Energy Savings Estimation Worksheet for Night Setback

Building Name: _____ **Location (city)** _____ **ECM No.** _____

ECM Description: _____

Instructions

Complete this form for each building where the winter Occupied Temperature will be reduced.

a) Complete the input assumptions and provide:
- a cost estimate for the proposed option.

b) The spreadsheet will calculate the savings for you.

Conversion Factors (CF)		
to	Conversion	Units
Electric	293	kWh/mmBtu
Natural Gas	10	Therms/mmBtu
Natural Gas	971	Cubic feet/mmBtu
#2 oil	7.2	Gallons/mmBtu
#6 oil	6.7	Gallons/mmBtu
Propane	10.5	Gallons/mmBtu

Input Assumptions

1) Floor Area..... **(FA)** 1,000 Square Feet

2) Unoccupied hours per day..... **(HPD)** 24 Hours/Day

3) Heating Degree Days for the site..... **(HDD)** 400

4) Current Unoccupied Heating Setpoint.... **(CUHS)** 72 °F

5) Proposed Unoccupied Heating Setpoint.. **(PUHS)** 45 °F

6) Average Winter Outdoor Temperature..... **(AWT)** 39 °F

7) Average Energy Cost Heating Fuel (e.g. kWh, Gal., therms)..... **(AEC)** $ 0.06 / kWh (heating unit)

8) Estimated Heating System Efficiency**..... **(HSE)** 100%

9) Estimated Project Cost..... **(PC)** $ -

10) Conversion Factor..... **(CF)** 293 kWh (Units)

Notes: * The value 0.198 is the estimated U-Factor (which is one over the total R-Value) for the walls and roof, and an adjustment to account for the wall area and assumes a square building and correction factor.
** The "estimated heating system efficiency" is the annual heating system efficiency; for gas or oil heat use 0.7, for electric resistance heat use 1.0, for heat pumps use 2.0.

Building Heat Loss = 0.198* x 1,000 (FA) x 24 (HPD) x 400 (HDD) / 1,000,000 = **A** 2 mmBtu/year

Total heat used = 2 (A) / 100% (HSE) = **B** 2 mmBtu/year

Existing Heating Energy Consumption = 2 (B) x 293 (CF) kWh (Units) /mmBtu = **C** 557 kWh /year (Heating Units/year)

72 (CUHS) - 39 (AWT) - 27 (CUHS - PUHS) = **D** 6

6 (D) / (72 (CUHS) - 39 (AWT)) = **E** 0.18

Future Heating Energy Consumption = 0.18 (E) x 557 (C) = **F** 101 kWh /year (Heating Units)

Estimated Energy Savings = 557 (C) - 101 (F) = **G** 456 kWh /year (Heating Units)

Dollar Savings = 456 (G) x $ 0.06 (AEC) = $ 29 $/year