APPENDIX 10B. SUPPLEMENTARY SCENARIOS FOR THE NATIONAL IMPACT ANALYSIS

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APPENDIX 10B. SUPPLEMENTARY SCENARIOS FOR THE NATIONAL IMPACTS ANALYSIS

10B.1 INTRODUCTION

In this appendix, DOE presents inputs and results for two additional IRL sensitivities. DOE presents the efficacy forecast, lamp stock, lumen output, NES and NPV results for the IRL 65W BR lamp substitution sensitivity and for the IRL 10 percent lumen increase sensitivity.

10B.2 STANDARDS CASE EFFICACY FORECAST, LAMP STOCK AND LUMEN OUTPUT

A key aspect of DOE's estimates of NES and NPV is the proportions of future lamp shipments meeting different efficacies for the base case (without new standards) and each of the standards cases (with new standards). Because key inputs to the calculation of the NES and NPV are dependent on the estimate of the efficacies shipped and efficacies in the stock, it is important to know the projected efficacy-distribution of lamp shipments. Table 10B.2.1 presents the efficacy distribution of lamp shipments for commercial IRL under the 65W BR lamp substitution sensitivity.

Table 10B.2.1 Commercial Incandescent Reflector Lamps: Base Case and Standards Case (65W BR Lamp Substitution Sensitivity) Efficacy Distributions from 2012 to 2042

			Proportions of Commercial IRL Shipped (%)			
				Standards Case (65W BR Lamp Substitution Sensitivity)		
Year	Level	Technology	Base Case	1	2	3
2012	65W BR	Incandescent	0	10	10	21
	Baseline	Halogen	82	-	-	-
	1	Improved Halogen	0	70	-	-
	2	HIR	18	20	90	-
	3	Improved HIR	0	0	0	79
	Total		**100**	**100**	**100**	**100**
2042	65W BR	Incandescent	0	10	10	24
	Baseline	Halogen	54	-	-	-
	1	Improved Halogen	0	45	-	-
	2	HIR	46	45	90	-
	3	Improved HIR	0	0	0	76
	Total		**100**	**100**	**100**	**100**

Table 10B.2.2 presents the efficacy distribution of lamp shipments for residential IRL under the 65W BR lamp substitution sensitivity.

Table 10B.2.2 Residential Incandescent Reflector Lamps: Base Case and Standards Case (65W BR Lamp Substitution Sensitivity) Efficacy Distributions from 2012 to 2042

Year	Level	Technology	Proportions of Residential IRL Shipped			
			Base Case	Standards Case (65W BR Lamp Substitution Sensitivity)		
				1	2	3
2012	65W BR	Incandescent	0	7	7	14
	Baseline	Halogen	100	-	-	-
	1	Improved Halogen	0	83	-	-
	2	HIR	0	0	83	-
	3	Improved HIR	0	0	0	86
	Total		**100**	**100**	**100**	**100**
2042	65W BR	Incandescent	0	10	10	28
	Baseline	Halogen	100	-	-	-
	1	Improved Halogen	0	90	-	-
	2	HIR	0	0	90	-
	3	Improved HIR	0	0	0	72
	Total		**100**	**100**	**100**	**100**

Table 10B.2.3 presents the efficacy distribution of lamp shipments for residential IRL under the 10 percent lumen increase sensitivity.

Table 10B.2.3 Residential Incandescent Reflector Lamps: Base Case and Standards Case (10 Percent Lumen Increase Sensitivity) Efficacy Distributions from 2012 to 2042

Year	Level	Technology	Proportions of Residential IRL Shipped			
			Base Case	Standards Case (10 percent Lumen Increase Sensitivity)		
				1	2	3
2012 to 2042	Baseline	Halogen	100	-	-	-
	1	Improved Halogen	0	100	-	-
	2	HIR	0	0	100	-
	3	Improved HIR	0	0	0	100
	Total		**100**	**100**	**100**	**100**

The calculation of the NES and NPV is dependent on the estimate of the average efficacy in the lamp stock. The following figures present the average efficacy of the IRL stock for each CSL under the two sensitivity scenarios. The average efficacy numbers do not include stock

moving to reflector CFL or other emerging technologies overtime. Figure 10B.2.1 and Figure 10B.2.2 present the base case and standards case average efficacy forecasts of IRL in the commercial and residential sectors, respectively, from 2012 to 2042 under the 65W BR lamp substitution sensitivity. Though 65W BR30 and BR40 lamps are not considered to be covered IRL product, the average efficacy forecasts below include both covered IRL product and lower-efficacy incandescent 65W BR30 lamp.

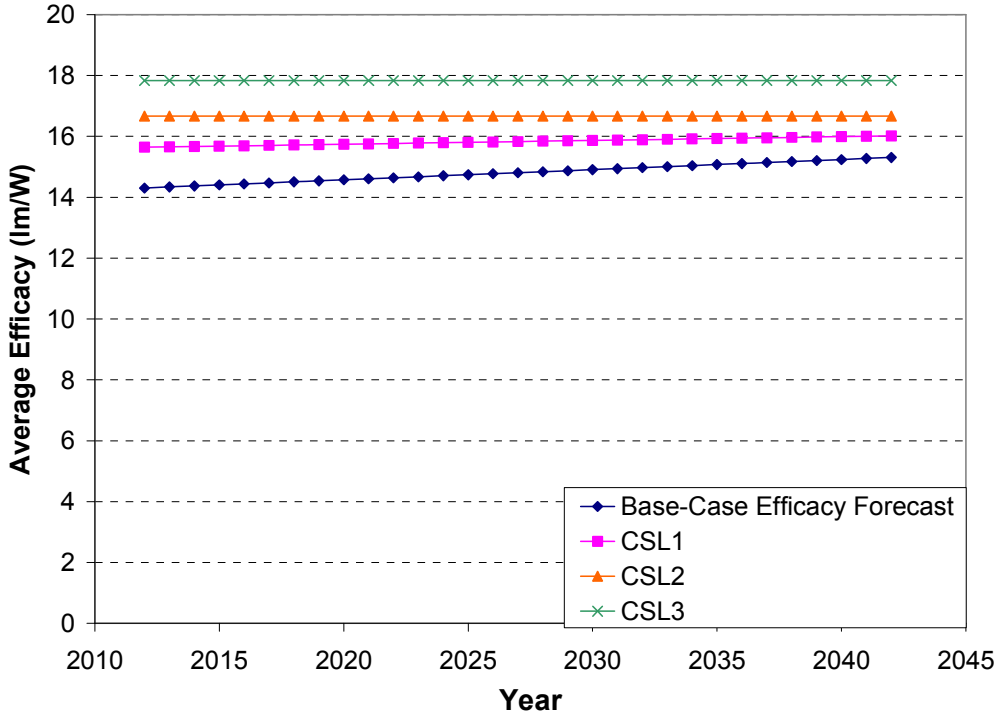

Figure 10B.2.1 Average Efficacy of the Commercial IRL Stock (65W BR Lamp Substitution Sensitivity)

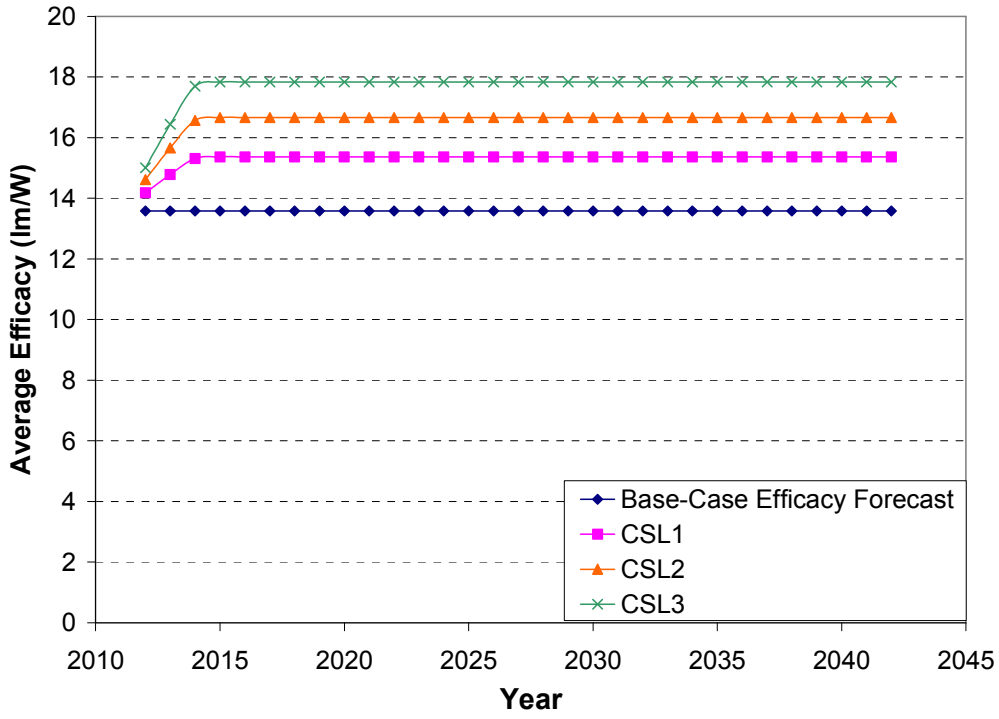

Figure 10B.2.2 Average Efficacy of the Residential IRL Stock (65W BR Lamp Substitution Sensitivity)

Figure 10B.2.2 presents the base case and standards case efficacy distribution of the residential IRL stock from 2012 to 2042 under the 10 percent lumen increase sensitivity.

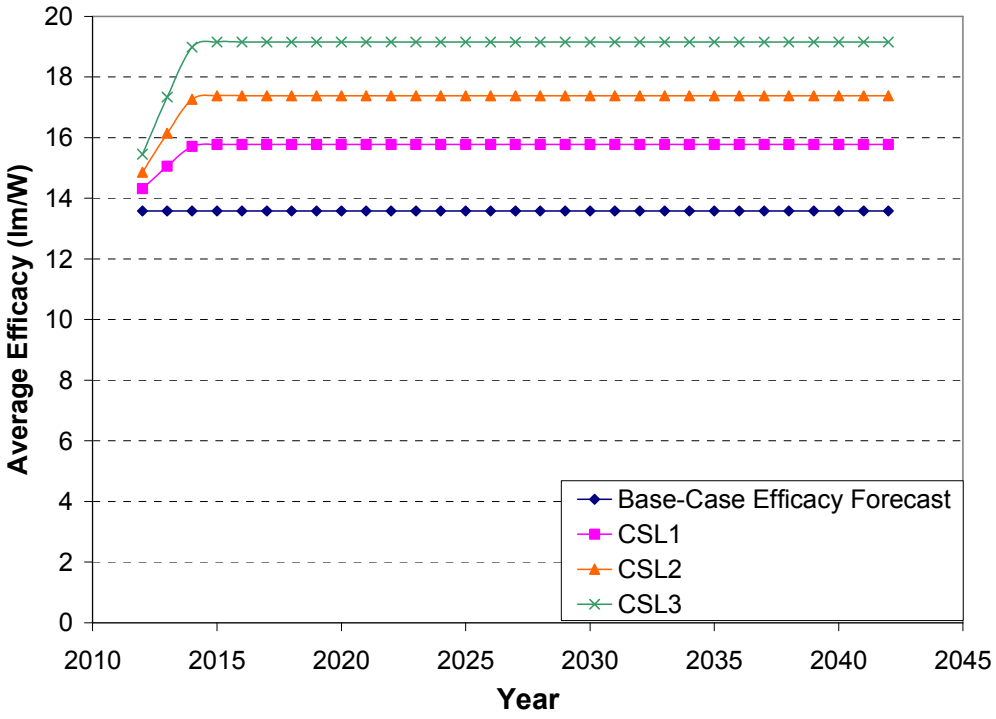

Figure 10B.2.3 Average Efficacy of the Residential IRL Stock (10 Percent Lumen Increase Sensitivity)

Changes in efficacy can lead to changes in lumen output. For IRL, the average lumen output numbers do not include stock moving to reflector CFL or other emerging technologies overtime. Figure 10B.2.4 presents the lumens serviced in the base case and standards case by the commercial IRL stock under the 65W BR lamp substitution sensitivity from 2012 to 2042. Figure 10B.2.4 presents the lumens serviced in the base case and standards case by the residential IRL stock under the 65W BR lamp substitution sensitivity from 2012 to 2042.

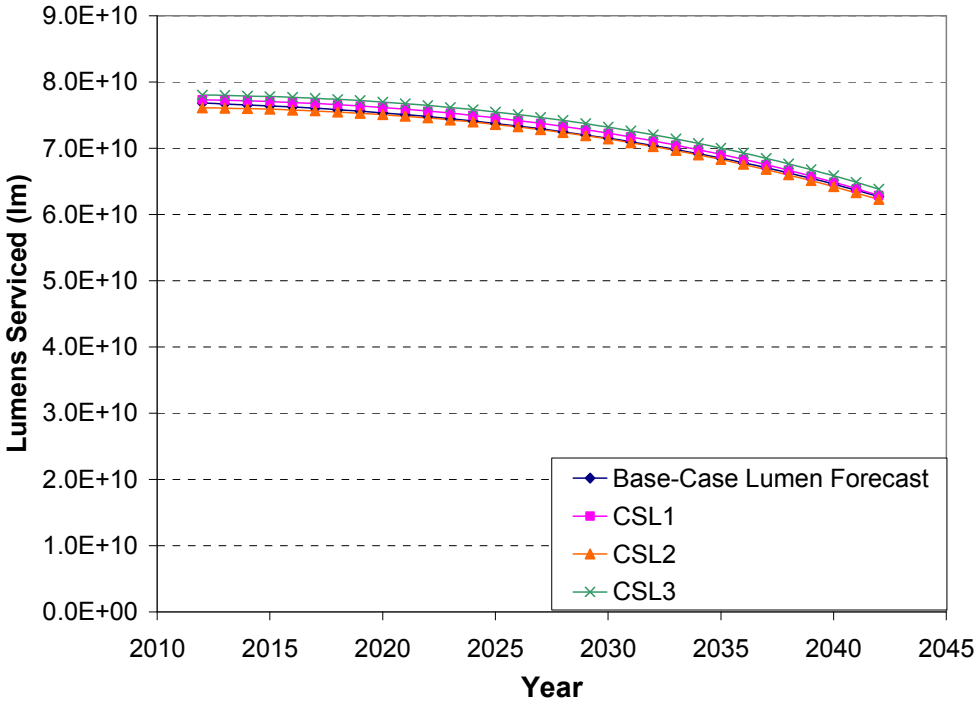

Figure 10B.2.4 Commercial IRL Lumens Serviced (65W BR Lamp Substitution Sensitivity)

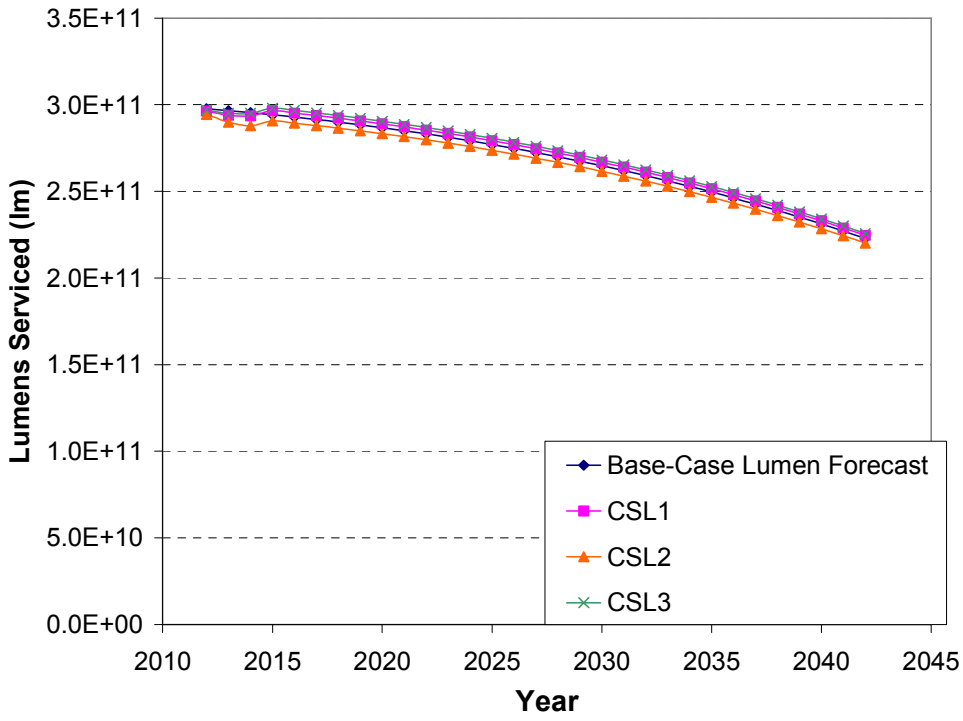

Figure 10B.2.5 Residential IRL Lumens Serviced (65W BR Lamp Substitution Sensitivity)

Figure 10B.2.6 presents the lumens serviced in the base case and standards case by the residential IRL stock under the 10 percent lumen increase sensitivity from 2012 to 2042.

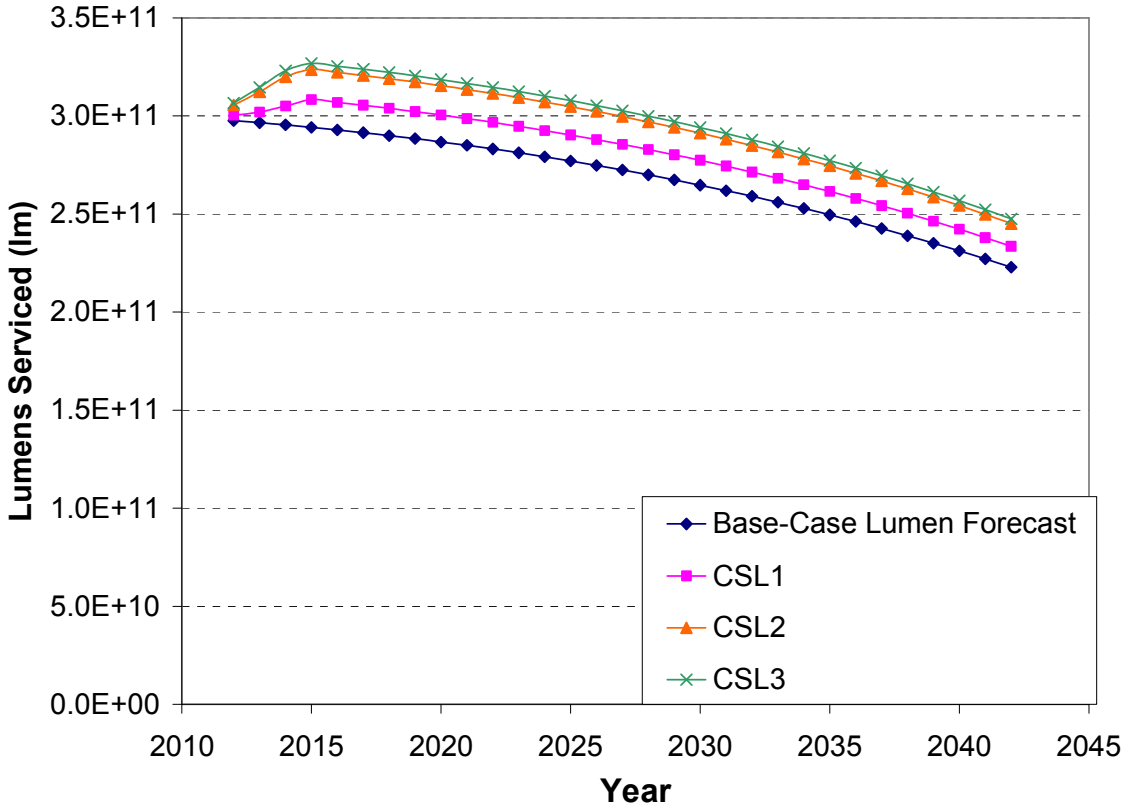

Figure 10B.2.6 Residential IRL Lumens Serviced (10 Percent Lumen Increase Sensitivity)

10B.3 NATIONAL ENERGY SAVINGS AND NET PRESENT VALUE RESULTS

The following tables provide NES results for each CSL considered for incandescent reflector lamps under the 65W BR lamp substitution and 10 percent lumen increase sensitivities. Results are cumulative to 2042 and are shown as primary energy savings in units of quads. In general, both of these sensitivity scenarios reflect lower energy savings than the main shipment scenario, as both sensitivities incorporate higher-wattage or same-wattage lamp designs. In contrast, the main shipment scenario utilizes reduced-wattage lamp designs.

Table 10B.3.1 Cumulative National Energy Savings for Commercial IRL (65W BR Lamp Substitution Sensitivity) (2012-2042) (quads)

Candidate Standard Level	NES *quads*		
	Undiscounted	Discounted at 7%	Discounted at 3%
1	0.36	0.12	0.21
2	0.70	0.23	0.41
3	0.85	0.27	0.50

Table 10B.3.2 Cumulative National Energy Savings for Residential IRL (65W BR Lamp Substitution Sensitivity) (2012-2042) (quads)

Candidate Standard Level	NES *quads*		
	Undiscounted	Discounted at 7%	Discounted at 3%
1	0.51	0.15	0.29
2	0.92	0.27	0.52
3	1.04	0.30	0.59

Table 10B.3.3 Cumulative National Energy Savings for Residential IRL (10 Percent Lumen Increase Sensitivity) (2012-2042) (quads)

Candidate Standard Level	NES *quads*		
	Undiscounted	Discounted at 7%	Discounted at 3%
1	0.47	0.14	0.26
2	0.72	0.21	0.41
3	1.07	0.31	0.60

The following tables provides NPV results for the candidate standards levels considered for incandescent reflector lamps under the 65W BR lamp substitution and 10 percent lumen increase sensitivities. Results are cumulative and are shown as the discounted value of these savings in dollar terms.

Table 10B.3.4 Cumulative NPV Results for Commercial IRL (65W BR Lamp Substitution Sensitivity) (billion 2006$)

Candidate Standard Level	NPV *billion 2006$*	
	Discounted at 7%	**Discounted at 3%**
1	0.74	1.35
2	1.43	2.64
3	2.55	4.75

Table 10B.3.5 Cumulative NPV Results for Residential IRL (65W BR Lamp Substitution Sensitivity) (billion 2006$)

Candidate Standard Level	NPV *billion 2006$*	
	Discounted at 7%	**Discounted at 3%**
1	1.13	2.29
2	2.21	4.41
3	3.07	6.15

Table 10B.3.6 Cumulative NPV Results for Residential IRL (10 Percent Lumen Increase Sensitivity) (billion 2006$)

Candidate Standard Level	NPV *billion 2006$*	
	Discounted at 7%	**Discounted at 3%**
1	0.82	1.73
2	1.44	2.96
3	2.76	5.64