AMERESCO
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Appendix for ECM 4: VAV Retrofit, Recreation Center

I. Energy Savings Calculations

ECM4 Vav Retrofit Recreation Center Savings Calculation

Savings Estimate

Date:	29-Aug-12
Project:	City of Greeley Colorado
Location:	Recreation Center
Measure:	ECM 4 VAV Retrofit

ECM 4 VAV Upgrades	
Estimated Savings (kWh/Yr):	68,650
Estimated Savings (kW):	15.9

Savings Estimate
Date: 28-Aug-12
Project: City of Greeley Colorado
Location: Recreation Center
Measure: ECM 4 VAV Retrofit

(HV-1) AHU 9 Supply Fan HP	20
(AC-1) AHU 10 Supply Fan HP	10
(AC-1) AHU 10 Return Fan HP	7.5
Motor Load Factor	0.85
(HV-1) AHU 9 Supply Fan kW	12.68
(AC-1) AHU 10 Supply Fan kW	6.34
(AC-1) AHU 10 Return Fan kW	4.76
Total kW	23.78

Average BIN Temp	Existing BIN Hours	Existing Fan kW	Existing Fan kWh	Airflow Fraction	VFD Load Fraction	Proposed Fan kW	Proposed Fan kWh	kW Savings	kWh/Yr Savings
-17.5	0	23.8	-	0.20	0.05	1.2	-	22.6	-
-12.5	10	23.8	238	0.20	0.05	1.2	12	22.6	226
-7.5	7	23.8	166	0.20	0.05	1.2	8	22.6	158
-2.5	18	23.8	428	0.20	0.05	1.2	21	22.6	407
2.5	28	23.8	666	0.20	0.05	1.2	33	22.6	633
7.5	34	23.8	808	0.20	0.05	1.2	40	22.6	768
12.5	39	23.8	927	0.20	0.05	1.2	46	22.6	881
17.5	100	23.8	2,378	0.25	0.06	1.4	143	22.4	2,235
22.5	168	23.8	3,995	0.30	0.08	1.9	320	21.9	3,675
27.5	202	23.8	4,803	0.35	0.11	2.6	528	21.2	4,275
32.5	258	23.8	6,135	0.40	0.14	3.3	859	20.4	5,276
37.5	331	23.8	7,871	0.45	0.17	4.0	1,338	19.7	6,533
42.5	405	23.8	9,630	0.50	0.21	5.0	2,022	18.8	7,608
47.5	416	23.8	9,892	0.55	0.26	6.2	2,572	17.6	7,320
52.5	384	23.8	9,131	0.60	0.32	7.6	2,922	16.2	6,209
57.5	356	23.8	8,465	0.65	0.38	9.0	3,217	14.7	5,248
62.5	368	23.8	8,751	0.70	0.44	10.5	3,850	13.3	4,900
67.5	354	23.8	8,418	0.75	0.5	11.9	4,209	11.9	4,209
72.5	306	23.8	7,276	0.80	0.57	13.6	4,147	10.2	3,129
77.5	294	23.8	6,991	0.85	0.64	15.2	4,474	8.6	2,517
82.5	280	23.8	6,658	0.90	0.73	17.4	4,860	6.4	1,798
87.5	244	23.8	5,802	0.95	0.86	20.4	4,990	3.3	812
92.5	129	23.8	3,067	1.00	1.05	25.0	3,221	-1.2	(153)
97.5	11	23.8	262	1.00	1.05	25.0	275	-1.2	(13)
Total	4742	23.8	112,759			7.8	44,109	15.9	68,650

Franktown Colorado

Latitude : 39° 23' 32" N
Longitude : 104° 45' 03" W
Elevation : 6158 ft.
Report Generated on: Aug. 3, 2012

Start Date : Jan. 1, 2011
End Date : Dec. 31, 2011
# of Days : 365 of 365
obs : poss : 8755 of 8760

Sub Interval Windows

	Start	End
Date	Jan. 01	Dec. 31
Hour	0	23

Average Air Temperature

Total number of Observations
Greater than or equal to initial interval value and Less than ending interval value.
Hour of day (L.S.T.)

Range Deg F		1 am	2 am	3 am	4 am	5 am	6 am	7 am	8 am	9 am	10 am	11 am	12 pm	1 pm	2 pm	3 pm	4 pm	5 pm	6 pm	7 pm	8 pm	9 pm	10 pm	11 pm	12 am	All Hrs
-20 to -15	-17.5	0	0	0	0	0																				0
-15 to -10	-12.5	0	0	0	0	0	3	3	2	1	1									0	0	0	0	0	0	10
-10 to -5	-7.5	0	0	0	0	0	1			1		1				1	1	1	1	0	0	0	0	0	0	7
-5 to 0	-2.5	0	0	0	0	0	1	3	4		1	1	1	1	1			1	4	0	0	0	0	0	0	18
0 to 5	2.5	0	0	0	0	0	5	4	3	2	1	1	2	1	1	1	1	4	2	0	0	0	0	0	0	28
5 to 10	7.5	0	0	0	0	0	7	6	1	4	1	1	1	2	2	2	3	1	3	0	0	0	0	0	0	34
10 to 15	12.5	0	0	0	0	0	7	8	7	3	4	2	1				1	4	2	0	0	0	0	0	0	39
15 to 20	17.5	0	0	0	0	0	20	19	10	5	3	3	2	4	4	7	9	5	9	0	0	0	0	0	0	100
20 to 25	22.5	0	0	0	0	0	31	25	21	13	10	7	10	8	8	7	3	9	16	0	0	0	0	0	0	168
25 to 30	27.5	0	0	0	0	0	41	28	23	19	9	9	7	4	4	4	9	19	26	0	0	0	0	0	0	202
30 to 35	32.5	0	0	0	0	0	41	40	31	19	16	7	8	9	8	10	19	30	20	0	0	0	0	0	0	258
35 to 40	37.5	0	0	0	0	0	34	25	30	30	29	25	18	19	20	21	24	20	36	0	0	0	0	0	0	331
40 to 45	42.5	0	0	0	0	0	27	35	29	34	34	32	31	31	25	31	29	33	34	0	0	0	0	0	0	405
45 to 50	47.5	0	0	0	0	0	35	25	27	31	30	35	37	33	37	31	31	33	31	0	0	0	0	0	0	416
50 to 55	52.5	0	0	0	0	0	26	19	26	28	29	27	28	35	35	40	37	26	28	0	0	0	0	0	0	384
55 to 60	57.5	0	0	0	0	0	31	32	24	29	29	31	31	19	30	26	25	27	22	0	0	0	0	0	0	356
60 to 65	62.5	0	0	0	0	0	36	18	24	22	30	27	27	35	31	30	30	24	34	0	0	0	0	0	0	368
65 to 70	67.5	0	0	0	0	0	17	32	25	24	21	30	28	30	32	33	30	29	23	0	0	0	0	0	0	354
70 to 75	72.5	0	0	0	0	0	2	31	31	27	24	24	26	25	25	24	22	25	20	0	0	0	0	0	0	306
75 to 80	77.5	0	0	0	0	0		11	25	26	28	20	20	21	21	24	34	30	34	0	0	0	0	0	0	294
80 to 85	82.5	0	0	0	0	0			19	28	23	30	26	28	30	29	25	27	15	0	0	0	0	0	0	280
85 to 90	87.5	0	0	0	0	0			2	18	34	28	28	32	30	30	23	14	5	0	0	0	0	0	0	244
90 to 95	92.5	0	0	0	0	0				1	7	23	29	25	20	13	9	2		0	0	0	0	0	0	129
95 to 100	97.5	0	0	0	0	0					1	1	4	3	1	1				0	0	0	0	0	0	11
Total # obs.		365	365	365	365	364	365	364	364	365	365	365	365	365	365	365	365	364	365	365	365	364	365	365	365	4742
Average Deg F		40.9	40.2	39.5	39.1	38.6	39.8	44.1	49.6	54.4	58.1	60.8	62	62.3	61.6	60.6	58.5	54.6	50.9	47.7	45.4	44	43.1	42.2	41.3	49.1

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Data are subject to further review and editing. Please refer any questions to the Western Regional Climate Center.

EUA Disaggregation								
Unit	SA Horespower	RA Horsepower	Total Horsepower	Load Factor	Hours/Yr	kWh/Yr		kWh
HV-1	15	0	15	0.95	4742	50,410		
HV-2	25	0	25	0.95	4742	84,016		
HV-3	5	0	5	0.95	4742	16,803		
HV-4	1.5	0	1.5	0.95	4742	5,041		
HV-5	1.5	0	1.5	0.95	4742	5,041		
HV-6	1.5	0	1.5	0.95	4742	5,041		
HV-7	0	0	0	0.95	4742	-		
HV-8	5	0	5	0.95	4742	16,803		
AC-1	10	7.5	17.5	0.95	4742	58,811		109,221
AC-2	20	0	20	0.95	4742	67,213		
AC-3	7.5	0	7.5	0.95	4742	25,205		
						334,385		1,844,897
						18.12%		

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Appendix for ECM 4: VAV Retrofit, Lincoln Park Annex

I. Energy Savings Calculations

ECM 4 VAV Retrofit Lincoln Park Annex Savings Calculation

Savings Estimate

Date:	28-Aug-12
Project:	City of Greeley Colorado
Location:	LPA
Measure:	ECM 4 VAV Retrofit

Supply Fan HP	25
Load Factor	0.7
Existing Supply Fan kW	13.06
Existing Return Fan kW	0.00
Existing Total kW	13.06

Average BIN Temp	Existing BIN Hours	Proposed BIN Hours	Existing Fan kW	Existing Fan kWh	Airflow Fraction	VFD Load Fraction	Proposed Fan kW	Proposed Fan kWh	kW Savings	kWh/Yr Savings
-17.5	5	0	13.1	65	0.20	0.05	0.7	-	12.4	65
-12.5	26	10	13.1	339	0.20	0.05	0.7	7	12.4	333
-7.5	26	7	13.1	339	0.20	0.05	0.7	5	12.4	335
-2.5	48	18	13.1	627	0.20	0.05	0.7	12	12.4	615
2.5	70	28	13.1	914	0.20	0.05	0.7	18	12.4	896
7.5	88	34	13.1	1,149	0.20	0.05	0.7	22	12.4	1,127
12.5	104	39	13.1	1,358	0.20	0.05	0.7	25	12.4	1,332
17.5	264	100	13.1	3,447	0.25	0.06	0.8	78	12.3	3,368
22.5	422	168	13.1	5,509	0.30	0.08	1.0	175	12.0	5,334
27.5	630	202	13.1	8,225	0.35	0.11	1.4	290	11.6	7,935
32.5	636	258	13.1	8,303	0.40	0.14	1.8	472	11.2	7,831
37.5	745	331	13.1	9,726	0.45	0.17	2.2	735	10.8	8,991
42.5	801	405	13.1	10,457	0.50	0.21	2.7	1,110	10.3	9,347
47.5	788	416	13.1	10,287	0.55	0.26	3.4	1,412	9.7	8,875
52.5	699	384	13.1	9,125	0.60	0.32	4.2	1,604	8.9	7,521
57.5	737	356	13.1	9,622	0.65	0.38	5.0	1,766	8.1	7,855
62.5	755	368	13.1	9,857	0.70	0.44	5.7	2,114	7.3	7,743
67.5	538	354	13.1	7,024	0.75	0.5	6.5	2,311	6.5	4,713
72.5	390	306	13.1	5,091	0.80	0.57	7.4	2,277	5.6	2,814
77.5	316	294	13.1	4,125	0.85	0.64	8.4	2,456	4.7	1,669
82.5	283	280	13.1	3,695	0.90	0.73	9.5	2,668	3.5	1,026
87.5	244	244	13.1	3,185	0.95	0.86	11.2	2,739	1.8	446
92.5	129	129	13.1	1,684	1.00	1.05	13.7	1,768	-0.7	(84)
97.5	11	11	13.1	144	1.00	1.05	13.7	151	-0.7	(7)
Total			13.1	114,297			4.3		8.7	90,080

Building: Lincoln Park Annex

CBECS Data

Electricity

Electric Intensity:	15.8 kWh/sqft	

	End-use %	End-use Intensity (kWh/sqft)	% Difference from CBECS data
Lighting	31%	4.96	0.0%
Cooling	19%	3.05	2.0%
Ventilation	17%	2.73	2.0%
Office Equip.	12%	1.94	-4.0%
Other	9%	1.36	0.0%
Heating	6%	0.98	1.9%
Water Heating	2%	0.30	-1.9%
Cooking	2%	0.25	0.0%
Refrigeration	1%	0.22	0.0%
	100.0%	16	

Natural Gas

Natural Gas Intensity:	38.7 kBtu/sqft	

Heating	72%	27.7	0.0%
Water Heating	20%	7.6	4.0%
Cooling	5%	1.9	-5.0%
Other	3%	1.2	0.0%
Cooking	1%	0.2	1.0%
	100.0%	38.7	

Estimated Building End Use

Electricity

Basline Consumption:	1,033,500 kWh/yr

	End-use %	End-use (kWh)
Lighting	31%	324,519
Cooling	21%	220,136
Ventilation	19%	199,466
Office Equip.	8%	85,781
Other	9%	88,881
Heating (pumping)	8%	83,714
Water Heating	0%	0
Cooking	2%	16,536
Refrigeration	1%	14,469
Total	100.0%	1,033,500

Natural Gas

Basline Consumption:	37,705	Therms

Heating	72%	26,997
Water Heating	24%	8,936
Cooling	0%	-
Other	3%	1,207
Cooking	2%	566
Total	100.0%	37,705

Lincoln Park Annex	Service Type	Account #	Meter #	Rate Code	Provider
	Electric	53-1957161-2	6357385	SG	Xcel
Month	**Facility Peak Demand (kW)**	**Facility Peak Demand Cost ($)**	**Electricity Consumption (kWH)**	**Electricity Consumption Cost ($)**	**Total Cost ($)**
January-11	269	$4,615	71,700	$2,383	$7,273
February-11	269	$4,634	66,600	$2,214	$7,240
March-11	269	$4,634	76,800	$2,693	$7,731
April-11	269	$4,634	82,500	$3,168	$8,229
May-11	269	$4,898	88,200	$3,387	$8,736
June-11	267	$5,406	103,800	$4,081	$9,981
July-11	279	$5,633	114,900	$4,691	$11,334
August-11	279	$5,633	109,800	$4,483	$10,664
September-11	279	$5,367	97,200	$3,910	$9,795
October-11	282	$4,859	71,400	$2,782	$8,094
November-11	279	$4,807	72,900	$2,840	$8,068
December-11	279	$4,798	77,700	$2,842	$8,061
Total	3,289	$59,918	1,033,500	$39,475	$105,205

Lincoln Park Annex	Service Type	Account #	Meter #	Rate Code	Provider
	Electric	53-1957161-2	6357385	SG	Xcel
Month	**Facility Peak Demand (kW)**	**Facility Peak Demand Cost ($)**	**Electricity Consumption (kWH)**	**Electricity Consumption Cost ($)**	**Total Cost ($)**
January-10	264	$3,369	73,200	$2,359	$7,203
February-10	171	$2,184	80,700	$2,600	$5,853
March-10	264	$3,367	60,300	$2,151	$6,966
April-10	210	$2,681	64,500	$2,597	$6,505
May-10	538	$8,312	87,000	$3,562	$14,107
June-10	269	$5,321	114,300	$4,581	$10,417
July-10	269	$5,331	93,600	$3,473	$9,264
August-10	269	$4,969	103,500	$3,840	$9,271
September-10	269	$4,714	24,900	$882	$5,898
October-10	269	$2,515	23,400	$756	$3,466
November-10	269	$4,541	176,700	$5,711	$10,788
December-10	269	$4,567	79,500	$2,595	$7,553
Total	3,330	$51,869	981,600	$35,105	$97,291

Lincoln Park Annex	Service Type	Account #	Meter #	Rate Code	Provider
	Electric	53-1957161-2	6357385	SG	Xcel
Month	**Facility Peak Demand (kW)**	**Facility Peak Demand Cost ($)**	**Electricity Consumption (kWH)**	**Electricity Consumption Cost ($)**	**Total Cost ($)**
January-09	161	$2,267	66,300	$1,559	$4,300
February-09	171	$2,408	71,100	$1,670	$4,583
March-09	213	$2,999	90,600	$2,206	$5,843
April-09	210	$2,957	87,600	$2,247	$5,835
May-09	246	$3,580	87,600	$2,247	$6,545
June-09	258	$3,921	117,300	$3,353	$8,305
July-09	258	$3,898	113,400	$3,713	$8,873
August-09	243	$3,672	113,400	$3,713	$8,596
September-09	243	$3,561	117,300	$3,925	$8,681
October-09	100	$1,393	69,900	$2,430	$4,377
November-09	207	$2,884	13,200	$479	$4,028
December-09	264	***$3,811***	77,400	***$2,260***	$7,394
Total	2,574	$37,350	1,025,100	$29,802	$77,359

Most Recent Year Totals:

	Facility Peak Demand (kW)	Facility Peak Demand ($)	Consumption (kWH)	Consumption ($)	Total ($)
	Total	Total	Total	Total	Total
	3,064	**$49,712**	**1,013,400**	**$34,794**	**$93,285**
Annual Peak	**282**				

231	70,400
204	72,800
249	75,900
230	78,200
351	87,600
265	111,800
269	107,300
264	108,900
264	79,800
217	54,900
252	87,600
271	78,200
351	1,013,400

Franktown Colorado

Latitude : 39° 23' 32" N
Longitude : 104° 45' 03" W
Elevation : 6158 ft.
Report Generated on: Aug. 3, 2012

Start Date : Jan. 1, 2011
End Date : Dec. 31, 2011
# of Days : 365 of 365
obs : poss : 8755 of 8760

Sub Interval Windows

	Start	End
Date	Jan. 01	Dec. 31
Hour	0	23

Average Air Temperature

Total number of Observations
Greater than or equal to initial interval value and Less than ending interval value.

Range Deg F		1 am	2 am	3 am	4 am	5 am	6 am	7 am	8 am	9 am	10 am	11 am	12 pm	1 pm	2 pm	3 pm	4 pm	5 pm	6 pm	7 pm	8 pm	9 pm	10 pm	11 pm	12 am	All Hrs
		Hour of day (L.S.T.)																								
-20 to -15	-17.5		1	2	1	1																				5
-15 to -10	-12.5	2	1	2	2	2	3	3	2	1	1									1	1	1	1	2	1	26
-10 to -5	-7.5	3	2				1			1		1				1	1	1	1	2	2	3	2	2	3	26
-5 to 0	-2.5	2	4	2	3	3	1	3	4		1	1	1	1	1			1	4	2	2	2	3	3	4	48
0 to 5	2.5	5	5	6	6	4	5	4	3	2	1	1	2	1	1	1	1	4	2	2	3	2	4	2	3	70
5 to 10	7.5	6	6	4	5	7	7	6	1	4	1	1	1	2	2	2	3	1	3	3	3	2	3	7	8	88
10 to 15	12.5	4	1	9	8	10	7	8	7	3	4	2	1				1	4	2	8	6	8	5	4	2	104
15 to 20	17.5	15	20	19	20	17	20	19	10	5	3	3	2	4	4	7	9	5	9	6	10	12	14	16	15	264
20 to 25	22.5	26	21	21	29	30	31	25	21	13	10	7	10	8	8	7	3	9	16	16	20	22	23	22	24	422
25 to 30	27.5	43	43	54	44	45	41	28	23	19	9	9	7	4	4	4	9	19	26	35	29	30	32	35	38	630
30 to 35	32.5	34	38	31	29	40	41	40	31	19	16	7	8	9	8	10	19	30	20	20	34	37	34	39	42	636
35 to 40	37.5	35	37	32	38	34	34	25	30	30	29	25	18	19	20	21	24	20	36	42	45	39	42	38	32	745
40 to 45	42.5	36	33	38	36	34	27	35	29	34	34	32	31	31	25	31	29	33	34	39	31	38	36	33	42	801
45 to 50	47.5	30	40	40	47	43	35	25	27	31	30	35	37	33	37	31	31	33	31	24	30	33	31	30	24	788
50 to 55	52.5	35	33	31	22	24	26	19	26	28	29	27	28	35	35	40	37	26	28	28	24	21	27	32	38	699
55 to 60	57.5	39	36	38	40	39	31	32	24	29	29	31	31	19	30	26	25	27	22	24	31	32	37	34	31	737
60 to 65	62.5	36	34	29	32	29	36	18	24	22	30	27	27	35	31	30	30	24	34	35	33	42	39	40	38	755
65 to 70	67.5	14	10	7	2	2	17	32	25	24	21	30	28	30	32	33	30	29	23	26	38	24	20	22	19	538
70 to 75	72.5				1		2	31	31	27	24	24	26	25	25	24	22	25	20	31	19	16	12	4	1	390
75 to 80	77.5							11	25	26	28	20	20	21	21	24	34	30	34	18	4					316
80 to 85	82.5								19	28	23	30	26	28	30	29	25	27	15	3						283
85 to 90	87.5								2	18	34	28	28	32	30	30	23	14	5							244
90 to 95	92.5									1	7	23	29	25	20	13	9	2								129
95 to 100	97.5										1	1	4	3	1	1										11
Total # obs.		365	365	365	365	364	365	364	364	365	365	365	365	365	365	365	365	364	365	365	365	364	365	365	365	8755
Average Deg F		40.9	40.2	39.5	39.1	38.6	39.8	44.1	49.6	54.4	58.1	60.8	62	62.3	61.6	60.6	58.5	54.6	50.9	47.7	45.4	44	43.1	42.2	41.3	49.1

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Franktown Colorado

Latitude : 39° 23' 32" N
Longitude : 104° 45' 03" W
Elevation : 6158 ft.
Report Generated on: Aug. 3, 2012

Start Date : Jan. 1, 2011
End Date : Dec. 31, 2011
# of Days : 365 of 365
obs : poss : 8755 of 8760

Sub Interval Windows

	Start	End
Date	Jan. 01	Dec. 31
Hour	0	23

Average Air Temperature

Total number of Observations
Greater than or equal to initial interval value and Less than ending interval value.
Hour of day (L.S.T.)

Range Deg F		1 am	2 am	3 am	4 am	5 am	6 am	7 am	8 am	9 am	10 am	11 am	12 pm	1 pm	2 pm	3 pm	4 pm	5 pm	6 pm	7 pm	8 pm	9 pm	10 pm	11 pm	12 am	All Hrs
-20 to -15	-17.5	0	0	0	0	0																				0
-15 to -10	-12.5	0	0	0	0	0	3	3	2	1	1									0	0	0	0	0	0	10
-10 to -5	-7.5	0	0	0	0	0	1			1		1				1	1	1	1	0	0	0	0	0	0	7
-5 to 0	-2.5	0	0	0	0	0	1	3	4		1	1	1	1	1			1	4	0	0	0	0	0	0	18
0 to 5	2.5	0	0	0	0	0	5	4	3	2	1	1	2	1	1	1	1	4	2	0	0	0	0	0	0	28
5 to 10	7.5	0	0	0	0	0	7	6	1	4	1	1	1	2	2	2	3	1	3	0	0	0	0	0	0	34
10 to 15	12.5	0	0	0	0	0	7	8	7	3	4	2	1				1	4	2	0	0	0	0	0	0	39
15 to 20	17.5	0	0	0	0	0	20	19	10	5	3	3	2	4	4	7	9	5	9	0	0	0	0	0	0	100
20 to 25	22.5	0	0	0	0	0	31	25	21	13	10	7	10	8	8	7	3	9	16	0	0	0	0	0	0	168
25 to 30	27.5	0	0	0	0	0	41	28	23	19	9	9	7	4	4	4	9	19	26	0	0	0	0	0	0	202
30 to 35	32.5	0	0	0	0	0	41	40	31	19	16	7	8	9	8	10	19	30	20	0	0	0	0	0	0	258
35 to 40	37.5	0	0	0	0	0	34	25	30	30	29	25	18	19	20	21	24	20	36	0	0	0	0	0	0	331
40 to 45	42.5	0	0	0	0	0	27	35	29	34	34	32	31	31	25	31	29	33	34	0	0	0	0	0	0	405
45 to 50	47.5	0	0	0	0	0	35	25	27	31	30	35	37	33	37	31	31	33	31	0	0	0	0	0	0	416
50 to 55	52.5	0	0	0	0	0	26	19	26	28	29	27	28	35	35	40	37	26	28	0	0	0	0	0	0	384
55 to 60	57.5	0	0	0	0	0	31	32	24	29	29	31	31	19	30	26	25	27	22	0	0	0	0	0	0	356
60 to 65	62.5	0	0	0	0	0	36	18	24	22	30	27	27	35	31	30	30	24	34	0	0	0	0	0	0	368
65 to 70	67.5	0	0	0	0	0	17	32	25	24	21	30	28	30	32	33	30	29	23	0	0	0	0	0	0	354
70 to 75	72.5	0	0	0	0	0	2	31	31	27	24	24	26	25	25	24	22	25	20	0	0	0	0	0	0	306
75 to 80	77.5	0	0	0	0	0		11	25	26	28	20	20	21	21	24	34	30	34	0	0	0	0	0	0	294
80 to 85	82.5	0	0	0	0	0			19	28	23	30	26	28	30	29	25	27	15	0	0	0	0	0	0	280
85 to 90	87.5	0	0	0	0	0			2	18	34	28	28	32	30	30	23	14	5	0	0	0	0	0	0	244
90 to 95	92.5	0	0	0	0	0				1	7	23	29	25	20	13	9	2		0	0	0	0	0	0	129
95 to 100	97.5	0	0	0	0	0					1	1	4	3	1	1				0	0	0	0	0	0	11
Total # obs.		365	365	365	365	364	365	364	364	365	365	365	365	365	365	365	365	364	365	365	365	364	365	365	365	4742
Average Deg F		40.9	40.2	39.5	39.1	38.6	39.8	44.1	49.6	54.4	58.1	60.8	62	62.3	61.6	60.6	58.5	54.6	50.9	47.7	45.4	44	43.1	42.2	41.3	49.1

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AC-4 Load Balance
Date: 28-Aug-12
Project: City of Greeley Colorado
Location: LPA
Measure: ECM 4 VAV Retrofit

Mark	HP	Load Factor	kW	Hours/Yr	kWh/yr
AC-1	10	0.7	5.2	3120	16,293
AC-2	10	0.7	5.2	3120	16,293
AC-3	3	0.7	1.6	3120	4,888
AC-4	25	0.7	13.1	8760	114,362
AC-5	3	0.7	1.6	3120	4,888
AC-6	15	0.7	7.8	3120	24,439
AC-7	5	0.7	2.6	3120	8,146
AC-8	5	0.7	2.6	3120	8,146
HV-9	3	0.7	1.6	3120	4,888
Total					202,342
EUA					199,466