PY2018 SMALL/MEDIUM COMMERCIAL (SMB) SECTOR ESPI IMPACT EVALUATION

Final Report - Appendices

Submitted to:
California Public Utilities Commission

Prepared by:

Itrön

1111 Broadway
Suite 300
Oakland, CA 94607
www.itron.com/strategicanalytics

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ers

ERS
151 North Sunrise Avenue
Suite 1108
Roseville, CA 95661

TIERRA
Resource Consultants, LLC

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Gross Lifecycle Savings (MWh)

PA	Standard Report Group	Ex-Ante Gross	Ex-Post Gross	GRR	% Ex-Ante Gross Pass Through	Eval GRR
PGE	PASS THROUGH	384,650	384,650	1.00	100.0%	
PGE	PGE - AG IRRIGATION	40,610	2,843	0.07	0.0%	0.07
PGE	PGE - PROCESS PUMPING VFD	54,677	64,875	1.19	2.1%	1.19
PGE	PGE - REFRIGERATION CASE LED LIGHTING	57,007	11,402	0.20	0.0%	0.20
PGE	PGE - WATER HEATING TANKLESS WATER HEATER	120	120	1.00	0.0%	1.00
PGE	**Total**	**537,065**	**463,890**	**0.86**	**71.8%**	**0.52**
SCE	PASS THROUGH	81,679	81,679	1.00	100.0%	
SCE	SCE - PROCESS PUMPING VFD	13,932	5,464	0.39	0.0%	0.39
SCE	SCE - REFRIGERATION CASE LED LIGHTING	0	0			
SCE	**Total**	**95,612**	**87,143**	**0.91**	**85.4%**	**0.39**
SCG	PASS THROUGH	2,699	2,699	1.00	100.0%	
SCG	SCG - WATER HEATING TANKLESS WATER HEATER	0	0			
SCG	**Total**	**2,699**	**2,699**	**1.00**	**100.0%**	
SDGE	PASS THROUGH	12,554	12,554	1.00	100.0%	
SDGE	SDGE - PROCESS PUMPING VFD	136	136	1.00	100.0%	
SDGE	SDGE - REFRIGERATION CASE LED LIGHTING	7,555	978	0.13	0.0%	0.13
SDGE	**Total**	**20,245**	**13,668**	**0.68**	**62.7%**	**0.13**
MCE	PASS THROUGH	1,415	1,415	1.00	100.0%	
MCE	**Total**	**1,415**	**1,415**	**1.00**	**100.0%**	
	Statewide	*657,035*	*568,816*	*0.87*	*73.7%*	*0.49*

Net Lifecycle Savings (MWh)

PA	Standard Report Group	Ex-Ante Net	Ex-Post Net	NRR	% Ex-Ante Net Pass Through	Ex-Ante NTG	Ex-Post NTG	Eval Ex-Ante NTG	Eval Ex-Post NTG
PGE	PASS THROUGH	255,270	255,270	1.00	100.0%	0.66	0.66		
PGE	PGE - AG IRRIGATION	26,397	1,848	0.07	100.0%	0.65	0.65		
PGE	PGE - PROCESS PUMPING VFD	35,540	28,578	0.80	2.1%	0.65	0.44	0.65	0.44
PGE	PGE - REFRIGERATION CASE LED LIGHTING	37,054	7,458	0.20	0.0%	0.65	0.65	0.65	0.65
PGE	PGE - WATER HEATING TANKLESS WATER HEATER	78	72	0.92	0.0%	0.65	0.60	0.65	0.60
PGE	**Total**	**354,339**	**293,225**	**0.83**	**79.7%**	**0.66**	**0.63**	**0.65**	**0.47**
SCE	PASS THROUGH	53,682	53,682	1.00	100.0%	0.66	0.66		
SCE	SCE - PROCESS PUMPING VFD	9,056	2,909	0.32	1.6%	0.65	0.53	0.65	0.53
SCE	SCE - REFRIGERATION CASE LED LIGHTING	0	0						
SCE	**Total**	**62,738**	**56,591**	**0.90**	**85.8%**	**0.66**	**0.65**	**0.65**	**0.53**
SCG	PASS THROUGH	1,845	1,845	1.00	100.0%	0.68	0.68		
SCG	SCG - WATER HEATING TANKLESS WATER HEATER	0	0						
SCG	**Total**	**1,845**	**1,845**	**1.00**	**100.0%**	**0.68**	**0.68**		
SDGE	PASS THROUGH	8,509	8,509	1.00	100.0%	0.68	0.68		
SDGE	SDGE - PROCESS PUMPING VFD	102	102	1.00	100.0%	0.75	0.75		
SDGE	SDGE - REFRIGERATION CASE LED LIGHTING	4,994	962	0.19	0.0%	0.66	0.98	0.66	0.98
SDGE	**Total**	**13,605**	**9,573**	**0.70**	**63.3%**	**0.67**	**0.70**	**0.66**	**0.98**
MCE	PASS THROUGH	1,213	1,213	1.00	100.0%	0.86	0.86		
MCE	**Total**	**1,213**	**1,213**	**1.00**	**100.0%**	**0.86**	**0.86**		
	Statewide	*433,741*	*362,448*	*0.84*	*80.2%*	*0.66*	*0.64*	*0.65*	*0.48*

*All Net Savings and NTG values presented above include the 0.05 Market Effects Adder.

Gross Lifecycle Savings (MW)

PA	Standard Report Group	Ex-Ante Gross	Ex-Post Gross	GRR	% Ex-Ante Gross Pass Through	Eval GRR
PGE	PASS THROUGH	67.5	67.5	1.00	100.0%	
PGE	PGE - AG IRRIGATION	32.2	3.9	0.12	0.0%	0.12
PGE	PGE - PROCESS PUMPING VFD	26.1	7.9	0.30	0.0%	0.30
PGE	PGE - REFRIGERATION CASE LED LIGHTING	12.3	2.5	0.20	0.0%	0.20
PGE	PGE - WATER HEATING TANKLESS WATER HEATER	0.1	0.1	1.00	0.0%	1.00
PGE	**Total**	**138.2**	**81.8**	**0.59**	**48.8%**	**0.20**
SCE	PASS THROUGH	9.7	9.7	1.00	100.0%	
SCE	SCE - PROCESS PUMPING VFD	6.8	1.3	0.19	0.0%	0.19
SCE	SCE - REFRIGERATION CASE LED LIGHTING	0.0	0.0			
SCE	**Total**	**16.5**	**11.0**	**0.66**	**58.8%**	**0.19**
SCG	PASS THROUGH	0.1	0.1	1.00	100.0%	
SCG	SCG - WATER HEATING TANKLESS WATER HEATER	0.0	0.0			
SCG	**Total**	**0.1**	**0.1**	**1.00**	**100.0%**	
SDGE	PASS THROUGH	1.2	1.2	1.00	100.0%	
SDGE	SDGE - PROCESS PUMPING VFD	0.1	0.1	1.00	100.0%	
SDGE	SDGE - REFRIGERATION CASE LED LIGHTING	1.2	0.2	0.13	0.0%	0.13
SDGE	**Total**	**2.5**	**1.4**	**0.56**	**49.8%**	**0.13**
MCE	PASS THROUGH	0.3	0.3	1.00	100.0%	
MCE	**Total**	**0.3**	**0.3**	**1.00**	**100.0%**	
	Statewide	*157.6*	*94.6*	*0.60*	*50.0%*	*0.20*

Net Lifecycle Savings (MW)

PA	Standard Report Group	Ex-Ante Net	Ex-Post Net	NRR	% Ex-Ante Net Pass Through	Ex-Ante NTG	Ex-Post NTG	Eval Ex-Ante NTG	Eval Ex-Post NTG
PGE	PASS THROUGH	44.3	44.3	1.00	100.0%	0.66	0.66		
PGE	PGE - AG IRRIGATION	21.0	2.5	0.12	100.0%	0.65	0.65		
PGE	PGE - PROCESS PUMPING VFD	17.0	3.4	0.20	0.0%	0.65	0.42	0.65	0.42
PGE	PGE - REFRIGERATION CASE LED LIGHTING	8.0	1.6	0.20	0.0%	0.65	0.65	0.65	0.65
PGE	PGE - WATER HEATING TANKLESS WATER HEATER	0.0	0.0	0.92	0.0%	0.65	0.60	0.65	0.60
PGE	**Total**	**90.3**	**51.8**	**0.57**	**72.3%**	**0.65**	**0.63**	**0.65**	**0.48**
SCE	PASS THROUGH	6.4	6.4	1.00	100.0%	0.66	0.66		
SCE	SCE - PROCESS PUMPING VFD	4.4	0.7	0.16	1.8%	0.65	0.57	0.65	0.57
SCE	SCE - REFRIGERATION CASE LED LIGHTING	0.0	0.0						
SCE	**Total**	**10.8**	**7.1**	**0.66**	**59.9%**	**0.66**	**0.65**	**0.65**	**0.57**
SCG	PASS THROUGH	0.0	0.0	1.00	100.0%	0.75	0.75		
SCG	SCG - WATER HEATING TANKLESS WATER HEATER	0.0	0.0						
SCG	**Total**	**0.0**	**0.0**	**1.00**	**100.0%**	**0.75**	**0.75**		
SDGE	PASS THROUGH	0.8	0.8	1.00	100.0%	0.68	0.68		
SDGE	SDGE - PROCESS PUMPING VFD	0.1	0.1	1.00	100.0%	0.75	0.75		
SDGE	SDGE - REFRIGERATION CASE LED LIGHTING	0.8	0.2	0.20	0.0%	0.66	0.98	0.66	0.98
SDGE	**Total**	**1.7**	**1.0**	**0.60**	**50.8%**	**0.67**	**0.72**	**0.66**	**0.98**
MCE	PASS THROUGH	0.3	0.3	1.00	100.0%	0.86	0.86		
MCE	**Total**	**0.3**	**0.3**	**1.00**	**100.0%**	**0.86**	**0.86**		
	Statewide	*103.1*	*60.3*	*0.58*	*70.7%*	*0.65*	*0.64*	*0.65*	*0.50*

*All Net Savings and NTG values presented above include the 0.05 Market Effects Adder.

Gross Lifecycle Savings (MTherms)

PA	Standard Report Group	Ex-Ante Gross	Ex-Post Gross	GRR	% Ex-Ante Gross Pass Through	Eval GRR
PGE	PASS THROUGH	48,525	48,525	1.00	100.0%	
PGE	PGE - AG IRRIGATION	0	0			
PGE	PGE - PROCESS PUMPING VFD	0	0			
PGE	PGE - REFRIGERATION CASE LED LIGHTING	-760	-760	1.00	0.0%	1.00
PGE	PGE - WATER HEATING TANKLESS WATER HEATER	29,046	16,266	0.56	0.0%	0.56
PGE	**Total**	**76,810**	**64,030**	**0.83**	**63.2%**	**0.55**
SCE	PASS THROUGH	-15	-15	1.00	100.0%	
SCE	SCE - PROCESS PUMPING VFD	0	0			
SCE	SCE - REFRIGERATION CASE LED LIGHTING	0	0			
SCE	**Total**	**-15**	**-15**	**1.00**	**100.0%**	
SCG	PASS THROUGH	54,366	54,366	1.00	100.0%	
SCG	SCG - WATER HEATING TANKLESS WATER HEATER	9,207	3,867	0.42	0.0%	0.42
SCG	**Total**	**63,573**	**58,233**	**0.92**	**85.5%**	**0.42**
SDGE	PASS THROUGH	2,102	2,102	1.00	100.0%	
SDGE	SDGE - PROCESS PUMPING VFD	0	0			
SDGE	SDGE - REFRIGERATION CASE LED LIGHTING	0	0			
SDGE	**Total**	**2,102**	**2,102**	**1.00**	**100.0%**	
MCE	PASS THROUGH	1	1	1.00	100.0%	
MCE	**Total**	**1**	**1**	**1.00**	**100.0%**	
	Statewide	*142,472*	*124,351*	*0.87*	*73.7%*	*0.52*

Net Lifecycle Savings (MTherms)

PA	Standard Report Group	Ex-Ante Net	Ex-Post Net	NRR	% Ex-Ante Net Pass Through	Ex-Ante NTG	Ex-Post NTG	Eval Ex-Ante NTG	Eval Ex-Post NTG
PGE	PASS THROUGH	31,561	31,561	1.00	100.0%	0.65	0.65		
PGE	PGE - AG IRRIGATION	0	0						
PGE	PGE - PROCESS PUMPING VFD	0	0						
PGE	PGE - REFRIGERATION CASE LED LIGHTING	-494	-459	0.93	0.0%	0.65	0.60	0.65	0.60
PGE	PGE - WATER HEATING TANKLESS WATER HEATER	18,011	9,732	0.54	0.0%	0.62	0.60	0.62	0.60
PGE	**Total**	**49,078**	**40,835**	**0.83**	**64.3%**	**0.64**	**0.64**	**0.62**	**0.60**
SCE	PASS THROUGH	-9	-9	1.00	100.0%	0.65	0.65		
SCE	SCE - PROCESS PUMPING VFD	0	0						
SCE	SCE - REFRIGERATION CASE LED LIGHTING	0	0						
SCE	**Total**	**-9**	**-9**	**1.00**	**100.0%**	**0.65**	**0.65**		
SCG	PASS THROUGH	37,080	37,080	1.00	100.0%	0.68	0.68		
SCG	SCG - WATER HEATING TANKLESS WATER HEATER	6,063	2,314	0.38	0.0%	0.66	0.60	0.66	0.60
SCG	**Total**	**43,143**	**39,393**	**0.91**	**85.9%**	**0.68**	**0.68**	**0.66**	**0.60**
SDGE	PASS THROUGH	1,363	1,363	1.00	100.0%	0.65	0.65		
SDGE	SDGE - PROCESS PUMPING VFD	0	0						
SDGE	SDGE - REFRIGERATION CASE LED LIGHTING	0	0						
SDGE	**Total**	**1,363**	**1,363**	**1.00**	**100.0%**	**0.65**	**0.65**		
MCE	PASS THROUGH	1	1	1.00	100.0%	1.72	1.72		
MCE	**Total**	**1**	**1**	**1.00**	**100.0%**	**1.72**	**1.72**		
	Statewide	*93,575*	*81,583*	*0.87*	*74.8%*	*0.66*	*0.66*	*0.63*	*0.60*

*All Net Savings and NTG values presented above include the 0.05 Market Effects Adder.

Gross First Year Savings (MWh)

PA	Standard Report Group	Ex-Ante Gross	Ex-Post Gross	GRR	% Ex-Ante Gross Pass Through	Eval GRR
PGE	PASS THROUGH	36,007	36,007	1.00	100.0%	
PGE	PGE - AG IRRIGATION	2,031	142	0.07	0.0%	0.07
PGE	PGE - PROCESS PUMPING VFD	16,448	9,055	0.55	1.4%	0.54
PGE	PGE - REFRIGERATION CASE LED LIGHTING	3,563	2,851	0.80	0.0%	0.80
PGE	PGE - WATER HEATING TANKLESS WATER HEATER	6	6	1.00	0.0%	1.00
PGE	**Total**	**58,055**	**48,061**	**0.83**	**62.4%**	**0.54**
SCE	PASS THROUGH	15,664	15,664	1.00	100.0%	
SCE	SCE - PROCESS PUMPING VFD	1,913	929	0.49	0.0%	0.49
SCE	SCE - REFRIGERATION CASE LED LIGHTING	0	0			
SCE	**Total**	**17,577**	**16,593**	**0.94**	**89.1%**	**0.49**
SCG	PASS THROUGH	475	475	1.00	100.0%	
SCG	SCG - WATER HEATING TANKLESS WATER HEATER	0	0			
SCG	**Total**	**475**	**475**	**1.00**	**100.0%**	
SDGE	PASS THROUGH	2,530	2,530	1.00	100.0%	
SDGE	SDGE - PROCESS PUMPING VFD	14	14	1.00	100.0%	
SDGE	SDGE - REFRIGERATION CASE LED LIGHTING	472	245	0.52	0.0%	0.52
SDGE	**Total**	**3,016**	**2,788**	**0.92**	**84.3%**	**0.52**
MCE	PASS THROUGH	119	119	1.00	100.0%	
MCE	**Total**	**119**	**119**	**1.00**	**100.0%**	
	Statewide	*79,242*	*68,036*	*0.86*	*69.5%*	*0.54*

Net First Year Savings (MWh)

PA	Standard Report Group	Ex-Ante Net	Ex-Post Net	NRR	% Ex-Ante Net Pass Through	Ex-Ante NTG	Ex-Post NTG	Eval Ex-Ante NTG	Eval Ex-Post NTG
PGE	PASS THROUGH	23,815	23,815	1.00	100.0%	0.66	0.66		
PGE	PGE - AG IRRIGATION	1,320	92	0.07	100.0%	0.65	0.65		
PGE	PGE - PROCESS PUMPING VFD	10,692	4,149	0.39	1.4%	0.65	0.46	0.65	0.45
PGE	PGE - REFRIGERATION CASE LED LIGHTING	2,316	1,865	0.81	0.0%	0.65	0.65	0.65	0.65
PGE	PGE - WATER HEATING TANKLESS WATER HEATER	4	4	0.92	0.0%	0.65	0.60	0.65	0.60
PGE	**Total**	**38,146**	**29,924**	**0.78**	**66.3%**	**0.66**	**0.62**	**0.65**	**0.50**
SCE	PASS THROUGH	10,231	10,231	1.00	100.0%	0.65	0.65		
SCE	SCE - PROCESS PUMPING VFD	1,244	496	0.40	1.8%	0.65	0.53	0.65	0.53
SCE	SCE - REFRIGERATION CASE LED LIGHTING	0	0						
SCE	**Total**	**11,475**	**10,727**	**0.93**	**89.4%**	**0.65**	**0.65**	**0.65**	**0.53**
SCG	PASS THROUGH	320	320	1.00	100.0%	0.67	0.67		
SCG	SCG - WATER HEATING TANKLESS WATER HEATER	0	0						
SCG	**Total**	**320**	**320**	**1.00**	**100.0%**	**0.67**	**0.67**		
SDGE	PASS THROUGH	1,675	1,675	1.00	100.0%	0.66	0.66		
SDGE	SDGE - PROCESS PUMPING VFD	10	10	1.00	100.0%	0.75	0.75		
SDGE	SDGE - REFRIGERATION CASE LED LIGHTING	312	240	0.77	0.0%	0.66	0.98	0.66	0.98
SDGE	**Total**	**1,997**	**1,926**	**0.96**	**84.4%**	**0.66**	**0.69**	**0.66**	**0.98**
MCE	PASS THROUGH	102	102	1.00	100.0%	0.86	0.86		
MCE	**Total**	**102**	**102**	**1.00**	**100.0%**	**0.86**	**0.86**		
	Statewide	*52,040*	*42,999*	*0.83*	*72.3%*	*0.66*	*0.63*	*0.65*	*0.51*

*All Net Savings and NTG values presented above include the 0.05 Market Effects Adder.

Gross First Year Savings (MW)

PA	Standard Report Group	Ex-Ante Gross	Ex-Post Gross	GRR	% Ex-Ante Gross Pass Through	Eval GRR
PGE	PASS THROUGH	7.1	7.1	1.00	100.0%	
PGE	PGE - AG IRRIGATION	1.6	0.2	0.12	0.0%	0.12
PGE	PGE - PROCESS PUMPING VFD	7.9	1.3	0.16	0.0%	0.16
PGE	PGE - REFRIGERATION CASE LED LIGHTING	0.8	0.6	0.81	0.0%	0.81
PGE	PGE - WATER HEATING TANKLESS WATER HEATER	0.0	0.0	1.00	0.0%	1.00
PGE	**Total**	**17.5**	**9.3**	**0.53**	**40.9%**	**0.20**
SCE	PASS THROUGH	1.5	1.5	1.00	100.0%	
SCE	SCE - PROCESS PUMPING VFD	0.9	0.2	0.21	0.0%	0.21
SCE	SCE - REFRIGERATION CASE LED LIGHTING	0.0	0.0			
SCE	**Total**	**2.4**	**1.7**	**0.70**	**61.7%**	**0.21**
SCG	PASS THROUGH	0.0	0.0	1.00	100.0%	
SCG	SCG - WATER HEATING TANKLESS WATER HEATER	0.0	0.0			
SCG	**Total**	**0.0**	**0.0**	**1.00**	**100.0%**	
SDGE	PASS THROUGH	0.2	0.2	1.00	100.0%	
SDGE	SDGE - PROCESS PUMPING VFD	0.0	0.0	1.00	100.0%	
SDGE	SDGE - REFRIGERATION CASE LED LIGHTING	0.1	0.0	0.53	0.0%	0.53
SDGE	**Total**	**0.3**	**0.3**	**0.88**	**74.2%**	**0.53**
MCE	PASS THROUGH	0.0	0.0	1.00	100.0%	
MCE	**Total**	**0.0**	**0.0**	**1.00**	**100.0%**	
	Statewide	*20.2*	*11.2*	*0.56*	*44.0%*	*0.21*

Net First Year Savings (MW)

PA	Standard Report Group	Ex-Ante Net	Ex-Post Net	NRR	% Ex-Ante Net Pass Through	Ex-Ante NTG	Ex-Post NTG	Eval Ex-Ante NTG	Eval Ex-Post NTG
PGE	PASS THROUGH	4.7	4.7	1.00	100.0%	0.65	0.65		
PGE	PGE - AG IRRIGATION	1.0	0.1	0.12	100.0%	0.65	0.65		
PGE	PGE - PROCESS PUMPING VFD	5.1	0.6	0.11	0.0%	0.65	0.44	0.65	0.44
PGE	PGE - REFRIGERATION CASE LED LIGHTING	0.5	0.4	0.81	0.0%	0.65	0.65	0.65	0.65
PGE	PGE - WATER HEATING TANKLESS WATER HEATER	0.0	0.0	0.92	0.0%	0.65	0.60	0.65	0.60
PGE	**Total**	**11.4**	**5.8**	**0.51**	**50.3%**	**0.65**	**0.63**	**0.65**	**0.51**
SCE	PASS THROUGH	1.0	1.0	1.00	100.0%	0.66	0.66		
SCE	SCE - PROCESS PUMPING VFD	0.6	0.1	0.19	2.0%	0.65	0.57	0.65	0.57
SCE	SCE - REFRIGERATION CASE LED LIGHTING	0.0	0.0						
SCE	**Total**	**1.6**	**1.1**	**0.69**	**62.6%**	**0.65**	**0.65**	**0.65**	**0.57**
SCG	PASS THROUGH	0.0	0.0	1.00	100.0%	0.75	0.75		
SCG	SCG - WATER HEATING TANKLESS WATER HEATER	0.0	0.0						
SCG	**Total**	**0.0**	**0.0**	**1.00**	**100.0%**	**0.75**	**0.75**		
SDGE	PASS THROUGH	0.1	0.1	1.00	100.0%	0.67	0.67		
SDGE	SDGE - PROCESS PUMPING VFD	0.0	0.0	1.00	100.0%	0.75	0.75		
SDGE	SDGE - REFRIGERATION CASE LED LIGHTING	0.1	0.0	0.79	0.0%	0.66	0.98	0.66	0.98
SDGE	**Total**	**0.2**	**0.2**	**0.95**	**74.4%**	**0.67**	**0.72**	**0.66**	**0.98**
MCE	PASS THROUGH	0.0	0.0	1.00	100.0%	0.86	0.86		
MCE	**Total**	**0.0**	**0.0**	**1.00**	**100.0%**	**0.86**	**0.86**		
	Statewide	*13.2*	*7.1*	*0.54*	*52.3%*	*0.65*	*0.63*	*0.65*	*0.53*

*All Net Savings and NTG values presented above include the 0.05 Market Effects Adder.

Gross First Year Savings (MTherms)

PA	Standard Report Group	Ex-Ante Gross	Ex-Post Gross	GRR	% Ex-Ante Gross Pass Through	Eval GRR
PGE	PASS THROUGH	5,344	5,344	1.00	100.0%	
PGE	PGE - AG IRRIGATION	0	0			
PGE	PGE - PROCESS PUMPING VFD	0	0			
PGE	PGE - REFRIGERATION CASE LED LIGHTING	-48	-48	1.00	0.0%	1.00
PGE	PGE - WATER HEATING TANKLESS WATER HEATER	1,452	813	0.56	0.0%	0.56
PGE	**Total**	**6,749**	**6,110**	**0.91**	**79.2%**	**0.55**
SCE	PASS THROUGH	-3	-3	1.00	100.0%	
SCE	SCE - PROCESS PUMPING VFD	0	0			
SCE	SCE - REFRIGERATION CASE LED LIGHTING	0	0			
SCE	**Total**	**-3**	**-3**	**1.00**	**100.0%**	
SCG	PASS THROUGH	6,696	6,696	1.00	100.0%	
SCG	SCG - WATER HEATING TANKLESS WATER HEATER	460	193	0.42	0.0%	0.42
SCG	**Total**	**7,156**	**6,889**	**0.96**	**93.6%**	**0.42**
SDGE	PASS THROUGH	189	189	1.00	100.0%	
SDGE	SDGE - PROCESS PUMPING VFD	0	0			
SDGE	SDGE - REFRIGERATION CASE LED LIGHTING	0	0			
SDGE	**Total**	**189**	**189**	**1.00**	**100.0%**	
MCE	PASS THROUGH	1	1	1.00	100.0%	
MCE	**Total**	**1**	**1**	**1.00**	**100.0%**	
	Statewide	*14,091*	*13,185*	*0.94*	*86.8%*	*0.51*

Net First Year Savings (MTherms)

PA	Standard Report Group	Ex-Ante Net	Ex-Post Net	NRR	% Ex-Ante Net Pass Through	Ex-Ante NTG	Ex-Post NTG	Eval Ex-Ante NTG	Eval Ex-Post NTG
PGE	PASS THROUGH	3,486	3,486	1.00	100.0%	0.65	0.65		
PGE	PGE - AG IRRIGATION	0	0						
PGE	PGE - PROCESS PUMPING VFD	0	0						
PGE	PGE - REFRIGERATION CASE LED LIGHTING	-31	-29	0.93	0.0%	0.65	0.60	0.65	0.60
PGE	PGE - WATER HEATING TANKLESS WATER HEATER	901	487	0.54	0.0%	0.62	0.60	0.62	0.60
PGE	**Total**	**4,356**	**3,944**	**0.91**	**80.0%**	**0.65**	**0.65**	**0.62**	**0.60**
SCE	PASS THROUGH	-2	-2	1.00	100.0%	0.65	0.65		
SCE	SCE - PROCESS PUMPING VFD	0	0						
SCE	SCE - REFRIGERATION CASE LED LIGHTING	0	0						
SCE	**Total**	**-2**	**-2**	**1.00**	**100.0%**	**0.65**	**0.65**		
SCG	PASS THROUGH	4,651	4,651	1.00	100.0%	0.69	0.69		
SCG	SCG - WATER HEATING TANKLESS WATER HEATER	303	116	0.38	0.0%	0.66	0.60	0.66	0.60
SCG	**Total**	**4,955**	**4,767**	**0.96**	**93.9%**	**0.69**	**0.69**	**0.66**	**0.60**
SDGE	PASS THROUGH	122	122	1.00	100.0%	0.65	0.65		
SDGE	SDGE - PROCESS PUMPING VFD	0	0						
SDGE	SDGE - REFRIGERATION CASE LED LIGHTING	0	0						
SDGE	**Total**	**122**	**122**	**1.00**	**100.0%**	**0.65**	**0.65**		
MCE	PASS THROUGH	1	1	1.00	100.0%	0.93	0.93		
MCE	**Total**	**1**	**1**	**1.00**	**100.0%**	**0.93**	**0.93**		
	Statewide	*9,432*	*8,832*	*0.94*	*87.6%*	*0.67*	*0.67*	*0.63*	*0.60*

*All Net Savings and NTG values presented above include the 0.05 Market Effects Adder.

APPENDIX AB STANDARDIZED PER UNIT SAVINGS

Per Unit (Quantity) Gross Energy Savings (kWh)

PA	Standard Report Group	Pass Through	% ER Ex-Ante	% ER Ex-Post	Average EUL (yr)	Ex-Post Lifecycle	Ex-Post First Year	Ex-Post Annualized
PGE	PGE - AG IRRIGATION	0	0.0%	0.0%	20.0	665.0	33.3	33.3
PGE	PGE - PROCESS PUMPING VFD	0	0.0%	0.0%	7.9	983.7	136.2	136.2
PGE	PGE - REFRIGERATION CASE LED LIGHTING	0	0.0%	0.0%	4.0	216.5	54.1	54.1
PGE	PGE - WATER HEATING TANKLESS WATER HEATER	0	0.0%	0.0%	20.0	0.3	0.0	0.0
PGE	PASS THROUGH	1	0.3%		16.3	401.8	37.6	37.6
PGE	PGE - PROCESS PUMPING VFD	1	0.0%		5.0	166,881.5	33,376.3	33,376.3
SCE	SCE - PROCESS PUMPING VFD	0	0.0%	0.0%	6.7	709.1	120.6	120.6
SCE	PASS THROUGH	1	0.0%		3.9	2,767.5	530.7	530.7
SCE	SCE - REFRIGERATION CASE LED LIGHTING	1	0.0%		4.0	0.0	0.0	0.0
SCG	SCG - WATER HEATING TANKLESS WATER HEATER	0	0.0%	0.0%	20.0	0.0	0.0	0.0
SCG	PASS THROUGH	1	0.4%		6.5	0.6	0.1	0.1
SDGE	SDGE - REFRIGERATION CASE LED LIGHTING	0	0.0%	0.0%	4.0	1,680.6	420.1	420.1
SDGE	PASS THROUGH	1	0.0%		4.5	365.2	73.6	73.6
SDGE	SDGE - PROCESS PUMPING VFD	1	0.0%		10.0	2,266.5	226.6	226.6
MCE	PASS THROUGH	1	0.0%		8.2	5,970.5	502.5	502.5

Per Unit (Quantity) Gross Energy Savings (Therms)

PA	Standard Report Group	Pass Through	% ER Ex-Ante	% ER Ex-Post	Average EUL (yr)	Ex-Post Lifecycle	Ex-Post First Year	Ex-Post Annualized
PGE	PGE - AG IRRIGATION	0	0.0%	0.0%	20.0	0.0	0.0	0.0
PGE	PGE - PROCESS PUMPING VFD	0	0.0%	0.0%	7.9	0.0	0.0	0.0
PGE	PGE - REFRIGERATION CASE LED LIGHTING	0	0.0%	0.0%	4.0	-14.4	-0.9	-3.6
PGE	PGE - WATER HEATING TANKLESS WATER HEATER	0	0.0%	0.0%	20.0	38.0	1.9	1.9
PGE	PASS THROUGH	1	0.3%		16.3	50.7	5.6	5.6
PGE	PGE - PROCESS PUMPING VFD	1	0.0%		5.0	0.0	0.0	0.0
SCE	SCE - PROCESS PUMPING VFD	0	0.0%	0.0%	6.7	0.0	0.0	0.0
SCE	PASS THROUGH	1	0.0%		3.9	-0.5	-0.1	-0.1
SCE	SCE - REFRIGERATION CASE LED LIGHTING	1	0.0%		4.0	0.0	0.0	0.0
SCG	SCG - WATER HEATING TANKLESS WATER HEATER	0	0.0%	0.0%	20.0	37.0	1.8	1.8
SCG	PASS THROUGH	1	0.4%		6.5	11.3	1.4	1.4
SDGE	SDGE - REFRIGERATION CASE LED LIGHTING	0	0.0%	0.0%	4.0	0.0	0.0	0.0
SDGE	PASS THROUGH	1	0.0%		4.5	61.2	5.5	5.5
SDGE	SDGE - PROCESS PUMPING VFD	1	0.0%		10.0	0.0	0.0	0.0
MCE	PASS THROUGH	1	0.0%		8.2	2.9	3.2	3.2

Per Unit (Quantity) Net Energy Savings (kWh)

PA	Standard Report Group	Pass Through	% ER Ex-Ante	% ER Ex-Post	Average EUL (yr)	Ex-Post Lifecycle	Ex-Post First Year	Ex-Post Annualized
PGE	PGE - PROCESS PUMPING VFD	0	0.0%	0.0%	7.9	430.4	61.8	61.8
PGE	PGE - REFRIGERATION CASE LED LIGHTING	0	0.0%	0.0%	4.0	141.6	35.4	35.4
PGE	PGE - WATER HEATING TANKLESS WATER HEATER	0	0.0%	0.0%	20.0	0.2	0.0	0.0
PGE	PASS THROUGH	1	0.3%		16.3	266.6	24.9	24.8
PGE	PGE - AG IRRIGATION	1	0.0%		20.0	432.3	21.6	21.6
PGE	PGE - PROCESS PUMPING VFD	1	0.0%		8.6	5,752.4	1,150.5	1,150.5
SCE	SCE - PROCESS PUMPING VFD	0	0.0%	0.0%	6.7	375.4	63.3	63.3
SCE	PASS THROUGH	1	0.0%		3.9	1,818.9	346.6	346.6
SCE	SCE - PROCESS PUMPING VFD	1	0.0%		4.0	484.3	120.4	120.4
SCE	SCE - REFRIGERATION CASE LED LIGHTING	1	0.0%		4.0	0.0	0.0	0.0
SCG	SCG - WATER HEATING TANKLESS WATER HEATER	0	0.0%	0.0%	20.0	0.0	0.0	0.0
SCG	PASS THROUGH	1	0.4%		6.5	0.4	0.1	0.1
SDGE	SDGE - REFRIGERATION CASE LED LIGHTING	0	0.0%	0.0%	4.0	1,652.6	413.1	413.1
SDGE	PASS THROUGH	1	0.0%		4.5	247.6	48.7	48.7
SDGE	SDGE - PROCESS PUMPING VFD	1	0.0%		10.0	1,699.9	170.0	170.0
MCE	PASS THROUGH	1	0.0%		8.2	5,120.0	432.1	432.1

Per Unit (Quantity) Net Energy Savings (Therms)

PA	Standard Report Group	Pass Through	% ER Ex-Ante	% ER Ex-Post	Average EUL (yr)	Ex-Post Lifecycle	Ex-Post First Year	Ex-Post Annualized
PGE	PGE - PROCESS PUMPING VFD	0	0.0%	0.0%	7.9	0.0	0.0	0.0
PGE	PGE - REFRIGERATION CASE LED LIGHTING	0	0.0%	0.0%	4.0	-8.7	-0.5	-2.2
PGE	PGE - WATER HEATING TANKLESS WATER HEATER	0	0.0%	0.0%	20.0	22.7	1.1	1.1
PGE	PASS THROUGH	1	0.3%		16.3	33.0	3.6	3.6
PGE	PGE - AG IRRIGATION	1	0.0%		20.0	0.0	0.0	0.0
PGE	PGE - PROCESS PUMPING VFD	1	0.0%		8.6	0.0	0.0	0.0
SCE	SCE - PROCESS PUMPING VFD	0	0.0%	0.0%	6.7	0.0	0.0	0.0
SCE	PASS THROUGH	1	0.0%		3.9	-0.3	-0.1	-0.1
SCE	SCE - PROCESS PUMPING VFD	1	0.0%		4.0	0.0	0.0	0.0
SCE	SCE - REFRIGERATION CASE LED LIGHTING	1	0.0%		4.0	0.0	0.0	0.0
SCG	SCG - WATER HEATING TANKLESS WATER HEATER	0	0.0%	0.0%	20.0	22.1	1.1	1.1
SCG	PASS THROUGH	1	0.4%		6.5	7.7	1.0	1.0
SDGE	SDGE - REFRIGERATION CASE LED LIGHTING	0	0.0%	0.0%	4.0	0.0	0.0	0.0
SDGE	PASS THROUGH	1	0.0%		4.5	39.7	3.6	3.6
SDGE	SDGE - PROCESS PUMPING VFD	1	0.0%		10.0	0.0	0.0	0.0
MCE	PASS THROUGH	1	0.0%		8.2	5.0	3.0	3.0

APPENDIX AC   RESPONSE TO RECOMMENDATIONS

ID	PA	Section	Conclusion	Recommendation	Disposition (Accepted, Rejected, or Other)	Disposition Notes (e.g. Description of specific program change or Reason for rejection or Under further review)
Refrigeration Case LED Lighting Measures						
RL1	PG&E	Section 5	By separately claiming savings for the refrigeration case lighting measure in addition to the new case, savings associated with the new efficient lighting in the case are double-counted	The program's application review and verification process should ensure that project savings are not being double counted for any participants receiving incentives in any given program or across any set of programs.		
RL2	SDG&E	Section 5	Ex-post hours of operation generally support the assumed HOU used in the workpapers and deemed savings for the refrigerated case LED measures.	Utilities should continue using the HOU currently being used in the ex-ante calculations. One possible exception is to develop a measure code for buildings that are open 24/7.		
RL3	PG&E, SDG&E	Section 5	Evaluators concluded the remaining useful life of the refrigerated case, or 1/3 of the case's 12 year EUL.	The Evaluation Team recommends this measure be considered accelerated replacement with an EUL equal to the remaining useful life of the refrigerated case itself, or 4 years.		
RL4	SDG&E, SCE	Section 6	In general, Refrigerated LED Case Lighting measures exhibited medium program influence levels.	As Refrigerated LED Case Lighting measures continue to be incented by SCE and SDG&E, free ridership should be monitored on an ongoing basis.		

ID	PA	Section	Conclusion	Recommendation	Disposition (Accepted, Rejected, or Other)	Disposition Notes (e.g. Description of specific program change or Reason for rejection or Under further review)
Process Pumping VFD Measures						
PPVFD1a	PG&E, SCE, SDG&E	Section 5	The workpaper-based estimates of savings currently draw results from a database of legacy custom and new construction projects involving pump VFDs.	Workpaper updates for agricultural pump VFD measures that are scheduled for 2020 should take into consideration the broad results of this evaluation and any trends observed in order to best improve the accuracy of future workpaper estimates.		
PPVFD1b	PG&E, SCE, SDG&E	Section 5	The workpaper-based estimates of savings currently draw results from a database of legacy custom and new construction projects involving pump VFDs.	The program's application and review process should be expanded to increase the range of irrigation pump performance information captured in the ex-ante tracking databases.		
PPVFD1c	PG&E, SCE, SDG&E	Section 5	The workpaper-based estimates of savings currently draw results from a database of legacy custom and new construction projects involving pump VFDs.	The PAs should consider using an enhanced measure savings algorithm that provides for some reasonable level of customization for relevant input parameters.		
PPVFD2a	PG&E, SCE and SDG&E	Section 5	By far the most valuable data source supporting ex-post gross impact accuracy was the AMI data that the utilities provided to the evaluation team.	The PAs should leverage AMI data for the purposes of deriving workpaper-based impact estimates.		

ID	PA	Section	Conclusion	Recommendation	Disposition (Accepted, Rejected, or Other)	Disposition Notes (e.g. Description of specific program change or Reason for rejection or Under further review)
PPVFD2b	PG&E, SCE and SDG&E	Section 5	By far the most valuable data source supporting ex-post gross impact accuracy was the AMI data that the utilities provided to the evaluation team.	The PAs should make use of AMI data to screen projects for eligibility based on pump run time being greater than the required 1,000 hours.		
PPVFD3	PG&E, SCE, SDG&E	Section 5	Although the evaluation did not contest the utility-derived standard practice baseline, nor conduct additional research surrounding standard practice for VFDs in pumping systems, there are certainly irrigation applications where there is a high likelihood that a VFD would have been installed in the absence of the program, given many non-energy benefits of VFD operations.	The workpaper baseline condition should be revisited in advance of completion of 2020 workpaper updates for the agricultural pump VFD measure.		
PPVFD4	PG&E, SCE	Section 5	Pumps in the sample frequently failed to comply with various program eligibility requirements. These requirements are generally in place to ensure each VFD installation will produce a desirable minimum level of program savings and/or produce savings at all.	The program's application and review process should be enhanced to better screen projects against eligibility requirements and exclusions, and verification should be performed to ensure that installations claimed are both valid and accurately represent the associated irrigation system.		
PPVFD5	PG&E, SCE, SDG&E	Section 5	Pumps that do not operate at substantially reduced speeds and flow should not be eligible for program VFD incentives.	The program eligibility requirements should be strengthened to exclude all such pumps from participation.		

ID	PA	Section	Conclusion	Recommendation	Disposition (Accepted, Rejected, or Other)	Disposition Notes (e.g. Description of specific program change or Reason for rejection or Under further review)
PPVFD6	PG&E, SCE	Section 5	Across both the PG&E and SCE samples (49 pumps), there were only two pumps where evaluation-based EUL assignments matched those applied by the utilities in the tracking system.	The PAs should apply greater due diligence in populating tracking system-based EULs and better classify participating projects as new pump installations versus retrofit add-on installations.		
PPVFD7	PG&E, SCE, SDG&E	Section 5	The Process Pumping VFD measure's average ex-post NTG ratio of 0.41 suggests a medium-low level of program influence and corresponding medium-high level of free ridership.	Given the medium-low program influence level, the programs should monitor free ridership on an ongoing basis.		

ID	PA	Section	Conclusion	Recommendation	Disposition (Accepted, Rejected, or Other)	Disposition Notes (e.g. Description of specific program change or Reason for rejection or Under further review)
Agricultural Irrigation Measures						
AG1	PG&E	Section 5	Nine of the 17 sampled projects in this evaluation were ineligible for program participation because each of these nine farms grow deciduous crops.	The program's application and review process should be enhanced to screen projects against all eligibility criteria, and selected auditing or verification should be performed to ensure that only valid installations are claimed.		
AG2	PG&E	Section 5	IOU models for estimating savings were found to lack key parameters that are critical for accurately characterizing irrigation needs and resulting savings.	Future workpaper revisions, ex-ante models, and impact claims should incorporate recent evaluation data and results.		

ID	PA	Section	Conclusion	Recommendation	Disposition (Accepted, Rejected, or Other)	Disposition Notes (e.g. Description of specific program change or Reason for rejection or Under further review)
Tankless Water Heaters						
TWH1	PG&E, SCG	Section 5	The tankless water heater measure's distributor-facing design results in inconsistent or missing tracking data.	For any offering where the IOUs are providing support and incentives through the state's energy efficiency programs, such as the tankless water heater measure, program administrators should require participating distributors and partnering contractors to collaboratively collect and submit basic information for each customer ultimately receiving the equipment or other support.		
TWH2	PG&E, SCG	Section 5	Three of the 25 evaluated projects were determined to result in zero savings due to non-install or ineligibility.	For any measures delivered midstream through distributor rebates, such as the tankless water heater measure, the programs must require participating distributors and partnering contractors to submit more comprehensive installation documentation (e.g., invoices, commissioning reports) and photographs to prove measure installation, quantity, size, fuel source, and efficiency.		

ID	PA	Section	Conclusion	Recommendation	Disposition (Accepted, Rejected, or Other)	Disposition Notes (e.g. Description of specific program change or Reason for rejection or Under further review)
TWH3a	PG&E, SCG	Section 5	11 of the 25 evaluated projects applied incorrect reported per-unit savings values or misclassified the type of facility where the measure was installed.	Deemed measures in the small-medium commercial sector should conform with workpapers active at the time of installation, and claimed savings should reflect the product of workpaper-recommended unit energy savings (UES) with the total installed quantity or size for the most appropriate facility type.		
TWH3b	PG&E, SCG	Section 5	Active workpapers for the TWH measure in PY2018 recommended an NTGR of 0.60. However, evaluators found that 19% of PY2018 tracking records reflected an NTGR of 0.60, 80% an NTGR of 0.65, and 1% an NTGR of 0.90.	Deemed measures in the small-medium commercial sector should conform with workpapers active at the time of installation, and applied NTGRs should consistently reflect the NTGRs specified by workpapers active at the time of project application.		
TWH4	PG&E, SCG	Section 5	We found differences in tankless water heater efficiency and temperature increase as compared with workpaper assumptions.	Future workpaper revisions, ex-ante models and impact claims should incorporate recent evaluation data and results.		

APPENDIX A   SMALL COMMERCIAL SECTOR TELEPHONE SURVEY INSTRUMENTS

- Participant Telephone Survey Instrument

- Vendor Telephone Survey Instrument

PARTICIPANT TELEPHONE SURVEY INSTRUMENT

	Participant Survey for CPUC PY2018 Small Commercial Evaluation	
	INTRODUCTION AND FINDING CORRECT RESPONDENT	
OUTCOME1	This is %n calling on behalf of the CPUC, from Pacific Market Research. THIS IS NOT A SALES CALL NOR A SERVICE CALL. May I please speak with ...<%CONTACT> ...<%OLDCONTACT> ... <%BUSINESS> ... the person at your organization that is most knowledgeable about your participation in <%UTILITY>'s <%PROGRAM> program. !___[IF NEEDED]...This is a fact-finding survey only, authorized by the California Public Utilities Commission.	
1	Yes (go to next screen)	Continue
2	Make appointment	Make appt and record time
3	Busy/engaged	Record Response and T&T
4	No Answer	Record Response and T&T
6	Refused	Record Response and T&T
6	Disconnected	Record Response and T&T
7	Answering Machine - no message	Record Response and T&T
8	Duplicate	Record Response and T&T
9	DRNA	Record Response and T&T
10	Disability	Record Response and T&T
11-12	Language Barriers	Record Response and T&T
13	Answering Machine - left message	Record Response and T&T
14	NO SCREEN - Participant	Record Response and T&T
15	Hang up	Record Response and T&T
16	Residence	Record Response and T&T
17	Fax	Record Response and T&T
18	Quota full	Record Response and T&T
19	Wrong Address	Record Response and T&T
20	Home office	Record Response and T&T
21	Max attempts	Record Response and T&T
24	General callback	Record Response and T&T
25	Name/Number changed	Record Response and T&T

Thank & Terminate PBLOCK NO_ONE	Thank you for your time. For this study, we need to speak to someone about your organization's installation of energy efficient equipment that your organization installed through <%UTILITY>'s <%PROGRAM> program.	END
Q1B	[IF YOU ARE TRANSFERRED TO ANOTHER PERSON OTHER THAN THE BEST CONTACT] Who would be the person most familiar about your organization's participation in <%UTILITY>'S <%PROGRAM> program? [ENTER NEW CONTACT NAME AND MOVE ON]	
	[IF NEEDED] This is not a sales call.	
	[IF NEEDED] This is a fact-finding survey only, and responses will not be connected with your firm in any way. The California Public Utilities Commission wants to better understand how businesses think about and manage their energy consumption.	
77	There is no one here who can help you	T&T
1	Continue Q1B until you find appropriate contact person, record as &NEW CONTACT NAME	Intro3:s
Intro3:S	[IF BEST CONTACT IS AVAILABLE] Hello, my name is _____%n_____ and I am calling on behalf of the California Public Utilities Commission from Pacific Market Research. THIS IS NOT A SALES CALL. We are interested in speaking with the person most knowledgeable about your organization's participation in ... <%UTILITY>'s <%PROGRAM> program during 2018......I was told that would be you. ...Your organization participated in <%UTILITY>'s <%PROGRAM> by installing energy saving equipment in 2018. You should have received an email recently that explained the evaluation process and provided a letter from the CPUC validating this study.	
	Through this program, your organization installed.... <%CUSTOM_MEASURE> on <CUST_INSTALL_DATE>...<CUST_PAID_DATE>... <%UNITS_1> ... <%MEASURE_1> on <MEASURE_1_DATE> <%UNITS_2> ... <%MEASURE_2> on <MEASURE_2_DATE> <%UNITS_3> ... <%MEASURE_3> on <MEASURE_3_DATE> Are you the best person to speak to about your organization's participation in this program?	
1	Yes	Person:s
2	No, there is someone else	Intro3:s
3	No and I don't know who to refer you to	Appoint
5	Property management company handles this	PMNAME
99	Don't know/refused	T&T

Ext	Is there a phone extension or phone number you recommend we use when we call back?	
77	Record Extension or Phone Number, &PHONE	Thank&Terminate
88	Refused	Thank&Terminate
99	Don't know	Thank&Terminate
PMNAME	May I have the name and contact information of your property management company?	
1	Yes - RECORD	Record Response and T&T
2	No	Thank&Terminate
88	Refused	Thank&Terminate
99	Don't Know	Thank&Terminate
Appoint	[IF RECOMMENDED CONTACT IS NOT CURRENTLY AVAILABLE] When would be a good day and time for us to call back?	
77	Record day of the week, time of day and date to call back, as &APPOINT	Record Response and T&T
88	Refused	Intro3(99)
99	Don't know	Intro3(99)
	If Person(3)	
Intro3(99)	Thank you for your time. We need to speak with the person at your organization that is most familiar with this facility's energy using equipment. Those are all of the questions I have for you today.	Abandoned User30
PBLOCK Hi	Who would be the person at this location who is most knowledgeable about this facility's energy using equipment? [Enter New Contact Name and move on.]	
77	Record Name, as &CONTACT	May_I
88	Refused	Thank&Terminate
99	Don't know	Intro3(99)
May_I	May I speak with him/her?	
77	Yes	Intro3:s
88	No (not available right now@, set cb)	Abandoned Appointment

PERSON:s	According to our records, your organization participated in <%UTILITY>'s <%PROGRAM> program by installing energy saving equipment around ... <%DEEM_PAID_DATE1> <%CUST_PAID_DATE> Through this program, your organization installed.... <%CUSTOM_MEASURE> on <CUST_INSTALL_DATE>...<CUST_PAID_DATE>... <%UNITS_1> ... <%MEASURE_1> on <MEASURE_1_DATE> <%UNITS_2> ... <%MEASURE_2> on <MEASURE_2_DATE> <%UNITS_3> ... <%MEASURE_3> on <MEASURE_3_DATE> Are you the person most knowledgeable about your organization's participation in ...<%UTILITY>'s <%PROGRAM> Program?	
1	Yes	Continue
2	Yes, need to make appointment	Appoint
4	No, but I will give you a name	Thank&Terminate
99	No one knows about the energy using equipment	Thank&Terminate
	If you need to provide validation for this survey, provide the following contact name and number: Mona Dzvova, California Public Utilities Commission, Energy Division, (415) 703-1231, and the following website: **www.cpuc.ca.gov/eevalidation**	
DISPLAY	Before we start, I would like to inform you that for quality control purposes, this call may be monitored by my supervisor. Today we're conducting a very important study on the energy needs and perceptions of organizations like yours. We are interested in how organizations like yours think about and manage their energy consumption. Your input will allow the California Public Utilities Commission to build and maintain better energy savings programs for customers like you. And we would like to remind you, your responses will not be connected with your organization in any way.	

	SCREENER	
VERIFY	For verification purposes only, may I please have your name?	
77	Get name	Scrn_Addr
88	Refused	Scrn_Addr
99	Don't know	Scrn_Addr
DISPLAY	For the sake of expediency, I will refer to ....<%UTILITY>'s <%PROGRAM> ...program as the PROGRAM.	
Scrn_Addr	First, I'd like to ask you a few questions about your organization and facility. Our records show your organization is located at %ADDRESS in %CITY. Is that correct?	
	[CONTINUE IF ADDRESS REPORTED BY RESPONDENT IS SIMILAR ENOUGH]	
1	Yes	Bus_Name
2	No	CORRECT
88	Refused	COMMENT
99	Don't Know	COMMENT
COMMENT	We were attempting to reach <%UTILITY>'s customer at <%ADDRESS> and since you cannot confirm this address, those are all the questions that we have for you today, on behalf of the California Public Utilities Commission, thank you for your time.	
CORRECT	May I have your correct address?	
%CORRECT	Corrected Address	COMPARE
COMPARE	Are these addresses similar or totally different? Computer Address - %ADDRESS Corrected Address - &CORRECT	
1	Similar	Bus_Name
2	Totally Different	COMMENT2
COMMENT2	We were attempting to reach the <%UTILITY> customer at <%ADDRESS> in <%CITY> and since that does not match your address, then we must have mis-dialed the telephone number. Those are all the questions that we have for you today, on behalf of the California Public Utilities Commission. Thank you for your time and cooperation.	Thank and Terminate
BUS_NAME	Our records show your organization's name as: <%BUSINESS> <%CONTACT> <%OLDCONTACT>. Is that correct?	
1	Yes	INCENT
2	No	Bus_Correct
88	Refused	COMMENT
99	Don't Know	COMMENT

BUS_CORRECT	What is the correct name for your organization?	
&BUS_CORRECT	Corrected Business	INCENT
INCENT	What percentage of the cost of your rebated equipment was covered by the program?	
77	RECORD RESPONSE	A1gg
101	REFUSED	FM050
102	DON'T KNOW	A1gg
	IF INCENT <> 100 then ask; Else skip to FM050	
A1gg	What incentive amount did your organization receive from the program towards your energy efficient equipment installation?	
77	RECORD VERBATIM	FM050
88	Refused	FM050
99999	Don't know	FM050
FM050	What is the main business ACTIVITY at this facility? [DO NOT READ] (SINGLE RESPONSE)	V1
1	Offices (non-medical)	V1
2	Restaurant/Food Service	V1
3	Food Store (grocery/liquor/convenience)	V1
4	Agricultural (farms, greenhouses)	V1
5	Retail Stores	V1
6	Warehouse	V1
7	Health Care	V1
8	Education	V1
9	Lodging (hotel/rooms)	V1
10	Public Assembly (church, fitness, theatre, library, museum, convention)	V1
11	Services (hair, nail, massage, spa, gas, repair)	V1
12	Industrial (food processing plant, manufacturing)	V1
13	Laundry (Coin Operated, Commercial Laundry Facility, Dry Cleaner)	V1
14	Condo Assoc./Apartment Mgr (Garden Style, Mobile Home Park, High-rise, Townhouse)	V1
15	Public Service (fire/police/postal/military)	V1
77	OPEN\Record Other Service Shop	V1
88	Refused	V1
99	Don't know	V1

	ROLE OF CONTRACTORS	
V1	Did you use a contractor/vendor to install any of the energy efficient measures that were purchased through the program?	
1	Yes	V2
2	No	AP9
88	Refused	AP9
99	Don't Know	AP9
	If V1 = 1 then ask; else skip to AP9	
V2	How did you come into contact with the contractor/vendor?	
1	They contacted you	V2b
2	You contacted them	V3
3	You had worked with them before	V2a
77	OTHER - Record	V3
88	Refused	V3
99	Don't Know	V3
	Ask if V2 = 3; else skip to V2b	
V2a	In relation to this project, did the vendor/contractor approach you about your energy efficient equipment retrofit/installation?	
1	Yes	V2ab
2	No	V3
88	Refused	V3
99	Don't Know	V3
	Ask if V2a=1 AND <PROGRAM>= IDEEA365 **else skip to V2b**	
V2ab	Did the VENDOR recommend purchasing high efficiency equipment instead of standard efficiency equipment?	
1	Yes	V2b
2	No	V2b
88	Refused	V2b
99	Don't Know	V2b
	Ask if V2 = 1 or V2a = 1; else skip to V3	
V2b	On a scale of 0 - 10, with 0 being NOT AT ALL LIKELY and 10 is VERY LIKELY, how likely is it that your organization would have installed this new equipment had the contractor/vendor not contacted you?	
1	0-10 response	V3
88	Refused	V3
99	Don't Know	V3

V3	Did the contractor/vendor tell you about or recommend the program?	
1	Yes	V3A
2	No	AP9
88	Refused	AP9
99	Don't Know	AP9
	Ask if V3=1 AND <PROGRAM>= IDEEA365 **else skip to V4**	
V3a.	Did you install what your VENDOR recommended?	
1	Yes	V4
2	No	V4
88	Refused	V4
99	Don't Know	V4
	Ask if V3 = 1; else skip to AP9	
V4	Prior to coming into contact with the contractor/vendor, did your organization have plans to replace/install this equipment?	
1	Yes	V4a
2	No	V4a
88	Refused	V4a
99	Don't Know	V4a
V4a	Using the same scale of 0 - 10 as before, how likely is it that your organization would have installed the new energy efficient equipment had the contractor/vendor not recommended it?	
1	0-10 response	V4b
88	Refused	V4b
99	Don't Know	V4b
V4b	Using the same scale, how likely is it that your organization would have installed the energy efficient equipment with the same level of efficiency if the contractor/vendor had not recommended to do so?	
1	0-10 response	V40
88	Refused	V40
99	Don't Know	V40
V40	On a scale of 0 - 10, with 0 being not at all important and 10 being very important, how important was the input from the contractor you worked with in deciding which specific equipment to install?	
1	0-10 response	AP9
88	Refused	AP9
99	Don't Know	AP9

	PROGRAM AWARENESS	
	Next, I'd like to ask you about various energy efficiency programs and what influenced your program participation.	
AP9	How did you FIRST learn about <%UTILITY>'s program? [DO NOT READ ANSWERS]	
1	Bill insert	AP9a
2	Program literature	AP9a
3	Account representative	AP9a
4	Program approved vendor	AP9a
5	Program representative	AP9a
6	Utility or program website	AP9a
7	Trade publication	AP9a
8	Conference	AP9a
9	Newspaper article	AP9a
10	Word of mouth	AP9a
11	Previous experience with it	AP9a
12	Company used it at other locations	AP9a
13	Contractor	AP9a
14	Result of an audit	AP9a
15	Part of a larger expansion or remodeling effort	AP9a
77	Other (RECORD VERBATIM)	AP9a
88	Refused	A1b
99	Don't know	A1b
	If AP9 in (1-77) then ask; else skip to N33	
AP9a	How ELSE did you learn about <%UTILITY>'s program? [DO NOT READ LIST, ACCEPT MULTIPLES]	
1	Bill insert	N33
2	Program literature	N33
3	Account representative	N33
4	Program approved vendor	N33
5	Program representative	N33
6	Utility or program website	N33
7	Trade publication	N33
8	Conference	N33
9	Newspaper article	N33
10	Word of mouth	N33
11	Previous experience with it	N33
12	Company used it at other locations	N33
13	Contractor	N33
14	Result of an audit	N33
15	Part of a larger expansion or remodeling effort	N33

66	No other sources	N33
77	Other (RECORD VERBATIM)	N33
88	Refused	N33
99	Don't know	N33
	If AP9 = 3 or AP9A = 3 then ask; else skip to NEXT SECTION (MEASURE BATTERY)	

N33	You mentioned that you have a Utility or Program Administrator Account Rep.
	 Can you give me his or her name?
	 !!___Do you have his/her email address?
	  !___Do you have a phone number for him/her?
	  !___Do you have a cell phone number for him/her?\,	

77	RECORD NAME, Phone, Email, etc.	NEXT SECTION (MEASURE BATTERY)
88	Refused	NEXT SECTION (MEASURE BATTERY)
99	Don't know	NEXT SECTION (MEASURE BATTERY)
	REFRIGERATION CASE LED LIGHTING EQUIPMENT	
	Ask if REFLEDLIGHTING = 1; else skip to NET TO GROSS BATTERY	
Comment	One way that organizations like yours can reduce their energy use is to install more energy efficient lighting equipment. I would like to ask you about the refrigeration case LED lighting you recently installed as part of your participation in <%UTILITY>'s program.	LED99
	CONTINUE IF REFLEDLIGHTING = 1	
LED99	Our records indicate that your organization installed REFRIGERATION CASE LED LIGHTING EQUIPMENT through the program. It is described as <%REFLEDLIGHTING_MEASURE>. Is this correct?	
1	Yes	LED100
2	No	DISPLAY
88	Refused	DISPLAY
99	Don't know	DISPLAY
	Ask if LED99 = 2, 88, 99; else skip to LED100.	
DISPLAY	We cannot continue this study unless we can speak to someone at your organization that is familiar with the refrigeration case LED lighting equipment that was installed through the program. Is there another person we can speak to?	Go to next person and loop back to LED99

	Ask if LED99 = 1; else T&T	
LED100	What types and sizes [IF NEEDED: bulb lengths] of Refrigeration Case LED lighting were installed as part of this installation?	<$2>
77	Other (PLEASE SPECIFY)	LED101C ($4)
88	Refused	LED101C (_4)
99	Don't know	LED101C (_4)
LED101C (_4)	Were any of the program provided <REFLEDLIGHTING_MEASURE> placed/installed at another facility? If so, what percentage would you estimate?	
1	Yes, #record percentage	LED101D <_5>
2	No	LED101D <_5>
88	Refused	LED101D <_5>
99	Don't know	LED101D <_5>
LED101D (_5)	What type of lighting equipment was removed and replaced when you installed <REFLEDLIGHTING_MEASURE> through the program?	
1	T12 Linear Fluorescent <= 5 ft Unit	LED101F <_7>
2	T12 Linear Fluorescent > 5 ft Unit	LED101F <_7>
3	T8 Linear Fluorescent <= 5 ft Unit	LED101F <_7>
4	T8 Linear Fluorescent > 5 ft Unit	LED101F <_7>
5	LED Case Lighting <= 5 ft Unit	LED101F <_7>
6	LED Case Lighting > 5 ft Unit	LED101F <_7>
66	Did not replace anything - new equipment	OP1
77	Other (PLEASE SPECIFY)	LED101F <_7>
88	Refused	LED101F <_7>
99	Don't know	LED101F <_7>
	Ask if LED101D <_5> DOES NOT EQUAL 66; else skip to OP1	
LED101F (_7)	Approximately how old was the Refrigerator Case lighting that was removed and replaced with <REFLEDLIGHTING_MEASURE>? Would you say...	
1	Less than 5 years old	LED101G <_8>
2	Between 5 and 10 years old	LED101G <_8>
3	Between 10 and 15 years old	LED101G <_8>
4	More than 15 years old	LED101G <_8>
88	Refused	LED101G <_8>
99	Don't know	LED101G <_8>

LED101G (_8)	How would you describe the condition of the removed Refrigerator Case lighting equipment? Would you say they were in…	
1	Poor condition	LED101H <_9>
2	Fair condition	LED101H <_9>
3	Good condition	LED101H <_9>
88	Refused	LED101H <_9>
99	Don't know	LED101H <_9>
LED101H (_9)	Approximately what percentage of the Refrigerator Case lighting that was removed and replaced was broken or not working prior to installing <REFLEDLIGHTING_MEASURE>?	
%	Percent	LED101I (_10A)
88	Refused	LED101I (_10A)
99	Don't know	LED101I (_10A)
LED101I (_10A)	Did you replace the Refrigerator Case at the same time as you installed the <REFLEDLIGHTING_MEASURE> through the PROGRAM?	
1	Yes	OP1
2	No	LED101I (_10)
88	Refused	LED101I (_10)
99	Don't know	LED101I (_10)
LED101I (_10)	Approximately how old are the Refrigerator Cases with the lighting that was removed and replaced with <_2>? Would you say...	
1	Less than 5 years old	LED101J (_11)
2	Between 5 and 10 years old	LED101J (_11)
3	Between 10 and 15 years old	LED101J (_11)
4	More than 15 years old	LED101J (_11)
88	Refused	LED101J (_11)
99	Don't know	LED101J ($11)
LED101J ($11)	How many years do you anticipate are left in the refrigerated case itself until you will replace the entire case?	
# Yrs	RECORD Number of years left	OP1
88	Refused	OP1
99	Don't know	OP1

	Operating Schedule for Refrigeration Case Lighting	
DISPLAY	The next few questions are to help us get a full understanding of the hours of operation for the refrigeration display case lighting.	
OP1	Does the refrigeration display case lighting operate 24 hours a day, 7 days a week?	
1	Yes	OP5
2	No	OP2
88	Refused	OP5
99	Don't know	OP5
OP2	Are there certain days of the week when the refrigeration display case lighting operates less than 24 hours?	
1	Yes	OP3
2	No	OP5
88	Refused	OP5
99	Don't know	OP5
OP3	Which days are they [IF NEEDED: when the refrigeration display case lighting operates less than 24 hours]?	
1	Monday	OP4
2	Tuesday	OP4
3	Wednesday	OP4
4	Thursday	OP4
5	Friday	OP4
6	Saturday	OP4
7	Sunday	OP4
88	Refused	OP5
99	Don't know	OP5
[FOR EACH DAY MENTIONED IN OP3, ASK]		
OP4	What hours does the refrigeration display case lighting operate on those days, in terms of the starting and ending times?	
1	Monday starting/ending hours [RECORD]	OP5
2	Tuesday starting/ending hours [RECORD]	OP5
3	Wednesday starting/ending hours [RECORD]	OP5
4	Thursday starting/ending hours [RECORD]	OP5
5	Friday starting/ending hours [RECORD]	OP5
6	Saturday starting/ending hours [RECORD]	OP5
7	Sunday starting/ending hours [RECORD]	OP5
88	Refused	OP5
99	Don't know	OP5

OP5	Does the refrigeration display case lighting schedule vary by the type of product stored in the refrigerated cases?	
1	Yes	OP5a
2	No	OP6
88	Refused	OP6
OP5a	Please explain [IF NEEDED: how the lighting schedule varies by the type of product stored in the refrigerated cases].	
77	RECORD VERBATIM	OP6
88	Refused	OP6
99	Don't know	OP6
OP6	Do you lower the level of illumination in the refrigeration display cases at certain times?	
1	Yes	OP6a
2	No	SP1
88	Refused	SP1
OP6a	What approach do you use to lower the level of illumination in the refrigeration display cases at certain times? [IF NEEDED: what technology do you use?]	
77	RECORD VERBATIM	SP1
88	Refused	SP1
99	Don't know	SP1
LEDs as Standard Practice		
SP1	Do you consider LED refrigerator case lighting to be standard practice for firms like yours? [IF NEEDED: by this, we mean that the majority of firms like yours install LED refrigerator case lighting on a routine basis either at the time of equipment replacement or on an accelerated schedule.}	
1	Yes	SP1a
2	No	SP1b
88	Refused	NTG BATTERY
SP1a	Why do you consider LED refrigerator case lighting to be standard practice for firms like yours?	
77	RECORD VERBATIM	NTG BATTERY
88	Refused	NTG BATTERY
99	Don't know	NTG BATTERY
SP1b	What do you consider to be standard practice when replacing lighting in refrigerator cases?	
77	RECORD VERBATIM	NTG BATTERY
88	Refused	NTG BATTERY
99	Don't know	NTG BATTERY

PROCESS PUMPING VFDs

IF PROCPUMPVFD =1 THEN ASK, ELSE SKIP TO NTG BATTERY

Comment	One way that organizations like yours can reduce their energy use is to install variable frequency drive flow controls on pumps used for irrigation. Throughout this survey I'll refer to this equipment as VFD flow controls. I would like to ask you about the VFD flow controls you recently installed as part of your participation in <%UTILITY>'s program.	VFD99
VFD99	Our records indicate that your organization installed VFD FLOW CONTROLS through the PROGRAM. More specifically, you installed <PROCPUMPVFD_MEASURE>. To the best of your knowledge is this correct?	
1	Yes	VFD100
2	No	DISPLAY
88	Refused	DISPLAY
99	Don't know	DISPLAY
	Ask if VFD99 = 2, 88, 99; else skip to VFD100.	
DISPLAY	We cannot continue this study unless we can speak to someone at your organization that is familiar with the VFD flow controls installed through the program. Is there another person we can speak to?	Go to next person and loop back to VFD99
	Ask if VFD99 = 1; else NET TO GROSS BATTERY	
VFD100	According to our records you installed VFD flow controls on a <PUMP_TYPE> pump with a motor size of <HORSEPOWER> horsepower. Is this correct?	
1	Yes	VFD101D
2	No	VFD100A
77	Other (PLEASE SPECIFY)	VFD101D
88	Refused	VFD101D
99	Don't know	VFD101D

VFD100A	In your own words please correct our pumping system description as best you are able.	
77	Other (PLEASE SPECIFY)	VFD101D
88	Refused	VFD101D
99	Don't know	VFD101D
VFD101D	Along with the new VFD flow controls, was a new pump also installed at the same time? [PROBE TO FIND CORRECT RESPONSE BELOW]	
1	Replaced existing pump (new pump)	VFD102A
2	Added a new pump	VFD102A
3	Added VFD to an existing pump (retained existing pump)	VFD101F
88	Refused	VFD102A
99	Don't know	VFD102A
	Ask if VFD101D EQUALS 3; else skip to VFD102A	
VFD101F	Approximately how old is the pump being controlled by the VFD flow controls? Would you say...	
1	Less than 5 years old	VFD101G
2	Between 5 and 10 years old	VFD101G
3	Between 10 and 15 years old	VFD101G
4	More than 15 years old	VFD101G
77	Enter age in years (PLEASE SPECIFY)	VFD101G
88	Refused	VFD101G
99	Don't know	VFD101G
VFD101G	How would you describe the condition of the pump being controlled by the VFD flow controls? Would you say it is in…	
1	Poor condition	VFD101J
2	Fair condition	VFD101J
3	Good condition	VFD101J
88	Refused	VFD101J
99	Don't know	VFD101J
VFD101J	How many years are left in the pump itself until you will replace it?	
# Yrs	RECORD Number of years left	VFD101K
88	Refused	VFD101K
99	Don't know	VFD101K
VFD101K	What type of pump flow controls were in place BEFORE the VFD was installed? [PROBE TO FIND CORRECT RESPONSE BELOW]	
1	None, pump was uncontrolled	VFD102
2	Throttle valve controls	VFD101L
3	VFD controls	VFD101L
77	Other (PLEASE SPECIFY)	VFD101L
88	Refused	VFD101L
99	Don't know	VFD101L

VFD101L	Approximately how old were the flow controls that you replaced with the VFD? Would you say...	
1	Less than 5 years old	VFD101M
2	Between 5 and 10 years old	VFD101M
3	Between 10 and 15 years old	VFD101M
4	More than 15 years old	VFD101M
77	Enter age in years (PLEASE SPECIFY)	VFD101M
88	Refused	VFD101M
99	Don't know	VFD101M
VFD101M	How would you describe the condition of the flow controls that you replaced with the VFD? Would you say the controls were...	
1	Not working	VFD102A
2	In poor condition	VFD102A
3	In fair condition	VFD102A
4	In good condition	VFD102A
88	Refused	VFD102A
99	Don't know	VFD102A
	Ask ALL	
VFD102A	What was the main reason you decided to install a VFD to control your pump flow?	
1	Existing controls were not functioning properly	VFD102D
2	Using alternative controls was not a feasible solution (such as throttling or running an uncontrolled pump)	VFD102D
3	The pump and VFD were sold as an integrated unit	VFD102D
4	Wanted improved pump performance or functionality	VFD102D
5	Wanted remote monitoring and control capabilities	VFD102D
6	Wanted automatic speed controls	VFD102D
77	Other (PLEASE SPECIFY)	VFD102D
88	Refused	VFD102D
99	Don't know	VFD102D
VFD102D	What type of pump does the VFD control?	
1	Vertical turbine pump	NTG BATTERY
2	Submersible pump	NTG BATTERY
3	Centrifugal pump	NTG BATTERY
77	Other (PLEASE SPECIFY)	NTG BATTERY
88	Refused	NTG BATTERY
99	Don't know	NTG BATTERY

NET TO GROSS BATTERY

IF MULTIPLE = 1, THEN ASK. ELSE A1c

A1b. Our records show that your organization installed more than one MEASURE at <%ADDRESS> through the <%UTILITY>'s <%PROGRAM> Program. They are … <%QTY_1> <%MEASURE1>, <%QTY_2> <%MEASURE2>, <%QTY_3> <%MEASURE3>. Was there a single decision making process for the installation of this equipment, or was there a separate decision making process for each type of equipment?

1	Single decision making process	A1c.
2	Separate decision making process for each type of equipment	A1c.
88	Refused	A1c.
99	Don't know	A1c.

IF MULTADD = 1, THEN ASK. ELSE AA3

A1c. Our records also show that your organization installed the same MEASURE at other addresses. Applications were submitted for the following addresses: <%ADDRESS1>, <%ADDRESS2>, <%ADDRESS3> … <%ADDRESS20>.   Was the decision making process the same for all of these addresses or was it different at each address?

1	Same decision making process for all addresses	AA3
2	Different decision making process for all addresses	AA3
88	Refused	AA3
99	Don't know	AA3

DISPLAY	For the sake of expediency, during this next battery we will be referring to the ..... program as THE PROGRAM and we will be referring to the installation of ...<%NTGMEASURE>... as THE MEASURE.	
AA3	There are usually a number of reasons why an organization like yours decides to participate in energy efficiency programs like this one. In your own words, can you tell me why you decided to participate in this program?	
1	To replace old or outdated equipment	AA3a
2	As part of a planned remodeling, build-out, or expansion	N2
3	To gain more control over how the equipment was used	N2
4	Maintenance downtime/associated expenses for old equipment were too high	A3a
5	Had process problems and were seeking a solution	N2
6	To improve equipment performance	N2
7	To improve production as a result of the change in equipment	N2
8	To comply with codes set by regulatory agencies	N2
9	To improve visibility/plant safety	N2
10	To comply with company policies regarding regular equipment retrofits or remodeling	A3a

11	To get a rebate from the program	N2
12	To protect the environment	N2
13	To reduce energy costs	N2
14	To reduce energy use/power outages	N2
15	To update to the latest technology	N2
16	To improve the comfort level of the facility	N2
77	RECORD VERBATIM	N2
88	Don't know	N2
99	Refused	N2
IF A3=1, 4 or 10 and PROCESS PUMPING VFDS = 1, THEN ASK. ELSE N2		
AA3a	Had the equipment that you replaced reached the end of its useful life?	
1	Yes	N2
2	No	N2
88	Refused	N2
99	Don't know	N2
N2	Did your organization make the decision to install this new equipment before, after, or at the same time as you became aware of that rebates [IF NEEDED: to reduce the cost of the measure] were available through the PROGRAM?	
1	Before	N3a
2	After	N3a
3	Same time	N3a
88	Refused	N3a
99	Don't know	N3a
DISPLAY	Next, I'm going to ask you to rate the importance of the program as well as other factors that might have influenced your decision to install this equipment through the program. Using a scale of 0 to 10 where 0 means not at all important and 10 means extremely important, how would you rate the importance of...	
N3a	The age or condition of the old equipment	
#	Record 0 to 10 score (_____)	N3aa
88	Refused	N3b
99	Don't know	N3b
	IF N3a > 5 and NTG_TYPE >= 2 THEN ASK	
N3aa	How, specifically, did this enter into your decision to install this equipment?	
77	RECORD VERBATIM	N3b
88	Don't know	N3b
99	Refused	N3b

N3b	Availability of the PROGRAM rebate [IF NEEDED: to reduce the cost of the measure]	
#	Record 0 to 10 score (_____)	N3bb
88	Refused	N3c
99	Don't know	N3c
	IF N3b > 7 AND NTG_TYPE >= 2, THEN ASK	
N3bb	Why do you give it this rating?	
77	Record VERBATIM	N3c
88	Refused	N3c
99	Don't know	N3c
	IF A1B(1)|ID0(1) THEN ASK; ELSE SKIP TO N3d	
N3c	Please rate the degree of importance of information provided through...A1B(1)|<ID0(1)/The Facility or System AUDIT/>	
#	Record 0 to 10 score (_____)	N3cc
88	Refused	N3d
99	Don't know	N3d
	IF N3c > 7 and NTG_TYPE >= 2, THEN ASK	
N3cc	Why do you give it this rating?	
77	Record VERBATIM	N3d
88	Refused	N3d
99	Don't know	N3d
	If V1 = 1 THEN ASK; ELSE SKIP TO N3e	
N3d	Recommendation from an equipment vendor that sold you the equipment and/or installed it for you **[VENDOR_1]**	
#	Record 0 to 10 score (_____)	N3e
88	Refused	N3e
99	Don't know	N3e
N3e	Your previous experience with similar types of energy efficient projects?	
#	Record 0 to 10 score (_____)	N3f
88	Refused	N3f
99	Don't know	N3f
N3f	Your previous experience with <%UTILITY>'s program or a similar utility program?	
#	Record 0 to 10 score (_____)	N3g
88	Don't know	N3g
99	Refused	N3g
	NTG_TYPE >= 3 THEN ASK, ELSE N3h	

N3g	Information from the Program, Utility, or Program Administrator training course?	
#	Record 0 to 10 score (_____)	N3gg
88	Refused	N3h
99	Don't know	N3h
	IF N3g > 5, THEN ASK, ELSE N3h	
N3gg	What type of information was provided during the training?	
77	Record VERBATIM	N3ggg
88	Refused	N3h
99	Don't know	N3h
N3ggg	How, specifically, did this enter into your decision to install this equipment?	
77	RECORD VERBATIM	N3h
88	Don't know	N3h
99	Refused	N3h
N3h	Information from the Program, Utility, or Program Administrator Marketing materials?	
#	Record 0 to 10 score (_____)	N3hh
88	Refused	N3j
99	Don't know	N3j
	IF N3h > 5 and NTG_TYPE >= 2, THEN ASK	
N3hh	What type of information was provided that pertained to the project?	
77	Record VERBATIM	N3hhh
88	Refused	N3j
99	Don't know	N3j
	IF N3hh = 77, THEN ASK	
N3hhh	How, specifically, did this enter into your decision to install this energy efficient equipment?	
77	RECORD VERBATIM	N3j
88	Don't know	N3j
99	Refused	N3j
	IF NTG_TYPE >= 2	
N3j	Standard practice in your business/industry	
#	Record 0 to 10 score (_____)	N3l
88	Refused	N3l
99	Don't know	N3l
	If AP9 = 3 or AP9a = 3 THEN ASK; ELSE SKIP TO N3m	

N3l	Endorsement or recommendation by your account rep?	
#	Record 0 to 10 score (_____)	N3ll
88	Refused	N3m
99	Don't know	N3m
	IF N3l > 5 & NTG_TYPE >1 THEN ASK	
N3ll	What did they recommend?	
77	Record VERBATIM	N3lll
88	Refused	N3m
99	Don't know	N3m
	IF N3LL(77)	
N3lll	How specifically did this enter into your decision to install this energy efficient equipment?	
77	RECORD VERBATIM	N3m
88	Don't know	N3m
99	Refused	N3m
	IF NTG_TYPE >= 2, ASK	
N3m	Corporate policy or guidelines	
#	Record 0 to 10 score (_____)	N3mm
88	Refused	N3n
99	Don't know	N3n
	IF N3m > 5, THEN ASK	
N3mm	How, specifically, did this enter into your decision to install this energy efficient equipment?	
77	RECORD VERBATIM	N3n
88	Don't know	N3n
99	Refused	N3n
N3n	Payback or return on investment of installing this equipment	
#	Record 0 to 10 score (_____)	N3o
88	Refused	N3o
99	Don't know	N3o
N3o	Improved product quality	
#	Record 0 to 10 score (_____)	N3oo
88	Refused	N3p
99	Don't know	N3p
	IF N3o > 5, THEN ASK	

N3oo	How, specifically, did this enter into your decision to install this energy efficient equipment?	
77	RECORD VERBATIM	N3p
88	Don't know	N3p
99	Refused	N3p
	IF FM050 = 12 AND NTG_TYPE >1, THEN ASK, ELSE SKIP TO N3r	
N3p	Compliance with state or federal regulations such as Title 24, air quality, OSHA, or FDA regulations	
#	Record 0 to 10 score (_____)	N3pp
88	Refused	N3r
99	Don't know	N3r
	IF N3p > 5, THEN ASK	
N3pp	How, specifically, did this enter into your decision to upgrade to energy efficient equipment?	
77	RECORD VERBATIM	N3r
88	Don't know	N3r
99	Refused	N3r
	ASK IF NTG_TYPE >=2	
N3r	Compliance with your organization's normal remodeling or equipment replacement practices?	
#	Record 0 to 10 score (_____)	N3rrr
88	Refused	N3s
99	Don't know	N3s
	IF AA3(2|10)&N3R(6||10);	
N3RRR	According to your organization's remodeling and equipment replacement policies, how often are you supposed to replace this type of equipment? [IF NEEDED: in terms of the number of years]	
# yrs	Record Number of Years	N3rr
88	Refused	N3rr
99	Don't know	N3rr
	IF N3r > 5, THEN ASK	
N3rr	How, specifically, did this enter into your decision to install this energy efficient equipment?	
77	RECORD VERBATIM	N3s.
88	Don't know	N3s.
99	Refused	N3s.

N3s	Were there any other factors we haven't discussed that were influential in your decision to install this energy efficient MEASURE?	
1	Nothing else influential	CC1
77	Record verbatim	N3ss
88	Refused	CC1
99	Don't know	CC1
	ASK IF N3s = 77	
N3ss	Using the same zero to 10 scale, how would you rate the influence of this factor?	
#	Record 0 to 10 score (_____)	CC1
88	Refused	CC1
99	Don't know	CC1
	CONSISTENCY CHECKS ON N3p, N3q and N3r	
	If NTG_TYPE = 4	
	IF AA3 = 8, AND N3p < 4, THEN ASK	
CC1	You indicated earlier that compliance with codes or regulatory policies was one of the reasons you did the project. However, just now you scored the importance of compliance with state or federal regulations or standards such as Title 24, air quality, OSHA, or FDA regulations in your decision making fairly low, why is that?	
77	RECORD VERBATIM	CC1a
88	Don't know	CC1a
99	Refused	CC1a
	IF AA3 ^= 8, and N3p > 7, THEN ASK	
CC1a	You indicated earlier that compliance with codes or regulatory policies was not one of the primary reasons you did the project. However, just now you scored the importance of compliance with state or federal regulations or standards such as Title 24,air quality, OSHA, or FDA regulations in your decision making fairly high, why is that?	
77	RECORD VERBATIM	NCC3
88	Don't know	NCC3
99	Refused	NCC3
	IF AA3 = 2 or 10, AND N3r < 4, THEN ASK	
NCC3	You indicated earlier that a regularly scheduled retrofit was one of the reasons you did the project. However, just now you scored the importance of compliance with your company's regularly scheduled retrofit or equipment replacement in your decision making fairly low, why is that?	
77	RECORD VERBATIM	NCC3a
88	Don't know	NCC3a
99	Refused	NCC3a
	IF AA3 ^= 2 and AA3 ^= 9 and AA3^=10 AND N3r > 7 THEN ASK	

NCC3a	You indicated earlier that a regularly scheduled retrofit was NOT one of the reasons you did the project. However, just now you scored the importance of compliance with your company's regularly scheduled retrofit or equipment replacement in your decision making fairly high, why is that?	
77	RECORD VERBATIM	P1
88	Don't know	P1
99	Refused	P1
	PAYBACK BATTERY	
	If INCENT <> 100 AND NTG_TYPE >= 2, THEN ASK; ELSE SKIP TO N41	
P1	What financial calculations does your company typically make before proceeding with the installation of energy efficient equipment like you installed through the program?	
1	Payback	P2A
2	Return on investment	P2B
77	Record VERBATIM	P3
88	Don't know	P3
99	Refused	P3
	If P1 = 1 THEN ASK; ELSE SKIP TO P2B	
P2A	What is your threshold in terms of the payback or return on investment your company uses before deciding to proceed with installing energy efficient equipment like you installed through the program? Is it…	
1	0 to 6 months	P3
2	6 months to 1 year	P3
3	1 to 2 years	P3
4	2 to 3 years	P3
5	3 to 5 years	P3
6	Over 5 years	P3
88	Don't know	P3
99	Refused	P3
	IF P1 = 2 THEN ASK	
P2B	What is your ROI?	
1	Record ROI____;	P3
P3	Did the rebate move your energy efficient equipment project within this acceptable range?	
1	Yes	P4
2	No	P3a
88	Don't know	P3a
99	Refused	P3a
	If P3 = 1 THEN ASK; ELSE SKIP TO P3A	

P4	On a scale of 0 to 10, with a zero meaning NOT AT ALL IMPORTANT and 10 meaning Very Important, how important in your decision was it that the project was in the acceptable range?	
#	Record 0 to 10 score (_____)	P3a
88	Refused	P3a
99	Don't know	P3a
	CONSISTENCY CHECKS ON N3b and P3	
	IF P3 = 1, AND N3b < 5, THEN ASK	
P3a	The rebate seemed to make the difference between meeting your financial criteria and not meeting them, but you are saying that the rebate didn't have much effect on your decision, why is that?	
77	Record VERBATIM	P3e
88	Don't know	P3e
99	Refused	P3e
	IF P3 = 2, AND N3b > 5, THEN ASK	
P3e	The rebate didn't cause the installation of energy efficient equipment to meet your company's financial criteria, but you said that the rebate had an impact on the decision to install this energy efficient equipment. Why did it have an impact?	
77	Record VERBATIM	N41
88	Don't know	N41
99	Refused	N41
	ASK ALL.	
DISPLAY	Next, with regard to your decision to implement this energy efficient MEASURE *instead of either less energy efficient or standard efficiency equipment*, I would like you to rate the importance of the PROGRAM as opposed to other Non-program factors that may have influenced your decision such as...(SCAN BELOW AND READ TO THEM THOSE FACTORS WITH RATINGS OF 8 OR HIGHER THAT INFLUENCED THEIR DECISION)	
	(READ ITEMS WHERE THEY GAVE A RATING OF 8 or higher)	
	Program-related factors	
	<%N3B> Availability of the PROGRAM rebate	...@[%N3B>@
	<%N3G> Information from the Program, Utility, or Program Administrator training course?	...@[%N3G>@
	<%N3H> Information from the Program, Utility, or Program Administrator Marketing materials?	...@[%N3H>@
	<%N3L> Endorsement or recommendation by your account rep?	...@[%N3L>@
	Non-Program factors	
	<%N3A>The age or condition of the old equipment	...@[%N3A>@
	<%N3C>Information provided through the Facility or System AUDIT/>	...@[%N3C>@
	<%N3D> Equipment Vendor recommendation	...@[%N3D>@
	<%N3E> Previous experience with this measure	...@[%N3E>@
	<%N3F> Previous experience with this program	...@[%N3F>@

	<%N3J> Standard practice in your business/industry	...@[%N3J>@
	<%N3M> Corporate policy or guidelines	...@[%N3M>@
	<%N3N> Payback on investment.	...@[%N3N>@
	<%N3O> To improve production as a result of lighting,	...@[%N3O>@
	<%N3P> Compliance with state or federal regulations or standards such as Title 24, air quality, OSHA, or FDA regulations	...@[%N3P>@
	<%N3R> Compliance with normal maintenance or retrocommissioning policies or your companies regularly scheduled retrofit or lighting replacement	...@[%N3R>@
	IF N3B<8 and N3G<8 AND N3H<8 and N3I<8, THEN READ:	
	Just now, you provided low to medium scores for the importance of several program-related factors in your decision making.	
	IF N3A<8 and N3C<8 and N3D<8 and N3E<8 AND N3F<8 and N3J<8 and N3J<8 and N3M<8 AND N3N<8 AND N3O<8 and N3P<8 and N3R<8 THEN READ:	
	Just now, you provided low to medium scores for the importance of several non-program related factors in your decision making.	
	IF N3B<8 and N3G<8 AND N3H<8 and N3I<8 and N3A<8 and N3C<8 and N3D<8 and N3E<8 AND N3F<8 and N3J<8 and N3J<8 and N3M<8 AND N3N<8 AND N3O<8 and N3P<8 and N3R<8, THEN READ:	
	Just now, you provided low to medium scores for the importance of all of the program and non-program related factors in your decision making.	
DISPLAY	If you were given 10 points to award in total, how many points would you give to the importance of the program and how many points would you give to these other non-program factors?	
N41	How many of the ten points would you give to the importance of the PROGRAM in your decision?	
#	Record 0 to 10 score (_____)	N42
88	Refused	N42
99	Don't know	N42
N42	and how many points would you give to all of these other non-program factors?	
#	Record 0 to 10 score (_____)	N41P
88	Refused	N41P
99	Don't know	N41P

	If N41 NOT EQUAL TO 88 OR 99 and N42 NOT EQUAL TO 88 OR 99 , compute N41 + N42. IF N41+N42 DOES NOT EQUAL 10, display:	
	__We want these two sets of numbers to equal 10.	
	<%N41> for Program influence and	
	<%N42> for Non Program factors	
DISPLAY	Next, I would like for you to consider the importance of the PROGRAM in your decision to install your equipment *at the time you did* rather than waiting to install new equipment sometime in the future, regardless of the actual efficiency of the equipment you selected. Please rate the importance of the program on this timing decision as opposed to other non-program factors that may have influenced your decision.	
	If Needed - else skip…	
	If you were given 10 points to award in total, how many points would you give to the importance of the program and how many points would you give to these other non-program factors in your decision to install your equipment **at the time you did** rather than waiting to install new equipment sometime in the future.	
N41P	How many of the ten points would you give to the importance of the PROGRAM in your decision TO INSTALL YOUR EQUIPMENT AT THE TIME YOU DID?	
#	Record 0 to 10 score (_____)	N42P
88	Refused	N42P
99	Don't know	N42P
N42P	and how many points would you give to all of these other non-program factors?	
#	Record 0 to 10 score (_____)	REPLACE
88	Refused	REPLACE
99	Don't know	REPLACE
	If N41 NOT EQUAL TO 88 OR 99 and N42 NOT EQUAL TO 88 OR 99 , compute N41 + N42. IF N41+N42 DOES NOT EQUAL 10, display:	
	__We want these two sets of numbers to equal 10.	
	<%N41P> for Program influence and	
	<%N42P> for Non Program factors	
	ASK ALL.	
REPLACE	Was the installation of this measure….<%NTGMEASURE> …a replacement of existing equipment or was it additional equipment you installed in your facility?	
1	Replace/Modification/Retrofit	DISPLAY
2	Add-on	DISPLAY
88	Refused	N6
99	Don't know	N6

DISPLAY	Now I would like you to think about the action you would have taken with regard to the installation of this equipment if the program had not been available.	
	IF REPLACE =1 THEN ASK; ELSE SKIP TO N5aa	
N5	Using a likelihood scale from 0 to 10, where 0 is not at all likely and 10 is extremely likely, if THE PROGRAM had NOT BEEN AVAILABLE, what is the likelihood that you would have installed exactly the same program-qualifying energy efficient equipment that you did for this project regardless of when you would have installed it?	
#	Record 0 to 10 score (_____)	N5a
88	Refused	N5B
99	Don't know	N5B
	IF REPLACE =2 THEN ASK; ELSE SKIP TO N6	
N5aa	Using a likelihood scale from 0 to 10, where 0 is Not at all likely and 10 is Extremely likely, if THE PROGRAM had NOT BEEN AVAILABLE, what is the likelihood that you would have installed exactly the same energy efficient equipment at the same time as you did?	
#	Record 0 to 10 score (_____)	N6
88	Don't know	N6
99	Refused	N6
	CONSISTENCY CHECKS	
	IF N3b > 7 and N5 > 7, THEN ASK	
N5a	When you answered ...<%N3B> ... for the question about the influence of the rebate, I would interpret that to mean that the rebate was quite important to your decision to install. Then, when you answered ..<%N5>... for how likely you would be to install the same equipment **without** the rebate, it sounds like the rebate was not very important in your installation decision. I want to check to see if I am misunderstanding your answers or if the questions may have been unclear. Will you explain in your own words, the role the rebate played in your decision to install this efficient equipment?	
77	Record VERBATIM	NN5aa
88	Don't know	NN5aa
99	Refused	NN5aa

NN5aa	Would you like for me to change your score on the importance of the rebate that you gave a rating of <%N3B> and/or change your rating on the likelihood you would install the same equipment without the rebate which you gave a rating of <%N5> and/or we can change both if you wish?	
1	No change	N5b
77	Record how they would rate rebate influence and how they would rate likelihood to install without the rebate	N5b
88	Don't know	N5b
99	Refused	N5b
	ASK IF REPLACE=1	
N5b	Using the same scale as before, if the program had not been available, what is the likelihood that you would have done this project at the same time as you did?	
#	Record 0 to 10 score (_____)	DISPLAY
88	Refused	DISPLAY
99	Don't know	DISPLAY
	If N5b < 9 THEN ASK; ELSE SKIP TO N6	
N5bb	Why do you say that?	
77	Record VERBATIM	N6
88	Don't know	N6
99	Refused	N6
	ADDITIONAL BASELINE INPUT	
N6	Now I would like you to think one last time about what action you would have taken if the program had not been available. Which of the following alternatives would you have been MOST likely to do?	
1	Install fewer units	N6aa
2	Install standard efficiency equipment or whatever required by code	N6aa
3	Installed equipment more efficient than code but less efficient than what you installed through the program	N6aa
4	Done nothing (keep existing equipment as is)	N6ba
5	Done the same thing I would have done as I did through the program	N6aa
6	Repair/rewind or overhaul the existing equipment	N7
77	Something else (specify what _____)	N6ca
88	Don't know	N6ca
99	Refused	N6ca
	If N6 = 1,2,3,5 ASK, ELSE N6ba	

N6aa	Would you have [FILL IN RESPONSE TO N6 for N6 = 1,2, 3, 5] at the same time as you did under the program, within a year, or at a later time?	
1	Same time	N7
2	Within one year	N7
3	At a later time	N6ab
88	Don't know	N7
99	Refused	N7
N6ab	How many years later would it have been?	
77	Record VERBATIM	N7
88	Don't know	N6ac
99	Refused	N7
N6ac	Would it have been….	
1	Less than one year	N7
2	About a year	N7
3	A couple of years	N7
4	A few years	N7
5	More than four years	N7
88	Don't know	N7
99	Refused	N7
	If N6 = 4 THEN ASK, ELSE N6ca	
N6ba	How long would you have waited to replace your equipment?	
1	Less than one year	N7
2	About a year	N7
3	A couple of years	N7
4	A few years	N7
5	More than four years	N7
88	Don't know	N7
99	Refused	N7
	IF N6=77, 88, 99 THEN ASK, ELSE N7	
N6ca	Would you still have replaced your equipment at the same time as you did under the program, within a year, or at a later time?	
1	Same time	N7
2	Within one year	N7
3	At a later time	N6cb
88	Don't know	N7
99	Refused	N7
N6cb	How many years later would it have been?	
77	Record VERBATIM	N6
88	Don't know	N6cc
99	Refused	N6

N6cc	Would it have been….	
1	Less than one year	N7
2	About a year	N7
3	A couple of years	N7
4	A few years	N7
5	More than four years	N7
88	Don't know	N7
99	Refused	N7
CONSISTENCY CHECK		
	Ask if N6 = (1, 2, 3, 4) and ((N5 > 8 and N5b > 8) OR N5aa > 8)	
N7	In an earlier response, you said that if the program had not been available, there was a very high likelihood that you would have installed exactly the same equipment as you did through the program. However, just now you have indicated that you would not have installed the same equipment as you did without the benefit of the program. Can you explain to me why there is this difference?	
77	Record VERBATIM	N6a
88	Don't know	N6a
99	Refused	N6a
	Ask if N6(1);	
N6a	How many fewer units would you have installed/Delamped? (It is okay to take an answer such as ...HALF...or 10 percent fewer ... etc.)	
77	RECORD VERBATIM	ER2
88	Refused	ER2
99	Refused	ER2
	Ask if N6(3);	
N6b	Can you tell me what model or efficiency level you were considering as an alternative? (It is okay to take an answer such as … 10 percent more efficient than code or 10 percent less efficient than the program equipment)	
77	RECORD VERBATIM	ER2
88	Don't know	ER2
99	Refused	ER2

	Ask if N6(6);	
N6c	How long do you think the repaired equipment would have lasted before requiring replacement?	
77	RECORD VERBATIM	EARLY REPLACEMENT BATTERY
88	Don't know	EARLY REPLACEMENT BATTERY
99	Refused	EARLY REPLACEMENT BATTERY
	EARLY REPLACEMENT BATTERY	
	[IF N5b < 8 and A3 = 1, 4, 8, or 10 THEN ASK. ELSE SKIP TO PP1]	
DISPLAY	Earlier, when I asked you a question about why you decided to implement the project using high efficiency equipment, you gave reasons related to <A3> Now I would like to ask you some follow up questions regarding these responses you gave me.	ER2
	IF REPLACE = 1 AND N6c IS UNRECORDED;	
ER2	How many more years do you think your equipment would have gone before failing and required replacement?	
77	___ Estimated Remaining Useful Life (in years)	ER6
88	Don't know	ER6
99	Refused	ER6
	IF AA3 = 4, THEN ASK	
ER6	How much downtime did you experience in the past year?	
77	_____Downtime Estimate (in weeks)	ER9
88	Don't know	ER9
99	Refused	ER9
ER9	In your opinion, based on the economics of operating this equipment, for how many more years could you have kept this equipment functioning?	
Yrs	___ Estimated Remaining Useful Life	ER15
88	Don't know	ER15
99	Refused	ER15
	IF AA3 = 8, THEN ASK	
ER15	Can you briefly describe the specific code/regulatory requirements that this project addressed?	
77	RECORD VERBATIM	ER19
88	Don't know	ER19
99	Refused	ER19

	IF AA3 = 10, THEN ASK	
ER19	Can you briefly describe the specific company policies regarding regular/normal maintenance/replacement policy(ies) that were relevant to this project? Or briefly describe the specific company policies regarding regular equipment retrofits and remodeling?	
77	RECORD VERBATIM	PP1
88	Don't know	PP1
99	Refused	PP1
	PROCESS QUESTIONS - ASK ALL	
PP1	What do you believe the PROGRAM'S primary strengths are?	
77	Record VERBATIM	PP2
88	Don't know	PP2
99	Refused	PP2
PP2	What concerns do you have about the PROGRAM, if any? (IF NEEDED: What do you view as the primary features that need to be improved?)	
77	Record VERBATIM	PP4
88	Don't know	PP4
99	Refused	PP4
PP4	On a scale of 0 - 10, where 0 is completely dissatisfied and 10 is completely satisfied, how would you rate your OVERALL satisfaction with the <%PROGRAM>?	
#	Record 0 to 10 score (_____)	PP5
88	Refused	PP5
99	Don't know	PP5
	IF PP4 < 4 THEN ASK; ELSE SKIP TO LT2	
PP5	Why do you say that?	
77	Record VERBATIM	LONG TERM INFLUENCE
88	Don't know	LONG TERM INFLUENCE
99	Refused	LONG TERM INFLUENCE

	LONG TERM INFLUENCE	
	IF N3f > 4, THEN ASK, ELSE OPERATING HOURS SECTION	
DISPLAY	Now I'd like you to think about your organization's experiences with %UTILITY's energy efficiency programs and efforts over the longer term, for example, over the past 5, 10, or even 20 years. In an earlier question, you indicated that your previous experience with utility energy efficiency programs was a factor that influenced your decision to implement this PROJECT. I would like to ask you a few questions about this experience.	LT2
LT2	For how many years have you been participating in %UTILITY's energy efficiency programs?	
# yrs	Record Number of Years	LT3
88	Refused	LT3
99	Don't know	LT3
LT3	During this time, how many times has your organization participated in these PROGRAM(s)?	
1	7 to 10 times, or more	CA6
2	4 to 7 times	CA6
3	2 to 4 times	CA6
4	less than 2 times	CA6
88	Refused	LT6
99	Don't know	LT6
	IF LT3 = 1, 2, 3 or 4, THEN ASK. ELSE LT8	
CA6	What type of equipment did you install through this (these) program(s)? [READ RESPONSE CATEGORIES]	
1	Indoor lighting	LT6
2	Cooling equipment	LT6
3	Natural gas equipment, such as water heater, furnace or appliances	LT6
4	Insulation or windows	LT6
5	Refrigeration	LT6
6	Industrial process equipment	LT6
7	Greenhouse heat curtains	LT6
8	Food service equipment	LT6
77	OPEN \SOMETHING OTHER (specify)	LT6
88	Refused	LT6
99	Don't Know	LT6
LT6	What factors led you to participate in these program(s)?	
77	Record VERBATIM	LT7
88	Refused	LT7
99	Don't know	LT7

LT7	And exactly how did that experience help to convince you to install this energy efficient equipment?	
77	Record VERBATIM	LT8
88	Refused	LT8
99	Don't know	LT8
	IF LT3 = 1 or 2, THEN ASK. ELSE GO TO OPERATING HOURS SECTION	
LT8	Have these programs had any long-term influence on your organization's energy efficiency related practices and policies that go beyond the immediate effect of incentives on individual projects? [DO NOT READ: Examples are causing them to add energy efficiency procurement policies, internal incentive or reward structures for improving energy efficiency, or adoption of energy management best practices.]	
1	Yes	OPERATING HOURS SECTION
2	No	OPERATING HOURS SECTION
88	Refused	OPERATING HOURS SECTION
99	Don't know	OPERATING HOURS SECTION

	OPERATING HOURS	
DISPLAY	The next few questions are to help us get a full understanding of your organization's operational hours.	
ALWAYS	Is your organization operation 24 hours a day, 7 days a week?	
1	Yes	HOLIDAYS
2	No	HOLIDAYS
88	Refused	HOLIDAYS
HOLIDAYS	Does your facility closed for any holidays during the year? If so, which one(s)?	
1	New Year's Day - January 1	DAYS
2	Martin Luther King Jr. Day (3rd Monday in January)	DAYS
3	President's Day (3rd Monday in February)	DAYS
4	Memorial Day (Last Monday in May)	DAYS
5	Independence Day - July 4th (Or Surrounding Monday/Friday if July 4 is a weekend)	DAYS
6	Labor Day (First Monday in September)	DAYS
7	Thanksgiving (4th Thursday in November)	DAYS
8	Day after Thanksgiving	DAYS

9	Christmas Eve - December 24	DAYS
10	Christmas Day - December 25	DAYS
66	NO HOLIDAY CLOSURES	DAYS
77	Other - Specify	DAYS
88	Refused	DAYS
99	Don't Know	DAYS
	Ask if ALWAYS = 2; else skip to OS_REC;	
DAYS	Is your facility closed any of the 7 days of the week? If so, which days are you CLOSED?	
1	Monday	MONDAY_OPEN
2	Tuesday	MONDAY_OPEN
3	Wednesday	MONDAY_OPEN
4	Thursday	MONDAY_OPEN
5	Friday	MONDAY_OPEN
6	Saturday	MONDAY_OPEN
7	Sunday	MONDAY_OPEN
66	Open EVERYDAY	MONDAY_OPEN
88	REFUSED	MONDAY_OPEN
99	DON'T KNOW	MONDAY_OPEN
	Ask if ALWAYS(2)&^DAYS(1); else skip to TUESDAY_OPEN;	
MONDAY_ OPEN	What time do you open your facility on MONDAY?	
	Record Time 1AM - 12:30 AM in 12 hour format by half hour as 1-24	MONDAY_CLOSE
88	REFUSED	MONDAY_CLOSE
99	DON'T KNOW	MONDAY_CLOSE
	IF MONDAY_OPEN(1||64)	
MONDAY_ CLOSE	What time do you close your facility on MONDAY?	
	Record Time 1AM - 12:30 AM in 12 hour format by half hour as 1-24	TUESDAY_OPEN
88	REFUSED	TUESDAY_OPEN
99	DON'T KNOW	TUESDAY_OPEN
	Ask if ALWAYS(2)&^DAYS(2); else skip to WEDNESDAY_OPEN;	
TUESDAY_ OPEN	What time do you open your facility on TUESDAY?	
	Record Time 1AM - 12:30 AM in 12 hour format by half hour as 1-24	TUESDAY_CLOSE
88	REFUSED	TUESDAY_CLOSE
99	DON'T KNOW	TUESDAY_CLOSE
	IF TUESDAY_OPEN(1||65)	

TUESDAY_CLOSE	What time do you close your facility on TUESDAY?	
	Record Time 1AM - 12:30 AM in 12 hour format by half hour as 1-24	WEDNESDAY_OPEN
88	REFUSED	WEDNESDAY_OPEN
99	DON'T KNOW	WEDNESDAY_OPEN
	Ask if ALWAYS(2)&^DAYS(3); else skip to THURSDAY_OPEN;	
WEDNESDAY_OPEN	What time do you open your facility on WEDNESDAY?	
	Record Time 1AM - 12:30 AM in 12 hour format by half hour as 1-24	WEDNESDAY_CLOSE
88	REFUSED	WEDNESDAY_CLOSE
99	DON'T KNOW	WEDNESDAY_CLOSE
	IF WEDNESDAY_OPEN(1||65)	
WEDNESDAY_CLOSE	What time do you close your facility on WEDNESDAY?	
	Record Time 1AM - 12:30 AM in 12 hour format by half hour as 1-24	THURSDAY_OPEN
88	REFUSED	THURSDAY_OPEN
99	DON'T KNOW	THURSDAY_OPEN
	Ask if ALWAYS(2)&^DAYS(4); else skip to FRIDAY_OPEN;	
THURSDAY_OPEN	What time do you open your facility on THURSDAY?	
	Record Time 1AM - 12:30 AM in 12 hour format by half hour as 1-24	THURSDAY_CLOSE
88	REFUSED	THURSDAY_CLOSE
99	DON'T KNOW	THURSDAY_CLOSE
	IF THURSDAY_OPEN(1||65)	
THURSDAY_CLOSE	What time do you close your facility on THURSDAY?	
	Record Time 1AM - 12:30 AM in 12 hour format by half hour as 1-24	FRIDAY_OPEN
88	REFUSED	FRIDAY_OPEN
99	DON'T KNOW	FRIDAY_OPEN

	Ask if ALWAYS(2)&^DAYS(5); else skip to SATURDAY_OPEN;	
FRIDAY_OPEN	What time do you open your facility on FRIDAY?	
	Record Time 1AM - 12:30 AM in 12 hour format by half hour as 1-24	FRIDAY_CLOSE
88	REFUSED	FRIDAY_CLOSE
99	DON'T KNOW	FRIDAY_CLOSE
	IF FRIDAY_OPEN(1||65)	
FRIDAY_CLOSE	What time do you close your facility on FRIDAY?	
	Record Time 1AM - 12:30 AM in 12 hour format by half hour as 1-24	SATURDAY_OPEN
88	REFUSED	SATURDAY_OPEN
99	DON'T KNOW	SATURDAY_OPEN
	Ask if ALWAYS(2)&^DAYS(6); else skip to SUNDAY_OPEN;	
SATURDAY_OPEN	What time do you open your facility on SATURDAY?	
	Record Time 1AM - 12:30 AM in 12 hour format by half hour as 1-24	SATURDAY_CLOSE
88	REFUSED	SATURDAY_CLOSE
99	DON'T KNOW	SATURDAY_CLOSE
	IF SATURDAY_OPEN(1||65)	
SATURDAY_CLOSE	What time do you close your facility on SATURDAY?	
	Record Time 1AM - 12:30 AM in 12 hour format by half hour as 1-24	SUNDAY_OPEN
88	REFUSED	SUNDAY_OPEN
99	DON'T KNOW	SUNDAY_OPEN
	Ask if ALWAYS(2)&^DAYS(7); else skip to DIFF_SCHEDULE;	
SUNDAY_OPEN	What time do you open your facility on SUNDAY?	
	Record Time 1AM - 12:30 AM in 12 hour format by half hour as 1-24	SUNDAY_CLOSE
88	REFUSED	SUNDAY_CLOSE
99	DON'T KNOW	SUNDAY_CLOSE
	IF SUNDAY_OPEN(1||65)	

SUNDAY_C LOSE	What time do you close your facility on SUNDAY?	
	Record Time 1AM - 12:30 AM in 12 hour format by half hour as 1-24	DIFF_SCHEDULE
88	REFUSED	DIFF_SCHEDULE
99	DON'T KNOW	DIFF_SCHEDULE
DIFF_SCHE DULE	Some organizations have different schedules for certain times of the year. Does your organization maintain a different schedule for certain months of the year?	
1	Yes	MONTHS
2	No	OS_REC
88	REFUSED	OS_REC
99	DON'T KNOW	OS_REC
	Ask if DIFF_SCHEDULE = 1; Else skip to OS_REC;	
MONTHS	Which months of the year does the schedule vary from the times I just recorded?	
1	January	ALT_DAYS
2	February	ALT_DAYS
3	March	ALT_DAYS
4	April	ALT_DAYS
5	May	ALT_DAYS
6	June	ALT_DAYS
7	July	ALT_DAYS
8	August	ALT_DAYS
9	September	ALT_DAYS
10	October	ALT_DAYS
11	November	ALT_DAYS
12	December	ALT_DAYS
88	REFUSED	ALT_DAYS
99	DON'T KNOW	ALT_DAYS
ALT_ALWA YS	Is your organization operation 24 hours a day, 7 days a week?	
1	Yes	HOLIDAYS
2	No	HOLIDAYS
88	Refused	HOLIDAYS
	If ^ALT_ALWAYS(1) then ask; Else skip to OS_REC;	

ALT_DAYS	During this alternate schedule, is your facility closed any of the 7 days of the week? If so, which days are you CLOSED?	
1	Monday	ALT_MONDAY_OPEN
2	Tuesday	ALT_MONDAY_OPEN
3	Wednesday	ALT_MONDAY_OPEN
4	Thursday	ALT_MONDAY_OPEN
5	Friday	ALT_MONDAY_OPEN
6	Saturday	ALT_MONDAY_OPEN
7	Sunday	ALT_MONDAY_OPEN
66	Open EVERYDAY	ALT_MONDAY_OPEN
88	REFUSED	ALT_MONDAY_OPEN
99	DON'T KNOW	ALT_MONDAY_OPEN
	Ask if DIFF_SCHEDULE(1)&^ALT_DAYS(1); else skip to ALT_TUESDAY_OPEN;	
ALT_MON DAY_OPEN	For the alternate schedule, what time do you open your facility on MONDAY?	
	Record Time 1AM - 12:30 AM in 12 hour format by half hour as 1-24	ALT_MONDAY_CLOSE
88	REFUSED	ALT_MONDAY_CLOSE
99	DON'T KNOW	ALT_MONDAY_CLOSE
	IF ALT_MONDAY_OPEN(1||64)	
ALT_MON DAY_CLOS E	What time do you close your facility on MONDAY?	
	Record Time 1AM - 12:30 AM in 12 hour format by half hour as 1-24	ALT_TUESDAY_OPEN
88	REFUSED	ALT_TUESDAY_OPEN
99	DON'T KNOW	ALT_TUESDAY_OPEN
	Ask if DIFF_SCHEDULE(1)&^ALT_DAYS(2); else skip to ALT_WEDNESDAY_OPEN;	
ALT_TUES DAY_OPEN	What time do you open your facility on TUESDAY during your alternate schedule?	
	Record Time 1AM - 12:30 AM in 12 hour format by half hour as 1-24	ALT_TUESDAY_CLOSE
88	REFUSED	ALT_TUESDAY_CLOSE
99	DON'T KNOW	ALT_TUESDAY_CLOSE
	IF ALT_TUESDAY_OPEN(1||65)	

ALT_TUESDAY_CLOSE	What time do you close your facility on TUESDAY?	
	Record Time 1AM - 12:30 AM in 12 hour format by half hour as 1-24	ALT_WEDNESDAY_OPEN
88	REFUSED	ALT_WEDNESDAY_OPEN
99	DON'T KNOW	ALT_WEDNESDAY_OPEN
	Ask if DIFF_SCHEDULE(1)&^ALT_DAYS(3); else skip to ALT_THURSDAY_OPEN;	
ALT_WEDNESDAY_OPEN	What time do you open your facility on WEDNESDAY during your alternate schedule?	
	Record Time 1AM - 12:30 AM in 12 hour format by half hour as 1-24	ALT_WEDNESDAY_CLOSE
88	REFUSED	ALT_WEDNESDAY_CLOSE
99	DON'T KNOW	ALT_WEDNESDAY_CLOSE
	IF ALT_WEDNESDAY_OPEN(1||65)	
ALT_WEDNESDAY_CLOSE	What time do you close your facility on WEDNESDAY?	
	Record Time 1AM - 12:30 AM in 12 hour format by half hour as 1-24	ALT_THURSDAY_OPEN
88	REFUSED	ALT_THURSDAY_OPEN
99	DON'T KNOW	ALT_THURSDAY_OPEN
	Ask if DIFF_SCHEDULE(1)&^ALT_DAYS(4); else skip to ALT_FRIDAY_OPEN;	
ALT_THURSDAY_OPEN	What time do you open your facility on THURSDAY during your alternate schedule?	
	Record Time 1AM - 12:30 AM in 12 hour format by half hour as 1-24	ALT_THURSDAY_CLOSE
88	REFUSED	ALT_THURSDAY_CLOSE
99	DON'T KNOW	ALT_THURSDAY_CLOSE
	ALT_THURSDAY_OPEN(1||65)	
ALT_THURSDAY_CLOSE	What time do you close your facility on THURSDAY?	
	Record Time 1AM - 12:30 AM in 12 hour format by half hour as 1-24	ALT_FRIDAY_OPEN
88	REFUSED	ALT_FRIDAY_OPEN
99	DON'T KNOW	ALT_FRIDAY_OPEN

	Ask if DIFF_SCHEDULE(1)&^ALT_DAYS(5); else skip to ALT_SATURDAY_OPEN;	
ALT_FRIDAY_OPEN	What time do you open your facility on FRIDAY during this alternate schedule?	
	Record Time 1AM - 12:30 AM in 12 hour format by half hour as 1-24	ALT_FRIDAY_CLOSE
88	REFUSED	ALT_FRIDAY_CLOSE
99	DON'T KNOW	ALT_FRIDAY_CLOSE
	IF ALT_FRIDAY_OPEN(1||65)	
ALT_FRIDAY_CLOSE	What time do you close your facility on FRIDAY?	
	Record Time 1AM - 12:30 AM in 12 hour format by half hour as 1-24	ALT_SATURDAY_OPEN
88	REFUSED	ALT_SATURDAY_OPEN
99	DON'T KNOW	ALT_SATURDAY_OPEN
	Ask if DIFF_SCHEDULE(1)&^ALT_DAYS(6); else skip to ALT_SUNDAY_OPEN;	
ALT_SATURDAY_OPEN	I recorded that during your alternate schedule you are also open on Saturday. What time do you open your facility on SATURDAY?	
	Record Time 1AM - 12:30 AM in 12 hour format by half hour as 1-24	ALT_SATURDAY_CLOSE
88	REFUSED	ALT_SATURDAY_CLOSE
99	DON'T KNOW	ALT_SATURDAY_CLOSE
	IF ALT_SATURDAY_OPEN(1||65)	
ALT_SATURDAY_CLOSE	What time do you close your facility on SATURDAY?	
	Record Time 1AM - 12:30 AM in 12 hour format by half hour as 1-24	ALT_SUNDAY_OPEN
88	REFUSED	ALT_SUNDAY_OPEN
99	DON'T KNOW	ALT_SUNDAY_OPEN
	Ask if DIFF_SCHEDULE(1)&^ALT_DAYS(7); else skip to OS_REC;	
ALT_SUNDAY_OPEN	I recorded that during your alternate schedule you are also open on Sunday. What time do you open your facility on SUNDAY?	
	Record Time 1AM - 12:30 AM in 12 hour format by half hour as 1-24	ALT_SUNDAY_CLOSE
88	REFUSED	ALT_SUNDAY_CLOSE
99	DON'T KNOW	ALT_SUNDAY_CLOSE
	IF ALT_SUNDAY_OPEN(1||65)	

ALT_SUNDAY _CLOSE	What time do you close your facility on SUNDAY?	
	Record Time 1AM - 12:30 AM in 12 hour format by half hour as 1-24	CUSTOMER CHARACTERISTICS
88	REFUSED	CUSTOMER CHARACTERISTICS
99	DON'T KNOW	CUSTOMER CHARACTERISTICS

	CUSTOMER CHARACTERISTICS	
	We're almost finished. Now, I'd like to ask you questions regarding your facility.	
CC2a	What is the total square footage at this facility?	
77	RECORD Square feet	CC2c
888888	Refused	CC3
999999	Don't know	CC3
	IF CC2a IN (88, 99)	
CC3	Would you say that the floor area is …?	
1	less than 1,500 sq. ft.	CC2c
2	1,500 - 5,000 sq. ft.	CC2c
3	5,000 - 10,000 sq. ft.	CC2c
4	10,000 – 25,000 sq. ft.	CC2c
5	25,000 – 50,000 sq. ft.	CC2c
6	50,000 – 75,000 sq. ft.	CC2c
7	75,000 – 100,000 sq. ft.	CC2c
8	over 100,000 sq. ft. (ag area)	CC2c
88	Refused	CC2c
99	Don't know	CC2c
CC2c	Is the entire floor area of this facility heated or cooled?	
1	Yes	CC3a
2	No	CC2d
88	Refused	C0
99	Don't know	C0
CC2d	What percentage of the floor area is heated or cooled?	
77	Percent	CC3a
101	Refused	C0
102	Don't know	C0
	If CC2d > 0 or CC2c = 1; else skip to C0	

CC3a	Is your space heated using electricity or gas or something else?	
1	Electricity	C0
2	Gas	C0
3	Both electricity and gas	C0
4	Propane	C0
77	OPEN\Other-record	C0
88	Refused	C0
99	Don't know	C0
C0	About what percentage of your operating costs does energy account for?	
1	Less than 1 percent	CC4
2	1-2 percent	CC4
3	3-5 percent	CC4
4	6-10 percent	CC4
5	11-15 percent	CC4
6	16-20 percent	CC4
7	21-50 percent	CC4
8	Over 51 percent	CC4
88	Refused	CC4
99	Don't Know	CC4
CC4	Does your organization own, lease, or manage the facility?	
1	Own	C5
2	Lease/Rent	C5
3	Manage	C5
88	Refused	C5
99	Don't know	C5
C5	How many locations does your organization have. Is it....	
1	This facility only	CC6
2	2 to 4 locations	CC6
3	5 to 10 locations	CC6
4	11 to 25 locations	CC6
5	more than 25 locations	CC6
88	Don't know	CC6
99	Refused	CC6

CC6	How active a role does your organization take in making purchase decisions related to energy using equipment at this facility? Would you say you are…	
1	Very active – involved in all phases and have veto power	CC7
2	Somewhat active – we approve decisions and provide some input and review	CC7
3	Slightly active – we have a voice but it's not the dominant voice	CC7
4	Not active at all – we're part of a larger firm	CC7
5	Not active at all – our firm doesn't get involved in these issues	CC7
88	Refused	CC7
99	Don't know	CC7

CC7	Does your firm have a maintenance company that you use to maintain any of your building systems such as lighting, HVAC, refrigeration, or food service equipment?	
1	Yes	CC12a
2	No	CC12a
88	Refused	CC12a
99	Don't Know	CC12a

CC12a	In what year was this organization established at this location?	
7777	Year	BC090
8888	Refused	CC12b
9999	Don't know	CC12b
	If CC12a in (88, 99) then ask; else skip to BC090	
CC12b	Would you say it was…	
1	After 2010	BC090
2	Between 2006 and 2010	BC090
3	Between 2000 and 2005	BC090
4	In the 1990s	BC090
5	In the 1980s	BC090
6	In the 1970s	BC090
7	In the 1960s or	BC090
8	Before 1960	BC090
88	Don't know	BC090
99	Refused	BC090

	ADDITIONAL FACILITY CHARACTERISTICS	
BC090	Has the square footage of the facility increased, decreased or remained the same since January 2017?	
1	Increase in square footage	BC100
2	Decrease in square footage	BC110
3	Stayed the same	V1
88	Refused	V1
99	Don't know	V1
	If BC090 = 1 then ask; else skip to BC110	
BC100	How many square feet were added?	
77	Square feet	BC120
88	Refused	BC120
99	Don't know	BC120
	If BC090 = 2 then ask; else skip to BC120	
BC110	By how many square feet was the facility reduced?	
77	Square feet	BC120
88	Refused	BC120
99	Don't know	BC120
	If BC090 in (1, 2) then ask; else skip to CA15	
BC120	In what year did this <%BC090> occur?	
1	2017	Vendor_Name
2	2018	Vendor_Name
88	Refused	Vendor_Name
99	Don't know	Vendor_Name
	CLOSING	
	Ask if V1(1)	
Vendor_Name	Earlier you stated that you had a vendor/contractor that helped you with the installation of the <%MEASURE> that was installed through the <%UTILITY> Program. Could you provide me with their name and phone number?	
1	Cannot provide	END
77	Record Name, Phone Number, Email Address or any other information they can provide. More is better.	END
88	Refused	END
99	Don't know	END
END	Those are all the questions I have for you today. On behalf of the CPUC, I would like to thank you very much for your kind cooperation. Have a good day.	

VENDOR TELEPHONE SURVEY INSTRUMENT

Introduction

AA1   This is %n calling on behalf of the CPUC [California Public Utilities Commission] from <%SURVEY FIRM>> regarding your firm's involvement with the sales and/or installations of ...<%MEASURE>... through ...<%PROGRAM> ... between January 1, 2018 and December 31, 2018.____Our records indicate that ...<%CONTACT>... would be the person most knowledgeable about this. Are they available?

1   Yes   AA7

2   No   AA2

AA2   Who would be the person most knowledgeable about your firm's involvement with ...<%PROGRAM> during 2018?

1   Record name and start over

A1   <%UTILITY>... has indicated that your firm implements the <% PROGRAM NAME> and was involved in selling and/or installing energy-efficient...<%MEASURE> throughout their service territory during 2018. Is this correct?

1   Yes   A2

2   No   Thank and Terminate

[DO NOT READ: The following question will determine if we ask about influences on their recommendations. Please be sure to be thorough with this question. If they truly only installed this equipment, then a "No" is fine]

A2   According to <%UTILITY>, your firm promotes and sells ...<%MEASURE> through the <% PROGRAM NAME> [ADJUST TO PROGRAM DESCRIPTION]. Is that correct??

1   Yes   A3

2   No   A11

A3   Now, I'm going to ask you about the various strategies you might have used to sell program-qualified equipment. Please indicate which ones you have used. [READ]

____ Upsell contractors to purchase program-qualified units

____ Upsell customers to purchase program-qualified units

____ Conduct training workshops for contractors

___ Increase marketing of program-qualified units

___ Reduce the prices of program-qualified units

___ Increase the stocking or assortment of program-qualified units

___ Discuss the benefits of program-qualified units with contractors

___ Discuss the benefits of program-qualified units with customers

___ Other (Please describe: _____)

Next, I am going to ask you to rate the importance of the various PROGRAM and NON-PROGRAM factors in influencing your decision to recommend this MEASURE to distributors/ customers. Think of the degree of importance as being shown on a scale with equally spaced units from 0 to 10, where 0 means not at all important and 10 means very important, so that an importance rating of 8 shows twice as much influence as a rating of 4.

A4   Using this 0-to-10 scale, please rate the following in terms of their importance in your decision to recommend this MEASURE to ...<%CUSTOMER>.and other customers

Program incentive	Record 0 to 10 score (_____)
Information about the cost-effectiveness of more efficient units	Record 0 to 10 score (_____)
Program promotional materials	Record 0 to 10 score (_____)
Program-provided training of sales staff	Record 0 to 10 score (_____)

Next, I am going to ask you to rate the importance of the PROGRAM in general in influencing your decision to recommend this MEASURE to <%UTILITY's> contractors/distributors/customers.

A5   Using this 0 to 10 scale where 0 is NOT AT ALL IMPORTANT and 10 is EXTREMELY IMPORTANT, how important was the PROGRAM, including incentives as well as program services and information, in influencing your decision to recommend that <%UTILITY's> contractors/distributors/customers purchase the energy efficiency MEASURE at this time?

Record 0 to 10 score (_____)   A5A

A5a. Now, if you were given 10 points to award in total, how many points would give to the importance of the program factors as a group and how many points would you give to the non-program factors as a group?

\#   Record 0 to 10 value (_____)   A6

A6   And using a 0 to10 likelihood scale where 0 is NOT AT ALL LIKELY and 10 is EXTREMELY LIKELY, if the PROGRAM, including incentives as well as program services and information, had not been available, what is the likelihood that you would have recommended this specific MEASURE to <%UTILITY's> contractors/distributors/customers?

\#   Record 0 to 10 score (_____)   A7

A7   Approximately, in what percent of sales situations did you recommend this MEASURE before you learned about the PROGRAM?

%   Record PERCENTAGE A8

A8   And approximately in what percent of sales situations do you recommend this MEASURE now that you have worked with the PROGRAM?

%   Record PERCENTAGE A8a

A8a   In what most important other way has the PROGRAM influenced your recommendations regarding this MEASURE?

RECORD ANSWER HERE:

A8aa   Using a 0 to 10 scale, how important was this influence on this recommendation?

\#   Record 0 to 10 score (_____)   A8b

A8b.   Was there another way the PROGRAM influenced your recommendations regarding this MEASURE?

1   No other way A9a

77   **Record SECOND mention here:**

A8bb   Using a 0 to 10 scale, how important was this influence on this recommendation?

\#   Record 0 to 10 score (_____)   A9a

A9a   Using the same scale as before, how important was the TRAINING SEMINAR provided by <%UTILITY> in your recommendation?

\#   Record 0 to 10 score (_____)   A9b

A9b   And how important was the information provided by the <%UTILITY> website?
Record 0 to 10 score (_____)   A9c

A9c   And how important was your firm's past participation in a rebate or audit program sponsored by <%UTILITY>?
Record 0 to 10 score (_____)   A10

A10   Approximately, what percentage of your sales over the last 12 months of this...<%MEASURE_TYPE> installed in <%UTILITY>'s service territory are energy efficient models…that qualify for incentives from the program?
%   Record PERCENTAGE A11

A11   On a 0 to 100 percent scale, in what percent of sales situations do you encourage your contractors/distributors/customers in <%UTILITY>'s territory to purchase program qualifying ...<%MEASURE_TYPE>...?
%   Record PERCENTAGE A11a

       IF A11 << 100;
A11a   In what situations do you NOT encourage your contractors/distributors/customers to purchase energy efficient models if they qualify for a rebate? Why is that?
RECORD ANSWER HERE:

A12   Of those installations of ...<%MEASURE_TYPE>... in <%UTILITY>'s service territory that qualify for incentives, approximately what percentage do not receive the incentive?
RECORD ANSWER HERE:

       IF A12 >> 0;
A13   Why do you think they do not receive the incentive?
RECORD ANSWER HERE:

A14   Do   you   also   sell   ...<%MEASURE_TYPE>..   in   areas   where contractors/distributors/customers do not have access to incentives for energy efficient models?

1   Yes   A15
2   No   A16

A15   About what percent of your sales of ...<%MEASURE_TYPE> ... are represented by these areas where incentives are not offered?
RECORD ANSWER HERE:

        IF A15 >> 10 & A15 << 101;
A15a   And approximately what percentage of your sales of this ...<%MEASURE_TYPE>..in these areas are the energy efficient models that would qualify for incentives in <%UTILITY>'s service territory?
RECORD ANSWER HERE:

A16   Have you changed your stocking practices as a result of the <%UTILITY> Program?\,
1   Yes   A17
2   No   A17

        IF A14=1
A17   Do you promote energy efficient models equally in areas with and without incentives?
1   Yes   END
2   No   END

END   Those are all the questions I have for you today. Thank you very much for your time.
       END OF SURVEY

APPENDIX B SMALL COMMERCIAL SECTOR ON-SITE SURVEY INSTRUMENTS

■   Refrigeration Case LED On-Site Survey Instrument

■   Process Pumping VFD On-Site Survey Instrument

■   Agricultural Irrigation On-Site Survey Instrument

■   ESPI Tankless Water Heater On-Site Survey Instrument

REFRIGERATION CASE LED ON-SITE SURVEY INSTRUMENT

Non-Residential Deemed Refrigeration Measure Data Collection On-Site Survey Form

General Site Information (from phone survey & IOU tracking database)

Itron SiteID	«nrfsiteid»

Corporate (Multi-Site) Name	«ServiceAccountName»
Business Name (Tracking Data)	
Actual Business Name	
Service Address	«SiteAddress»
City	«SiteCity»

City	«SiteCity»	Zip Code	«SiteZipCode»

CORRECTIONS TO SITE INFORMATION

Revised Corp. (Multi-Site) Name	
Revised Business Name	
Revised Service Address	
Revised City	

Revised City		Revised Zip	

Site Contact Information

PS Completion Date:		Length (min)		Respondent:		Date of Install:	

	Contacted	Contact Name	Phone Number	Alternate Phone	Email Address
OS Primary	☐	*«Onsite_ContactName»*	*«Onsite_ContactNumber»*		
OS Back-up	☐				
OS Other	☐				

Note: Use the "Contacted" check box to indicate the actual contact(s) for the site visit.

Scheduling Notes/Special Instructions for On-site Visit: «Schedule_Notes»

Survey Tracking Information

Survey Company:		Assigned Surveyor's Initials:	
Survey Travel Mileage:	miles	Total Travel Time	hrs
Survey Duration (24 hr clock)	Start:	Survey Duration (24 hr clock)	End:
Total Onsite Time	hrs	Total Time to Fill Out Survey Form	hrs

	Date:	Initials
Field survey completed:	__ __ / __ __ / __ __	__ __ __
Survey received from surveyor:	__ __ / __ __ / __ __	__ __ __
Initial QC check completed:	__ __ / __ __ / __ __	__ __ __
Survey sent back to surveyor (*if needed*):	__ __ / __ __ / __ __	__ __ __
Received from surveyor (*if needed*):	__ __ / __ __ / __ __	__ __ __
Itron QC completed:	__ __ / __ __ / __ __	__ __ __
Data entry (DE) completed:	__ __ / __ __ / __ __	__ __ __
Logger extraction DE complete:	__ __ / __ __ / __ __	__ __ __
Follow-up Logger Extraction DE complete:	__ __ / __ __ / __ __	__ __ __

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COMMENTS

IOU Tracking Data Measure Summary Sheet

This is a summary of all of the measures implemented at this site as extracted from the IOU tracking database. All of the measures listed here should also be found on the measure-level verification forms.

Claim ID	Measure Code	IOU MeasureName	Rebated # of Units	Unit Basis
«CLaimID_1»	«OS_MeasCode_1»	«OS_MeasDescription_1»	«OS_NumUnits_1»	«OS_InstalledNormUnit_1»
«CLaimID_2»	«OS_MeasCode_2»	«OS_MeasDescription_2»	«OS_NumUnits_2»	«OS_InstalledNormUnit_2»
«CLaimID_3»	«OS_MeasCode_3»	«OS_MeasDescription_3»	«OS_NumUnits_3»	«OS_InstalledNormUnit_3»
«CLaimID_4»	«OS_MeasCode_4»	«OS_MeasDescription_4»	«OS_NumUnits_4»	«OS_InstalledNormUnit_4»
«CLaimID_5»	«OS_MeasCode_5»	«OS_MeasDescription_5»	«OS_NumUnits_5»	«OS_InstalledNormUnit_5»

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COMMENTS

Premise-Level Schedule Definitions

Standard Holidays *(check all that apply)* ☐ **N/A**

Indicate below which, if any, standard holidays that the business is closed or operation deviates drastically from normal/typical operations,and indicate on Form BUS_HRS what the holiday operation hours are. Indicate any additional holidays in the comment block.

New Year's Eve	☐	July 4th Celebrated	☐
New Year's Day	☐	Labor Day	☐
New Year's Day Celebrated	☐	Columbus Day	☐
Martin Luther King Day	☐	Veterans' Day	☐
Presidents' Day	☐	Thanksgiving	☐
St. Patrick's Day	☐	Thanksgiving Friday	☐
Easter Sunday	☐	Christmas Eve	☐
Memorial Day	☐	Christmas Day	☐
Flag Day	☐	Christmas Day Celebrated	☐
July 4th	☐	Caesar Chavez Day	☐
Other (1) _____	☐	Other (2)_____	☐

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COMMENTS

Business Schedule
Primary Business Hours

Define typical operation for <u>all</u> Day Types listed below and specify hours in military time (00 to 24). For partial (i.e. not full) operation days, also indicate the approximate % of full operation as Partial Op %.

Day Type	From Phone Survey	Corrected Business Hours	Closed All Day?	Open 24 hrs?	PartialOp%
Monday	from _____ to _____	from _____ to_____			
Tuesday	from _____ to _____	from _____ to_____			
Wednesday	from _____ to _____	from _____ to_____			
Thursday	from _____ to _____	from _____ to_____			
Friday	from _____ to _____	from _____ to_____			
Saturday	from _____ to _____	from _____ to_____			
Sunday	from _____ to _____	from _____ to_____			
Holidays	from _____ to _____	from _____ to_____			

Seasonal Operation Business Hours – Time Period 2   ☐ N/A

Day Type	From Phone Survey	Corrected Business Hours	Closed All Day?	Open 24 hrs?	PartialOp%
Monday	from _____ to _____	from _____ to_____			
Tuesday	from _____ to _____	from _____ to_____			
Wednesday	from _____ to _____	from _____ to_____			
Thursday	from _____ to _____	from _____ to_____			
Friday	from _____ to _____	from _____ to_____			
Saturday	from _____ to _____	from _____ to_____			
Sunday	from _____ to _____	from _____ to_____			
Holidays	from _____ to _____	from _____ to_____			

Seasonal Operation Business Hours – Time Period 3   ☐ N/A

Day Type	Business Hours	Closed All Day?	Open 24 hrs?	PartialOp%
Monday	from _____ to_____	Y N	Y N	
Tuesday	from _____ to_____	Y N	Y N	
Wednesday	from _____ to_____	Y N	Y N	
Thursday	from _____ to_____	Y N	Y N	
Friday	from _____ to_____	Y N	Y N	
Saturday	from _____ to_____	Y N	Y N	
Sunday	from _____ to_____	Y N	Y N	
Holidays	from _____ to_____	Y N	Y N	

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COMMENTS

Hourly Operation Schedules –Refrigeration Case Lightng

Use this form if refrigerated case lighting operation is independent of Business Hours <u>as indicated on Form BUS_HRS</u>.
Use one block for each unique/seasonal schedule. Indicate the applicable daytypes for each unique/seasonal schedule,
and account for all day types including holidays. Specify the % of max. lighting power for all time periods and be sure to
accurately capture <u>transition periods</u>.

Hour	12-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9	9-10	10-11	11-12

Schedule #___   ControlType_____   Description_____

Applicable DayTypes		**%** Equipment On			Temp Setpoint								
M T W T F S S H	AM												
	PM												
M T W T F S S H	AM												
	PM												
M T W T F S S H	AM												
	PM												
M T W T F S S H	AM												
	PM												

Schedule #___   ControlType_____   Description_____

Applicable DayTypes		**%** Equipment On			Temp Setpoint								
M T W T F S S H	AM												
	PM												
M T W T F S S H	AM												
	PM												
M T W T F S S H	AM												
	PM												
M T W T F S S H	AM												
	PM												

Schedule #___   ControlType_____   Description_____

Applicable DayTypes		**%** Equipment On			Temp Setpoint								
M T W T F S S H	AM												
	PM												
M T W T F S S H	AM												
	PM												
M T W T F S S H	AM												
	PM												
M T W T F S S H	AM												
	PM												

_____   COMMENTS

Premise/Site-Plan Sketch

This sketch should provide a high-level view of the <u>interior space and the layout of the refrigeration display cases. Please include quantity of doors by case and locations of lighting logger installation.</u> Use multiple sheets/drawings if necessary. Also indicate the "front" or primary entrance for each building.

Premise/Site-Plan sketch comments:

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COMMENTS

LED Case Lighting Measure 1

IOU Tracking Data	Claim Id	«CLaimID_1»	
	Measure Code	«OS_MeasCode_1»	
	Measure Name	«OS_MeasDescription_1»	
	Rebated #of Units	«OS_NumUnits_1»	
	IOU <u>Unit Basis</u>	«OS_InstalledNormUnit_1»	
	Anticipated ex-ante Qty of LED Fixtures	«OS_Qty_5ft_6ft_1»	

Physical Measure Verification Data	Can Rebated measures be clearly identified?	Y N
	Check box if Fixtures are NOT accessible (explain below)	☐
	# of LED Fixtures/Lamps physically inspected	
	LED Fixture Manufacturer	
	LED Fixture Model Number	
	LED LampType (tube or strip)	
	LED Lamp Length	
	# of LED Lamps per Fixture	
	LED Fixture Wattage	

Measure Verification Location and Counts	**Glass-door Reach-in Display Cases**	Total # of Reach-In Cases	
		Total # of Reach-In Doors	
		Total # of operating LED Fixtures	
		Total Length of operating LED Fixtures	
		Control (switch, panel, occ sensor)	
		Low temp or Med?	
	Open Display Cases	Total Length of Open Cases	
		Total # of operating LED Fixtures	
		Total Length of operating LED Fixtures	
		Control (switch, panel, occ sensor)	

Verification Summary	**(VS.A) Total Quantity Installed & Operational of LED Fixtures (ex post qty.)**	
	(VS.B) Is the ex post qty. of verified LED fixtures equal to the anticipated ex-ante qty. of LED fixtures? **If NO and site is in PG&E, answer (VS.C)** **If NO and site is in SDG&E, answer (VS.D)**	**Y N**
	(VS.C) For PG&E measure codes with baseline lamps <=5', does the ex-post quantity match anticipated quantity of LED fixtures using the 4' baseline? (anticipated quantity needs to be calculated by surveyor on-site as Rebated # of units divided by 4)	**Y N NA**
	(VS.D) For SDG&E measure codes, is the total number of verified Reach-in Doors equal to the ex-ante Rebated#of Units (doors)?	**Y N NA**
	If no to either VS.C or VS.D, please attempt to explain differences between verified ex-post quantities and anticipated ex-ante quantities (e.g. Qty not installed and in storage, Qty installed but non-operational, more refrigerated cases added since initial retrofit, etc,):	

_____   COMMENTS

	Anticipated Baseline Lighting	«OS_BaselineDesc_1»
	Is post-installation operation the same as pre-retrofit operation?	Y N B SC E
	-- If pre-retrofit operation was different, specify Sched #	
	Control (switch, panel, occ sensor)	B SC E
	Lamp Type Code	B SC E
	(If LF Baseline) - **Tube Length (e.g. 4ft, 5ft, 6ft)**	B SC E
	(If LF Baseline) **- Tube Type (e.g. T8, T12)**	B SC E
	If NOT LF Baseline: Fixture Description (e.g. LED)	B SC E
	Lamp Wattage	B SC E
	# Lamps per Fixture	B SC E
Baseline System Specific to Measure Code	Fixture Wattage	B SC E
	Total # of Fixtures	B SC E
	Please provide additional comments on how you determined the baseline lighting system characteristics and, if there are differences between antipated baseline lighting and baseline as you verified.	
	Were there changes to the quantities of refrigerated cases and doors remain at time of lighting retrofit?	Y N B SC E
	If Yes, there were changes to refrigerated cases and doors, please explain the alterations (e.g. if any were removed or new ones added) and list total # cases and doors in existing system	

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COMMENTS

LED Case Lighting Measure 2

IOU Tracking Data	Claim Id	«CLaimID_2»
	Measure Code	«OS_MeasCode_2»
	Measure Name	«OS_MeasDescription_2»
	Rebated #of Units	«OS_NumUnits_2»
	IOU Unit Basis	«OS_InstalledNormUnit_2»
	Anticipated ex-ante Qty of LED Fixtures	«OS_Qty_5ft_6ft_2»

Physical Measure Verification Data	Can Rebated measures be clearly identified?	Y N
	Check box if Fixtures are NOT accessible (explain below)	☐
	# of LED Fixtures/Lamps physically inspected	
	LED Fixture Manufacturer	
	LED Fixture Model Number	
	LED LampType (tube or strip)	
	LED Lamp Length	
	# of LED Lamps per Fixture	
	LED Fixture Wattage	

Measure Verification Location and Counts	**Glass-door Reach-in Display Cases**	Total # of Reach-In Cases	
		Total # of Reach-In Doors	
		Total # of operating LED Fixtures	
		Total Length of operating LED Fixtures	
		Control (switch, panel, occ sensor)	
		Low temp or Med?	
	Open Display Cases	Total Length of Open Cases	
		Total # of operating LED Fixtures	
		Total Length of operating LED Fixtures	
		Control (switch, panel, occ sensor)	

Verification Summary	**(VS.A) Total Quantity Installed & Operational of LED Fixtures (ex post qty.)**	
	(VS.B) Is the ex post qty. of verified LED fixtures equal to the anticipated ex-ante qty. of LED fixtures? **If NO and site is in PG&E, answer (VS.C)** **If NO and site is in SDG&E, answer (VS.D)**	Y N
	(VS.C) For PG&E measure codes with baseline lamps <=5', does the ex-post quantity match anticipated quantity of LED fixtures using the 4' baseline? (anticipated quantity needs to be calculated by surveyor on-site as Rebated # of units divided by 4)	Y N NA
	(VS.D) For SDG&E measure codes, is the total number of verified Reach-in Doors equal to the ex-ante Rebated#of Units (doors)?	Y N NA
	If no to either VS.C or VS.D, please attempt to explain differences between verified ex-post quantities and anticipated ex-ante quantities (e.g. Qty not installed and in storage, Qty installed but non-operational, more refrigerated cases added since initial retrofit, etc,):	

_____   COMMENTS

Baseline System Specific to Measure Code	**Anticipated Baseline Lighting**	**«OS_BaselineDesc_2»**	
	Is post-installation operation the same as pre-retrofit operation?	**Y N**	**B SC E**
	-- If pre-retrofit operation was different, specify Sched #		
	Control (switch, panel, occ sensor)		**B SC E**
	Lamp Type Code		**B SC E**
	(If LF Baseline) - **Tube Length (e.g. 4ft, 5ft, 6ft)**		**B SC E**
	(If LF Baseline) **- Tube Type (e.g. T8, T12)**		**B SC E**
	If NOT LF Baseline: Fixture Description (e.g. LED)		**B SC E**
	Lamp Wattage		**B SC E**
	# Lamps per Fixture		**B SC E**
	Fixture Wattage		**B SC E**
	Total # of Fixtures		**B SC E**
	Please provide additional comments on how you determined the baseline lighting system characteristics and, if there are differences between antipated baseline lighting and baseline as you verified.		
	Were there changes to the quantities of refrigerated cases and doors remain at time of lighting retrofit?	**Y N**	**B SC E**
	If Yes, there were changes to refrigerated cases and doors, please explain the alterations (e.g. if any were removed or new ones added) and list total # cases and doors in existing system		

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COMMENTS

LED Case Lighting Measure 3

<table>
<tr>
<td rowspan="6">IOU Tracking Data</td>
<td>Claim Id</td>
<td colspan="2" style="text-align:center">«CLaimID_3»</td>
</tr>
<tr>
<td>Measure Code</td>
<td colspan="2" style="text-align:center"><i>«OS_MeasCode_3»</i></td>
</tr>
<tr>
<td>Measure Name</td>
<td colspan="2" style="text-align:center">«OS_MeasDescription_3»«OS_MeasDescription_3»</td>
</tr>
<tr>
<td style="text-align:right">Rebated #of Units</td>
<td colspan="2" style="text-align:center">«OS_NumUnits_3»</td>
</tr>
<tr>
<td style="text-align:right">IOU <u>Unit Basis</u></td>
<td colspan="2" style="text-align:center"><i>«OS_InstalledNormUnit_3»</i></td>
</tr>
<tr>
<td style="text-align:right">Anticipated ex-ante Qty of LED Fixtures</td>
<td colspan="2" style="text-align:center">«OS_Qty_5ft_6ft_3»</td>
</tr>
<tr>
<td rowspan="9">Physical Measure Verification Data</td>
<td style="text-align:center">Can Rebated measures be clearly identified?</td>
<td colspan="2" style="text-align:center">Y   N</td>
</tr>
<tr>
<td style="text-align:center"><i>Check box if Fixtures are <u>NOT</u> accessible (explain below)</i></td>
<td colspan="2" style="text-align:center">☐</td>
</tr>
<tr>
<td style="text-align:right"># of LED Fixtures/Lamps physically inspected</td>
<td colspan="2"></td>
</tr>
<tr>
<td style="text-align:right">LED Fixture Manufacturer</td>
<td colspan="2"></td>
</tr>
<tr>
<td style="text-align:right">LED Fixture Model Number</td>
<td colspan="2"></td>
</tr>
<tr>
<td style="text-align:right">LED LampType (tube or strip)</td>
<td colspan="2"></td>
</tr>
<tr>
<td style="text-align:right">LED Lamp Length</td>
<td colspan="2"></td>
</tr>
<tr>
<td style="text-align:right"># of LED Lamps per Fixture</td>
<td colspan="2"></td>
</tr>
<tr>
<td style="text-align:right">LED Fixture Wattage</td>
<td colspan="2"></td>
</tr>
<tr>
<td rowspan="11">Measure Verification Location and Counts</td>
<td rowspan="7">Glass-door Reach-in Display Cases</td>
<td>Total # of Reach-In Cases</td>
<td></td>
</tr>
<tr>
<td>Total # of Reach-In Doors</td>
<td></td>
</tr>
<tr>
<td>Total # of operating LED Fixtures</td>
<td></td>
</tr>
<tr>
<td>Total Length of operating LED Fixtures</td>
<td></td>
</tr>
<tr>
<td>Control (switch, panel, occ sensor)</td>
<td></td>
</tr>
<tr>
<td>Low temp or Med?</td>
<td></td>
</tr>
<tr>
<td rowspan="4">Open Display Cases</td>
<td>Total Length of Open Cases</td>
<td></td>
</tr>
<tr>
<td>Total # of operating LED Fixtures</td>
<td></td>
</tr>
<tr>
<td>Total Length of operating LED Fixtures</td>
<td></td>
</tr>
<tr>
<td>Control (switch, panel, occ sensor)</td>
<td></td>
</tr>
<tr>
<td rowspan="6">Verification Summary</td>
<td colspan="2">(VS.A) Total Quantity Installed & Operational of LED Fixtures (ex post qty.)</td>
<td></td>
</tr>
<tr>
<td colspan="2">(VS.B) Is the ex post qty. of verified LED fixtures equal to the anticipated ex-ante qty. of LED fixtures?
If NO and site is in PG&E, answer (VS.C)
If NO and site is in SDG&E, answer (VS.D)</td>
<td style="text-align:center">Y   N</td>
</tr>
<tr>
<td colspan="2">(VS.C) For PG&E measure codes with baseline lamps <=5', does the ex-post quantity match anticipated quantity of LED fixtures using the 4' baseline? (anticipated quantity needs to be calculated by surveyor on-site as Rebated # of units divided by 4)</td>
<td style="text-align:center">Y   N   NA</td>
</tr>
<tr>
<td colspan="2">(VS.D) For SDG&E measure codes, is the total number of verified Reach-in Doors equal to the ex-ante Rebated#of Units (doors)?</td>
<td style="text-align:center">Y   N   NA</td>
</tr>
<tr>
<td colspan="3">If no to either VS.C, VS.D, please attempt to explain differences between verified ex-post quantities and anticipated ex-ante quantities (e.g. Qty not installed and in storage, Qty installed but non-operational, more refrigerated cases added since initial retrofit, etc,):</td>
</tr>
<tr>
<td colspan="3" style="height:250px"></td>
</tr>
</table>

_____   COMMENTS

Baseline System Specific to Measure Code	**Anticipated Baseline Lighting**	«OS BaselineDesc 3»	
	Is post-installation operation the same as pre-retrofit operation?	Y N	B SC E
	-- If pre-retrofit operation was different, specify Sched #		
	Control (switch, panel, occ sensor)		B SC E
	Lamp Type Code		B SC E
	(If LF Baseline) - **Tube Length (e.g. 4ft, 5ft, 6ft)**		B SC E
	(If LF Baseline) **- Tube Type (e.g. T8, T12)**		B SC E
	If NOT LF Baseline: Fixture Description (e.g. LED)		B SC E
	Lamp Wattage		B SC E
	# Lamps per Fixture		B SC E
	Fixture Wattage		B SC E
	Total # of Fixtures		B SC E
	Please provide additional comments on how you determined the baseline lighting system characteristics and, if there are differences between antipated baseline lighting and baseline as you verified.		
	Were there changes to the quantities of refrigerated cases and doors remain at time of lighting retrofit?	Y N	B SC E
	If Yes, there were changes to refrigerated cases and doors, please explain the alterations (e.g. if any were removed or new ones added) and list total # cases and doors in existing system		

_____

COMMENTS

LED Case Lighting Measure 4

IOU Tracking Data		
Claim Id		«CLaimID_4»
Measure Code		«OS_MeasCode_4»
Measure Name		«OS_MeasDescription_4»
Rebated #of Units		«OS_NumUnits_4»
IOU <u>Unit Basis</u>		«OS_InstalledNormUnit_4»
Anticipated ex-ante Qty of LED Fixtures		«OS_Qty_5ft_6ft_4»

Physical Measure Verification Data		
Can Rebated measures be clearly identified?		Y N
Check box if Fixtures are <u>NOT</u> accessible (explain below)		☐
# of LED Fixtures/Lamps physically inspected		
LED Fixture Manufacturer		
LED Fixture Model Number		
LED LampType (tube or strip)		
LED Lamp Length		
# of LED Lamps per Fixture		
LED Fixture Wattage		

Measure Verification Location and Counts		
Glass-door Reach-in Display Cases	Total # of Reach-In Cases	
	Total # of Reach-In Doors	
	Total # of operating LED Fixtures	
	Total Length of operating LED Fixtures	
	Control (switch, panel, occ sensor)	
	Low temp or Med?	
Open Display Cases	Total Length of Open Cases	
	Total # of operating LED Fixtures	
	Total Length of operating LED Fixtures	
	Control (switch, panel, occ sensor)	

Verification Summary		
(VS.A) Total Quantity Installed & Operational of LED Fixtures (ex post qty.)		
(VS.B) Is the ex post qty. of verified LED fixtures equal to the anticipated ex-ante qty. of LED fixtures? **If NO and site is in PG&E, answer (VS.C)** **If NO and site is in SDG&E, answer (VS.D)**	Y N	
(VS.C) For PG&E measure codes with baseline lamps <=5', does the ex-post quantity match anticipated quantity of LED fixtures using the 4' baseline? (anticipated quantity needs to be calculated by surveyor on-site as Rebated # of units divided by 4)	Y N NA	
(VS.D) For SDG&E measure codes, is the total number of verified Reach-in Doors equal to the ex-ante Rebated#of Units (doors)?	Y N NA	
If no to either VS.C or VS.D, please attempt to explain differences between verified ex-post quantities and anticipated ex-ante quantities (e.g. Qty not installed and in storage, Qty installed but non-operational, more refrigerated cases added since initial retrofit, etc,):		

_____   COMMENTS

Baseline System Specific to Measure Code	**Anticipated Baseline Lighting**	**«OS BaselineDesc 4»**	
	Is post-installation operation the same as pre-retrofit operation?	Y N	B SC E
	-- If pre-retrofit operation was different, specify Sched #		
	Control (switch, panel, occ sensor)		B SC E
	Lamp Type Code		B SC E
	(If LF Baseline) - **Tube Length (e.g. 4ft, 5ft, 6ft)**		B SC E
	(If LF Baseline) **- Tube Type (e.g. T8, T12)**		B SC E
	If NOT LF Baseline: Fixture Description (e.g. LED)		B SC E
	Lamp Wattage		B SC E
	# Lamps per Fixture		B SC E
	Fixture Wattage		B SC E
	Total # of Fixtures		B SC E
	Please provide additional comments on how you determined the baseline lighting system characteristics and, if there are differences between antipated baseline lighting and baseline as you verified.		
	Were there changes to the quantities of refrigerated cases and doors remain at time of lighting retrofit?	Y N	B SC E
	If Yes, there were changes to refrigerated cases and doors, please explain the alterations (e.g. if any were removed or new ones added) and list total # cases and doors in existing system		

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COMMENTS

LED Case Lighting Measure 5

IOU Tracking Data		
	Claim Id	«CLaimID_5»
	Measure Code	«OS_MeasCode_5»
	Measure Name	«OS_MeasDescription_5»
	Rebated #of Units	«OS_NumUnits_5»
	IOU <u>Unit Basis</u>	*«OS_InstalledNormUnit_5»*
	Anticipated ex-ante Qty of LED Fixtures	«OS_Qty_5ft_6ft_5»

Physical Measure Verification Data		
	Can Rebated measures be clearly identified?	Y N
	Check box if Fixtures are <u>NOT</u> accessible (explain below)	☐
	# of LED Fixtures/Lamps physically inspected	
	LED Fixture Manufacturer	
	LED Fixture Model Number	
	LED LampType (tube or strip)	
	LED Lamp Length	
	# of LED Lamps per Fixture	
	LED Fixture Wattage	

Measure Verification Location and Counts			
	Glass-door Reach-in Display Cases	Total # of Reach-In Cases	
		Total # of Reach-In Doors	
		Total # of operating LED Fixtures	
		Total Length of operating LED Fixtures	
		Control (switch, panel, occ sensor)	
		Low temp or Med?	
	Open Display Cases	Total Length of Open Cases	
		Total # of operating LED Fixtures	
		Total Length of operating LED Fixtures	
		Control (switch, panel, occ sensor)	

Verification Summary		
	(VS.A) Total Quantity Installed & Operational of LED Fixtures (ex post qty.)	
	(VS.B) Is the ex post qty. of verified LED fixtures equal to the anticipated ex-ante qty. of LED fixtures? **If NO and site is in PG&E, answer (VS.C)** **If NO and site is in SDG&E, answer (VS.D)**	**Y N**
	(VS.C) For PG&E measure codes with baseline lamps <=5', does the ex-post quantity match anticipated quantity of LED fixtures using the 4' baseline? (anticipated quantity needs to be calculated by surveyor on-site as Rebated # of units divided by 4)	**Y N NA**
	(VS.D) For SDG&E measure codes, is the total number of verified Reach-in Doors equal to the ex-ante Rebated#of Units (doors)?	**Y N NA**
	If no to either VS.C or VS.D, please attempt to explain differences between verified ex-post quantities and anticipated ex-ante quantities (e.g. Qty not installed and in storage, Qty installed but non-operational, more refrigerated cases added since initial retrofit, etc,):	

_____   COMMENTS

Baseline System Specific to Measure Code	**Anticipated Baseline Lighting**	**«OS BaselineDesc 5»**	
	Is post-installation operation the same as pre-retrofit operation?	Y N	B SC E
	-- If pre-retrofit operation was different, specify Sched #		
	Control (switch, panel, occ sensor)		B SC E
	Lamp Type Code		B SC E
	(If LF Baseline) - **Tube Length (e.g. 4ft, 5ft, 6ft)**		B SC E
	(If LF Baseline) **- Tube Type (e.g. T8, T12)**		B SC E
	If NOT LF Baseline: Fixture Description (e.g. LED)		B SC E
	Lamp Wattage		B SC E
	# Lamps per Fixture		B SC E
	Fixture Wattage		B SC E
	Total # of Fixtures		B SC E
	Please provide additional comments on how you determined the baseline lighting system characteristics and, if there are differences between antipated baseline lighting and baseline as you verified.		
	Were there changes to the quantities of refrigerated cases and doors remain at time of lighting retrofit?	Y N	B SC E
	If Yes, there were changes to refrigerated cases and doors, please explain the alterations (e.g. if any were removed or new ones added) and list total # cases and doors in existing system		

_____   COMMENTS

Overall Project Baseline Characterization

Please describe why all lights at the project level were changed to LEDs instead of any other lighting technology.		
Approximate age of existing lighting system prior to retrofit (years)		
Condition of original fixtures prior to retrofit (**G**ood, **F**air, **P**oor)	**G F P**	
What % of original fixtures were completely burned out?		
What % of original fixtures were partially burned out?		
On a scale of 1-10, Please rate the following topics on their level of influence for retrofitting the lighting fixtures:		
Burned out fixtures		
Adequate lighting levels		
Major Renovation / Re-Modeling		
Safety of Occupants		
Productivity of Occupants		
Other (*describe in comments*)		
Considering all of the influential factors above, in the absence of an energy efficiency rebate program: How long would you have continued to operate the original fixtures before replacing them? (years)		

Comments: _____

_____

_____

_____

COMMENTS

Refrigeration System Characteristics

			1	2	3
		Refrigeration Itron #			
		Remote Refrigeration or Self Contained	RR SC	RR SC	RR SC
Refrigeration Equipment	**Case Temperature**	**LT** = Low (Ice Cream /Frozen	LT	LT	LT
		MT = Medium (Fresh Meat /	MT	MT	MT
		HT = High (Produce/Prep Areas)	HT	HT	HT
		OT = Other (describe)	OT	OT	OT
	IF SC	Case Make/Manufacturer			
		Case Model Number			
		Number of Cases			
	IF RR	Compressor Type			
		Number of Compressors			
		Compressor Make			
		Compressor Model Number			
		CondenserType			
		Condenser Make/Manufacturer			
		Mocdel Number			

LED Fixture - Activity Area Assignment Table (AAAT)   Measure Code: _____

*Use the AAAT below to associate lighting fixtures to measure codes, equipment oper. schedules, and lighting loggers. The values in the "Represented Verified Qty LED" column must add up to the **total # of Installed and Operational** units.*

- *If ONLY FIXTURE **DENT LL**: Only fill out **AAAT** below.*
- *If **DENT LL & (DENT CT or HOBO**): Fill out **AAAT** with logger info & the **HIGHBAY** Form ffor Panel Metering*
- *If ONLY **PANEL METERING**: Check **N/A** box and only fill out **HIGHBAY** Form.*

Circle all that apply: *(If Verify Only, circle 'NA', and fill out AAAT)*

Metering Type:	DENT LL DENT CT HOBO NA

☐ **N/A**

Refrig. #	Sched #	Item #	Control Type Code	Repres. Verified Qty LED	% of Total Verified Qty LED	Primary Logger S/N	Ref. Logger	Back-up Logger S/N	Comments
					%		☐		
					%		☐		
					%		☐		
					%		☐		
					%		☐		
					%		☐		
					%		☐		
					%		☐		
					%		☐		
					%		☐		
					%		☐		

| | | % | <= Total # of Installed & Operational Units check *(no data entry)* |

_____

COMMENTS

Logger Installation Form

Use this table to record information for installed measurement devices such as lighting loggers.

Installation Date		Extraction Date	
Installer's Initials		Extraction Initials	
Scheduled Extraction Date			

Installation

Logger Serial				
Primary or Backup Logger?	P B	P B	P B	P B
Case Temperature	MT HT	MT HT	MT HT	MT HT
Case Control Type				
Placement Description Include building, floor, room #, etc. and be descriptive enough that it can be located for extraction.				
Schedule #				

Extraction

Logger Intact? See	Y N L *P*	Y N L *P*	Y N L *P*	Y N L *P*
Logger Tested "OK"	Y N NA	Y N NA	Y N NA	Y N NA
% "ON" Time	%	%	%	%
Extraction Comments				
Logger Date&Time (HH:MM)				
Computer Date&Time (HH:MM)				
Alternate Extraction Date				

Logger Intact: "Y" – If logger is as originally installed, does not appear to be tampered with, and display indicates the logger is working **Logger Tested "OK"** – If Logger Intact was "Y" then is it properly logging the light ON/OFF, "Y" or "N"? If Logger Intact was "N" use "NA"

_____

COMMENTS

Logger Installation Form (continued)
Use this table to record information for installed measurement devices such as lighting loggers.

Installation

Logger Serial Number				
Primary or Backup Logger?	**P B**	**P B**	**P B**	**P B**
Case Temperature	**MT HT**	**MT HT**	**MT HT**	**MT HT**
Case Control Type				
Placement Description Include building, floor, room #, etc. and be descriptive enough that it can be located for extraction.				
Schedule #				

Extraction

Logger Intact?	**Y N L *P***	**Y N L *P***	**Y N L *P***	**Y N L *P***
Logger Tested "OK"	**Y N NA**	**Y N NA**	**Y N NA**	**Y N NA**
% "ON" Time	%	%	%	%
Extraction Comments				
Logger Date&Time (HH:MM)				
Computer Date&Time (HH:MM)				
Alternate Extraction Date				

Logger Intact: "Y" – If logger is as originally installed, does <u>not</u> appear to be tampered with, and display indicates the logger is working

Logger Tested "OK" – <u>If Logger Intact is "Y"</u> then is it properly logging the light ON/OFF, "Y" or "N"? <u>If Logger Intact is "N"</u> use "NA"

_____

COMMENTS

General Comments

Item #	Form Name	Comments

Site Photo Log

Record site photo information here including the PhotoID (i.e. digital file name) and a brief description of the photo where needed. Site Photos should include the site entrance and entire building, rebated measures, and close-up photos of nameplates, lamp codes, and other make/model identification. Refer to the training manual for more on what photos to take. Photo/file naming conventions is SiteID_Item# or SiteID 00# (e.g. PGE_056789_1.jpg, PGE_056789 001.jpg).

Item #	Description/Comments/Measure Code *(no data entry)*
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
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24	

Incentive Payment

My signature acknowledges that I received a participation incentive in the form of a $____ gift card for the survey effort.

Print Name		**Date Received**	
Gift Card Company		**Gift Card Serial #**	
Signature			

PROCESS PUMPING VFD ON-SITE SURVEY INSTRUMENT

Process Pumping VFD On-Site Data Collection Form

Project Information			
IOU			
ApplicationCode or ProjectID			
Program ID			
Program Name			
Point of Sale Purchase?			
IOU Claim ID(s)	Measure 1:		Put units from tracking system below
	Measure 2:		
IOU Measure Description	Measure 1:		
	Measure 2:		<NormUnit>
Number of Units Installed	Measure 1:		
	Measure 2:		
Project Application Date			
Project Installation Date			Engineer update below as needed [ENTER]:
Business Name			
Business Street Address			
Business City			
Customer Contact Name			
Customer Contact Phone Number			
Customer Contact E-mail Address			
Vendor Business Name			
Vendor Contact Name			
Vendor Contact Phone Number			
Vendor Contact E-mail Address			
Site Information			
Assigned Engineer Name			
Assigned Engineer Firm			
Site Visit Consent Granted Y/N			
Date of First On-Site Visit			
Utility Meter Information			Engineer update below as needed [ENTER]:
Account Number from Tracking Data	Measure 1:		
Dedicated Electric Meter for Pump			
If no, describe other loads on meter			
Associated Electric Meter Number for			
Account Number from Tracking Data	Measure 2:		
Dedicated Electric Meter for Pump			
If no, describe other loads on meter			
Associated Electric Meter Number for			

Process Pumping VFD On-Site Data Collection Form

Recruitment Checklist

Application # _____

Meeting	
Location of Meeting	
Directions to Meeting Spot	
Date of Meeting	
Time of Meeting	
Site Contact Name	
Site Contact Phone Number	
Site Contact E-mail	
VFD Measure #1	
Is the pump/VFD served by a dedicated electric meter, or are there other loads such as pumps on the same electric meter?	
If shared load -- what other loads are on the electric meter including horsepower associated with additional pumps?	
VFD Measure #2	
Is the pump/VFD served by a dedicated electric meter, or are there other loads such as pumps on the same electric meter?	
If shared load -- what other loads are on the electric meter including horsepower associated with additional pumps?	
VFD Information	
Does VFD Have Trending Capability?	
If yes, do you trend data, such as kWh every hour, VFD Hz, etc?	
Can you share that with us?	
If yes, can you trend data for us, including kWh every hour, VFD Hz, etc?	
Project Information Requested from Participants	
Project invoices	
Monthly water usage data for last three years	
Pump test data (OPE) from VFD post-installation period	
Pump test data (OPE) from VFD pre-installation period	

Process Pumping VFD On-Site Data Collection Form

Business Activity

Application # _____

[Circle One Below]	What is the main business ACTIVITY at this facility?	
1	Offices (non-medical)	
2	Restaurant/Food Service	
3	Food Store (grocery/liquor/convenience)	
4	Agricultural (farms, greenhouses)	
5	Retail Stores	
6	Warehouse	
7	Health Care	
8	Education	
9	Lodging (hotel/rooms)	
10	Public Assembly (church, fitness, theatre, library, museum, convention)	
11	Services (hair, nail, massage, spa, gas, repair)	
12	Industrial (food processing plant, manufacturing)	
13	Laundry (Coin Operated, Commercial Laundry Facility, Dry Cleaner)	
14	Condo Assoc./Apartment Mgr (Garden Style, Mobile Home Park, High-rise, Townhouse)	
15	Public Service (fire/police/postal/military)	
77	Other / Record Business Activity [ENTER] ===>	

Provide additional comments as needed [ENTER] ===>

Provide specifics on activity [ENTER] ===>
(i.e., industrial bakery or commercial greenhouse)

Process Pumping VFD On-Site Data Collection Form

Application # _____   <=== Enter Application Code

[Circle One Entry]	[Answer for Measure #1] Along with the new VFD, was a new pump also installed at the same time? [PROBE TO FIND CORRECT RESPONSE BELOW]	[Circle One Entry]	[Answer for Measure #2] Along with the new VFD, was a new pump also installed at the same time? [PROBE TO FIND CORRECT RESPONSE BELOW]
1	Replaced existing pump	1	Replaced existing pump
2	Added a new pump	2	Added a new pump
3	Added VFD to existing pump	3	Added VFD to existing pump
88	Refused	88	Refused
99	Don't know	99	Don't know

Provide additional comments as needed [ENTER] ===>

[Ask for any new VFD added to an existing pump; ANSWER #3 ABOVE]

(Circle One Entry)	[Answer for Measure #1] Approximately how old is the pump being controlled by the VFD? Would you say...	(Circle One Entry)	[Answer for Measure #2] Approximately how old is the pump being controlled by the VFD? Would you say...
4	Less than 5 years old	4	Less than 5 years old
5	Between 5 and 10 years old	5	Between 5 and 10 years old
6	Between 10 and 15 years old	6	Between 10 and 15 years old
7	More than 15 years old	7	More than 15 years old
8	Stated age _____years	8	Stated age _____years
88	Refused	88	Refused
99	Don't know	99	Don't know

Provide additional comments as needed [ENTER] ===>

Process Pumping VFD On-Site Data Collection Form

EE Measure Replacement Battery

Application # _____   <=== Enter Application Code

[Ask for any new VFD added to an existing pump; ANSWER #3 ABOVE]

[Answer for Measure #1]		**[Answer for Measure #2]**	
[Circle One Entry]	How would you describe the condition of the pump being controlled by the VFD? Would you say it is in…	**[Circle One Entry]**	How would you describe the condition of the pump being controlled by the VFD? Would you say it is in…
9	Poor condition	9	Poor condition
10	Fair condition	10	Fair condition
11	Good condition	11	Good condition
88	Refused	88	Refused
99	Don't know	99	Don't know

Provide additional comments as needed [ENTER] ===>

[Ask for any new VFD added to an existing pump; ANSWER #3 ABOVE]

[Answer for Measure #1]		**[Answer for Measure #2]**	
[Circle One Entry]	How many years are left in the pump itself until you will replace it?	**[Circle One Entry]**	How many years are left in the pump itself until you will replace it?
12	Remaining pump life _____ years	12	Remaining pump life _____ years
88	Refused	88	Refused
99	Don't know	99	Don't know

Provide additional comments as needed [ENTER] ===>

Process Pumping VFD On-Site Data Collection Form

Application # _____   <=== Enter Application Code

[Ask for any new VFD added to an existing pump; ANSWER #3 ABOVE]

[Answer for Measure #1]		[Answer for Measure #2]	
[Circle One Entry]	What type of pump flow controls were in place BEFORE the VFD was installed?	**[Circle One Entry]**	What type of pump flow controls were in place BEFORE the VFD was installed?
13	None; pump was uncontrolled	13	None; pump was uncontrolled
14	Throttle valve controls	14	Throttle valve controls
15	VFD controls	15	VFD controls
16	Other / Provide Related Commentary Below:	16	Other / Provide Related Commentary Below:
88	Refused	88	Refused
99	Don't know	99	Don't know

Provide additional comments as needed [ENTER] ===>

[Ask for any new VFD added to an existing pump; ANSWER #3 ABOVE]

[Answer for Measure #1]		[Answer for Measure #2]	
(Circle One Entry)	Approximately how old were the replaced pump flow controls? Would you say...	**(Circle One Entry)**	Approximately how old were the replaced pump flow controls? Would you say...
17	Less than 5 years old	17	Less than 5 years old
18	Between 5 and 10 years old	18	Between 5 and 10 years old
19	Between 10 and 15 years old	19	Between 10 and 15 years old
20	More than 15 years old	20	More than 15 years old
21	Stated age _____ years	21	Stated age _____ years
88	Refused	88	Refused
99	Don't know	99	Don't know

Provide additional comments as needed [ENTER] ===>

Process Pumping VFD On-Site Data Collection Form

EE Measure Replacement Battery

Application # _____   <=== Enter Application Code

[Ask for any new VFD added to an existing pump; ANSWER #3 ABOVE]

[Answer for Measure #1]		**[Answer for Measure #2]**	
[Circle One Entry]	How would you describe the condition of the replaced pump flow controls? Would you say the controls were …	**[Circle One Entry]**	How would you describe the condition of the replaced pump flow controls? Would you say the controls were …
22	Not working	22	Not working
23	In poor condition	23	In poor condition
24	In fair condition	24	In fair condition
25	In good condition	25	In good condition
88	Refused	88	Refused
99	Don't know	99	Don't know

Provide additional comments as needed [ENTER] ===>

Process Pumping VFD On-Site Data Collection Form

EE VFD Battery

Application # _____   <=== Enter Application Code

	[Answer for Measure #1]		**[Answer for Measure #2]**
	[Ask ALL]		
[Circle One Entry]	What was the main reason you decided to control your pump flow using a VFD?	**[Circle One Entry]**	What was the main reason you decided to control your pump flow using a VFD?
26	Existing controls were not functioning adequately	26	Existing controls were not functioning adequately
27	Using alternative controls was not a feasible solution (such as throttling or running an uncontrolled pump)	27	Using alternative controls such as throttling or running an uncontrolled pump was not a feasible solution
28	The pump and VFD were sold as an integrated unit	28	The pump and VFD were sold as an integrated unit
29	Wanted improved pump performance or functionality	29	Wanted improved pump performance or functionality
30	Wanted remote monitoring and control capability	29	Wanted improved pump performance or functionality
31	Wanted automatic speed controls	29	Wanted improved pump performance or functionality
32	Other / Provide Related Commentary Below:	30	Other / Provide Related Commentary Below:
88	Refused	88	Refused
99	Don't know	99	Don't know

Provide additional comments as needed [ENTER] ===>

Process Pumping VFD On-Site Data Collection Form

Application # _____   <=== Enter Application Code

[Ask ALL]

[Circle One Entry]	[Answer for Measure #1] At the time of VFD installation, was the program or rebate important or influential in your decision to purchase a VFD?	[Circle One Entry]	[Answer for Measure #2] At the time of VFD installation, was the program or rebate important or influential in your decision to purchase a VFD?
33	Yes	31	Yes
34	No	32	No
35	Other / Provide Related Commentary Below:	33	Other / Provide Related Commentary Below:
88	Refused	88	Refused
99	Don't know	99	Don't know

Provide additional comments as needed [ENTER] ===>

Process Pumping VFD On-Site Data Collection Form

EE VFD Battery

Application # _____   <=== Enter Application Code

[Ask ALL]

	[Answer for Measure #1]		**[Answer for Measure #2]**
(Circle One Entry)	If not for the program/rebate, approximately how much longer would you have waited to install VFD flow controls? Would you say...	**(Circle One Entry)**	If not for the program/rebate, approximately how much longer would you have waited to install VFD flow controls? Would you say...
36	Within a one-year period	34	Within a one-year period
37	Between 2 and 3 years	35	Between 2 and 3 years
38	4 or more years	36	4 or more years
39	Would never have installed a VFD	38	Would never have installed a VFD
40	Stated _____ years	37	Stated _____ years
88	Refused	88	Refused
99	Don't know	99	Don't know

Provide additional comments as needed [ENTER] ===>

Process Pumping VFD On-Site Data Collection Form

Application # _____   <=== Enter Application Code

[Ask ALL]

	[Answer for Measure #1]		**[Answer for Measure #2]**
[Circle One Entry]	What type of pump does the VFD control?	**[Circle One Entry]**	What type of pump does the VFD control?
41	Vertical turbine pump	39	Vertical turbine pump
42	Submiersible pump	40	Submiersible pump
43	Centrifugal pump	41	Centrifugal pump
44	Other / Provide Related Commentary Below:	30	Other / Provide Related Commentary Below:
88	Refused	88	Refused
99	Don't know	99	Don't know

Provide additional comments as needed [ENTER] ===>

[Ask ALL]

	[Answer for Measure #1]		**[Answer for Measure #2]**
(Circle One Entry)	What is the horsepower rating of the pump that is being controlled by the VFD? Would you say...	**(Circle One Entry)**	What is the horsepower rating of the pump that is being controlled by the VFD? Would you say...
45	Less than 25 hp	42	Less than 25 hp
46	Between 25 and 50 hp	43	Between 25 and 50 hp
47	Between 50 and 100 hp	44	Between 50 and 100 hp
48	Between 100 and 200 hp	45	Between 100 and 200 hp
49	Between 200 and 300 hp	46	Between 200 and 300 hp
50	More than 300 hp	47	More than 300 hp
51	Rated capacity _____ hp	48	Rated capacity _____ hp
88	Refused	88	Refused
99	Don't know	99	Don't know

Provide additional comments as needed [ENTER] ===>

Process Pumping VFD On-Site Data Collection Form

2019 Pumping System Operation by Measure

Measure # _____

Application # _____

IOU Measure Description _____

Number of units installed # _____

Month of 2019	During what months did you irrigate using this pump? [Check All that Apply]	How many acres were served by this pump each month? [Enter Acres]	List crops grown that were served by this pump? [Enter Crops and Percentage of Area Served if More Than One Crop]	List crop age for each crop in years. [Enter Crops and Age]	List irrigation method served by this pump? [Enter Drip, Sprinkler, flood, etc. and Percentages of Area Served if More Than One Method is Used]	List water supply serving this pump? [Enter Well Water, District Main, etc. and Percentages of Area Served if More Than One Source was Used]	Describe the field configuration? [Enter Number of Irrigation Sets and Associated Acres and Any Association with Each Crop]
January							
February							
March							
April							
May							
June							
July							
August							
September							
October							
November							
December							
	Provide additional comments as needed [ENTER BELOW]	Provide additional comments as needed [ENTER BELOW]	Provide additional comments as needed [ENTER BELOW]	Provide additional comments as needed [ENTER BELOW]	Provide additional comments as needed [ENTER BELOW]	Provide additional comments as needed [ENTER BELOW]	Provide additional comments as needed [ENTER BELOW]

Process Pumping VFD On-Site Data Collection Form

2018 Pumping System Operation by Measure

Measure # _____

Application # _____

IOU Measure Description _____

Number of units installed # _____

Month of 2018	During what months did you irrigate using this pump? [Check All that Apply]	How many acres were served by this pump each month? [Enter Acres]	List crops grown that were served by this pump? [Enter Crops and Percentage of Area Served if More Than One Crop]	List crop age for each crop in years. [Enter Crops and Age]	List irrigation method served by this pump? [Enter Drip, Sprinkler, flood, etc. and Percentages of Area Served if More Than One Method is Used]	List water supply serving this pump? [Enter Well Water, District Main, etc. and Percentages of Area Served if More Than One Source was Used]	Describe the field configuration? [Enter Number of Irrigation Sets and Associated Acres and Any Association with Each Crop]
January							
February							
March							
April							
May							
June							
July							
August							
September							
October							
November							
December							
	Provide additional comments as needed [ENTER BELOW]	Provide additional comments as needed [ENTER BELOW]	Provide additional comments as needed [ENTER BELOW]	Provide additional comments as needed [ENTER BELOW]	Provide additional comments as needed [ENTER BELOW]	Provide additional comments as needed [ENTER BELOW]	Provide additional comments as needed [ENTER BELOW]

Process Pumping VFD On-Site Data Collection Form

2017 Pumping System Operation by Measure

Measure # _____

Application # _____

IOU Measure Description _____

Number of units installed # _____

Month of 2017	During what months did you irrigate using this pump? [Check All that Apply]	How many acres were served by this pump each month? [Enter Acres]	List crops grown that were served by this pump? [Enter Crops and Percentage of Area Served if More Than One Crop]	List crop age for each crop in years. [Enter Crops and Age]	List irrigation method served by this pump? [Enter Drip, Sprinkler, flood, etc. and Percentages of Area Served if More Than One Method is Used]	List water supply serving this pump? [Enter Well Water, District Main, etc. and Percentages of Area Served if More Than One Source was Used]	Describe the field configuration? [Enter Number of Irrigation Sets and Associated Acres and Any Association with Each Crop]
January							
February							
March							
April							
May							
June							
July							
August							
September							
October							
November							
December							
	Provide additional comments as needed [ENTER BELOW]	Provide additional comments as needed [ENTER BELOW]	Provide additional comments as needed [ENTER BELOW]	Provide additional comments as needed [ENTER BELOW]	Provide additional comments as needed [ENTER BELOW]	Provide additional comments as needed [ENTER BELOW]	Provide additional comments as needed [ENTER BELOW]

Process Pumping VFD On-Site Data Collection Form

2019 Pumping System Operation by Measure (part 2)   (page 1 of 2)

Measure # _____

Application # _____

IOU Measure Description _____

Number of units installed # _____

An important modeling feature we want to define concerns the
the **predominant modes of operation** that we can define, based on feedback from
the farmer, and defined as the pump operating at a certain speed and flow rate.

Predominant Modes of Operation	Motor speed [expressed as percent of full speed] (%)	Pumping Flow Rate (gpm)	VFD Frequency (Hz)	Pump Operating Pressure (psi)	VFD Settings [Manual versus Auto]
Mode 1					
Mode 2					
Mode 3					
Full speed/flow					
	Provide additional comments as needed [ENTER BELOW]	Provide additional comments as needed [ENTER BELOW]	Provide additional comments as needed [ENTER BELOW]	Provide additional comments as needed [ENTER BELOW]	Provide additional comments as needed [ENTER BELOW]

Process Pumping VFD On-Site Data Collection Form

Seasonal Operation by Mode	List Months with Common Irrigation Needs	Predominant Modes of Operation	Days per Week in Each Mode	Hours per Day in Each Mode	Percent of Irrigation During Weekday Afternoons
Spring		Mode 1			
		Mode 2			
		Mode 3			
		Full speed/flow			
Summer		Mode 1			
		Mode 2			
		Mode 3			
		Full speed/flow			
Fall		Mode 1			
		Mode 2			
		Mode 3			
		Full speed/flow			
Winter		Mode 1			
		Mode 2			
		Mode 3			
		Full speed/flow			
	Provide additional comments as needed [ENTER BELOW]	Provide additional comments as needed [ENTER BELOW]	Provide additional comments as needed [ENTER BELOW]	Provide additional comments as needed [ENTER BELOW]	Provide additional comments as needed [ENTER BELOW]

Process Pumping VFD On-Site Data Collection Form

EE Measure Installation Verification

Measure # _____

Application # _____

IOU Measure Description _____

Number of units installed # _____

[Circle One Entry]	Was the VFD found to be installed and operable at the time of the on-site inspection?	
1	Yes	
2	No	
3	Other / Provide Related Commentary [ENTER] ====>	
	Provide additional comments as needed [ENTER] ===>	

[If 2/No above, then provide additional comments]

	Provide additional comments to explain [ENTER] ===>	

Process Pumping VFD On-Site Data Collection Form

EE Pumping System Specifications

Measure # _____

Application # _____

IOU Measure Description _____

Number of units installed # _____

[Circle One per Line or Write Down Units if Different]

[ENTER PUMP SPECIFICATIONS]

Manufacturer _____

Make _____

Model _____

Pump Type _____   Vertical turbine   Submersible   Centrifugal

Year of manufacture _____

Pumping Application _____   Booster pump   Well pump

Current Operating Output Pressure _____   PSIG

Current Operating Flow Rate _____   gpm

[ENTER MOTOR SPECIFICATIONS]

Manufacturer _____

Make _____

Model _____

Power Rating _____   Horsepower

Voltage _____   110   115   208   230   460

RLA _____   Running load amps

Rated Motor Efficiency _____   %

Motor Rated Speed _____   rpm

Year of manufacture _____

[ENTER VFD EQUIPMENT SPECIFICATIONS]

Manufacturer _____

Make _____

Model _____

[Circle One per Line or Write Down Units if Different]

Rated VFD Efficiency _____   %

Year of manufacture _____

Current Operating Frequency _____   Hz

Current Operating Motor Speed _____   rpm   %

Cumulative Electric Usage _____   kWh

Cumulative Run Hours _____   Hours

Provide additional comments as needed [ENTER] ===>

[ENTER RELEVANT WELL CHARACTERISTICS]   **[Circle One per Line or Write Down Units if Different]**
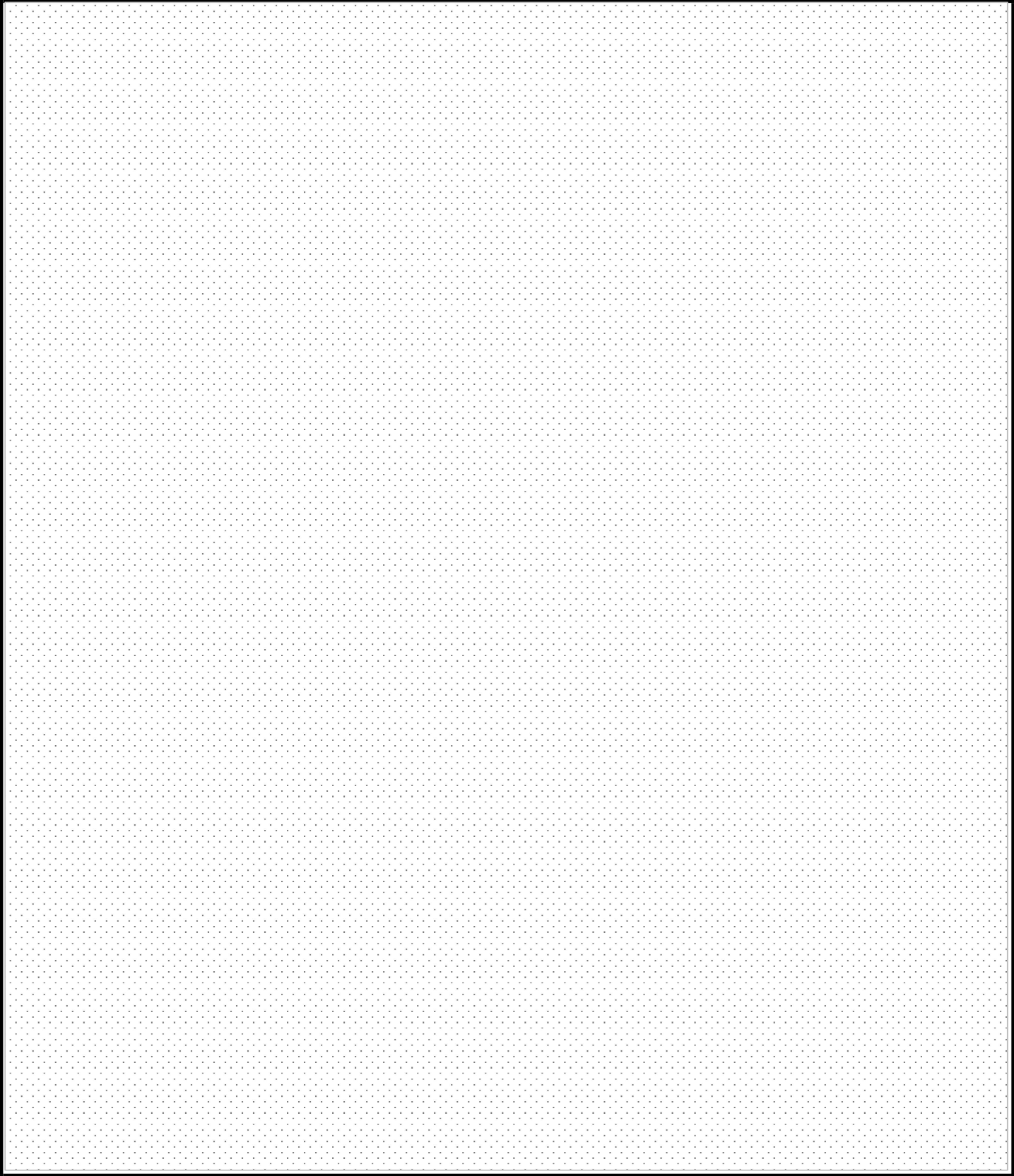
Well depth _____   Feet

Provide additional comments as needed [ENTER] ===>
Ask if well depth varies and if so describe

Process Pumping VFD On-Site Data Collection Form

Please provide of sketch of the Pumping Operation/ Field, depicting pump configuration

Additional Notes from Site Visit

AGRICULTURAL IRRIGATION ON-SITE SURVEY INSTRUMENT

CPUC Agricultural Irrigation Prescriptive Measure Study	
1. General Info	**2. Site Visit Preparation Checklist**

1. General Info		**2. Site Visit Preparation Checklist**	
Site ID		□ Confirm site visit date/time/location	
Visit Date & Time			
Field Engineer		**3. Data Requests**	
Facility Name		□ Project invoices	
Address		□ Utility bills - pre and post (up to 24 months)	
Contact		□ Water usage data - pre and post (up to 24 months)	
Phone		□ Copy of recent pump testing data (OPE)	
Install Date		□ Copy of pre-installation pump testing data (OPE)	
Operation Notes		□ Smart meter interval data	

4. Site Visit Logistics			
Where to meet and when?		Contact cell phone number:	
Who are we meeting?		Details of meeting spot:	

5. Farm Characteristics		
Irrigation area impacted by project (acres)		
Growing season(s) - as detailed as possible		
Does irrigation occur outside of growing season(s)? Describe.		
Irrigation start (# month)		Irrigation end (# month)	
How is irrigation water supplied (well, district main, other)?		
Interview to determine if pre/post water use was atypical due to drought.		

6. Irrigation Characteristics		
	Pre	**Post**
Irrigation method (flood, drip, sprinkler, vacant field, other)		
Crop type(s)		
Crop age(s)		
Quantity and average size of "sets" (sections of acreage irrigated at a time)		
Estimated count of trees/bushes/plants per acre		
Quantity of sprinkler nozzles/emitters per acre		
Nozzle/emitter manufacturer		
Nozzle/emitter casing color and/or model		
Nozzle/emitter rated flow rate (gpm - may need to look up after)		
Pump control configuration (constant, two-speed, VFD)		
If VFD, explain how speed is controlled - manually set or automatic?		
If VFD, estimate average pump speed during irrigation		
Estimated pump operating pressure (gauge readings) (psi)		
On average, how many times per month is each set irrigated?		
In the warmest/driest month, how many times per month is each set irrigated?		
How long is each set irrigated on average? (hours)		
Does irrigation occur during summer weekday afternoons?		
Additional pre-project notes		

7. Motor Nameplate Data
(Note: Record pre-install pump information if it has changed)

Motor #	Make	Model	Horsepower	Phase	Voltage	Rated Amps	RPM	Rated Efficiency
Motor 1								
Motor 2								
Motor 3								
Motor 4								
Motor 5								

8. Preexisting Equipment Details
How old was your existing irrigation equipment?
In what condition was the existing irrigation equipment?
How much longer do you think the irrigation system would have lasted if you had not replaced it?
Is this your first time using drip tape as an irrigation method?
[If yes] How is functioning so far? When are you anticipating to replace it next?
[If no] How long/How many times have you used drip tape? How frequently do you typically replace your drip tape?

ESPI TANKLESS WATER HEATER ON-SITE SURVEY INSTRUMENT

CPUC ESPI Tankless Water Heater Prescriptive Measure Study

1. General Info	ERS Site ID:
Visit Date & Time	
Field Engineer	
Facility Name	
Address	
Contact	
Phone	
Project Installation Date	
Decision maker contact info	
Contractor contact info	

2. Site Visit Preparation Checklist

□ Identify and check out equipment as needed

□ Bring site visit kit, gloves, Hobo thermocouple logger, IR gun

□ Confirm site visit date/time/location

□ Ask battery of pre-visit questions with site contact

□ Does facility have additional safety requirements?

□ Verify TWH installation with site contact (qty, size)

3. TWH Nameplate Information			Efficiency				4. Spot Measurements	
WH #	Make/Model	Max GPM (@ temp rise)	UEF or EF	Et (thermal eff)	Recovery Efficiency	Input Capacity (Btu/h)	Temp Out (F)*	Temp In (F)*
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								

* Temperature inlet or outlet (in/exit), Spot check temperature with IR gun

5. Pre Existing WH Information	
Type (storage/ tankless)	
Fuel	
Tank Size (Gallon) or Capacity (kBtuh)	
Operating Condition	
Age†	
Quantity	
RUL (yrs)	

† Use increments of 5 years for estimation

6. Operational Information
What are the facility's typical hours of operation
Does the facility operate on holidays? Indicate holidays with no operation.
Does facility operation/production vary throughout the year? Please indicate fluctuation by season or by month.
Is there enough variation in facility operation to affect energy usage?

7. EUL Questions
1) Was your existing water heater equipment a storage or tankless water heater(s)?
2) How old was your existing water heater equipment?[†]
3) What condition wat the existing water heating equipment in?
4) How much longer do you think your existing water heater(s) would have lasted if you had not replaced it?
5) How is your new tankless water heater(s) functioning so far?
6) When are you anticipating replacing your water heater(s) next?

† Use increments of 5 years for estimation

Data Collection
❑ Collect TWH nameplate information (max GPM, UEF or EF, Input Capacity, Recovery Eff)
❑ Gather information on hot water end uses and survey the relatent hot water fixtures during walkthrough
Spot Measurements
❑ Request permission to spot measure TWH inlet temperature and supply (exit) temperature by puncturing small hole in insulation.
❑ Spot measurements of inlet and supply (exit) pipe surface temperature.
Baseline
❑ Survey site staff for information on project baseline and preexisting conditions at facility
❑ Determine the baseline water heater type, age, (and if possible, model, tank size (gal), model)
Facility Operating Conditions
❑ Survey site staff for information on facility's operating schedule and seasonal variation
❑ Inventory all gas meters at facility
❑ Inventory all gas uses at facility, by season (estimate gas usage share)
Checkout
❑ Provide contact information via business card

8. Notes

APPENDIX C   ESPI MEASURE MAPPING

PA	ESPI Category	Measure Description
PGE	AG IRRIGATION	Sprinkler to Drip irrigation - Field/Vegs (well and non well)
PGE	PROCESS PUMPING VFD	AGR WELL PUMPS (LTE 75HP) VFD - ENHANCED SPECIFICATIONS
PGE	PROCESS PUMPING VFD	BOOSTER PUMPS (GT 75HP TO LTE 150HP) VFD - ENHANCED SPECIFICATIONS, RETROFIT AND NEW CONSTRUCTION
PGE	PROCESS PUMPING VFD	BOOSTER PUMPS (LTE 75HP) VFD - ENHANCED SPECIFICATIONS, RETROFIT AND NEW CONSTRUCTION
PGE	PROCESS PUMPING VFD	Glycol Pump VFD- 15HP
PGE	PROCESS PUMPING VFD	Glycol Pump VFD- 20HP
PGE	PROCESS PUMPING VFD	Glycol Pump VFD- 5HP
PGE	PROCESS PUMPING VFD	Variable Frequency Drive on Agricultural Booster Pumps (<=150hp)
PGE	PROCESS PUMPING VFD	Variable Frequency Drive on Agricultural Well Pumps (<=300hp)
PGE	PROCESS PUMPING VFD	WELL PUMPS (GT 75HP TO LTE 600HP) VFD - ENHANCED SPECIFICATIONS, RETROFIT AND NEW CONSTRUCTION
PGE	REFRIGERATION CASE LED LIGHTING	LIN FT T1 LED LTBAR <= 5FT UNIT NO OCC SENS CTRL REPLACE MULT LAMP PROFILE
PGE	REFRIGERATION CASE LED LIGHTING	LIN FT T1 LED LTBAR > 5FT UNIT NO OCC SENS CTRL REPLACE MULT LAMP PROFILE
PGE	REFRIGERATION CASE LED LIGHTING	LIN FT T2 LED LTBAR <= 5FT UNIT NO OCC SENS CTRL REPLACE MULT LAMP PROFILE
PGE	REFRIGERATION CASE LED LIGHTING	LIN FT T2 LED LTBAR > 5FT UNIT NO OCC SENS CTRL REPLACE MULT LAMP PROFILE
PGE	REFRIGERATION CASE LED LIGHTING	LIN FT T3 LED LTBAR <= 5FT UNIT NO OCC SENS CTRL REPLACE MULT LAMP PROFILE
PGE	REFRIGERATION CASE LED LIGHTING	LIN FT T3 LED LTBAR > 5FT UNIT NO OCC SENS CTRL REPLACE MULT LAMP PROFILE
PGE	REFRIGERATION CASE LED LIGHTING	REFRIG CASE LTG-TIER 1 LED LIGHTBAR <= 5-FOOT UNIT NO OCC SENSOR CONTROL
PGE	REFRIGERATION CASE LED LIGHTING	REFRIG CASE LTG-TIER 1 LED LIGHTBAR > 5-FOOT UNIT NO OCC SENSOR CONTROL
PGE	REFRIGERATION CASE LED LIGHTING	REFRIG CASE LTG-TIER 2 LED LIGHTBAR <= 5-FOOT UNIT NO OCC SENSOR CONTROL
PGE	REFRIGERATION CASE LED LIGHTING	REFRIG CASE LTG-TIER 2 LED LIGHTBAR > 5-FOOT UNIT NO OCC SENSOR CONTROL
PGE	REFRIGERATION CASE LED LIGHTING	REFRIG CASE LTG-TIER 3 LED LIGHTBAR <= 5-FOOT UNIT NO OCC SENSOR CONTROL

PA	ESPI Category	Measure Description
PGE	REFRIGERATION CASE LED LIGHTING	REFRIG CASE LTG-TIER 3 LED LIGHTBAR > 5-FOOT UNIT NO OCC SENSOR CONTROL
PGE	WATER HEATING TANKLESS WATER HEATER	Instantaneous Domestic Water Heater - Condensing, 76-200 kBTUh, TE > 90%
PGE	WATER HEATING TANKLESS WATER HEATER	Instantaneous Domestic Water Heater - Condensing, > 200 kBTUh, > 90% TE
PGE	WATER HEATING TANKLESS WATER HEATER	Instantaneous Domestic Water Heater, > 200 kBTUh, > 85% TE
SCE	PROCESS PUMPING VFD	VFD on Ag Booster Pumps (<=150hp) NEW Express Pump
SCE	PROCESS PUMPING VFD	VFD on Ag Well Pumps (<=300hp) NEW Express Pump
SCE	PROCESS PUMPING VFD	VFD on Agricultural Booster Pumps (<=150hp) Pump
SCE	PROCESS PUMPING VFD	VFD on Agricultural Well Pumps (<=300hp) Pump
SCE	PROCESS PUMPING VFD	Variable Frequency Drive on Agricultural Booster Pumps (<=150hp)
SCE	PROCESS PUMPING VFD	Variable Frequency Drive on Agricultural Well Pumps (<=300hp)
SCE	REFRIGERATION CASE LED LIGHTING	(1) 72in Retrofits in Medium Temp Reach-in Display Cases LED replacing (1) 72in T12 Linear Fluorescent
SCG	WATER HEATING TANKLESS WATER HEATER	Tankless Water Heater <=200 MBtu/hr (Small / Medium), Tier 1 (>=0.81 UEF)
SCG	WATER HEATING TANKLESS WATER HEATER	Tankless Water Heater <=200 MBtu/hr (Small / Medium), Tier 2 (>=0.87 UEF)
SCG	WATER HEATING TANKLESS WATER HEATER	TanklessWaterHeaters-Large(>200MBtuh)-Tier2(>=90%TE)
SDGE	PROCESS PUMPING VFD	VFD on Agricultural Booster Pumps for 150 HP and below
SDGE	REFRIGERATION CASE LED LIGHTING	Lighting - Premium Tier 5 foot Case Door
SDGE	REFRIGERATION CASE LED LIGHTING	Lighting - Premium Tier 6 foot Case Door

APPENDIX D NET-TO-GROSS SUPPORTING MATERIALS

This appendix provides the following materials to support the NTG Analysis:

- A document describing the updates made to the current Nonresidential Net-to-Gross (NTG) framework for this 2018 evaluation cycle.

- A detailed description of the NTG algorithm for both downstream and midstream programs. Also included are the individual survey responses for each customer and vendor survey, along with the PAI and vendor scores, and the resulting NTGRs used to develop the ex-post NTGR values for the Refrigeration Case Lighting, Process Pumping VFDs and Tankless Water Heating measures.

UPDATES TO NONRESIDENTIAL NET-TO-GROSS FRAMEWORK FOR 2018 EVALUATION

This Appendix describes updates made to the current Nonresidential Net-to-Gross (NTG) framework for this 2018 evaluation cycle. This framework has been used with minor modifications since the 2006-2008 evaluation cycle. Team members from both the Group A and Group D evaluation teams coordinated to develop two changes that have been incorporated into the 2018 Small Commercial and Lighting evaluations:

1. **An alternative to the current PAI-1 score.** This is designed to address problems identified in previous evaluation cycles.
2. **Expansion of the framework to address Midstream programs.** The expanded framework incorporates a Vendor score and combines it with the Participating Customer score if certain conditions are met.

The updates apply to the following nonresidential programs and measures for the PY2018 evaluation cycle. The Group A and Group D evaluation teams will consider modifications to these updates as well as expansion to additional measures for the PY2019 evaluations.

TABLE D-1: AFFECTED PROGRAMS AND MEASURES

NTG Component	Program Type	Program Year	Program	Measure
PAI_1	Deemed	PY18 & 19	All Relevant Nonresidential Downstream Deemed Programs	Agricultural Irrigation
				Process Pumping VFD
				Refrigeration Case LED Lighting
				Water Heating Tankless Water Heater
				Lighting Indoor LED Reflector Lamp
				Lighting Indoor LED Lamp
		PY19		Lighting Indoor LED Fixture
				Lighting Indoor LED High Bay Fixture
				Lighting Outdoor LED Fixture
				Ozone Laundry
	Calculated	PY18 & 19	All Nonresidential Calculated Program-Measures	
Midstream	Deemed	PY18	SCE Midstream Point of Purchase	Lighting Indoor LED lamps and fixtures
			SCE IDEEA365	Process Pumping VFD
			PG&E and SCG Commercial Deemed Incentives	Tankless Water Heaters
		PY19	TBD	TBD
	Calculated	PY18 & 19	None	None

D.1   BACKGROUND

Over the last several evaluation cycles, Net-to-Gross (NTG) analysis for Nonresidential programs has used a Self-Report Approach (SRA) that is based on the results of self-report telephone surveys with program participants. The existing Nonresidential Net-to-Gross (NTG) framework was originally developed by the Nonresidential Working Group during the 2006-2008 evaluation cycle and was updated modestly during the 2010-2012 cycle.   This approach was designed to fully comply with the California Energy Efficiency Evaluation: Protocols: Technical, Methodological, and Reporting Requirements for Evaluation Professionals[1] (Protocols) and the Guidelines for Estimating Net-To-Gross Ratios Using the Self-Report Approaches (Guidelines), as demonstrated in the Nonresidential NTGR Methods (Appendix D-1 to the full WO033 Custom Final Report).

Standardized Nonresidential NTG Algorithm Improvements

Current Algorithm and Rationale

The standardized Nonresidential NTG framework incorporates a 0 to 10 scoring system for key questions used to estimate the NTGR. It consists of a 3-score structure, with each score representing a different way of characterizing program influence:

- **Program attribution index 1 (PAI–1)** score that reflects the influence of the most important of various program and non-program-related elements in the customer's decision to select the specific program measure at the time they did. Program influence through vendor recommendations is also incorporated in this score.

- **Program attribution index 2 (PAI–2)** score that captures the perceived importance of the program (whether rebate, recommendation, training, or other program intervention) relative to non-program factors in the decision to implement the specific measure that was eventually adopted or installed. This score is determined by asking respondents to assign importance values to both the program and most important non-program influences so that the two total 10. The program influence score is reduced in half if respondents say they had already made their decision to install the specific program qualifying measure before they learned about the program.

- **Program attribution index 3 (PAI–3)** score that captures the likelihood of various actions the customer might have taken at the time they did, and in the future, if the program had not been available (the counterfactual).

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[1]   The TecMarket Works Team. California Energy Efficiency Evaluation Protocols: Technical, Methodological, and Reporting Requirements for Evaluation Professionals. Directed by the CPUC's Energy Division, and with guidance from Joint Staff, April 2006.

The resulting self-reported NTGR in most cases is simply the average of the PAI-1, PAI-2, and PAI-3 values, divided by 10. The one exception to this is when the respondent indicates a 10 in 10 probability of installing the same equipment at the same time in the absence of the program, in which case the NTGR is based on the average of the PAI-2, and PAI-3 values only. The reasoning is that the customer has responded with absolute certainty that the program did not influence their decisionmaking through their responses to PAI-3, whereas responses to the PAI-1 score typically indicate some level of program influence despite efforts to check and resolve the consistency of their responses.

The rationale for using three separate scores (triangulation [2]), rather than relying on a single metric, is as follows. The objective of the NTGR analysis is to determine the fraction of the gross savings that occurred because of the program. One minus this score is interpreted as freeridership. Some questions are designed to measure the counterfactual by asking the participant several questions about what they would have done in the absence of the program. Other questions attempt to get at the direct influence of the rebate and other forms of assistance on the decision to install efficient equipment. As part of this set of questions, the respondent is prompted to consider other possible non-program influences that might have played a role in the decision. Still other questions attempt to establish the chronology of when the participant first heard about the program and their decision to install the efficient equipment. These three different types of questions are trying to measure three slightly different things with some being more difficult than others for the respondent to assess. For example, it is easier for the respondent to recall whether they found out about the availability of the rebate before or after they decided to buy the efficient equipment than it is to imagine what they would have done in the absence of the program or assess the influence of the rebate. Nevertheless, all three types of questions provide information about the influence of the program that decision makers should find both meaningful and useful.

One of the problems inherent in asking program participants if they would have installed the same equipment or adopted the same energy-saving practices without the program is that we are asking them to recall what has happened in the past. Worse than that is the fact that what we are really asking them, among other things, is report on a hypothetical situation, what they would have done in the absence of the program. In many cases, the respondent may simply not know and/or cannot know what would have happened in the absence of the program. Even if the customer has some idea of what would have happened, there is, of necessity, uncertainty about it. The situation just described is a circumstance ripe for invalid answers (low construct validity) and answers with low reliability, where reliability is defined as the likelihood that a respondent will give the same answer to the same question whenever or wherever it is asked. It is well known in the interview literature that the more factual and concrete the information the survey requests, the more accurate responses are likely to be. Where we are asking for motivations

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[2] Triangulation, using a variety of research methods and data sources, is a strategy adopted ideally before the data are collected and reduces the risk of systematic biases. In some cases, the decision to use triangulation is adopted after the data are collected and found robust enough to support this approach.

and processes in hypothetical situations that occurred in the past, there is room for bias. Using a framework that combines scores based on three different concepts mutes the impact of such bias and increases the accuracy of the resulting NTGR for each project evaluated.

The **PAI- 1** score has evolved since the original specification in 2008. The 2008 version called for the score to be based on the highest rating for a program element. Since most decisionmakers would choose to rate at least one program element highly, this often resulted in a PAI-1 score that was significantly higher than either the PAI-2 or PAI-3 scores, and in some cases, led to the elimination of PAI-1 due to it being an outlier. The score was revised in the 2010-2012 cycle to be based on the highest rating for a program influence divided by the sum of the highest-rating for a program influences plus the highest rating for a non-program influence, multiplied by 10. This revised normalized structure solved the problem with outlier results but led to a different issue due to the normalization process yielding mid-range values approximating 5 in nearly all cases, since most decisionmakers give a high score to at least one program element and one non-program element. This issue was flagged in the 2013-2015 Program Performance Assessment of the Nonresidential Downstream Programs, with a recommendation that PAI-1 be eliminated from the NTGR calculation until an alternative formulation could be developed.

The 2017 evaluation of Deemed measures continued use of this standard SRA framework with relatively minor modifications to NTG survey question batteries. Based on the 2013-2015 Program Performance Assessment recommendation, the PAI-1 score was eliminated from the NTG ratio computation. *The Nonresidential NTG Working Group was re-established, in part, to identify an alternative to the current PAI-1 scoring structure.*

Extend NTGR Framework to Accommodate Midstream Programs

The standardized Nonresidential NTG framework is primarily designed for Downstream programs. However, a small number of programs offered are classified as Midstream and, with the transition to predominantly third-party (3P) programs in 2020, they will become more predominant. *Thus, it is necessary to extend the standardized framework to accommodate Midstream programs.*

Dual Baseline NTGR Framework for Accelerated Replacement Projects

During the 2010-2012 evaluation cycle, the Nonresidential Net-to-Gross Working Group also identified the need to extend the standard NTG framework to accommodate early replacement dual baseline projects, based on a CPUC policy change to look at lifetime savings (D.11-07-030, July 15, 2011). This structure is intended to mirror the dual baseline framework adopted for Gross Savings at that time. The group identified some relatively modest changes to both the survey questions and the standard NTG algorithm for such projects, but the changes were not implemented at that time. During the 2017 and

2018 evaluations, the Net evaluation team for Deemed Measures considered modifying the NTG framework to incorporate a dual baseline NTG approach but decided to defer it to the 2019 evaluation cycle since there were very few measures in the 2018 cycle where the dual baseline approach applied.

The remainder of this memo will describe the proposed modifications to the current Nonresidential NTGR framework to address these two areas:

- the alternative to the current PAI-1 scoring structure
- the extension of the framework to accommodate Midstream programs

D.2   ALTERNATIVE TO CURRENT PAI-1 SCORING STRUCTURE

Issues with Current PAI-1 Score

As discussed previously, a number of issues with the PAI-1 score have emerged in previous evaluations. The observations below are specific to the 2017 Deemed evaluations where these problems resulted in a decision to exclude the PAI-1 score from the NTGR calculation.

The inclusion of the PAI-1 score biased the NTGR towards a value of 0.5. The PAI-1 score tended to converge to a value of around 5. Overall, the PAI-1 score averaged 4.9, with over 80 percent of the individual scores within 0.5 of that mean (i.e., between 4.4 and 5.4). This was likely due to respondents rating at least one program and one non-program factor very high. Respondents gave a 9 or 10 rating to at least one program factor 72 percent of the time, and at least one non-program factor 80 percent of the time. Furthermore, 66 percent of the time, the respondent's highest rated program and non-program factors were rated equally.   Averaging in the PAI-1 score with PAI-2 and PAI-3 will therefore reduce the NTGR.

PAI-1 scores did not appear to be correlated with "no program" responses indicating free ridership. When PAI-1 scores were compared to other survey questions that would indicate a high likelihood for free ridership, they did not correlate well to these metrics. Specifically, we examined the relationship between PAI-1 and two survey questions that we felt were strong indications of free ridership:

N2: Did your organization make the decision to install this new equipment before, after, or at the same time as you became aware of the program rebate?

N6: Now I would like you to think one last time about what action you would have taken if the program had not been available. Which of the following alternatives would you have been MOST likely to do?

        1   Install/Delamped fewer units

        2   Install standard efficiency equipment or whatever required by code

        3   Installed equipment more efficient than code but less efficient than what you installed through the program

        4   Done nothing (keep existing equipment as is)

        5   Done the same thing I would have done as I did through the program

        6   Repair/rewind or overhaul the existing equipment

        77   Something else (specify what _____)

The first question (N2) concerns the timing of the decision to install the measure relative to when they became aware of program rebates. For this question, higher levels of free ridership would be expected for those that already made the decision to install their new equipment before they became aware of the program rebate, and PAI-1 scores would be substantially lower for this response than the other two responses. Our expectation was to see significant increases in the PAI scores for the Same Time and After responses, compared to the Before response. This was the case for PAI-2 and PAI-3 scores, however, the PAI-1 scores changed by only 0.08 points.

Another telling indication of program influence is the self-reported action that participants say they would have taken had the program not existed in question N6. Respondents were asked what they would have been most likely to do if the program had not been available. Two common responses were "done nothing and keep existing equipment as is", and "done the same thing I would have done as I did through the program". One would expect relatively high PAI scores for the "done nothing" and relatively low PAI scores for the "done the same thing" responses. The PAI-2 and PAI-3 scores did meet this expectation, but the PAI-1 score differed by only 0.10 points.

Non-program factors may actually be program factors. What we may think is a non-program factor, may actually be a marketing message of the program. For example, better lighting quality may be considered a non-program factor. However, this may be something the program promotes. Therefore, it may be that the influence of better lighting quality on their decision may have been due to the program.

Similarity in concept between PAI-1 and PAI-2 scores. The PAI-1 and PAI-2 scores are based on a similar concept of program influence and are based on self-reported influence scores for individual program and non-program elements. While both scores are intended to represent different ways of characterizing program influence, there is a high degree of similarity between them. Including both scores in the NTGR calculation amounts to assigning a two-thirds weight to similar program influence metrics and reduces

the importance of the PAI-3 "no program" score in the overall calculation. It is possible that PAI-1 may represent another aspect of program influence that PAI-2 may not be capturing, but quantifying this is difficult to do, and it could be equally likely that instead they are capturing the same influence, accounting for double attribution of program influence. Additionally, removing PAI-1 will give a more consistent representation of program influence across respondents.

Alternatives to the PAI-1 Score

We examined a few different alternatives to the PAI_1 score and then calculated the resulting NTGR using each alternative by averaging it with the PAI_2 and PAI_3 scores. The alternatives we considered were as follows:

NTGR_2a – PAI-1 alternative 1 = ratio of average program element score to sum of average program plus non-program element scores. Average all the program element scores and divide by the average of all the program element scores plus the average of the non-program element scores. For example:

Program scores = 10, 8, 7, 6, 6 = average of 7.4
Nonprogram = 9, 9, 4, 4, 4 = average of 6.0
PAI_1 = 7.4/ (7.4+6.0) = 0.55

NTGR_2b – PAI-1 alternative 2 = Ratio of number of highly rated program factors to highly rated non-program factors
Identify the number of scores that rate an 8 or higher and set the PAI score equal to the ratio of the number of high program scores to high program and non-program scores. For example:

Program scores = 10, 8, 7, 6, 6 = 3 high scores
Nonprogram = 9, 9, 4, 4, 4 = 2 high scores
PAI_1 = 3/ (3+2) = 0.6
If you get no high scores, then NTG =0.5

NTGR_2c – PAI-1 alternative 3 = Assign value based on No Program actions (N6). This Approach uses the N6 value and assigns a PAI score as follows.

- If N6 = 2,4 then NTGR = 1
    - 2   Install standard efficiency equipment or whatever required by code
    - 4   Done nothing (keep existing equipment as is)
- If N6=5 then NTGR = 0
    - 5   Done the same thing I would have done as I did through the program
- If N6=1, then NTGR = 1.00 minus the % share they would have installed
    - 1   Install/Delamped fewer units
- If N6=3, then NTGR =0.75
    - 3   Installed equipment more efficient than code but less efficient than what you installed through the program
- IF N6=6, NTGR=missing – this is an Accelerated Replacement and the efficiency of the action is unknown, therefore this response is excluded from the analysis
    - 6   Repair/rewind or overhaul the existing equipment
- If N6=77, the response is reviewed and a judgment made regarding the likely NTGR level, usually a 0, 0.5 or 1
    - 77   Something else (specify what _____)

The overall NTGR_2c is the average of PAI-2, PAI-3, and PAI-N6.

Figure D-1 below shares results from the 2017 Deemed evaluations for question N6. The response category with the largest share is category 5 (Done the same thing I would have done as I did through the program, 45 percent). Other categories that were commonly selected were 2 (Install standard efficiency equipment or whatever required by code, 34 percent), 4 (Done nothing, 19 percent and 6 (Repair/rewind or overhaul the existing equipment, 19 percent).

FIGURE D-1: DISTRIBUTION OF RESPONSES TO QUESTION N6 IN SMALL COMMERCIAL EVALUATION
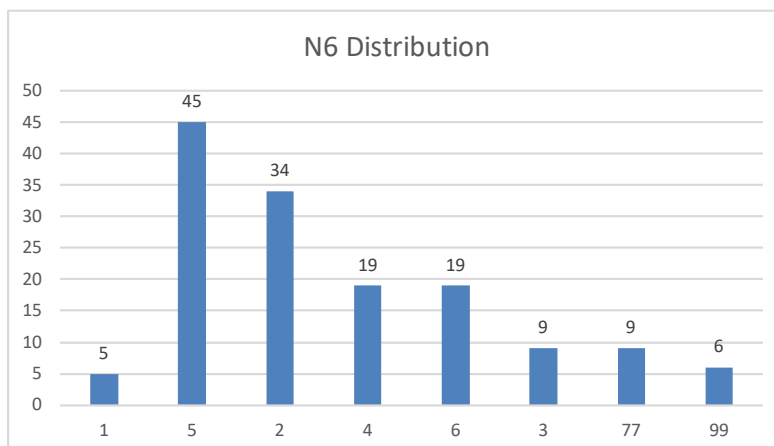
NTGR_2d – PAI-1 alternative 4 = Preponderance of Evidence approach. If there is significant evidence of free ridership, the value is set to 0, if there is significant evidence of program influence, the value is set to 1, or else the PAI-1 alternative algorithm of choice is used to determine the NTGR. Here is the algorithm.

First calculate PAI_2 and PAI_3 and use question N6 shown earlier:

        If PAI_2 >= 7 then NTG_2 = 1

        Else if PAI_2<= 3 then NTG_2 = -1

        Else NTG_2 = 0

        If PAI_3 >= 7 then NTG_3 = 1

        Else if PAI_3<= 3 then NTG_3 = -1

        Else NTG_3 = 0

        IF N6 = 2, 4 (and possibly more options) then NTG_6 = 1

        Else if N6 = 5 (and possibly more options) then NTG_6 = -1

        Else NTG_6 = 0

        THEN:

        If sum of NTG2,3,6 >=2, then NTGR = 1 (so in other words you have at least 2 indicators of being net, and no contradictions)

        Else, if sum of NTG2,3,6 <= -2, then NTGR = 0, (so in other words you have at least 2 indicators of being a free rider, and no contradictions)

        ELSE = NTGR = the standard calculation (the average of PAI2, PAI3 and the PAI-1 alternative algorithm of choice)

Comparison of Results Across Methods

The following two figures graphically illustrate the NTGR results across methods, based on the data collected in the 2017 Deemed evaluations.

Figure D-2 illustrates the distribution of NTGR values for each of the methods tested. Note that NTGR is based on the approach used in the 2017 Deemed evaluation and represents the average of the PAI-2 and PAI-3 scores. NTGR_wPAI1 is the historic 3 score framework, and NTGR_2a through NTGR_2d are the variants described above.

FIGURE D-2: DISTRIBUTION OF NTGRS ACROSS ALTERNATIVE METHODS
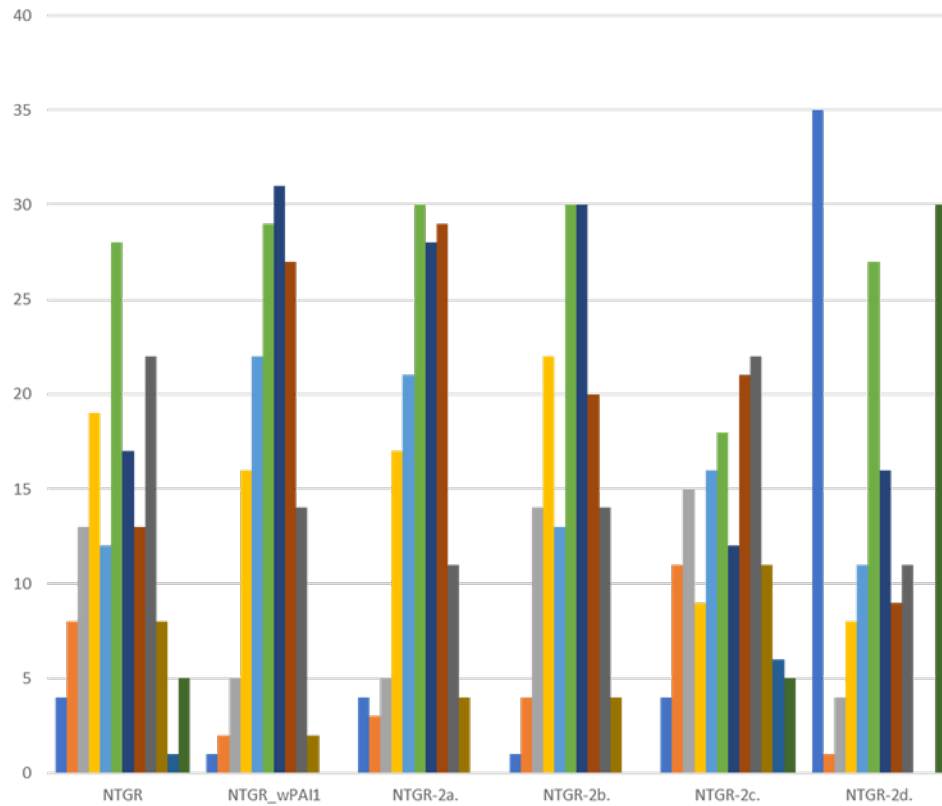
Figure D-3 below provides mean NTGR values and 90 percent confidence intervals across all six cases. The whiskers indicate the range of values analyzed.

FIGURE D-3: NTGR MEAN VALUES AND CONFIDENCE INTERVALS ACROSS ALTERNATIVE METHODS
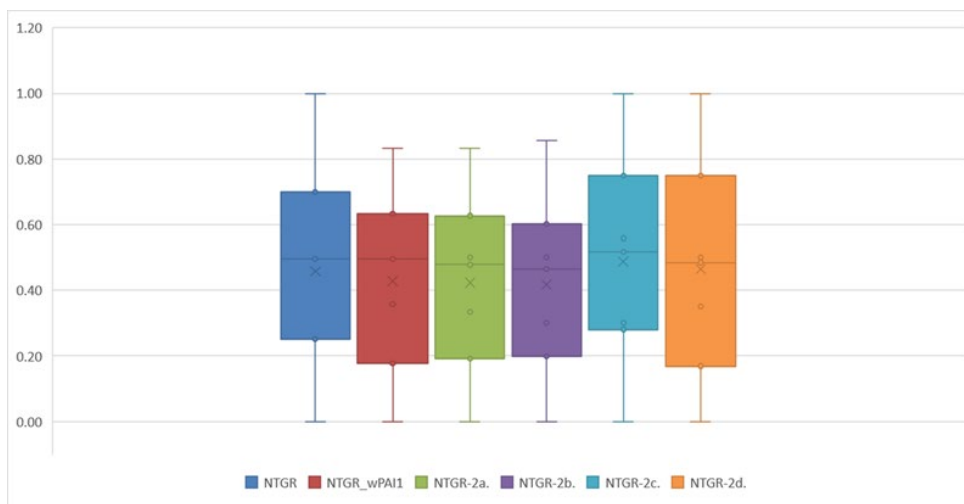
The following observations can be made from these two figures:

- From Figure D-2:
  - NTGR_wPAI1 – note the clustering of NTGRs around the mid-range values of 0.4 to 0.7. This illustrates the issue with the PAI_1. In contrast, the NTGR case, which is based on PAI-2 and PAI-3 only, has a wider distribution of values.
  - NTGR_2a and NTGR_2b are still relatively narrowly distributed around the 0.5 value, while NTGR_2c and NTGR_2d show much wider variance. Similarly, NTGR_2a and NTGR_2b have relatively narrow standard deviations, while those for NTGR_2c and NTGR_2d are significantly wider.
  - NTGR_2c values are well-distributed and more homogeneous while NTGR_2d values tend toward the extreme 0 and 1 values in many instances.
- In Figure D-3, it is striking how relatively similar the mean NTGR values are, and likely reflects the contribution of the PAI-2 and PAI-3 scores (2/3 weight) in all cases.

Method Change 1

The core NTGR algorithm has been revised and the current PAI-1 score has been replaced with the N6-based score in NTGR_2c – PAI-1 alternative 3. This option leverages the counterfactual information from the survey more fully, with 2 of three scores derived from it. Further, as noted above, the NTGR_2c values have desirable qualities in that they are more normally distributed across each of the scoring intervals and have higher inter-item correlations.

The three PAI scores using the NTGR_2c approach all represent very different approaches and uses of survey information, whereas the other approaches still have the issue of the revised PAI-1 and PAI-2 scores utilizing similar information. We also feel there are some issues with the other alternate PAI_1 scores such as:

NTGR_2a – PAI-1 alternative 1 = ratio of average program element score to sum of average program plus non-program element scores. Consider the following example where an individual was highly influenced by a couple program factors, not at all influenced by the other program factors, and only moderately influenced by the non-program factors

Program scores = 10, 10, 0, 0, 0 = average of 4

Non-program scores = 4, 4, 4, 4, 4 = average of 4

PAI_1 = 4/(4+4) = 0.5

One could argue that the NTGR in this case should be very high because there was clear influence of the program by more than one factor, and no other factor seemed to be very influential. Yet the NTGR is 0.5, inconsistent with this observation. We do not like this alternative because of this issue, where low factor scores can offset high influential factors. A customer does not need all factors to be influential for the program to have influenced their decision.

NTGR_2b – PAI-1 alternative 2 = Ratio of number of highly rated program factors to highly rated non-program factors. This alternative tells us if there were multiple factors that influenced their decision, and how many influential program versus non program factors there are. But it does not tell us which of the influential factors were the most influential, and what may have really driven their decision. Even though a customer may rate two factors a 10 does not mean they were equally influential. The PAI-2 score does address this, however. So the PAI-2 score on its own is a more accurate representation of attribution than this approach.

NTGR_2d – PAI-1 alternative 4 = Preponderance of Evidence approach. If there is significant evidence of free ridership, the value is set to 0, if there is significant evidence of program influence, the value is set to 1, or else the PAI-1 alternative algorithm of choice is used to determine the NTGR. The issue with this approach is that is uses PAI-2 and PAI-3 in its construction, so it's obviously highly correlated with those values and does not provide as independent a result as, say, using the N6 questions in NTGR_2c.

Given the replacement of PAI-1, for projects that report a high level of vendor influence, it is necessary to incorporate vendor influence into one of the other scores. One option is to include it in PAI-3, and another alternative is to develop a fourth score that reflects vendor influence only.

D.3 EXTEND NTGR FRAMEWORK TO ACCOMMODATE MIDSTREAM PROGRAMS

The current Nonresidential NTG framework is designed mainly for Downstream programs, which are focused on delivering incentives directly to end-use customers. Some programs are positioned higher up in the supply chain, so that they work through vendors (e.g., distributors, contractors, and design professionals) to deliver incentives to customers. Such programs are classified as Midstream.

The current Downstream-centric framework relies primarily on findings from end-use customer surveys for determining NTGRs, which is appropriate, given the customer-focused program delivery approach. The method does allow for vendor input into the NTGR but only in cases where the customer rates the vendor higher than any other program or non-program element in their decisionmaking. The vendor is interviewed, and their input is incorporated into the PAI-1 score.

NTG Approach for Midstream Programs

The Midstream approach as described applies to programs delivered through vendors[3] that meaningfully change how they stock, promote and price program-qualified energy efficient equipment as a result of their participation in the program. There are multiple Midstream program delivery approaches, some for which the program intervention(s) is "invisible" to the end-use customer, and others where the end-use customer is fully aware of the program intervention(s). The design of the program, and the availability (vs. not) of customer data will determine the specific NTG approach to be used. Two such variants are:

- Programs that work through vendors, where customer contact data is collected, and where it is believed the end-user is either unaware or aware of the program (**Midstream A**).

- Programs that work entirely with vendors, customer contact data is not collected, and where it is believed the end-user may not be aware of the program (**Midstream B**).

Midstream Program Logic

Most Midstream programs transact directly with vendors and provide incentives in exchange for their promoting the program to their customers, developing projects, enrolling them in the program, and aiding them with program applications and paperwork. The approaches used typically work in the following manner:

- The programs work through participating vendors [usually distributors (including retailers) and contractors] to promote program-eligible energy efficient measures, develop projects and provide incentives to customers. Customers can either be contractors, installers, or end-users.

- Vendors provide instant incentives at the point-of-sale to reduce the upfront price to their customers by all or a portion of the incentive amount. If the customer of a distributor is a contractor or installer, they must pass down all or a portion of the incentive to ultimate purchasers (end-users) of the eligible measures.

- Vendors also aid their customers with program applications and paperwork.

- Periodically, vendors bundle applications together and submit them to the Program Administrator (PA) for reimbursement. As a result, transactions with the program are between the Vendor and the PA.

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[3] "Vendors" in this discussion is being used broadly to refer to the entity that transacts with the program to deliver incentives and other program features to end-use customers. Vendors can include distributors, contractors or design professionals but they must have direct involvement with the program via a contract, application or other mechanism to obtain incentives from the program administrator and re-distribute them to the next level(s) down.

Having incentives available to buy down the cost of program measures to ultimate purchasers potentially motivates Vendors to change their behavior from "business as usual" in several ways. Knowing that they will receive an incentive for selling high efficiency units, and in some cases having received training and marketing support to encourage stocking and upselling, Vendors may choose to:

- Reduce prices of program-eligible units,

- Increase their stock of high efficiency units,

- Upsell high efficiency units to contractors and/or end-users,

- Offer training sessions or marketing campaigns aimed at engineers, architects, and contractors to increase awareness of these high efficiency units.

As a result of the program's actions:

- Contractors/customers may be more likely to purchase high efficiency units because they are in stock,

- Contractors/customers may be more likely to purchase high efficiency equipment because the distributor upsold these units,

- Contractors/customers may be more likely to purchase high efficiency units because the incremental cost is lower than it would have been without the incentive, and

- Design professionals and contractors may be more likely to specify or recommend high efficiency units because they are more aware or more familiar with these options.

The expected outcome is that a greater share of end-users will purchase high efficiency units. Ultimately, the overall market in a utility's service territory will become more efficient than it otherwise would have been, or it will achieve this efficiency sooner than if no intervention had occurred.

Midstream NTG Protocol

To assess impacts from Midstream A programs, evaluators need to continue to collect standard self-reported information from end-use customers regarding the importance of various program and non-program factors that influenced their decision, the relative importance of the program, and the likely actions they would have taken absent the program. In addition, for Midstream A and Midstream B programs, evaluators need to determine if the Vendor changed their practices in a way that ultimately influenced the customer's buying decision. Assessing the influence of the program on vendors involves conducting in-depth interviews with participating vendors and asking them how the program influenced their stocking, pricing and promotion practices, and alternatively, how they would behave in the absence of the program.

For Midstream A programs where customer contact data is collected, surveys are conducted of both participating customers and participating vendors, Customer and Vendor-based estimates of free ridership are developed and are combined into a single NTGR metric. For Midstream B programs that work exclusively with vendors and customer information is not collected, telephone or web surveys with end-use customers are not feasible. However, in-store intercept surveys would allow for direct questioning of customers at the point-of-sale. If in-store or telephone/web surveys are not feasible, the NTGR is derived fully from the Vendor algorithm.

For the **Customer** component, the standard NTG framework is used, participating customer surveys are conducted, and the customer-based NTGR is calculated.

Vendor Component

The **Vendor** component of this methodology uses three indicators of free ridership, Program Importance Score, the Relative Program Influence Score (similar to PAI-2), and the No-Program Score (similar to PAI-3).

Vendor Surveys. During the in-depth interviews, the Vendor is asked which of the available sales strategies they used to promote program-qualified equipment:

A3   Now, I'm going to ask you about the various strategies you might have used to sell program-qualifying MEASURE. Please indicate which ones you have used. [READ]
___ Upsell contractors to purchase program-qualified units
___ Upsell customers to purchase program-qualified units
___ Conduct training workshops for contractors
___ Increase marketing of program-qualified units
___ Reduce the prices of program-qualified units
___ Increase the stocking or assortment of program-qualified units
___Increase stock for emergency replacements
___Increase signage on sales floor
___ Discuss the benefits of program-qualified units with contractors
___ Discuss the benefits of program-qualified units with customers
___ Other (Please describe: _____)

Next, the Vendor is asked to use a 0-to-10 importance scale to rate the importance of various program and non-program factors in their decision to recommend the program-qualifying measure to distributors/customers.

A4   Using this 0-to-10 scale, please rate the following in terms of their importance in your
***decision to recommend** MEASURE to contractors and your other customers*

Increased awareness of MEASURE benefits	*0 to 10 score (_____)*
Program-provided training of sales staff	*0 to 10 score (_____)*
Program promotional materials	*0 to 10 score (_____)*
Information from PROGRAM website	*0 to 10 score (_____)*
PROGRAM incentive	*0 to 10 score (_____)*
Reduced high-efficiency MEASURE prices from manufacturers	*0 to 10 score (_____)*
Availability of manufacturers' promotional rebates/spiffs	*0 to 10 score (_____)*
Information about the cost-effectiveness of more efficient units	*0 to 10 score (_____)*
Increased stocking of high-efficiency MEASURE	*0 to 10 score (_____)*
Past participation in PROGRAM	*0 to 10 score (_____)*

Next, Vendors are asked to rate the importance of the Program in influencing their decision to recommend the program-qualifying measure to distributors/customers, and a follow-up question regarding the relative importance of the Program in their decision. Finally, there is a counterfactual question regarding their likelihood to recommend the program-qualifying measure absent the program.

A5   Using this 0-to-10 scale where 0 is NOT AT ALL IMPORTANT and 10 is EXTREMELY IMPORTANT, how important was the PROGRAM, including incentives as well as program services and information, in influencing your decision to recommend that UTILITY's contractors/customers purchase the energy efficient MEASURE at this time?

Next, I would like you to rate the importance of the PROGRAM FACTORS as a group in your decision to implement these sales strategies as opposed to other NON-PROGRAM FACTORS as a group that might have influenced your decision.

> *Program factors include: [READ IN A MINIMUM OF TWO PROGRAM FACTORS, SELECTED BY CHOOSING THOSE THAT RECEIVED THE HIGHEST TWO SCORES AMONG ALL PROGRAM COMPONENTS IN THE PROGRAM COMPONENTS SECTION]*

> *Non-program factors include: [READ IN A MINIMUM OF TWO NON-PROGRAM FACTORS, SELECTED BY CHOOSING THOSE THAT RECEIVED THE HIGHEST TWO SCORES AMONG ALL NON-PROGRAM COMPONENTS IN THE PROGRAM COMPONENTS SECTION.]*

A5a. Now, if you were given 10 points to award in total, how many points would give to the importance of the program factors as a group and how many points would you give to the non-program factors as a group?

A6   And using a 0-to-10 likelihood scale where 0 is NOT AT ALL LIKELY and 10 is EXTREMELY LIKELY, if the PROGRAM, including incentives as well as program services and information, had not been available, what is the likelihood that you would have recommended this specific MEASURE to UTILITY's contractors /customers?

Vendor NTGR Algorithm. First the three separate scores are computed, then averaged to produce the Vendor NTGR. The three component scores are as follows:

- *Program Importance Score.* This score is based on the response to question A5 and is computed using the following equation:

    Program Importance Score = Program importance rating from A5.

- *Relative Program Influence Score.* Responses to question A5a are used to calculate this score as follows:

    Relative Program Influence Score = Program Points from A5a.

- *No-Program Score.* This represents the numeric score of the likelihood that the respondent would have recommended program-qualified equipment in the absence of the program. It is calculated from the response to question A6, using the following equation:

    No-Program FR Score = 10 minus No-Program Likelihood to Recommend

The Vendor-based NTGR is simply the average of these three scores divided by 10. Once this has been computed, the project-level NTGR is determined from a combination of findings from the participating customer and participating vendor surveys. The triangulation approach, combining customer and vendor input, is used. The algorithm uses the customer's input to guide the assessment, with input by the vendor if certain conditions are met.   This Midstream scoring approach is shown below in Table D-2.

TABLE D-2: MIDSTREAM SCORING ALGORITHM

Scoring Criteria	Question Number	Decision Rule	Explanation
Criteria 1	N5aa	IF N5aa < 3 Then Use CUSTOMER NTGR only	Per decisionmaker, very low likelihood of installing same absent program. Vendor influence unimportant.
Criteria 2	N5aa	IF N5aa >7 Then Use CUSTOMER NTGR only	Per decisionmaker, very high likelihood of installing same at same time absent the program. Vendor influence unimportant.
Criteria 3	N5, N5b	If N5 < 3 and N6aa = 0 Then Use CUSTOMER NTGR only	Per decisionmaker, very low likelihood of installing same absent program. Vendor influence unimportant.
Criteria 4	N5, N5b	If N5 > 7and N6aa > 7, Then Use CUSTOMER NTGR only	Per decisionmaker, very high likelihood of installing same at same time absent program. Vendor influence unimportant.
Criteria 5	N6	If N6 = 2 and N6aa = Same Time, Then Use CUSTOMER NTGR only	Per decisionmaker, would have installed Standard efficiency at the same time absent the program
Criteria 6	N6	If N6 = 4 and N6aa = Same Time, Then Use CUSTOMER NTGR only	Per decisionmaker, would have Done Nothing at the same time absent the program. Vendor influence unimportant.
Criteria 7	N6	If N6 = 6 and N6aa = Same Time, Then Use CUSTOMER NTGR only	Per decisionmaker, would have Repaired/Rewound Existing equipment at the same time absent the program. Vendor influence unimportant.
Criteria 8	N6	If N6 = 5 and N6aa = Same Time, Then Use CUSTOMER NTGR only	Per decisionmaker, would have Done Same Thing at the same time absent the program. Vendor influence unimportant.
Criteria 9	V3, N3d, V4a	If V3 = Yes, N3d > 7 and V4a >7, and Criteria 1 through 8 not met, Vendor NTGR > 0.70, then use VENDOR NTGR only	Vendor recommended high efficiency, made customer aware of program, vendor was highly influential to the customer
Criteria 10	Multiple	If Criteria 1 through 9 not met, Average Customer and Vendor NTGRs	Moderate program influence and potential for vendor influence

Method Change 2

We have incorporated the Midstream NTG methodology as described for PY2018, and plan to use this method or refinements of it for future program years. This change allows for consideration of the vendor's assessment of the program's influence on the customer's decision to upgrade to program-qualifying equipment in cases where the program is working primarily through vendors.

DETAILED NTGR CALCULATION AND INDIVIDUAL RESPONSES

This appendix provides a detailed description of the NTG algorithm for both downstream and midstream programs, including every survey question used in the algorithm, and how each survey question is used to develop the NTGR.

Also provided are the individual survey responses for each customer and vendor survey, along with the PAI and vendor scores, and the resulting NTGRs used to develop the ex-post NTGR values for the Refrigeration Case Lighting, Process Pumping VFDs and Tankless Water Heating measures.

CUSTOMER NET-TO-GROSS ALGORITHM

The customer NTGR algorithm is based on six survey questions asked of participants, as shown below.

N2	Did your organization make the decision to install this new equipment before or, after, or at the same time as you became aware of that rebates [IF NEEDED: to reduce the cost of the measure] were available through the PROGRAM?
1	Before
2	After
3	Same time

	If you were given 10 points to award in total, how many points would you give to the importance of the program and how many points would you give to these other non-program factors?
N41	How many of the ten points would you give to the importance of the PROGRAM in your decision?
#	Record 0 to 10 score (_____)

REPLACE	Was the installation of this measure....<%NTGMEASURE> ...a replacement of existing equipment or was it additional equipment you installed in your facility?
1	Replace/Modification/Retrofit
2	Add-on

N5	Using a likelihood scale from 0 to 10, where 0 is not at all likely and 10 is extremely likely, if THE PROGRAM had NOT BEEN AVAILABLE, what is the likelihood that you would have installed exactly the same program-qualifying energy efficient equipment that you did for this project regardless of when you would have installed it?
#	Record 0 to 10 score (_____)

N5aa	Using a likelihood scale from 0 to 10, where 0 is Not at all likely and 10 is Extremely likely, if THE PROGRAM had NOT BEEN AVAILABLE, what is the likelihood that you would have installed exactly the same energy efficient equipment at the same time as you did?
#	Record 0 to 10 score (_____)

N6	Now I would like you to think one last time about what action you would have taken if the program had not been available. Which of the following alternatives would you have been MOST likely to do?
1	Install/Delamped fewer units
2	Install standard efficiency equipment or whatever required by code
3	Installed equipment more efficient than code but less efficient than what you installed through the program
4	Done nothing (keep existing equipment as is)
5	Done the same thing I would have done as I did through the program
6	Repair/rewind or overhaul the existing equipment
77	Something else (specify what _____)

Three separate scores are calculated based on these questions, as follows:

PAI-2 Score:

The PAI-2 score utilizes the N2 and N41 questions, and is calculated as:

> If N2 = after, then PAI-2 = N41/2
>
> Else PAI-2 = N41

PAI-3 Score:

The PAI-3 score utilizes the REPLACE, N5 and N5aa questions, and is calculated as:

>   If REPLACE = 1, then PAI-3 = 10 − N5

>   Else PAI-3 = 10 − N5aa

PAI-N6 Score:

The third PAI score is based on Question N6, as follows:

- If N6 = 2,4 then PAI-N6 = 10
  - — 2 Install standard efficiency equipment or whatever required by code
  - — 4 Done nothing (keep existing equipment as is)
- If N6=5 then PAI-N6 = 0
  - — 5 Done the same thing I would have done as I did through the program
- If N6=1, then PAI-N6 = 10* (1.00 minus the % share they would have installed)
  - — 1 Install/Delamped fewer units
- If N6=3, then PAI-N6 =7.5
  - — 3 Installed equipment more efficient than code but less efficient than what you installed through the program
- IF N6=6, PAI-N6=missing (This is a repair and the efficiency of the action ultimately taken is unknown, therefore this response is excluded from the analysis.)
  - — 6 Repair/rewind or overhaul the existing equipment
- If N6=77, the response is reviewed and a judgment made regarding the likely PAI-N6 value, frequently a 0 or 10
  - — 77 Something else (specify what _____)

Customer NTGR Calculation:

Finally, the NTGR is calculated as the average of these three scores, divided by 10:

>   NTGR = ((PAI-2 + PAI-3 + PAI-N6)/3)/10

Note that is only two PAI scores are available, then the NTGR equals the average of those two PAI scores divided by 10. Finally, if only one PAI score is available, then the NTGR is set to missing.

For downstream programs, only the customer NTGR is used. For midstream programs, a combination of customer and vendor NTGRs are used, as discussed below.

REFRIGERATION CASE LED LIGHTING NET-TO-GROSS ALGORITHM

As discussed in Chapter 6 of the report, the protocol for the Refrigeration Case LED Lighting measure differs slighting from the standard approach listed above because this measure only provides savings when the lighting retrofit was accelerated and the case was not replaced at the same time.

Revised PAI-2 Score:

The PAI-2 score for Refrigeration Case LED lighting uses question N41P which is modified to include the effects of timing:

> Next, I would like for you to consider the importance of the PROGRAM in your decision to install your equipment *at the time you did* rather than waiting to install new equipment sometime in the future, regardless of the actual efficiency of the equipment you selected. Please rate the importance of the program on this timing decision as opposed to other non-program factors that may have influenced your decision.
>
> N41P - If you were given 10 points to award in total, how many points would you give to the importance of the program and how many points would you give to these other non-program factors in your decision to install your equipment *at the time you did* rather than waiting to install new equipment sometime in the future?

Therefore,

If N2 = after, then PAI-2 = N41P/2

Else PAI-2 = N41P

Revised PAI-3 Score:

The PAI-3 score for Refrigeration Case LED lighting uses question N5B which is modified to include the effects of timing:

> N5B- Using the same scale as before, if the program had not been available, what is the likelihood that you would have done this project *at the same time as you did*?

Therefore,

PAI-3 = 10 − N5b

Revised N6 Score:

Because LED lighting is considered ISP, if the customer responded to N6 (shown above) that they would have installed whatever is required by code or something more efficient than code, then they would have installed LEDs and would be a free rider. Therefore, we modify the scoring using N6 as follows:

- If N6 = 2 or 3 then PAI-N6 = 0
    - 2   Install standard efficiency equipment or whatever required by code
    - 3   Installed equipment more efficient than code but less efficient than what you installed through the program

Also, if the customer responded to N6 saying that they would have repaired their equipment, we take this to mean they would not have retrofitted the lighting at that time and give them credit for an accelerated replacement and set the NTGR to 1 as follows:

- IF N6=6, PAI-N6 =10
    - 6   Repair/rewind or overhaul the existing equipment

Otherwise, the algorithm is the same as above:

- If N6 = 4 then PAI-N6 = 10
    - 4   Done nothing (keep existing equipment as is)
- If N6=5 then PAI-N6 = 0
    - 5   Done the same thing I would have done as I did through the program
- If N6=1, then PAI-N6 = 10* (1.00 minus the % share they would have installed)
    - 1   Install/Delamped fewer units
- If N6=77, the response is reviewed and a judgment made regarding the likely PAI-N6 value, frequently a 0 or 10
    - 77 Something else (specify what _____)

Customer NTGR Calculation:

Finally, the NTGR is calculated as the average of these three scores, divided by 10, as above:

NTGR = ((PAI-2 + PAI-3 + PAI-N6)/3)/10

Note that is only two PAI scores are available, then the NTGR equals the average of those two PAI scores divided by 10. Finally, if only one PAI score is available, then the NTGR is set to missing.

VENDOR NET-TO-GROSS ALGORITHM

The vendor NTGR algorithm is based on three survey questions asked of distributors, as shown below.

A5   Using this 0 to 10 scale where 0 is NOT AT ALL IMPORTANT and 10 is EXTREMELY IMPORTANT, how important was the PROGRAM, including incentives as well as program services and information, in influencing your decision to recommend that <%UTILITY's> contractors/distributors/customers purchase the energy efficiency MEASURE at this time?
\#   Record 0 to 10 score (_____)   A5A

A5a. Now, if you were given 10 points to award in total, how many points would give to the importance of the program factors as a group and how many points would you give to the non-program factors as a group?
\#   Record 0 to 10 value (_____)   A6

A6   And using a 0 to 10 likelihood scale where 0 is NOT AT ALL LIKELY and 10 is EXTREMELY LIKELY, if the PROGRAM, including incentives as well as program services and information, had not been available, what is the likelihood that you would have recommended this specific MEASURE to <%UTILITY's> contractors/distributors/customers?
\#   Record 0 to 10 score (_____)   A7

Three separate scores are calculated using these survey questions, as follows:

PIS - Program Importance Score:

This score is based on the response to question A5 and is computed using the following equation:

$$PIS = A5.$$

RPIS - Relative Program Importance Score:

Responses to question A5a are used to calculate this score as follows:

$$RPIS = A5a.$$

NPS — No-Program Score:

This represents the numeric score of the likelihood that the respondent would have recommended program-qualified equipment in the absence of the program. It is calculated from the response to question A6, using the following equation:

$$NPS = 10 - A6$$

Vendor NTGR Calculation:

Finally, the NTGR is calculated as the average of these three scores, divided by 10:

NTGR = ((PIS + RPIS + NPS)/3)/10

Note that is only two scores are available, then the NTGR equals the average of those two scores divided by 10. Finally, if only one score is available, then the NTGR is set to missing.

MIDSTREAM NET-TO-GROSS ALGORITHM

For midstream programs, the project-level NTGR is determined from a combination of findings from the customer and vendor NTGRs. The triangulation approach, combining customer and vendor input, is used. In cases where customer contact information is not available, the midstream program NTGR is based solely on the vendor NTGR. The algorithm uses the customer's input to guide the assessment, with input by the vendor if certain conditions are met, based on the following questions.

NN5aa	Would you like for me to change your score on the importance of the rebate that you gave a rating of <%N3B> and/or change your rating on the likelihood you would install the same equipment without the rebate which you gave a rating of <%N5> and/or we can change both if you wish?
1	No change
77	Record how they would rate rebate influence and how they would rate likelihood to install without the rebate

N5	Using a likelihood scale from 0 to 10, where 0 is not at all likely and 10 is extremely likely, if THE PROGRAM had NOT BEEN AVAILABLE, what is the likelihood that you would have installed exactly the same program-qualifying energy efficient equipment that you did for this project regardless of when you would have installed it?
#	Record 0 to 10 score (_____)

N6aa	Would you have [FILL IN RESPONSE TO N6 for N6 = 1,2, 3, 5] at the same time as you did under the program, within a yea
1	Same time
2	Within one year
3	At a later time

N6	Now I would like you to think one last time about what action you would have taken if the program had not been available. Which of the following alternatives would you have been MOST likely to do?
1	Install/Delamped fewer units
2	Install standard efficiency equipment or whatever required by code
3	Installed equipment more efficient than code but less efficient than what you installed through the program
4	Done nothing (keep existing equipment as is)
5	Done the same thing I would have done as I did through the program
6	Repair/rewind or overhaul the existing equipment
77	Something else (specify what _____)

N3d	Recommendation from an equipment vendor that sold you the equipment and/or installed it for you **[VENDOR_1]**
#	Record 0 to 10 score (_____)

	V3	Did the contractor/vendor tell you about or recommend the program?
	1	Yes
	2	No

	V4a	Using the same scale of 0 - 10 as before, how likely is it that your organization would have installed the new energy efficient equipment had the contractor/vendor not recommended it?
	1	0-10 response

This Midstream scoring approach is shown below.

TABLE D-3: MIDSTREAM SCORING ALGORITHM

Scoring Criteria	Question Number	Decision Rule	Explanation
Criteria 1	N5aa	IF N5aa < 3 Then Use CUSTOMER NTGR only	Per decisionmaker, very low likelihood of installing same absent program. Vendor influence unimportant.
Criteria 2	N5aa	IF N5aa >7 Then Use CUSTOMER NTGR only	Per decisionmaker, very high likelihood of installing same at same time absent the program. Vendor influence unimportant.
Criteria 3	N5, N5b	If N5 < 3 and N6aa = 0 Then Use CUSTOMER NTGR only	Per decisionmaker, very low likelihood of installing same absent program. Vendor influence unimportant.
Criteria 4	N5, N5b	If N5 > 7and N6aa > 7, Then Use CUSTOMER NTGR only	Per decisionmaker, very high likelihood of installing same at same time absent program. Vendor influence unimportant.
Criteria 5	N6	If N6 = 2 and N6aa = Same Time, Then Use CUSTOMER NTGR only	Per decisionmaker, would have installed Standard efficiency at the same time absent the program
Criteria 6	N6	If N6 = 4 and N6aa = Same Time, Then Use CUSTOMER NTGR only	Per decisionmaker, would have Done Nothing at the same time absent the program. Vendor influence unimportant.
Criteria 7	N6	If N6 = 6 and N6aa = Same Time, Then Use CUSTOMER NTGR only	Per decisionmaker, would have Repaired/Rewound Existing equipment at the same time absent the program. Vendor influence unimportant.
Criteria 8	N6	If N6 = 5 and N6aa = Same Time, Then Use CUSTOMER NTGR only	Per decisionmaker, would have Done Same Thing at the same time absent the program. Vendor influence unimportant.
Criteria 9	V3, N3d, V4a	If V3 = Yes, N3d > 7 and V4a >7, and Criteria 1 through 8 not met, Vendor NTGR > 0.70, then use VENDOR NTGR only	Vendor recommended high efficiency, made customer aware of program, vendor was highly influential to the customer
Criteria 10	Multiple	If Criteria 1 through 9 not met, Average Customer and Vendor NTGRs	Moderate program influence and potential for vendor influence

TANKLESS WATERHEATER MIDSTREAM NET-TO-GROSS ALGORITHM

As mentioned in Chapter 6 of the report, the Tankless Water Heating measure offered by PG&E and SCG is delivered exclusively through a Midstream approach. The program falls into the Midstream B category discussed in the report, working exclusively through vendors, and does not collect any participating customer or contractor information. Therefore, telephone surveys with end-use customers are not feasible.

Therefore, the NTGR for the Tankless Water Heating measure is based solely on the Vendor NTG.

INDIVIDUAL SURVEY RESPONSES, PAI AND VENDOR SCORES AND NTGRS

The following tables provide the survey responses for each customer and vendor survey, and along with the PAI and vendor scores, and resulting NTGR used to develop the ex-post NTGR values for Refrigeration Case Lighting, Process Pumping VFDs and Tankless Water Heating.

TABLE D-4: INDIVIDUAL SURVEY RESPONSES, PAI SCORES AND NTGRS FOR REFRIGERATION CASE LED LIGHTING

Measure Group	n41p	n2	PAI2	n5b	PAI3	n6	PAI4	NTGR
Refrigeration Case LED Lighting	5	2	5	6	4	2	0	0.30
Refrigeration Case LED Lighting	8	1	4	10	0	5	0	0.13
Refrigeration Case LED Lighting	4	2	4	0	10	5	0	0.47
Refrigeration Case LED Lighting	7	2	7	5	5	4	10	0.73
Refrigeration Case LED Lighting	7	2	7	5	5	4	10	0.73
Refrigeration Case LED Lighting	6	3	6	0	10	2	0	0.53
Refrigeration Case LED Lighting	10	2	10	0	10	6	10	1.00
Refrigeration Case LED Lighting		2		3	7	5	0	0.35
Refrigeration Case LED Lighting		3		5	5	5	0	0.25
Refrigeration Case LED Lighting	5	3	5	0	10	4	10	0.83
Refrigeration Case LED Lighting		3		5	5	2	0	0.25
Refrigeration Case LED Lighting	9	1	4.5	0	10	4	10	0.82
Refrigeration Case LED Lighting	10	99	10	10	0	4	10	0.67
Refrigeration Case LED Lighting	8	2	8	10	0	4	10	0.60
Refrigeration Case LED Lighting	10	1	5	0	10	4	10	0.83
Refrigeration Case LED Lighting		1		0	10	4	10	1.00
Refrigeration Case LED Lighting	5	3	5	6	4	2	0	0.30
Refrigeration Case LED Lighting	5	3	5	0	10	4	10	0.83
Refrigeration Case LED Lighting	0	1	0	10	0	3	0	0.00
Refrigeration Case LED Lighting	9	3	9	1	9	4	10	0.93
Refrigeration Case LED Lighting	8	2	8	0	10	4	10	0.93

TABLE D-5: PG&E INDIVIDUAL SURVEY RESPONSES, PAI SCORES AND NTGRS FOR PROCESS PUMPING VFDS

PA	Measure Group	n41	n2	PAI2	Replace	n5aa	n5	PAI3	n6	n6_77	n6a_Pct	PAI-N6	NTGR
PG&E	Process Pumping VFDs		1		2	8		2	5			0	0.10
PG&E	Process Pumping VFDs	3	2	3	1		7	3	2			10	0.53
PG&E	Process Pumping VFDs	7	3	7	2	8		2	2			10	0.63
PG&E	Process Pumping VFDs	5	3	5	1		10	0	5			0	0.17
PG&E	Process Pumping VFDs	4	3	4	1		6	4	4			10	0.60
PG&E	Process Pumping VFDs	3	1	1.5	99				5			0	0.08
PG&E	Process Pumping VFDs	8	2	8	2	3		7	2			10	0.83
PG&E	Process Pumping VFDs	7	3	7	2	10		0	5			0	0.23
PG&E	Process Pumping VFDs	5	2	5	2	4		6	1		2	9.8	0.69
PG&E	Process Pumping VFDs	5	2	5	2	5		5	77	10		10	0.67
PG&E	Process Pumping VFDs	4	1	2	2	10		0	5			0	0.07
PG&E	Process Pumping VFDs	9	1	4.5	2	5		5	77	10		10	0.65
PG&E	Process Pumping VFDs	3	2	3	1	6	10	0	1		50	5	0.27
PG&E	Process Pumping VFDs	7	2	7	1	0	0	10	4			10	0.90
PG&E	Process Pumping VFDs	6	1	3		0	8		5			0	0.15
PG&E	Process Pumping VFDs	0	1	0	2	7	7	3	5			0	0.10
PG&E	Process Pumping VFDs		1		1		5	5	5			0	0.25
PG&E	Process Pumping VFDs	3	1	1.5	1		3	7	4			10	0.62
PG&E	Process Pumping VFDs	2	3	2	1		9	1	5			0	0.10
PG&E	Process Pumping VFDs		3		1		5	5	4			10	0.75
PG&E	Process Pumping VFDs	6	1	3	2	10		0	5			0	0.10
PG&E	Process Pumping VFDs		3		2	1		9	4			10	0.95
PG&E	Process Pumping VFDs	10	2	10	1		10	0	5			0	0.33
PG&E	Process Pumping VFDs	7	1	3.5	2	10		0	5			0	0.12
PG&E	Process Pumping VFDs	7	1	3.5	2	8		2	5			0	0.18
PG&E	Process Pumping VFDs	4	2	4	1		8	2	6				0.30
PG&E	Process Pumping VFDs	5	1	2.5	1		10	0	5			0	0.08
PG&E	Process Pumping VFDs	0	1	0	2	10		0	5			0	0.00
PG&E	Process Pumping VFDs		1		1		10	0	5			0	0.00
PG&E	Process Pumping VFDs	4	1	2	2	5		5	6				0.35
PG&E	Process Pumping VFDs	6	2	6	2	5		5	5			0	0.37
PG&E	Process Pumping VFDs	3	1	1.5	99				5			0	0.08
PG&E	Process Pumping VFDs	8	2	8	2	1		9	77	10		10	0.90
PG&E	Process Pumping VFDs	5	2	5	2	4		6	1		2	9.8	0.69
PG&E	Process Pumping VFDs	5	2	5	2	5		5	77	10		10	0.67
PG&E	Process Pumping VFDs	4	1	2	2	10		0	5			0	0.07
PG&E	Process Pumping VFDs	9	1	4.5	2	5		5	77	10		10	0.65
PG&E	Process Pumping VFDs	3	2	3	1	6	10	0	1		50	5	0.27
PG&E	Process Pumping VFDs	5		5	2	0	0	10	4			10	0.83
PG&E	Process Pumping VFDs	2	2	2	2	5	5	5	3			7.5	0.48
PG&E	Process Pumping VFDs	6	1	3		0	8		5			0	0.15
PG&E	Process Pumping VFDs	0	1	0	2	7	7	3	5			0	0.10
PG&E	Process Pumping VFDs	3	3	3	2	7	7	3	5			0	0.20

TABLE D-6: SCE INDIVIDUAL SURVEY RESPONSES, PAI SCORES AND NTGRS FOR PROCESS PUMPING VFDS

PA	Measure Group	n41	n2	PAI2	Replace	n5aa	n5	PAI3	n6	n6_77	n6a_Pct	PAI-N6	NTGR
SCE	Process Pumping VFDs	7	2	7	2	3		7	4			10	0.80
SCE	Process Pumping VFDs	2	1	1	1		10	0	5			0	0.03
SCE	Process Pumping VFDs	8	3	8	2	2		8	4			10	0.87
SCE	Process Pumping VFDs	8	2	8	1		4	6	77	10		10	0.80
SCE	Process Pumping VFDs		1		2	10		0	5			0	0.00
SCE	Process Pumping VFDs	5	2	5	1		4	6	4			10	0.70
SCE	Process Pumping VFDs	8	1	4	1		4	6	3			7.5	0.58
SCE	Process Pumping VFDs	6	3	6	2	4		6	6				0.60
SCE	Process Pumping VFDs	2	3	2	2	10		0	5			0	0.07
SCE	Process Pumping VFDs	9	3	9	2	10		0	5			0	0.30
SCE	Process Pumping VFDs	7	1	3.5	1		6	4	5			0	0.25
SCE	Process Pumping VFDs	5	2	5	2	7		3	1		30	7	0.50
SCE	Process Pumping VFDs	3	3	3	2	8		2	5			0	0.17
SCE	Process Pumping VFDs	8	3	8	2	10	3	0	3			7.5	0.52
SCE	Process Pumping VFDs	10	2	10	2	6	6	4	2			10	0.80
SCE	Process Pumping VFDs		1		2	10		0	5			0	0.00
SCE	Process Pumping VFDs	10	2	10	2	6	6	4	2			10	0.80

TABLE D-7: INDIVIDUAL SURVEY RESPONSES, VENDOR SCORES AND NTGRS FOR TANKLESS WATER HEATING

Measure Group	A5	PIS Score 1	A5a	RPIS Score 2	A6	NPS Score 3	NTGR
Tankless Water Heating	9	9	8	8	4	6	0.77
Tankless Water Heating	10	10	7	7	7	3	0.67
Tankless Water Heating	10	10	5	5	10	0	0.50
Tankless Water Heating	5	5	4	4	9	1	0.33
Tankless Water Heating	10	10	7	7	4	6	0.77
Tankless Water Heating	9	9	8	8	8	2	0.63

APPENDIX E   RESPONSE TO COMMENTS

Submitted by	Section	Topic	Page	Comment	Evaluator Response
SCE		Industry Standard Practice		SCE recommends the reintroduction of market share tracking studies to determine on a regular basis these key inputs (baseline mix, useful lives, sales trends etc.) as opposed to one off ISP studies or Dispositions. There are better ways to determine these key parameters.	Thank you for the comment. We acknowledge that market share tracking studies can provide useful information to help inform the development of measure baselines.
SCE		NTG Result		ACEEE's State Scorecard Annual report uses NTG values from every state except California. California leads and has led the country in Energy Efficiency, Solar and now GHG abatement. We surely can find a way to lead in the measurement of program impacts and SCE looks forward to working with the team in moving in this direction.	Thank you for your comments. We expect there will be a NTG webinar scheduled in the future which would provide a forum for your collaboration and feedback.
SCG		Program Delivery Approach	p .3-15	For Tankless Water Heaters (TWH), upstream and midstream delivery are mentioned. This appears to be all midstream for TWH. Can you confirm and edit as needed?	Acknowledged, but upstream is one of the labels used in the tracking system for this subset of claims. This includes the majority of the SCG records and one PG&E record. However, the evaluation team has come to understand the TWH measure delivery is actually midstream, and has edited the report accordingly.
SCG		NTG Approach	p. 6-4	Changing methodology seems appropriate given the issues with the PAI-1 score. Replacing that score with question N6 asks 'what action you would have taken if the program had not been available'. This is very similar to the PAI-3 score and may lead to an over-emphasis on the non-program responses. Would it be better to combine question N6 into the PAI-3 score?	Each of these (PAI-3 and PAI-N6) represents a different way of reflecting program influence. PAI-3 signifies the likelihood of doing the same project at the same time absent the program. PAI-N6 reflects the specific action they would have taken if there had been no program. They are related, but they are different.
SCG		NTG Result	p. 3-21 and p. D-30	Given the newness of the midstream vendor NTG survey for TWHs, and the fact that interviews were conducted with only 6 vendors (with 2 for SCG and 4 for PG&E), the results may not be representative and should be informative only. We do realize that these vendors account for most of the TWH installations. That said, one of the six vendors has a very low NTG score and could be an outlier. Moreover, it is possible that midstream program influences are 'felt' by the customers (e.g., price effects, better promotion and information, etc.) and as end users their input should be considered.	Thank you for your observations. The Midstream framework relies on a combination of customer and vendor NTG findings. However, the utility could not provide any customer contact information so our choices were to either: (1) use vendor findings only; or (2) pass through savings based on the ex-ante NTG value. We elected to use vendor findings since, as you noted, they do represent the majority of program activity/savings. Note that the resulting vendor-centric NTGR of 0.55 is very similar to the ex-ante NTGR value of 0.58. We have strongly recommended that Program Administrators collect full contact information for the customers that purchase the program-qualifying measure so that we are able to use the full Midstream framework in the future.

Submitted by	Section	Topic	Page	Comment	Evaluator Response
SCG		Recommendations	p. 8-7	The recommendation to provide better customer contact information for midstream programs is good. Please consider expanding that to possibly include program design or requirements to have vendors indicate to all participating customers that the IOU/PAs are providing support and rebates in the state's energy efficiency program.	Thank you for this suggestion. The recommendation in the report was adjusted as suggested.
SCG		TWH Gross Impact Result, and Report Content	p. 3-21 and p. D-30	For TWHs, it is not clear how the hot water fixtures and the temperature increases are used to recalculate evaluated savings. Later sections discuss the use of recirculation systems and the fact that the entering temperature are higher and temperature differences are less (between the inlet and outlet temperature). A spot measurement which does not consider fluctuations over time to reflect various cold water inputs to the water heater during the day does not yield a good estimate of savings. Standby losses in recirculation loops (baseline and new) also should be considered. In the absence of better information, workpaper assumptions should be used. The survey instrument should be edited to include capture of the presence of recirculation loops and their controls. It may be useful to readers to have the relevant workpapers included in an appendix.	Evaluators referenced the workpapers' underlying DEER model inputs in the ex-post savings calculation. The spot-measured temperature rise was used in place of the DEER-assumed temperature delta to recreate unit energy savings with field-verified data. Refer to the below PG&E comment and response that references page 5-48; this addresses concerns expressed here regarding inlet water temperature fluctuations.

We agree that additional data should be collected with regard to the presence and characteristics of a recirculation loop. We were in fact surprised to see TWHs used with recirculating systems. While the applicable workpapers do not expressly bar TWH installations for use with a recirc loop, they acknowledge that such systems are inefficient TWH uses.

The report has been revised with footnotes and links to the applicable workpapers. |
| SCG | | TW Gross Impact Result, and Report Content | p. 5-37 | Several times in the report there is mention that one TWH 'project occurred at a service address that had no evidence of recent TWH installation'. Can you explain this in more detail, and whether or not this is a customer refusal, if a site visit was conducted, and other context and evidence collected. | The site visit was conducted as planned. However, upon comprehensive inspection of the facility, the field engineer found no evidence of a TWH system, much less one installed in recent years. The facility representative had no knowledge of a TWH project. Since no TWH system could be found at the service address claimed in the tracking data, evaluators were forced to apply a 0% RR for this isolated project. |
| SCG | | TW Gross Impact Result, and Report Content | p. 5-51 | Given the poor relative precision (RP) of +/-24% for SCG and +/- 40% for PG&E, with respective realization rates of 42% and 56%, it will be necessary to study the TWH measures in future years to produce reliable updates. Until that time, savings should utilize the approved workpapers. | We agree that the TWH measure warrants further study in future evaluation years. In fact, the TWH measure appears on the 2019 uncertain measure list.

The evaluation report does not recommend that the programs degrade the savings with the RRs by utility. Rather, the report recommends that the workpapers are refined with field-verified data such as temperature rise and efficiency. |
SCG		TWH NTG Result	p. 6-9	NRR is 55% vs. WP at 58%. Only based on 6 vendors (total) and 2 for SCG.	Thank you for this input.
SCG		Cost Effectiveness		There was almost no discussion of cost effectiveness in this evaluation. Something to consider for future evaluations.	Thank you for this input.
SCG		Process Pump VFD EUL		EUL set (ex post) at 1/3 of host equipment (pump motor) EUL. This might be waived and the full EUL used if we consider that the pump motor will most likely be replaced with a similar sized pump motor on failure.	Thank you for this input. However, there is no CPUC evaluation policy or guidance that is consistent with this recommendation.

Submitted by	Section	Topic	Page	Comment	Evaluator Response
PG&E	Overarching	Report Content	NA	PG&E commends the evaluation team for providing a well-written draft report with the inclusion of appendices for IESR tables and Recommendations. Furthermore, PG&E appreciates that the evaluation team has included analyses to categorize and quantify the reasons for discrepancies between ex ante and ex post results. These are best practices for impact evaluations.	Thank you for this complimentary input on the report content.
PG&E	Cover	Repot Title		To aid future searchability of this report, could the evaluators rename the study to include keywords "PY2018", "impact evaluation" and "SMB?" A revised title could be, "PY2018 Small/Medium Commercial (SMB) Sector ESPI Impact Evaluation, Draft," or similar?	The evaluation team made this suggested change.
PG&E	Overarching	Ex-Ante Savings	NA	PG&E would like to replicate the ex ante savings values for the four measures identified in the report. Can you specify what measure codes or other identifying information was used to query the ex ante savings from the Cedars data to construct the ex ante savings for each measure?	Appendix C includes a listing of tracking system-based measure descriptions by IOU that were included within the scope of this evaluation. However, it is notable that common measure descriptions are sometimes mapped to more than one such sector. The data are further screened, as needed, to remove all residential records, custom records, lighting records, HVAC records and codes and standards records. The evaluation team will provide PG&E with a complete listing of the claim IDs that constitute the population frame for this evaluation more generally, including both the four measure groups included in the evaluation scope AND those of other measure groups that also fell under the small/medium commercial sector but were passed through.
PG&E	Overarching	Ex-Ante Savings	NA	Can the report clarify throughout, where market effects (ME) of five percentage points are included in net savings and NTG values?	We have clarified in the report in multiple places where ME is included or not. To summarize, ME is included in all net values presented in section 1, section 7 and the IESR appendix AA. However, the NTGR in chapter 6 is defined as one minus free ridership, and therefore does not include the ME adder.
PG&E	Executive Summary	Ex-Ante Savings	NA	The executive summary discusses savings from four measures while the IESR table (Appendix AA) shows 60-70% pass through savings for other measures. What are the other measures that are passed through? If these other measures are part of the SMB commercial impact evaluation, should there be a summary table in the executive summary that includes all the savings covered by the evaluation?	There are only 4 uncertain measures that were evaluated under this study. For these four measure, little to no savings values were passed thru (i.e., the pass thru is typically 0% or something very small. All other measures were 100% passed through. These measures are not part of a reporting group, and are indicated with a reporting group called "Pass Through" and will show 100% passed through. Therefore, when the PA total line is shown, it will often be in the 60-70% range because the four measures that were evaluated, only represent 30-40% of the ex ante savings and the other measures, which were passed through, represent the other 60-70%. These other non-evaluated measures were not in any way examined by this study, and include a large number of other measures, and therefore will not be identified in the report.

Submitted by	Section	Topic	Page	Comment	Evaluator Response
PG&E	Executive Summary	Pump VFD Measure Description	p. 1-4	Can the report be clarified to explain what "Pumps are mislabeled, including proper classification…" means? Does this refer to labeling on the pump itself or mis-identification in the ex ante claims data?	Report updated to clarify that this issue relates to the accuracy of tracking system-based measure descriptions and pump horsepower ratings.
PG&E	Executive Summary, and Section 5.1	Refrigeration Case LED EUL	p. 1-5	The workpaper used a measure application type of replace on burnout (ROB) with a CPUC approved EUL of 16 years. PA's are required to use the approved workpaper values when making ex ante claims. However, we agree the 16-year EUL is inconsistent with a refrigerated case EUL of 12 years, although that value may be low. How did the evaluators come up with a 4-year RUL? We note that usage of RUL=1/3 EUL for custom retrofit add-on measure application types is not appropriate because LED lighting was not added but replaced existing lighting. Therefore, the evaluators have liberty to determine an appropriate RUL. PG&E doesn't believe most customers would invest in retrofitting equipment that they believe is near end of life. Will the evaluators consider a more appropriate measure life somewhere between 4 and 16 years?	Application of an evaluation-based EUL of 4 years is both appropriate and consistent with CPUC evaluation guidance that relates measure life to host equipment remaining useful life.
PG&E	Executive Summary Section 1.4.4	TWH Ex-Ante Savings Values		The report states, "11 of the 25 evaluated projects applied incorrect per-unit savings values…" This is a deemed measure; we are required to use workpaper values. Can the evaluators clarify what is meant by incorrect savings values or re-word the finding?	We agree that deemed measures, including TWH, must conform with applicable workpapers. The quoted statement refers to the underlying DEER models referenced by the applicable workpapers. These prototype models result in different unit energy savings values as a function of facility type, climate zone, efficiency tier, and system size. In 11 of 25 cases, the UES value applied by the programs contradicted the DEER-recommended UES based on facility type, climate zone, efficiency tier, and system size. We have added this information in the report.
PG&E	Chapter 2 Intro and Overview Section 2.2 and Table 2-2	Studies Measure Groups		Could the report clarify what is an "ESPI measure group" and what is an "ESPI measure?" Is there a distinction between measures on the Uncertain Measure List and ESPI measures, or are those synonymous terms?	The terms ESPI measure group and ESPI measure are synonymous when used in the report. Both terms refer to ESPI uncertain measures that were assigned to the Small/Medium Commercial sector evaluation.
PG&E	Chapter 2 Intro and Overview Table 2-2 and Table 2-3	Studies Measure Groups		Tables 2-2 and 2-3 both have footnotes "*** ESPI measures selected for evaluation." Where does this selection occur? These tables include Water Heater Boiler and Water Heating Storage Water Heater Measures. Based on the final 2018 Uncertain Measures List (October 31, 2017), these two measures contributed 7.4% and 6.4% respectively to statewide total uncertainty. Why were these measures not selected for evaluation and who makes that determination?	The evaluation team made the decision to exclude these two measures from the scope of the evaluation. That decision was made at the workplan stage of the project in June of 2019. Refer to page 1-2 of the final workplan.

Submitted by	Section	Topic	Page	Comment	Evaluator Response
PG&E	Chapter 5 Gross Impact Evaluation Results	Pump VFD Savings	pp. 5-20 to 5-23	PG&E commends the evaluation team for the excellent Tables 5-15 and 5-16 showing site-level sample results and discrepancy classifications. This is best practice reporting. In cases where pump run hours were found to be < 500 hours/yr., it looks like the evaluators calculated the resulting savings and factored that into the final measure GRRs. Is that correct, or were these considered "ineligible" and zeroed out?	First, thank you for your appreciation of the evaluation team efforts. Second, where pump run hours were under 500 hours per year, evaluators calculated ex-post savings and did not zero-out savings on an eligibility basis.
PG&E	Chapter 5 Gross Impact Evaluation Results	TWH Zero Savers	p. 5-47	The report states, "Three of the 25 projects were deemed zero-savers: one project occurred at a facility that has since gone out of business, one project occurred at a facility that uses electricity for water heating, and one project occurred at a service address that had no evidence of recent TWH installation." The tankless WH measure is a midstream program intervention. During the data request process PG&E initially did not provide end-customer data for this measure because that information is not definitively known. Recipients of tankless WHs were not direct program participants because it's a midstream program. Itron persisted asking PG&E "to do the best we could..." and we cautioned Itron that the end-customer matching through shipping addresses for these measures would result in low matching rates and could not be considered 100% accurate to identify end-customers benefiting from a midstream intervention. How are the evaluators certain that they were looking at the correct customer sites to warrant zero savings assessments when they were warned that the data are not 100% accurate? Unless the evaluators can demonstrate with high confidence that the sites they visited received incentivized tankless WH, and something else happened such that the incentivized tankless WH were not installed at any other location, can these sites be removed from the sample?	The summary of the PG&E/evaluator data request process is accurate. PG&E did caution the evaluators of the uncertainty of the customer-matched data, and evaluators carefully cleaned and examined the data to identify the projects with the highest-confidence contact information. The low-confidence projects resulted in a very poor recruitment rate. To maximize the recruitment rate and quantity of evaluated projects as the March 1 bus stop loomed, evaluators focused recruitment efforts on high-confidence projects with good contact information. For all recruited facilities, evaluators pre-screened the customers to minimize unfruitful site visits. Such recruitment efforts were necessary due to the data gaps and inaccuracies from the midstream measure design. Nonetheless, evaluators were only able to conduct site visits at 25 of the target sample count of 36 facilities. These difficulties caused evaluators to recommend that the programs more comprehensively collect end-user information, not only for evaluation purposes but for basic, proof-of-install auditing purposes. Evaluation site visits therefore generally occurred for customers with credible contact information and verbal agreement to participate. Only one of the 25 evaluated projects appear to be affected by the comment's last question-- the site for which a TWH could not be found, which was addressed above in response to the SCG comment referencing p. 5-37. Regarding sample design, removing a project from the sample would bias the results. The sample is designed such that, for every zero-saver in the sample, there are likely many other zero-savers in the participant population represented by that individual project.
PG&E	Chapter 5 Gross Impact Evaluation Results	TWH Zero Savers	p. 5-47	During the draft comment period, PG&E asked Itron by email to provide details for a site that may have received a midstream program instantaneous gas WH, but the site had electric water heating. Itron declined to provide the site data on concerns of anonymity. PG&E appreciates promises made around survey anonymity, and we believe that commitment has been met since no survey responses have been shared. However, how can program processes be improved if we are unable to identify and investigate possible issues? PG&E is requesting site-identifying information again. Further, we are requesting site-identifying information for the other two PG&E zero-saver WHs so that we can investigate what happened to determine if program changes are warranted.	The evaluation team and CPUC are not comfortable providing site-identifying information to PG&E, as our team has promised those participants that their responses will remain anonymous, and we feel it is important to provide that assurance to willing study participants in order to obtain full disclosure and honesty during data collection. When we identify issues with an application in our sample, we provide this information in the report, as well as recommendations to help alleviate ongoing problems more broadly. In this case, we have identified the issues we've encountered in the hope that PG&E can better address these and other similar problems through a combination of process improvements and thorough verification. That is the purpose behind the provision of some of the discrepancy factors identified in Chapter 5 . In our opinion taking a forward-looking, proactive approach would be more productive than a backward looking investigation of lost opportunities.

Submitted by	Section	Topic	Page	Comment	Evaluator Response
PG&E	Chapter 5 Gross Impact Evaluation Results	TWH Zero Savers	p. 5-47	The tankless WH heating measure is a midstream intervention. PG&E appreciates that this is mentioned in the Executive Summary, but no mention of this appears anywhere in the section 5.4 write-up. Could the evaluators edit this section to acknowledge the midstream intervention approach, the data limitations associated with identifying end-customers in midstream programs, how those limitations could impact evaluation results, and steps the evaluator took to mitigate those impacts?	Good suggestions, and we have made these points more clear in Section 5.
PG&E	Chapter 5 Gross Impact Evaluation Results	TWH Zero Savers	p. 5-48	The evaluators indicate they re-estimated savings in part by examining the delta T resulting from both inlet and outlet temperatures. What months were inlet water temperatures taken? Inlet water temperatures vary at least 15degF throughout the year (p20, CEC Water Heating Design Guide, 2012, https://ww2.energy.ca.gov/2013publications/CEC-500-2013-126/CEC-500-2013-126.pdf). In calculating savings, were spot measurements used, or was there an effort to estimate average annual inlet temperatures?	Evaluators considered annual average city water temperatures in the site-specific savings calculations. When spot-measured inlet temperatures differed materially from the range of typical city water temperatures for a given climate zone, evaluators defaulted to the annual average city water temperature.