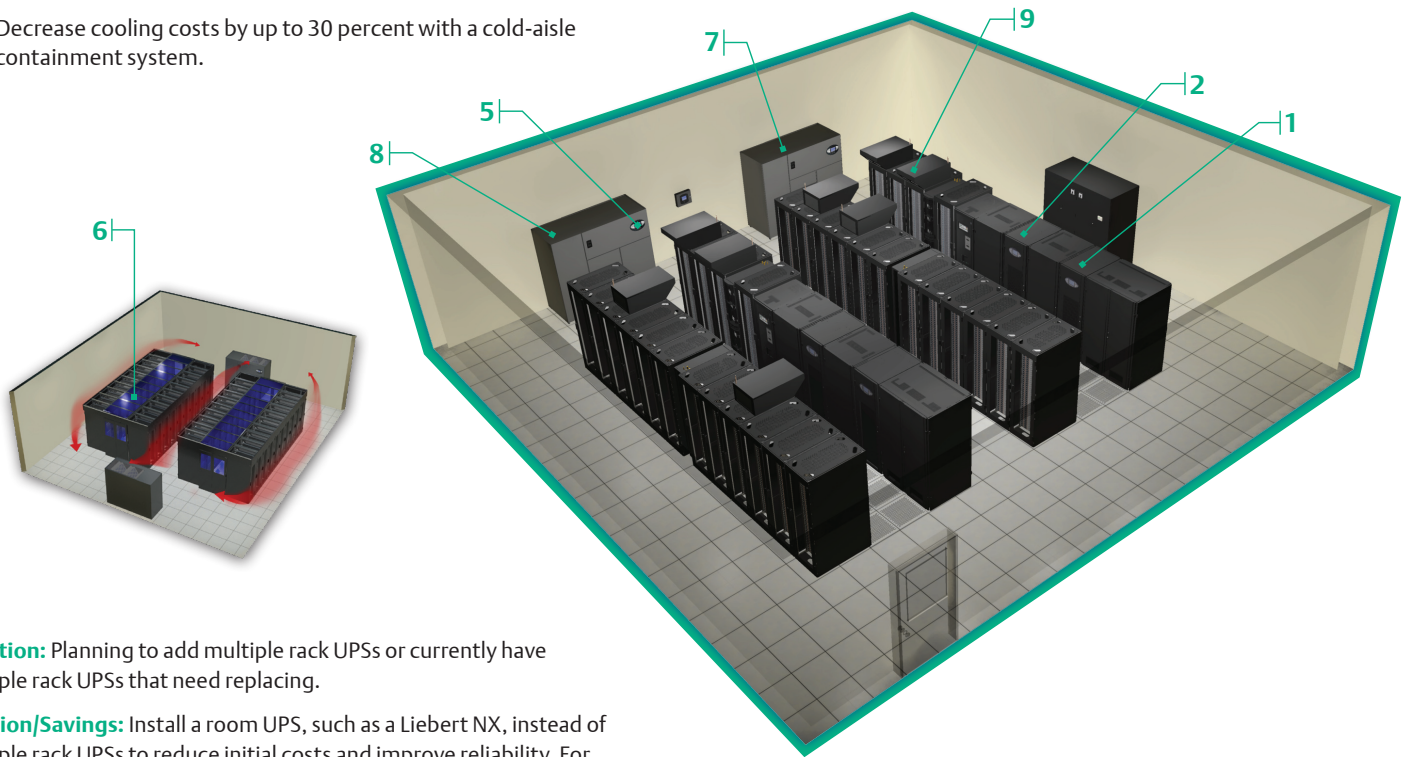


# Cutting Costs from the Data Center

## 11 Ways to Improve Energy Efficiency and Reduce Expenses

- 1 Reduce UPS costs by up to 24 percent by using a room UPS system instead of multiple rack UPSs.
- 2 Buy a room UPS sized for anticipated growth to save money compared to continually purchasing rack UPSs.
- 3 Switch from line-interactive rack UPSs to on-line rack UPSs to gain higher reliability and save up to 43 percent on maintenance and battery replacement costs.
- 4 Use precision cooling instead of comfort cooling (building air conditioning systems) to decrease operating costs and better protect equipment.
- 5 Reduce energy usage of multiple cooling systems by up to 7 percent with Liebert iCOM controls.
- 6 Decrease cooling costs by up to 30 percent with a cold-aisle containment system.
- 7 Cut cooling system compressor energy usage by up to 30 percent with Digital Scroll™ technology.
- 8 Save up to 25 percent a year on cooling system energy costs by taking advantage of cold outside air.
- 9 Use supplemental cooling to reduce the costs of cooling high density equipment by up to 32 percent.
- 10 Use underfloor fans with chilled water cooling systems to reduce fan energy consumption by up to 65 percent.
- 11 Switch computer room air conditioner fans to variable speed drive fans to decrease energy consumption.



- 1 Situation:** Planning to add multiple rack UPSs or currently have multiple rack UPSs that need replacing.

**Solution/Savings:** Install a room UPS, such as a Liebert NX, instead of multiple rack UPSs to reduce initial costs and improve reliability. For example, the Liebert NX 30kVA costs approximately 24 percent less when compared to adding six Liebert GXT2 6kVA UPSs. Long-term cost savings will also be realized from longer battery life and less maintenance.

- 2 Situation:** Planning to buy rack UPSs and expect power demands to increase in the next three to five years.

**Solution/Savings:** Buy a room UPS now with capacity to support future growth instead of buying rack UPSs now and adding more later, including replacement batteries. For example, if you purchased six rack UPSs (6000kVA) to support 25kW and then your demand doubles to 50kW, you'd need to purchase six more rack UPSs. You can save up to 40 percent if you purchase one room UPS at 60kW.

- 3 Situation:** Need to replace aging line-interactive rack UPSs.

**Solution/Savings:** Replace with on-line UPSs. Over a three-year period, you can save up to 43 percent on maintenance and battery replacement costs compared with a line-interactive UPS (assumes one battery replacement), and 50 percent over a five-year period. The on-line UPS also offers higher reliability and better power conditioning to prevent downtime.

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- 4 | Situation:** Currently considering comfort cooling (building air conditioning system) to protect IT equipment.

**Solution/Savings:** Using precision cooling, you can reduce operating costs and gain the advantages that precision cooling provides: year-round, 24x7 cooling, humidity control, better air filtration and more efficient cooling.

When a 10-ton precision cooling system was compared with a 15-ton comfort cooling system required to provide the same level of cooling for computer equipment, the precision system saved more than \$10,000 in annual costs – providing a 12-month payback for the additional purchase cost of a precision system when compared to the cost of a comfort system.

- 5 | Situation:** Have multiple cooling systems in the data center.

**Solution/Savings:** If cooling systems in a data center work independently, you run the risk of over-humidifying or over-dehumidifying the room since the systems are not aware of what the others are doing. Liebert iCOM centralizes control of the systems and synchronizes their operations. This coordinated control can reduce cooling energy costs up to 7 percent over traditional controls. Liebert iCOM retrofit kits are available for many Liebert systems.

- 6 | Situation:** Have hot spots in rack rows.

**Solution/Savings:** A cold-aisle containment system physically encloses rack rows and their cold aisles to improve the cooling efficiency. You can save more than 30 percent on energy to cool high density equipment over non-contained aisles. Cold-aisle containment systems can be used in non-raised and raised floor environments.

- 7 | Situation:** Buying a new cooling system and want optimal performance and reduced energy costs.

**Solution/Savings:** Liebert solutions using Digital Scroll technology can reduce energy consumption by up to 30 percent on an air-cooled system and up to 20 percent on a Glycol-cooled system. Digital Scroll compressor technology matches cooling to the changing demands of the room without cycling compressors on and off.

- 8 | Situation:** Data center is located in region with cold winter months.

**Solution/Savings:** Liebert cooling systems with a GLYCOOL option use cold outdoor temperatures to reduce or eliminate compressor runtime to save energy. By using cold outside air, you can save up to 25 percent on the energy required to run a cooling system annually (based on a winter average temperature of 35°F).

- 9 | Situation:** Have hot spots in racks.

**Solution/Savings:** Use supplemental cooling. By placing a high density cooling system, such as the Liebert XD, closer to the heat source, you can reduce the energy required to cool equipment by 27 to 32 percent compared to using only the data center precision cooling system. Liebert XD solutions also include an integrated cooling cabinet, the Liebert XDF, for smaller applications.

- 10 | Situation:** Want to install energy-efficient chilled water cooling system.

**Solution/Savings:** Using underfloor fans, such as EC Plug fans, with chilled water cooling systems can reduce fan energy consumption by up to 65 percent compared with traditional centrifugal blowers. The EC Plug fans are positioned horizontally under the floor so turning vanes are not required, and the fans are variable speed in nature so they can easily adjust speeds based on the changing room requirements, consuming less energy.

Liebert CW (chilled water) cooling system is available with EC Plug Fans and variable speed drive fans – also a great option to reduce energy costs.

- 11 | Situation:** Interested in fan options that can reduce energy costs and improve cooling efficiency.

**Solution/Savings:** Most chilled water air conditioner fans run at a constant speed and deliver a constant air flow. Converting these fans to variable speed drive (VSD) fans can save energy because the VSD fans adjust speeds based on the changing room requirements. By lowering the fan speed by 20 percent, you can reduce fan energy consumption up to 50 percent. These drives are available in retrofit kits for Liebert CW and Liebert Deluxe System/3 chilled water systems that make it easy to upgrade, with an average payback of usually less than two years.

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