



California Solar Initiative
**Workshop on Budget, Incentive
Mechanism and Dropouts**
Monday, July 14 2008

Agenda

10:00 – 10:15 Introductions

10:15 – 11:00 Presentation on CSI incentive budget

11:00 – 12:15 Discussion of CSI incentive budgets

12:15 – 1:30 Lunch

1:30 – 2:15 Presentation on dropout data

2:15 – 4:00 Discussion of dropouts data

Interested parties are strongly encouraged to attend in person, as the the workshop will be presentation- and data- heavy. Although a call-in number is available, please note that the phone will be "listen-only". We will only take questions from our callers via email (eah@cpuc.ca.gov). Call-in number 866 -



The purpose of this workshop:

- 1. Present information on CSI incentive budget and program dropouts (*we don't have all the answers!*)**
- 2. Facilitate a *focused* and *informed* discussion on these issues**
- 3. Listen to your feedback and take all suggestions under consideration**



Key questions for discussion

CSI Incentive Budget

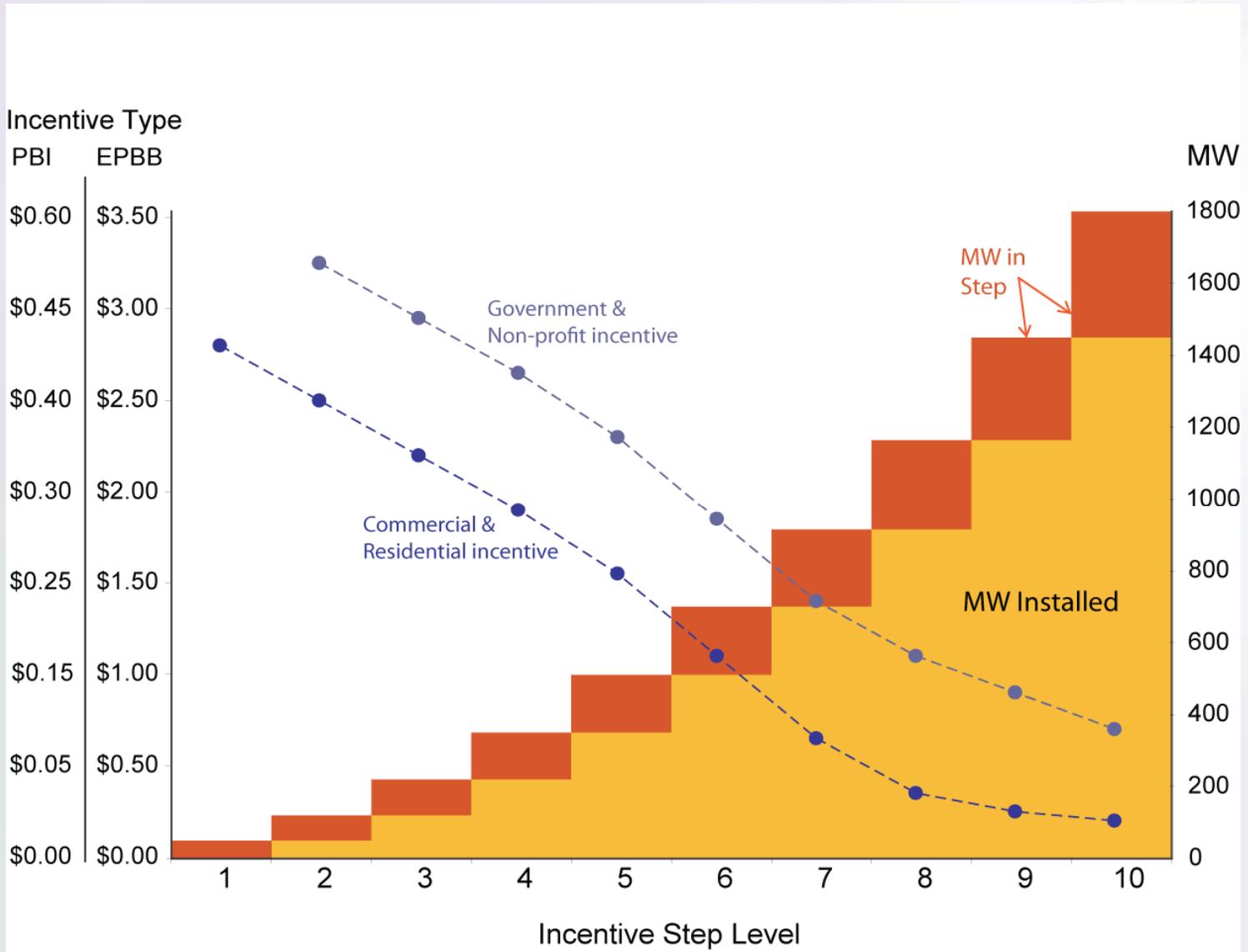
- Are there unspent CSI funds and where do they come from? Are we overspent?
- Is it the right time to take action on potential unspent CSI monies?
 - When is the right time?
 - Should we take action on *some* sources of unspent monies?
 - What action, if any, should we take?

Dropouts

- Is there a “dropout problem” and does it need to be addressed?
 - How do we calculate an accurate dropout rate?
 - Do we need to take action now to limit future dropouts? If yes, what actions?
 - What should our plan of action be if dropouts surpass a threshold limit?
 - How will changes to the federal tax credit affect CSI dropout rate?



CSI incentive levels decline as installed MW increase



PBI: Performance Based Incentive, paid over 5 years, in \$ / kWh
 EPBB: Expected Performance Based Buydown, paid upfront, in \$ / W



Movement of CSI incentive levels in IOU territories since 2007

Program Month	PG&E			SCE			CCSE		
	Residential	Non-Residential	Govt & Non-Profit	Residential	Non-Residential	Govt & Non-Profit	Residential	Non-Residential	Govt & Non-Profit
Jan 07	Step 2 \$2.50 \$0.39	Step 2 \$2.50 \$0.39	\$3.25 \$0.50	Step 2 \$2.50 \$0.39	Step 2 \$2.50 \$0.39	\$3.25 \$0.50	Step 2 \$2.50 \$0.39	Step 2 \$2.50 \$0.39	\$3.25 \$0.50
Feb									
Mar		Step 3 \$2.20 \$0.34	\$2.95 \$0.37		Step 3 \$2.20 \$0.34	\$2.95 \$0.37			
Apr									
May		Step 4 \$1.90 \$0.26	\$2.65 \$0.37						
Jun									
Jul					Step 4 \$1.90 \$0.26	\$2.65 \$0.37			
Aug	Step 3 \$2.20 \$0.34							Step 3 \$2.20 \$0.34	\$2.95 \$0.37
Sep									
Oct									
Nov									
Dec									
Jan 08							Step 3 \$2.20 \$0.34		
Feb								Step 4 \$1.90 \$0.26	\$2.65 \$0.37
Mar		Step 5 \$1.55 \$0.22	\$2.30 \$0.32		Step 5 \$1.55 \$0.22	\$2.30 \$0.32			
Apr	Step 4 \$1.90 \$0.26								
May				Step 3 \$2.20 \$0.34					
Jun									

EPBB: Expected Performance Based Buydown, in \$/W
 PBI: Performance Based Incentive, in \$/kW
 Note: MW from Step 1 of the solar Trigger Tracker were fully reserved under SGIP in 2006.



Regulatory overview

December 2005 and January 2006: D.05-12-045 added \$300 million to SGIP 2006 solar budget and D.06-01-024 outlined a new, solar-specific incentive program, known as the California Solar Initiative, to begin immediately as part of SGIP, but to stand alone in 2007

August 2006: D.06-08-028 outlined specifics of the CSI program, such as performance-based incentives, program administration and incentive mechanism

August 2006: Senate Bill 1 (SB 1) (2006, Murray) Effective 1/1/07, reduced the CPUC's portion of the CSI budget to \$2.16 billion and modified other program requirements

December 2006: D.06-12-033 revised D.06-08-028 to be in compliance with SB 1

March 2008: R.08-03-008 continues the work of R.06-03-004 on both CSI and distributed generation through SGIP



CSI budget (D.06-12-033, Table 1, pg. 28, effective 1/1/07)

Budget Category	(\$ in millions)
SB 1 CSI Budget	\$2,166.80
Low Income Budget (10%)	216.68
Research Development and Demonstration (RD&D) Budget	50.00
<i>CCSE (formerly SDREO) Solar Water Heating Pilot Budget</i>	3.00
Budget remaining for general market program	1897.12
Administration Budget	189.71
Total CSI Budget for Direct Incentives	\$1707.41





CSI Incentive Adjustment Mechanism

Step	MW in Step	Gov't/ Non-Profit	Res	Commercial	Total \$ Disbursed in Step (\$ in millions)
1	50	n/a	n/a	n/a	n/a
2	70	\$3.25	\$2.50	\$2.50	\$186
3	100	\$2.95	\$2.20	\$2.20	\$235
4	130	\$2.65	\$1.90	\$1.90	\$267
5	160	\$2.30	\$1.55	\$1.55	\$272
6	190	\$1.85	\$1.10	\$1.10	\$237
7	215	\$1.40	\$0.65	\$0.65	\$172
8	250	\$1.10	\$0.35	\$0.35	\$125
9	285	\$0.90	\$0.25	\$0.25	\$108
10	350	\$0.70	\$0.20	\$0.20	\$105
				Total	\$1,707

(This table is the most recent iteration, found in D.06-12-033, Appendix B, Table 13)



CSI total budget is fixed by statute, but how the budget is divided between steps was based on assumptions. Like any budget, it may require adjustment if assumptions are inaccurate, although total spending remains fixed.

Actual spending may differ if/because:

1. Participation of government & non-profit entities is above or below the 30% participation rate estimated in D.06-08-028
2. PBI systems over- or under-perform
3. Dropouts occur and MW are paid out at lower incentive rates than anticipated
4. Timing of drop to Step 2 incentives was earlier than anticipated. Because Step 2 began in Spring 2006, rather than January 2007, a portion of Step 2 incentives were paid out of SGIP rather than CSI funds.

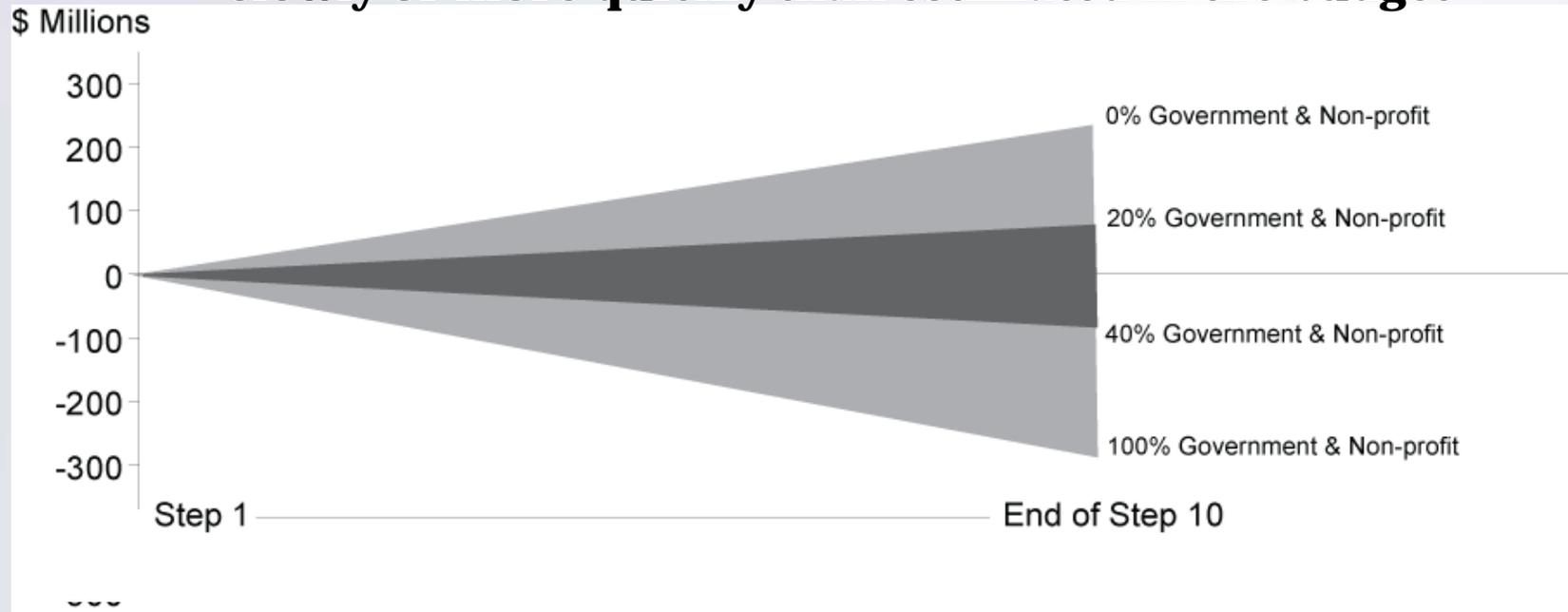
We have committed to continually monitor these assumptions and their effects on the CSI budget.



D.06-08-028 estimated that 30% of non-residential projects would be government or non-profit

- No cap set on government & non-profit participation
- 40% participation in SGIP
- 23% participation in CSI so far
- New tariffs may be more “solar friendly”, affecting future participation levels

With varying participation levels, we may spend more slowly or more quickly than estimated in the budget





Over- and under-performance of PBI systems: a hypothetical

- System with CEC AC rating of 1 MW, design factor of 1, at incentive step 4
- Incentive “reserved” is \$1.9 million ($\$1.90 / \text{watt} \times 1 \text{ MW}$)
- Consistently over-perform by 10%, incentive payout is \$2.1 million
- Consistently under-perform by 10%, incentive payout is \$1.7 million
- System may over-perform some months and under-perform others
 - Weather, soiling, addition or removal of shading
- CSI administrators have only made a handful of PBI payments- not enough data
- On a broad policy level, do we need to provide budget flexibility to accommodate fluctuations in PBI system performance?



Defining CSI “Dropouts”: Problem vs. no problem

- Broadly, “dropouts” are those applications (and associated MW) that have applied to the program and then failed to complete
- Some dropouts don’t cause any affect on MW or \$
 - Applications that drop out before they are granted a reservation
 - Applications that drop out and whose MW are added in at the same step at which they were reserved
- “Problematic” dropouts affect MW and \$ in the CSI Program
 - Applications that drop out and whose MW are added back into the program at a different incentive step
- For the sake of this discussion, **we will define dropouts as those projects that have ever been granted a reservation**, not all projects that have ever applied
 - For non-residential projects, this is all projects that have at least reached the “reservation reserved” status
 - For residential projects, this is all projects that have reached the “confirmed reservation” status



CSI Program Dropouts: a hypothetical

- 1 MW commercial project reserved at Step 4, with design factor of 1
 - Expected incentive payout= \$1.9 million ($\$1.90 / \text{watt} \times 1 \text{ MW}$)
- Project drops out *after some time has passed*, and Program Administrator is in Step 5
 - 1 MW added back in to Program at Step 5 level
- New project is then reserved and paid out at Step 5 incentive level
- Actual payout = \$1.55 million ($\$1.55 / \text{watt} \times 1 \text{ MW}$)
- Payout difference (\$1.9 million - \$1.55 million) is \$350,000
- This \$350,000 is “unspent funds” for that step

Results:

- **The same amount of MWs are installed, for less money**
- **\$350,000 is available, or unspent, and could be used to fund additional MWs**



CSI Dropouts: MW per Step

Step	PG&E				SCE				CCSE				All			
	Res MW	% of MW in Step	NonRes MW	% of MW in Step	Res MW	% of MW in Step	NonRes MW	% of MW in Step	Res MW	% of MW in Step	NonRes MW	% of MW in Step	Res MW	% Res MW	NonRes MW	% NonRes MW
1			16.62	59.8			7.01	54.2			6.16	95.9	0.00	0.0	29.79	59.6
2a			3.10	34.1			0	0.0			0	0.0	0.00	0.0	3.10	13.5
2b	0.50	3.8	10.07	42.0	0.07	0.7	0.5	3.3	0.03	1.2	0.5	6.1	0.60	2.3	11.07	36.8
3	5.91	39.9	6.96	20.6	0	0.0	2.17	6.3	0	0.0	0.42	5.3	5.91	17.9	9.55	14.3
4	0.01	0.1	18.01	36.3			2.13	5.0			1.11	11.5	0.01	0.0	21.25	20.1
5			0.11	0.2			0	0.0							0.11	0.6
Totals	6.42	17%	54.87	28%	0.07	1%	11.81	11%	0.03	1%	8.19	25%	6.52	11%	74.87	25%

Table from July 2008 Staff Progress Report. Data current as of 5/31/08 and based on information provided by Program Administrators in response to CPUC data request.

When these dropout MW are paid out at lower rates, the *estimated* resulting “stranded incentive” total is \$16.13 million



CSI Dropouts: MW per Step

Step	PG&E			SCE			CCSE			All		
	Res MW	NonRes MW	\$million un-reserved	Res MW	NonRes MW	\$million un-reserved	Res MW	NonRes MW	\$million un-reserved	Res MW	NonRes MW	\$million un-reserved
1		16.62			7.01			6.16			29.79	
2a		3.10			0			0			3.10	
2b	0.50	10.07	\$5.68	0.07	0.50	\$0.54	0.03	0.50	\$1.15	0.60	11.07	\$7.40
3	5.91	6.96	\$2.85	0	2.17	\$1.70	0	0.42	\$0.63	5.91	9.55	\$5.18
4	0.01	18.01	\$3.37		2.13	\$0.18		1.11	\$0	0.01	21.25	\$3.55
5		0.11	\$0		0	\$0					0.11	\$0
Totals	6.42	35.04	\$11.90	0.07	4.8	\$2.42	0.03	2.03	\$1.81	6.52	41.87	\$16.13

Table from July 2008 Staff Progress Report. Data current as of 5/31/08 and based on information provided by Program Administrators in response to CPUC data request.

When these dropout MW are paid out at lower rates, the *estimated* resulting “stranded incentive” total is \$16.13 million



Timing of change to Step 2

Step	MW in Step		Gov't/ Non-Profit	Res	Commercial	Total \$ Disbursed in Step (\$ in millions)
	Res	Non-R				
1	50		n/a	n/a	n/a	n/a
2	23.1	46.9	\$3.25	\$2.50	\$2.50	\$186
3	33	67	\$2.95	\$2.20	\$2.20	\$235
4	42.8	87.2	\$2.65	\$1.90	\$1.90	\$267
5	52.8	107.1	\$2.30	\$1.55	\$1.55	\$272
6	62.7	127.3	\$1.85	\$1.10	\$1.10	\$237
7	70.9	144	\$1.40	\$0.65	\$0.65	\$172
8	82.6	167.6	\$1.10	\$0.35	\$0.35	\$125
9	94.1	190.9	\$0.90	\$0.25	\$0.25	\$108
10	115.5	234.6	\$0.70	\$0.20	\$0.20	\$105
					Total	\$1,707

Originally, Step 1 drawn from SGIP 2006 budget

Steps 2-10 intended to be drawn from CSI budget. In reality, some MWs in Step 2 (i.e. applications received in 2006) were funded by SGIP.



SGIP and CSI Regulatory Overlap in 2006

The market responded to the creation of CSI with a rapid uptake of solar incentives in 2006, therefore

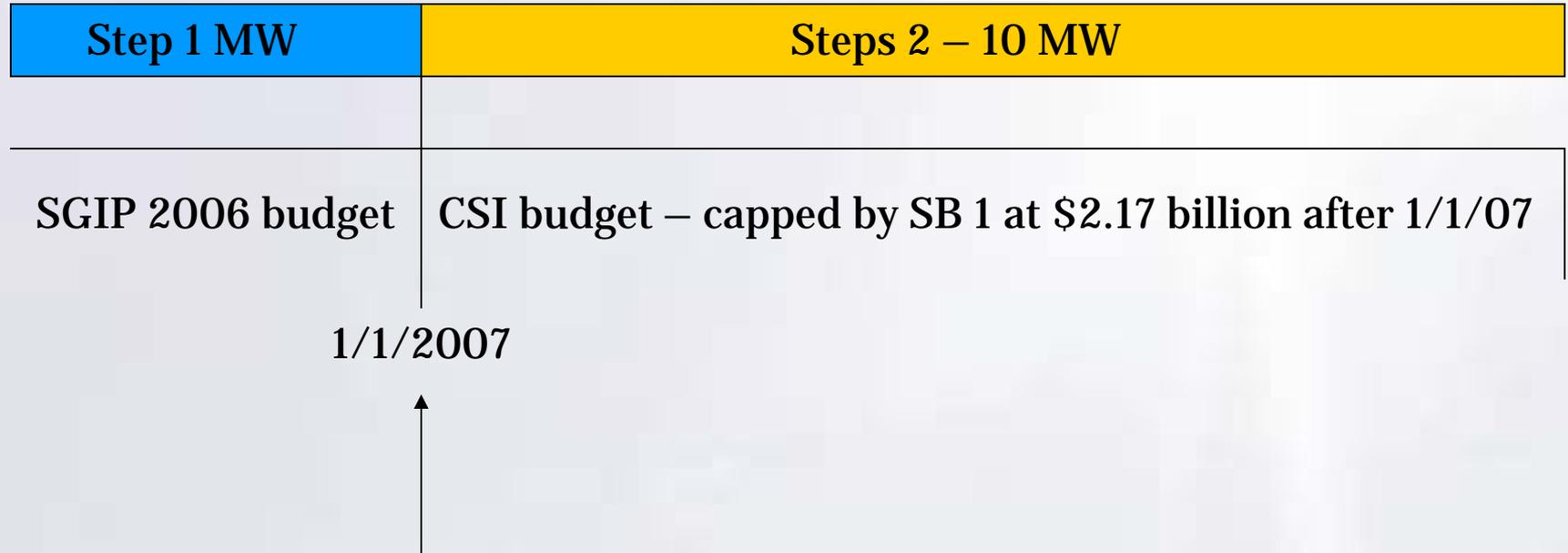
Step 2 started in 2006 under SGIP, instead of on 1/1/2007 under CSI

SO, we are left with a ***mismatch*** between SGIP and CSI budgets and incentive mechanism steps

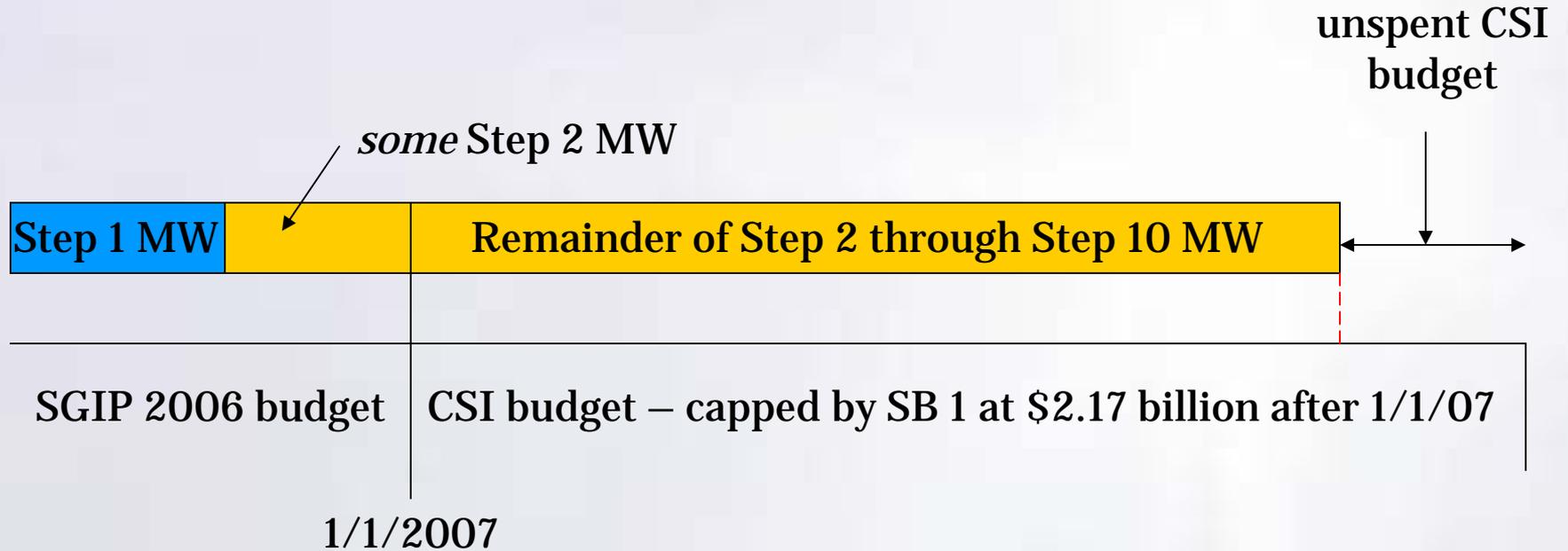
The “magnitude” of CSI funds affected is approximately equal to the value of

Step 2 MW “bought” in 2006 with SGIP funds

Reminder: As per Commission decision, all “leftover” SGIP solar funds from electric ratepayers were transferred into the CSI balancing accounts on 12/31/06, and then *subject to the SB 1 spending cap*



Any remaining SGIP solar PV funds are transferred to CSI balancing accounts at the end of 2006, according to the percentage of electric ratepayers of each IOU





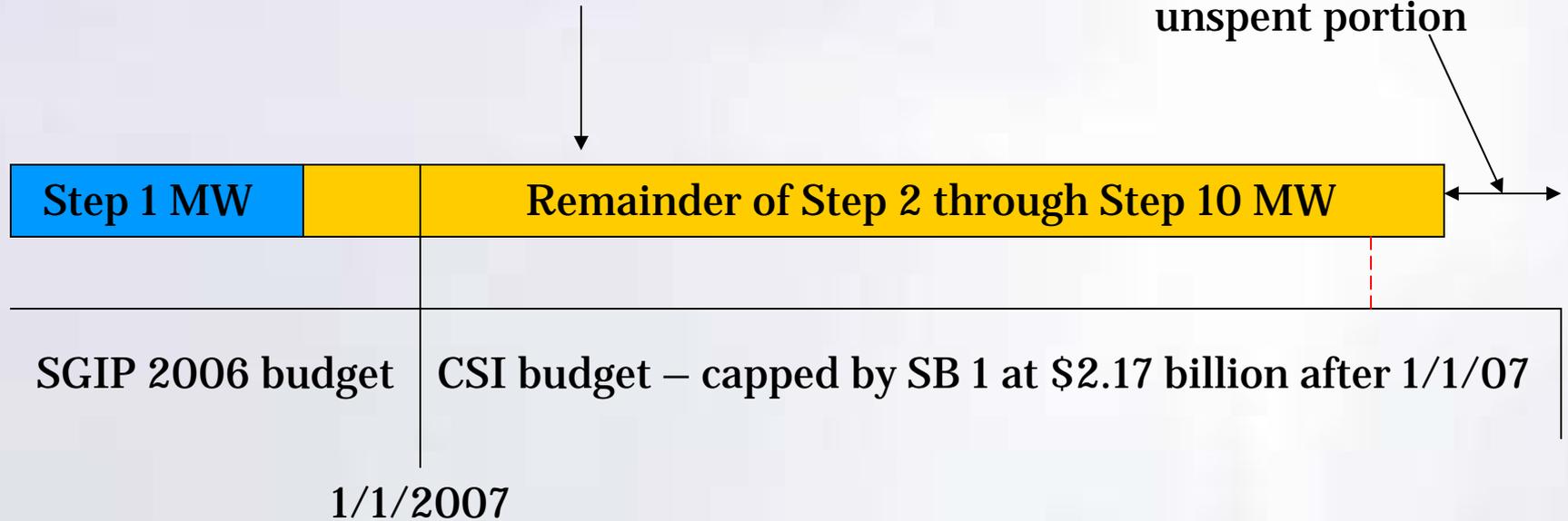
Some of these MW drop out,
and are added back in to the
trigger after 1/1/07





Dropouts from 2006 increase the number of MW we must pay out of CSI budget

Dropouts from 2006 slightly decrease this unspent portion





Estimating the amount of current unspent CSI funds from dropouts

	\$ millions	MW
Step 2 MW "bought" in 2006 , when Step 2 incentive levels began under SGIP	57	23
LESS (Step 2 dropouts after 1/1/07 x new incentive , as these MW then had to be funded through CSI budget, although at a discounted incentive rate)	(25.6)	(12.3)
LESS (Step 1 dropouts after 1/1/07 x new incentive , as these MW then had to be funded through CSI budget, although at a discounted incentive rate)	(2.3)	(1.1)
Estimated Total:	29.1	9.6
PLUS current incentive differential from dropouts , when MW are added back at a lower incentive level	16.4	N/A
Estimated Total:	46	

\$millions =
MW x incentive rate



Another way to estimate the total:

How much money does the incentive step mechanism predict CSI should have reserved or paid in incentives, given where we are in the Program?

\$599.9 million as of 06/19/08

(Starting with Step 2, multiply each MW by its incentive rate and sum total through current Step – see spreadsheet handout)



"Perfect" scenario based on budget in decision

MW in Steps									
Step	PG&E		SCE		CCSE		Totals		
	Res	NonRes	Res	NonRes	Res	NonRes	Res	NonRes	ALL
2	10.1	20.5	10.6	21.6	2.4	4.8	23.1	46.9	70
3	14.4	29.3	0.92	30.8	1.55	6.9	16.87	67	83.87
4	4.01	38.1		40.1		3.64	4.01	81.84	85.85
5		15.29		3.4				18.69	18.69
6									
7									
8									
9									
10									

Incentive rates \$ / watt	
Res / Comm	GNP
\$2.50	\$3.25
\$2.20	\$2.95
\$1.90	\$2.65
\$1.55	\$2.30

Sum of incentive per step (\$million)	
	185.6
	199.6
	181.5
	33.2
Total	599.9

Government and NP participation rates in non-res sector		
PG&E	SCE	CCSE
25.80 %	20.40 %	19.50%



Another way to estimate the total:

How much have we actually paid or reserved?

\$593 million as of 06/19/08 in PowerClerk

(sum all incentives for projects in PowerClerk that are reserved or paid)



Another way to estimate the total:

A	B	C
Decision-based analysis: \$599.8 million	Model-based analysis: \$553.8 million	Data-based analysis: \$593.0 million

Predicted unspent monies =
 (decision – model) = (A – B)
 = \$46 million

“Actual” unspent monies =
 (decision – data) = (A – C) =
 \$6.8 million

\$6.8 million << \$46 million = potentially overspent, rather than underspent?

A guess: PBI design factors and PBI overpayments (?)

Other ideas?



Programmatic options:

• **Option 1:**

- Let the program run its course, and refund any leftover \$ to ratepayers

• **Option 2:**

- Wait, and consider incentive mechanism or budget adjustments during 2009 program review or other future program review, with more data

• **Option 3:** (if underspent)

- Calculate actual “unspent funds”
- Based on results, change MW or incentive levels in:
 - Current steps in each territory
 - Highest current step for all territories (Step 4 res, Step 5 non-res)
 - Other future steps

• **Option 4:** (if overspent)

- Adjust PBI capacity factors
- Wait for additional data



Criteria for evaluating options:

- **Market transformation**: what option will provide the most support to our long-term market transformation goals?
- **Equity**: which option is the most equitable for all parties, including manufacturers, installers, host customers, ratepayers, past, present and future?
- **Other criteria?**
- Brainstorm topics for discussion



Dropouts



Defining CSI “Dropouts”: Problem vs. no problem (repeat slide)

- Broadly, “dropouts” are those applications (and associated MW) that have applied to the program and then failed to complete
- Some dropouts don’t cause any affect on MW or \$
 - Applications that drop out before they are granted a reservation
 - Applications that drop out and whose MW are added in at the same step at which they were reserved
- “Problematic” dropouts affect MW and \$ in the CSI Program
 - Applications that drop out and whose MW are added back into the program at a different incentive step
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CSI Program Dropouts: a hypothetical (repeat slide)

- 1 MW commercial project reserved at Step 4
 - Expected incentive payout= \$1.9 million ($\$1.90 / \text{watt} \times 1 \text{ MW}$)
- Project drops out *after some time has passed*, and Program Administrator is in Step 5
 - 1 MW added back in to Program at Step 5 level
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- Actual payout = \$1.55 million ($\$1.55 / \text{watt} \times 1 \text{ MW}$)
- Payout difference (\$1.9 million - \$1.55 million) is \$350,000
- This \$350,000 is “unspent funds” for that step

Results:

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- **\$350,000 is available, or unspent, and could be used to fund additional MWs**



CSI Dropouts: MW per Step (repeat slide)

Step	PG&E				SCE				CCSE				All			
	Res MW	% of MW in Step	NonRes MW	% of MW in Step	Res MW	% of MW in Step	NonRes MW	% of MW in Step	Res MW	% of MW in Step	NonRes MW	% of MW in Step	Res MW	% Res MW	NonRes MW	% NonRes MW
1			16.62	59.8			7.01	54.2			6.16	95.9	0.00	0.0	29.79	59.6
2a			3.10	34.1			0	0.0			0	0.0	0.00	0.0	3.10	13.5
2b	0.50	3.8	10.07	42.0	0.07	0.7	0.5	3.3	0.03	1.2	0.5	6.1	0.60	2.3	11.07	36.8
3	5.91	39.9	6.96	20.6	0	0.0	2.17	6.3	0	0.0	0.42	5.3	5.91	17.9	9.55	14.3
4	0.01	0.1	18.01	36.3			2.13	5.0			1.11	11.5	0.01	0.0	21.25	20.1
5			0.11	0.2			0	0.0							0.11	0.6
Totals	6.42	17%	54.87	28%	0.07	1%	11.81	11%	0.03	1%	8.19	25%	6.52	11%	74.87	25%

Data current as of 5/31/08 and based on information provided by Program Administrators in response to CPUC data request.

When these dropout MW are paid out at lower rates, the resulting “stranded incentive” total is \$16.3 million



Dropouts

- SGIP dropout rate was about 50% for all projects, through 2006
- CSI dropout rate currently appears lower **but**
 - is based on different programmatic rules
 - is variable, based on project implementation timeline
 - is complicated by extensions and incomplete projects that are over time but have not dropped out
- CSI dropout rate is difficult to calculate:
 - Additional MW have been added to each step
 - MW based? \$-based? Application based?

California Solar Initiative – Workshop on Incentive Budget and Dropouts



Status	All Reserved (= A+B)				Projects >12 mo (A)				Projects <12 mo (B)			
	Res	Commerc	G / NP	(total)	Res	Commerc	G/NP	(total)	Res	Commerc	G/NP	(total)
Completed or Pending Payment (X)												
Applications	6117	98	17	6232	1018	66	10	1094	5099	32	7	5138
%	61.2	16.8	10.0	58.0	93.0	28.8	20.8	79.7	57.3	9.1	5.7	54.8
MW	26.3	19.12	1.52	46.94	4.6	16.14	0.45	21.19	21.7	2.98	1.07	25.75
%	58.3	11.4	4.0	18.7	91.6	22.5	3.5	23.6	54.1	3.1	4.3	16.0
Incentive (\$)	63.9	56.8	3.84	124.54	11.6	50.2	1.35	63.15	52.3	6.6	2.49	61.39
%	59.6	14.1	2.8	19.3	91.4	23.6	2.7	22.9	55.3	3.5	2.9	16.6
Active (Y)												
Applications	3808	415	145	4368	52	140	32	224	3756	275	113	4144
%	38.1	71.3	85.3	40.6	4.7	61.1	66.7	16.3	42.2	77.9	92.6	44.2
MW	18.43	129.27	34.81	182.51	0.28	48.77	11.46	60.51	18.15	80.5	23.35	122
%	40.8	77.3	91.6	72.9	5.6	67.9	88.0	67.3	45.2	84.3	93.4	76.0
Incentive (\$)	42.36	300.19	125.93	468.48	0.75	143.09	44.2	188.04	41.61	157.1	81.73	280.44
%	39.5	74.4	93.0	72.5	5.9	67.2	89.0	68.3	44.0	82.4	95.4	75.6
Canceled and Withdrawn (Z)												
Applications	75	69	8	152	25	23	6	54	50	46	2	98
%	0.8	11.9	4.7	1.4	2.3	10.0	12.5	3.9	0.6	13.0	1.6	1.0
MW	0.42	18.9	1.69	21.01	0.14	6.9	1.11	8.15	0.28	12	0.58	12.86
%	0.9	11.3	4.4	8.4	2.8	9.6	8.5	9.1	0.7	12.6	2.3	8.0
Incentive (\$)	1.04	46.49	5.58	53.11	0.34	19.64	4.1	24.08	0.7	26.85	1.48	29.03
%	1.0	11.5	4.1	8.2	2.7	9.2	8.3	8.7	0.7	14.1	1.7	7.8
Total (=X+Y+Z)												
Applications	10000	582	170	10752	1095	229	48	1372	8905	353	122	9380
MW	45.15	167.29	38.02	250.46	5.02	71.81	13.02	89.85	40.13	95.48	25	160.61
Incentive \$	107.3	403.48	135.35	646.13	12.69	212.93	49.65	275.27	94.61	190.55	85.7	370.86

As of
6/19/08



Of the active commercial projects that are older than 12 mos...

PG&E: 32 projects

SCE: 67 projects

CCSE: 17 projects

Average age: 425 days (just over 14 months)

Percent with official extensions: 86%

Average length of extensions: 145 days (almost 5 months)

Common reasons for extensions:

- Delays in project start-up / schedule delays
- Zoning / permitting / engineering / contracting delays
- Panel delays
- Force Majeure



Is there a dropouts “problem”?

- Data shows a current cumulative rate between 9% and 10% for CSI MW
 - 10% for MW that have reached 12 month maturity
 - A large number of commercial projects older than 12 months are incomplete – are extensions a problem?
- What is an appropriate threshold limit for CSI dropouts? 20%? 50%?

What is being done *now* that will affect dropouts?

- Program Administrator advice letter
 - *Original* “dropouts” advice letter (PG&E Advice 3062-E / SCE Advice 2131-E Filed June 4th, 2007) suspended due to lack of data, protest
 - Stabilized application fee
 - Penalty application fee for installers with >20% dropouts
 - Proof of building permit for systems >10 kW required
 - *Current* advice letter addresses some dropouts-related issues
 - Stabilized application fee that does not decline over time
 - Transferability of reservation for host customer with multiple sites



If CSI dropout rate passes a threshold limit in the future, what should we do?

- Even if there is not a problem, should we do something preemptively to limit dropouts?
 - What should our extension policy be?
- How will the ITC affect dropouts?

Criteria for evaluating options:

- **Market transformation**: what option will provide the most support to our long-term market transformation goals?
- **Equity**: which option is the most equitable for all parties, including manufacturers, installers, host customers, ratepayers, past, present and future?
- *What other criteria should the Commission use in evaluating options?*

- **Brainstorm topics for discussion**



Next Steps?