

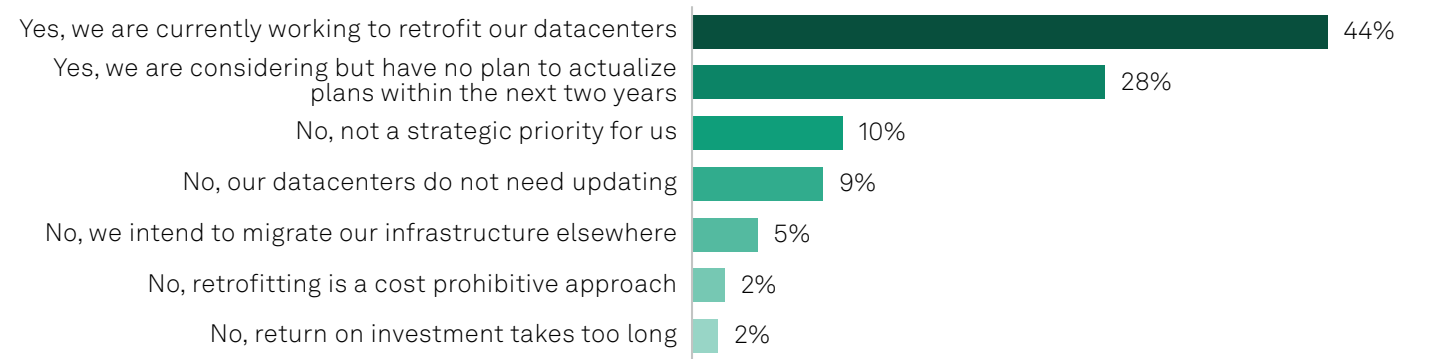


# UPS refreshes: Opex vs. capex considerations

## The Take

As compute and sustainability requirements increase, datacenter capacity demand soars. In addition to building new datacenters, it is crucial to fully utilize existing datacenters and extend their life cycle. Operators of aging datacenters will need to modernize critical equipment such as uninterruptible power supplies (UPS) — a process that can require significant time, including costly downtime. To address this issue, datacenter providers must weigh the pros and cons of refreshes and retrofits. According to recent 451 Research Voice of the Enterprise survey data, more than 70% of datacenter operators are either already retrofitting their datacenters (44%) or considering doing so (28%).

## More than 70% of surveyed datacenter operators are retrofitting existing datacenters or considering doing so



Q. Has your organization considered, or is it considering, retrofitting its datacenters to improve efficiency and sustainability (e.g., upgrading cooling systems, integrating renewable energy integration)?  
Base: Respondents whose organizations currently own and/or operate datacenter facilities, server rooms, or use colocation (n=222).  
Source: 451 Research's Voice of the Enterprise: Datacenters, Sustainability 2025.

Even before the rise of AI, datacenter capacity had grown steadily for years due to increased digitalization and cloud computing, surging data volumes, online content consumption and proliferation of the internet of things. Rapid adoption of generative AI, sparked by the release of ChatGPT in 2022, has only intensified datacenter demand, further transforming the industry landscape. On top of increased capacity, the high density of AI workloads has intensified datacenters' energy needs, prompting many to pursue infrastructure optimization. Retrofitting allows companies to upgrade outdated equipment, implement energy-efficient technologies and integrate renewable energy sources, thereby reducing operational costs and aligning with sustainability goals. Operators have three main options to address aging critical equipment such as UPS: replace it with new equipment, update it with critical components or continue to operate it until it fails. Decision-makers must consider performance and reliability, the mix of capital and operating expenditure, as well as time and ease of implementation, and they must balance these with organizational goals and circumstances. The section below outlines key considerations for each of the three major options.

## Business impact

### REPLACE THE FULL UPS SYSTEM

**Performance and reliability:** Gain increased reliability and efficiency, possibly reduced footprint and increased capacity via the latest technology. However, form factor could be an issue, including ingress, clearances and alignment with existing conduit and cabinets, and new battery cabinets.

**Sustainability:** New materials include UPS system and associated conduit, wiring, circuit breakers, transformer, maintenance bypass, distribution and battery cabinets. However, improved efficiency would reduce energy consumption.



**Cost:** Significant capex investment for new UPS system and ancillary equipment. Major labor expense, including removal of the old system and installation of the new system.

**Operational disruption:** Transition to new UPS system may take weeks or months, causing operational disruption. Critical load will be on bypass, exposed to unconditioned utility, or switched to one side, losing 2N redundancy for at least three days, depending on site configuration. May interrupt business continuity.

#### UPDATE THE EXISTING UPS' INTERNAL ELECTRONICS

**Performance and reliability:** Improved reliability as critical electronic parts or subassemblies are replaced with the latest generation. Other consumable parts such as capacitors, fans and batteries may also be replaced.

**Sustainability:** New materials include electronic parts, subassemblies, capacitors, fans and batteries. Compared to full rip-and-replace upgrade, many materials can be retained, such as UPS sheet metal, framework, copper busbar, power cables and control wiring. Optional value upgrades can improve system efficiency and reduce energy consumption.

**Cost:** Moderate investment is required to cover parts and certain labor expenses. This may be allocated as opex, which is often viewed more favorably than capex for financial approval.

**Operational disruption:** Replacing critical parts entails operational disruption, but much less than full replacement — typically one day.

#### CONTINUE TO OPERATE THE UPS UNTIL IT FAILS

**Performance and reliability:** No gain in performance or efficiency characteristics. The risk of system failure will quickly increase as critical parts exceed their service life. Downtime is unpredictable and may be substantial. Inadvisable except for power systems with redundancy.

**Sustainability:** No extra materials are needed. No gain on efficiency.

**Cost:** No immediate investment required, but there is a potential for increased expense for service contracts due to the greater likelihood of failure and cost of spare parts for an aging UPS system compared to a new one.

**Operational disruption:** No planned operational disruption, but the organization must operate the UPS system with great caution, precise planning and close cooperation between the facility and IT teams to minimize the impact of failure.

## Looking ahead

The topic of aging UPS systems will remain relevant since a new UPS system begins to age the moment it is installed. Organizations typically manage a diverse fleet of datacenters that include both relatively new and older UPS systems, with each facility fulfilling distinct business requirements.

As organizations weigh their options, they face a complex decision-making process encompassing questions about performance, reliability and financial implications, and each choice carries its own risks and benefits. The future of datacenters will depend on the ability to balance these considerations while minimizing operational disruptions. By adopting a proactive approach to UPS management, organizations can enhance the reliability of their power systems while contributing to a more sustainable and resilient datacenter ecosystem, ultimately supporting their long-term business goals.



While this article has explained the aging options around UPS infrastructure specifically, the three options of replacement, update, or run to failure apply to additional data center infrastructure as well. Critical data center power distribution (DCPD) equipment, such as Static Transfer Switches (STS), Power Distribution Units (PDU) and Remote Power Panels (RPP) face similar challenges for aging infrastructure. Learn more about Eaton's Modernization Services by visiting:

[Modernization Services for UPS](#)

[Modernization Services for PDU, RPP, STS](#)

[Battery Replacement Services](#)

[UPS Replacement Parts](#)