



# Business Sector Market Assessment and Baseline: Commercial New Construction Vol. 2 Appendices

Final Report



Prepared for the Vermont Department of Public Service

Madison, Wisconsin, October 5, 2009





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## Appendix A: General and Building Envelope

### A.1. Facility Details

#### A.1.1. Premise Weighted Results

**Table A-1  
Primary Economic Activity (Premise)**

Economic Activity	# of Sites	Weighted Percent
Retail	6	22%
Office	4	15%
Restaurant	1	4%
Warehouse	1	4%
Other Health	6	22%
School	2	7%
Other	7	26%

**Table A-2  
Secondary Economic Activity (Premise)**

Economic Activity	# of Sites	Weighted Percent
None	16	59%
Retail	1	4%
Office	2	7%
Restaurant	2	7%
Warehouse	0	0%
Other Health	1	4%
School	0	0%
Other	2	7%
Unknown	3	11%

**Table A-3  
Number of Floors (Premise)**

Number of Floors	# of Sites	Weighted Percent
One	13	48%
Two	8	30%
Three	5	19%
Four or more	1	4%



**Table A-4  
Total Indoor Floorspace (Premise)**

Total Indoor Floorspace (Sq. Ft.)	# of Sites	Percent
<= 2000	0	0%
2001 - 5000	8	30%
5001 - 10000	6	22%
10001 - 20000	5	19%
20001 - 50000	6	22%
50001+	2	7%

**Table A-5  
Total Conditioned Floorspace (Premise)**

Total Conditioned Floorspace (Sq. Ft.)	# of Sites	Percent
<= 2000	1	4%
2001 - 5000	7	26%
5001 - 10000	7	26%
10001 - 20000	5	19%
20001 - 50000	5	19%
50001+	2	7%

**Table A-6  
Year of Original Construction (Premise)**

Time Period	# of Sites	Weighted Percent
Before 2005	2	7%
2005	1	4%
2006	13	48%
2007	9	33%
2008	2	7%
Unknown	0	0%

**Table A-7  
Percent of Floor Space from Original Construction (Premise)**

Percent of Space	# of Sites	Weighted Percent
0 - 25%	0	0%
26 - 50%	1	4%
51 - 75%	0	0%
76 - 100%	25	93%
Unknown	1	4%



## A.2. On-Site Generation

### A.2.1. Square Foot Weighted Results

**Table A-8  
On-Site Generation Details (Square Foot)**

Onsite Generation Details	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Have On-Site Generation	20%	27	8%	33%
Cogeneration Capable	0%	7	0%	0%

**Table A-9  
On-Site Generation Fuel Types (Square Foot)**

Fuel Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Natural Gas	0%	7	0%	0%
LPG	14%	7	-2%	29%
Diesel	81%	7	64%	99%
Other	5%	7	-2%	12%
Unknown Fuel Type	0%	7	0%	0%

**Table A-10  
On-Site Generation Usage (Square Foot)**

Usage	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Emergency	100%	7	100%	100%
Peak Shaving	0%	7	0%	0%
Baseload	0%	7	0%	0%
Other	0%	7	0%	0%
Unknown Usage	0%	7	0%	0%

### A.2.2. Premise Weighted Results

**Table A-11  
On-Site Generation Details (Premise)**

Onsite Generation Details	Percent/ Size	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Have Onsite Generation	26%	27	15%	37%
Size (kW)	68	7	25.1	110.1
Unknown Size	0%	7	0%	0%
Cogeneration Capable	0%	7	0%	0%



**Table A-12  
On-Site Generation Fuel Types (Premise)**

Fuel Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Natural Gas	0%	7	0%	0%
LPG	29%	7	6%	51%
Diesel	57%	7	32%	82%
Other	14%	7	-3%	32%
Unknown Fuel Type	0%	7	0%	0%

**Table A-13  
On-Site Generation Usage (Premise)**

Usage	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Emergency	100%	7	100%	100%
Peak Shaving	0%	7	0%	0%
Baseload	0%	7	0%	0%
Other	0%	7	0%	0%
Unknown Usage	0%	7	0%	0%

### A.3. Maintenance

#### A.3.1. Square Foot Weighted Results

**Table A-14  
Maintenance Contracts (Square Foot)**

Conditioning Type with Maintenance Contract	Percent of Conditioned Floorspace	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Packaged HVAC	53.6%	14	25.5%	81.8%
Boiler	82.9%	20	69.1%	96.7%
Air Handler	36.0%	11	14.0%	58.1%
Chiller	43.2%	2	-3.3%	89.7%
Built-up HVAC	41.5%	5	6.9%	76.1%



**Table A-15  
Packaged HVAC Maintenance (Square Foot)**

Packaged HVAC Service Type # Times / Year	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
<b>Coils Cleaned</b>				
0 Times	2.2%	14	-0.9%	5.4%
Less than Once	14.2%	14	-0.3%	28.6%
Once	66.7%	14	45.6%	87.8%
Twice	13.4%	14	2.6%	24.3%
3+	0.0%	14	0.0%	0.0%
<b>Refrigerant Checked</b>				
0 Times	2.2%	14	-0.9%	5.4%
Less than Once	14.2%	14	-0.3%	28.6%
Once	71.5%	14	52.0%	91.0%
Twice	8.6%	14	-0.4%	17.7%
3+	0.0%	14	0.0%	0.0%
<b>Dampers Checked</b>				
0 Times	0.0%	14	0.0%	0.0%
Less than Once	14.2%	14	-0.3%	28.6%
Once	64.7%	14	42.8%	86.6%
Twice	10.7%	14	0.8%	20.6%
3+	4.8%	14	-0.7%	10.2%

**Table A-16  
Chiller Maintenance (Square Foot)**

Chiller Serviced # Times / Year	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
0 Times	0.0%	2	0.0%	0.0%
Less than Once	0.0%	2	0.0%	0.0%
Once	0.0%	2	0.0%	0.0%
Twice	0.0%	2	0.0%	0.0%
3+	56.8%	2	10.3%	103.3%



**Table A-17  
Boiler Maintenance (Square Foot)**

<b>Boiler Efficiency Checked # Times / Year</b>	<b>Percent</b>	<b># of Cases</b>	<b>Lower 80% Confidence Limit</b>	<b>Upper 80% Confidence Limit</b>
0 Times	0.0%	20	0.0%	0.0%
Less than Once	0.0%	20	0.0%	0.0%
Once	70.9%	20	53.3%	88.4%
Twice	15.0%	20	1.0%	29.0%
3+	2.3%	20	-0.1%	4.6%

**Table A-18  
Air Handler Maintenance (Square Foot)**

<b>Air Handler Controls Checked # Times / Year</b>	<b>Percent</b>	<b># of Cases</b>	<b>Lower 80% Confidence Limit</b>	<b>Upper 80% Confidence Limit</b>
0 Times	4.0%	11	-1.6%	9.6%
Less than Once	7.3%	11	-2.6%	17.2%
Once	59.3%	11	35.0%	83.6%
Twice	0.0%	11	0.0%	0.0%
3+	17.1%	11	0.0%	34.1%

**Table A-19  
Built-up Air Handler Maintenance (Square Foot)**

<b>Built-up Air Handler Serviced # Times / Year</b>	<b>Percent</b>	<b># of Cases</b>	<b>Lower 80% Confidence Limit</b>	<b>Upper 80% Confidence Limit</b>
0 Times	5.3%	5	-2.4%	12.9%
Less than Once	9.6%	5	-3.8%	22.9%
Once	37.1%	5	0.7%	73.5%
Twice	0.0%	5	0.0%	0.0%
3+	16.2%	5	-5.0%	37.3%



### A.3.2. Premise Weighted Results

**Table A-20  
Maintenance Contracts (Premise)**

Conditioning Type with Maintenance Contract	Percent of Conditioned Premises	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Packaged HVAC	71.4%	14	55.3%	87.6%
Boiler	80.0%	20	68.0%	92.0%
Air Handler	63.6%	11	44.2%	83.1%
Chiller	50.0%	2	2.6%	97.4%
Built-up HVAC	40.0%	5	10.6%	69.4%

**Table A-21  
Packaged HVAC Maintenance (Premise)**

Packaged HVAC Service Type # Times / Year	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
<b>Coils Cleaned</b>				
0 Times	7.1%	14	-2.1%	16.4%
Less than Once	14.3%	14	1.8%	26.8%
Once	35.7%	14	18.6%	52.9%
Twice	35.7%	14	18.6%	52.9%
3+	0.0%	14	0.0%	0.0%
<b>Refrigerant Checked</b>				
0 Times	7.1%	14	-2.1%	16.4%
Less than Once	14.3%	14	1.8%	26.8%
Once	57.1%	14	39.4%	74.9%
Twice	14.3%	14	1.8%	26.8%
3+	0.0%	14	0.0%	0.0%
<b>Dampers Checked</b>				
0 Times	0.0%	14	0.0%	0.0%
Less than Once	14.3%	14	1.8%	26.8%
Once	35.7%	14	18.6%	52.9%
Twice	21.4%	14	6.7%	36.1%
3+	14.3%	14	1.8%	26.8%



**Table A-22  
Chiller Maintenance (Premise)**

Chiller Serviced # Times / Year	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
0 Times	0.0%	2	0.0%	0.0%
Less than Once	0.0%	2	0.0%	0.0%
Once	0.0%	2	0.0%	0.0%
Twice	0.0%	2	0.0%	0.0%
3+	50.0%	2	2.6%	97.4%

**Table A-23  
Boiler Maintenance (Premise)**

Boiler Efficiency Checked # Times / Year	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
0 Times	0.0%	20	0.0%	0.0%
Less than Once	0.0%	20	0.0%	0.0%
Once	65.0%	20	50.7%	79.3%
Twice	10.0%	20	1.0%	19.0%
3+	10.0%	20	1.0%	19.0%

**Table A-24  
Air Handler Maintenance (Premise)**

Air Handler Controls Checked # Times / Year	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
0 Times	9.1%	11	-2.5%	20.7%
Less than Once	9.1%	11	-2.5%	20.7%
Once	45.5%	11	25.3%	65.6%
Twice	0.0%	11	0.0%	0.0%
3+	18.2%	11	2.6%	33.8%

**Table A-25  
Built-up Air Handler Maintenance (Premise)**

Built-up Air Handler Serviced # Times / Year	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
0 Times	20.0%	5	-4.0%	44.0%
Less than Once	20.0%	5	-4.0%	44.0%
Once	20.0%	5	-4.0%	44.0%
Twice	0.0%	5	0.0%	0.0%
3+	20.0%	5	-4.0%	44.0%





## A.4. Building Envelope

### A.4.1. Square Foot Weighted Results

#### A.4.1.1. Walls

**Table A-26**  
**Area of Exterior Walls (Square Foot)**

Area of Exterior Walls	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Less than 5,000	12%	27	5%	19%
5,000 to 10,000	17%	27	7%	26%
10,000 to 15,000	20%	27	7%	33%
15,000 to 20,000	5%	27	-2%	12%
Greater than 20,000	35%	27	14%	57%
Unknown	11%	27	-3%	24%

**Table A-27**  
**Wall Types (Square Foot)**

Wall Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Frame	40%	27	20%	59%
Brick	11%	27	-3%	24%
Concrete	0%	27	0%	0%
Brick and Block	2%	27	-1%	4%
Composite Panel	35%	27	17%	53%
Other Masonry	0%	27	0%	0%
Other	13%	27	3%	22%
Unknown	0%	27	0%	0%

**Table A-28**  
**Wall Frame Types (Square Foot)**

Frame Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Metal	40%	27	22%	58%
Wood	58%	27	39%	76%
Other	0%	27	0%	0%
Unknown	2%	27	0%	5%



**Table A-29  
Above Ground Exterior Wall Insulation Level (Square Foot)**

Above Ground Wall Insulation (R-Value)	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Average R-Value	22	27	21	24
Less than 10	1%	27	0%	1%
10 to 15	1%	27	0%	2%
15 to 20	26%	27	10%	41%
20 to 30	37%	27	17%	57%
Greater than 30	5%	27	1%	10%
Unknown	30%	27	13%	47%

**Table A-30  
Below Ground Exterior Wall Insulation Level (Square Foot)**

Below Ground Wall Insulation (R-Value)	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Average R-Value	7	27	5	9
Less than 10	27%	27	6%	47%
10 to 15	5%	27	-1%	11%
15 to 20	2%	27	-1%	5%
20 to 30	1%	27	0%	3%
Greater than 30	0%	27	0%	0%
No Below Ground Walls	36%	27	19%	53%
Unknown	29%	27	12%	46%

**A.4.1.2. Windows**

**Table A-31  
Percent of Wall Area Glazed (Square Foot)**

Percent of Wall Area Glazed (Percent)	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Average Percent of Wall area Glazed	24%	27	19%	30%
None	7%	27	0%	13%
Less than 10 Percent	7%	27	1%	14%
10 to 20	20%	27	9%	32%
20 to 30	43%	27	23%	63%
30 to 40	7%	27	-2%	15%
Greater than 40	15%	27	1%	29%
Unknown	1%	27	0%	2%



**Table A-32  
Window Glaze Types (Square Foot)**

Glaze Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Single	1%	27	0%	1%
Double	82%	27	70%	94%
Triple	7%	27	-1%	16%
Not Applicable	7%	27	0%	13%
Unknown	4%	27	-1%	9%

**Table A-33  
Window Treatment Types (Square Foot)**

Window Treatment Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Clear	46%	27	27%	66%
Tinted	0%	27	0%	0%
Reflective	0%	27	0%	0%
Gas-Filled	11%	27	2%	19%
Low E	35%	27	17%	52%
Opaque	0%	27	0%	0%
Unknown	9%	27	1%	16%

**A.4.1.3. Roofs**

**Table A-34  
Roof Size (Square Foot)**

Roof Size (Square Feet)	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Average Roof Size	20,205	27	15,260	25,149
Less than 5,000	11%	27	5%	18%
5,000 to 10,000	4%	27	1%	7%
10,000 to 15,000	22%	27	10%	34%
15000 to 20,000	23%	27	2%	43%
20,000 to 25,0000	16%	27	4%	28%
Greater than 25,000	24%	27	5%	42%
Unknown	2%	27	-1%	4%

**Table A-35  
Roof Configuration (Square Foot)**

Roof Configuration	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Flat	37%	27	16%	57%
Pitched	63%	27	43%	84%
Interior Space	0%	27	0%	0%



**Table A-36  
Roof Deck Material (Square Foot)**

Roof Deck Material	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Concrete	2%	27	-1%	5%
Wood	44%	27	25%	63%
Metal	31%	27	14%	47%
Other	2%	27	-1%	5%
Unknown	21%	27	0%	42%

**Table A-37  
Roof Surface Material (Square Foot)**

Roof Surface Material	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Shingles/Felt	30%	27	13%	47%
Built-Up	19%	27	-2%	40%
Membrane	22%	27	7%	37%
Other	27%	27	13%	40%
Unknown	2%	27	0%	5%

**Table A-38  
Roof Insulation Types (Square Foot)**

Roof Insulation Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
None	1%	27	0%	1%
Rigid	35%	27	15%	55%
Batt/Blown	35%	27	17%	52%
Other	9%	27	2%	17%
Unknown	21%	27	6%	36%

**Table A-39  
Roof Insulation Level (Square Foot)**

Roof Insulation (R-Value)	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Average R-Value	36	27	32	40
Less than 20	7%	27	0%	14%
20 to 30	1%	27	0%	3%
30 to 40	35%	27	15%	56%
40 to 50	12%	27	3%	21%
Greater than 50	5%	27	1%	9%
Unknown	40%	27	21%	59%



#### A.4.1.4. Building Envelope Energy Efficiency Opportunities

**Table A-40  
Building Envelope Energy Efficiency Opportunities (Square Foot)**

Energy Efficiency Opportunities	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Add Wall Insulation	8%	27	1%	16%
Cool Roof	3%	27	0%	6%
Add Roof Insulation	2%	27	0%	4%

#### A.4.2. Premise Weighted Results

##### A.4.2.1. Walls

**Table A-41  
Area of Exterior Walls (Premise)**

Area of Exterior Walls	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Less than 5,000	37%	27	25%	49%
5,000 to 10,000	30%	27	18%	41%
10,000 to 15,000	15%	27	6%	24%
15,000 to 20,000	4%	27	-1%	9%
Greater than 20,000	11%	27	3%	19%
Unknown	4%	27	-1%	9%

**Table A-42  
Wall Types (Premise)**

Wall Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Frame	52%	27	39%	65%
Brick	4%	27	-1%	9%
Concrete	0%	27	0%	0%
Brick and Block	4%	27	-1%	9%
Composite Panel	26%	27	15%	37%
Other Masonry	0%	27	0%	0%
Other	15%	27	6%	24%
Unknown	0%	27	0%	0%



**Table A-43  
Wall Frame Types (Premise)**

Frame Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Metal	41%	27	28%	53%
Wood	52%	27	39%	65%
Other	0%	27	0%	0%
Unknown	7%	27	1%	14%

**Table A-44  
Above Ground Exterior Wall Insulation Level (Premise)**

Above Ground Wall Insulation (R-Value)	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Average R-Value	22	27	20	25
Less than 10	4%	27	-1%	9%
10 to 15	4%	27	-1%	9%
15 to 20	33%	27	21%	45%
20 to 30	22%	27	12%	33%
Greater than 30	11%	27	3%	19%
Unknown	26%	27	15%	37%

**Table A-45  
Below Ground Exterior Wall Insulation Level (Premise)**

Below Ground Wall Insulation (R-Value)	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Average R-Value	9	27	6	12
Less than 10	19%	27	9%	29%
10 to 15	7%	27	1%	14%
15 to 20	4%	27	-1%	9%
20 to 30	4%	27	-1%	9%
Greater than 30	0%	27	0%	0%
No Below Ground Walls	44%	27	32%	57%
Unknown	22%	27	12%	33%



### A.4.2.2. Windows

**Table A-46  
Percent of Wall Area Glazed (Premise)**

Percent of Wall Area Glazed (Percent)	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Average Percent of Wall area Glazed	19%	27	15%	23%
None	7%	27	1%	14%
Less than 10 Percent	15%	27	6%	24%
10 to 20	33%	27	21%	45%
20 to 30	26%	27	15%	37%
30 to 40	4%	27	-1%	9%
Greater than 40	11%	27	3%	19%
Unknown	4%	27	-1%	9%

**Table A-47  
Window Glaze Types (Premise)**

Glaze Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Single	4%	27	-1%	9%
Double	78%	27	67%	88%
Triple	7%	27	1%	14%
Not Applicable	7%	27	1%	14%
Unknown	4%	27	-1%	9%

**Table A-48  
Window Treatment Types (Premise)**

Window Treatment Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Clear	33%	27	21%	45%
Tinted	0%	27	0%	0%
Reflective	0%	27	0%	0%
Gas-Filled	15%	27	6%	24%
Low E	37%	27	25%	49%
Opaque	0%	27	0%	0%
Unknown	15%	27	6%	24%



### A.4.2.3. Roofs

**Table A-49  
Roof Size (Premise)**

Roof Size (Square Feet)	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Average Roof Size	12,075	27	9,278	14,872
Less than 5,000	33%	27	21%	45%
5,000 to 10,000	11%	27	3%	19%
10,000 to 15,000	26%	27	15%	37%
15000 to 20,000	7%	27	1%	14%
20,000 to 25,0000	11%	27	3%	19%
Greater than 25,000	7%	27	1%	14%
Unknown	4%	27	-1%	9%

**Table A-50  
Roof Configuration (Premise)**

Roof Configuration	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Flat	22%	27	12%	33%
Pitched	78%	27	67%	88%
Interior Space	0%	27	0%	0%

**Table A-51  
Roof Deck Material (Premise)**

Roof Deck Material	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Concrete	4%	27	-1%	9%
Wood	52%	27	39%	65%
Metal	30%	27	18%	41%
Other	4%	27	-1%	9%
Unknown	11%	27	3%	19%

**Table A-52  
Roof Surface Material (Premise)**

Roof Surface Material	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Shingles/Felt	37%	27	25%	49%
Built-Up	4%	27	-1%	9%
Membrane	15%	27	6%	24%
Other	37%	27	25%	49%
Unknown	7%	27	1%	14%





**Table A-53  
Roof Insulation Types (Premise)**

Roof Insulation Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
None	4%	27	-1%	9%
Rigid	22%	27	12%	33%
Batt/Blown	41%	27	28%	53%
Other	15%	27	6%	24%
Unknown	19%	27	9%	29%

**Table A-54  
Roof Insulation Level (Premise)**

Roof Insulation (R-Value)	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Average R-Value	37	27	33	41
Less than 20	7%	27	1%	14%
20 to 30	4%	27	-1%	9%
30 to 40	26%	27	15%	37%
40 to 50	15%	27	6%	24%
Greater than 50	11%	27	3%	19%
Unknown	37%	27	25%	49%

**A.4.2.4. Building Envelope Energy Efficiency Opportunities**

**Table A-55  
Building Envelope Energy Efficiency Opportunities (Premise)**

Energy Efficiency Opportunities	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Add Wall Insulation	11%	27	3%	19%
Cool Roof	7%	27	1%	14%
Add Roof Insulation	7%	27	1%	14%





## Appendix B: Indoor Lighting

### B.1. Types of Indoor Lighting

#### B.1.1. Square Foot Weighted Results

**Table B-1**  
**Types of Indoor Lighting (Square Foot)**

Light Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Incandescent	36%	26	23%	48%
CFL	57%	26	43%	70%
HID	3%	26	0%	7%
T5	30%	26	15%	45%
Standard T8	39%	26	27%	51%
High Performance T8	20%	26	11%	30%
T12	3%	26	0%	7%
Quartz	5%	26	0%	11%
Other Fluorescent	19%	26	7%	32%
Unknown Fluorescent Tube	10%	26	2%	19%
Other	25%	26	15%	34%
Unknown T8	5%	26	1%	8%

#### B.1.2. Premise Weighted Results

**Table B-2**  
**Types of Indoor Lighting (Premise)**

Light Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Incandescent	46%	26	33%	59%
CFL	58%	26	45%	71%
HID	12%	26	3%	20%
T5	42%	26	29%	55%
Standard T8	46%	26	33%	59%
High Performance T8	35%	26	22%	47%
T12	12%	26	3%	20%
Quartz	8%	26	1%	15%
Other Fluorescent	27%	26	15%	39%
Unknown Fluorescent Tube	19%	26	9%	30%
Other	38%	26	26%	51%
Unknown T8	19%	26	9%	30%



## B.2. Lighting Densities

**Table B-3**  
Default Values Used For Missing Data

HID		
	Magnetic	Electronic
Lamp Quantity per ballast	1	1
MH or HPS <=100W	90	NA
250W MH HID	295	270
320W MH HID	365	345
350W MH HID	400	375
400W MH HID	458	430
250W HPS HID	295	NA
310W HPS HID	365	NA
400W HPS HID	465	NA

Source: Efficiency Vermont Technical Reference User Manual No. 2008-53  
Source: Advance Atlas 2008-2009, based on 277V systems

CFL												
	Magnetic				Magnetic Energy Saving				Electronic			
	1	2	3	4	1	2	3	4	1	2	3	4
Lamp Quantity per ballast	1	2	3	4	1	2	3	4	1	2	3	4
CFL <20W	15	35	NA	NA	NA	NA	NA	NA	14	27	NA	NA
CFL >=20W	29	50	NA	NA	NA	NA	NA	NA	27	51	NA	NA
Dimming CFL <20W	20	NA	NA	NA	NA	NA	NA	NA	18	33	86	112
Dimming CFL >=20W	25	NA	NA	NA	NA	NA	NA	NA	31	58	NA	NA

Source: Efficiency Vermont Technical Reference User Manual No. 2008-53  
Source: Advance Atlas 2008-2009, based on 277V systems  
Source: Advance Atlas 2008-2009, based on 277V systems (assumed 13W lamps for <20W and 26W lamps for >=20W)

Fluorescent												
	Magnetic				Magnetic Energy Saving				Electronic			
	1	2	3	4	1	2	3	4	1	2	3	4
Lamp Quantity per ballast	1	2	3	4	1	2	3	4	1	2	3	4
T5	NA	NA	NA	NA	NA	NA	NA	NA	32	64	96	128
T5HO	NA	NA	NA	NA	NA	NA	NA	NA	62	117	179	234
T8	41	76	NA	NA	NA	NA	NA	NA	29	55	86	112
HPT8	NA	NA	NA	NA	NA	NA	NA	NA	28	59	87	108
T10	53	88	NA	NA	NA	NA	NA	NA	35	71	112	NA
T12	50	86	NA	172	43	72	103	144	35	71	107	NA

Source: Efficiency Vermont Technical Reference User Manual No. 2008-53  
Source: Advance Atlas 2008-2009, based on 277V systems  
Average wattage based on CEE Approved ballasts

Operating Hours	
Building Type	Annual Hours
Office	3435
Restaurant	4156
Retail	3068
Grocery/Supermarket	4612
Warehouse	2388
Elem/Sec School	2080
College	5010
Health	3392
Hospital	4532
Hotel/Motel	2697
Manufacturing	3500
Other/misc.	2278

Source: Efficiency Vermont Technical Reference User Manual No. 2008-53

**Table B-4**  
Overall Light Density

Statistic	Mean	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Lighting Power Density (W/sqft)	0.88	26	0.68	1.09
Total Lighting kWh per Premise	38,884	26	29,908	47,861
Watts per Fixture	52	25	24	80



**Table B-5  
Incandescent Density**

Statistic	Mean	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Lighting Power Density (W/sqft)	0.44	11	0.31	0.57
Total Lighting kWh per Premise	11,052	11	4,841	17,264
Watts per Fixture	90	11	82	97

**Table B-6  
CFL Light Density**

Statistic	Mean	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Lighting Power Density (W/sqft)	0.15	14	0.12	0.18
Total Lighting kWh per Premise	7,082	14	3,628	10,535
Watts per Fixture	32	14	30	34

**Table B-7  
HID Light Density**

Statistic	Mean	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Lighting Power Density (W/sqft)	1.46	1	1.46	1.46
Total Lighting kWh per Premise	7,665	1	7,665	7,665
Watts per Fixture	175	1	175	175

**Table B-8  
T5 Light Density**

Statistic	Mean	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Lighting Power Density (W/sqft)	0.73	10	0.33	1.13
Total Lighting kWh per Premise	19,057	10	8,844	29,269
Watts per Fixture	241	10	174	307

**Table B-9  
Standard T8 Light Density**

Statistic	Mean	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Lighting Power Density (W/sqft)	0.26	8	0.07	0.44
Total Lighting kWh per Premise	11,878	8	6,472	17,284
Watts per Fixture	70	8	54	85



**Table B-10  
HP T8 Light Density**

Statistic	Mean	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Lighting Power Density (W/sqft)	0.38	7	0.27	0.49
Total Lighting kWh per Premise	13,748	7	7,676	19,820
Watts per Fixture	71	7	61	80

**Table B-11  
Unknown T8 Light Density**

Statistic	Mean	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Lighting Power Density (W/sqft)	0.47	5	0.26	0.67
Total Lighting kWh per Premise	4,340	5	1,523	7,156
Watts per Fixture	47	5	38	57

**Table B-12  
T12 Light Density**

Statistic	Mean	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Lighting Power Density (W/sqft)	0.02	1	0.02	0.02
Total Lighting kWh per Premise	431	1	431	431
Watts per Fixture	38	1	38	38

**Table B-13  
Unknown Fluorescent Tube Light Density**

Statistic	Mean	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Lighting Power Density (W/sqft)	0.46	3	0.05	0.86
Total Lighting kWh per Premise	31,754	3	2,525	60,984
Watts per Fixture	24	3	19	29

**Table B-14  
Other Fluorescent Light Density**

Statistic	Mean	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Lighting Power Density (W/sqft)	0.13	5	0.05	0.22
Total Lighting kWh per Premise	2,684	5	1,563	3,804
Watts per Fixture	49	5	42	56



**Table B-15  
Other Light Density**

Statistic	Mean	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Lighting Power Density (W/sqft)	0.05	6	(0.00)	0.10
Total Lighting kWh per Premise	1,100	5	727	1,472
Watts per Fixture	23	6	14	33

**Table B-16  
Quartz Light Density**

Statistic	Mean	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Lighting Power Density (W/sqft)	0.07	2	0.03	0.12
Total Lighting kWh per Premise	733	2	689	778
Watts per Fixture	50	2	50	50

### B.3. Square Foot Weighted Results

#### B.3.1. Usage

**Table B-17  
Overall Light Usage (Square Foot)**

Usage	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Area	97%	25	95%	99%
Task	0%	25	0%	0%
Exit	2%	25	0%	3%
Display	1%	25	-1%	3%
Other	0%	25	0%	0%
Unknown	0%	25	0%	0%

**Table B-18  
Incandescent Light Usage (Square Foot)**

Usage	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Area	99%	11	98%	100%
Task	1%	11	0%	1%
Exit	0%	11	0%	0%
Display	0%	11	0%	1%
Other	0%	11	0%	0%
Unknown	0%	11	0%	0%



**Table B-19  
CFL Light Usage (Square Foot)**

Usage	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Area	99%	15	97%	101%
Task	0%	15	0%	0%
Exit	0%	15	0%	0%
Display	1%	15	-1%	3%
Other	0%	15	0%	0%
Unknown	0%	15	0%	0%

**Table B-20  
HID Light Usage (Square Foot)**

Usage	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Area	92%	3	79%	105%
Task	0%	3	0%	0%
Exit	0%	3	0%	0%
Display	8%	3	-5%	21%
Other	0%	3	0%	0%
Unknown	0%	3	0%	0%

**Table B-21  
T5 Light Usage (Square Foot)**

Usage	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Area	100%	11	100%	100%
Task	0%	11	0%	0%
Exit	0%	11	0%	0%
Display	0%	11	0%	0%
Other	0%	11	0%	0%
Unknown	0%	11	0%	0%





**Table B-22  
Standard T8 Light Usage (Square Foot)**

Usage	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Area	100%	12	100%	100%
Task	0%	12	0%	0%
Exit	0%	12	0%	0%
Display	0%	12	0%	0%
Other	0%	12	0%	0%
Unknown	0%	12	0%	0%

**Table B-23  
HP T8 Light Usage (Square Foot)**

Usage	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Area	100%	8	100%	100%
Task	0%	8	0%	0%
Exit	0%	8	0%	0%
Display	0%	8	0%	0%
Other	0%	8	0%	0%
Unknown	0%	8	0%	0%

**Table B-24  
Unknown T8 Light Usage (Square Foot)**

Usage	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Area	99%	5	98%	100%
Task	1%	5	0%	2%
Exit	0%	5	0%	0%
Display	0%	5	0%	0%
Other	0%	5	0%	0%
Unknown	0%	5	0%	0%



**Table B-25  
T12 Light Usage (Square Foot)**

Usage	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Area	23%	3	-8%	53%
Task	77%	3	47%	108%
Exit	0%	3	0%	0%
Display	0%	3	0%	0%
Other	0%	3	0%	0%
Unknown	0%	3	0%	0%

**Table B-26  
Unknown Fluorescent Tube Light Usage (Square Foot)**

Usage	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Area	100%	5	100%	100%
Task	0%	5	0%	0%
Exit	0%	5	0%	0%
Display	0%	5	0%	0%
Other	0%	5	0%	0%
Unknown	0%	5	0%	0%

**Table B-27  
Other Fluorescent Light Usage (Square Foot)**

Usage	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Area	100%	7	100%	100%
Task	0%	7	0%	0%
Exit	0%	7	0%	0%
Display	0%	7	0%	0%
Other	0%	7	0%	0%
Unknown	0%	7	0%	0%



**Table B-28  
Other Light Usage (Square Foot)**

Usage	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Area	8%	10	-3%	19%
Task	0%	10	0%	1%
Exit	67%	10	32%	102%
Display	25%	10	-7%	56%
Other	0%	10	0%	0%
Unknown	0%	10	0%	0%

**Table B-29  
Quartz Light Usage (Square Foot)**

Usage	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Area	0%	2	0%	0%
Task	0%	2	0%	0%
Exit	0%	2	0%	0%
Display	100%	2	100%	100%
Other	0%	2	0%	0%
Unknown	0%	2	0%	0%

### B.3.2. Ballast Types

**Table B-30  
Overall Light Ballast Types (Square Foot)**

Ballast Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Standard Magnetic	0%	25	0%	0%
Energy Saving Magnetic	0%	25	0%	1%
Electronic	49%	25	36%	63%
Other	0%	25	0%	0%
No Ballast	50%	25	37%	64%
Unknown	0%	25	0%	0%



**Table B-31  
CFL Light Ballast Types (Square Foot)**

Ballast Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Standard Magnetic	0%	15	0%	0%
Energy Saving Magnetic	0%	15	0%	0%
Electronic	84%	15	70%	97%
Other	0%	15	0%	0%
No Ballast	16%	15	3%	30%
Unknown	0%	15	0%	0%

**Table B-32  
HID Light Ballast Types (Square Foot)**

Ballast Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Standard Magnetic	0%	3	0%	0%
Energy Saving Magnetic	85%	3	64%	106%
Electronic	0%	3	0%	0%
Other	0%	3	0%	0%
No Ballast	15%	3	-6%	36%
Unknown	0%	3	0%	0%

**Table B-33  
T5 Light Ballast Types (Square Foot)**

Ballast Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Standard Magnetic	0%	11	0%	1%
Energy Saving Magnetic	0%	11	0%	0%
Electronic	52%	11	13%	90%
Other	0%	11	0%	0%
No Ballast	48%	11	10%	87%
Unknown	0%	11	0%	0%



**Table B-34  
Standard T8 Light Ballast Types (Square Foot)**

Ballast Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Standard Magnetic	0%	12	0%	0%
Energy Saving Magnetic	5%	12	-2%	11%
Electronic	75%	12	56%	94%
Other	0%	12	0%	0%
No Ballast	20%	12	2%	38%
Unknown	0%	12	0%	0%

**Table B-35  
HP T8 Light Ballast Types (Square Foot)**

Ballast Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Standard Magnetic	0%	8	0%	0%
Energy Saving Magnetic	0%	8	0%	0%
Electronic	100%	8	100%	100%
Other	0%	8	0%	0%
No Ballast	0%	8	0%	0%
Unknown	0%	8	0%	0%

**Table B-36  
Unknown T8 Light Ballast Types (Square Foot)**

Ballast Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Standard Magnetic	0%	5	0%	0%
Energy Saving Magnetic	0%	5	0%	0%
Electronic	100%	5	100%	100%
Other	0%	5	0%	0%
No Ballast	0%	5	0%	0%
Unknown	0%	5	0%	0%



**Table B-37  
T12 Light Ballast Types (Square Foot)**

Ballast Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Standard Magnetic	5%	3	-3%	13%
Energy Saving Magnetic	0%	3	0%	0%
Electronic	0%	3	0%	0%
Other	0%	3	0%	0%
No Ballast	95%	3	87%	103%
Unknown	0%	3	0%	0%

**Table B-38  
Unknown Fluorescent Tube Light Ballast Types (Square Foot)**

Ballast Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Standard Magnetic	0%	5	0%	0%
Energy Saving Magnetic	0%	5	0%	0%
Electronic	100%	5	99%	100%
Other	0%	5	0%	0%
No Ballast	0%	5	0%	1%
Unknown	0%	5	0%	0%

**Table B-39  
Other Fluorescent Light Ballast Types (Square Foot)**

Ballast Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Standard Magnetic	0%	7	0%	0%
Energy Saving Magnetic	0%	7	0%	0%
Electronic	2%	7	1%	4%
Other	0%	7	0%	0%
No Ballast	98%	7	96%	99%
Unknown	0%	7	0%	0%



### B.3.3. Control Types

**Table B-40  
Overall Light Control Types (Square Foot)**

Control Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Manual On/Off Switch	82%	25	72%	92%
Dimmer	2%	25	-1%	4%
Motion/Occupancy Sensor	9%	25	2%	15%
Photocell	0%	25	0%	0%
Timeclock	0%	25	0%	0%
Photocell/Timeclock	0%	25	0%	0%
Photocell with Dimming	0%	25	0%	0%
EMS	5%	25	-1%	11%
None/Continuous	3%	25	1%	6%
Other	0%	25	0%	0%
Unknown	0%	25	0%	0%

**Table B-41  
Incandescent Light Control Types (Square Foot)**

Control Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Manual On/Off Switch	98%	11	95%	101%
Dimmer	2%	11	-1%	5%
Motion/Occupancy Sensor	0%	11	0%	0%
Photocell	0%	11	0%	0%
Timeclock	0%	11	0%	0%
Photocell/Timeclock	0%	11	0%	0%
Photocell with Dimming	0%	11	0%	0%
EMS	0%	11	0%	0%
None/Continuous	0%	11	0%	0%
Other	0%	11	0%	0%
Unknown	0%	11	0%	0%



**Table B-42  
CFL Light Control Types (Square Foot)**

Control Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Manual On/Off Switch	93%	15	89%	98%
Dimmer	2%	15	-1%	5%
Motion/Occupancy Sensor	3%	15	1%	5%
Photocell	0%	15	0%	0%
Timeclock	0%	15	0%	0%
Photocell/Timeclock	0%	15	0%	0%
Photocell with Dimming	0%	15	0%	0%
EMS	2%	15	-1%	4%
None/Continuous	0%	15	0%	0%
Other	0%	15	0%	0%
Unknown	0%	15	0%	0%

**Table B-43  
HID Light Control Types (Square Foot)**

Control Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Manual On/Off Switch	15%	3	-6%	36%
Dimmer	0%	3	0%	0%
Motion/Occupancy Sensor	0%	3	0%	0%
Photocell	85%	3	64%	106%
Timeclock	0%	3	0%	0%
Photocell/Timeclock	0%	3	0%	0%
Photocell with Dimming	0%	3	0%	0%
EMS	0%	3	0%	0%
None/Continuous	0%	3	0%	0%
Other	0%	3	0%	0%
Unknown	0%	3	0%	0%





**Table B-44  
T5 Light Control Types (Square Foot)**

Control Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Manual On/Off Switch	39%	11	11%	68%
Dimmer	0%	11	0%	0%
Motion/Occupancy Sensor	13%	11	0%	25%
Photocell	0%	11	0%	0%
Timeclock	0%	11	0%	0%
Photocell/Timeclock	0%	11	0%	0%
Photocell with Dimming	0%	11	0%	0%
EMS	48%	11	10%	87%
None/Continuous	0%	11	0%	0%
Other	0%	11	0%	0%
Unknown	0%	11	0%	0%

**Table B-45  
Standard T8 Light Control Types (Square Foot)**

Control Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Manual On/Off Switch	86%	12	70%	101%
Dimmer	0%	12	0%	0%
Motion/Occupancy Sensor	1%	12	0%	2%
Photocell	0%	12	0%	0%
Timeclock	0%	12	0%	0%
Photocell/Timeclock	0%	12	0%	0%
Photocell with Dimming	0%	12	0%	0%
EMS	14%	12	-1%	29%
None/Continuous	0%	12	0%	0%
Other	0%	12	0%	0%
Unknown	0%	12	0%	0%



**Table B-46  
HP T8 Light Control Types (Square Foot)**

Control Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Manual On/Off Switch	15%	8	-3%	33%
Dimmer	0%	8	0%	0%
Motion/Occupancy Sensor	72%	8	57%	88%
Photocell	0%	8	0%	0%
Timeclock	0%	8	0%	0%
Photocell/Timeclock	0%	8	0%	0%
Photocell with Dimming	0%	8	0%	0%
EMS	0%	8	0%	0%
None/Continuous	13%	8	10%	16%
Other	0%	8	0%	0%
Unknown	0%	8	0%	0%

**Table B-47  
Unknown T8 Light Control Types (Square Foot)**

Control Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Manual On/Off Switch	82%	5	74%	90%
Dimmer	0%	5	0%	0%
Motion/Occupancy Sensor	18%	5	10%	26%
Photocell	0%	5	0%	0%
Timeclock	0%	5	0%	0%
Photocell/Timeclock	0%	5	0%	0%
Photocell with Dimming	0%	5	0%	0%
EMS	0%	5	0%	0%
None/Continuous	0%	5	0%	0%
Other	0%	5	0%	0%
Unknown	0%	5	0%	0%



**Table B-48  
T12 Light Control Types (Square Foot)**

Control Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Manual On/Off Switch	100%	3	100%	100%
Dimmer	0%	3	0%	0%
Motion/Occupancy Sensor	0%	3	0%	0%
Photocell	0%	3	0%	0%
Timeclock	0%	3	0%	0%
Photocell/Timeclock	0%	3	0%	0%
Photocell with Dimming	0%	3	0%	0%
EMS	0%	3	0%	0%
None/Continuous	0%	3	0%	0%
Other	0%	3	0%	0%
Unknown	0%	3	0%	0%

**Table B-49  
Unknown Fluorescent Tube Light Control Types (Square Foot)**

Control Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Manual On/Off Switch	100%	5	100%	100%
Dimmer	0%	5	0%	0%
Motion/Occupancy Sensor	0%	5	0%	0%
Photocell	0%	5	0%	0%
Timeclock	0%	5	0%	0%
Photocell/Timeclock	0%	5	0%	0%
Photocell with Dimming	0%	5	0%	0%
EMS	0%	5	0%	0%
None/Continuous	0%	5	0%	0%
Other	0%	5	0%	0%
Unknown	0%	5	0%	0%



**Table B-50  
Other Fluorescent Light Control Types (Square Foot)**

Control Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Manual On/Off Switch	94%	7	84%	104%
Dimmer	0%	7	0%	0%
Motion/Occupancy Sensor	0%	7	0%	0%
Photocell	0%	7	0%	0%
Timeclock	0%	7	0%	0%
Photocell/Timeclock	0%	7	0%	0%
Photocell with Dimming	0%	7	0%	0%
EMS	6%	7	-4%	15%
None/Continuous	0%	7	0%	0%
Other	0%	7	0%	0%
Unknown	0%	7	0%	1%

**Table B-51  
Other Light Control Types (Square Foot)**

Control Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Manual On/Off Switch	8%	10	-2%	19%
Dimmer	25%	10	-7%	56%
Motion/Occupancy Sensor	0%	10	0%	0%
Photocell	0%	10	0%	0%
Timeclock	0%	10	0%	0%
Photocell/Timeclock	0%	10	0%	0%
Photocell with Dimming	0%	10	0%	0%
EMS	0%	10	0%	0%
None/Continuous	67%	10	32%	102%
Other	0%	10	0%	0%
Unknown	0%	10	0%	0%



**Table B-52  
Quartz Light Control Types (Square Foot)**

Control Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Manual On/Off Switch	8%	2	-6%	23%
Dimmer	92%	2	77%	106%
Motion/Occupancy Sensor	0%	2	0%	0%
Photozell	0%	2	0%	0%
Timeclock	0%	2	0%	0%
Photozell/Timeclock	0%	2	0%	0%
Photozell with Dimming	0%	2	0%	0%
EMS	0%	2	0%	0%
None/Continuous	0%	2	0%	0%
Other	0%	2	0%	0%
Unknown	0%	2	0%	0%

## B.4. Premise Weighted Results

### B.4.1. Usage

**Table B-53  
Overall Light Usage (Premise)**

Usage	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Area	96%	25	92%	100%
Task	1%	25	0%	1%
Exit	1%	25	0%	2%
Display	3%	25	-1%	6%
Other	0%	25	0%	0%
Unknown	0%	25	0%	0%

**Table B-54  
Incandescent Light Usage (Premise)**

Usage	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Area	94%	11	87%	100%
Task	4%	11	-1%	10%
Exit	0%	11	0%	0%
Display	1%	11	-1%	3%
Other	1%	11	0%	2%
Unknown	0%	11	0%	0%



**Table B-55  
CFL Light Usage (Premise)**

Usage	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Area	96%	15	91%	101%
Task	0%	15	0%	0%
Exit	1%	15	0%	2%
Display	4%	15	-1%	8%
Other	0%	15	0%	0%
Unknown	0%	15	0%	0%

**Table B-56  
HID Light Usage (Premise)**

Usage	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Area	88%	3	69%	106%
Task	0%	3	0%	0%
Exit	0%	3	0%	0%
Display	13%	3	-6%	31%
Other	0%	3	0%	0%
Unknown	0%	3	0%	0%

**Table B-57  
T5 Light Usage (Premise)**

Usage	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Area	100%	11	100%	100%
Task	0%	11	0%	0%
Exit	0%	11	0%	0%
Display	0%	11	0%	0%
Other	0%	11	0%	0%
Unknown	0%	11	0%	0%



**Table B-58  
Standard T8 Light Usage (Premise)**

Usage	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Area	100%	12	100%	100%
Task	0%	12	0%	0%
Exit	0%	12	0%	0%
Display	0%	12	0%	0%
Other	0%	12	0%	0%
Unknown	0%	12	0%	0%

**Table B-59  
HP T8 Light Usage (Premise)**

Usage	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Area	100%	8	100%	100%
Task	0%	8	0%	0%
Exit	0%	8	0%	0%
Display	0%	8	0%	0%
Other	0%	8	0%	0%
Unknown	0%	8	0%	0%

**Table B-60  
Unknown T8 Light Usage (Premise)**

Usage	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Area	98%	5	95%	101%
Task	2%	5	-1%	5%
Exit	0%	5	0%	0%
Display	0%	5	0%	0%
Other	0%	5	0%	0%
Unknown	0%	5	0%	0%



**Table B-61  
T12 Light Usage (Premise)**

Usage	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Area	41%	3	0%	82%
Task	59%	3	18%	100%
Exit	0%	3	0%	0%
Display	0%	3	0%	0%
Other	0%	3	0%	0%
Unknown	0%	3	0%	0%

**Table B-62  
Unknown Fluorescent Tube Light Usage (Premise)**

Usage	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Area	100%	5	100%	100%
Task	0%	5	0%	0%
Exit	0%	5	0%	0%
Display	0%	5	0%	0%
Other	0%	5	0%	0%
Unknown	0%	5	0%	0%

**Table B-63  
Other Fluorescent Light Usage (Premise)**

Usage	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Area	100%	7	100%	100%
Task	0%	7	0%	0%
Exit	0%	7	0%	0%
Display	0%	7	0%	0%
Other	0%	7	0%	0%
Unknown	0%	7	0%	0%





**Table B-64  
Other Light Usage (Premise)**

Usage	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Area	16%	10	0%	33%
Task	2%	10	-1%	5%
Exit	35%	10	6%	63%
Display	47%	10	10%	83%
Other	0%	10	0%	1%
Unknown	0%	10	0%	0%

**Table B-65  
Quartz Light Usage (Premise)**

Usage	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Area	0%	2	0%	0%
Task	0%	2	0%	0%
Exit	0%	2	0%	0%
Display	100%	2	100%	100%
Other	0%	2	0%	0%
Unknown	0%	2	0%	0%

### B.4.2. Ballast Types

**Table B-66  
Overall Light Ballast Types (Premise)**

Ballast Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Standard Magnetic	0%	25	0%	0%
Energy Saving Magnetic	1%	25	0%	2%
Electronic	40%	25	29%	51%
Other	0%	25	0%	0%
No Ballast	58%	25	47%	70%
Unknown	0%	25	0%	0%



**Table B-67  
CFL Light Ballast Types (Premise)**

Ballast Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Standard Magnetic	0%	15	0%	0%
Energy Saving Magnetic	0%	15	0%	0%
Electronic	64%	15	45%	83%
Other	0%	15	0%	0%
No Ballast	36%	15	17%	55%
Unknown	0%	15	0%	0%

**Table B-68  
HID Light Ballast Types (Premise)**

Ballast Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Standard Magnetic	0%	3	0%	0%
Energy Saving Magnetic	63%	3	23%	102%
Electronic	0%	3	0%	0%
Other	0%	3	0%	0%
No Ballast	38%	3	-2%	77%
Unknown	0%	3	0%	0%

**Table B-69  
T5 Light Ballast Types (Premise)**

Ballast Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Standard Magnetic	1%	11	-1%	3%
Energy Saving Magnetic	0%	11	0%	0%
Electronic	67%	11	35%	98%
Other	0%	11	0%	0%
No Ballast	32%	11	0%	64%
Unknown	0%	11	0%	0%



**Table B-70  
Standard T8 Light Ballast Types (Premise)**

Ballast Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Standard Magnetic	0%	12	0%	0%
Energy Saving Magnetic	9%	12	-1%	19%
Electronic	48%	12	24%	72%
Other	0%	12	0%	0%
No Ballast	43%	12	15%	72%
Unknown	0%	12	0%	0%

**Table B-71  
HP T8 Light Ballast Types (Premise)**

Ballast Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Standard Magnetic	0%	8	0%	0%
Energy Saving Magnetic	0%	8	0%	0%
Electronic	100%	8	100%	100%
Other	0%	8	0%	0%
No Ballast	0%	8	0%	0%
Unknown	0%	8	0%	0%

**Table B-72  
Unknown T8 Light Ballast Types (Premise)**

Ballast Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Standard Magnetic	0%	5	0%	0%
Energy Saving Magnetic	0%	5	0%	0%
Electronic	100%	5	100%	100%
Other	0%	5	0%	0%
No Ballast	0%	5	0%	0%
Unknown	0%	5	0%	0%



**Table B-73  
T12 Light Ballast Types (Premise)**

Ballast Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Standard Magnetic	12%	3	-6%	29%
Energy Saving Magnetic	0%	3	0%	0%
Electronic	0%	3	0%	0%
Other	0%	3	0%	0%
No Ballast	88%	3	71%	106%
Unknown	0%	3	0%	0%

**Table B-74  
Unknown Fluorescent Tube Light Ballast Types (Premise)**

Ballast Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Standard Magnetic	0%	5	0%	0%
Energy Saving Magnetic	0%	5	0%	0%
Electronic	97%	5	93%	102%
Other	0%	5	0%	0%
No Ballast	3%	5	-2%	7%
Unknown	0%	5	0%	0%

**Table B-75  
Other Fluorescent Light Ballast Types (Premise)**

Ballast Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Standard Magnetic	0%	7	0%	0%
Energy Saving Magnetic	0%	7	0%	0%
Electronic	4%	7	0%	8%
Other	0%	7	0%	0%
No Ballast	96%	7	92%	100%
Unknown	0%	7	0%	0%



### B.4.3. Control Types

**Table B-76  
Overall Light Control Types (Premise)**

Control Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Manual On/Off Switch	82%	25	70%	95%
Dimmer	4%	25	0%	9%
Motion/Occupancy Sensor	4%	25	1%	8%
Photocell	0%	25	0%	0%
Timeclock	0%	25	0%	0%
Photocell/Timeclock	0%	25	0%	0%
Photocell with Dimming	0%	25	0%	0%
EMS	7%	25	-1%	15%
None/Continuous	2%	25	0%	3%
Other	0%	25	0%	0%
Unknown	0%	25	0%	0%

**Table B-77  
Incandescent Light Control Types (Premise)**

Control Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Manual On/Off Switch	83%	11	62%	104%
Dimmer	16%	11	-5%	37%
Motion/Occupancy Sensor	0%	11	0%	0%
Photocell	0%	11	0%	0%
Timeclock	0%	11	0%	0%
Photocell/Timeclock	0%	11	0%	0%
Photocell with Dimming	0%	11	0%	0%
EMS	0%	11	0%	0%
None/Continuous	0%	11	0%	0%
Other	1%	11	0%	2%
Unknown	0%	11	0%	0%



**Table B-78  
CFL Light Control Types (Premise)**

Control Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Manual On/Off Switch	88%	15	78%	98%
Dimmer	6%	15	-2%	15%
Motion/Occupancy Sensor	2%	15	1%	4%
Photocell	0%	15	0%	0%
Timeclock	0%	15	0%	0%
Photocell/Timeclock	0%	15	0%	0%
Photocell with Dimming	0%	15	0%	0%
EMS	3%	15	-1%	6%
None/Continuous	1%	15	0%	2%
Other	0%	15	0%	0%
Unknown	0%	15	0%	0%

**Table B-79  
HID Light Control Types (Premise)**

Control Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Manual On/Off Switch	38%	3	-2%	77%
Dimmer	0%	3	0%	0%
Motion/Occupancy Sensor	0%	3	0%	0%
Photocell	63%	3	23%	102%
Timeclock	0%	3	0%	0%
Photocell/Timeclock	0%	3	0%	0%
Photocell with Dimming	0%	3	0%	0%
EMS	0%	3	0%	0%
None/Continuous	0%	3	0%	0%
Other	0%	3	0%	0%
Unknown	0%	3	0%	0%



**Table B-80  
T5 Light Control Types (Premise)**

Control Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Manual On/Off Switch	52%	11	27%	77%
Dimmer	0%	11	0%	0%
Motion/Occupancy Sensor	16%	11	3%	29%
Photocell	0%	11	0%	0%
Timeclock	0%	11	0%	0%
Photocell/Timeclock	0%	11	0%	0%
Photocell with Dimming	0%	11	0%	0%
EMS	32%	11	0%	64%
None/Continuous	0%	11	0%	0%
Other	0%	11	0%	0%
Unknown	0%	11	0%	0%

**Table B-81  
Standard T8 Light Control Types (Premise)**

Control Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Manual On/Off Switch	65%	12	35%	95%
Dimmer	0%	12	0%	0%
Motion/Occupancy Sensor	2%	12	-1%	4%
Photocell	0%	12	0%	0%
Timeclock	0%	12	0%	0%
Photocell/Timeclock	0%	12	0%	0%
Photocell with Dimming	0%	12	0%	0%
EMS	33%	12	3%	63%
None/Continuous	0%	12	0%	0%
Other	0%	12	0%	0%
Unknown	0%	12	0%	0%



**Table B-82  
HP T8 Light Control Types (Premise)**

Control Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Manual On/Off Switch	50%	8	16%	85%
Dimmer	0%	8	0%	0%
Motion/Occupancy Sensor	43%	8	14%	71%
Photocell	0%	8	0%	0%
Timeclock	0%	8	0%	0%
Photocell/Timeclock	0%	8	0%	0%
Photocell with Dimming	0%	8	0%	0%
EMS	0%	8	0%	0%
None/Continuous	7%	8	1%	12%
Other	0%	8	0%	0%
Unknown	0%	8	0%	0%

**Table B-83  
Unknown T8 Light Control Types (Premise)**

Control Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Manual On/Off Switch	84%	5	75%	93%
Dimmer	0%	5	0%	0%
Motion/Occupancy Sensor	16%	5	7%	25%
Photocell	0%	5	0%	0%
Timeclock	0%	5	0%	0%
Photocell/Timeclock	0%	5	0%	0%
Photocell with Dimming	0%	5	0%	0%
EMS	0%	5	0%	0%
None/Continuous	0%	5	0%	0%
Other	0%	5	0%	0%
Unknown	0%	5	0%	0%





**Table B-84  
T12 Light Control Types (Premise)**

Control Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Manual On/Off Switch	100%	3	100%	100%
Dimmer	0%	3	0%	0%
Motion/Occupancy Sensor	0%	3	0%	0%
Photocell	0%	3	0%	0%
Timeclock	0%	3	0%	0%
Photocell/Timeclock	0%	3	0%	0%
Photocell with Dimming	0%	3	0%	0%
EMS	0%	3	0%	0%
None/Continuous	0%	3	0%	0%
Other	0%	3	0%	0%
Unknown	0%	3	0%	0%

**Table B-85  
Unknown Fluorescent Tube Light Control Types (Premise)**

Control Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Manual On/Off Switch	99%	5	98%	101%
Dimmer	1%	5	-1%	2%
Motion/Occupancy Sensor	0%	5	0%	0%
Photocell	0%	5	0%	0%
Timeclock	0%	5	0%	0%
Photocell/Timeclock	0%	5	0%	0%
Photocell with Dimming	0%	5	0%	0%
EMS	0%	5	0%	0%
None/Continuous	0%	5	0%	0%
Other	0%	5	0%	0%
Unknown	0%	5	0%	0%



**Table B-86  
Other Fluorescent Light Control Types (Premise)**

Control Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Manual On/Off Switch	96%	7	89%	103%
Dimmer	0%	7	0%	0%
Motion/Occupancy Sensor	0%	7	0%	0%
Photocell	0%	7	0%	0%
Timeclock	0%	7	0%	0%
Photocell/Timeclock	0%	7	0%	0%
Photocell with Dimming	0%	7	0%	0%
EMS	4%	7	-3%	10%
None/Continuous	0%	7	0%	0%
Other	0%	7	0%	0%
Unknown	1%	7	0%	1%

**Table B-87  
Other Light Control Types (Premise)**

Control Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Manual On/Off Switch	19%	10	1%	37%
Dimmer	47%	10	10%	83%
Motion/Occupancy Sensor	0%	10	0%	0%
Photocell	0%	10	0%	0%
Timeclock	0%	10	0%	0%
Photocell/Timeclock	0%	10	0%	0%
Photocell with Dimming	0%	10	0%	0%
EMS	0%	10	0%	0%
None/Continuous	35%	10	6%	63%
Other	0%	10	0%	0%
Unknown	0%	10	0%	0%



**Table B-88  
Quartz Light Control Types (Premise)**

Control Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Manual On/Off Switch	12%	2	-8%	31%
Dimmer	88%	2	69%	108%
Motion/Occupancy Sensor	0%	2	0%	0%
Photocell	0%	2	0%	0%
Timeclock	0%	2	0%	0%
Photocell/Timeclock	0%	2	0%	0%
Photocell with Dimming	0%	2	0%	0%
EMS	0%	2	0%	0%
None/Continuous	0%	2	0%	0%
Other	0%	2	0%	0%
Unknown	0%	2	0%	0%

## B.5. Energy Efficient Opportunities

### B.5.1. Square Foot Weighted Results

**Table B-89  
Overall EE Opportunities (Square Foot)**

Energy Efficiency Opportunity	Minimum Percent of Premises with Opportunity	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Switch to CFL	49%	26	29%	69%
Switch to Standard T8	4%	26	0%	7%
Switch to High Performance T8	38%	26	19%	57%
Switch to T5	8%	26	0%	15%
Switch to Pulse Start Metal Halide	1%	26	0%	1%
Replace Ballasts for Automatic Daylighting	27%	26	4%	49%
Occupancy Sensors	77%	26	66%	89%
Dimmers	15%	26	4%	26%
Other Controls	4%	26	0%	7%
Other	2%	26	-1%	4%



**Table B-90  
Incandescent EE Opportunities (Square Foot)**

Energy Efficiency Opportunity	Minimum Percent of Premises with Opportunity	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Switch to CFL	86%	12	74%	98%
Switch to Standard T8	0%	12	0%	0%
Switch to High Performance T8	0%	12	0%	0%
Switch to T5	0%	12	0%	0%
Switch to Pulse Start Metal Halide	1%	12	0%	2%
Replace Ballasts for Automatic Daylighting	0%	12	0%	0%
Occupancy Sensors	10%	12	-3%	23%
Dimmers	15%	12	0%	30%
Other Controls	3%	12	-1%	8%
Other	0%	12	0%	0%

**Table B-91  
CFL EE Opportunities (Square Foot)**

Energy Efficiency Opportunity	Minimum Percent of Premises with Opportunity	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Switch to CFL	0%	15	0%	0%
Switch to Standard T8	0%	15	0%	0%
Switch to High Performance T8	0%	15	0%	0%
Switch to T5	0%	15	0%	0%
Switch to Pulse Start Metal Halide	0%	15	0%	0%
Replace Ballasts for Automatic Daylighting	0%	15	0%	0%
Occupancy Sensors	42%	15	17%	67%
Dimmers	0%	15	0%	0%
Other Controls	2%	15	-1%	6%
Other	0%	15	0%	0%



**Table B-92  
HID EE Opportunities (Square Foot)**

Energy Efficiency Opportunity	Minimum Percent of Premises with Opportunity	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Switch to CFL	0%	3	0%	0%
Switch to Standard T8	0%	3	0%	0%
Switch to High Performance T8	0%	3	0%	0%
Switch to T5	60%	3	20%	100%
Switch to Pulse Start Metal Halide	0%	3	0%	0%
Replace Ballasts for Automatic Daylighting	0%	3	0%	0%
Occupancy Sensors	0%	3	0%	0%
Dimmers	0%	3	0%	0%
Other Controls	0%	3	0%	0%
Other	0%	3	0%	0%

**Table B-93  
T5 EE Opportunities (Square Foot)**

Energy Efficiency Opportunity	Minimum Percent of Premises with Opportunity	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Switch to CFL	0%	11	0%	0%
Switch to Standard T8	0%	11	0%	0%
Switch to High Performance T8	0%	11	0%	0%
Switch to T5	0%	11	0%	0%
Switch to Pulse Start Metal Halide	0%	11	0%	0%
Replace Ballasts for Automatic Daylighting	0%	11	0%	0%
Occupancy Sensors	56%	11	32%	80%
Dimmers	15%	11	-3%	34%
Other Controls	0%	11	0%	0%
Other	0%	11	0%	0%



**Table B-94  
St T8 EE Opportunities (Square Foot)**

Energy Efficiency Opportunity	Minimum Percent of Premises with Opportunity	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Switch to CFL	0%	12	0%	0%
Switch to Standard T8	0%	12	0%	0%
Switch to High Performance T8	51%	12	22%	80%
Switch to T5	4%	12	-2%	9%
Switch to Pulse Start Metal Halide	0%	12	0%	0%
Replace Ballasts for Automatic Daylighting	9%	12	0%	18%
Occupancy Sensors	36%	12	9%	62%
Dimmers	4%	12	0%	9%
Other Controls	0%	12	0%	0%
Other	3%	12	-1%	6%

**Table B-95  
HP T8 EE Opportunities (Square Foot)**

Energy Efficiency Opportunity	Minimum Percent of Premises with Opportunity	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Switch to CFL	0%	9	0%	0%
Switch to Standard T8	0%	9	0%	0%
Switch to High Performance T8	0%	9	0%	0%
Switch to T5	0%	9	0%	0%
Switch to Pulse Start Metal Halide	0%	9	0%	0%
Replace Ballasts for Automatic Daylighting	48%	9	12%	84%
Occupancy Sensors	83%	9	65%	101%
Dimmers	0%	9	0%	0%
Other Controls	0%	9	0%	0%
Other	0%	9	0%	0%



**Table B-96  
Unknown T8 EE Opportunities (Square Foot)**

Energy Efficiency Opportunity	Minimum Percent of Premises with Opportunity	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Switch to CFL	0%	5	0%	0%
Switch to Standard T8	0%	5	0%	0%
Switch to High Performance T8	0%	5	0%	0%
Switch to T5	0%	5	0%	0%
Switch to Pulse Start Metal Halide	0%	5	0%	0%
Replace Ballasts for Automatic Daylighting	0%	5	0%	0%
Occupancy Sensors	11%	5	-4%	26%
Dimmers	0%	5	0%	0%
Other Controls	0%	5	0%	0%
Other	0%	5	0%	0%

**Table B-97  
T12 EE Opportunities (Square Foot)**

Energy Efficiency Opportunity	Minimum Percent of Premises with Opportunity	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Switch to CFL	0%	3	0%	0%
Switch to Standard T8	83%	3	58%	107%
Switch to High Performance T8	57%	3	16%	97%
Switch to T5	57%	3	16%	97%
Switch to Pulse Start Metal Halide	0%	3	0%	0%
Replace Ballasts for Automatic Daylighting	0%	3	0%	0%
Occupancy Sensors	17%	3	-7%	42%
Dimmers	0%	3	0%	0%
Other Controls	0%	3	0%	0%
Other	0%	3	0%	0%



**Table B-98  
Unknown Fluorescent Tube EE Opportunities (Square Foot)**

Energy Efficiency Opportunity	Minimum Percent of Premises with Opportunity	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Switch to CFL	0%	5	0%	0%
Switch to Standard T8	0%	5	0%	0%
Switch to High Performance T8	38%	5	0%	75%
Switch to T5	0%	5	0%	0%
Switch to Pulse Start Metal Halide	0%	5	0%	0%
Replace Ballasts for Automatic Daylighting	0%	5	0%	0%
Occupancy Sensors	81%	5	57%	105%
Dimmers	0%	5	0%	0%
Other Controls	0%	5	0%	0%
Other	0%	5	0%	0%

**Table B-99  
Other Fluorescent EE Opportunities (Square Foot)**

Energy Efficiency Opportunity	Minimum Percent of Premises with Opportunity	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Switch to CFL	0%	7	0%	0%
Switch to Standard T8	0%	7	0%	0%
Switch to High Performance T8	0%	7	0%	0%
Switch to T5	0%	7	0%	0%
Switch to Pulse Start Metal Halide	0%	7	0%	0%
Replace Ballasts for Automatic Daylighting	0%	7	0%	0%
Occupancy Sensors	22%	7	-4%	47%
Dimmers	13%	7	-1%	27%
Other Controls	0%	7	0%	0%
Other	0%	7	0%	0%





**Table B-100  
Other Light Type EE Opportunities (Square Foot)**

Energy Efficiency Opportunity	Minimum Percent of Premises with Opportunity	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Switch to CFL	0%	10	0%	0%
Switch to Standard T8	0%	10	0%	0%
Switch to High Performance T8	0%	10	0%	0%
Switch to T5	0%	10	0%	0%
Switch to Pulse Start Metal Halide	0%	10	0%	0%
Replace Ballasts for Automatic Daylighting	0%	10	0%	0%
Occupancy Sensors	2%	10	-1%	4%
Dimmers	0%	10	0%	0%
Other Controls	4%	10	-2%	11%
Other	0%	10	0%	0%

**Table B-101  
Quartz EE Opportunities (Square Foot)**

Energy Efficiency Opportunity	Minimum Percent of Premises with Opportunity	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Switch to CFL	0%	2	0%	0%
Switch to Standard T8	0%	2	0%	0%
Switch to High Performance T8	0%	2	0%	0%
Switch to T5	0%	2	0%	0%
Switch to Pulse Start Metal Halide	0%	2	0%	0%
Replace Ballasts for Automatic Daylighting	0%	2	0%	0%
Occupancy Sensors	0%	2	0%	0%
Dimmers	0%	2	0%	0%
Other Controls	0%	2	0%	0%
Other	0%	2	0%	0%



## B.5.2. Premise Weighted Results

**Table B-102  
Overall EE Opportunities (Premise)**

Energy Efficiency Opportunity	Minimum Percent of Premises with Opportunity	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Switch to CFL	31%	26	19%	43%
Switch to Standard T8	8%	26	1%	15%
Switch to High Performance T8	31%	26	19%	43%
Switch to T5	8%	26	1%	15%
Switch to Pulse Start Metal Halide	4%	26	-1%	9%
Replace Ballasts for Automatic Daylighting	12%	26	3%	20%
Occupancy Sensors	62%	26	49%	74%
Dimmers	19%	26	9%	30%
Other Controls	8%	26	1%	15%
Other	4%	26	-1%	9%

**Table B-103  
Incandescent EE Opportunities (Premise)**

Energy Efficiency Opportunity	Minimum Percent of Premises with Opportunity	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Switch to CFL	67%	12	48%	85%
Switch to Standard T8	0%	12	0%	0%
Switch to High Performance T8	0%	12	0%	0%
Switch to T5	0%	12	0%	0%
Switch to Pulse Start Metal Halide	8%	12	-2%	19%
Replace Ballasts for Automatic Daylighting	0%	12	0%	0%
Occupancy Sensors	8%	12	-2%	19%
Dimmers	25%	12	8%	42%
Other Controls	8%	12	-2%	19%
Other	0%	12	0%	0%



**Table B-104  
CFL EE Opportunities (Premise)**

Energy Efficiency Opportunity	Minimum Percent of Premises with Opportunity	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Switch to CFL	0%	15	0%	0%
Switch to Standard T8	0%	15	0%	0%
Switch to High Performance T8	0%	15	0%	0%
Switch to T5	0%	15	0%	0%
Switch to Pulse Start Metal Halide	0%	15	0%	0%
Replace Ballasts for Automatic Daylighting	0%	15	0%	0%
Occupancy Sensors	47%	15	29%	64%
Dimmers	0%	15	0%	0%
Other Controls	7%	15	-2%	15%
Other	0%	15	0%	0%

**Table B-105  
HID EE Opportunities (Premise)**

Energy Efficiency Opportunity	Minimum Percent of Premises with Opportunity	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Switch to CFL	0%	3	0%	0%
Switch to Standard T8	0%	3	0%	0%
Switch to High Performance T8	0%	3	0%	0%
Switch to T5	33%	3	-3%	70%
Switch to Pulse Start Metal Halide	0%	3	0%	0%
Replace Ballasts for Automatic Daylighting	0%	3	0%	0%
Occupancy Sensors	0%	3	0%	0%
Dimmers	0%	3	0%	0%
Other Controls	0%	3	0%	0%
Other	0%	3	0%	0%



**Table B-106  
T5 EE Opportunities (Premise)**

Energy Efficiency Opportunity	Minimum Percent of Premises with Opportunity	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Switch to CFL	0%	11	0%	0%
Switch to Standard T8	0%	11	0%	0%
Switch to High Performance T8	0%	11	0%	0%
Switch to T5	0%	11	0%	0%
Switch to Pulse Start Metal Halide	0%	11	0%	0%
Replace Ballasts for Automatic Daylighting	0%	11	0%	0%
Occupancy Sensors	36%	11	17%	56%
Dimmers	9%	11	-3%	21%
Other Controls	0%	11	0%	0%
Other	0%	11	0%	0%

**Table B-107  
St T8 EE Opportunities (Premise)**

Energy Efficiency Opportunity	Minimum Percent of Premises with Opportunity	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Switch to CFL	0%	12	0%	0%
Switch to Standard T8	0%	12	0%	0%
Switch to High Performance T8	58%	12	39%	77%
Switch to T5	8%	12	-2%	19%
Switch to Pulse Start Metal Halide	0%	12	0%	0%
Replace Ballasts for Automatic Daylighting	17%	12	2%	31%
Occupancy Sensors	42%	12	23%	61%
Dimmers	17%	12	2%	31%
Other Controls	0%	12	0%	0%
Other	8%	12	-2%	19%



**Table B-108  
HP T8 EE Opportunities (Premise)**

Energy Efficiency Opportunity	Minimum Percent of Premises with Opportunity	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Switch to CFL	0%	9	0%	0%
Switch to Standard T8	0%	9	0%	0%
Switch to High Performance T8	0%	9	0%	0%
Switch to T5	0%	9	0%	0%
Switch to Pulse Start Metal Halide	0%	9	0%	0%
Replace Ballasts for Automatic Daylighting	11%	9	-3%	25%
Occupancy Sensors	78%	9	59%	96%
Dimmers	0%	9	0%	0%
Other Controls	0%	9	0%	0%
Other	0%	9	0%	0%

**Table B-109  
Unknown T8 EE Opportunities (Premise)**

Energy Efficiency Opportunity	Minimum Percent of Premises with Opportunity	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Switch to CFL	0%	5	0%	0%
Switch to Standard T8	0%	5	0%	0%
Switch to High Performance T8	0%	5	0%	0%
Switch to T5	0%	5	0%	0%
Switch to Pulse Start Metal Halide	0%	5	0%	0%
Replace Ballasts for Automatic Daylighting	0%	5	0%	0%
Occupancy Sensors	20%	5	-4%	44%
Dimmers	0%	5	0%	0%
Other Controls	0%	5	0%	0%
Other	0%	5	0%	0%



**Table B-110  
T12 EE Opportunities (Premise)**

Energy Efficiency Opportunity	Minimum Percent of Premises with Opportunity	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Switch to CFL	0%	3	0%	0%
Switch to Standard T8	67%	3	30%	103%
Switch to High Performance T8	33%	3	-3%	70%
Switch to T5	33%	3	-3%	70%
Switch to Pulse Start Metal Halide	0%	3	0%	0%
Replace Ballasts for Automatic Daylighting	0%	3	0%	0%
Occupancy Sensors	33%	3	-3%	70%
Dimmers	0%	3	0%	0%
Other Controls	0%	3	0%	0%
Other	0%	3	0%	0%

**Table B-111  
Unknown Fluorescent Tube EE Opportunities (Premise)**

Energy Efficiency Opportunity	Minimum Percent of Premises with Opportunity	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Switch to CFL	0%	5	0%	0%
Switch to Standard T8	0%	5	0%	0%
Switch to High Performance T8	20%	5	-4%	44%
Switch to T5	0%	5	0%	0%
Switch to Pulse Start Metal Halide	0%	5	0%	0%
Replace Ballasts for Automatic Daylighting	0%	5	0%	0%
Occupancy Sensors	80%	5	56%	104%
Dimmers	0%	5	0%	0%
Other Controls	0%	5	0%	0%
Other	0%	5	0%	0%



**Table B-112  
Other Fluorescent EE Opportunities (Premise)**

Energy Efficiency Opportunity	Minimum Percent of Premises with Opportunity	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Switch to CFL	0%	7	0%	0%
Switch to Standard T8	0%	7	0%	0%
Switch to High Performance T8	0%	7	0%	0%
Switch to T5	0%	7	0%	0%
Switch to Pulse Start Metal Halide	0%	7	0%	0%
Replace Ballasts for Automatic Daylighting	0%	7	0%	0%
Occupancy Sensors	14%	7	-3%	32%
Dimmers	29%	7	6%	51%
Other Controls	0%	7	0%	0%
Other	0%	7	0%	0%

**Table B-113  
Other Light Type EE Opportunities (Premise)**

Energy Efficiency Opportunity	Minimum Percent of Premises with Opportunity	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Switch to CFL	0%	10	0%	0%
Switch to Standard T8	0%	10	0%	0%
Switch to High Performance T8	0%	10	0%	0%
Switch to T5	0%	10	0%	0%
Switch to Pulse Start Metal Halide	0%	10	0%	0%
Replace Ballasts for Automatic Daylighting	0%	10	0%	0%
Occupancy Sensors	10%	10	-3%	23%
Dimmers	0%	10	0%	0%
Other Controls	10%	10	-3%	23%
Other	0%	10	0%	0%



**Table B-114  
Quartz EE Opportunities (Premise)**

<b>Energy Efficiency Opportunity</b>	<b>Minimum Percent of Premises with Opportunity</b>	<b># of Cases</b>	<b>Lower 80% Confidence Limit</b>	<b>Upper 80% Confidence Limit</b>
Switch to CFL	0%	2	0%	0%
Switch to Standard T8	0%	2	0%	0%
Switch to High Performance T8	0%	2	0%	0%
Switch to T5	0%	2	0%	0%
Switch to Pulse Start Metal Halide	0%	2	0%	0%
Replace Ballasts for Automatic Daylighting	0%	2	0%	0%
Occupancy Sensors	0%	2	0%	0%
Dimmers	0%	2	0%	0%
Other Controls	0%	2	0%	0%
Other	0%	2	0%	0%





## Appendix C: Outdoor Lighting

### C.1. Types of Outdoor Lighting

**Table C-1  
Outdoor Lamp Types (Wattage)**

Percent of Total Watts by Lamp Type		# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Watts / Premise	1247	21	993	1501
Facilities Where Outdoor Lighting Wattage is Known	78%	27	67%	88%
HID	78%	21	68%	88%
Fluorescent	3%	21	2%	5%
Incandescent / Quartz	19%	21	9%	29%
LED / Exit Sign	0%	21	0%	0%

**Table C-2  
Specific HID Lamps as a Percent of Overall Outdoor Lighting(Wattage)**

Percent of Total Watts by Lamp Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Mercury Vapor	0%	21	0%	0%
Standard Metal Halide	56%	21	43%	70%
PS Metal Halide	17%	21	3%	31%
HP Sodium Vapor	4%	21	0%	8%
LP Sodium Vapor	0%	21	0%	0%

**Table C-3  
Specific HID Lamps as a Percent of Outdoor HID Lighting (Wattage)**

Percent of HID Watts by Lamp Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Mercury Vapor	0%	17	0%	0%
Standard Metal Halide	73%	17	56%	89%
PS Metal Halide	22%	17	5%	39%
HP Sodium Vapor	5%	17	0%	11%
LP Sodium Vapor	0%	17	0%	0%



## C.2. Usage

**Table C-4  
Outdoor Lighting Usage (Wattage)**

Percent of Total Watts per Area	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Parking Lot	58%	21	46%	70%
Parking Garage	1%	21	0%	2%
Advertising	1%	21	0%	2%
Building Facade	26%	21	15%	37%
Walkway	14%	21	5%	23%

**Table C-5  
Parking Lot Lamps (Wattage)**

Lamp Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
HID	98%	14	97%	100%
Fluorescent	2%	14	0%	3%
Incandescent / Quartz	0%	14	0%	0%
LED / Exit Sign	0%	14	0%	0%

**Table C-6  
Advertising Lamps (Wattage)**

Lamp Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
HID	0%	3	0%	0%
Fluorescent	30%	3	-6%	65%
Incandescent / Quartz	70%	3	35%	106%
LED / Exit Sign	0%	3	0%	0%

**Table C-7  
Building Facade Lamps (Wattage)**

Lamp Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
HID	71%	13	49%	94%
Fluorescent	4%	13	0%	8%
Incandescent / Quartz	25%	13	3%	47%
LED / Exit Sign	0%	13	0%	0%



**Table C-8  
Walkway Lamps (Wattage)**

Lamp Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
HID	7%	6	-1%	15%
Fluorescent	8%	6	1%	15%
Incandescent / Quartz	84%	6	75%	94%
LED / Exit Sign	0%	6	0%	0%

### C.3. Control Types

**Table C-9  
Overall Outdoor Lighting Control Types (Wattage)**

Control Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Manual On/Off Switch	17%	21	4%	30%
Dimmer	0%	21	0%	0%
Motion/Occupancy Sensor	1%	21	0%	3%
Photocell	34%	21	21%	46%
Timeclock	12%	21	4%	20%
Photocell/Timeclock	13%	21	4%	21%
Photocell with Dimming	0%	21	0%	0%
Energy Management System	7%	21	-2%	17%
None/Continuous	0%	21	0%	0%
Other	0%	21	0%	0%

**Table C-10  
Outdoor HID Control Types (Wattage)**

Control Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Manual On/Off Switch	15%	17	0%	29%
Dimmer	0%	17	0%	0%
Motion/Occupancy Sensor	0%	17	0%	0%
Photocell	37%	17	22%	52%
Timeclock	4%	17	0%	9%
Photocell/Timeclock	16%	17	6%	26%
Photocell with Dimming	0%	17	0%	0%
Energy Management System	9%	17	-3%	21%
None/Continuous	0%	17	0%	0%
Other	0%	17	0%	0%



**Table C-11  
Outdoor Fluorescent Control Types (Wattage)**

Control Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Manual On/Off Switch	52%	9	26%	79%
Dimmer	0%	9	0%	0%
Motion/Occupancy Sensor	0%	9	0%	0%
Photocell	7%	9	-3%	17%
Timeclock	19%	9	1%	36%
Photocell/Timeclock	13%	9	-3%	29%
Photocell with Dimming	0%	9	0%	0%
Energy Management System	0%	9	0%	0%
None/Continuous	0%	9	0%	0%
Other	0%	9	0%	0%

**Table C-12  
Outdoor Incandescent / Quartz Control Types (Wattage)**

Control Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Manual On/Off Switch	21%	6	-4%	45%
Dimmer	0%	6	0%	0%
Motion/Occupancy Sensor	6%	6	-2%	15%
Photocell	24%	6	-3%	52%
Timeclock	40%	6	10%	70%
Photocell/Timeclock	0%	6	0%	0%
Photocell with Dimming	0%	6	0%	0%
Energy Management System	0%	6	0%	0%
None/Continuous	0%	6	0%	0%
Other	0%	6	0%	0%

## C.4. Ballast Types

**Table C-13  
Overall Outdoor Lighting Ballast Types (Wattage)**

Ballast Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Standard Magnetic	8%	21	1%	15%
Energy Saving Magnetic	12%	21	1%	24%
Electronic	1%	21	0%	1%
Other	0%	21	0%	0%
No Ballast	73%	21	60%	85%
Unknown	6%	21	1%	12%



**Table C-14  
Outdoor HID Ballast Types (Wattage)**

Ballast Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Standard Magnetic	11%	17	2%	19%
Energy Saving Magnetic	16%	17	2%	30%
Electronic	0%	17	0%	0%
Other	0%	17	0%	0%
No Ballast	66%	17	50%	82%
Unknown	8%	17	0%	15%

**Table C-15  
Outdoor Fluorescent Ballast Types (Wattage)**

Ballast Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Standard Magnetic	0%	9	0%	0%
Energy Saving Magnetic	0%	9	0%	0%
Electronic	15%	9	-1%	32%
Other	0%	9	0%	0%
No Ballast	68%	9	46%	90%
Unknown	17%	9	1%	32%

**Table C-16  
Outdoor Standard Metal Halide Ballast Types (Wattage)**

Ballast Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Standard Magnetic	7%	14	-2%	17%
Energy Saving Magnetic	6%	14	-2%	14%
Electronic	0%	14	0%	0%
Other	0%	14	0%	0%
No Ballast	76%	14	61%	92%
Unknown	10%	14	0%	20%



**Table C-17  
Outdoor High Pressure Sodium Ballast Types (Wattage)**

Ballast Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Standard Magnetic	100%	2	100%	100%
Energy Saving Magnetic	0%	2	0%	0%
Electronic	0%	2	0%	0%
Other	0%	2	0%	0%
No Ballast	0%	2	0%	0%
Unknown	0%	2	0%	0%

## C.5. Energy Efficiency Opportunities

### C.5.1. Premise Weighted

**Table C-18  
Overall Outdoor Lighting EE Ops (Premise)**

Energy Efficiency Opportunity	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Switch to CFL	17%	24	6%	27%
Switch to Pulse-Start Metal Halide	17%	24	6%	27%
Switch to T5	0%	24	0%	0%
Astronomical Time Clock	13%	24	3%	22%
Light Sensing Controls	4%	24	-1%	10%
Other Controls	4%	24	-1%	10%
Other	0%	24	0%	0%

### C.5.2. Wattage Weighted

**Table C-19  
Overall Outdoor Lighting EE Ops (Wattage)**

Energy Efficiency Opportunity	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Switch to CFL	8%	21	1%	14%
Switch to Pulse-Start Metal Halide	10%	21	2%	17%
Switch to T5	0%	21	0%	0%
Astronomical Time Clock	8%	21	1%	15%
Light Sensing Controls	4%	21	-1%	10%
Other Controls	0%	21	0%	1%
Other	0%	21	0%	0%



**Table C-20  
HID Outdoor Lighting EE Ops (Wattage)**

Energy Efficiency Opportunity	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Switch to CFL	0%	17	0%	0%
Switch to Pulse-Start Metal Halide	12%	17	3%	22%
Switch to T5	0%	17	0%	0%
Astronomical Time Clock	4%	17	0%	7%
Light Sensing Controls	0%	17	0%	0%
Other Controls	0%	17	0%	0%
Other	0%	17	0%	0%

**Table C-21  
Fluorescent Outdoor Lighting EE Ops (Wattage)**

Energy Efficiency Opportunity	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Switch to CFL	0%	9	0%	0%
Switch to Pulse-Start Metal Halide	0%	9	0%	0%
Switch to T5	0%	9	0%	0%
Astronomical Time Clock	40%	9	11%	68%
Light Sensing Controls	9%	9	-3%	22%
Other Controls	7%	9	-3%	17%
Other	0%	9	0%	0%

**Table C-22  
Incandescent / Quartz Outdoor Lighting EE Ops (Wattage)**

Energy Efficiency Opportunity	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Switch to CFL	40%	6	12%	68%
Switch to Pulse-Start Metal Halide	0%	6	0%	0%
Switch to T5	0%	6	0%	0%
Astronomical Time Clock	21%	6	-4%	45%
Light Sensing Controls	21%	6	-4%	45%
Other Controls	0%	6	0%	0%
Other	0%	6	0%	0%



**Table C-23  
Standard Metal Halide Outdoor Lighting EE Ops (Wattage)**

Energy Efficiency Opportunity	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Switch to CFL	0%	14	0%	0%
Switch to Pulse-Start Metal Halide	17%	14	4%	30%
Switch to T5	0%	14	0%	0%
Astronomical Time Clock	5%	14	0%	10%
Light Sensing Controls	0%	14	0%	0%
Other Controls	0%	14	0%	0%
Other	0%	14	0%	0%

**Table C-24  
High Pressure Sodium Outdoor Lighting EE Ops (Wattage)**

Energy Efficiency Opportunity	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Switch to CFL	0%	2	0%	0%
Switch to Pulse-Start Metal Halide	0%	2	0%	0%
Switch to T5	0%	2	0%	0%
Astronomical Time Clock	0%	2	0%	0%
Light Sensing Controls	0%	2	0%	0%
Other Controls	0%	2	0%	0%
Other	0%	2	0%	0%





## Appendix D: Cooling

**Table D-1**  
**Percent of Floorspace with Cooling**

Conditioned Type	Percent of Floorspace	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Cooled (Overall Floorspace)	48.1%	27	36.7%	59.5%
Cooled (Conditioned Floorspace)	50.4%	27	39.3%	61.4%

**Table D-2**  
**Percent of Premises with Cooling**

Conditioned Type	Percent of Premises	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Cooled (Overall Premises)	85.2%	27	76.0%	94.3%
Cooled (Conditioned Premises)	88.5%	27	80.1%	96.9%

### D.1. Cooling Types by Tonnage

**Table D-3**  
**Percent of Known Tons by Cooling Type (Premise)**

Cooling Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Packaged HVAC	13%	19	4%	22%
Split System HVAC	36%	19	15%	57%
Chiller	39%	19	10%	68%
Window	0%	19	0%	0%
Heat Pump	12%	19	2%	22%
Miscellaneous Cooling	0%	19	0%	0%
Percent of Units with Unknown Tonnage	13%	19	2%	25%



## D.2. Conditioned Square Foot Weighted Results

### D.2.1. Equipment Types

**Table D-4  
Percent of Facilities with Cooling of Type (Conditioned Square Foot)**

	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
None	9%	26	1%	17%
Packaged HVAC	48%	26	29%	67%
Split System HVAC	62%	26	46%	79%
Chiller	12%	26	1%	24%
Window	0%	26	0%	0%
Heat Pump	26%	26	8%	44%
Miscellaneous Cooling	0%	26	0%	0%

**Table D-5  
Percent of Units with Cooling of Type (Conditioned Square Foot)**

Cooling Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Packaged HVAC	17%	22	9%	25%
Split System HVAC	36%	22	15%	56%
Chiller	4%	22	0%	8%
Window	0%	22	0%	0%
Heat Pump	43%	22	18%	69%
Miscellaneous Cooling	0%	22	0%	0%

### D.2.2. Energy Efficiency Opportunities

**Table D-6  
Overall Cooling EE Ops (Premise)**

Energy Efficiency Opportunity	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Economizer	38%	21	24%	52%
Upgrade to NEMA Efficiency Motors	22%	9	4%	41%
ECM	38%	8	15%	60%
Automatic Setback Thermostat	23%	22	11%	35%
Other HVAC Controls	15%	20	4%	26%
Refrigerant Charge	0%	21	0%	0%
Other O&M	0%	21	0%	0%
Other EE Op	5%	22	-1%	10%



**Table D-7  
Packaged HVAC EE Ops (Premise)**

Energy Efficiency Opportunity	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Economizer	25%	8	4%	46%
Upgrade to NEMA Efficiency Motors	25%	8	4%	46%
ECM	38%	8	15%	60%
Automatic Setback Thermostat	25%	8	4%	46%
Other HVAC Controls	25%	8	4%	46%
Refrigerant Charge	0%	8	0%	0%
Other O&M	0%	8	0%	0%
Other EE Op	13%	8	-3%	28%

**Table D-8  
Split System HVAC EE Ops (Premise)**

Energy Efficiency Opportunity	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Economizer	46%	13	28%	65%
Automatic Setback Thermostat	23%	13	7%	39%
Other HVAC Controls	8%	13	-2%	18%
Refrigerant Charge	0%	13	0%	0%
Other O&M	0%	13	0%	0%
Other EE Op	0%	13	0%	0%

**Table D-9  
Heat Pump EE Ops (Premise)**

Energy Efficiency Opportunity	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Economizer	50%	2	3%	97%
Upgrade to NEMA Efficiency Motors	100%	1	100%	100%
ECM	100%	1	100%	100%
Automatic Setback Thermostat	20%	5	-4%	44%
Other HVAC Controls	50%	2	3%	97%
Refrigerant Charge	0%	2	0%	0%
Other O&M	0%	2	0%	0%
Other EE Op	0%	5	0%	0%



### D.2.3. Equipment Details

**Table D-10  
Overall Cooling Characteristics (Conditioned Square Foot)**

Detail	Percent or Quantity	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Units Per Facility	13.0	22	8.60	17.49
Efficiency of Units (EER)	11.1	9	9.96	12.17
Percent of Units Missing Efficiency	10%	9	3%	17%
Unit Size (tons)	3.2	19	1.63	4.81
Percent of Units Missing Size	11%	19	1%	20%
Tons per Premise	39.0	19	23.66	54.35

**Table D-11  
Packaged HVAC Cooling Characteristics (Conditioned Square Foot)**

Detail	Percent or Quantity	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Units Per Facility	4.2	8	2.54	5.88
Efficiency of Units (EER)	11.7	2	11.54	11.94
Percent of Units Missing Efficiency	0%	2	0%	0%
Unit Size (tons)	4.3	5	2.75	5.78
Percent of Units Missing Size	3%	5	-1%	7%
Tons per Premise	14.5	5	9.72	19.31

**Table D-12  
Split System HVAC Cooling Characteristics (Conditioned Square Foot)**

Detail	Percent or Quantity	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Units Per Facility	6.8	13	3.58	9.93
Efficiency of Units (EER)	12.7	5	11.63	13.71
Percent of Units Missing Efficiency	2%	5	-1%	4%
Unit Size (tons)	3.2	12	2.80	3.52
Percent of Units Missing Size	0%	12	0%	0%
Tons per Premise	21.3	12	12.24	30.44



**Table D-13  
Heat Pump Cooling Characteristics (Conditioned Square Foot)**

Detail	Percent or Quantity	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Units Per Facility	19.7	5	15.47	23.83
Efficiency of Units (EER)	10.8	4	9.62	12.04
Percent of Units Missing Efficiency	5%	4	-3%	12%
Unit Size (tons)	0.9	5	0.50	1.34
Percent of Units Missing Size	5%	5	-3%	12%
Tons per Premise	17.3	5	7.26	27.32

### D.2.4. Thermostat Controls

**Table D-14  
Overall Cooling Thermostat Types (Conditioned Square Foot)**

Thermostat Control Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Programmable Thermostat	37%	21	16%	57%
Manual Thermostat	34%	21	11%	57%
EMS	25%	21	-2%	52%
Always on, constant Temp	0%	21	0%	0%
Manually Shut on/off	0%	21	0%	0%
Other	0%	21	0%	0%
Missing	3%	21	0%	6%

**Table D-15  
Packaged HVAC Thermostat Types (Conditioned Square Foot)**

Thermostat Control Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Programmable Thermostat	12%	8	-1%	24%
Manual Thermostat	48%	8	9%	88%
EMS	39%	8	2%	75%
Always on, constant Temp	0%	8	0%	0%
Manually Shut on/off	0%	8	0%	0%
Other	0%	8	0%	0%
Missing	1%	8	0%	3%



**Table D-16  
Split System HVAC Thermostat Types (Conditioned Square Foot)**

Thermostat Control Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Programmable Thermostat	94%	13	88%	101%
Manual Thermostat	3%	13	-1%	8%
EMS	1%	13	-1%	3%
Always on, constant Temp	0%	13	0%	0%
Manually Shut on/off	0%	13	0%	0%
Other	0%	13	0%	0%
Missing	2%	13	-1%	4%

**Table D-17  
Heat Pump Thermostat Types (Conditioned Square Foot)**

Thermostat Control Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Programmable Thermostat	0%	5	0%	0%
Manual Thermostat	55%	5	11%	99%
EMS	40%	5	-3%	83%
Always on, constant Temp	0%	5	0%	0%
Manually Shut on/off	0%	5	0%	0%
Other	0%	5	0%	0%
Missing	5%	5	-2%	12%

### D.2.5. Economizers

**Table D-18  
Overall Cooling Economizer Types (Conditioned Square Foot)**

Economizer Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Percent of Units with Economizers	3%	21	0%	6%
Percent of Facilities with Economizers	26%	21	9%	43%
Dry Bulb	0%	5	0%	0%
Single Enthalpy	57%	5	25%	88%
Dual Enthalpy	0%	5	0%	0%
DCV	24%	5	-4%	52%
Other	0%	5	0%	0%
Missing Type	19%	5	-4%	43%



**Table D-19  
Packaged HVAC Cooling Economizer Types (Conditioned Square Foot)**

Economizer Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Percent of Units with Economizers	12%	8	-1%	25%
Percent of Facilities with Economizers	35%	8	7%	64%
Dry Bulb	0%	3	0%	0%
Single Enthalpy	65%	3	27%	104%
Dual Enthalpy	0%	3	0%	0%
DCV	35%	3	-4%	73%
Other	0%	3	0%	0%
Missing Type	0%	3	0%	0%

**Table D-20  
Split System HVAC Cooling Economizer Types (Conditioned Square Foot)**

Economizer Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Percent of Units with Economizers	3%	13	-1%	6%
Percent of Facilities with Economizers	10%	13	0%	21%
Dry Bulb	0%	2	0%	0%
Single Enthalpy	38%	2	-7%	82%
Dual Enthalpy	0%	2	0%	0%
DCV	0%	2	0%	0%
Other	0%	2	0%	0%
Missing Type	62%	2	18%	107%

### D.2.6. Energy Efficiency Opportunities

**Table D-21  
Overall Cooling EE Ops (Conditioned Square Foot)**

Energy Efficiency Opportunity	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Economizer	39%	21	19%	59%
Upgrade to NEMA Efficiency Motors	35%	9	8%	62%
ECM	31%	8	6%	56%
Automatic Setback Thermostat	43%	22	21%	64%
Other HVAC Controls	16%	20	3%	29%
Refrigerant Charge	0%	21	0%	0%
Other O&M	0%	21	0%	0%
Other EE Op	3%	22	-1%	6%



**Table D-22  
Packaged HVAC EE Ops (Conditioned Square Foot)**

Energy Efficiency Opportunity	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Economizer	25%	8	2%	49%
Upgrade to NEMA Efficiency Motors	39%	8	9%	69%
ECM	31%	8	6%	56%
Automatic Setback Thermostat	49%	8	17%	80%
Other HVAC Controls	20%	8	-1%	40%
Refrigerant Charge	0%	8	0%	0%
Other O&M	0%	8	0%	0%
Other EE Op	5%	8	-2%	12%

**Table D-23  
Split System HVAC EE Ops (Conditioned Square Foot)**

Energy Efficiency Opportunity	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Economizer	37%	13	11%	62%
Automatic Setback Thermostat	25%	13	2%	48%
Other HVAC Controls	7%	13	-2%	16%
Refrigerant Charge	0%	13	0%	0%
Other O&M	0%	13	0%	0%
Other EE Op	0%	13	0%	0%

**Table D-24  
Heat Pump EE Ops (Conditioned Square Foot)**

Energy Efficiency Opportunity	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Economizer	79%	2	49%	110%
Upgrade to NEMA Efficiency Motors	100%	1	100%	100%
ECM	100%	1	100%	100%
Automatic Setback Thermostat	27%	5	-6%	60%
Other HVAC Controls	79%	2	49%	110%
Refrigerant Charge	0%	2	0%	0%
Other O&M	0%	2	0%	0%
Other EE Op	0%	5	0%	0%





### D.3. Premise Weighted Results

#### D.3.1. Equipment Types

**Table D-25  
Percent of Facilities with Cooling of Type (Conditioned Square Foot)**

	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
None	19%	27	9%	29%
Packaged HVAC	30%	27	18%	41%
Split System HVAC	48%	27	35%	61%
Chiller	7%	27	1%	14%
Window	0%	27	0%	0%
Heat Pump	19%	27	9%	29%
Miscellaneous Cooling	0%	27	0%	0%

**Table D-26  
Percent of Units with Cooling of Type (Conditioned Square Foot)**

Cooling Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Packaged HVAC	16%	22	10%	22%
Split System HVAC	38%	22	21%	56%
Chiller	5%	22	0%	10%
Window	0%	22	0%	0%
Heat Pump	41%	22	23%	59%
Miscellaneous Cooling	0%	22	0%	0%

#### D.3.2. Equipment Details

**Table D-27  
Overall Cooling Characteristics (Premise)**

Detail	Percent or Quantity	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Units Per Facility	7.4	22	4.70	10.03
Efficiency of Units (EER)	11.7	9	10.93	12.47
Percent of Units Missing Efficiency	17%	9	0%	34%
Unit Size (tons)	4.2	19	2.17	6.21
Percent of Units Missing Size	13%	19	2%	25%
Tons per Premise	29.3	19	16.3	42.3
Conditioned Sq. Ft. per Ton	666	19	350	983
Indoor Sq. Ft. per Ton	723	19	371	1,075



**Table D-28  
Packaged HVAC Cooling Characteristics (Premise)**

Detail	Percent or Quantity	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Units Per Facility	3.3	8	1.96	4.54
Efficiency of Units (EER)	11.6	2	11.09	12.02
Percent of Units Missing Efficiency	0%	2	0%	0%
Unit Size (tons)	4.3	5	3.09	5.58
Percent of Units Missing Size	6%	5	-1%	13%
Tons per Premise	14.8	5	10.58	18.92

**Table D-29  
Split System HVAC Cooling Characteristics (Premise)**

Detail	Percent or Quantity	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Units Per Facility	4.8	13	3.44	6.10
Efficiency of Units (EER)	12.9	5	12.14	13.74
Percent of Units Missing Efficiency	5%	5	-1%	11%
Unit Size (tons)	3.7	12	3.04	4.30
Percent of Units Missing Size	0%	12	0%	0%
Tons per Premise	16.8	12	12.89	20.77

**Table D-30  
Heat Pump Cooling Characteristics (Premise)**

Detail	Percent or Quantity	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Units Per Facility	13.2	5	6.65	19.75
Efficiency of Units (EER)	11.3	4	10.16	12.43
Percent of Units Missing Efficiency	20%	4	-5%	45%
Unit Size (tons)	1.3	5	0.76	1.74
Percent of Units Missing Size	20%	5	-5%	44%
Tons per Premise	13.3	5	4.61	21.89



### D.3.3. Thermostat Controls

**Table D-31  
Overall Cooling Thermostat Types (Premise)**

Thermostat Control Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Programmable Thermostat	38%	21	21%	56%
Manual Thermostat	22%	21	6%	37%
EMS	26%	21	1%	51%
Always on, constant Temp	0%	21	0%	0%
Manually Shut on/off	0%	21	0%	0%
Other	0%	21	0%	0%
Missing	12%	21	1%	24%

**Table D-32  
Packaged HVAC Thermostat Types (Premise)**

Thermostat Control Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Programmable Thermostat	27%	8	6%	48%
Manual Thermostat	23%	8	-4%	50%
EMS	42%	8	11%	73%
Always on, constant Temp	0%	8	0%	0%
Manually Shut on/off	0%	8	0%	0%
Other	0%	8	0%	0%
Missing	8%	8	-1%	16%

**Table D-33  
Split System HVAC Thermostat Types (Premise)**

Thermostat Control Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Programmable Thermostat	85%	13	74%	97%
Manual Thermostat	8%	13	-1%	17%
EMS	2%	13	-1%	4%
Always on, constant Temp	0%	13	0%	0%
Manually Shut on/off	0%	13	0%	0%
Other	0%	13	0%	0%
Missing	5%	13	-2%	11%



**Table D-34  
Heat Pump Thermostat Types (Premise)**

Thermostat Control Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Programmable Thermostat	0%	5	0%	0%
Manual Thermostat	35%	5	1%	69%
EMS	44%	5	4%	84%
Always on, constant Temp	0%	5	0%	0%
Manually Shut on/off	0%	5	0%	0%
Other	0%	5	0%	0%
Missing	21%	5	-4%	46%

### D.3.4. Economizers

**Table D-35  
Overall Cooling Economizer Types (Premise)**

Economizer Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Percent of Units with Economizers	6%	21	2%	11%
Percent of Facilities with Economizers	24%	21	11%	36%
Dry Bulb	0%	5	0%	0%
Single Enthalpy	40%	5	10%	70%
Dual Enthalpy	0%	5	0%	0%
DCV	30%	5	-2%	62%
Other	0%	5	0%	0%
Missing Type	30%	5	-2%	62%

**Table D-36  
Packaged HVAC Cooling Economizer Types (Premise)**

Economizer Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Percent of Units with Economizers	23%	8	4%	42%
Percent of Facilities with Economizers	38%	8	15%	60%
Dry Bulb	0%	3	0%	0%
Single Enthalpy	50%	3	8%	92%
Dual Enthalpy	0%	3	0%	0%
DCV	50%	3	8%	92%
Other	0%	3	0%	0%
Missing Type	0%	3	0%	0%



**Table D-37  
Split System HVAC Cooling Economizer Types (Premise)**

Economizer Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Percent of Units with Economizers	6%	13	-1%	13%
Percent of Facilities with Economizers	15%	13	2%	29%
Dry Bulb	0%	2	0%	0%
Single Enthalpy	25%	2	-11%	61%
Dual Enthalpy	0%	2	0%	0%
DCV	0%	2	0%	0%
Other	0%	2	0%	0%
Missing Type	75%	2	39%	111%

## D.4. Surveyed Chiller Results

**Table D-38  
Chiller Details  
Chillers Surveyed**

Site	1	1	2	2
Chiller Number	A	B	A	B
Chilled Water Loop	Yes	No	UNK	UNK
Compressor Type	Scroll	Scroll	Scroll	Scroll
Equipment Age (Years)	1	1	2	2
Fuel Type	Electric	Electric	Electric	Electric
Number of Units	1	1	4	2
Nominal Capacity (tons)	20	5	40	15
Control Type	Lead/Lag	Lead/Lag	UNK	UNK
Energy Management System Control Strategy	UNK	UNK	UNK	UNK
Condenser Type	Cooling Tower	UNK	Air-Cooled	Air-Cooled
Number of Fan Condenser Motors	1.5	UNK	1	UNK
Serves Chilled Water Loop	Yes	No	UNK	UNK
Chilled Water System Pump HP	15	2	UNK	UNK
Pump Motor Efficiency	93	87	UNK	UNK

**Table D-39  
Chiller EE Opportunities  
Energy Efficiency Opportunities**

Site	1	1	2	2
Chiller Number	A	B	A	B
NEMA Premium Motors	Yes	Yes	UNK	UNK
Automatic Setback Thermostat	Yes	Yes	No	No
Energy Management System	Yes	Yes	Yes	Yes





## Appendix E: Heating Results

### E.1. Overall Heating

#### E.1.1. Conditioned Square Foot Weighted Results

##### E.1.1.1. Details

**Table E-1  
Heating Fuel Types (Conditioned Square Foot)**

Fuel Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Have Heating Equipment	100%	26	100%	100%
Electric	22%	26	5%	38%
Natural Gas	24%	26	5%	42%
Fuel Oil	25%	26	12%	37%
LPG	38%	26	20%	57%
Not Electric or Natural Gas	8%	26	1%	15%
Other	10%	26	2%	18%
Unknown	11%	26	1%	22%

**Table E-2  
Percent of Heating Units of Fuel Type (Conditioned Square Foot)**

Fuel Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Electric	30%	26	7%	54%
Natural Gas	26%	26	2%	49%
Fuel Oil	4%	26	1%	7%
LPG	19%	26	7%	32%
Not Electric or Natural Gas	10%	26	-3%	22%
Other	4%	26	-1%	9%
Unknown	7%	26	1%	12%



**Table E-3  
Heating Equipment Types (Conditioned Square Foot)**

Equipment Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Boiler	72%	26	56%	88%
Furnace	22%	26	10%	35%
Electric Resistance	15%	26	0%	29%
Unit Heater	7%	26	0%	13%
Cabinet Unit Heater	4%	26	-1%	10%
Heat Pump	7%	26	-2%	16%
Other	6%	26	0%	12%
Unknown	3%	26	0%	5%

**Table E-4  
Percent of Heating Units by Equipment Type (Conditioned Square Foot)**

Equipment Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Boiler	36%	26	13%	58%
Furnace	17%	26	5%	30%
Electric Resistance	4%	26	-1%	10%
Unit Heater	8%	26	-2%	19%
Cabinet Unit Heater	1%	26	0%	3%
Heat Pump	32%	26	2%	62%
Other	1%	26	0%	1%
Unknown	0%	26	0%	1%

**Table E-5  
Heating Control Types (Conditioned Square Foot)**

Thermostat Control	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Programmable Thermostat	30%	26	13%	47%
Manual Thermostat	15%	26	1%	28%
EMS	49%	26	20%	78%
Multiple Zones	0%	26	0%	0%
Outdoor Temperature Reset	0%	26	0%	1%
Other	0%	26	0%	0%
Unknown	6%	26	0%	12%

**Table E-6  
Efficiency of Heating Equipment (Conditioned Square Foot)**

Efficiency	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Mean	0.8	21	0.7	0.9
Unknown	61%	26	44%	78%





### E.1.1.2. Energy Efficiency Opportunities

**Table E-7  
Heating Energy Efficiency Opportunities (Conditioned Square Foot)**

Energy Efficiency Opportunity	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Economizer	14%	26	2%	25%
Automatic Setback Thermostat	35%	26	14%	55%
Install VFD on Pump Motors	22%	26	5%	39%
ECM	24%	26	10%	38%
Install NEMA Premium Motors	29%	26	11%	47%
Outdoor Reset	11%	26	2%	19%
Outdoor Cut-off	4%	26	0%	8%
Modulating Boiler	6%	26	1%	11%
Duct Sealing/Insulation	0%	26	0%	0%
Pipe Insulation	3%	26	-1%	7%
Refrigerant Charge	0%	26	0%	0%
Replace Steam Traps	0%	26	0%	0%
Replace Steam Vents	0%	26	0%	0%
Balance System	2%	26	-1%	4%
Other HVAC Controls	14%	26	3%	25%
Other O & M	5%	26	0%	9%
Other EE Op	4%	26	0%	8%

### E.1.2. Premise Weighted Results

#### E.1.2.1. Details

**Table E-8  
Heating Fuel Types (Premise)**

Fuel Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Have Heating Equipment	96%	27	91%	101%
Electric	12%	26	3%	20%
Natural Gas	15%	26	6%	25%
Fuel Oil	42%	26	29%	55%
LPG	35%	26	22%	47%
Not Electric or Natural Gas	12%	26	3%	20%
Other	12%	26	3%	20%
Unknown	8%	26	1%	15%



**Table E-9  
Percent of Heating Units of Fuel Type (Premise)**

Fuel Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Electric	21%	26	2%	40%
Natural Gas	20%	26	6%	33%
Fuel Oil	8%	26	4%	13%
LPG	28%	26	12%	43%
Not Electric or Natural Gas	13%	26	-1%	27%
Other	5%	26	0%	10%
Unknown	6%	26	2%	10%

**Table E-10  
Heating Equipment Types (Premise)**

Equipment Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Boiler	69%	26	57%	81%
Furnace	31%	26	19%	43%
Electric Resistance	8%	26	1%	15%
Unit Heater	8%	26	1%	15%
Cabinet Unit Heater	4%	26	-1%	9%
Heat Pump	4%	26	-1%	9%
Other	8%	26	1%	15%
Unknown	8%	26	1%	15%

**Table E-11  
Percent of Heating Units by Equipment Type (Premise)**

Equipment Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Boiler	25%	26	14%	35%
Furnace	36%	26	17%	54%
Electric Resistance	2%	26	0%	5%
Unit Heater	10%	26	-2%	22%
Cabinet Unit Heater	2%	26	0%	4%
Heat Pump	23%	26	-1%	47%
Other	1%	26	0%	2%
Unknown	1%	26	0%	2%



**Table E-12  
Heating Control Types (Premise)**

Thermostat Control	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Programmable Thermostat	26%	26	13%	39%
Manual Thermostat	19%	26	3%	34%
EMS	43%	26	19%	67%
Multiple Zones	0%	26	0%	0%
Outdoor Temperature Reset	1%	26	0%	3%
Other	0%	26	0%	0%
Unknown	11%	26	3%	19%

**Table E-13  
Capacity of Heating Equipment (Premise)**

Capacity ( kbtu / hr )	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Mean	130.5	22	69.0	192.0
250 or less	61%	26	44%	79%
250 - 500	7%	26	3%	10%
500 - 1,000	3%	26	1%	5%
Larger than 1,000	1%	26	0%	1%
Unknown	29%	26	13%	45%

**Table E-14  
Efficiency of Heating Equipment (Premise)**

Efficiency	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Mean	0.9	21	0.8	0.9
Unknown	54%	26	36%	72%



### E.1.2.2. Energy Efficiency Opportunities

**Table E-15  
Heating Energy Efficiency Opportunities (Premise)**

Energy Efficiency Opportunity	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Economizer	12%	26	3%	20%
Automatic Setback Thermostat	12%	26	3%	20%
Install VFD on Pump Motors	15%	26	6%	25%
ECM	23%	26	12%	34%
Install NEMA Premium Motors	19%	26	9%	30%
Outdoor Reset	15%	26	6%	25%
Outdoor Cut-off	8%	26	1%	15%
Modulating Boiler	12%	26	3%	20%
Duct Sealing/Insulation	0%	26	0%	0%
Pipe Insulation	4%	26	-1%	9%
Refrigerant Charge	0%	26	0%	0%
Replace Steam Traps	0%	26	0%	0%
Replace Steam Vents	0%	26	0%	0%
Balance System	4%	26	-1%	9%
Other HVAC Controls	12%	26	3%	20%
Other O & M	8%	26	1%	15%
Other EE Op	8%	26	1%	15%

## E.2. Electric Heating

### E.2.1. Conditioned Square Foot Weighted Results

#### E.2.1.1. Details

**Table E-16  
Percent of Electric Heating Units Equipment Types (Conditioned Square Foot)**

Equipment Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Boiler	0%	3	0%	0%
Furnace	0%	3	0%	0%
Electric Resistance	15%	3	-8%	38%
Unit Heater	0%	3	0%	0%
Cabinet Unit Heater	0%	3	0%	0%
Heat Pump	85%	3	62%	108%
Other	0%	3	0%	0%



**Table E-17  
Electric Heating Control Types (Conditioned Square Foot)**

Thermostat Control	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Programmable Thermostat	14%	3	-8%	36%
Manual Thermostat	0%	3	0%	0%
EMS	86%	3	64%	108%
Multiple Zones	0%	3	0%	0%
Outdoor Temperature Reset	0%	3	0%	0%
Other	0%	3	0%	0%
Unknown	0%	3	0%	0%

**Table E-18  
Electric Heating Efficiency of Equipment (Conditioned Square Foot)**

Efficiency	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Mean	9%	1	9%	9%
Unknown	86%	3	64%	108%

**E.2.1.2. Energy Efficiency Opportunities**

**Table E-19  
Electric Heating Energy Efficiency Opportunities (Conditioned Square Foot)**

Energy Efficiency Opportunity	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Economizer	33%	3	-5%	71%
Automatic Setback Thermostat	87%	3	67%	106%
Install VFD on Pump Motors	0%	3	0%	0%
ECM	46%	3	4%	88%
Install NEMA Premium Motors	33%	3	-5%	71%
Outdoor Reset	0%	3	0%	0%
Outdoor Cut-off	0%	3	0%	0%
Modulating Boiler	0%	3	0%	0%
Duct Sealing/Insulation	0%	3	0%	0%
Pipe Insulation	0%	3	0%	0%
Refrigerant Charge	0%	3	0%	0%
Replace Steam Traps	0%	3	0%	0%
Replace Steam Vents	0%	3	0%	0%
Balance System	0%	3	0%	0%
Other HVAC Controls	33%	3	-5%	71%
Other O & M	0%	3	0%	0%
Other EE Op	0%	3	0%	0%



## E.2.2. Premise Weighted Results

### E.2.2.1. Details

**Table E-20**  
**Percent of Electric Heating Units Equipment Types (Premise)**

Equipment Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Boiler	0%	3	0%	0%
Furnace	0%	3	0%	0%
Electric Resistance	11%	3	-6%	29%
Unit Heater	0%	3	0%	0%
Cabinet Unit Heater	0%	3	0%	0%
Heat Pump	89%	3	71%	106%
Other	0%	3	0%	0%

**Table E-21**  
**Electric Heating Control Types (Premise)**

Thermostat Control	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Programmable Thermostat	9%	3	-6%	23%
Manual Thermostat	0%	3	0%	0%
EMS	91%	3	77%	106%
Multiple Zones	0%	3	0%	0%
Outdoor Temperature Reset	0%	3	0%	0%
Other	0%	3	0%	0%
Unknown	0%	3	0%	0%

**Table E-22**  
**Electric Heating Capacity of Equipment (Premise)**

Capacity ( kbtu / hr )	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Mean	25.4	2	23.9	27.0
250 or less	97%	3	92%	102%
250 - 500	0%	3	0%	0%
500 - 1,000	0%	3	0%	0%
Larger than 1,000	0%	3	0%	0%
Unknown	3%	3	-2%	8%



**Table E-23  
Electric Heating Efficiency of Equipment (Premise)**

Efficiency	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Mean	9%	1	9%	9%
Unknown	91%	3	77%	106%

**E.2.2.2. Energy Efficiency Opportunities**

**Table E-24  
Electric Heating Energy Efficiency Opportunities (Premise)**

Energy Efficiency Opportunity	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Economizer	33%	3	-3%	70%
Automatic Setback Thermostat	67%	3	30%	103%
Install VFD on Pump Motors	0%	3	0%	0%
ECM	67%	3	30%	103%
Install NEMA Premium Motors	33%	3	-3%	70%
Outdoor Reset	0%	3	0%	0%
Outdoor Cut-off	0%	3	0%	0%
Modulating Boiler	0%	3	0%	0%
Duct Sealing/Insulation	0%	3	0%	0%
Pipe Insulation	0%	3	0%	0%
Refrigerant Charge	0%	3	0%	0%
Replace Steam Traps	0%	3	0%	0%
Replace Steam Vents	0%	3	0%	0%
Balance System	0%	3	0%	0%
Other HVAC Controls	33%	3	-3%	70%
Other O & M	0%	3	0%	0%
Other EE Op	0%	3	0%	0%



### E.3. Natural Gas Heating

#### E.3.1. Conditioned Square Foot Weighted Results

##### E.3.1.1. Details

**Table E-25**  
**Percent of Natural Gas Heating Units Equipment Types (Conditioned Square Foot)**

Equipment Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Boiler	78%	4	52%	104%
Furnace	22%	4	-4%	48%
Electric Resistance	0%	4	0%	0%
Unit Heater	0%	4	0%	0%
Cabinet Unit Heater	0%	4	0%	0%
Heat Pump	0%	4	0%	0%
Other	0%	4	0%	0%

**Table E-26**  
**Natural Gas Heating Control Types (Conditioned Square Foot)**

Thermostat Control	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Programmable Thermostat	48%	4	37%	59%
Manual Thermostat	45%	4	28%	63%
EMS	3%	4	-2%	7%
Multiple Zones	0%	4	0%	0%
Outdoor Temperature Reset	0%	4	0%	0%
Other	0%	4	0%	0%
Unknown	4%	4	-2%	10%

**Table E-27**  
**Natural Gas Efficiency of Heating Equipment (Conditioned Square Foot)**

Efficiency	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Mean	92%	4	91%	93%
Unknown	49%	4	36%	63%





### E.3.1.2. Energy Efficiency Opportunities

**Table E-28  
Natural Gas Heating Energy Efficiency Opportunities (Conditioned Square Foot)**

Energy Efficiency Opportunity	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Economizer	7%	4	-4%	19%
Automatic Setback Thermostat	69%	4	36%	102%
Install VFD on Pump Motors	0%	4	0%	0%
ECM	0%	4	0%	0%
Install NEMA Premium Motors	0%	4	0%	0%
Outdoor Reset	0%	4	0%	0%
Outdoor Cut-off	0%	4	0%	0%
Modulating Boiler	0%	4	0%	0%
Duct Sealing/Insulation	0%	4	0%	0%
Pipe Insulation	0%	4	0%	0%
Refrigerant Charge	0%	4	0%	0%
Replace Steam Traps	0%	4	0%	0%
Replace Steam Vents	0%	4	0%	0%
Balance System	7%	4	-4%	19%
Other HVAC Controls	0%	4	0%	0%
Other O & M	12%	4	-6%	31%
Other EE Op	0%	4	0%	0%

### E.3.2. Premise Weighted Results

#### E.3.2.1. Details

**Table E-29  
Percent of Natural Gas Heating Units Equipment Types (Premise)**

Equipment Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Boiler	36%	4	4%	68%
Furnace	64%	4	32%	96%
Electric Resistance	0%	4	0%	0%
Unit Heater	0%	4	0%	0%
Cabinet Unit Heater	0%	4	0%	0%
Heat Pump	0%	4	0%	0%
Other	0%	4	0%	0%



**Table E-30  
Natural Gas Heating Control Types (Premise)**

Thermostat Control	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Programmable Thermostat	61%	4	45%	76%
Manual Thermostat	18%	4	-2%	38%
EMS	6%	4	-2%	14%
Multiple Zones	0%	4	0%	0%
Outdoor Temperature Reset	0%	4	0%	0%
Other	0%	4	0%	0%
Unknown	15%	4	-1%	32%

**Table E-31  
Natural Gas Capacity of Heating Equipment (Premise)**

Capacity ( kbtu / hr )	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Mean	127.4	4	65.4	189.4
250 or less	64%	4	32%	96%
250 - 500	18%	4	4%	32%
500 - 1,000	0%	4	0%	0%
Larger than 1,000	0%	4	0%	0%
Unknown	18%	4	-2%	38%

**Table E-32  
Natural Gas Efficiency of Equipment (Premise)**

Efficiency	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Mean	92%	4	89%	94%
Unknown	33%	4	15%	51%



### E.3.2.2. Energy Efficiency Opportunities

**Table E-33  
Natural Gas Heating Energy Efficiency Opportunities (Premise)**

Energy Efficiency Opportunity	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Economizer	25%	4	-4%	54%
Automatic Setback Thermostat	25%	4	-4%	54%
Install VFD on Pump Motors	0%	4	0%	0%
ECM	0%	4	0%	0%
Install NEMA Premium Motors	0%	4	0%	0%
Outdoor Reset	0%	4	0%	0%
Outdoor Cut-off	0%	4	0%	0%
Modulating Boiler	0%	4	0%	0%
Duct Sealing/Insulation	0%	4	0%	0%
Pipe Insulation	0%	4	0%	0%
Refrigerant Charge	0%	4	0%	0%
Replace Steam Traps	0%	4	0%	0%
Replace Steam Vents	0%	4	0%	0%
Balance System	25%	4	-4%	54%
Other HVAC Controls	0%	4	0%	0%
Other O & M	25%	4	-4%	54%
Other EE Op	0%	4	0%	0%

## E.4. Fuel Oil Heating

### E.4.1. Conditioned Square Foot Weighted Results

#### E.4.1.1. Details

**Table E-34  
Percent of Fuel Oil Heating Units Equipment Types (Conditioned Square Foot)**

Equipment Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Boiler	100%	11	100%	100%
Furnace	0%	11	0%	0%
Electric Resistance	0%	11	0%	0%
Unit Heater	0%	11	0%	0%
Cabinet Unit Heater	0%	11	0%	0%
Heat Pump	0%	11	0%	0%
Other	0%	11	0%	0%



**Table E-35  
Fuel Oil Heating Control Types (Conditioned Square Foot)**

Thermostat Control	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Programmable Thermostat	21%	11	2%	41%
Manual Thermostat	30%	11	8%	53%
EMS	38%	11	11%	64%
Multiple Zones	0%	11	0%	0%
Outdoor Temperature Reset	11%	11	-3%	25%
Other	0%	11	0%	0%
Unknown	0%	11	0%	0%

**Table E-36  
Fuel Oil Heating Efficiency of Equipment (Conditioned Square Foot)**

Efficiency	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Mean	82%	8	80%	85%
Unknown	24%	11	5%	42%

#### E.4.1.2. Energy Efficiency Opportunities

**Table E-37  
Fuel Oil Heating Energy Efficiency Opportunities (Conditioned Square Foot)**

Energy Efficiency Opportunity	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Economizer	0%	11	0%	0%
Automatic Setback Thermostat	0%	11	0%	0%
Install VFD on Pump Motors	33%	11	10%	55%
ECM	35%	11	11%	59%
Install NEMA Premium Motors	33%	11	10%	55%
Outdoor Reset	35%	11	11%	59%
Outdoor Cut-off	16%	11	0%	32%
Modulating Boiler	25%	11	6%	44%
Duct Sealing/Insulation	0%	11	0%	0%
Pipe Insulation	12%	11	-3%	28%
Refrigerant Charge	0%	11	0%	0%
Replace Steam Traps	0%	11	0%	0%
Replace Steam Vents	0%	11	0%	0%
Balance System	0%	11	0%	0%
Other HVAC Controls	0%	11	0%	0%
Other O & M	0%	11	0%	0%
Other EE Op	0%	11	0%	0%



## E.4.2. Premise Weighted Results

### E.4.2.1. Details

**Table E-38**  
**Percent of Fuel Oil Heating Units Equipment Types (Premise)**

Equipment Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Boiler	100%	11	100%	100%
Furnace	0%	11	0%	0%
Electric Resistance	0%	11	0%	0%
Unit Heater	0%	11	0%	0%
Cabinet Unit Heater	0%	11	0%	0%
Heat Pump	0%	11	0%	0%
Other	0%	11	0%	0%

**Table E-39**  
**Fuel Oil Heating Control Types (Premise)**

Thermostat Control	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Programmable Thermostat	14%	11	1%	27%
Manual Thermostat	43%	11	22%	64%
EMS	29%	11	9%	48%
Multiple Zones	0%	11	0%	0%
Outdoor Temperature Reset	14%	11	-3%	32%
Other	0%	11	0%	0%
Unknown	0%	11	0%	0%

**Table E-40**  
**Fuel Oil Heating Capacity of Equipment (Premise)**

Capacity ( kbtu / hr )	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Mean	497.0	10	336.4	657.6
250 or less	43%	11	22%	64%
250 - 500	14%	11	1%	27%
500 - 1,000	36%	11	14%	57%
Larger than 1,000	0%	11	0%	0%
Unknown	7%	11	-2%	17%



**Table E-41  
Fuel Oil Heating Efficiency of Equipment (Premise)**

Efficiency	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Mean	84%	8	83%	86%
Unknown	29%	11	9%	48%

**E.4.2.2. Energy Efficiency Opportunities**

**Table E-42  
Fuel Oil Heating Energy Efficiency Opportunities (Premise)**

Energy Efficiency Opportunity	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Economizer	0%	11	0%	0%
Automatic Setback Thermostat	0%	11	0%	0%
Install VFD on Pump Motors	27%	11	9%	45%
ECM	27%	11	9%	45%
Install NEMA Premium Motors	27%	11	9%	45%
Outdoor Reset	27%	11	9%	45%
Outdoor Cut-off	18%	11	3%	34%
Modulating Boiler	27%	11	9%	45%
Duct Sealing/Insulation	0%	11	0%	0%
Pipe Insulation	9%	11	-3%	21%
Refrigerant Charge	0%	11	0%	0%
Replace Steam Traps	0%	11	0%	0%
Replace Steam Vents	0%	11	0%	0%
Balance System	0%	11	0%	0%
Other HVAC Controls	0%	11	0%	0%
Other O & M	0%	11	0%	0%
Other EE Op	0%	11	0%	0%



## E.5. LPG Heating

### E.5.1. Conditioned Square Foot Weighted Results

#### E.5.1.1. Details

**Table E-43**  
**Percent of LPG Heating Units Equipment Types (Conditioned Square Foot)**

Equipment Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Boiler	58%	9	28%	88%
Furnace	42%	9	12%	72%
Electric Resistance	0%	9	0%	0%
Unit Heater	0%	9	0%	0%
Cabinet Unit Heater	0%	9	0%	0%
Heat Pump	0%	9	0%	0%
Other	0%	9	0%	0%

**Table E-44**  
**LPG Heating Control Types (Conditioned Square Foot)**

Thermostat Control	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Programmable Thermostat	44%	9	15%	73%
Manual Thermostat	9%	9	-3%	21%
EMS	23%	9	1%	44%
Multiple Zones	0%	9	0%	0%
Outdoor Temperature Reset	0%	9	0%	0%
Other	0%	9	0%	0%
Unknown	24%	9	2%	46%

**Table E-45**  
**LPG Heating Efficiency of Equipment (Conditioned Square Foot)**

Efficiency	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Mean	90%	8	89%	92%
Unknown	24%	9	2%	46%



## E.5.1.2. Energy Efficiency Opportunities

**Table E-46  
LPG Heating Energy Efficiency Opportunities (Conditioned Square Foot)**

Energy Efficiency Opportunity	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Economizer	13%	9	-4%	31%
Automatic Setback Thermostat	0%	9	0%	0%
Install VFD on Pump Motors	38%	9	5%	72%
ECM	15%	9	-2%	33%
Install NEMA Premium Motors	38%	9	5%	72%
Outdoor Reset	2%	9	-1%	5%
Outdoor Cut-off	2%	9	-1%	5%
Modulating Boiler	2%	9	-1%	5%
Duct Sealing/Insulation	0%	9	0%	0%
Pipe Insulation	0%	9	0%	0%
Refrigerant Charge	0%	9	0%	0%
Replace Steam Traps	0%	9	0%	0%
Replace Steam Vents	0%	9	0%	0%
Balance System	0%	9	0%	0%
Other HVAC Controls	6%	9	-2%	15%
Other O & M	0%	9	0%	0%
Other EE Op	6%	9	-2%	15%

## E.5.2. Premise Weighted Results

### E.5.2.1. Details

**Table E-47  
Percent of LPG Heating Units Equipment Types (Premise)**

Equipment Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Boiler	28%	9	9%	48%
Furnace	72%	9	52%	91%
Electric Resistance	0%	9	0%	0%
Unit Heater	0%	9	0%	0%
Cabinet Unit Heater	0%	9	0%	0%
Heat Pump	0%	9	0%	0%
Other	0%	9	0%	0%





**Table E-48  
LPG Heating Heating Control Types (Premise)**

Thermostat Control	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Programmable Thermostat	22%	9	5%	38%
Manual Thermostat	41%	9	6%	76%
EMS	13%	9	0%	27%
Multiple Zones	0%	9	0%	0%
Outdoor Temperature Reset	0%	9	0%	0%
Other	0%	9	0%	0%
Unknown	24%	9	3%	45%

**Table E-49  
LPG Heating Capacity of Equipment (Premise)**

Capacity ( kbtu / hr )	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Mean	87.5	8	24.5	150.6
250 or less	72%	9	52%	91%
250 - 500	7%	9	-3%	16%
500 - 1,000	0%	9	0%	0%
Larger than 1,000	0%	9	0%	0%
Unknown	22%	9	4%	39%

**Table E-50  
LPG Heating Efficiency of Equipment (Premise)**

Efficiency	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Mean	91%	8	89%	92%
Unknown	24%	9	3%	45%



## E.5.2.2. Energy Efficiency Opportunities

**Table E-51  
LPG Heating Energy Efficiency Opportunities (Premise)**

Energy Efficiency Opportunity	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Economizer	11%	9	-3%	25%
Automatic Setback Thermostat	0%	9	0%	0%
Install VFD on Pump Motors	22%	9	4%	41%
ECM	22%	9	4%	41%
Install NEMA Premium Motors	22%	9	4%	41%
Outdoor Reset	11%	9	-3%	25%
Outdoor Cut-off	11%	9	-3%	25%
Modulating Boiler	11%	9	-3%	25%
Duct Sealing/Insulation	0%	9	0%	0%
Pipe Insulation	0%	9	0%	0%
Refrigerant Charge	0%	9	0%	0%
Replace Steam Traps	0%	9	0%	0%
Replace Steam Vents	0%	9	0%	0%
Balance System	0%	9	0%	0%
Other HVAC Controls	11%	9	-3%	25%
Other O & M	0%	9	0%	0%
Other EE Op	11%	9	-3%	25%

## E.6. Boiler Energy Efficiency Opportunities

### E.6.1. Conditioned Square Foot Weighted Results

**Table E-52  
Boiler Energy Efficiency Opportunities (Conditioned Square Foot)**

Energy Efficiency Opportunity	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
VFD on Pump Motors	31%	18	8%	53%
ECM	12%	18	1%	23%
NEMA Premium Motors	31%	18	8%	53%
Outdoor Reset	15%	18	3%	26%
Outdoor Cut off	5%	18	-1%	11%
Modulating Boiler	8%	18	1%	16%
Duct Sealing / Insulation	0%	18	0%	0%
Pipe Insulation	4%	18	-2%	10%
Refrigerant Charge	0%	18	0%	0%
Replace Steam Traps	0%	18	0%	0%
Replace Steam Vents	0%	18	0%	0%
Balance System	0%	18	0%	0%
Other O & M	7%	18	0%	13%
Other Opportunities	3%	18	-1%	6%



## E.6.2. Premise Weighted Results

**Table E-53  
Boiler Energy Efficiency Opportunities (Premise)**

Energy Efficiency Opportunity	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
VFD on Pump Motors	22%	18	9%	35%
ECM	17%	18	5%	28%
NEMA Premium Motors	22%	18	9%	35%
Outdoor Reset	22%	18	9%	35%
Outdoor Cut off	11%	18	1%	21%
Modulating Boiler	17%	18	5%	28%
Duct Sealing / Insulation	0%	18	0%	0%
Pipe Insulation	6%	18	-2%	13%
Refrigerant Charge	0%	18	0%	0%
Replace Steam Traps	0%	18	0%	0%
Replace Steam Vents	0%	18	0%	0%
Balance System	0%	18	0%	0%
Other O & M	11%	18	1%	21%
Other Opportunities	6%	18	-2%	13%

## E.7. Furnace Energy Efficiency Opportunities

### E.7.1. Conditioned Square Foot Weighted Results

**Table E-54  
Furnace Energy Efficiency Opportunities (Conditioned Square Foot)**

Energy Efficiency Opportunity	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
VFD on Pump Motors	5%	5	-2%	13%
ECM	39%	5	5%	74%
NEMA Premium Motors	5%	5	-2%	13%
Outdoor Reset	39%	5	5%	74%
Outdoor Cut off	5%	5	-2%	13%
Modulating Boiler	5%	5	-2%	13%
Duct Sealing / Insulation	0%	5	0%	0%
Pipe Insulation	0%	5	0%	0%
Refrigerant Charge	0%	5	0%	0%
Replace Steam Traps	0%	5	0%	0%
Replace Steam Vents	0%	5	0%	0%
Balance System	12%	5	-4%	28%
Other O & M	0%	5	0%	0%
Other Opportunities	0%	5	0%	0%



## E.7.2. Premise Weighted Results

**Table E-55  
Furnace Energy Efficiency Opportunities (Premise)**

Energy Efficiency Opportunity	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
VFD on Pump Motors	20%	5	-4%	44%
ECM	40%	5	11%	69%
NEMA Premium Motors	20%	5	-4%	44%
Outdoor Reset	40%	5	11%	69%
Outdoor Cut off	20%	5	-4%	44%
Modulating Boiler	20%	5	-4%	44%
Duct Sealing / Insulation	0%	5	0%	0%
Pipe Insulation	0%	5	0%	0%
Refrigerant Charge	0%	5	0%	0%
Replace Steam Traps	0%	5	0%	0%
Replace Steam Vents	0%	5	0%	0%
Balance System	20%	5	-4%	44%
Other O & M	0%	5	0%	0%
Other Opportunities	0%	5	0%	0%



## Appendix F: Domestic Hot Water Results

### F.1.Overall Results

**Table F-1  
Overall DHW Fuel Type (Premise)**

Water Heater Fuel Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Premises with Water Heater	88.9%	27	80.8%	97.0%
Electric	17.2%	24	8.3%	26.2%
Natural Gas	13.8%	24	3.4%	24.2%
Fuel Oil	20.7%	24	10.2%	31.2%
LPG	34.5%	24	20.6%	48.3%
Steam	0.0%	24	0.0%	0.0%
Heat Recovery	3.5%	24	-1.0%	7.9%
Solar	0.0%	24	0.0%	0.0%
Other Fuel	3.5%	24	-1.1%	8.0%
Unknown Fuel	6.9%	24	0.7%	13.0%

**Table F-2  
Overall DHW Type (Premise)**

Water Heater Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Self-Contained WH Tank	34.5%	24	22.3%	46.7%
Space Heating Boiler w/ Separate Water Tank	55.2%	24	41.5%	68.8%
Heat Pump Water Heater	0.0%	24	0.0%	0.0%
Instantaneous (Tankless)	10.3%	24	2.9%	17.8%
HW Generator with Separate Tank	0.0%	24	0.0%	0.0%
Side Arm Heater	0.0%	24	0.0%	0.0%
Other	0.0%	24	0.0%	0.0%
Unknown	0.0%	24	0.0%	0.0%

**Table F-3  
Overall DHW Tank Capacity (Premise)**

Tank Capacity	Ratio	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Units Per Premise	1.2	24	1.1	1.3
Average Tank Capacity Per Premise	87.2	19	68.9	105.5
Average Tank Capacity Per Unit	69.0	19	58.1	80.0
Percent Tankless Units	11.5%	21	3.3%	19.8%
<= 30 gallons	3.5%	24	-1.1%	8.0%
31 - 50 gallons	20.7%	24	9.0%	32.3%
51-100 gallons	37.9%	24	24.9%	51.0%
101+ gallons	17.2%	24	5.0%	29.5%
Unknown	10.3%	24	2.6%	18.1%



**Table F-4  
Overall DHW EE Ops (Premise)**

Energy Efficiency Opportunity	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Install Timers	37.5%	24	24.3%	50.7%
Install Pipe Insulation	16.7%	24	6.5%	26.9%
Install Supplemental Tank Insulation	16.7%	24	6.5%	26.9%
Repair Leaks	0.0%	24	0.0%	0.0%
Other Operations and Maintenance	0.0%	24	0.0%	0.0%
Other Opportunities	4.2%	24	-1.3%	9.6%

## F.2.Electric DHW Results

**Table F-5  
Electric DHW Type (Premise)**

Water Heater Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Self-Contained WH Tank	80.0%	5	56.0%	104.0%
Space Heating Boiler w/ Separate Water Tank	0.0%	5	0.0%	0.0%
Heat Pump Water Heater	0.0%	5	0.0%	0.0%
Instantaneous (Tankless)	20.0%	5	-4.0%	44.0%
HW Generator with Separate Tank	0.0%	5	0.0%	0.0%
Side Arm Heater	0.0%	5	0.0%	0.0%
Other	0.0%	5	0.0%	0.0%
Unknown	0.0%	5	0.0%	0.0%

**Table F-6  
Electric DHW Tank Capacity (Premise)**

Tank Capacity	Ratio	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Units Per Premise	1.0	5	1.0	1.0
Average Tank Capacity Per Premise	13.2	19	4.9	21.4
Average Tank Capacity Per Unit	62.5	4	50.5	74.5
Percent Tankless Units	20.0%	5	-4.0%	44.0%
<= 30 gallons	0.0%	5	0.0%	0.0%
31 - 50 gallons	40.0%	5	10.6%	69.4%
51-100 gallons	40.0%	5	10.6%	69.4%
101+ gallons	0.0%	5	0.0%	0.0%
Unknown	0.0%	5	0.0%	0.0%



**Table F-7  
Electric DHW Details (Premise)**

Detail	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Average Size (kW)	3.8	5	3.1	4.5
Unknown Size (kW)	0.0%	5	0.0%	0.0%
Controlled By a Timer	20.0%	5	-4.0%	44.0%
Controlled by Utility	0.0%	5	0.0%	0.0%
On Time of Use Rate	0.0%	4	0.0%	0.0%

**Table F-8  
Electric DHW EE Ops (Premise)**

Energy Efficiency Opportunity	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Install Timers	40.0%	5	10.6%	69.4%
Install Pipe Insulation	20.0%	5	-4.0%	44.0%
Install Supplemental Tank Insulation	20.0%	5	-4.0%	44.0%
Repair Leaks	0.0%	5	0.0%	0.0%
Other Operations and Maintenance	0.0%	5	0.0%	0.0%
Other Opportunities	0.0%	5	0.0%	0.0%

### F.3.Natural Gas DHW Results

**Table F-9  
Natural Gas DHW Type (Premise)**

Water Heater Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Self-Contained WH Tank	50.0%	3	9.0%	91.0%
Space Heating Boiler w/ Separate Water Tank	50.0%	3	9.0%	91.0%
Heat Pump Water Heater	0.0%	3	0.0%	0.0%
Instantaneous (Tankless)	0.0%	3	0.0%	0.0%
HW Generator with Separate Tank	0.0%	3	0.0%	0.0%
Side Arm Heater	0.0%	3	0.0%	0.0%
Other	0.0%	3	0.0%	0.0%
Unknown	0.0%	3	0.0%	0.0%



**Table F-10  
Natural Gas DHW Tank Capacity (Premise)**

Tank Capacity	Ratio	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Units Per Premise	1.3	3	1.0	1.7
Average Tank Capacity Per Premise	18.7	19	1.8	35.7
Average Tank Capacity Per Unit	89.0	3	62.8	115.2
Percent Tankless Units	0.0%	3	0.0%	0.0%
<= 30 gallons	0.0%	3	0.0%	0.0%
31 - 50 gallons	25.0%	3	-6.3%	56.3%
51-100 gallons	25.0%	3	-6.3%	56.3%
101+ gallons	50.0%	3	9.0%	91.0%
Unknown	0.0%	3	0.0%	0.0%

**Table F-11  
Natural Gas DHW EE Ops (Premise)**

Energy Efficiency Opportunity	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Install Timers	33.3%	3	-3.1%	69.8%
Install Pipe Insulation	0.0%	3	0.0%	0.0%
Install Supplemental Tank Insulation	33.3%	3	-3.1%	69.8%
Repair Leaks	0.0%	3	0.0%	0.0%
Other Operations and Maintenance	0.0%	3	0.0%	0.0%
Other Opportunities	0.0%	3	0.0%	0.0%

## F.4.Fuel Oil DHW Results

**Table F-12  
Fuel Oil DHW Type (Premise)**

Water Heater Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Self-Contained WH Tank	0.0%	6	0.0%	0.0%
Space Heating Boiler w/ Separate Water Tank	100.0%	6	100.0%	100.0%
Heat Pump Water Heater	0.0%	6	0.0%	0.0%
Instantaneous (Tankless)	0.0%	6	0.0%	0.0%
HW Generator with Separate Tank	0.0%	6	0.0%	0.0%
Side Arm Heater	0.0%	6	0.0%	0.0%
Other	0.0%	6	0.0%	0.0%
Unknown	0.0%	6	0.0%	0.0%





**Table F-13  
Fuel Oil DHW Tank Capacity (Premise)**

Tank Capacity	Ratio	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Units Per Premise	1.0	6	1.0	1.0
Average Tank Capacity Per Premise	13.7	19	6.3	21.1
Average Tank Capacity Per Unit	52.0	5	43.2	60.8
Percent Tankless Units	0.0%	5	0.0%	0.0%
<= 30 gallons	16.7%	6	-3.7%	37.1%
31 - 50 gallons	16.7%	6	-3.7%	37.1%
51-100 gallons	50.0%	6	22.6%	77.4%
101+ gallons	0.0%	6	0.0%	0.0%
Unknown	16.7%	6	-3.7%	37.1%

**Table F-14  
Fuel Oil DHW EE Ops (Premise)**

Energy Efficiency Opportunity	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Install Timers	66.7%	6	40.9%	92.5%
Install Pipe Insulation	33.3%	6	7.5%	59.1%
Install Supplemental Tank Insulation	33.3%	6	7.5%	59.1%
Repair Leaks	0.0%	6	0.0%	0.0%
Other Operations and Maintenance	0.0%	6	0.0%	0.0%
Other Opportunities	16.7%	6	-3.7%	37.1%

## F.5.LPG DHW Results

**Table F-15  
LPG DHW Type (Premise)**

Water Heater Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Self-Contained WH Tank	20.0%	8	4.4%	35.6%
Space Heating Boiler w/ Separate Water Tank	60.0%	8	35.1%	84.9%
Heat Pump Water Heater	0.0%	8	0.0%	0.0%
Instantaneous (Tankless)	20.0%	8	4.4%	35.6%
HW Generator with Separate Tank	0.0%	8	0.0%	0.0%
Side Arm Heater	0.0%	8	0.0%	0.0%
Other	0.0%	8	0.0%	0.0%
Unknown	0.0%	8	0.0%	0.0%



**Table F-16  
LPG DHW Tank Capacity (Premise)**

Tank Capacity	Ratio	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Units Per Premise	1.3	8	1.0	1.5
Average Tank Capacity Per Premise	29.3	19	11.7	46.9
Average Tank Capacity Per Unit	69.6	6	47.6	91.6
Percent Tankless Units	22.2%	7	5.2%	39.3%
<= 30 gallons	0.0%	8	0.0%	0.0%
31 - 50 gallons	10.0%	8	-3.0%	23.0%
51-100 gallons	40.0%	8	19.9%	60.1%
101+ gallons	20.0%	8	-3.1%	43.1%
Unknown	10.0%	8	-3.0%	23.0%

**Table F-17  
LPG DHW EE Ops (Premise)**

Energy Efficiency Opportunity	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Install Timers	25.0%	8	4.5%	45.5%
Install Pipe Insulation	12.5%	8	-3.2%	28.2%
Install Supplemental Tank Insulation	0.0%	8	0.0%	0.0%
Repair Leaks	0.0%	8	0.0%	0.0%
Other Operations and Maintenance	0.0%	8	0.0%	0.0%
Other Opportunities	0.0%	8	0.0%	0.0%



## Appendix G: Air Handler Results

### G.1. Conditioned Square Foot Weighted Results

**Table G-1  
Air Handlers and Economizers (Conditioned Square Foot)**

Details	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Percent of Conditioned Square Feet with Air Handler	78%	26	66%	90%
Percent of Air Handlers with Economizers	39%	12	14%	65%

**Table G-2  
Air Handler Percent of Fans with Control Type (Conditioned Square Foot)**

Percent of Fans with Control Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Discharge Damper	38%	15	19%	58%
Inlet Vane	3%	15	-1%	7%
VFD	5%	15	0%	10%
Other	5%	15	-1%	11%
Not Applicable	13%	15	3%	23%
Unknown	36%	15	21%	50%

**Table G-3  
Air Handler EE Ops by Building Type (Conditioned Square Foot)**

Energy Efficiency Opportunity	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
VFD on Motors	48%	15	24%	71%
O & M	26%	15	3%	49%
Other EE Opportunity	0%	15	0%	0%

### G.2. Premise Weighted Results

**Table G-4  
Air Handlers and Economizers (Premise)**

Details	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Percent of Premises with Air Handler	56%	27	43%	68%
Percent of Air Handlers with Economizers	33%	12	15%	52%



**Table G-5  
Air Handler Percent of Fans with Control Type (Premise)**

Percent of Fans with Control Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Discharge Damper	22%	15	8%	37%
Inlet Vane	3%	15	-1%	7%
VFD	7%	15	2%	13%
Other	1%	15	-1%	4%
Not Applicable	24%	15	7%	41%
Unknown	42%	15	26%	58%

**Table G-6  
Air Handler EE Ops by Building Type (Premise)**

Energy Efficiency Opportunity	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
VFD on Motors	33%	15	17%	50%
O & M	13%	15	2%	25%
Other EE Opportunity	0%	15	0%	0%



## Appendix H: Cooking Equipment Results

### H.1. Square Foot Weighted

**Table H-1  
Cooking Equipment (Square Foot)**

Cooking Equipment	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Percent with Cooking Equipment	33%	27	15%	50%
Fryers	28%	10	5%	51%
Griddle/Grill	18%	10	-2%	38%
Range	51%	10	20%	82%
Oven-Baking	5%	10	-1%	10%
Oven-General	84%	10	69%	98%
Steam Kettle	18%	10	-2%	38%
Dishwater Booster Heater	44%	10	15%	73%

**Table H-2  
Electric Cooking Equipment (Square Foot)**

Electric Cooking Equipment	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Fryers	35%	4	0%	69%
Griddle/Grill	0%	2	0%	0%
Range	37%	7	10%	64%
Oven-Baking	41%	2	-5%	86%
Oven-General	62%	6	29%	94%
Steam Kettle	0%	2	0%	0%
Dishwater Booster Heater	28%	5	0%	55%

**Table H-3  
Cooking EE Options in Place (Square Foot)**

Energy Efficient Equipment in Place	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Infrared Fryers	0%	10	0%	0%
Infrared Stovetops	0%	10	0%	0%
Convection Ovens	25%	10	3%	47%
Smart Range Hoods (Melink-sensor Controlled)	0%	10	0%	0%
Engineered Pre-rinse Nozzles	0%	10	0%	0%



**Table H-4  
Cooking EE Opportunities (Square Foot)**

Energy Efficient Opportunity	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Infrared Fryers	0%	4	0%	0%
Infrared Stovetops	0%	4	0%	0%
Convection Ovens	0%	4	0%	0%
Smart Range Hoods (Melink-sensor Controlled)	72%	4	44%	99%
Engineered Pre-rinse Nozzles	0%	4	0%	0%

## H.2. Premise Weighted

**Table H-5  
Cooking Equipment (Premise)**

Cooking Equipment	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Premises with Cooking Equipment	37%	27	25%	49%
Fryers	40%	10	19%	61%
Griddle/Grill	20%	10	3%	37%
Range	70%	10	51%	89%
Oven-Baking	20%	10	3%	37%
Oven-General	60%	10	39%	81%
Steam Kettle	20%	10	3%	37%
Dishwater Booster Heater	50%	10	29%	71%

**Table H-6  
Electric Cooking Equipment (Premise)**

Electric Cooking Equipment	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Fryers	50%	4	16%	84%
Griddle/Grill	0%	2	0%	0%
Range	57%	7	32%	82%
Oven-Baking	50%	2	3%	97%
Oven-General	50%	6	23%	77%
Steam Kettle	0%	2	0%	0%
Dishwater Booster Heater	40%	5	11%	69%



**Table H-7  
Cooking EE Options in Place (Premise)**

Energy Efficient Equipment in Place	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Infrared Fryers	0%	10	0%	0%
Infrared Stovetops	0%	10	0%	0%
Convection Ovens	30%	10	11%	49%
Smart Range Hoods (Melink-sensor Controlled)	0%	10	0%	0%
Engineered Pre-rinse Nozzles	0%	10	0%	0%

**Table H-8  
Cooking EE Opportunities (Premise)**

Energy Efficient Opportunity	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Infrared Fryers	0%	4	0%	0%
Infrared Stovetops	0%	4	0%	0%
Convection Ovens	0%	4	0%	0%
Smart Range Hoods (Melink-sensor Controlled)	50%	4	16%	84%
Engineered Pre-rinse Nozzles	0%	4	0%	0%







## Appendix I: Miscellaneous Equipment

### I.1.Details

**Table I-1  
Computer Equipment Inventory (Premise)**

Equipment Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Total Premises with Desktop Computers	77.8%	27	67.1%	88.5%
Desktop Computers per Premise	16.2	21	6.6	25.8
Total Premises with Inkjet Printers	48.2%	27	35.3%	61.0%
Inkjet Printers per Premise	2.2	13	1.6	2.8
Total Premises with Laser Printers	48.2%	27	35.3%	61.0%
Laser Printers per Premise	3.3	13	2.4	4.2
Total Premises with Servers	37.0%	27	24.6%	49.5%
Servers per Premise	1.0	10	1.0	1.0

**Table I-2  
Copier Equipment Inventory (Premise)**

Equipment Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Total Premises with Small Copiers	18.5%	27	8.5%	28.5%
Small Copiers per Premise	1.8	5	1.4	2.2
Total Premises with Medium Copiers	33.3%	27	21.2%	45.5%
Medium Copiers per Premise	1.7	9	1.0	2.4
Total Premises with Large Copiers	22.2%	27	11.5%	32.9%
Large Copiers per Premise	1.2	6	1.0	1.4
Total Premises with Fax Machines	48%	27	35%	61%
Fax Machines per Premise	1.1	13	1.0	1.2



**Table I-3  
Vending Equipment Inventory (Premise)**

Equipment Type	Percent with Opportunity	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Total Premises with Hot Food Vending	0.0%	27	0.0%	0.0%
Hot Food Vending Machines / Premise	0.0	0	0.0	0.0
Total Premises with Refrigerated Vending	18.5%	27	8.5%	28.5%
Refrigerated Vending Machines / Premise	1.2	5	1.0	1.4
Total Premises with Non-Refrigerated Vending	11.1%	27	3.0%	19.2%
Non-Refrigerated Vending Machines / Premise	1.0	3	1.0	1.0
Total Premises with Vending Miser	0.0%	27	0.0%	0.0%
Vending Miser / Premise	0.0	0	0.0	0.0

**Table I-4  
Elevator Equipment Inventory (Premise)**

Equipment Type	Percent with Opportunity	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Total Premises with Hydraulic Elevator	33.3%	27	21.2%	45.5%
Hydraulic Elevators per Premise	1.1	9	1.0	1.3
Total Premises with Cable Elevator	0.0%	27	0.0%	0.0%
Cable Elevators per Premise	0.0	0	0.0	0.0
Total Premises with Escalator	0.0%	27	0.0%	0.0%
Escalators per Premise	0.0	0	0.0	0.0
Total Premises with Hoist	3.7%	27	-1.2%	8.6%
Hoists per Premise	1.0	1	1.0	1.0



**Table I-5  
Laundry Equipment Inventory (Premise)**

Equipment Type	Percent	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Total Premises with Residential Dryer	14.8%	27	5.7%	24.0%
Residential Dryers per Premise	1.0	4	1.0	1.0
Total Premises with Residential Washer	14.8%	27	5.7%	24.0%
Residential Washers per Premise	1.0	4	1.0	1.0
Total Premises with Commercial Dryer	7.4%	27	0.7%	14.2%
Commercial Dryers per Premise	4.0	2	1.2	6.8
Total Premises with Commercial Washer	7.4%	27	0.7%	14.2%
Commercial Washers per Premise	4.0	2	1.2	6.8

## I.2. Energy Efficiency Opportunities

**Table I-6  
Office Equipmet EE Opportunities (Premise)**

Energy Efficiency Opportunity	Percent with Opportunity	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Total Premises with Office Equipment	77.8%	27	67.1%	88.5%
Premises with No Energy Star	19.1%	21	7.6%	30.5%
Premises with No Computer Sleep	0.0%	21	0.0%	0.0%
Premises with No Copier Sleep	4.8%	21	-1.5%	11.0%
Premises with No Hard Shut-off at Night	47.6%	21	33.0%	62.2%

**Table I-7  
Vending Machine EE Opportunities (Premise)**

Energy Efficiency Opportunity	Percent with Opportunity	# of Cases	Lower 80% Confidence Limit	Upper 80% Confidence Limit
Total Premises with Vending Machines	18.5%	27	8.5%	28.5%
Premises with No Energy Star	80.0%	5	56.0%	104.0%
Premises with No Vending Miser	100.0%	5	100.0%	100.0%



**Table I-8  
Elevator EE Opportunities (Premise)**

<b>Energy Efficiency Opportunity</b>	<b>Percent with Opportunity</b>	<b># of Cases</b>	<b>Lower 80% Confidence Limit</b>	<b>Upper 80% Confidence Limit</b>
Total Premises with Elevators	29.6%	27	17.9%	41.4%
Elevator Premises with No Shutdown Equipment	75.0%	8	54.5%	95.5%
Elevator Premises without Optimal Cab Positioning	75.0%	8	54.5%	95.5%

**Table I-9  
Laundry EE Opportunities (Premise)**

<b>Energy Efficiency Opportunity</b>	<b>Percent with Opportunity</b>	<b># of Cases</b>	<b>Lower 80% Confidence Limit</b>	<b>Upper 80% Confidence Limit</b>
Total Premises with Laundry Equipment	25.9%	27	14.6%	37.2%
Laundry Premises with no Energy Star Equipment	14.3%	7	-3.4%	32.0%