

How to Reduce Data Center Operating Expenses

With the rapid expansion in data payload, data center managers struggle to maximize performance while minimizing operating expenses (OPEX). Because commodity power supplies are inefficient, they force higher data center OPEX by wasting power, generating excessive heat, and reducing system reliability. These factors all chip away at the bottom line. Regardless of the data center size, adding more servers means adding costly infrastructure.

ColdWatt takes power supply efficiency to the next level by exceeding the 70% efficiency level of commodity power supplies. ColdWatt's unique approach to high efficiency produces lower electric bills, lower cooling requirements, and lower maintenance-related support costs.

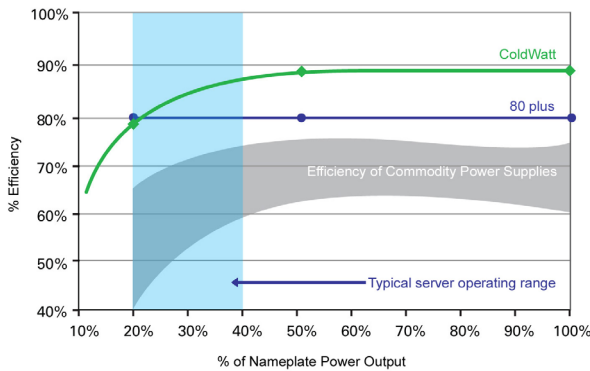
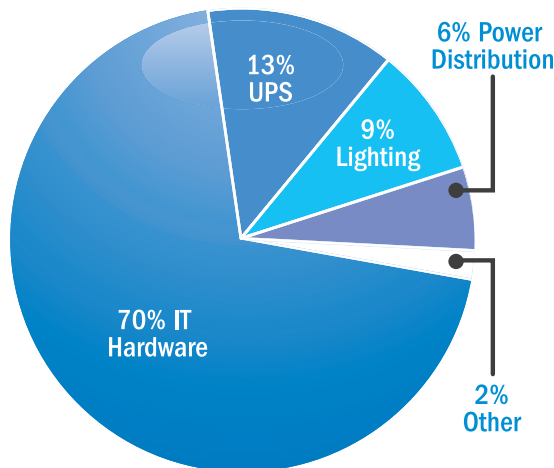


Figure 1: ColdWatt Delivers Industry Leading Energy Efficiency

Decrease Cooling Requirements

Data centers are an ecosystem. As server density increases, the heat generated by the processors and surrounding electronics also increases. Servers, storage devices, and network equipment account for up to 70% of the heat generated in a data center (see Figure 2)¹. Removing this excess heat has a substantial impact on OPEX.



Source APC 2003

Figure 2: Data Center Thermal Sources

Regardless of size, estimates for cooling a server cluster range between 50-100% of power consumption. Because cooling resources are typically determined during data center planning and construction, most data centers lack enough spare HVAC and ducting capacity to support significant expansion. Rebuilding a data center's infrastructure is simply not an option every time server density and power consumption increases.

The fact is, adding more IT equipment forces data center managers to make difficult choices: add more cooling infrastructure, reduce server density, or reduce average server uptime. In each of these cases, the choice is to either expend more capital to cool the systems, or reduce system uptime and average data throughput.

Efficient Power Supplies Reduce Thermal Output

ColdWatt's highly efficient power supplies generate less heat and consume less power than commodity power supplies. Data center managers who purchase servers equipped with ColdWatt power supplies can add more processing density while still maintaining their existing cooling infrastructure.

Reducing server and IT equipment heat load improves a data center's bottom line in several ways:

- Maintains investment in existing cooling, airflow, and power distribution infrastructure
- Decreases cooling-related power consumption
- Reduces per server power consumption
- Increases server and IT hardware density
- Decreases total acquisition costs of IT equipment

Decrease Data Center Power Needs

Adding more server systems means increasing the data center AC power requirements—for cooling and for powering the servers. Although calculations for determining per-server AC loads are simple, expanding AC power infrastructure is costly. This effort requires the involvement of multiple contractors, the electrical utility provider, and extensive permits and inspections. Some data centers delay or even stop purchasing more servers because of the significant AC power impact on the bottom line.

As reported by the IDC², power requirements will continue to expand significantly for data centers of all sizes. Unfortunately, much of this power is wasted. In fact, the typical data center uses 2.2x more power than needed by the actual load. This means higher initial infrastructure costs and higher long-term energy costs.

With cooling, the average server consumes 511 Watts of power. Because of excessive heat generation, 70% inefficient AC-DC conversion, and 90% efficient DC-DC conversion, as much as 311 Watts of power is wasted per server (see Figure 3).

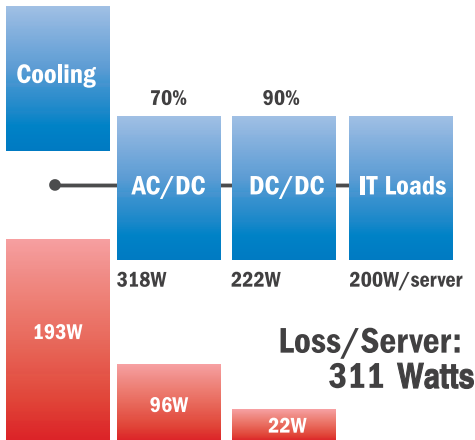


Figure 3: Per-Server Power Losses

A server equipped with a ColdWatt power supply generates 45% less heat and achieves 90% efficiency during AC-DC power conversion. This produces a per-server power savings of 158 Watts (see Figure 4).

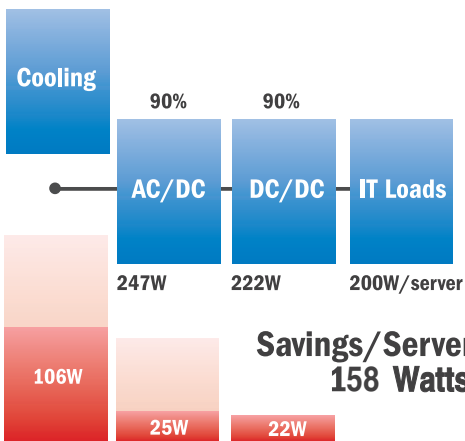


Figure 4: Per-Server Power Savings

ColdWatt's highly efficient power supplies reduce IT hardware power consumption. This means lower initial AC power requirements, and lower data center utility bills.

Increase System Reliability

Excessive heat is the leading cause of electronic component failure. Maintaining a low semiconductor junction temperature significantly increases the reliability of the component. In fact, junction failure rates double for every 10 degrees Celsius rise in temperature.

ColdWatt's highly efficient power supplies generate less heat, making ColdWatt's solutions more reliable than commodity, non-power factor corrected power supplies. By reducing heat-related component stress within the rest of the system, ColdWatt's highly efficient power supplies can increase system reliability by as much as 40%.

In the data center, high system reliability is crucial:

- Fewer costly system repairs means lower operating expenses and more capital available for expanding data throughput
- Reduced repair support load allows IT staff to focus on optimizing data center productivity
- Increase uptime of critical business applications

Improve Employee Productivity

The high noise levels associated with server-class systems are a common complaint voiced by IT and data center staff. Increased cooling airflow means more noise and system vibration. Because ColdWatt's power supplies generate less heat, fewer cooling fans are required in system enclosures. This results in a quieter, more productive environment.

ColdWatt Boosts Your Bottom Line

Servers containing ColdWatt power supplies have room for extra performance-enhancing features, so data centers require fewer systems to boost data throughput. This lowers initial acquisition and infrastructure costs, and reduces long-term operational expenses.

Servers containing power supplies use less power so they run cooler. Data centers pay less for the electricity to run them, and pay less for the electricity to cool them.

1 "Calculating Total Cooling Requirements for Data Centers," American Power Conversion, Rev. 2003-1
 2 Source, IDC, 2006

For more information on ColdWatt solutions, contact us at info@coldwatt.com.

ColdWatt • 13809 Research Blvd. Suite 475 • Austin, TX 78750 • Phone: 512.439.4900 Fax: 512.439.4999
www.coldwatt.com