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Request IR-12:

With respect to ENSC's revised response to Multeese IR-5(a) and 5(b) dated April 18, 2012, the inclusion of NTG in the calculation of the TRC appears to be a revision of the calculation of TRC in 2011 and 2012.

For 2011, the TRC formula was provided by NSPI on March 30, 2010 in response to Multeese IR-5(d) as:

TRC = [PV(avoided energy cost over the measure life x first year energy savings) + PV(avoided demand costs over the measure life x coincident peak demand savings)]/(One-Time Incremental Measure Cost + Program Administration Cost)

This formula was applied to the CFL: Screw-in, <=15w, Direct Install. The energy savings assumed were 38.5 Kwh, the demand savings were 4W, the incremental measure cost was \$2.80 and the Program Administration Cost was \$3.50. The TRC was calculated as:

TRC = [(\$0.59/Kwh x 38.5Kwh) + (\$0/KW x 4W)]/(2.80 + 3.50) = 3.6

For 2012, in response to Multeese IR-5(b) dated March 29, 2011, ENSC confirmed that the avoided costs were being applied in the same manner as in 2011.

a) Please reconcile the method being used to calculate the TRC in 2013 with the method used in 2011 and 2012.

b) If the method in 2013 is a revision of the 2011 and 2012 method, please explain why it is being altered.

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Response IR-12:

a) The TRC calculation methods used from year to year are consistent. In 2011, the net-to-gross (NTG) ratio applied was 1.0 in all instances, but the formula did not show NTG, since a NTG of 1.0 would not alter TRC results. 2012 and 2013 NTG ratios, in many instances, are less than 1.0.

The 2010 evaluated NTG ratio for residential CFLs was considerably higher than 1.0. The evaluated NTG ratio for residential CFLs was not applied, and that was balanced out by not applying a NTG ratio for other residential measures that the 2010 evaluation reports indicated were less than 1.0. A NTG ratio of 1.0 was used for all BNI programs for planning purposes in the 2011 DSM Plan.

In 2012 and 2013, NTG ratios of less than 1.0 are applied to account for the projected free riders, except for measures for the low income component of the Existing Residential Program, and for the Energy Savings Actions program.

b) Please refer to part a.

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Request IR-13:

With respect to the Navigant report "Energy Efficiency Resource Assessment Model (RAM Tool) Update prepared for ENSC dated April 13, 2012,

- a) Please provide a copy of the clarification memo referred to in Footnote 1.**
- b) In the paragraph immediately preceding Table 1 on page 2, it is noted that the RAM Tool incorporates a resource optimization model to place greater relative emphasis within a program on those measures with higher TRC benefit/cost ratios. Please describe the algorithm used in this module.**
- c) Please apply the algorithm in b) to the Existing Residential program to illustrate how it affects the mix of measures which make up this program.**

Response IR-13:

- a) Please refer to Attachment 1.**
- b) Please refer to Synapse IR-15.**

All of the calculations referenced in Synapse IR-15 are affected if a measure is part of a competition group. Technical, Economic, and Base Year Market Potential can be affected. Measures within a competition group can be in different programs. Within a competition group, the measures affect the same baseline measure and are considered mutually exclusive. Each competing measure is given a percentage of the baseline to compete for. The share is based on the TRC for each competing measure. The method is to sum all of the competing measure TRC values, then determine share by each competing measure's TRC ratio. The result is measure level technical potential, which then filters down to the other types of potential.

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2 c) Data is provided for the Existing Houses, Efficient Products, and Low Income
3 components, as these compete for certain measures. The Existing Residential program
4 includes both the Existing Houses and Low Income components.

5
6 Existing Houses Calibration target = 6,500 MWh

7 Efficient Products Calibration target = 20,000 MWh

8 Low Income Calibration target = 7,500 MWh

9
10 The tables below summarize pre and post model change values by measure for maximum
11 market potential for each of these three components. Maximum market potential will
12 change if:

- 13
14 1) TRC changes, and, as a result, the determination that a measure passes (or not
15 passes TRC) changes, and/or
16 2) The specific measure is part of a competition group and the relative share of the
17 total TRC for the competition group changes.

18
19 The mix of measures comprising each program competition group did not change, but the
20 maximum market potential changed as provided below.

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EXISTING HOUSES COMPONENT

Measure	Program Type	Maximum Market Potential (MWh)	Maximum Market Potential (MWh)	In a Competition Group?	Difference (MWh)
		before RAM Tool correction	after RAM Tool correction		
		312,628	315,120		2,491.8
CFL - Dimmable - 19 W	Existing Homes	307	307	no	
Energy Star Decorative CFL Lamps-Chandelier (5 W)	Existing Homes	15	15	no	
Power Bar With Timer	Existing Homes	3,785	3,785	no	
SmartStrip (replaces conventional power bar - for TV and Computer peripherals ONLY)	Existing Homes	5,256	5,256	no	
Low Flow Showerhead (base 2.0 GPM, efficient 1.25 GPM)	Existing Homes	9,824	9,824	no	
Faucet Aerator Base 2.2GPM, efficient 1.5 GPM (all faucet aerators in home replaced)	Existing Homes	3,214	3,214	no	
Programmable Thermostat	Existing Homes	6,119	6,119	no	
Clothes Dryer - Gas Fuel Switch	Existing Homes	17,554	17,554	no	
Gas Range (Fuel Switch)	Existing Homes	8,096	8,096	no	
Premium Ductless Heat Pump from Baseboard	Existing Homes	10,716	10,716	no	
Premium Ductless Heat Pump from Standard DHP	Existing Homes	2,965	2,965	no	
Wood Stove supplement Electric Baseboard or Central	Existing Homes	15,403	15,403	no	
Pellet Stove supplement Electric Baseboard or Central	Existing Homes	4,229	4,229	no	
Solar Hot Water Heater, replacing electric water heater	Existing Homes	981	981	no	
Drain Water Heat Recovery (42% efficient or higher)	Existing Homes	7,744	7,744	no	
Hot Water Heater Tank Wrap	Existing Homes	2,341	2,341	no	
Hot Water Heater Pipe Insulation	Existing Homes	454	454	no	
Replace Space- or Water Heating Equipment or Retrofits Envelope Measures - Level 1 (base measure: home less efficient than tier 4)	Existing Homes	11,290	11,290	no	
Replace Space- or Water Heating Equipment or Retrofits Envelope Measures - Level 2 (base measure: home less efficient than tier 4)	Existing Homes	98,778	98,778	no	
Replace Space- or Water Heating Equipment or Retrofits Envelope Measures - Level 3 (base measure: home less efficient than tier 4)	Existing Homes	41,981	41,981	no	
Replace Space- or Water Heating Equipment or Retrofits Envelope Measures - Level 4 (base measure: home less efficient than tier 4)	Existing Homes	34,390	34,390	no	

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1 EXISTING HOUSES (cont.)

Measure	Program Type	Maximum Market Potential (MWh)	Maximum Market Potential (MWh)	In a Competition Group?	Difference (MWh)
		before RAM Tool correction	after RAM Tool correction		
CFL: Screw-In (<=15W)	Existing Homes	368	497	Yes-1	128.9
CFL: Screw-In (16-24W)	Existing Homes	1,172	1,210	Yes-2	38.3
CFL: Screw-In (>=25W)	Existing Homes	5,338	7,168	Yes-3	1,829.9
CFL: Screw-In (<=15W) (MURB)	Existing Homes	207	209	Yes-4	2.0
LED 6 W Screw-In (replacing 60 W Incandescent) (MURB)	Existing Homes	10	10	Yes-4	-0.1
CFL: Screw-In (16-24W) (MURB)	Existing Homes	527	527		
CFL: Screw-In (>=25W) (MURB)	Existing Homes	750	774	Yes-5	24.3
LED 15 W Screw-In (replacing 100 W Incandescent) (MURB)	Existing Homes	46	44	Yes-5	-2.0
CFL - Dimmable - 19 W (MURB)	Existing Homes	46	46		
LED Exit Sign (MURB)	Existing Homes	739	739		
Energy Star Decorative CFL Lamps-Chandelier (5 W) (MURB)	Existing Homes	5	5		
Hot Water Heater Tank Wrap (MURB)	Existing Homes	879	879		
Low Flow Showerhead (base 2.0 GPM, efficient 1.25 GPM) (MURB)	Existing Homes	2,596	2,596		
Faucet Aerator Base 2.2GPM, efficient 1.5 GPM (all faucet aerators in home replaced) (MURB)	Existing Homes	1,206	1,206		
Indoor Lighting Sensors (MURB)	Existing Homes	861	861	Yes-6	0.5
Indoor Common Area Lighting Timers (competes w/ sensor) (MURB)	Existing Homes	8,856	9,333	Yes-6	477.6
Outdoor Lighting Sensor (MURB)	Existing Homes	1,326	1,278	Yes-7	-48.7
Outdoor Lighting Timer (competes w/ sensor) (MURB)	Existing Homes	1,623	1,664	Yes-7	41.1
Programmable Thermostats (MURB)	Existing Homes	939	939		

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1 EFFICIENT PRODUCTS PROGRAM

Measure	Program Type	Maximum Market Potential (MWh)	Maximum Market Potential (MWh)	In a Competition Group?	Difference (MWh)
		before RAM Tool correction	after RAM Tool correction		
		105,126	106,458		1,332
Convection Oven	Efficient Products	238	238	no	
Power Bar With Timer	Efficient Products	3,785	3,785	no	
SmartStrip (replaces conventional power bar - for TV and Computer peripherals ONLY)	Efficient Products	5,256	5,256	no	
High Efficiency Clothes Washer - Tier 3	Efficient Products	549	549	no	
Low Flow Showerhead (base 2.0 GPM, efficient 1.25 GPM)	Efficient Products	9,824	9,824	no	
Faucet Aerator Base 2.2GPM, efficient 1.5 GPM (all faucet aerators in home replaced)	Efficient Products	2,655	2,655	no	
Programmable Thermostat	Efficient Products	6,174	6,174	no	
Solar Landscape Lights	Efficient Products	34	34	no	
Energy Star Cable Boxes	Efficient Products	646	646	no	
CEE Tier 4 Television (replacing Tier 2 or less efficient TV)	Efficient Products	7,153	7,153	no	
LED Holiday Lights (300 bulb string)	Efficient Products	1,324	1,324	no	
Tier 3 Dehumidifier	Efficient Products	4,122	4,122	no	
Refrigerator Recycling - removal of secondary refrigerator	Efficient Products	39,975	39,975	no	
Freezer Recycling - removal of secondary freezer	Efficient Products	14,702	14,702	no	
CFL: Screw-In (<=15W)	Efficient Products	714	888	Yes-1	174.6
LED 6 W Screw-In (replacing 60 W Incandescent)	Efficient Products	76	54	Yes-1	(21.5)
CFL: Screw-In (16-24W)	Efficient Products	1,248	1,210	Yes-2	(38.3)
CFL: Screw-In (>=25W)	Efficient Products	5,669	7,168	Yes-3	1,499.2
LED 15 W Screw-In (replacing 100 W Incandescent)	Efficient Products	981	699	Yes-3	(282.1)

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1 LOW INCOME PROGRAM

Measure	Program Type	Maximum Market Potential (MWh)	Maximum Market Potential (MWh)	In a Competition Group?	Difference (MWh)
		before RAM Tool correction	after RAM Tool correction		
		39,856	39,856		0.0
CFL: Screw-In (<=15W)	Low Income	663	663	no	
CFL: Screw-In (16-24W)	Low Income	958	958	no	
CFL: Screw-In (>=25W)	Low Income	5,646	5,646	no	
CFL: Torchiere	Low Income	387	387	no	
Refrigerator Recycling - removal of secondary refrigerator	Low Income	8,132	8,132	no	
Freezer Recycling - removal of secondary freezer	Low Income	2,096	2,096	no	
Hot Water Heater Tank Wrap	Low Income	2,340	2,340	no	
Hot Water Heater Pipe Insulation	Low Income	2,077	2,077	no	
Low Flow Showerhead (base 2.0 GPM, efficient 1.25 GPM)	Low Income	3,070	3,070	no	
Faucet Aerator Base 2.2GPM, efficient 1.5 GPM (all faucet aerators in home replaced)	Low Income	1,004	1,004	no	
Programmable Thermostat	Low Income	1,530	1,530	no	
Tier 3 Dehumidifier	Low Income	4,017	4,017	no	
Power Bar With Timer	Low Income	946	946	no	
Electric kettle	Low Income	140	140	no	
Retrofit Envelope Measures, Level 1	Low Income	1,829	1,829	no	
Retrofit Envelope Measures, Level 2	Low Income	406	406	no	
Retrofit Envelope Measures, Level 3	Low Income	894	894	no	
Retrofit Envelope Measures, Level 4	Low Income	813	813	no	
Retrofit Envelope Measures, Level 5	Low Income	1,544	1,544	no	
Retrofit Envelope Measures, Level 6	Low Income	1,361	1,361	no	

2
 3 This data then affects each measure's calibration target. The next set of tables identifies how the
 4 calibration targets change by measure within each component. The total is the same, but there are
 5 some differences from measure to measure; especially for the measures in a competition group.
 6 There are no changes to Low Income.

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1 EXISTING HOUSES COMPONENT

Measure	Program Type	MWh before RAM Tool correction	MWh after RAM Tool correction	Difference (MWh)
	Calibration Total (MWh)	6,500	6,500	0
CFL - Dimmable - 19 W	Existing Homes	6.4	6.3	-0.1
Energy Star Decorative CFL Lamps- Chandelier (5 W)	Existing Homes	0.3	0.3	0.0
Power Bar With Timer	Existing Homes	78.6	78.0	-0.6
SmartStrip (replaces conventional power bar - for TV and Computer peripherals ONLY)	Existing Homes	109.2	108.3	-0.9
Low Flow Showerhead (base 2.0 GPM, efficient 1.25 GPM)	Existing Homes	204.1	202.4	-1.6
Faucet Aerator Base 2.2GPM, efficient 1.5 GPM (all faucet aerators in home replaced)	Existing Homes	66.8	66.2	-0.5
Programmable Thermostat	Existing Homes	127.1	126.1	-1.0
Clothes Dryer - Gas Fuel Switch	Existing Homes	364.6	361.7	-2.9
Gas Range (Fuel Switch)	Existing Homes	168.2	166.8	-1.3
Premium Ductless Heat Pump from Baseboard	Existing Homes	222.6	220.8	-1.8
Premium Ductless Heat Pump from Standard DHP	Existing Homes	61.6	61.1	-0.5
Wood Stove supplement Electric Baseboard or Central	Existing Homes	319.9	317.4	-2.5
Pellet Stove supplement Electric Baseboard or Central	Existing Homes	87.8	87.2	-0.7
Solar Hot Water Heater, replacing electric water heater	Existing Homes	20.4	20.2	-0.2
Drain Water Heat Recovery (42% efficient or higher)	Existing Homes	160.8	159.6	-1.3
Hot Water Heater Tank Wrap	Existing Homes	48.6	48.2	-0.4
Hot Water Heater Pipe Insulation	Existing Homes	9.4	9.4	-0.1
Replace Space- or Water Heating Equipment or Retrofits Envelope Measures - Level 1 (base measure: home less efficient than tier 4)	Existing Homes	234.5	232.6	-1.9
Replace Space- or Water Heating Equipment or Retrofits Envelope Measures - Level 2 (base measure: home less efficient than tier 4)	Existing Homes	2,051.7	2,035.5	-16.2
Replace Space- or Water Heating Equipment or Retrofits Envelope Measures - Level 3 (base measure: home less efficient than tier 4)	Existing Homes	872.0	865.1	-6.9
Replace Space- or Water Heating Equipment or Retrofits Envelope Measures - Level 4 (base measure: home less efficient than tier 4)	Existing Homes	714.3	708.7	-5.6
CFL: Screw-In (<=15W)	Existing Homes	7.7	10.2	2.6
CFL: Screw-In (16-24W)	Existing Homes	24.3	24.9	0.6
CFL: Screw-In (>=25W)	Existing Homes	110.9	147.7	36.8
CFL: Screw-In (<=15W) (MURB)	Existing Homes	4.3	4.3	0.0

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1 EXISTING HOUSES COMPONENT (cont.)

Measure	Program Type	MWh before RAM Tool correction	MWh after RAM Tool correction	Difference (MWh)
LED 6 W Screw-In (replacing 60 W Incandescent) (MURB)	Existing Homes	0.2	0.2	0.0
CFL: Screw-In (16-24W) (MURB)	Existing Homes	10.9	10.9	-0.1
CFL: Screw-In (>=25W) (MURB)	Existing Homes	15.6	15.9	0.4
LED 15 W Screw-In (replacing 100 W Incandescent) (MURB)	Existing Homes	0.9	0.9	0.0
CFL - Dimmable - 19 W (MURB)	Existing Homes	1.0	1.0	0.0
LED Exit Sign (MURB)	Existing Homes	15.4	15.2	-0.1
Energy Star Decorative CFL Lamps-Chandelier (5 W) (MURB)	Existing Homes	0.1	0.1	0.0
Hot Water Heater Tank Wrap (MURB)	Existing Homes	18.2	18.1	-0.1
Low Flow Showerhead (base 2.0 GPM, efficient 1.25 GPM) (MURB)	Existing Homes	53.9	53.5	-0.4
Faucet Aerator Base 2.2GPM, efficient 1.5 GPM (all faucet aerators in home replaced) (MURB)	Existing Homes	25.1	24.9	-0.2
Indoor Lighting Sensors (MURB)	Existing Homes	17.9	17.8	-0.1
Indoor Common Area Lighting Timers (competes w/ sensor) (MURB)	Existing Homes	183.9	192.3	8.4
Outdoor Lighting Sensor (MURB)	Existing Homes	27.5	26.3	-1.2
Outdoor Lighting Timer (competes w/ sensor) (MURB)	Existing Homes	33.7	34.3	0.6
Programmable Thermostats (MURB)	Existing Homes	19.5	19.4	-0.2

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1 EFFICIENT PRODUCTS COMPONENT

Measure	Program Type	MWh before RAM Tool correction	MWh after RAM Tool correction	Difference (MWh)
	Calibration Total (MWh)	20,000	20,000	0
Convection Oven	Efficient Products	45.2	44.6	-0.6
Power Bar With Timer	Efficient Products	720.1	711.0	-9.0
SmartStrip (replaces conventional power bar - for TV and Computer peripherals ONLY)	Efficient Products	1,000.0	987.5	-12.5
High Efficiency Clothes Washer - Tier 3	Efficient Products	104.4	103.1	-1.3
Low Flow Showerhead (base 2.0 GPM, efficient 1.25 GPM)	Efficient Products	1,869.0	1,845.6	-23.4
Faucet Aerator Base 2.2GPM, efficient 1.5 GPM (all faucet aerators in home replaced)	Efficient Products	505.1	498.8	-6.3
Programmable Thermostat	Efficient Products	1,174.7	1,160.0	-14.7
Solar Landscape Lights	Efficient Products	6.5	6.4	-0.1
Energy Star Cable Boxes	Efficient Products	123.0	121.4	-1.5
CEE Tier 4 Television (replacing Tier 2 or less efficient TV)	Efficient Products	1,360.9	1,343.9	-17.0
LED Holiday Lights (300 bulb string)	Efficient Products	251.9	248.7	-3.2
Tier 3 Dehumidifier	Efficient Products	784.3	774.5	-9.8
Refrigerator Recycling - removal of secondary refrigerator	Efficient Products	7,605.2	7,510.0	-95.1
Freezer Recycling - removal of secondary freezer	Efficient Products	2,797.1	2,762.1	-35.0
CFL: Screw-In (<=15W)	Efficient Products	135.8	166.9	31.1
LED 6 W Screw-In (replacing 60 W Incandescent)	Efficient Products	14.4	10.2	-4.2
CFL: Screw-In (16-24W)	Efficient Products	237.5	227.3	-10.2
CFL: Screw-In (>=25W)	Efficient Products	1,078.5	1,346.7	268.2
LED 15 W Screw-In (replacing 100 W Incandescent)	Efficient Products	186.6	131.3	-55.3

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1 LOW INCOME COMPONENT

Measure	Program Type	MWh before RAM Tool correction	MWh after RAM Tool correction	Difference (MWh)
	Calibration Total (MWh)	7,500	7,500	0
CFL: Screw-In (<=15W)	Low Income	124.8	124.8	
CFL: Screw-In (16-24W)	Low Income	180.3	180.3	
CFL: Screw-In (>=25W)	Low Income	1,062.4	1,062.4	
CFL: Torchiere	Low Income	72.9	72.9	
Refrigerator Recycling - removal of secondary refrigerator	Low Income	1,530.4	1,530.4	
Freezer Recycling - removal of secondary freezer	Low Income	394.4	394.4	
Hot Water Heater Tank Wrap	Low Income	440.4	440.4	
Hot Water Heater Pipe Insulation	Low Income	390.9	390.9	
Low Flow Showerhead (base 2.0 GPM, efficient 1.25 GPM)	Low Income	577.7	577.7	
Faucet Aerator Base 2.2GPM, efficient 1.5 GPM (all faucet aerators in home replaced)	Low Income	189.0	189.0	
Programmable Thermostat	Low Income	287.9	287.9	
Tier 3 Dehumidifier	Low Income	756.0	756.0	
Power Bar With Timer	Low Income	178.1	178.1	
Electric kettle	Low Income	26.3	26.3	
Retrofit Envelope Measures, Level 1	Low Income	344.1	344.1	
Retrofit Envelope Measures, Level 2	Low Income	76.5	76.5	
Retrofit Envelope Measures, Level 3	Low Income	168.2	168.2	
Retrofit Envelope Measures, Level 4	Low Income	152.9	152.9	
Retrofit Envelope Measures, Level 5	Low Income	290.6	290.6	
Retrofit Envelope Measures, Level 6	Low Income	256.2	256.2	

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4 These individual measure targets are then translated into units implemented. For the base year,

5 the following tables summarize by program. There are no changes to Low Income.

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1 EXISTING HOUSES COMPONENT

Measure	Program Type	MWh before RAM Tool correction	MWh after RAM Tool correction	Difference (MWh)
CFL - Dimmable - 19 W	Existing Homes	235	233	-2
Energy Star Decorative CFL Lamps- Chandelier (5 W)	Existing Homes	18	18	0
Power Bar With Timer	Existing Homes	1,877	1,862	-15
SmartStrip (replaces conventional power bar - for TV and Computer peripherals ONLY)	Existing Homes	758	752	-6
Low Flow Showerhead (base 2.0 GPM, efficient 1.25 GPM)	Existing Homes	703	698	-5
Faucet Aerator Base 2.2GPM, efficient 1.5 GPM (all faucet aerators in home replaced)	Existing Homes	492	488	-4
Programmable Thermostat	Existing Homes	763	757	-6
Clothes Dryer - Gas Fuel Switch	Existing Homes	796	789	-6
Gas Range (Fuel Switch)	Existing Homes	388	385	-3
Premium Ductless Heat Pump from Baseboard	Existing Homes	810	810	
Premium Ductless Heat Pump from Standard DHP	Existing Homes	64	64	
Wood Stove supplement Electric Baseboard or Central	Existing Homes	60	60	
Pellet Stove supplement Electric Baseboard or Central	Existing Homes	30	30	
Solar Hot Water Heater, replacing electric water heater	Existing Homes	250	250	
Drain Water Heat Recovery (42% efficient or higher)	Existing Homes	212	210	-2
Hot Water Heater Tank Wrap	Existing Homes	238	236	-2
Hot Water Heater Pipe Insulation	Existing Homes	170	169	-1
Replace Space- or Water Heating Equipment or Retrofits Envelope Measures - Level 1 (base measure: home less efficient than tier 4)	Existing Homes	75	75	
Replace Space- or Water Heating Equipment or Retrofits Envelope Measures - Level 2 (base measure: home less efficient than tier 4)	Existing Homes	298	298	
Replace Space- or Water Heating Equipment or Retrofits Envelope Measures - Level 3 (base measure: home less efficient than tier 4)	Existing Homes	50	50	
Replace Space- or Water Heating Equipment or Retrofits Envelope Measures - Level 4 (base measure: home less efficient than tier 4)	Existing Homes	302	302	
CFL: Screw-In (<=15W)	Existing Homes	514	680	166
CFL: Screw-In (16-24W)	Existing Homes	1,057	1,083	26
CFL: Screw-In (>=25W)	Existing Homes	2,614	3,455	840
CFL: Screw-In (<=15W) (MURB)	Existing Homes	134	135	0

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1 EXISTING HOUSES COMPONENT (cont.)

Measure	Program Type	MWh before RAM Tool correction	MWh after RAM Tool correction	Difference (MWh)
LED 6 W Screw-In (replacing 60 W Incandescent) (MURB)	Existing Homes	7	6	0
CFL: Screw-In (16-24W) (MURB)	Existing Homes	223	221	-2
CFL: Screw-In (>=25W) (MURB)	Existing Homes	324	332	8
LED 15 W Screw-In (replacing 100 W Incandescent) (MURB)	Existing Homes	15	15	-1
CFL - Dimmable - 19 W (MURB)	Existing Homes	28	28	0
LED Exit Sign (MURB)	Existing Homes	60	60	0
Energy Star Decorative CFL Lamps-Chandelier (5 W) (MURB)	Existing Homes	5	5	0
Hot Water Heater Tank Wrap (MURB)	Existing Homes	76	75	-1
Low Flow Showerhead (base 2.0 GPM, efficient 1.25 GPM) (MURB)	Existing Homes	159	157	-1
Faucet Aerator Base 2.2GPM, efficient 1.5 GPM (all faucet aerators in home replaced) (MURB)	Existing Homes	149	148	-1
Indoor Lighting Sensors (MURB)	Existing Homes	846	837	-10
Indoor Common Area Lighting Timers (competes w/ sensor) (MURB)	Existing Homes	3,200	3,348	148
Outdoor Lighting Sensor (MURB)	Existing Homes	1,277	1,226	-51
Outdoor Lighting Timer (competes w/ sensor) (MURB)	Existing Homes	1,905	1,932	27
Programmable Thermostats (MURB)	Existing Homes	98	97	-1

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1 EFFICIENT PRODUCTS COMPONENT

Measure	Program Type	MWh before RAM Tool correction	MWh after RAM Tool correction	Difference (MWh)
CFL: Torchiere	Efficient Products	0	0	
Convection Oven	Efficient Products	558	551	-7
Power Bar With Timer	Efficient Products	11,734	11,602	-132
SmartStrip (replaces conventional power bar - for TV and Computer peripherals ONLY)	Efficient Products	4,985	4,925	-60
High Efficiency Clothes Washer - Tier 3	Efficient Products	268	265	-3
Low Flow Showerhead (base 2.0 GPM, efficient 1.25 GPM)	Efficient Products	2,579	2,558	-21
Faucet Aerator Base 2.2GPM, efficient 1.5 GPM (all faucet aerators in home replaced)	Efficient Products	1,809	1,794	-15
Programmable Thermostat	Efficient Products	3,163	3,130	-32
Solar Landscape Lights	Efficient Products	1,221	1,206	-15
LED Holiday Lights (300 bulb string)	Efficient Products	8,092	7,996	-96
Tier 3 Dehumidifier	Efficient Products	1,075	1,062	-13
Refrigerator Recycling - removal of secondary refrigerator	Efficient Products	9,135	9,020	-114
Freezer Recycling - removal of secondary freezer	Efficient Products	3,020	2,982	-38
CFL: Screw-In (<=15W)	Efficient Products	6,179	7,537	1,358
LED 6 W Screw-In (replacing 60 W Incandescent)	Efficient Products	393	277	-117
CFL: Screw-In (16-24W)	Efficient Products	10,932	10,463	-469
CFL: Screw-In (>=25W)	Efficient Products	26,957	33,384	6,427
LED 15 W Screw-In (replacing 100 W Incandescent)	Efficient Products	1,890	1,320	-570

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1 LOW INCOME COMPONENT

Measure	Program Type	MWh before RAM Tool correction	MWh after RAM Tool correction	Difference (MWh)
CFL: Screw-In (<=15W)	Low Income	2,722	2,722	0
CFL: Screw-In (16-24W)	Low Income	2,620	2,620	0
CFL: Screw-In (>=25W)	Low Income	12,920	12,920	0
CFL: Torchiere	Low Income	1,022	1,022	0
Refrigerator Recycling - removal of secondary refrigerator	Low Income	1,684	1,684	0
Freezer Recycling - removal of secondary freezer	Low Income	557	557	0
Hot Water Heater Tank Wrap	Low Income	242	242	0
Hot Water Heater Pipe Insulation	Low Income	181	181	0
Low Flow Showerhead (base 2.0 GPM, efficient 1.25 GPM)	Low Income	759	759	0
Faucet Aerator Base 2.2GPM, efficient 1.5 GPM (all faucet aerators in home replaced)	Low Income	532	532	0
Programmable Thermostat	Low Income	741	741	0
Tier 3 Dehumidifier	Low Income	675	675	0
Power Bar With Timer	Low Income	2,059	2,059	0
Electric kettle	Low Income	298	298	0
Retrofit Envelope Measures, Level 1	Low Income	25	25	0
Retrofit Envelope Measures, Level 2	Low Income	7	7	0
Retrofit Envelope Measures, Level 3	Low Income	18	18	0
Retrofit Envelope Measures, Level 4	Low Income	22	22	0
Retrofit Envelope Measures, Level 5	Low Income	62	62	0
Retrofit Envelope Measures, Level 6	Low Income	110	110	0

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2007 SPM Clarification Memo
(D.07-09-043, Mimeo pages 154-158)

We clarify today how the NTG ratio is to be applied to the cost-side of the TRC equation. As described in the SPM and reiterated in D.06-06-063, the intent of the TRC test of cost-effectiveness is to capture “all costs associated with the energy efficiency activity, whether paid for out-of-pocket by program participants or by non-participants through the authorized revenue requirement that fund the programs.”¹ Ratepayers, through the energy efficiency revenue requirements collected to fund these programs, incur a cost for free rider participants that must not be ignored in the formulation of the TRC test. Because the simplified numerical examples we presented in D.06-06-063 involved only one participant, the issue of how to fold in free rider considerations on the cost side of the TRC equation was never explicitly addressed in that decision.

In fact, the only time we have discussed in a Commission decision how to apply the NTG ratio to costs associated with energy efficiency programs was in 1992, in the very limited context of the DSM bidding pilots undertaken in the early 1990s. In that context, our objective was to ensure that doing so would not create “an advantage to bidders over the utility program even when the projects have identical total costs and benefits.”² Our determinations in D.92-12-050 were designed to achieve that specific objective, based on the record in that proceeding. However, in 1992 we did not consider how applying the NTG ratio to individual components of “participant costs” could impact the cost-effectiveness of different program delivery approaches (e.g., direct install versus rebate programs), that is, how such application could unduly advantage one approach over the other. It was not until the post-2005 portfolio plans were being developed and evaluated that Energy Division and its consultants brought these implications and questions concerning the 1998 SPM Correction Memo to our attention. Therefore, it is appropriate and important that we fully examine and resolve this issue in the context of post-2005 energy efficiency portfolio development and evaluation, and we do so today.

Without further clarification, the mathematical formulation of the 1988 SPM Correction Memo appears to create a free rider cost advantage to rebate programs relative to direct install programs, which should not occur if all else is equal. This is because this memo first displays the equation for TRC costs, which included at that time a “participant cost” (PC_i) term,³ and then “suggest[s]

¹ D.06-06-063, *mimeo.*, p. 67.

² D.92-12-050, 47 CPUC 2d, p. 73.

³ *Standard Practice Manual: Economic Analysis of Demand-Side Management Programs* (1987 SPM), December 1987, p. 29.

renaming the participant cost as PCN to designate ‘Participant cost—net’.” (See Attachment 9.) That particular PC_t term has always been defined in the SPM as participant costs *before* receiving the dollar rebate incentive (cash rebate or bill credit) discussed above, which is represented as the “INC” term in SPM equations.⁴ Therefore, the 1988 SPM Correction Memo could be interpreted to mean that the NTG ratio is applied to the participants’ out-of-pocket costs (after receiving a rebate incentive) as well as to the rebate incentive paid, up to the full cost of the measure or device.

This result means, as currently formulated in that memo, removal from TRC costs of all revenue requirements associated with paying free riders a rebate incentive. However, an equivalent financial incentive to the customer offered under a direct install program would not be removed. In other words, if instead of offering a cash rebate to the customer, the utility directly installs that same measure and requires a customer co-payment (such that the out-of-pocket cost to the customer is the same under either approach), the financial incentive to free rider participants would be *included* in the costs. This is because all of the direct install costs would appear in the “program administrative cost” (PRC) term.⁵ As indicated in Attachment 9, the 1988 SPM Correction Memo specifically prohibits applying the NTG ratio to the administrative cost component of TRC costs, since these are costs unrelated to participant expenditures.⁶

This means, all other things being equal, the 1988 SPM Correction Memo formulation would assign more costs to a direct install program than to a

⁴ See 1987 SPM, p. Appendix C, p. C-6; See also 2001 SPM at p. 11, footnote 3, and p. 32.

⁵ See D.06-06-063, pp. 71-72 and Ordering Paragraph 15. The utilities recently filed a joint petition to modify D.06-06-063 with regard to our orders that certain costs be included in the administrative cost component of the TRC, and not be considered transfer payments. (See *Joint Petition of PG&E, SDG&E, and SCE for Modification of D.06-06-063*, May 31, 2007 in R.04-04-025 and also served on the parties to this rulemaking.) We do not address this issue in today’s decision. Instead, we focus on how the NTG should be applied to TRC cost components within the context of the SPM and our determinations to date on the application of the TRC and PAC tests to various energy efficiency delivery approaches. Until further order by the Commission, our determinations in D.06-06-063 and the 2006 ALJ Compliance Ruling on how costs are to be accounted for under these tests remain unchanged.

⁶ The 1988 SPM Correction Memo utilizes the “UC” (for “utility administrative costs”) term, which as been subsequently renamed “PRC” (“program administrator program costs”) in more recent versions of the SPM. Therefore, we use the current PRC term in today’s clarification.

customer rebate program that is identical except for the delivery approach. As we stated in D.06-06-063, this type of inconsistency in cost-effectiveness results makes no sense, and is inconsistent with the intent of the TRC discussed above.⁷ It is not even clear that this was the intent of the authors of the 1988 memo, since the formula did not actually present a full restatement of all the equations (benefit and cost side) of the TRC test with explicit NTG ratios applied.

To clarify how the NTG ratio should in fact be applied, a transfer incentive (INC) recapture quantity will be added to the TRC cost equation presented in the 1988 SPM Correction Memo as follows:

TRC Costs = PRC + NTG*PC + UIC + (1.0-NTG)*INC, where:

PRC = program administrator program costs

PC = participant device costs (*before* INC is received)

UIC = (for fuel substitution programs) utility increase supply costs

NTG = net-to-gross ratio

INC = incentive costs, restricted to include only dollar benefits such as rebates or rate incentives (bill credits).

Adding this term to the TRC cost formulation will ensure that the removal of free rider costs does not also remove program costs that become ratepayer revenue requirements, consistent with the intent and purpose of this test.⁸ In doing so, it also serves to ensure that direct install programs and customer rebate programs are treated consistently when the measure cost, the customer financial incentive, program administration costs and the NTG ratio are the same under the two delivery approaches.⁹ This can be seen from the numerical

⁷ See D.06-06-063, p. 72.

⁸ As we note in Section 10, the SPM defines the “perspective” of this test as one of evaluating *program* cost-effectiveness, that is, looking at “the total costs of the program, including both the participants’ and the utility’s costs.” (2001 SPM, p. 18.) In its comments on the Proposed Decision, PG&E argues that we “erode” the concept of rebates by adding this clarification to the 1988 SPM Correction Memo. However, PG&E’s argument hinges on its characterization of the TRC test as one “designed to count the total incremental cost of energy efficiency measures to society as a whole (considering ratepayers and utilities collectively).” (*Comments of PG&E on Proposed Decision*, August 29, 2007, p. 8.) This is not the definition or perspective presented for this test in the SPM or in any Commission decision.

⁹ As discussed in D.06-06-063, there may be limited instances for program design purposes where the cash rebate to the customer exceeds the measure

examples presented in Attachment 9. This formulation is also fully consistent with the text description of the TRC test in the SPM, which recognizes that the “incentives” (INC) term will cancel from the benefit and cost side of the equation “except for the differences in net and gross savings.”¹⁰

installation cost. Under these circumstances, the TRC results will be the same for both direct install and the rebate program (all other things being equal), given the transfer payment treatment of cash rebates in the SPM. However, the PAC test will favor the direct install program to reflect the lower revenue requirements associated with direct install under these circumstances. See D.06-06-063, p. 72.

¹⁰ 2001 SPM, p. 18. (emphasis added.)

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Request IR-14:

With respect to Figure 4.2 as filed on April 18, the energy savings for each program are the same as the initial filing on February 27 and the March 30 revision. However, for Existing Residential, New Residential and BNI Efficient Products, the cost of achieving those savings has increased by \$1.3 million, \$1.4 million and 0.9 million respectively. Please explain why these costs have increased.

Response IR-14:

The increase in investment is due to correcting the error found in the Energy Efficiency Resource Assessment Model (RAM Tool), which resulted in an understatement of costs, specifically, incentive costs for free riders. Correcting the cost-related error resulted in only minor changes to energy and demand savings.