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PRODUCT

# Managing AI and HPC Power Demands

*An Employee Owned Company*

Artificial intelligence (AI) and other high-performance compute (HPC) workloads are demanding unprecedented levels of computational power. This directly impacts power consumption and how it's operationally managed. Below, we'll explore these challenges, propose strategies to address them, and consider their benefits to data center operations.

## Challenges of Supporting IT's Evolving Power Demands

### Cost Management

- ✓ Increased energy use can lead to higher operational costs, challenging facilities and IT directors to find a balance between performance and affordability.
- ✓ This balance can be swayed by technology choices, product lifespans, and the ultimate cost of downtime.

### Increased Power Density

- ✓ Previously 15-20 kW was high.
- ✓ Now, with AI, 50-75 kW is becoming the norm with applications evolving quickly to instances of 100, 200, even 300 kW per rack.

### Energy Efficiency Pressure

- ✓ Municipalities are implementing stringent "energy efficiency codes" onto all industrial facilities, resulting in data centers being caught in the cross-hairs.

### Cooling Requirements

- ✓ Mechanical loads, once secondary in data center power planning, are now mission critical as hardware failure tolerances shrink from minutes to seconds.

### Infrastructure Readiness

- ✓ Existing facilities, especially older ones, may lack the infrastructure to support today's loads.
- ✓ Structural stability to support newly added weight is key to operational readiness.
- ✓ Previously, servers created a consistent and predictable draw, but today's applications are spiking these power demands.

## Managing AI and HPC Power Demands

### Adopt Scalable Power Infrastructure

- Transition to modular power systems that can scale.
- Build in strategic locations that have more power available.

### Fortify Advanced Cooling

- Due to liquid cooling's inability for downtime, incorporate uninterruptible power systems on coolant distribution infrastructure.

### Enhance Energy Management Practices

- Employ power usage effectiveness (PUE) metrics to identify inefficiencies.
- Work with local power systems experts to more efficiently manage facility power at the PLC.

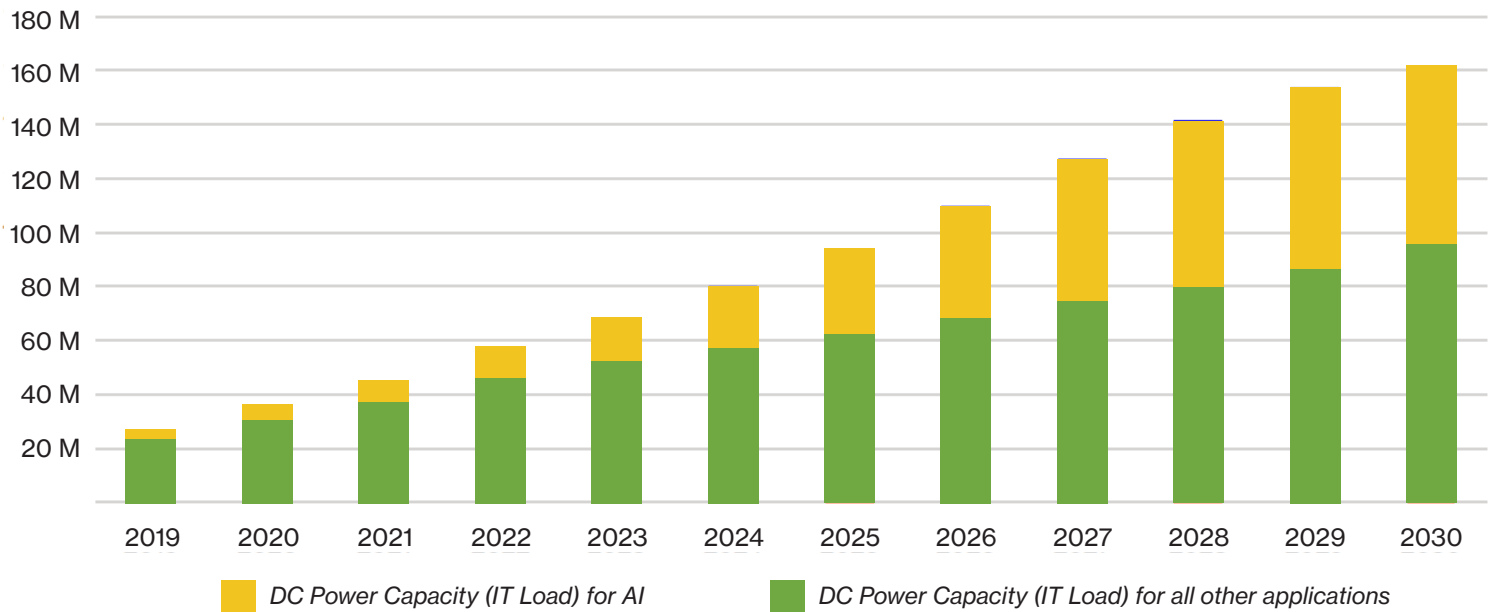
### Invest in Microgrids with Distributed Energy Resources

- Incorporate solar, wind, or other renewable energy options to meet organizational efficiency goals.
- Use energy storage systems to stabilize supply and to reduce reliance on the grid during peak loads.

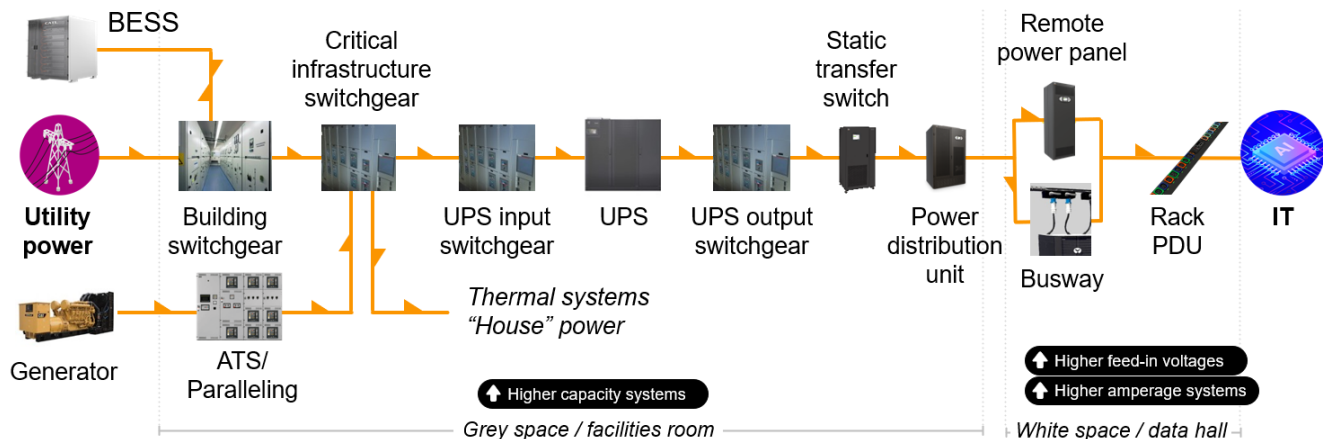
### Future-Proof Infrastructure

- Design facilities with flexibility to adapt to emerging technologies and workloads.
- Scalability needs to top all operational teams' list of goals.

# Trends in Data Center Power Capacity



Facilities will be measured by how successfully they've navigated the impacts of the forecasted growth fueled by AI's new demands. IT and facilities teams must collaborate in new ways and partner with specialists who understand the power train end-to-end.



## Benefits of Addressing Your Changing Power Demands

### Operational Efficiency

- Minimize costs while still maximizing efficiency.
- Reduce the risk of thermal inefficiencies and equipment failures.

### Enhanced Performance

- Seamless deployment of AI and HPC infrastructure to ensure equipment harmony.
- Microgrids minimize downtime and help to maximize computational output.

### Environmental Impact

- Engineering efficient systems reduces the carbon footprint of data center operations.
- Align your goals with stakeholder expectations and global energy trend demands.

### Competitive Advantage

- Adapt quicker to changing market demands, as being a leader in handling AI workloads attracts customers and partners.
- Consider how AI can improve your user applications.

Contact us for help from our data centers engineers.

[www.DVLnet.com/Contact](http://www.DVLnet.com/Contact)

