3M
Window Film

Demand Analyzer Large Hotel Payback Analysis

Demand Analyzer utilizes the U.S. Department of Energy's sophisticated DOE-2 building energy analysis software for estimating energy savings for building projects. DOE-2 is a whole-building analysis program that calculates energy use and operating cost for each hour of the year, using typical weather data for the selected location. DOE-2 is widely used by consulting engineers for the design of energy-efficient buildings; by researchers for impact analysis of new heating, cooling and lighting technologies; and by state and federal agencies for developing energy-efficiency standards. DOE-2 is internationally recognized for the accuracy of its energy analysis algorithms as well as its ability to model a variety of buildings, HVAC systems and energy conservation measures.

Additional information about ITEM Systems and Demand Analyzer is available at http://www.halcyon.com/byrne and DOE-2 information can be found at http://gundog.lbl.gov.

The energy savings are based on methods using the U.S. Department of Energy's DOE-2 energy simulation program. The methods used are believed to be reliable, but the accuracy and completeness thereof is not and cannot be guaranteed. Neither the party presenting this report, AIMCAL, the referenced film manufacturer, or the film seller assumes liability in connection with the inability to realize the estimated energy savings shown.

1. To begin the Energy Simulation Process, please refer to the inputs below and answer each line item. Note, some questions have multiple choices, please check or circle the correct answer.

When complete fax to 3M Technical Service Attn:

This section to be filled out by the 3M Window Film Dealer

Category (Dealer Name)_____
Dealer Address
_____
Dealer Phone _____

Dealer Fax_____
Dealer Email _____
Description (Project Name)
_____

Films to be analyzed	**Cost per ft^2**

This section to be filled out by the building owner/facility engineer
General Information

2. Building type
    a. If this is not a large hotel please refer to the correct Demand Analyzer checklist
    b. A large office is a building with more than 3 stories and greater than 50,000 ft^2 floor area.
3. Building Age
    a. Pre 1978
    b. 1978-1992
    c. 1992-Present
4. Climate Zone (Project City) _____
5. Total Floor Area (All Floors)_____
6. Aspect Ratio: (Building length east-west)/(Building length north-south. For example, a square building this is 1, for a rectangular building take the length along the east west side and divide that length by the north south length) _____
7. Number of stories _____
8. Building Azimuth/Building **Orientation** (example, a rectangular building with each face pointing directly north south east and west would be 0degrees, if the building is turned clockwise so that north faces north-east, it would be 45 degrees) _____

Utility Rates

Electric

9. Energy cost per kWh _____
10. Demand cost per kW _____
11. Minimum demand cost per kW _____
12. Fixed cost per month _____
13. Minimum cost per month _____
14. Maximum effective rate per kWh _____

Gas

15. Energy cost per therm_____
16. Fixed cost per month _____
17. Minimum cost per month_____
18. Maximum effective rate per therm _____

19. Required: Annual Energy Cost for building _____
20. ***Also please attach latest energy bill

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21. Occupant Density
    a. Corridor _____ ft^2/person
    b. Guest Rooms_____ ft^2/person
    c. Kitchen_____ ft^2/person
    d. Restaurant_____ ft^2/person
    e. Lounge_____ ft^2/person
    f. Office_____ ft^2/person
    g. Lobby_____ ft^2/person
    h. Laundry_____ ft^2/person
22. Indoor Occupancy Sensors (Circle yes or no)
23. Indoor lighting
    a. Corridor _____ W/ ft^2
    b. Guest Rooms_____ W/ ft^2
    c. Kitchen_____ W/ ft^2
    d. Restaurant_____ W/ ft^2
    e. Lounge_____ W/ ft^2
    f. Office_____ W/ ft^2
    g. Lobby_____ W/ ft^2
    h. Laundry_____ W/ ft^2
24. Outdoor lighting type
    a. Mercury Vapor Lamps
    b. High Pressure Sodium Lamps
    c. Metal Halide Lamps
25. Electrical equipment
    a. Corridor _____ W/ ft^2
    b. Guest Rooms_____ W/ ft^2
    c. Kitchen_____ W/ ft^2
    d. Restaurant_____ W/ ft^2
    e. Lounge_____ W/ ft^2
    f. Office_____ W/ ft^2
    g. Lobby_____ W/ ft^2
    h. Laundry_____ W/ ft^2

Thermostat Setting

26. Heating Setback _____˚F
27. Lobby Heating _____˚F
28. Kitchen Heating _____˚F
29. Restaurant Heating_____˚F
30. Corridor Heating_____ ˚F
31. Vacant Guest Rooms Heating _____ ˚F
32. Occupied Guest Rooms Heating _____ ˚F
33. Cooling Setback _____˚F
34. Lobby Cooling _____˚F
35. Kitchen Cooling _____˚F
36. Restaurant Cooling _____˚F
37. Corridor Cooling _____ ˚F
38. Vacant Guest Rooms Cooling _____ ˚F
39. Occupied Guest Rooms Cooling _____ ˚F

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40. Ceiling roof insulation (R-value Typically R-11, with a typical upgrade to R-19) _____
41. Roof Absorbance (This is a value between 0 and 1, with a typical value of 0.8, lighter smoother roofs approach 0, with darker rougher roofs closer to 1)_____
42. Air Curtain Entrance (Circle yes or no)

Exterior Shading

43. North (Check yes or no)
44. East (Check yes or no)
45. South (Check yes or no)
46. West (Check yes or no)

Window Area ft^2

47. North _____ ft^2
48. East _____ ft^2
49. South _____ ft^2
50. West _____ ft^2

Window Setback ft

51. North _____ ft
52. East _____ ft
53. South _____ ft
54. West _____ ft

Window Shading/Window Treatments (The number here should be the % of time that the window treatments are open, if you have no blinds/drapes, or the blinds/drapes are always open this number should be 1, if the blinds/drapes are always closed this number should be 0)

55. North _____
56. East _____
57. South _____
58. West _____

Window Glass Type (ex 1/4" tinted insulated, or 1/8" single pane clear)

59. North _____ ft
60. East _____ ft
61. South _____ ft
62. West _____ ft

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63. Domestic hot water heater type
    a. Electric
    b. Gas
    c. Point of use
    d. Heat pump
64. Domestic hot water heater efficiency _____
65. Domestic hot water tank insulation (Circle yes or no)
66. Domestic hot water pipe insulation (Circle yes or no)
67. Domestic hot water circulation pump timeclock (Circle yes or no)

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68. Air handler type
    a. Constant volume reheat
    b. Variable air volume
    c. Powered induction units
69. Ventilation rate _____cfm/person
70. Oversized coils (Circle yes or no)
71. Duct insulation (Circle yes or no)
72. Air side economizer (Circle yes or no)
73. Kitchen Exhaust
    a. Standard Exhaust Hood
    b. Grease Extractor Hood
    c. Makeup Air Exhaust Hood
    d. Smoke Sensor Activated Hood
    e. Makeup Air Heat Exchanger
74. HVAC system clocks (Circle yes or no)
75. Energy management system (Circle yes or no)

76. Deadband thermostats (A deadband thermostat provides a range or a band of temperatures where neither the heating nor the cooling systems of an HVAC system operate. This type of thermostat prevents heating and cooling equipment from operating simultaneously, in immediate succession, or when room air characteristics require no conditioning of the air) (Circle yes or no)

Central Plant

77. Heating plant
    a. None
    b. Gas boilers
    c. Electric boilers

78. Cooling plant
    a. None
    b. Centrifugal chillers
    c. Reciprocating chillers
    d. Variable speed drive chillers
    e. Double bundle chillers
    f. Gas absorption chillers

79. Cooling tower
    a. None
    b. Centrifugal fans
    c. Propeller fans
    d. Two-Speed propeller fans
    e. Variable speed propeller fans

80. Heating plant efficiency _____
81. Hot water reset (Circle yes or no)
82. VSD hot water pumps (Circle yes or no)

83. Cooling plant efficiency _____
84. Chilled water reset (Circle yes or no)
85. VSD chilled water pumps (Circle yes or no)

86. Flue heat retriever (Circle yes or no)
87. Infrared space heaters (Circle yes or no)
88. Chiller strainer cycle (Circle yes or no)
89. Chiller optimizer (Circle yes or no)
90. Thermal energy storage (Thermal Energy Storage (TES) is the temporary storage of high or low temperature energy for later use. For heating or cooling of buildings, thermal storage translates into the storage of heating energy or cooling energy for use within the next 24 hours or in some cases, 7 days. This thermal storage is used to shift energy use to off-peak hours to take advantage of demand or time-of-use rate structures or to meet short term high loads with lower capacity equipment.) (Circle yes or no)
91. Indirect evaporative pre-cooling (An evaporative pre-cooler uses a wetted filter positioned on the suction side of the condenser fan. The filter is continuously kept wet. Air is drawn through the filter and across the condenser coils by the condenser fan. By evaporating water into the ambient air before it passes across the condenser coils, the ambient air is cooled, causing lower condenser temperatures.) (Circle yes or no)