Parametric	Short Description
D0	Turn off the "Switching" flag in the model
D1	Use full AHCS distribution to define fuel switching payback periods
D2	Use linear function of income derived from AHCS to define fuel switching payback periods
D3	Use linear function of income derived from the 2013 AHCS to define fuel switching payback periods
D4	Use calculated condensing furnace payback times and DOE extrapolated shipment data (broken out by region, new/replacement, residential/commercial) to define affected and not impacted buildings
D5	Set minimum condensing furnace payback time at 0 years (below this time the mandated EL or higher is selected)
D6	Set minimum condensing furnace payback time at 3.5 years (below this time the mandated EL or higher is selected)
D7	Set minimum condensing furnace payback time based on the full AHCS distribution
D8	Set any cases where switching has first cost benefits relative to 80% furnace and operational cost benefit relative to the mandated EL as not impacted buildings

D9	Set payback period for condensing furnaces and fuel switching payback period based on extrapolated shipment data with a minimum value of 3.5 years. It is a combination of D4 and D6 with modified fuel switching payback periods.
D10	Set payback period for condensing furnaces and switching payback period based on extrapolated shipment data with a minimum value of 0.5 years
D11	Set minimum payback period for condensing furnaces to 0 years and assign all others based on extrapolated shipment data.
D12	Set minimum payback period for condensing furnaces to 3.5 years and assign all others based on extrapolated shipment data.

Note: Several of these modifications will only work on one E

Rationale and Description
This prevents all fuel switching. Can be used to determine the impact of allowing fuel switching in combination with other parametrics.
The American Home Comfort Study contains between 2849 and 3803 respondents for the years 2006, 2008, 2010, and 2013. All years show that payback times are a function of income and that the distribution of payback times spans a wide range even within an income group. Each year was analyzed following the methodology in the TSD for transforming the amount consumers are willing to pay into an inflation adjusted payback time, but this was done for individual data points rather than the average so that the full distribution of each income group can be used. Using the cumulative distribution of payback times, 5000 data points were generated for each year and income grouping and then these were used to create a master cumulative distribution in 0.5 year increments for each income group. This was integrated with the LCC model by assigning income groups from the RECS data to income groups aligned with the AHCS. Then a random number is generated and the fuel switching payback period is selected from a look up table in essentially the same way that BaseCase AFUE is determined in the baseline LCC model with cumulative distributions of extrapolated shipment data.
The 2006, 2008, 2010, and 2013 editions of the American Home Comfort Study show a clear trend of allowable payback period with income (using DOE's methodology from the TSD). Each year of the study was inflation adjusted and a linear fit to income averaged across all study years was used to determine fuel switching payback periods.
This used only the most current year, 2013, of the American Home Comfort Study to relate household income to fuel switching payback period using a linear fit to the income vs. payback time data.
The baseline LCC model assumes that consumers do not consider economics in furnace choices except for fuel switching options. Base Case AFUE is determined by random number generation and a lookup table which aligns Base Case AFUE with extrapolated shipment data. This causes many consumers with large economic incentive at the mandated level to instead be assigned a non-condensing furnace and be affected by the rule. It also casuses consumers with a large economic disincentive at the mandated level to be assigned furnaces with at least that efficiency level and therefore become not impacted by the rule. This parametric introduces economic decision making into Base Case AFUE assignment. The payback time, calculated by the LCC model, of the mandated efficiency level is used to determine where on the cumulative distribution of extrapolated shipment data a given consumer falls. A problem with this logic, and the baseline LCC logic, is that frequently it will assign payback periods that are negative. Negative paybacks occur when there is both a first cost advantage and an operational cost advantage relative to the furnace the consumer would have chosen in the absence of the rule. These cases are frequent because DOE assumes both a significant decrease in condensing furnace cost and assumes that shipments of condensing furnaces will continue linearly in spite of conditions where the condensing furnace is actually less expensive to install than a non-condensing furnace. This parametric is always run in combination with D5, D6, or D7, each of which sets minimum payback times that are at least zero.
Because consumers are extremely unlikely to choose an option with higher first cost that also has higher operational cost, assuming buildings with negative payback periods are affected by the rule is not reasonable. This parametric assigns a Base Case AFUE of 98% in any cases where the mandated efficiency level has a negative payback period so they become not impacted by the rule. This parametric is always run in combination with D4 to maintain economic decision making for condensing furnace choice.
This is similar to D5 except instead of a minimum payback period of 0 years a minimum payback period of 3.5 years is used. This is consistent with DOE's analysis of the AHCS which found that consumers are willing to pay for improved efficiency as long as the payback period does not exceed 3.5 years. This parametric is always run in combination with D4 to maintain economic decision making for condensing furnace choice.
This is similar to D6 except that the full distribution of payback times from the AHCS is used to set minimum payback periods. This parametric is always run in combination with D4 to maintain economic decision making for condensing furnace choice.
The baseline LCC model assumes that in cases where a consumer has switching options that would have a lower first cost relative to an 80% furnace and lower operational costs relative to the mandated efficiency level that the consumer would switch to this lower first cost lower operational cost option. While this behavior is rational, it is not related to the rule. This parametric looks for these cases and assigns them a Base Case AFUE of 98% to make them not impacted cases.

The baseline LCC model assumes that consumers do not consider economics in furnace choices except for fuel switching options. Base Case AFUE is determined by random number generation and a lookup table which aligns Base Case AFUE with extrapolated shipment data. This causes many consumers with large economic incentive to choose at the mandated level to instead choose a non-condensing furnace and are considered by DOE to be affected by the rule. It also casuses consumers with a large economic disincentive to choose at the mandated level to choose furnaces with at least that efficiency level and therefore are considered by DOE to be not impacted by the rule. This parametric introduces economic decision making into Base Case AFUE assignment. The payback times for the mandated efficiency level compared to an 80% baseline, calculated by the LCC model, of the mandated efficiency level is used to determine where on the cumulative distribution of extrapolated shipment data a given consumer falls. A problem with this logic, and the baseline LCC logic, is that frequently it will assign payback periods that are negative. Negative paybacks occur when there is both a first cost advantage and an operational cost advantage relative to the furnace the consumer would have chosen in the absence of the rule. These cases are frequent because DOE assumes both a decrease in condensing furnace cost relative to non-condensing furnace, and assumes that shipments of condensing furnaces will continue linearly in spite of conditions where the condensing furnace is actually less expensive to install than a non-condensing furnace. This parametric combines D4 and D6 and uses these same payback periods as fuel switching payback periods.
The baseline LCC model assumes that consumers do not consider economics in furnace choices except for fuel switching options. Base Case AFUE is determined by random number generation and a lookup table which aligns Base Case AFUE with extrapolated shipment data. This causes many consumers with large economic incentive to choose at the mandated level to instead choose a non-condensing furnace and are considered by DOE to be affected by the rule. It also casuses consumers with a large economic disincentive to choose at the mandated level to choose furnaces with at least that efficiency level and therefore are considered by DOE to be not impacted by the rule. This parametric introduces economic decision making into Base Case AFUE assignment. The payback times for the mandated efficiency level compared to an 80% baseline, calculated by the LCC model, of the mandated efficiency level is used to determine where on the cumulative distribution of extrapolated shipment data a given consumer falls. A problem with this logic, and the baseline LCC logic, is that frequently it will assign payback periods that are negative. Negative paybacks occur when there is both a first cost advantage and an operational cost advantage relative to the furnace the consumer would have chosen in the absence of the rule. These cases are frequent because DOE assumes both a significant decrease in condensing furnace cost and assumes that shipments of condensing will continue linearly in spite of conditions where the condensing furnace is actually less expensive to install than a non-condensing one. This parametric combines D4 and a 0.5 minimum payback period and uses these same payback periods as fuel switching periods.
The baseline model assumes that consumers do not consider economics at all. This parametric operates between this case and the combination of D4 and D5 where furnace assignments are made in order of simple payback periods with a zero year minimum. Here consumers with negative payback periods will be not impacted and all other consumers will be assigned randomly into AFUE bins according to shipment data.
The baseline model assumes that consumers do not consider economics at all. This parametric operates between this case and the combination of D4 and D6 where furnace assignments are made in order of simple payback periods with a 3.5 year minimum. Here consumers with simple paybacks of less than 3.5 years will be not impacted and all other consumers will be assigned randomly into AFUE bins according to shipment data.

L at a time, so any parametrics that include them will have to be run at the 90%, 92%, and 95% levels.

Scenario	California	Southern California	Residential Replacement	Residential Replacement - Southern California	Residential New
					LCC Savings Summary
DOE NOPR (GTI Scenario 0)	$122	-$137	-$50	-$269	$857
GTI Scenario Int-5	-$526	-$635	-$605	-$694	-$176
					LCC Savings Summary
DOE NOPR (GTI Scenario 0)	$186	-$98	-$241	-$228	$903
GTI Scenario Int-5	-$492	-$609	-$241	-$667	-$145
					LCC Savings Summary
DOE NOPR (GTI Scenario 0)	$221	-$115	-$228	-$243	$893
GTI Scenario Int-5	-$719	-$850	-$228	-$934	-$364
					LCC Savings Summary
DOE NOPR (GTI Scenario 0)	$156	-$259	-$296	-$398	$815
GTI Scenario Int-5	-$847	-$1,026	-$296	-$1,132	-$476

Residential New - Southern California	Senior Only	Senior Only - Southern California	Low Income	Low Income - Southern California
y - 90% TSL				
$405	$250	-$92	-$113	-$506
-$392	-$469	-$623	-$842	-$1,046
y - 92% TSL				
$435	$328	-$33	-$60	-$474
-$375	-$432	-$586	-$807	-$1,032
y - 95% TSL				
$392	$393	-$35	-$78	-$584
-$520	-$638	-$781	-$1,017	-$1,278
y - 98% TSL				
$231	$331	-$158	-$125	-$651
-$680	-$749	-$971	-$1,089	-$1,433

DOE Baseline LCC Model Scenario 0		California				Replacement			
TSL		LCC Savings	Net Cost	No Impact	Net Benefit	LCC Savings	Net Cost	No Impact	Net Benefit
1	NWGF 90%	$122	47%	15%	38%	-$50	56%	15%	30%
2	NWGF 92%	$186	44%	12%	44%	$17	52%	12%	36%
3	NWGF 95%	$221	48%	3%	48%	$61	55%	4%	41%
4	NWGF 98%	$156	58%	0%	42%	-$17	65%	0%	35%

DOE Baseline LCC Model Scenario 0		Replacement				Replacement - Southern California			
TSL		LCC Savings	Net Cost	No Impact	Net Benefit	LCC Savings	Net Cost	No Impact	Net Benefit
1	NWGF 90%	-$50	56%	15%	30%	-$269	62%	15%	24%
2	NWGF 92%	$17	52%	12%	36%	-$228	59%	12%	29%
3	NWGF 95%	$61	55%	4%	41%	-$243	64%	4%	32%
4	NWGF 98%	-$17	65%	0%	35%	-$398	74%	0%	26%

DOE Baseline LCC Model Scenario 0		New				New - Southern California			
TSL		LCC Savings	Net Cost	No Impact	Net Benefit	LCC Savings	Net Cost	No Impact	Net Benefit
1	NWGF 90%	$857	10%	15%	75%	$405	13%	15%	72%
2	NWGF 92%	$903	10%	12%	78%	$435	13%	12%	76%
3	NWGF 95%	$893	20%	2%	78%	$392	23%	2%	76%
4	NWGF 98%	$815	29%	0%	71%	$231	34%	0%	66%

DOE Baseline LCC Model Scenario 0		Senior				Low-Income			
TSL		LCC Savings	Net Cost	No Impact	Net Benefit	LCC Savings	Net Cost	No Impact	Net Benefit
1	NWGF 90%	$250	46%	15%	40%	-$113	53%	14%	33%
2	NWGF 92%	$328	42%	12%	46%	-$60	51%	11%	38%
3	NWGF 95%	$393	44%	4%	52%	-$78	57%	3%	40%
4	NWGF 98%	$331	54%	0%	46%	-$125	64%	0%	36%

New			
LCC Savings	Net Cost	No Impact	Net Benefit
$857	10%	15%	75%
$903	10%	12%	78%
$893	20%	2%	78%
$815	29%	0%	71%

Int-5 (Scenarios 24 and I-16)		California		
TSL		LCC Savings	Net Cost	No Impact
1	NWGF 90%	-$526	57%	33%
2	NWGF 92%	-$492	56%	29%
3	NWGF 95%	-$719	78%	9%
4	NWGF 98%	-$847	83%	4%

Int-5 (Scenarios 24 and I-16)		Replacement		
TSL		LCC Savings	Net Cost	No Impact
1	NWGF 90%	-$605	65%	31%
2	NWGF 92%	-$571	64%	27%
3	NWGF 95%	-$803	84%	7%
4	NWGF 98%	-$952	87%	2%

Int-5 (Scenarios 24 and I-16)		New		
TSL		LCC Savings	Net Cost	No Impact
1	NWGF 90%	-$176	22%	39%
2	NWGF 92%	-$145	21%	39%
3	NWGF 95%	-$364	55%	18%
4	NWGF 98%	-$476	67%	8%

Int-5 (Scenarios 24 and I-16)		Senior		
TSL		LCC Savings	Net Cost	No Impact
1	NWGF 90%	-$469	52%	42%
2	NWGF 92%	-$432	51%	37%
3	NWGF 95%	-$638	78%	9%
4	NWGF 98%	-$749	82%	4%

Replacement					New			
Net Benefit	LCC Savings	Net Cost	No Impact	Net Benefit	LCC Savings	Net Cost	No Impact	Net Benefit
10%	-$605	65%	31%	3%	-$176	22%	39%	38%
15%	-$571	64%	27%	9%	-$145	21%	39%	39%
13%	-$803	84%	7%	10%	-$364	55%	18%	27%
13%	-$952	87%	2%	11%	-$476	67%	8%	24%

Replacement - Southern California				
Net Benefit	LCC Savings	Net Cost	No Impact	Net Benefit
3%	-$694	74%	21%	4%
9%	-$667	74%	18%	8%
10%	-$934	87%	5%	8%
11%	-$1,132	89%	3%	8%

New - Southern California				
Net Benefit	LCC Savings	Net Cost	No Impact	Net Benefit
38%	-$392	25%	36%	40%
39%	-$375	24%	35%	42%
27%	-$520	54%	22%	24%
24%	-$680	64%	13%	23%

Low-Income				
Net Benefit	LCC Savings	Net Cost	No Impact	Net Benefit
6%	-$842	66%	26%	9%
12%	-$807	64%	21%	14%
13%	-$1,017	81%	5%	14%
15%	-$1,089	83%	3%	14%

LCC Savings Summary - 90% EL

	California	Southern California	Residential Replacement	Residential Replacement - Southern California	Residential New
Scenario 0 (DOE NOPR LCC Model)	$122	-$137	-$50	-$269	$857
Scenario 24 (D2, D4, D5, D8)	-$233	-$362	-$296	-$449	$54
Scenario I-16 (I2, I6, I8, I13)	-$157	-$344	-$265	-$419	$291
Scenario Int-5 (Scenarios 24 & I-16)	-$526	-$635	-$605	-$694	-$176

Residential New - Southern California	Senior Only	Senior Only - Southern California	Low Income	Low Income - Southern California
$405	$250	-$92	-$113	-$506
$12	-$163	-$343	-$436	-$954
-$65	-$98	-$316	-$300	-$566
-$392	-$469	-$623	-$842	-$1,046

LCC Savings Summary - 92% EL

	California	Southern California	Residential Replacement	Residential Replacement - Southern California	Residential New
Scenario 0 (DOE NOPR LCC Model)	$186	-$98	-$241	-$228	$903
Scenario 24 (D2, D4, D5, D8)	-$185	-$330	-$241	-$411	$80
Scenario I-16 (I2, I6, I8, I13)	-$109	-$313	-$241	-$385	$323
Scenario Int-5 (Scenarios 24 & I-16)	-$492	-$609	-$241	-$667	-$145

Residential New - Southern California	Senior Only	Senior Only - Southern California	Low Income	Low Income - Southern California
$435	$328	-$33	-$60	-$474
$15	-$113	-$286	-$394	-$978
-$49	-$31	-$272	-$260	-$539
-$375	-$432	-$586	-$807	-$1,032

LCC Savings Summary - 95% EL

	California	Southern California	Residential Replacement	Residential Replacement - Southern California	Residential New
Scenario 0 (DOE NOPR LCC Model)	$221	-$115	-$228	-$243	$893
Scenario 24 (D2, D4, D5, D8)	-$156	-$335	-$228	-$432	$182
Scenario I-16 (I2, I6, I8, I13)	-$319	-$554	-$228	-$623	-$11
Scenario Int-5 (Scenarios 24 & I-16)	-$719	-$850	-$228	-$934	-$364

Residential New - Southern California	Senior Only	Senior Only - Southern California	Low Income	Low Income - Southern California
$392	$393	-$35	-$78	-$584
$79	-$70	-$282	-$400	-$991
-$326	-$203	-$502	-$520	-$914
-$520	-$638	-$781	-$1,017	-$1,278

LCC Savings Summary - 98% EL

	California	Southern California	Residential Replacement	Residential Replacement - Southern California	Residential New
Scenario 0 (DOE NOPR LCC Model)	$156	-$259	-$296	-$398	$815
Scenario 24 (D2, D4, D5, D8)	-$267	-$486	-$296	-$592	$54
Scenario I-16 (I2, I6, I8, I13)	-$428	-$737	-$296	-$810	-$132
Scenario Int-5 (Scenarios 24 & I-16)	-$847	-$1,026	-$296	-$1,132	-$476

Residential New - Southern California	Senior Only	Senior Only - Southern California	Low Income	Low Income - Southern California
$231	$331	-$158	-$125	-$651
-$113	-$168	-$371	-$510	-$1,099
-$560	-$272	-$680	-$592	-$1,035
-$680	-$749	-$971	-$1,089	-$1,433

California Only		Scenario 0 (DOE NOPR LCC Model)					
Level	Description	LCC Savings	Total Buildings	Affected Buildings	Net Cost	No Impact	Net Benefit
NWGF							
0	NWGF 80%						
1	NWGF 90%	$122	10,361	8,824	47%	15%	38%
2	NWGF 92%	$186	10,361	9,080	44%	12%	44%
3	NWGF 95%	$221	10,361	10,004	48%	3%	48%
4	NWGF 98%	$156	10,361	10,357	58%	0%	42%

Southern California Only		Scenario 0 (DOE NOPR LCC Model)					
Level	Description	LCC Savings	Total Buildings	Affected Buildings	Net Cost	No Impact	Net Benefit
NWGF							
0	NWGF 80%						
1	NWGF 90%	-$137	3,290	2,802	52%	15%	33%
2	NWGF 92%	-$98	3,290	2,894	50%	12%	38%
3	NWGF 95%	-$115	3,290	3,181	56%	3%	40%
4	NWGF 98%	-$259	3,290	3,289	67%	0%	33%

California Senior Only		Scenario 0 (DOE NOPR LCC Model)					
Level	Description	LCC Savings	Total Buildings	Affected Buildings	Net Cost	No Impact	Net Benefit
NWGF							
0	NWGF 80%						
1	NWGF 90%	$250	1,458	1,244	46%	15%	40%
2	NWGF 92%	$328	1,458	1,280	42%	12%	46%
3	NWGF 95%	$393	1,458	1,400	44%	4%	52%
4	NWGF 98%	$331	1,458	1,457	54%	0%	46%

California Low Income Only		Scenario 0 (DOE NOPR LCC Model)					
Level	Description	LCC Savings	Total Buildings	Affected Buildings	Net Cost	No Impact	Net Benefit
NWGF							
0	NWGF 80%						
1	NWGF 90%	-$113	501	432	53%	14%	33%
2	NWGF 92%	-$60	501	446	51%	11%	38%
3	NWGF 95%	-$78	501	484	57%	3%	40%
4	NWGF 98%	-$125	501	501	64%	0%	36%

Residential - Replacement California Only		Scenario 0 (DOE NOPR LCC Model)					
Level	Description	LCC Savings	Total Buildings	Affected Buildings	Net Cost	No Impact	Net Benefit
NWGF							
0	NWGF 80%						
1	NWGF 90%	-$50	8,264	7,054	56%	15%	30%
2	NWGF 92%	$17	8,264	7,244	52%	12%	36%
3	NWGF 95%	$61	8,264	7,952	55%	4%	41%
4	NWGF 98%	-$17	8,264	8,260	65%	0%	35%

Residential - Replacement Southern California Only		Scenario 0 (DOE NOPR LCC Model)					
Level	Description	LCC Savings	Total Buildings	Affected Buildings	Net Cost	No Impact	Net Benefit
NWGF							
0	NWGF 80%						
1	NWGF 90%	-$269	2,640	2,256	62%	15%	24%
2	NWGF 92%	-$228	2,640	2,323	59%	12%	29%
3	NWGF 95%	-$243	2,640	2,544	64%	4%	32%
4	NWGF 98%	-$398	2,640	2,639	74%	0%	26%

Southern California Senior Only		Scenario 0 (DOE NOPR LCC Model)					
Level	Description	LCC Savings	Total Buildings	Affected Buildings	Net Cost	No Impact	Net Benefit
NWGF							
0	NWGF 80%						
1	NWGF 90%	-$92	416	359	58%	14%	28%
2	NWGF 92%	-$33	416	370	53%	11%	36%
3	NWGF 95%	-$35	416	399	55%	4%	41%
4	NWGF 98%	-$158	416	416	66%	0%	34%

Southern California Low Income Only		Scenario 0 (DOE NOPR LCC Model)					
Level	Description	LCC Savings	Total Buildings	Affected Buildings	Net Cost	No Impact	Net Benefit
NWGF							
0	NWGF 80%						
1	NWGF 90%	-$506	119	108	65%	9%	26%
2	NWGF 92%	-$474	119	109	64%	8%	28%
3	NWGF 95%	-$584	119	116	70%	3%	28%
4	NWGF 98%	-$651	119	119	74%	0%	26%

Residential - New California Only		Scenario 0 (DOE NOPR LCC Model)					
Level	Description	LCC Savings	Total Buildings	Affected Buildings	Net Cost	No Impact	Net Benefit
NWGF							
0	NWGF 80%						
1	NWGF 90%	$857	1,919	1,627	10%	15%	75%
2	NWGF 92%	$903	1,919	1,687	10%	12%	78%
3	NWGF 95%	$893	1,919	1,886	20%	2%	78%
4	NWGF 98%	$815	1,919	1,919	29%	0%	71%

Residential - New Southern California Only		Scenario 0 (DOE NOPR LCC Model)					
Level	Description	LCC Savings	Total Buildings	Affected Buildings	Net Cost	No Impact	Net Benefit
NWGF							
0	NWGF 80%						
1	NWGF 90%	$405	600	508	13%	15%	72%
2	NWGF 92%	$435	600	531	13%	12%	76%
3	NWGF 95%	$392	600	591	23%	2%	76%
4	NWGF 98%	$231	600	600	34%	0%	66%

Commercial - Replacement California Only		Scenario 0 (DOE NOPR LCC Model)					
Level	Description	LCC Savings	Total Buildings	Affected Buildings	Net Cost	No Impact	Net Benefit
NWGF							
0	NWGF 80%						
1	NWGF 90%	$74	152	121	48%	20%	32%
2	NWGF 92%	$163	152	127	46%	16%	38%
3	NWGF 95%	$285	152	142	55%	7%	39%
4	NWGF 98%	$1,095	152	152	64%	0%	36%

Commercial - Replacement Southern California Only		Scenario 0 (DOE NOPR LCC Model)					
Level	Description	LCC Savings	Total Buildings	Affected Buildings	Net Cost	No Impact	Net Benefit
NWGF							
0	NWGF 80%						
1	NWGF 90%	$287	46	35	35%	24%	41%
2	NWGF 92%	$387	46	37	35%	20%	46%
3	NWGF 95%	$531	46	42	50%	9%	41%
4	NWGF 98%	$287	46	35	35%	24%	41%

Commercial - New California Only		Scenario 0 (DOE NOPR LCC Model)					
Level	Description	LCC Savings	Total Buildings	Affected Buildings	Net Cost	No Impact	Net Benefit
NWGF							
0	NWGF 80%						
1	NWGF 90%	$931	26	22	4%	15%	81%
2	NWGF 92%	$975	26	22	4%	15%	81%
3	NWGF 95%	$1,000	26	24	12%	8%	81%
4	NWGF 98%	$884	26	26	27%	0%	73%

Commercial - New Southern California Only		Scenario 0 (DOE NOPR LCC Model)					
Level	Description	LCC Savings	Total Buildings	Affected Buildings	Net Cost	No Impact	Net Benefit
NWGF							
0	NWGF 80%						
1	NWGF 90%	$743	4	3	0%	25%	75%
2	NWGF 92%	$743	4	3	0%	25%	75%
3	NWGF 95%	$764	4	4	0%	0%	100%
4	NWGF 98%	$743	4	3	0%	25%	75%

California Only		Scenario 24 (D2, D4, D5, D8)					
Level	Description	LCC Savings	Total Buildings	Affected Buildings	Net Cost	No Impact	Net Benefit
NWGF							
0	NWGF 80%						
1	NWGF 90%	-$233	10,361	7,352	52%	29%	18%
2	NWGF 92%	-$185	10,361	7,653	49%	26%	24%
3	NWGF 95%	-$156	10,361	8,755	51%	16%	34%
4	NWGF 98%	-$267	10,361	9,142	56%	29%	32%

Southern California Only		Scenario 24 (D2, D4, D5, D8)					
Level	Description	LCC Savings	Total Buildings	Affected Buildings	Net Cost	No Impact	Net Benefit
NWGF							
0	NWGF 80%						
1	NWGF 90%	-$362	3,290	2,406	58%	27%	15%
2	NWGF 92%	-$330	3,290	2,445	55%	26%	19%
3	NWGF 95%	-$335	3,290	2,768	57%	16%	27%
4	NWGF 98%	-$486	3,290	2,909	63%	12%	25%

California Senior Only		Scenario 24 (D2, D4, D5, D8)					
Level	Description	LCC Savings	Total Buildings	Affected Buildings	Net Cost	No Impact	Net Benefit
NWGF							
0	NWGF 80%						
1	NWGF 90%	-$163	1,458	1,134	53%	22%	25%
2	NWGF 92%	-$113	1,458	1,200	49%	18%	33%
3	NWGF 95%	-$70	1,458	1,309	49%	10%	40%
4	NWGF 98%	-$168	1,458	1,341	54%	8%	38%

California Low Income Only		Scenario 24 (D2, D4, D5, D8)					
Level	Description	LCC Savings	Total Buildings	Affected Buildings	Net Cost	No Impact	Net Benefit
NWGF							
0	NWGF 80%						
1	NWGF 90%	-$436	501	402	63%	20%	18%
2	NWGF 92%	-$394	501	414	59%	17%	23%
3	NWGF 95%	-$400	501	451	62%	10%	28%
4	NWGF 98%	-$510	501	461	64%	8%	28%

Residential - Replacement California Only		Scenario 24 (D2, D4, D5, D8)					
Level	Description	LCC Savings	Total Buildings	Affected Buildings	Net Cost	No Impact	Net Benefit
NWGF							
0	NWGF 80%						
1	NWGF 90%	-$296	8,264	6,993	64%	15%	20%
2	NWGF 92%	-$241	8,264	7,264	60%	12%	28%
3	NWGF 95%	-$228	8,264	7,763	60%	6%	34%
4	NWGF 98%	-$363	8,264	7,927	66%	15%	30%

Residential - Replacement Southern California Only		Scenario 24 (D2, D4, D5, D8)					
Level	Description	LCC Savings	Total Buildings	Affected Buildings	Net Cost	No Impact	Net Benefit
NWGF							
0	NWGF 80%						
1	NWGF 90%	-$449	2,640	2,320	71%	12%	17%
2	NWGF 92%	-$411	2,640	2,358	67%	11%	22%
3	NWGF 95%	-$432	2,640	2,463	68%	7%	25%
4	NWGF 98%	-$592	2,640	2,520	73%	5%	22%

Southern California Senior Only		Scenario 24 (D2, D4, D5, D8)					
Level	Description	LCC Savings	Total Buildings	Affected Buildings	Net Cost	No Impact	Net Benefit
NWGF							
0	NWGF 80%						
1	NWGF 90%	-$343	416	363	63%	13%	24%
2	NWGF 92%	-$286	416	369	58%	11%	31%
3	NWGF 95%	-$282	416	389	59%	6%	34%
4	NWGF 98%	-$371	416	395	62%	5%	33%

Southern California Low Income Only		Scenario 24 (D2, D4, D5, D8)					
Level	Description	LCC Savings	Total Buildings	Affected Buildings	Net Cost	No Impact	Net Benefit
NWGF							
0	NWGF 80%						
1	NWGF 90%	-$954	119	108	80%	9%	11%
2	NWGF 92%	-$978	119	111	77%	7%	16%
3	NWGF 95%	-$991	119	114	79%	4%	17%
4	NWGF 98%	-$1,099	119	117	80%	2%	18%

Residential - New California Only		Scenario 24 (D2, D4, D5, D8)					
Level	Description	LCC Savings	Total Buildings	Affected Buildings	Net Cost	No Impact	Net Benefit
NWGF							
0	NWGF 80%						
1	NWGF 90%	$54	1,919	244	2%	87%	11%
2	NWGF 92%	$80	1,919	270	2%	86%	12%
3	NWGF 95%	$182	1,919	865	8%	55%	37%
4	NWGF 98%	$103	1,919	1,069	18%	87%	38%

Residential - New Southern California Only		Scenario 24 (D2, D4, D5, D8)					
Level	Description	LCC Savings	Total Buildings	Affected Buildings	Net Cost	No Impact	Net Benefit
NWGF							
0	NWGF 80%						
1	NWGF 90%	$12	600	53	1%	91%	8%
2	NWGF 92%	$15	600	54	2%	91%	8%
3	NWGF 95%	$79	600	270	7%	55%	38%
4	NWGF 98%	-$113	600	345	20%	43%	37%

Commercial - Replacement California Only		Scenario 24 (D2, D4, D5, D8)					
Level	Description	LCC Savings	Total Buildings	Affected Buildings	Net Cost	No Impact	Net Benefit
NWGF							
0	NWGF 80%						
1	NWGF 90%	-$561	152	113	60%	26%	14%
2	NWGF 92%	-$516	152	117	58%	23%	19%
3	NWGF 95%	-$564	152	124	59%	18%	22%
4	NWGF 98%	$211	152	140	61%	8%	31%

Commercial - Replacement Southern California Only		Scenario 24 (D2, D4, D5, D8)					
Level	Description	LCC Savings	Total Buildings	Affected Buildings	Net Cost	No Impact	Net Benefit
NWGF							
0	NWGF 80%						
1	NWGF 90%	-$266	46	33	48%	28%	24%
2	NWGF 92%	-$213	46	33	46%	28%	26%
3	NWGF 95%	-$258	46	35	50%	24%	26%
4	NWGF 98%	$675	46	44	52%	4%	43%

Commercial - New California Only		Scenario 24 (D2, D4, D5, D8)					
Level	Description	LCC Savings	Total Buildings	Affected Buildings	Net Cost	No Impact	Net Benefit
NWGF							
0	NWGF 80%						
1	NWGF 90%	$179	26	2	0%	92%	8%
2	NWGF 92%	$182	26	2	0%	92%	8%
3	NWGF 95%	$165	26	3	4%	88%	8%
4	NWGF 98%	$173	26	6	8%	77%	15%

Commercial - New Southern California Only		Scenario 24 (D2, D4, D5, D8)					
Level	Description	LCC Savings	Total Buildings	Affected Buildings	Net Cost	No Impact	Net Benefit
NWGF							
0	NWGF 80%						
1	NWGF 90%	$0	4	0	0%	100%	0%
2	NWGF 92%	$0	4	0	0%	100%	0%
3	NWGF 95%	$0	4	0	0%	100%	0%
4	NWGF 98%	$0	4	0	0%	100%	0%

California Only		Scenario I-16 (I2, I6, I8, I13)					
Level	Description	LCC Savings	Total Buildings	Affected Buildings	Net Cost	No Impact	Net Benefit
NWGF							
0	NWGF 80%						
1	NWGF 90%	-$157	10,361	7,021	46%	32%	22%
2	NWGF 92%	-$109	10,361	7,580	44%	27%	29%
3	NWGF 95%	-$319	10,361	9,652	72%	7%	21%
4	NWGF 98%	-$428	10,361	10,351	80%	0%	20%

Southern California Only		Scenario I-16 (I2, I6, I8, I13)					
Level	Description	LCC Savings	Total Buildings	Affected Buildings	Net Cost	No Impact	Net Benefit
NWGF							
0	NWGF 80%						
1	NWGF 90%	-$344	3,290	2,228	49%	32%	19%
2	NWGF 92%	-$313	3,290	2,410	48%	27%	25%
3	NWGF 95%	-$554	3,290	3,065	77%	7%	16%
4	NWGF 98%	-$737	3,290	3,287	86%	0%	14%

California Senior Only		Scenario I-16 (I2, I6, I8, I13)					
Level	Description	LCC Savings	Total Buildings	Affected Buildings	Net Cost	No Impact	Net Benefit
NWGF							
0	NWGF 80%						
1	NWGF 90%	-$98	1,458	1,004	47%	31%	22%
2	NWGF 92%	-$31	1,458	1,072	44%	26%	29%
3	NWGF 95%	-$203	1,458	1,347	69%	8%	24%
4	NWGF 98%	-$272	1,458	1,456	76%	0%	24%

California Low Income Only		Scenario I-16 (I2, I6, I8, I13)					
Level	Description	LCC Savings	Total Buildings	Affected Buildings	Net Cost	No Impact	Net Benefit
NWGF							
0	NWGF 80%						
1	NWGF 90%	-$300	501	356	53%	29%	18%
2	NWGF 92%	-$260	501	380	51%	24%	25%
3	NWGF 95%	-$520	501	468	75%	7%	19%
4	NWGF 98%	-$592	501	501	81%	0%	19%

Residential - Replacement California Only		Scenario I-16 (I2, I6, I8, I13)					
Level	Description	LCC Savings	Total Buildings	Affected Buildings	Net Cost	No Impact	Net Benefit
NWGF							
0	NWGF 80%						
1	NWGF 90%	-$265	8,264	5,610	53%	32%	15%
2	NWGF 92%	-$214	8,264	6,038	51%	27%	22%
3	NWGF 95%	-$395	8,264	7,649	75%	7%	17%
4	NWGF 98%	-$518	8,264	8,256	83%	0%	17%

Residential - Replacement Southern California Only		Scenario I-16 (I2, I6, I8, I13)					
Level	Description	LCC Savings	Total Buildings	Affected Buildings	Net Cost	No Impact	Net Benefit
NWGF							
0	NWGF 80%						
1	NWGF 90%	-$419	2,640	1,803	57%	32%	12%
2	NWGF 92%	-$385	2,640	1,938	56%	27%	18%
3	NWGF 95%	-$623	2,640	2,444	81%	7%	12%
4	NWGF 98%	-$810	2,640	2,637	89%	0%	11%

Southern California Senior Only		Scenario I-16 (I2, I6, I8, I13)					
Level	Description	LCC Savings	Total Buildings	Affected Buildings	Net Cost	No Impact	Net Benefit
NWGF							
0	NWGF 80%						
1	NWGF 90%	-$316	416	293	54%	30%	16%
2	NWGF 92%	-$272	416	308	52%	26%	22%
3	NWGF 95%	-$502	416	383	75%	8%	17%
4	NWGF 98%	-$680	416	416	85%	0%	15%

Southern California Low Income Only		Scenario I-16 (I2, I6, I8, I13)					
Level	Description	LCC Savings	Total Buildings	Affected Buildings	Net Cost	No Impact	Net Benefit
NWGF							
0	NWGF 80%						
1	NWGF 90%	-$566	119	94	61%	21%	18%
2	NWGF 92%	-$539	119	99	62%	17%	21%
3	NWGF 95%	-$914	119	113	77%	5%	18%
4	NWGF 98%	-$1,035	119	119	82%	0%	18%

Residential - New California Only		Scenario I-16 (I2, I6, I8, I13)					
Level	Description	LCC Savings	Total Buildings	Affected Buildings	Net Cost	No Impact	Net Benefit
NWGF							
0	NWGF 80%						
1	NWGF 90%	$291	1,919	1,300	16%	32%	52%
2	NWGF 92%	$323	1,919	1,420	16%	26%	58%
3	NWGF 95%	-$11	1,919	1,844	59%	4%	37%
4	NWGF 98%	-$132	1,919	1,917	67%	0%	33%

Residential - New Southern California Only		Scenario I-16 (I2, I6, I8, I13)					
Level	Description	LCC Savings	Total Buildings	Affected Buildings	Net Cost	No Impact	Net Benefit
NWGF							
0	NWGF 80%						
1	NWGF 90%	-$65	600	395	18%	34%	48%
2	NWGF 92%	-$49	600	440	17%	27%	56%
3	NWGF 95%	-$326	600	578	64%	4%	33%
4	NWGF 98%	-$560	600	600	73%	0%	27%

Commercial - Replacement California Only		Scenario I-16 (I2, I6, I8, I13)					
Level	Description	LCC Savings	Total Buildings	Affected Buildings	Net Cost	No Impact	Net Benefit
NWGF							
0	NWGF 80%						
1	NWGF 90%	-$120	152	93	38%	39%	23%
2	NWGF 92%	-$40	152	102	38%	33%	30%
3	NWGF 95%	-$220	152	135	66%	11%	22%
4	NWGF 98%	$593	152	152	75%	0%	25%

Commercial - Replacement Southern California Only		Scenario I-16 (I2, I6, I8, I13)					
Level	Description	LCC Savings	Total Buildings	Affected Buildings	Net Cost	No Impact	Net Benefit
NWGF							
0	NWGF 80%						
1	NWGF 90%	$262	46	28	30%	39%	30%
2	NWGF 92%	$357	46	30	30%	35%	35%
3	NWGF 95%	$336	46	39	52%	15%	33%
4	NWGF 98%	$262	46	28	30%	39%	30%

Commercial - New California Only		Scenario I-16 (I2, I6, I8, I13)					
Level	Description	LCC Savings	Total Buildings	Affected Buildings	Net Cost	No Impact	Net Benefit
NWGF							
0	NWGF 80%						
1	NWGF 90%	$657	26	18	0%	31%	69%
2	NWGF 92%	$697	26	20	0%	23%	77%
3	NWGF 95%	$417	26	24	35%	8%	58%
4	NWGF 98%	$306	26	26	46%	0%	54%

Commercial - New Southern California Only		Scenario I-16 (I2, I6, I8, I13)					
Level	Description	LCC Savings	Total Buildings	Affected Buildings	Net Cost	No Impact	Net Benefit
NWGF							
0	NWGF 80%						
1	NWGF 90%	$331	4	2	0%	50%	50%
2	NWGF 92%	$331	4	2	0%	50%	50%
3	NWGF 95%	$218	4	4	50%	0%	50%
4	NWGF 98%	$331	4	2	0%	50%	50%

California Only		Scenario Int-5 (Scenarios 24 & I-16)					
Level	Description	LCC Savings	Total Buildings	Affected Buildings	Net Cost	No Impact	Net Benefit
NWGF							
0	NWGF 80%						
1	NWGF 90%	-$526	10,361	6,949	57%	33%	10%
2	NWGF 92%	-$492	10,361	7,339	56%	29%	15%
3	NWGF 95%	-$719	10,361	9,421	78%	9%	13%
4	NWGF 98%	-$847	10,361	9,984	83%	4%	13%

Southern California Only		Scenario Int-5 (Scenarios 24 & I-16)					
Level	Description	LCC Savings	Total Buildings	Affected Buildings	Net Cost	No Impact	Net Benefit
NWGF							
0	NWGF 80%						
1	NWGF 90%	-$635	3,290	2,499	65%	24%	11%
2	NWGF 92%	-$609	3,290	2,589	64%	21%	14%
3	NWGF 95%	-$850	3,290	3,001	81%	9%	11%
4	NWGF 98%	-$1,026	3,290	3,127	84%	5%	11%

California Senior Only		Scenario Int-5 (Scenarios 24 & I-16)					
Level	Description	LCC Savings	Total Buildings	Affected Buildings	Net Cost	No Impact	Net Benefit
NWGF							
0	NWGF 80%						
1	NWGF 90%	-$469	1,458	842	52%	42%	6%
2	NWGF 92%	-$432	1,458	917	51%	37%	12%
3	NWGF 95%	-$638	1,458	1,327	78%	9%	13%
4	NWGF 98%	-$749	1,458	1,405	82%	4%	15%

California Low Income Only		Scenario Int-5 (Scenarios 24 & I-16)					
Level	Description	LCC Savings	Total Buildings	Affected Buildings	Net Cost	No Impact	Net Benefit
NWGF							
0	NWGF 80%						
1	NWGF 90%	-$842	501	372	66%	26%	9%
2	NWGF 92%	-$807	501	394	64%	21%	14%
3	NWGF 95%	-$1,017	501	476	81%	5%	14%
4	NWGF 98%	-$1,089	501	488	83%	3%	14%

Residential - Replacement California Only		Scenario Int-5 (Scenarios 24 & I-16)					
Level	Description	LCC Savings	Total Buildings	Affected Buildings	Net Cost	No Impact	Net Benefit
NWGF							
0	NWGF 80%						
1	NWGF 90%	-$605	8,264	5,672	65%	31%	3%
2	NWGF 92%	-$571	8,264	6,053	64%	27%	9%
3	NWGF 95%	-$803	8,264	7,711	84%	7%	10%
4	NWGF 98%	-$952	8,264	8,067	87%	2%	11%

Residential - Replacement Southern California Only		Scenario Int-5 (Scenarios 24 & I-16)					
Level	Description	LCC Savings	Total Buildings	Affected Buildings	Net Cost	No Impact	Net Benefit
NWGF							
0	NWGF 80%						
1	NWGF 90%	-$694	2,640	2,081	74%	21%	4%
2	NWGF 92%	-$667	2,640	2,167	74%	18%	8%
3	NWGF 95%	-$934	2,640	2,498	87%	5%	8%
4	NWGF 98%	-$1,132	2,640	2,561	89%	3%	8%

Southern California Senior Only		Scenario Int-5 (Scenarios 24 & I-16)					
Level	Description	LCC Savings	Total Buildings	Affected Buildings	Net Cost	No Impact	Net Benefit
NWGF							
0	NWGF 80%						
1	NWGF 90%	-$623	416	287	64%	31%	5%
2	NWGF 92%	-$586	416	306	64%	26%	10%
3	NWGF 95%	-$781	416	388	85%	7%	8%
4	NWGF 98%	-$971	416	402	88%	3%	9%

Southern California Low Income Only		Scenario Int-5 (Scenarios 24 & I-16)					
Level	Description	LCC Savings	Total Buildings	Affected Buildings	Net Cost	No Impact	Net Benefit
NWGF							
0	NWGF 80%						
1	NWGF 90%	-$1,046	119	100	73%	16%	11%
2	NWGF 92%	-$1,032	119	102	73%	14%	13%
3	NWGF 95%	-$1,278	119	115	80%	3%	17%
4	NWGF 98%	-$1,433	119	118	84%	1%	15%

Residential - New California Only		Scenario Int-5 (Scenarios 24 & I-16)					
Level	Description	LCC Savings	Total Buildings	Affected Buildings	Net Cost	No Impact	Net Benefit
NWGF							
0	NWGF 80%						
1	NWGF 90%	-$176	1,919	1,164	22%	39%	38%
2	NWGF 92%	-$145	1,919	1,169	21%	39%	39%
3	NWGF 95%	-$364	1,919	1,574	55%	18%	27%
4	NWGF 98%	-$476	1,919	1,757	67%	8%	24%

Residential - New Southern California Only		Scenario Int-5 (Scenarios 24 & I-16)					
Level	Description	LCC Savings	Total Buildings	Affected Buildings	Net Cost	No Impact	Net Benefit
NWGF							
0	NWGF 80%						
1	NWGF 90%	-$392	600	387	25%	36%	40%
2	NWGF 92%	-$375	600	390	24%	35%	42%
3	NWGF 95%	-$520	600	466	54%	22%	24%
4	NWGF 98%	-$680	600	521	64%	13%	23%

Commercial - Replacement California Only		Scenario Int-5 (Scenarios 24 & I-16)					
Level	Description	LCC Savings	Total Buildings	Affected Buildings	Net Cost	No Impact	Net Benefit
NWGF							
0	NWGF 80%						
1	NWGF 90%	-$715	152	108	63%	29%	9%
2	NWGF 92%	-$666	152	111	61%	27%	13%
3	NWGF 95%	-$774	152	126	66%	17%	17%
4	NWGF 98%	$82	152	149	72%	2%	26%

Commercial - Replacement Southern California Only		Scenario Int-5 (Scenarios 24 & I-16)					
Level	Description	LCC Savings	Total Buildings	Affected Buildings	Net Cost	No Impact	Net Benefit
NWGF							
0	NWGF 80%						
1	NWGF 90%	-$461	46	31	61%	33%	7%
2	NWGF 92%	-$402	46	32	59%	30%	11%
3	NWGF 95%	-$375	46	36	61%	22%	17%
4	NWGF 98%	$406	46	45	63%	2%	35%

Commercial - New California Only		Scenario Int-5 (Scenarios 24 & I-16)					
Level	Description	LCC Savings	Total Buildings	Affected Buildings	Net Cost	No Impact	Net Benefit
NWGF							
0	NWGF 80%						
1	NWGF 90%	$147	26	5	4%	81%	15%
2	NWGF 92%	$167	26	6	4%	77%	19%
3	NWGF 95%	$10	26	10	23%	62%	15%
4	NWGF 98%	-$163	26	11	35%	58%	8%

Commercial - New Southern California Only		Scenario Int-5 (Scenarios 24 & I-16)					
Level	Description	LCC Savings	Total Buildings	Affected Buildings	Net Cost	No Impact	Net Benefit
NWGF							
0	NWGF 80%						
1	NWGF 90%	$0	4	0	0%	100%	0%
2	NWGF 92%	$0	4	0	0%	100%	0%
3	NWGF 95%	-$39	4	1	25%	75%	0%
4	NWGF 98%	$0	4	0	0%	100%	0%