

# Data Center Energy Profiler Questions Checklist

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## **Step 1**

<b>Case Name</b>	Fill in the blank
<b>Date Center Company</b>	Fill in the blank
<b>State/Region</b>	Select from the list
<b>County</b>	Select from the list
<b>Floor Area – Data Center Space</b>	Square feet or meters of data center space
<b>Floor Area – Non Data Center Space</b>	Square feet or meters of non data center space
<b>Floor Area – Data Center Support Space</b>	Square feet or meters of data center support space
<b>Type of Data Center</b>	<b>Select from list:</b> Colocation, Financial, Government, Other Corporate, Managed Disaster Recovery, Telecom Switches, ISP Routers, Operations/Processing, Data Storage, or Internet Service Provider
<b>Data Center Tier (Uptime Institution Definition)</b>	<b>Select from list:</b> Tier I, Tier II, Tier III, Tier IV, or mixed
<b>Current Data Center Build out Level</b>	%

**Step 2**

**Energy Management**

**Has an energy audit or commissioning been conducted within the last 2 years?**

Yes or No

**Is there a written energy management plan?**

Yes or No

**Is there an energy manager directly responsible for the energy management plan?**

**(Only asked if you have a written energy management plan)**

Yes or No

**Has upper management accepted the energy management plan?**

**(Only asked if you have a written energy management plan)**

Yes or No

**Is there an energy measurement and calibration program in place?**

Yes or No

**Is there a preventative maintenance program in place?**

Yes or No

## **IT Equipment**

**Do you measure and track IT equipment (storage, server & network) utilization?**

Yes or No

**Do you have a process for identifying abandoned/un-used servers and taking them offline?**

Yes or No

**What is the average age at which you replace your servers?**

**Select from the list:** 0-2yrs, 3yrs, 4yrs, or 5 or more years

**Are you using virtualization to consolidate your server workloads?**

Yes or No

**How extensive is your storage consolidation?**

**Select from the list:** 0%, 1% to 50%, 51% to 99%, or 100%

**What storage tiers have you implemented? (mark all that apply)**

**Select from the list:** More than one production tier, Archiving tier, or Near-line storage

**Have you implemented storage optimization techniques such as thin provisioning, incremental snapshots, or de-duplication?**

Yes or No

## Environmental Conditions

**What is a typical difference between supply and return air temperatures?**

**Select from the list:** 5 F (3 C), 10 F (6C), 15 F (8 C), 20 F (11 C), 25 F (14 C), 30 F (17 C), 35 F (19 C), 40 F (22 C)

**Has the temperature setpoint of the cooling system been optimized for the load?**

Yes or No

**What is a typical (average) supply temperature?**

**Select from the list:** 45 F (7 C), 50 F (10 C), 55 F (13 C), 60 F (16 C), 65 F (18 C), 70 F (21 C), 75 F (24 C), 80 F (27 C), or >80 F (>27 C)

**What is a typical (average) IT equipment intake temperature?**

**Select from the list:** 50 F (10 C), 55 F (13 C), 60 F (16 C), 65 F (18 C), 70 F (21 C), 75 F (24 C), 80 F (27 C), 85 F (29 C), or >85 F (>29 C)

**Do you have active, working humidification controls?**

Yes or No

**What type of humidifier do you have?**

**Select from the list: (Only asked if you have a automatic humidification controls)**

Electric, Steam, or Direct Evaporative

**What is the prevalent humidification setpoint? (% RH)**

**Select from the list: (Only asked if you have a automatic humidification controls)**

20%, 30%, 40%, or 50%

**Do you have dehumidification controls?**

Yes or No

**What is the prevalent dehumidification setpoint? (% RH)**

**Select from the list: (Only asked if you have a automatic dehumidification controls)**

≤ 40%, 50%, 60%, 70%, or ≥ 80%

**Where are air temperature and humidity sensors located?**

**Select from the list:** Air Return, Air Supply, IT Equipment Intake, IT Equipment Exhaust, or Other Location

**Do CRAC/H units have centralized (networked) or distributed controls?**

**Select from the list:** Centralized or Distributed

**Are there procedures and personnel/cable grounding equipment to prevent ESD?**

Yes or No

**Are CRACs/CRAHs fighting each other (for example, simultaneously humidifying and dehumidifying)?**

Yes or No

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**Does system have capability of taking slope and offset for sensor recalibration?**

Yes or No

## **Air Management**

**How many CRAC/CRAH/AHUs are there that operate under normal conditions?**

**Is there any supplemental cooling?**

**Select from the list:** None, In-Row Modular, Overhead, Rear-Door, or Liquid-Cooled Cabinet

**Does the CRAC/CRAH/AHU have a free cooling coil (water side economizer)?**

Yes or No

**Is there air-side free cooling?**

Yes or No

### **Air Supply Path**

**Select from the list:** Overhead Ducts, Overhead Plenum, Underfloor Plenum, or Free

**Is there a floor-tightness (sealing leaks) program in place? (Only asked if you employ Underfloor Plenum as your Air Supply Path)**

Yes or No

**Are the cable penetrations sealed?**

**Select from the list:** 0% to 10%, 11% to 89%, or 90% to 100%

**Is the cable build-up in the floor plenum or the over-head plenum more than 1/3 of the plenum height?**

Yes or No

**Is there a cable-mining (allow proper pressure distribution) program in place?**

Yes or No

**IT equipment in rows?**

Yes or No

**Is there a rack/lineup-tightness (using blanking panels) program in place?  
(Only asked if your IT equipment are in rows)**

Yes or No

**Degree of current implementation of alternating hot and cold aisles?**

**(Only asked if your IT equipment are in rows)**

**Select from the list:** Poor to None, Fair, or Good

**Degree of current efforts to minimize recirculated air at the racks (for example, blanking panels)?  
(Only asked if the degree of implementation is "Fair" or "Good")**

**Select from the list:** None to Poor, Fair, or Good

**Degree of current efforts to minimize bypass air at the racks (for example, sealing cable penetrations in the floor)?**

**(Only asked if the degree of implementation is "Fair" or "Good")**

**Select from the list:** Poor to None, Fair, or Good

**Supply air: Where are the overhead diffusers or perforated floor tiles placed?**

**(Only asked if the degree of implementation is "Fair" or "Good")**

**Select from the list:** Cold Aisles Only, Hot Aisles Only, Hot and Cold Aisles, or Not Applicable

**Is there a diffuser/tile-location (to conserve hot and cold aisles) program in place?**

**(Only asked if the degree of implementation is "Fair" or "Good")**

Yes or No

**Degree to which hot and cold aisles are currently fully enclosed?**

**(Only asked if the degree of implementation is "Fair" or "Good")**

**Select from the list:** Poor to None, Fair, or Good

**Supply fans?**

**Select from the list:** Constant Speed or Equipped with VFDs

**Do some areas of the data center have load densities that are more than 4 times the average load density?**

Yes or No

**Is the air-delivery system balanced to ensure correct airflow rates?**

Yes or No

**Is there an air-balancing (allow proper airflow distribution) program in place?**

Yes or No

## **Cooling Plant**

### **Cooling system type?**

**Select from the list:** Air-Cooled DX, Water-Cooled DX, Evaporatively-Cooled DX, or Chilled Water

### **Condenser cooling system**

**(Asked only if you answer Water-Cooled DX or Chilled Water as your cooling system type)**

**Select from the list:** Cooling Tower or Dry Cooler

### **Chiller type**

**(Asked only if you answer Chilled Water as your cooling system type)**

**Select from the list:** Air-Cooled or Water-Cooled

### **Water-side economizer**

**(Asked only if you answer Water-Cooled as your chiller type)**

**Select from the list:** None, Integrated, or Non-Integrated

### **Cooling tower fan control**

**(Asked only if you answer Cooling Tower as your condenser cooling system)**

**Select from the list:** Fixed Speed, Two-Speed Motor, or VSD

### **Type of valves**

**(Asked only if you answer Water-Cooled DX or Chilled Water as your cooling system type)**

**Select from the list:** 2-way or 3-way

**Do you have premium efficiency motors on all cooling supply fans, pumps, and cooling towers that serve the data center?**

Yes or No

**What is the redundancy level for HVAC systems?**

**Select from the list:** N, N+1, exceeds N+1, or 2N

## **IT Equipment Power Chain**

### **Is there an Uninterruptible Power Supply (UPS)?**

Yes or No

### **UPS Technology Type**

**(Asked only if you answer Yes to having a UPS)**

**Select from the list:** Double Conversion, Delta Conversion, Rotary, or Flywheel

### **What is the average load factor per active UPS module?**

**(Asked only if you answer Yes to having a UPS)**

**Select from the list:** 0% to 24%, 25% to 49%, or 50% to 100%

### **UPS Redundancy Configuration**

**(Asked only if you answer Yes to having a UPS)**

**Select from the list:** N, N+1, or 2N

### **Is there a standby generator?**

Yes or No

### **Standby Generator Power Configuration**

**(Asked only if you have a standby generator)**

**Select from the list:** N or N+1

### **Is there a generator block heater?**

**(Asked only if you have a standby generator)**

Yes or No

### **What is the power source for the block heater?**

**(Asked only if you have a block heater)**

Utility power or Alternate source

### **Is there a thermostat on the generator block heater?**

**(Asked only if you have a block heater)**

Yes or No

### **Are there PDUs with built-in transformers?**

Yes or No

### **What are the types of MV and LV transformer(s)?**

**(Asked only if have a PDUs with built-in transformers)**

**Select from the list:** Temp rise 80C, Temp rise >80C, TP1, or EPACT 2005

### **Average Load Factor per Active PDUs / Transformers**

**(Asked only if have a PDUs with built-in transformers)**

**Select from the list:** 0% to 24%, 25% to 49%, or 50% to 100%

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**What is the load balance between the phases?**

**(Asked only if have a PDUs with built-in transformers)**

**Select from the list:** Less than or equal to 20% or Greater than 20%

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## **Lighting**

**Lighting power density (watts per square foot)?**

**How are the lights controlled?**

**Select from the list:** Manual, Occupancy Sensor, or Timer

**What type of lamps are used?**

**Select from the list:** T-12, T-8, or T-5

**What type of ballasts are used?**

**Select from the list:** Magnetic or Electronic

### **Step 3**

(Note: Questions in this section are not required to be answered.)

#### **Supplied Electricity**

<b>Meter ID</b>	Fill in the blank
<b>Use per period</b>	Fill in the blank (numbers only)
<b>Unit</b>	Select from list: kWh, MWh, GWh, kJ, MJ, GJ, TJ, MMBtu
<b>Period</b>	Select from list: Annual, Quarterly, Monthly
<b>Cost per period</b>	Fill in the blank (numbers only)
<b>Source energy factor</b>	Fill in the blank (numbers only, a default value is provided)

#### **Supplied Fuel**

<b>Meter ID</b>	Fill in the blank
<b>Fuel Type</b>	Select from list
<b>Heating Value</b>	Fill in the blank (numbers only)
<b>Use per period</b>	Fill in the blank (numbers only)
<b>Unit</b>	Select from list
<b>Period</b>	Select from list: Annual, Quarterly, Monthly
<b>Cost per period</b>	Fill in the blank (numbers only)
<b>Source energy factor</b>	Fill in the blank (numbers only, a default value is provided)

#### **Imported Steam**

<b>Meter ID</b>	Fill in the blank
<b>Use per period</b>	Fill in the blank (numbers only)
<b>Use Unit</b>	Select from list
<b>Temperature</b>	Fill in the blank (numbers only)
<b>Temperature Unit</b>	Select from list: def F, deg C, R, K
<b>Pressure</b>	Fill in the blank (numbers only)
<b>Pressure Unit</b>	Select from list: Psia, Psig, KPa, MPa, Bars, Atmosphere
<b>Period</b>	Select from list: Annual, Quarterly, Monthly
<b>Cost per period</b>	Fill in the blank (numbers only)
<b>Source energy factor</b>	Fill in the blank (numbers only, a default value is provided)

#### **Chilled Water**

<b>Meter ID</b>	Fill in the blank
<b>Use per period</b>	Fill in the blank (numbers only)
<b>Unit</b>	Select from list: ton-hours, MMBtu
<b>Period</b>	Select from list: Annual, Quarterly, Monthly
<b>Cost per period</b>	Fill in the blank (numbers only)
<b>Source energy factor</b>	Fill in the blank (numbers only, a default value is provided)

#### **Step 4**

(Note: Questions in this section are not required to be answered.)

#### **Electricity Energy Distribution**

<b>IT Load Usage (kWh)</b>	Fill in the blank (numbers only)
<b>Lights Usage (kWh)</b>	Fill in the blank (numbers only)
<b>Electric Distribution Losses Usage (kWh)</b>	Fill in the blank (numbers only)
<b>Fans Usage (kWh)</b>	Fill in the blank (numbers only)
<b>Cooling and Humidity Controls Usage (kWh)</b>	Fill in the blank (numbers only)
<b>Remainder (Non-Data Center Use) Usage (kWh)</b>	Fill in the blank (numbers only)
<b>IT Load Usage (%)</b>	Fill in the blank (numbers only)
<b>Lights Usage (%)</b>	Fill in the blank (numbers only)
<b>Electric Distribution Losses Usage (%)</b>	Fill in the blank (numbers only)
<b>Fans Usage (%)</b>	Fill in the blank (numbers only)
<b>Cooling and Humidity Usage (%)</b>	Fill in the blank (numbers only)
<b>Remainder (Non-Data Center Use) Usage (%)</b>	Fill in the blank (numbers only)

(Note: Usage can only be entered as kWh or as a percentage, not both.)

#### **Fuel Energy Distribution**

<b>Cooling and Humidity Controls Usage (kWh)</b>	Fill in the blank (numbers only)
<b>Remainder (Non-Data Center Use) Usage (kWh)</b>	Fill in the blank (numbers only)
<b>Cooling and Humidity Usage (%)</b>	Fill in the blank (numbers only)
<b>Remainder (Non-Data Center Use) Usage (%)</b>	Fill in the blank (numbers only)

(Note: Usage can only be entered as kWh or as a percentage, not both.)

#### **Imported Steam**

<b>Cooling and Humidity Controls Usage (kWh)</b>	Fill in the blank (numbers only)
<b>Remainder (Non-Data Center Use) Usage (kWh)</b>	Fill in the blank (numbers only)
<b>Cooling and Humidity Usage (%)</b>	Fill in the blank (numbers only)
<b>Remainder (Non-Data Center Use) Usage (%)</b>	Fill in the blank (numbers only)

(Note: Usage can only be entered as kWh or as a percentage, not both.)

#### **Chilled Water**

<b>Cooling and Humidity Controls Usage (kWh)</b>	Fill in the blank (numbers only)
<b>Remainder (Non-Data Center Use) Usage (kWh)</b>	Fill in the blank (numbers only)
<b>Cooling and Humidity Usage (%)</b>	Fill in the blank (numbers only)
<b>Remainder (Non-Data Center Use) Usage (%)</b>	Fill in the blank (numbers only)

(Note: Usage can only be entered as kWh or as a percentage, not both.)