



eCube[®] Pilot results



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Pilot Goals

Install and monitor eCube® at Store #413 (Covina, CA)

1. Confirm Energy savings on Walk in Cooler, Walk in Freezer, Victory Unit, and Cold Case Display
2. Confirm Maintenance Savings on Walk in Cooler, Walk in Freezer, Victory Unit, and Cold Case Display
3. Confirm payback period for rollout



Pilot Process

1. Install loggers on designated units
2. Monitor for 3 Days without eCube®
3. Install eCube®, monitor for additional 3 Days
4. Compare results



Loggers Used

Dent CT TOU Logger



***Measures Compressor Cycles
and Total Consumption***



Compressor & Logger



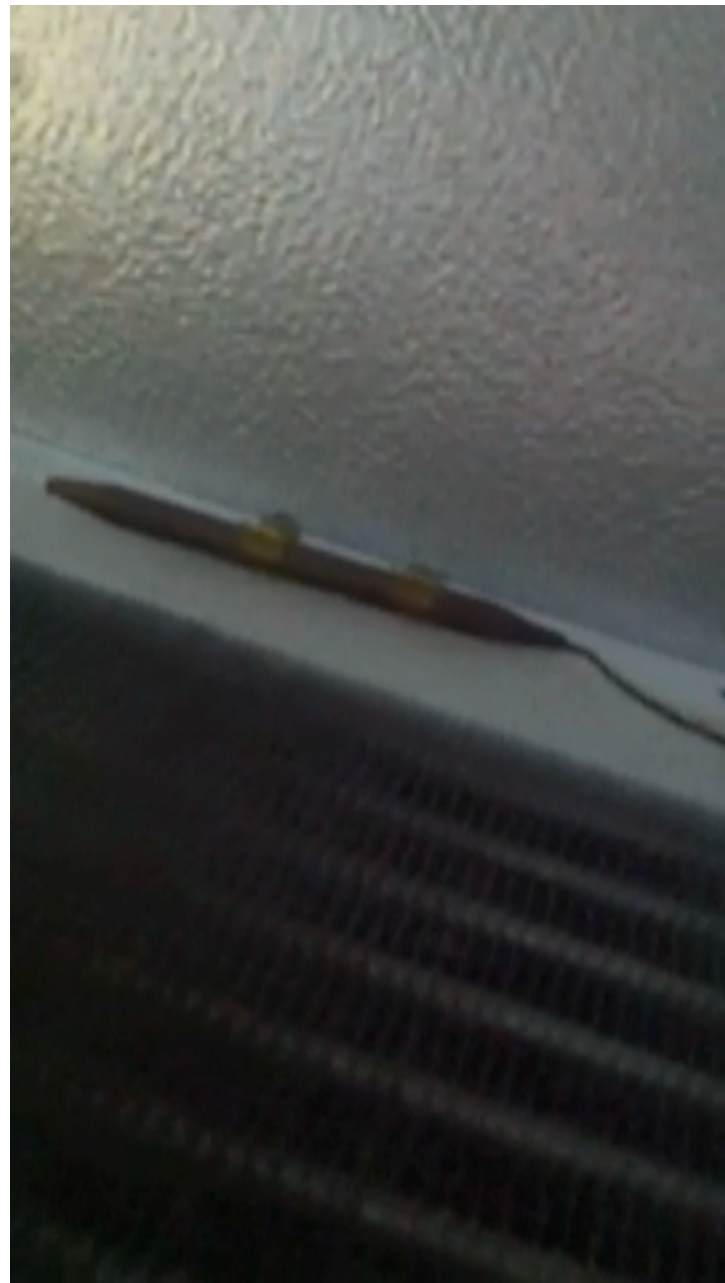
The logger is installed on the rooftop of the Ikea in Covina, CA. The logger is clamped around the hot lead on the compressor for the walk in freezer.



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Thermostat Probe Location



*The probe is located on the evaporator fan
at the Ikea in Covina, CA.*

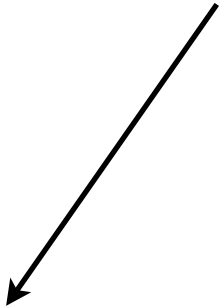


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Data File Name:	Ikea_Pre eCube_Walk in Cooler.log
Logger Serial Number:	CT09040136
Description:	Walk in Cooler
Logger Reset:	9/21/2011 2:56:24 PM
Elapsed Time Since Reset:	95.43 hrs
On-Time Since Reset:	53.10 hrs (223.0 kWh, \$26.76)
Percent On Since Reset:	55.64 %
Connected Load:	4.2 kW
Energy Cost:	\$0.12 per kWh
Data Starts:	9/21/2011 7:55:22 PM
Data Ends:	9/25/2011 2:22:53 PM
Data Elapsed Time:	90.46 hrs
Estimated Annual Hours On:	5047 hrs (21196.7 kWh, \$2543.61)
Number of Turn Ons:	229
Percent On:	57.61 %
Data On-Time:	52.12 hrs (218.9 kWh, \$26.27)
Average On-Time:	0.23 hrs (1.0 kWh, \$0.11)
Longest On-Time:	4.69 hrs (19.7 kWh, \$2.37)
Shortest On-Time:	0.10 hrs (0.4 kWh, \$0.05)
Number of Turn Offs:	230
Percent Off:	42.39 %
Data Off-Time:	38.34 hrs
Average Off-Time:	0.17 hrs
Longest Off-Time:	0.23 hrs
Shortest Off-Time:	< 0.01 hrs

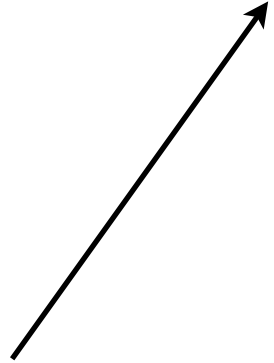
Cooler Data



Data File Name:	Ikea_Pre eCube_Walk in Freezer.log
Logger Serial Number:	CT10110066
Description:	Walk in Freezer
Logger Reset:	9/21/2011 3:54:38 PM
Elapsed Time Since Reset:	95.48 hrs
On-Time Since Reset:	62.90 hrs (301.9 kWh, \$36.23)
Percent On Since Reset:	65.88 %
Connected Load:	4.8 kW
Energy Cost:	\$0.12 per kWh
Data Starts:	9/21/2011 3:54:38 PM
Data Ends:	9/25/2011 3:23:54 PM
Data Elapsed Time:	95.49 hrs
Estimated Annual Hours On:	5779 hrs (27737.9 kWh, \$3328.54)
Number of Turn Ons:	270
Percent On:	65.97 %
Data On-Time:	62.99 hrs (302.4 kWh, \$36.28)
Average On-Time:	0.23 hrs (1.1 kWh, \$0.13)
Longest On-Time:	5.60 hrs (26.9 kWh, \$3.22)
Shortest On-Time:	< 0.01 hrs (0.0 kWh, \$0.00)
Number of Turn Offs:	271
Percent Off:	34.03 %
Data Off-Time:	32.50 hrs
Average Off-Time:	0.12 hrs
Longest Off-Time:	0.43 hrs
Shortest Off-Time:	< 0.01 hrs

Data File Name:	Ikea_Post eCube_Walk in Cooler.log
Logger Serial Number:	CT09040136
Description:	Walk in Cooler
Logger Reset:	9/25/2011 2:23:25 PM
Elapsed Time Since Reset:	96.03 hrs
On-Time Since Reset:	52.50 hrs (220.5 kWh, \$26.46)
Percent On Since Reset:	54.67 %
Connected Load:	4.2 kW
Energy Cost:	\$0.12 per kWh
Data Starts:	9/25/2011 7:55:22 PM
Data Ends:	9/29/2011 2:25:37 PM
Data Elapsed Time:	90.50 hrs
Estimated Annual Hours On:	3889 hrs (16333.2 kWh, \$1959.98)
Number of Turn Ons:	118
Percent On:	44.39 %
Data On-Time:	40.18 hrs (168.7 kWh, \$20.25)
Average On-Time:	0.34 hrs (1.4 kWh, \$0.17)
Longest On-Time:	1.28 hrs (5.4 kWh, \$0.65)
Shortest On-Time:	0.22 hrs (0.9 kWh, \$0.11)
Number of Turn Offs:	119
Percent Off:	55.61 %
Data Off-Time:	50.33 hrs
Average Off-Time:	0.42 hrs
Longest Off-Time:	1.79 hrs
Shortest Off-Time:	0.04 hrs

Logger output: Walk In's



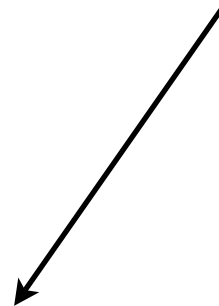
Data File Name:	Ikea_Post eCube_Walk in Freezer.log
Logger Serial Number:	CT10110066
Description:	Walk in Freezer
Logger Reset:	9/25/2011 3:24:23 PM
Elapsed Time Since Reset:	95.98 hrs
On-Time Since Reset:	37.30 hrs (179.0 kWh, \$21.48)
Percent On Since Reset:	38.86 %
Connected Load:	4.8 kW
Energy Cost:	\$0.12 per kWh
Data Starts:	9/25/2011 3:54:38 PM
Data Ends:	9/29/2011 3:23:54 PM
Data Elapsed Time:	95.49 hrs
Estimated Annual Hours On:	3379 hrs (16217.1 kWh, \$1946.05)
Number of Turn Ons:	119
Percent On:	38.57 %
Data On-Time:	36.83 hrs (176.8 kWh, \$21.21)
Average On-Time:	0.31 hrs (1.5 kWh, \$0.18)
Longest On-Time:	1.07 hrs (5.1 kWh, \$0.61)
Shortest On-Time:	< 0.01 hrs (0.0 kWh, \$0.00)
Number of Turn Offs:	119
Percent Off:	61.43 %
Data Off-Time:	58.66 hrs
Average Off-Time:	0.49 hrs
Longest Off-Time:	0.79 hrs
Shortest Off-Time:	< 0.01 hrs

Freezer Data



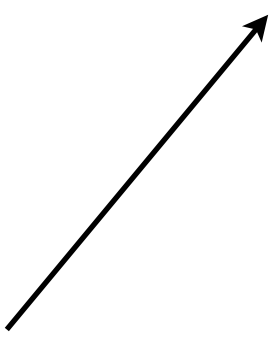
Data File Name:	Ikea_Pre eCube_Victory.log
Logger Serial Number:	CT10110071
Description:	Victory Unit
Logger Reset:	9/21/2011 3:50:39 PM
Elapsed Time Since Reset:	95.35 hrs
On-Time Since Reset:	64.20 hrs (141.2 kWh, \$16.95)
Percent On Since Reset:	67.33 %
Connected Load:	2.2 kW
Energy Cost:	\$ 0.12 per kWh
Data Starts:	9/21/2011 3:50:39 PM
Data Ends:	9/25/2011 3:11:42 PM
Data Elapsed Time:	95.35 hrs
Estimated Annual Hours On:	6094 hrs (13405.8 kWh, \$1608.69)
Number of Turn Ons:	824
Percent On:	69.56 %
Data On-Time:	66.33 hrs (145.9 kWh, \$17.51)
Average On-Time:	0.08 hrs (0.2 kWh, \$0.02)
Longest On-Time:	2.27 hrs (5.0 kWh, \$0.60)
Shortest On-Time:	< 0.01 hrs (0.0 kWh, \$0.00)
Number of Turn Offs:	824
Percent Off:	30.44 %
Data Off-Time:	29.02 hrs
Average Off-Time:	0.04 hrs
Longest Off-Time:	1.89 hrs
Shortest Off-Time:	0.02 hrs

Victory Unit Data



Data File Name:	Ikea_Pre eCube_Cold Case Display.log
Logger Serial Number:	CT10110054
Description:	Cold Case Display
Logger Reset:	9/21/2011 3:53:02 PM
Elapsed Time Since Reset:	95.25 hrs
On-Time Since Reset:	62.60 hrs (112.7 kWh, \$13.52)
Percent On Since Reset:	65.72 %
Connected Load:	1.8 kW
Energy Cost:	\$ 0.12 per kWh
Data Starts:	9/21/2011 3:53:02 PM
Data Ends:	9/25/2011 3:08:40 PM
Data Elapsed Time:	95.26 hrs
Estimated Annual Hours On:	5764 hrs (10375.7 kWh, \$1245.09)
Number of Turn Ons:	358
Percent On:	65.80 %
Data On-Time:	62.68 hrs (112.8 kWh, \$13.54)
Average On-Time:	0.18 hrs (0.3 kWh, \$0.04)
Longest On-Time:	3.54 hrs (6.4 kWh, \$0.76)
Shortest On-Time:	< 0.01 hrs (0.0 kWh, \$0.00)
Number of Turn Offs:	358
Percent Off:	34.20 %
Data Off-Time:	32.58 hrs
Average Off-Time:	0.09 hrs
Longest Off-Time:	0.96 hrs
Shortest Off-Time:	< 0.01 hrs

Logger output: Reach In's



Data File Name:	Ikea_Post eCube_Victory.log
Logger Serial Number:	CT10110071
Description:	Victory Unit
Logger Reset:	9/25/2011 3:12:32 PM
Elapsed Time Since Reset:	95.98 hrs
On-Time Since Reset:	66.90 hrs (147.2 kWh, \$17.66)
Percent On Since Reset:	69.70 %
Connected Load:	2.2 kW
Energy Cost:	\$ 0.12 per kWh
Data Starts:	9/25/2011 3:12:32 PM
Data Ends:	9/29/2011 3:11:42 PM
Data Elapsed Time:	95.99 hrs
Estimated Annual Hours On:	5238 hrs (11523.9 kWh, \$1382.87)
Number of Turn Ons:	694
Percent On:	59.80 %
Data On-Time:	57.40 hrs (126.3 kWh, \$15.15)
Average On-Time:	0.08 hrs (0.2 kWh, \$0.02)
Longest On-Time:	1.94 hrs (4.3 kWh, \$0.51)
Shortest On-Time:	< 0.01 hrs (0.0 kWh, \$0.00)
Number of Turn Offs:	694
Percent Off:	40.20 %
Data Off-Time:	38.59 hrs
Average Off-Time:	0.06 hrs
Longest Off-Time:	1.12 hrs
Shortest Off-Time:	0.02 hrs

Cold Case Display Data

Data File Name:	Ikea_Post eCube_Cold Case Display.log
Logger Serial Number:	CT10110054
Description:	Cold Case Display
Logger Reset:	9/25/2011 3:09:23 PM
Elapsed Time Since Reset:	95.98 hrs
On-Time Since Reset:	53.10 hrs (95.6 kWh, \$11.47)
Percent On Since Reset:	55.32 %
Connected Load:	1.8 kW
Energy Cost:	\$ 0.12 per kWh
Data Starts:	9/25/2011 3:09:23 PM
Data Ends:	9/29/2011 3:08:40 PM
Data Elapsed Time:	95.99 hrs
Estimated Annual Hours On:	4849 hrs (8728.0 kWh, \$1047.36)
Number of Turn Ons:	603
Percent On:	55.35 %
Data On-Time:	53.13 hrs (95.6 kWh, \$11.48)
Average On-Time:	0.09 hrs (0.2 kWh, \$0.02)
Longest On-Time:	2.62 hrs (4.7 kWh, \$0.57)
Shortest On-Time:	< 0.01 hrs (0.0 kWh, \$0.00)
Number of Turn Offs:	603
Percent Off:	44.65 %
Data Off-Time:	42.86 hrs
Average Off-Time:	0.07 hrs
Longest Off-Time:	0.97 hrs
Shortest Off-Time:	0.01 hrs



Energy Savings Walk in Cooler



- 21,196.7 Annualized kWh before eCube®
- 16,333.2 Annualized kWh after eCube®
- **22.95% Energy Savings**



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Energy Savings Walk in Freezer



- 27,737.9 Annualized kWh before eCube®
- 16,217.1 Annualized kWh after eCube®
- **41.54% Energy Savings**



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Energy Savings Victory Unit



- 13,405.8 Annualized kWh before eCube®
- 11,523.9 Annualized kWh after eCube®
- **14.04% Energy Savings**



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Energy Savings Cold Case Display



- 10,375.7 Annualized kWh before eCube®
- 8,728 Annualized kWh after eCube®
- **15.88% Energy Savings**

This unit needs to be serviced immediately due to short cycling



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Mechanical Savings Walk in Cooler



- 229 Compressor cycles before eCube®
- 118 Compressor cycles after eCube®
- **48.48% reduction in mechanical shock**



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Mechanical Savings Walk in Freezer



- 270 Compressor cycles before eCube®
- 119 Compressor cycles after eCube®
- **55.93% reduction in mechanical shock**



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Mechanical Savings Victory Unit



- 824 Compressor cycles before eCube®
- 694 Compressor cycles after eCube®
- **15.78% reduction in mechanical shock**



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*Total Financial Impact
For
Store # 413 (Covina, CA)*



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Current Consumption

Description	kWh	# of Units	Total kWh Consumption
Walk in Cooler	21,196.7	2	42,393.4
Walk in Freezer	27,737.9	1	27,737.9
Victory Unit	13,405.8	5	67029
Cold Case Display	10,375.7	10	103,757
Total		18	240,917.3



Energy Savings

- 56,856 kWh/year
- \$6,697 per year in Store #413 electricity savings
- Eliminates 35 tons of CO2 annually



Mechanical Savings

- 40% less mechanical shock
- \$200/year/unit savings
- \$3,605 per year in savings



Investment Summary

Energy Savings	\$6,697
Mechanical Savings	\$3,605
Total Annual Savings	\$10,302
eCube® Investment	\$8,982
IRR	114.70%
Payback Months	10.5

Investment based on customer-supplied data. Actual number of units required per location may vary from store to store.



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5 Year Savings

	Energy Savings	Mechanical Savings	Total
Year 1	\$6,697	\$3,605	\$10,302
Year 2	\$7,299.73	\$3,605	\$10,904.73
Year 3	\$7,956.71	\$3,605	\$11,561.71
Year 4	\$8,672.81	\$3,605	\$12,277.81
Year 5	\$9,453.36	\$3,605	\$13,058.36
Total	<u>\$40,079.61</u>	<u>\$18,025</u>	<u>\$58,104.61</u>

Investment based on customer-supplied data. Actual number of units required per location may vary from store to store.



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Appendix

- Affidavit of Authenticity
- Detailed logger results

