

# Getting To Zero Cost Effectively

Monitoring Data

Mike Duclos

Energy Efficiency Associates, LLC

DEAP Energy Group, LLC

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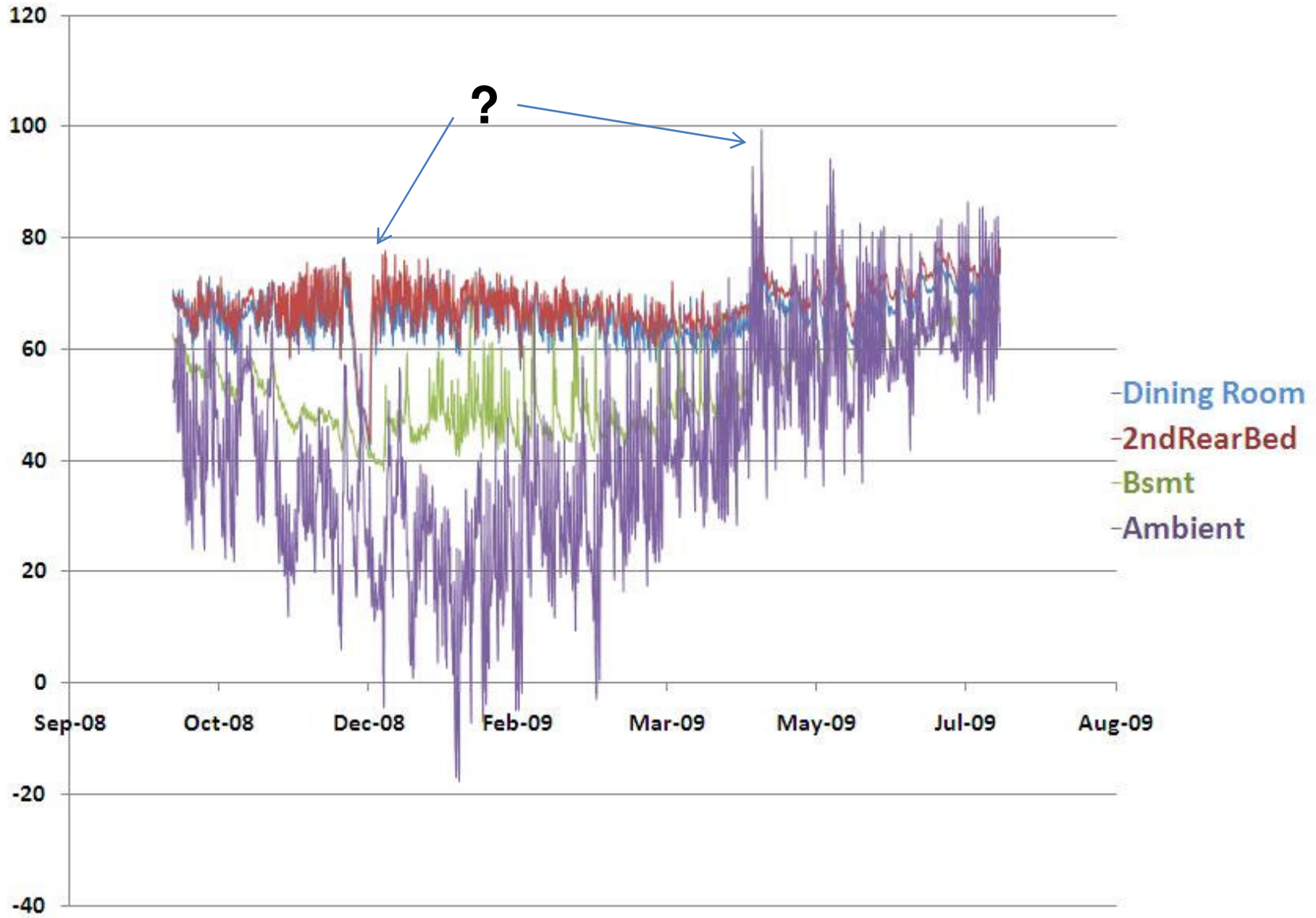
# 18 Coppersmith Way



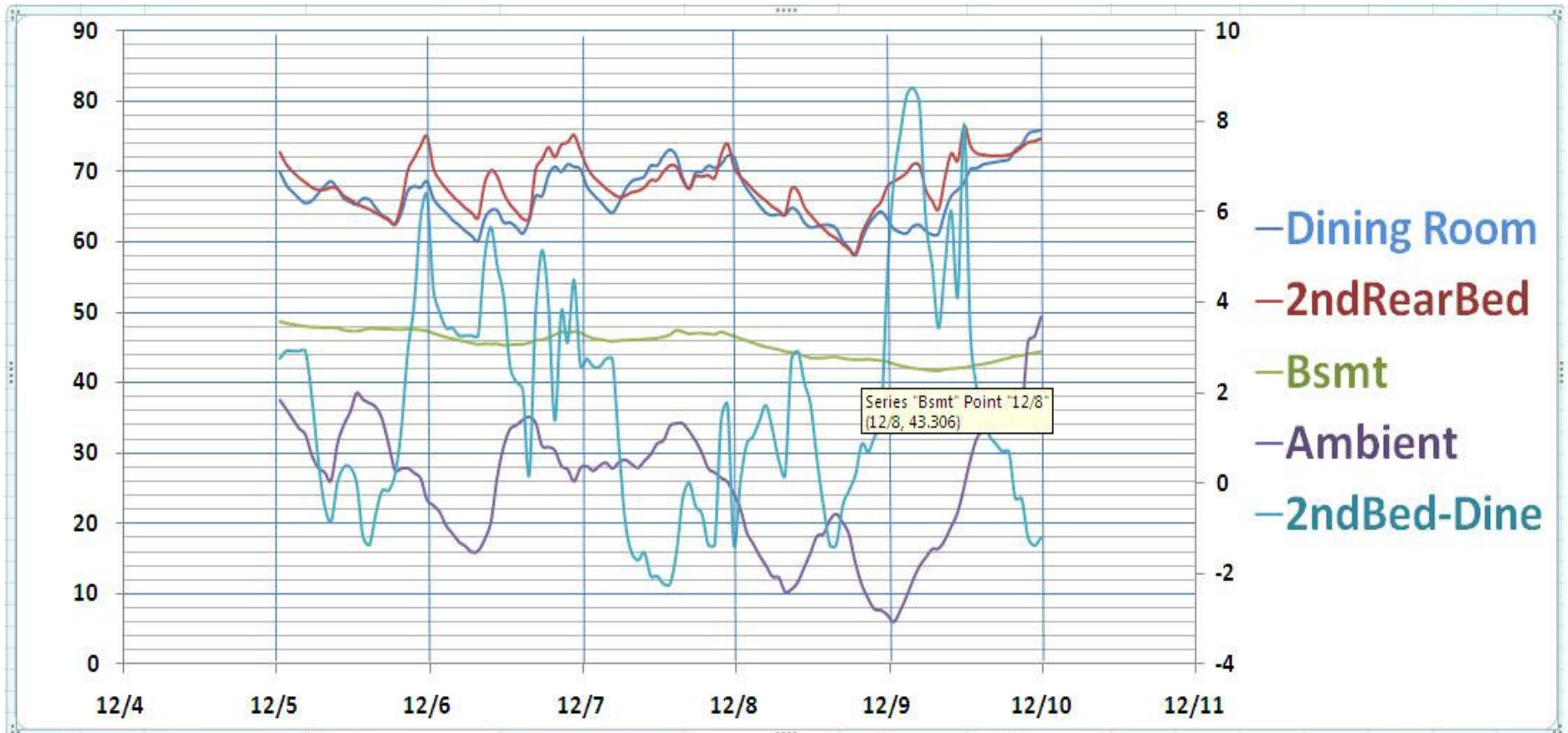
# Temp., RH, External Temp. Probe



# Full Data Set

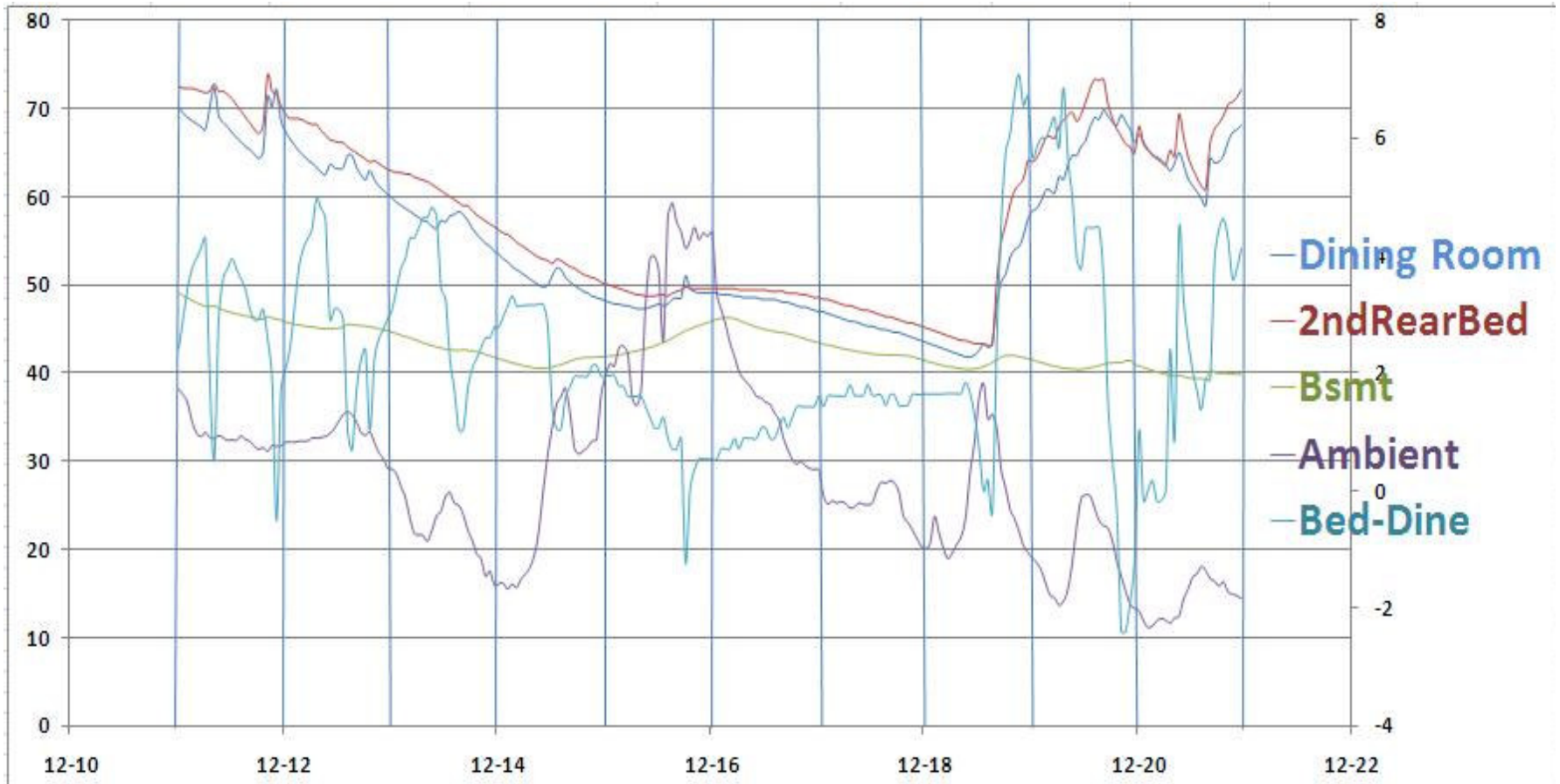


# Dec. 5 to Dec 10



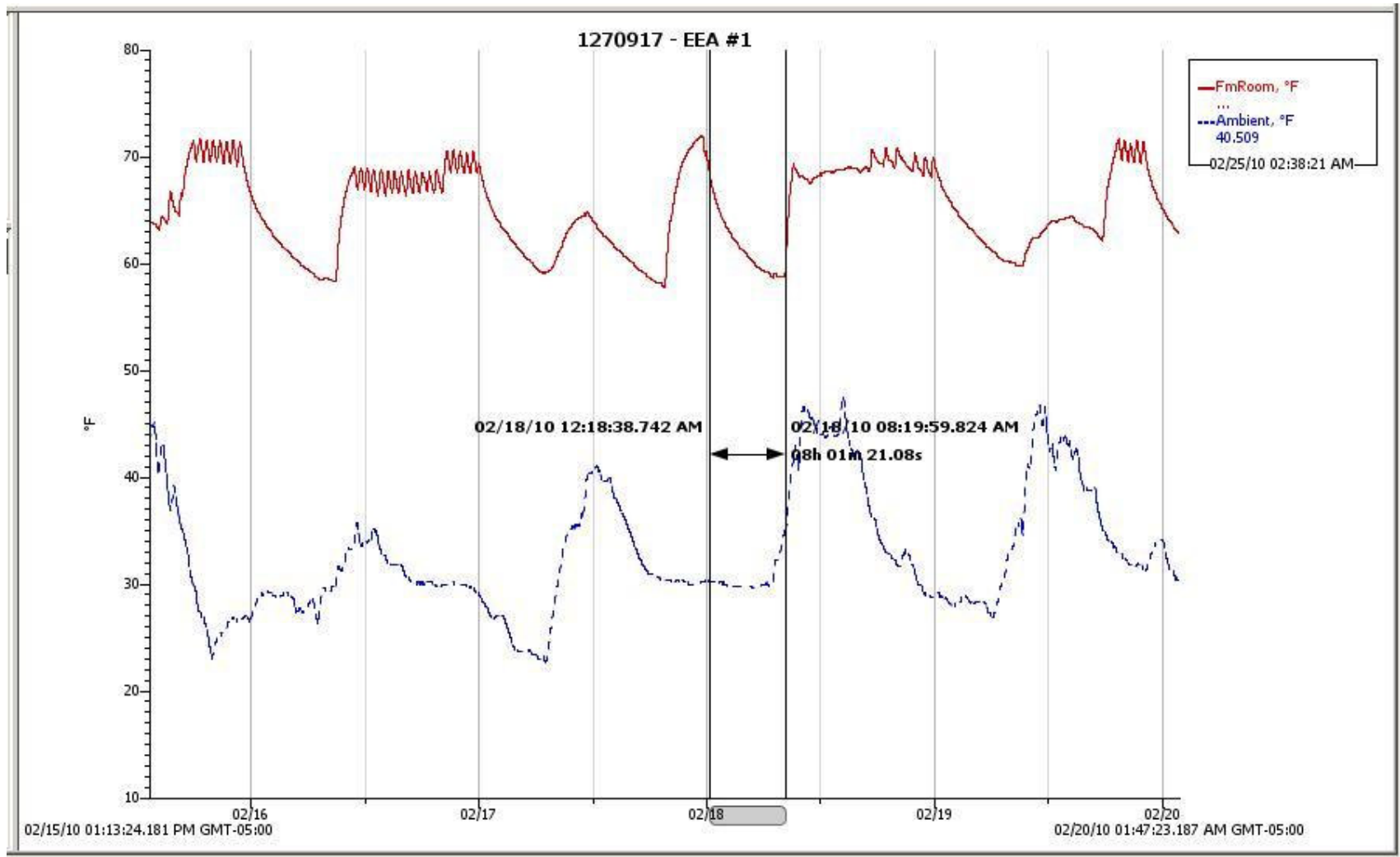
Summary	Dining Room	2ndRearBed	Basement	Ambient	Bed-Dine
Minimums	58.1	58.3	41.7	6.1	-2.2
Maximums	75.8	76.4	48.5	49.2	8.7
Average	66.3	68.0	45.4	25.1	1.7

# Dec. 11 to Dec 21

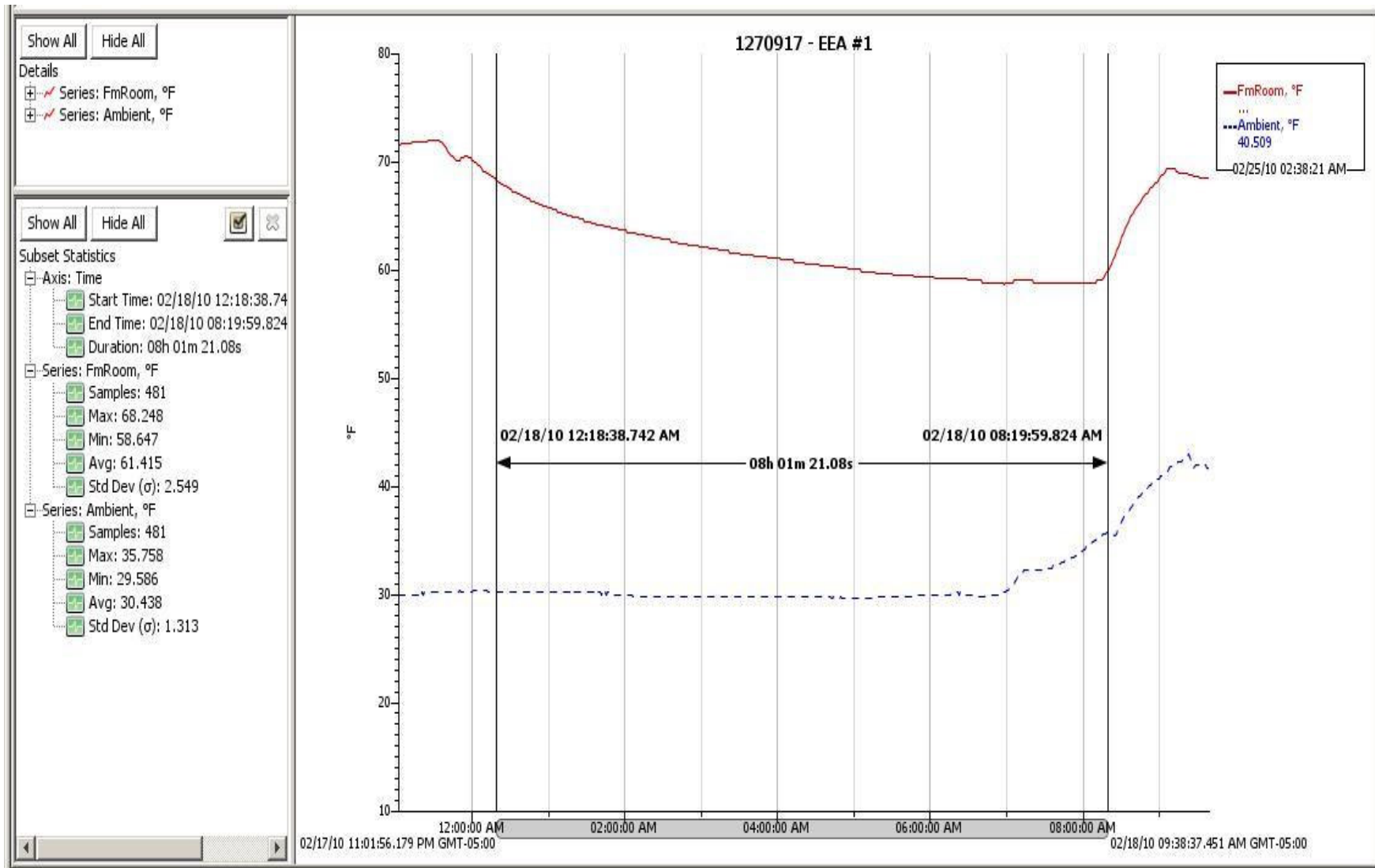


Summary	Dining Room	2ndRearBed	Basement	Ambient	Bed-Dine
Minimums	41.8	43.1	39.3	11.2	-2.4
Maximums	69.8	73.4	46.2	49.1	7.1
Average	53.7	56.0	41.7	23.8	2.2

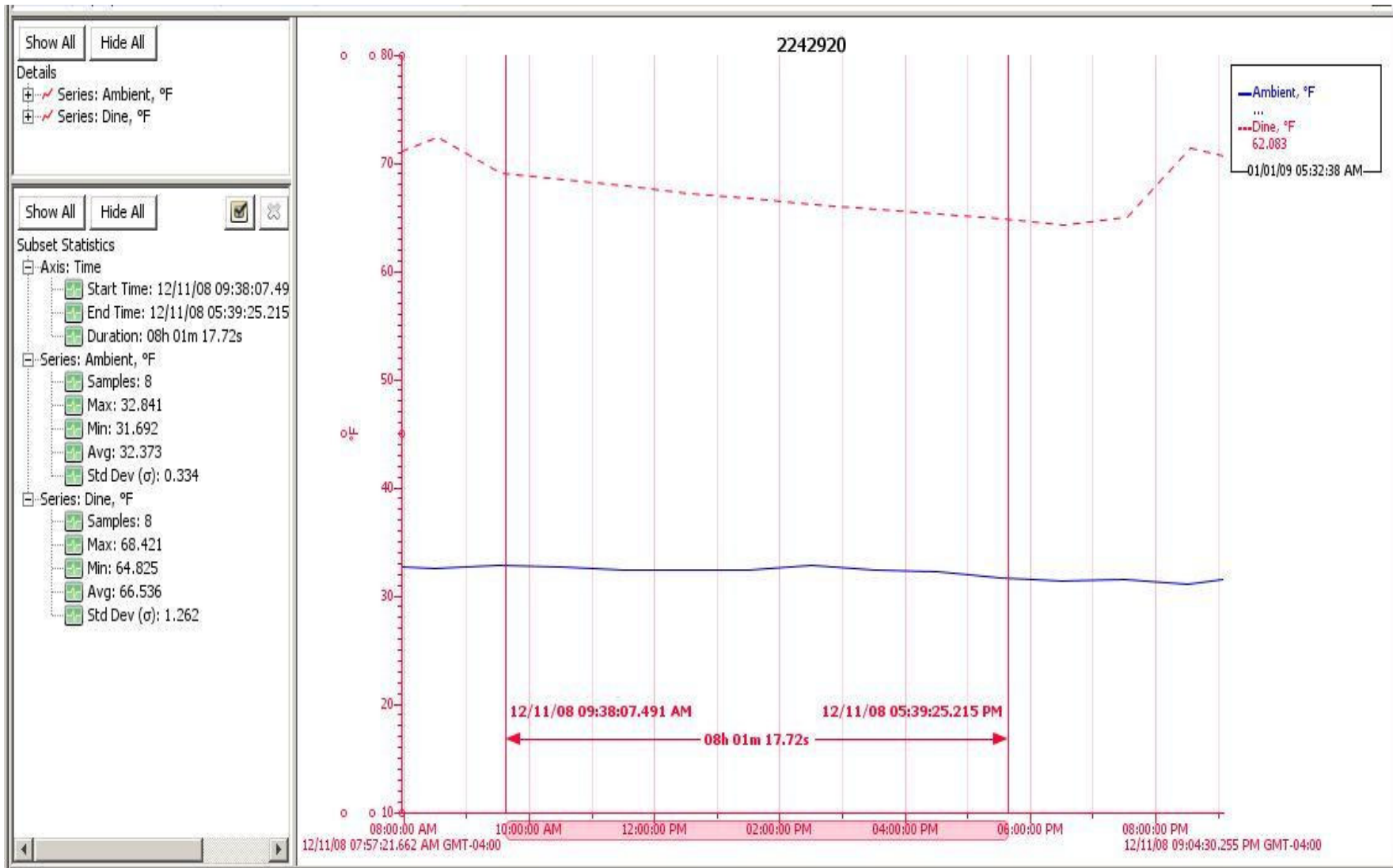
# Birch Hill



# Birch Hill



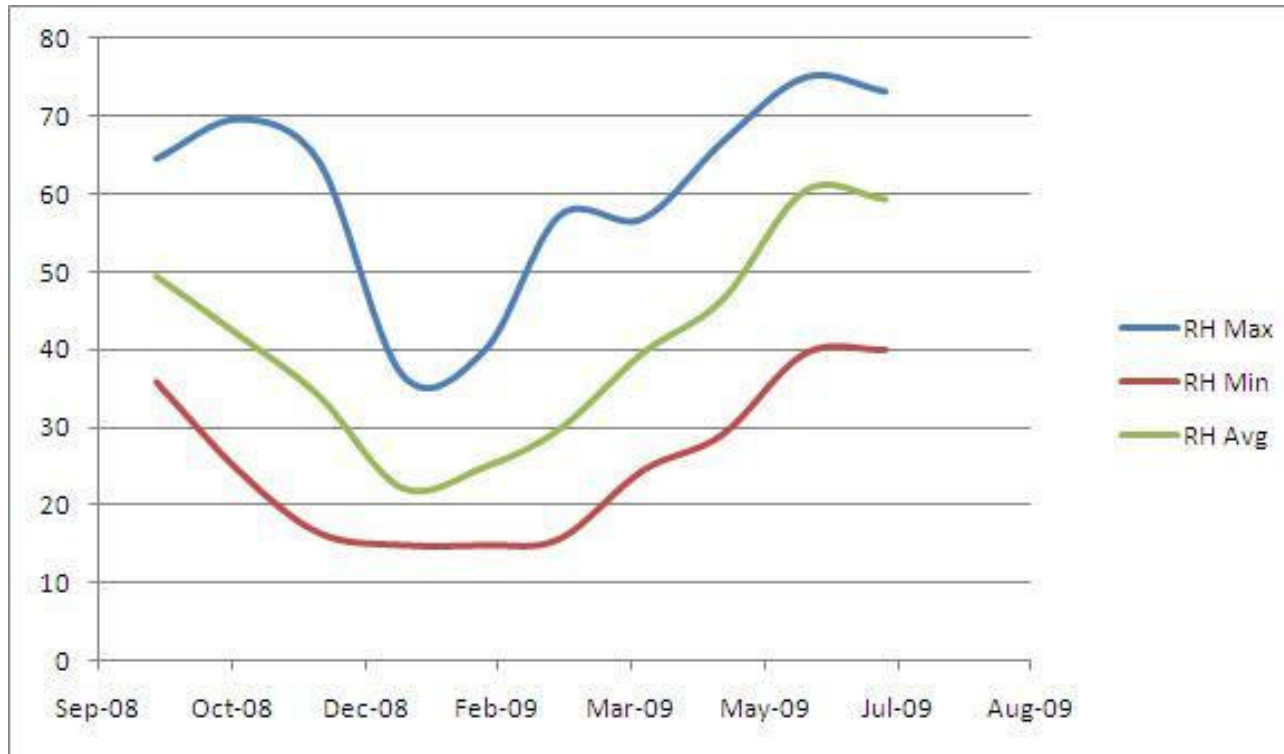
# Needham



# Passive Survivability

	Needham	Birch Hill	Delta
Start Room Temp	68.4	68.3	0.10
End Room Temp	64.8	58.6	6.20
Average Room Temp	66.5	61.4	5.10
<b>Temp Delta</b>	<b>3.6</b>	<b>9.7</b>	<b>(6.10)</b>
Start Ambient Temp	31.7	29.6	2.10
End Ambient Temp	32.8	35.8	(3.00)
Temp Delta	-28.1	-19.9	(8.20)
Average Ambient Temp	32.4	30.4	2.00
Ambient Delta Temp	1.1	6.2	(5.10)
Duration	481	481	0.00
Start Inside-Ambient Delta	36.7	38.7	(2.00)
End Inside-Ambient Delta	32	22.8	9.20

# Humidity



Month	RH Max	RH Min	RH Avg
Oct-08	64.62	35.84	49.47316
Nov-08	69.71	24.43	41.89181
Dec-08	64.18	16.54	34.08466
Jan-09	36.83	15	22.29985
Feb-09	40.03	15	25.01587
Mar-09	57.32	15.81	29.87786
Apr-09	56.88	24.51	39.59575
May-09	66.79	29.13	46.49466
Jun-09	75.09	39.52	60.48375
Jul-09	73.24	39.96	59.36836

# Current / Future Work

- Not quite Net Zero. Why ?
- Some reasons identified ...
- What is the actual envelope loss ?
- What is the actual ASHP COP ?
- Are there reasons for excess energy use/loss ?
- More experiments in progress ...

# Thank You !

- Questions ?

Energy Efficiency Associates, LLC  
DEAP Energy Group, LLC

[Mike\\_Duclos@ieee.org](mailto:Mike_Duclos@ieee.org)