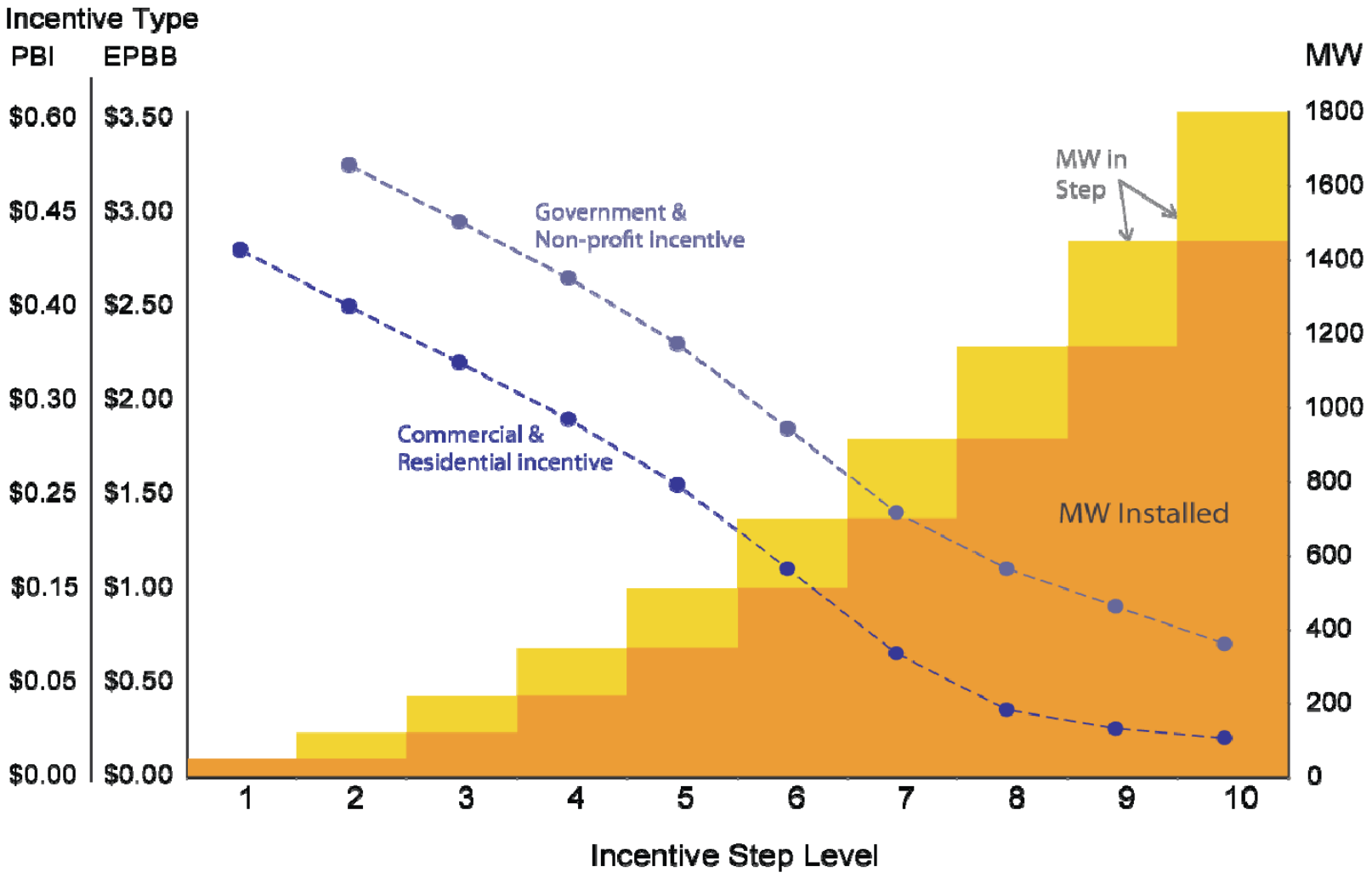
Installed Capacity In SGIP



The California Solar Initiative

- Statewide program
  - *Seeks to drive technology and deployment costs down through the deployment of 3000 MW of behind the meter solar systems.*
  - *Overall program budget allocated across CPUC, CEC, and POUs, each of which has established its own program covering a specific region and/or component of the solar market.*
- CPUC program emphasizes system performance and market transformation
  - *Larger systems, currently those >= 30kW receive performance based incentives.*
  - *Smaller systems receive upfront incentive based on anticipated production.*
  - *As total deployed capacity increases, incentives are reduced to calibrate incentive levels of market requirements.*
  - *Program also empahsizes “market facilitation”, i.e. helping the industry build the capacity necessary to mainstream this technology.*

Incentive Step Down as a Function of Capacity Installed

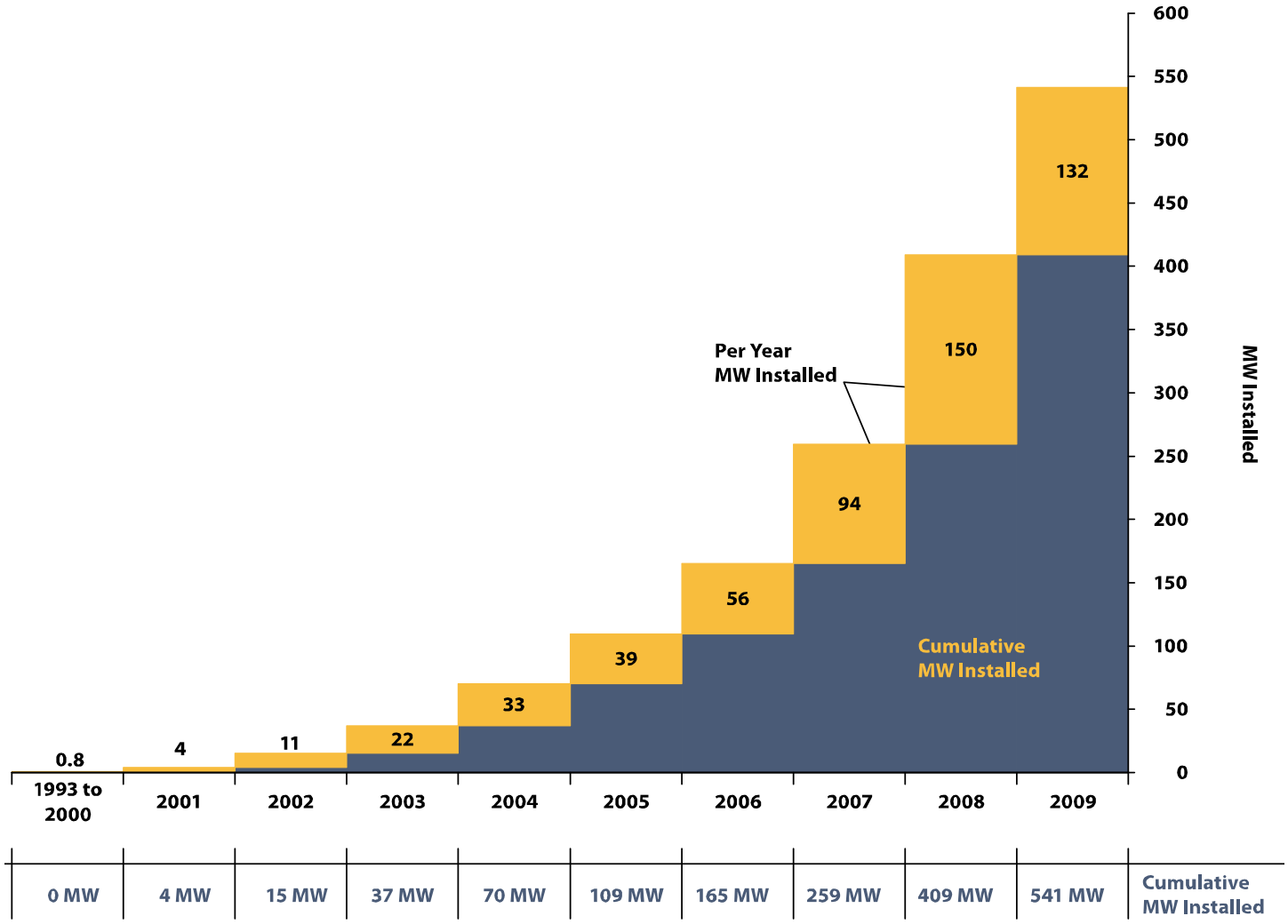


PBI: Performance Based Incentive, paid over 5 years, in $ / kWh

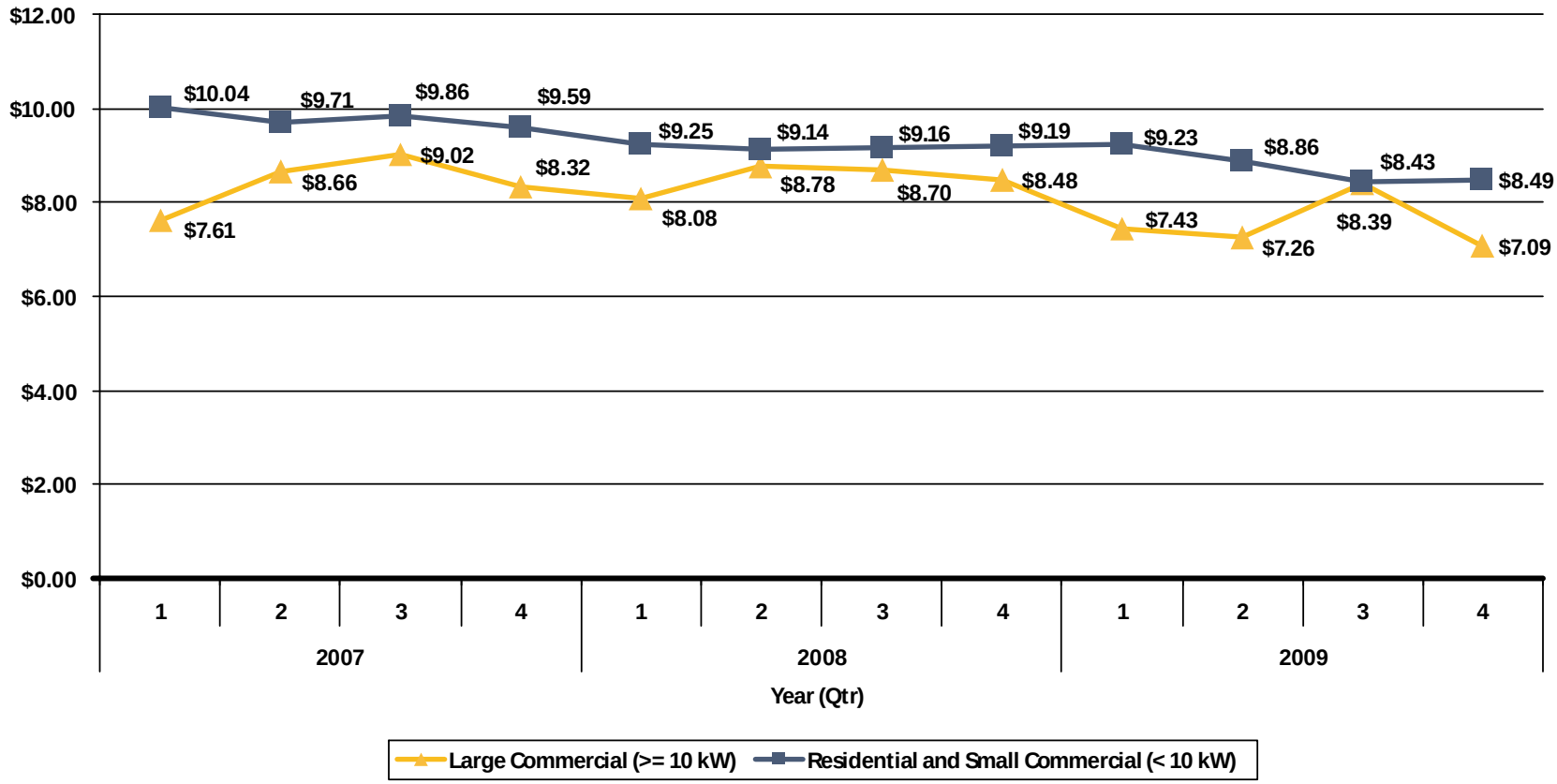
Current CSI Incentive Levels by Service Territory

		PG&E			SCE			SDG&E		
			Non-Residential			Non-Residential			Non-Residential	
Step	MW in Step	Res	Comm	Gov't/Non-Profit	Res	Comm	Gov't/Non-Profit	Res	Comm	Gov't/Non-Profit
1	50	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
2	70	$2.50	$2.50	$3.25	$2.50	$2.50	$3.25	$2.50	$2.50	$3.25
3	100	$2.20	$2.20	$2.95	$2.20	$2.20	$2.95	$2.20	$2.20	$2.95
4	130	$1.90	$1.90	$2.65	**$1.90**	$1.90	$2.65	$1.90	$1.90	$2.65
5	160	$1.55	$1.55	$2.30	$1.55	$1.55	$2.30	$1.55	$1.55	$2.30
6	190	$1.10	$1.10	$1.85	$1.10	$1.10	$1.85	$1.10	$1.10	$1.85
7	215	**$0.65**	$0.65	$1.40	$0.65	**$0.65**	**$1.40**	**$0.65**	**$0.65**	**$1.40**
8	250	$0.35	**$0.35**	**$1.10**	$0.35	$0.35	$1.10	$0.35	$0.35	$1.10
9	285	$0.25	$0.25	$0.90	$0.25	$0.25	$0.90	$0.25	$0.25	$0.90
10	350	$0.20	$0.20	$0.70	$0.20	$0.20	$0.70	$0.20	$0.20	$0.70

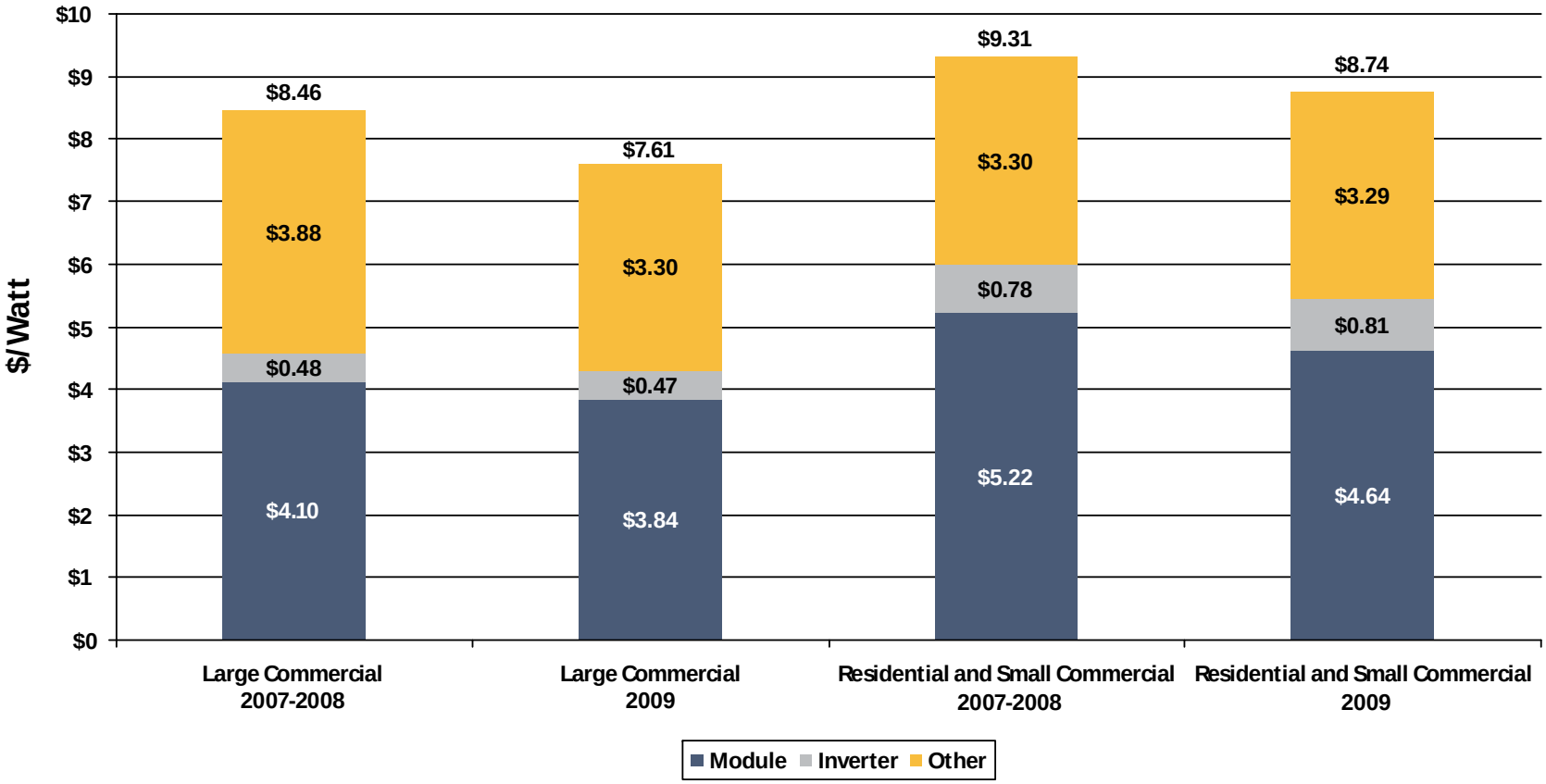
Installed Solar Capacity in IOU Service Territories



Installed Cost Trends



System Cost Breakdown and Trends



CSI Solar Thermal Program

- On May 1, 2010 the CSI-Thermal Program began offering rebates for Solar Water Heaters on single-family residences
  - *Rebate is $1,500 for the typical system.*
- Rebates for multi-family and commercial facilities are expected in September 2010, pending resolution of technical issues
- Applications for low-income housing and non-water heating solar thermal technologies likely in the fall or early next year
- Like the CSI PV Program, this program bases its incentives on estimated performance and will also support a variety of market facilitation efforts.

Current Issues In CSI

- Incentive adjustments to address budget constraints
  - *PBI incentives have a larger impact on budget than anticipated owing to higher than expected performance and impact of discount rate.*
- Expansion of Virtual Net Metering
  - *VNM allows net energy metering credits to be allocated across tenants in multi-unit buildings.*
  - *Currently only authorized in low income program.*
- Ongoing Implementation of Solar Water Heating Program
  - *Single family residential program currently accepting applications.*
  - *Resolution pending on commercial/multi-family program.*
- “Post-NEM” policies to support distributed solar
  - *Passage of SB32; directs PUC to develop a feed-in tariff for small scale solar, price to be based on an avoided cost benchmark plus environmental adders.*

Distributed Wholesale Generation

- Growing interest in supporting DG as a wholesale supply side technology rather than as a quasi demand management application
  - *DG can play an important role in facilitating RPS goals – fewer permitting challenges and transmission constraints.*
  - *Full retail NEM is disliked by the utilities owing to cross subsidization issues.*
  - *DG as a behind the meter solution only fractionally contributes to CSI goals.*

Wholesale DG Program Developments

- CPUC recently approved two 500 MW solar PV programs in the Edison and PG&E service territories for smaller scale PV system deployments
  - *Each program consists of a split between utility owned projects and PPAs.*
  - *CPUC currently contemplating similar program for SDG&E.*
- CPUC approved six utility owned fuel cell projects to be located on UC and CSU campuses
- CPUC considering a technology neutral carve-out from the RPS to support wholesale DG deployment
  - *Would target projects < 20 MW that can come online in 18 months or less.*
- CPUC tasked by SB32 to develop FIT based on MPR
  - *Recent FERC decision in response to CPUC Petition for Declaratory Order on the AB1613 CHP FIT program suggests that such a program would have to be done under the auspices of PURPA.*