

# Energy Audit Services

Part of the **UTILI-SERV™** MANAGEMENT PROGRAM

## FACILITY ENERGY ANALYSIS QUESTIONNAIRE

Return completed questionnaire to:

**Gibson Consulting Group**

**Fax: 724/836-1656**

**Questions??**

**Call: 724/836-5378**

Company Name: \_\_\_\_\_

Facility Name: \_\_\_\_\_

Completed By: \_\_\_\_\_

Telephone: \_\_\_\_\_

Date: \_\_\_\_\_

**Facility Overview**

1. Which category best characterizes your business? (Select one)

- Chemicals/petroleum refineries/oil & gas
- Communications/data centers/transaction processing hubs
- Property Management/retail outlets
- K-12 education
- Higher education
- Banking (lg branch)/insurance
- Pulp & paper/leather
- Printing & publishing
- Government
- Healthcare
- Electronics manufacturing
- Food processing
- Primary materials
- Manufacturing
- Recreation/sports/facilities
- Retail/wholesale/service
- Tourism/hotels
- Retail food/restaurants
- Transportation
- Other (please specify) \_\_\_\_\_

2. What type of facility is this? (Select one)

- Stand-alone retail
- Strip Mall
- Large Mall
- Grocery store
- Motel/hotel
- Elementary school
- Middle/high school
- Extended care
- High-rise office (4 stories or more)
- Low-rise office (3 stories or less)

3. When was your facility built? (Select one)

- 2000s
- 1990s
- 1980s
- 1970s
- 1960s
- 1950s
- 1940s
- 1930s
- 1920s
- Prior to 1920s

**Facility Overview** (continued)

4. Besides electricity, what fuel type(s) do you typically use?  
(Do not include fuels for backup heating or generation.)

\_\_\_\_\_ Natural Gas  
\_\_\_\_\_ Propane  
\_\_\_\_\_ Steam  
\_\_\_\_\_ Fuel oil

5. How long ago was a retrofit completed on your facility?  
Please indicate for each type of retrofit performed.

Building shell: (Select one)

\_\_\_\_\_ Less than 2 years  
\_\_\_\_\_ 2 – 5 years  
\_\_\_\_\_ 5 - 10 years  
\_\_\_\_\_ 10 – 15 years  
\_\_\_\_\_ 15 – 30 years  
\_\_\_\_\_ More than 30 years  
\_\_\_\_\_ Never

Lighting: (Select one)

\_\_\_\_\_ Less than 2 years  
\_\_\_\_\_ 2 – 5 years  
\_\_\_\_\_ 5 - 10 years  
\_\_\_\_\_ 10 – 15 years  
\_\_\_\_\_ 15 – 30 years  
\_\_\_\_\_ More than 30 years  
\_\_\_\_\_ Never

Heating, cooling & ventilation: (Select one)

\_\_\_\_\_ Less than 2 years  
\_\_\_\_\_ 2 – 5 years  
\_\_\_\_\_ 5 - 10 years  
\_\_\_\_\_ 10 – 15 years  
\_\_\_\_\_ 15 – 30 years  
\_\_\_\_\_ More than 30 years  
\_\_\_\_\_ Never

Domestic hot water: (Select one)

\_\_\_\_\_ Less than 2 years  
\_\_\_\_\_ 2 – 5 years  
\_\_\_\_\_ 5 - 10 years  
\_\_\_\_\_ 10 – 15 years  
\_\_\_\_\_ 15 – 30 years  
\_\_\_\_\_ More than 30 years  
\_\_\_\_\_ Never

**Facility Overview**, (continued)

1. What is the floor area of your facility that is heated or cooled? \_\_\_\_\_ ft<sup>2</sup>
2. What type of system do you use to heat and cool your facility? (Select one)  
Choose the selection which most closely matches your situation.  
  
\_\_\_\_\_ Constant volume  
\_\_\_\_\_ Constant volume, all electric heat  
\_\_\_\_\_ Constant volume, electric baseboards and reheat  
\_\_\_\_\_ Distributed heat pumps  
\_\_\_\_\_ Distributed heat pumps, electric boiler  
\_\_\_\_\_ Fan coils  
\_\_\_\_\_ Fan coils, all electric heat  
\_\_\_\_\_ Variable volume  
\_\_\_\_\_ Variable volume. All electric heat  
\_\_\_\_\_ Variable volume, electric baseboards and reheat
3. Is your facility air-conditioned? \_\_\_\_\_ Yes \_\_\_\_\_ No
4. What are the number of weekly, normal operating hours of the facility? \_\_\_\_\_
5. How many people occupy the facility during main operating hours? \_\_\_\_\_
6. How many months per year is the facility in use? \_\_\_\_\_

**\*Electric/Natural Gas Billing Data**

1. What is the total annual kWh usage of the facility? \_\_\_\_\_ (kWh)
2. What is the total annual kW for the facility? \_\_\_\_\_ (kW)
3. What is the cost per kWh for the facility? \$\_\_\_\_\_
4. What was the total annual electric cost for this facility? \$\_\_\_\_\_
5. What is the total annual Mcf, Ccf, Dth usage of the facility? \_\_\_\_\_
6. What is the cost per Mcf, Ccf, Dth for the facility? \$\_\_\_\_\_
7. What was the total annual natural gas cost for this facility? \$\_\_\_\_\_

*\* All information requested below can be found on your monthly electric and natural gas invoices. For multiple metered/billed accounts for the same facility, please aggregate/total all information and enter in spaces above.*

*Note: Some local natural gas utilities and/or suppliers bill in Mcf, Ccf or Dth.*

**Facility Shell Information**

1. Looking at the outside of your facility, how much of the wall area is made up of windows?

- \_\_\_\_\_ 0 – 10%
- \_\_\_\_\_ 11 – 20%
- \_\_\_\_\_ 21 – 30%
- \_\_\_\_\_ 31 – 40%
- \_\_\_\_\_ 41 – 50%
- \_\_\_\_\_ 51 – 60%
- \_\_\_\_\_ 61 – 70%
- \_\_\_\_\_ 71 – 80%
- \_\_\_\_\_ 81 – 90%
- \_\_\_\_\_ 91 – 100%

2. What type of windows do you have (overall window U-value)?

- \_\_\_\_\_ I don't know (use typical value)
- \_\_\_\_\_ 1 pane, aluminum frame, no thermal break (U-1.14)
- \_\_\_\_\_ 1 pane, aluminum frame, thermal break (U-0.96)
- \_\_\_\_\_ 2 panes, aluminum frame, no thermal break (U-0.87)
- \_\_\_\_\_ 2 panes, aluminum frame, thermal break (U-0.58)
- \_\_\_\_\_ 2 panes, curtain wall system (U-0.73)
- \_\_\_\_\_ 2 panes, wood or vinyl frame (U-0.55)
- \_\_\_\_\_ 2 panes, low-e, curtain wall system (U-0.57)
- \_\_\_\_\_ 2 panes, low-e, aluminum frame (U-0.50)
- \_\_\_\_\_ 2 panes, low-e, wood or vinyl frame (U-0.39)
- \_\_\_\_\_ 3 panes, low-e, aluminum frame (U-0.38)
- \_\_\_\_\_ 3 panes, low-e, wood or vinyl frame (U-0.31)

3. What is the color or tint of your windows (average shading coefficient)?

- \_\_\_\_\_ I don't know (use typical value)
- \_\_\_\_\_ Clear, 1 pane (SC-1.0)
- \_\_\_\_\_ Clear, 2 panes (SC-0.9)
- \_\_\_\_\_ Clear, low-e, 2 panes (SC-0.5)
- \_\_\_\_\_ Tinted, 1 pane (SC-0.8)
- \_\_\_\_\_ Tinted, 2 panes (SC-0.6)
- \_\_\_\_\_ Tinted, low-e, 2 panes (SC-0.4)
- \_\_\_\_\_ Reflective, 1 pane (SC-0.4)
- \_\_\_\_\_ Reflective, 2 panes (SC-0.2)

4. How are your walls constructed (overall R-value)?

- \_\_\_\_\_ I don't know (use typical value)
- \_\_\_\_\_ Metal stud, no insulation (R-2.5)
- \_\_\_\_\_ Metal stud, 3.5" (9 cm) batt insulation (R-7)

**Facility Shell Information**, (continued)

- \_\_\_\_\_ Metal stud, 5.5" (14 cm) batt insulation (R-12)
- \_\_\_\_\_ Metal stud, 1" (2.5 cm) rigid insulation (R-6)
- \_\_\_\_\_ Metal stud, 2" (5 cm) rigid insulation (R-10)
- \_\_\_\_\_ Curtain wall, 3.5" (9 cm) batt insulation (R-5)
- \_\_\_\_\_ Curtain wall, 5.5" (14 cm) batt insulation (R-7)
- \_\_\_\_\_ Wood stud, no insulation (R-3)
- \_\_\_\_\_ Wood stud, 3.5" (9 cm) batt insulation (R-10)
- \_\_\_\_\_ Wood stud, 5.5" (14 cm) batt insulation (R-17)

5. How is your roof constructed (overall R-value)?

- \_\_\_\_\_ I don't know (use typical value)
- \_\_\_\_\_ Attic, 6" (15 cm) batt insulation (R-18)
- \_\_\_\_\_ Attic, 12" (30 cm) batt insulation (R-36)
- \_\_\_\_\_ Concrete, 2" (5 cm) rigid common insulation (R-9)
- \_\_\_\_\_ Concrete, 4" (10 cm) rigid common insulation (R-17)
- \_\_\_\_\_ Concrete, 2" (5 cm) rigid polyiso insulation (R-16)
- \_\_\_\_\_ Concrete, 4" (10 cm) rigid polyiso insulation (R-30)
- \_\_\_\_\_ Wood truss roof, no insulation (R-4.5)
- \_\_\_\_\_ Wood truss roof, 6" (15 cm) batt insulation (R-22)
- \_\_\_\_\_ Wood truss roof, 12" (30 cm) batt insulation (R-39)

**Heating and Cooling**

1. What is the efficiency of your heating system?

- \_\_\_\_\_ I don't know (use typical value)
- \_\_\_\_\_ Below average (60%)
- \_\_\_\_\_ Average (70%)
- \_\_\_\_\_ Above average (80%)
- \_\_\_\_\_ High efficiency (90%)

2. How much of your facility is mechanically cooled?

- \_\_\_\_\_ I don't know (use typical value)
- \_\_\_\_\_ 25%
- \_\_\_\_\_ 50%
- \_\_\_\_\_ 75%
- \_\_\_\_\_ 100%

3. How efficient is your cooling system?

- \_\_\_\_\_ I don't know (use typical value)
- \_\_\_\_\_ Low efficiency air conditioners (COP-2.0)
- \_\_\_\_\_ Average efficiency air conditioners (COP-3.0)
- \_\_\_\_\_ High efficiency air conditioners (COP-4.0)
- \_\_\_\_\_ Low efficiency chillers (COP-3.5)
- \_\_\_\_\_ Average efficiency chillers (COP-4.5)
- \_\_\_\_\_ High efficiency chillers (COP-6.0)

**Heating and Cooling**, (continued)

4. Does your facility use outside air for “free cooling”?

\_\_\_\_\_ Yes      \_\_\_\_\_ No

5. What type of exhaust air heat recovery do you have? (Select one)

- \_\_\_\_\_ No heat recovery
- \_\_\_\_\_ Glycol run-around loop (35% effective)
- \_\_\_\_\_ Air-to-air heat recovery (50% effective)
- \_\_\_\_\_ Heat pipe (65% effective)
- \_\_\_\_\_ Enthalpy wheel (70% effective)

**Fans and Controls**

1. How much do you lower the temperature at night (or during off-peak times)?

- \_\_\_\_\_ I don't know (use typical value)
- \_\_\_\_\_ No setback (0°)
- \_\_\_\_\_ 2°F, 1.1°C
- \_\_\_\_\_ 5°F, 2.8°C
- \_\_\_\_\_ 10°F, 5.6°C

2. Do your air handling fans have variable speed control?

\_\_\_\_\_ Yes      \_\_\_\_\_ No

3. How much is your outdoor air is regulated using CO2 sensors? \_\_\_\_\_%

4. What is the minimum amount of outside air provided for ventilation? \_\_\_\_\_%

**Domestic Hot Water System (DHW)**

1. How is your service water primarily heated?

- \_\_\_\_\_ Electricity
- \_\_\_\_\_ Natural gas
- \_\_\_\_\_ Not heated

**Domestic Hot Water System (DHW) (continued)**

2. What is your facility's hot water usage on a typical day?

- I don't know (use typical value)
- Low (3 gal)
- Average (16 gal)
- High (80 gal)

3. What is the temperature of your domestic hot water?

- I don't know (use typical value)
- Mainly for hand washing (100°F)
- Low (120°F)
- Typical (140°F)
- High (160°F)

4. How efficient is your domestic hot water system?

- I don't know (use typical value)
- Below average (60%)
- Average (70%)
- Above average (80%)
- High efficiency (90%)

**Lighting and Miscellaneous**

1. What is your overall interior lighting load?

- I don't know (use typical value)
- Above average (1.8 W/ft<sup>2</sup>)
- Average (1.5 W/ft<sup>2</sup>)
- Below average (1.2 W/ft<sup>2</sup>)
- High efficiency (0.9W/ft<sup>2</sup>)

2. Do you have any indoor day lighting sensors and/or occupancy controls?  
Select up to two different combinations and enter the percent of floor area controlled.

Primary type of control system:

- Daylighting (on/off)
- Daylighting (multiple step dimming)
- Daylighting (continuous dimming)
- Occupancy sensors
- Occupancy and daylighting (on/off) in same area
- Occupancy and daylighting (multiple step dimming) in same area
- Occupancy and daylighting (continuous dimming) in same area

**Lighting and Miscellaneous**, (continued)

2. (continued)

What percent of floor area does this control? \_\_\_\_\_%

Secondary type of control system:

- \_\_\_\_\_ Daylighting (on/off)
- \_\_\_\_\_ Daylighting (multiple step dimming)
- \_\_\_\_\_ Daylighting (continuous dimming)
- \_\_\_\_\_ Occupancy sensors
- \_\_\_\_\_ Occupancy and daylighting (on/off) in same area
- \_\_\_\_\_ Occupancy and daylighting (multiple step dimming) in same area
- \_\_\_\_\_ Occupancy and daylighting (continuous dimming) in same area

What percent of floor area does this control? \_\_\_\_\_%

3. What is your overall general plug load?

- \_\_\_\_\_ I don't know (use typical value)
- \_\_\_\_\_ Low (0.5 W/ft<sup>2</sup>)
- \_\_\_\_\_ Below average (0.7 W/ft<sup>2</sup>)
- \_\_\_\_\_ Average (0.9 W/ft<sup>2</sup>)
- \_\_\_\_\_ Above average (1.1 W/ft<sup>2</sup>)
- \_\_\_\_\_ High (1.3 W/ft<sup>2</sup>)

4. What is your outdoor electrical load?

(This would include outdoor lighting and garage fans, for example.)

\_\_\_\_\_ kW

5. How many elevators (and/or escalators) are typically in operation in your facility?

- \_\_\_\_\_ None
- \_\_\_\_\_ 1 – 2
- \_\_\_\_\_ 3 – 4
- \_\_\_\_\_ 5 – 6
- \_\_\_\_\_ 7 – 8
- \_\_\_\_\_ 9 – 10
- \_\_\_\_\_ 11 – 12

6. What type of fuel is used for commercial cooking?

\_\_\_\_\_ Not applicable    \_\_\_\_\_ Electricity    \_\_\_\_\_ Natural gas

**Lighting and Miscellaneous** (continued)

7. On average, what is your daily maximum cooking load? (If applicable)

\_\_\_\_\_ kBtuh

8. Do you experience symptoms that might indicate a power quality problem in your facility?

\_\_\_\_\_ Yes      \_\_\_\_\_ No

**NOTE: ALL INFORMATION PROVIDED WILL REMAIN CONFIDENTIAL AND  
WILL ONLY BE UTILIZED FOR ENERGY ANALYSIS PURPOSES.**