



Powering the AI Era

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Welcome



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Today's agenda



- **Evolving Critical Power Needs**
- **AI Datacenter evolution: Densification and AI Loads**
- **Speed of Deployment, Integration and Optimization**
- **Decarbonization and Power Availability**
- **What's next**

Evolving Critical Power Needs

Drivers

Needs / Objectives

1

AI Datacenter
evolution:
Densification and
AI Loads

- Larger scale, building blocks and higher voltages
- Reliable, efficient and denser integrated distribution for AI workloads
- Manage AI Compute Loads power swings
- Provide power protection for server liquid cooling systems
- Protect the AI load with end-to-end services empowered by data

2

Speed of Deployment,
Integration and
Optimization

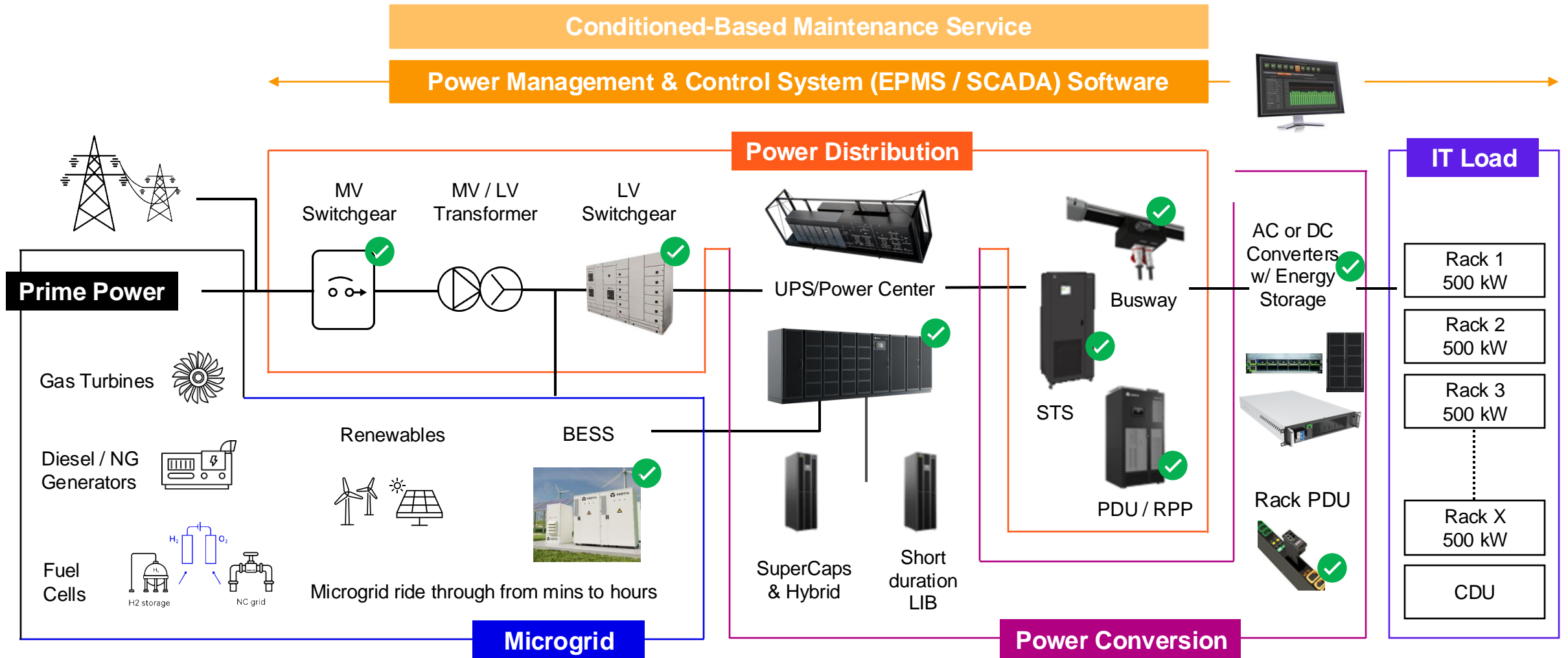
- Move work from site back into the supply chain – Integrated solutions (Skids, Power Modules)
- Deploy in modular chunks vs total build up front, “Normalized” designs
- Increase automation, controls and adoption of Power Monitoring
- Rely on consistent project services procedures and scopes of work

3

Decarbonization and
Power Availability

- Reduce diesel generator starts
- Enable BYOP (Bring Your Own Power) and Microgrids strategies to be a good grid citizen
- Deploy Distributed Energy Resources (DERs): Gas Turbines, BESS, Fuel Cell, Solar, etc

Evolving challenges and opportunities for Critical Power Train



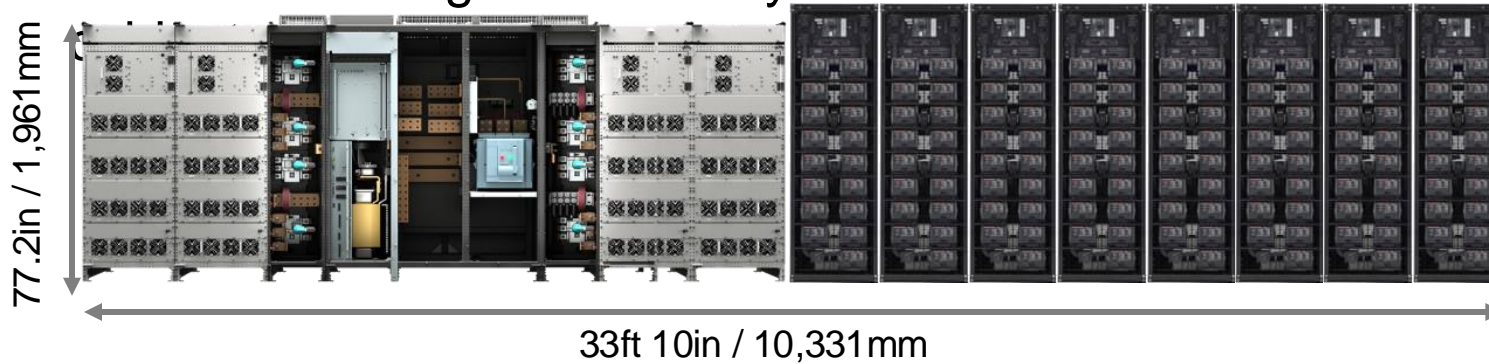
The rapid evolution of High Performance is driving data center power densification through all the Power Train components. Vertiv brings together hardware, software, and services across the entire power train.

1

AI Datacenter Evolution: Densification and AI Loads Power Management

Power Protection Densification

1,600kW Vertiv™ Trinergy™ Cube
with 8x Samsung 136S battery



1,600kW New Vertiv™ Trinergy™
With 6x Vertiv™ Energy Core battery cabinets



Critical Power Protection footprint reduction optimizes space. Increasing Voltages will become even more important in the densification of the power train.

As compute-intensive AI workloads grow rapidly, compact and high-capacity scalable systems have become essential for today's data centers, providing reliability without compromise

UPS workloads management

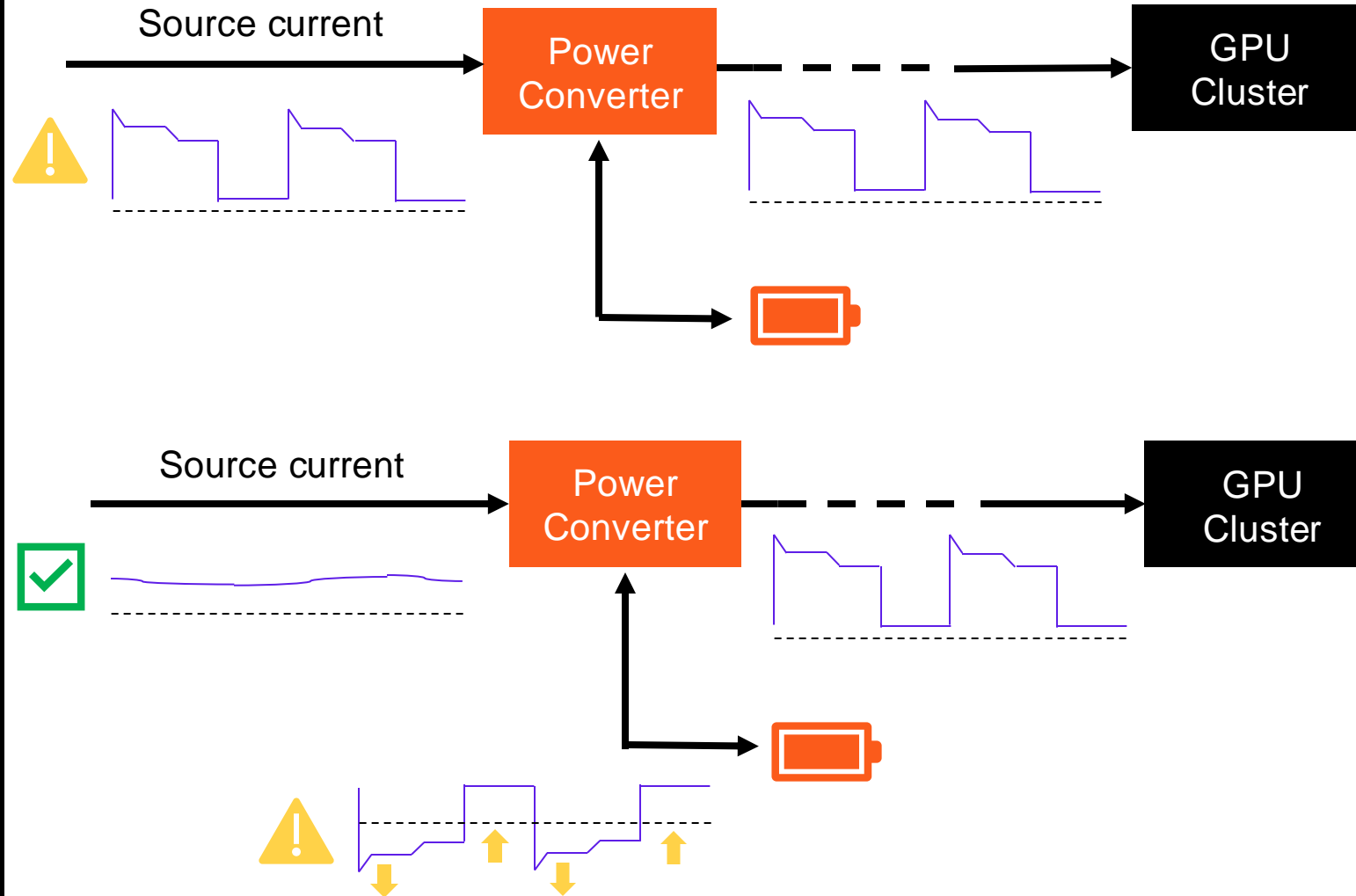
Minimize impact batteries

UPS FW is able to handle load steps >100%

Minimize impact on grid/generators

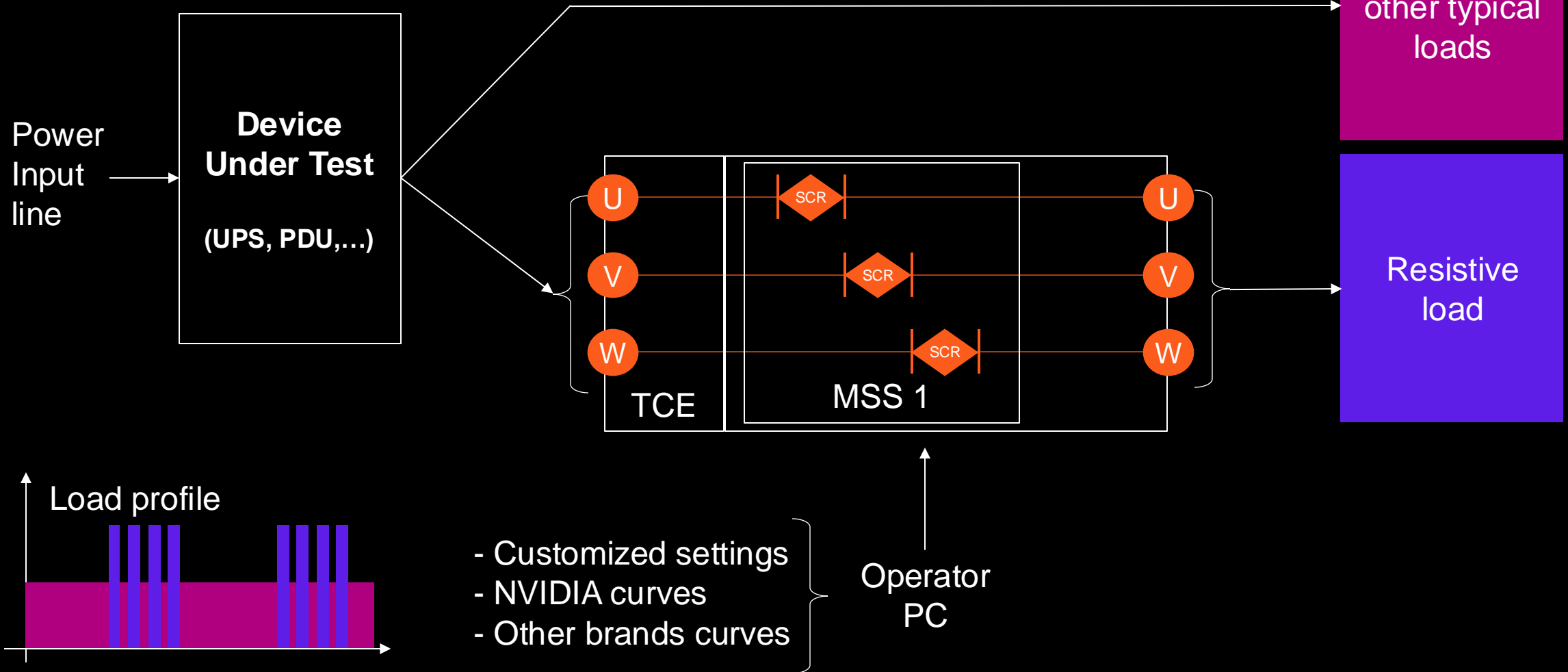
UPS FW will be able to use Batteries for Power Smoothing (Input Load Averaging)

At UPS level, two approaches can be taken to eliminate/minimize the AI load impact on the power train or batteries



AI loads simulator

The AI load simulator will allow testing multiple real case scenarios and can be used indistinctly for **design & validation testing** and for **customer demonstrations**



Let's connect
with the
Engineering
team to see the
AI simulator
they developed

2

Speed of Deployment, Integration and Optimization

**Close
coupled system
increase reliability,
saves space,
reduces installation
and commissioning
time.**

Site Architecture - Vertiv™ PowerNexus is a close coupled solution that combines the robust power of Vertiv™ Trinerigy™ and Switchboard, reducing equipment footprint, cabling materials, and installation labor costs

Speed up installation – Installation time in factory and on site is significantly reduced comparing with traditional build

Increased reliability – Minimum quantity of interconnections reduces risk of faults and simplifies installation and maintenance

Install on site, install in factory – PowerNexus design enables different build strategies and eliminates compromises



The background features a complex network of glowing green and blue lines and particles, resembling a neural network or a data visualization. The lines are thin and interconnected, with some larger, more prominent structures. The overall color palette is dark, with the glowing elements providing a strong contrast.

3

Decarbonization and Power Availability

Efficiency improvements

to reduce datacenters' PUE to the minimum possible while still maintaining the highest levels of availability

- **up to 99% in dynamic online mode**
- >97% in double conversion mode
- up to 99.5% in ECO mode

Dynamic Grid Support to enable cost savings and revenue generation by participation in demand management and other grid support services

- **Continuous duty booster** to run from a DC source, even at full load, for an indefinite amount of time, contributing to decarbonization and the transition to green energy
- **Power Source Sharing** contributing to AI loads management, decarbonization and transition to green energy

An aerial photograph of a high-voltage power transmission tower (pylon) situated in a dense green forest. The tower is a complex lattice structure of metal. Power lines extend from the tower across the frame. The background is a thick canopy of trees.

**A path to grid
independence
in cases of
constraints and
complexity in
power
availability**

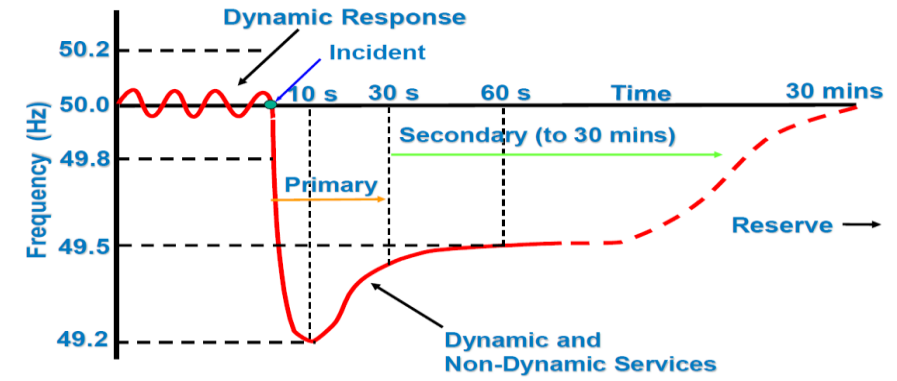
partners with
Vertiv to provide services to the grid operator and contributing to support alternative energies.

UPS, battery storage and dynamic power are increasingly being monetized by data centers

Frequency management

A fast-acting balancing system provides a quick response to sudden frequency variations and increase or reduce the electricity demand within a few seconds (fast frequency response and primary reserves) or minutes (secondary reserve).

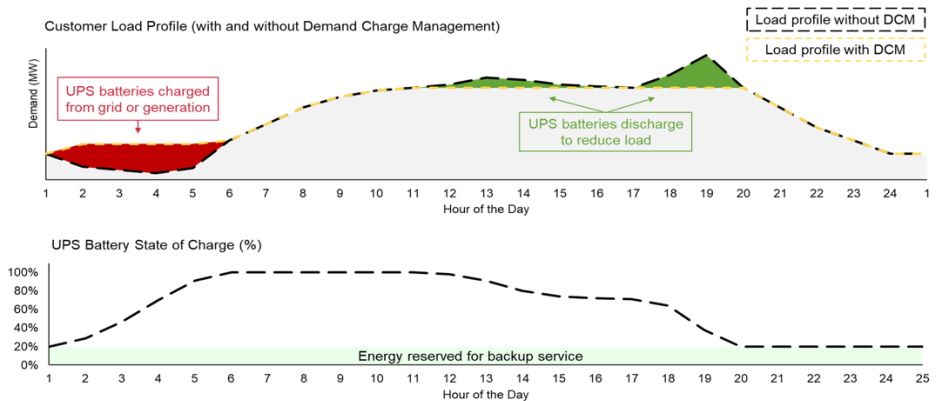
The faster the response, the higher the revenue opportunity.



Demand management (peak shaving)

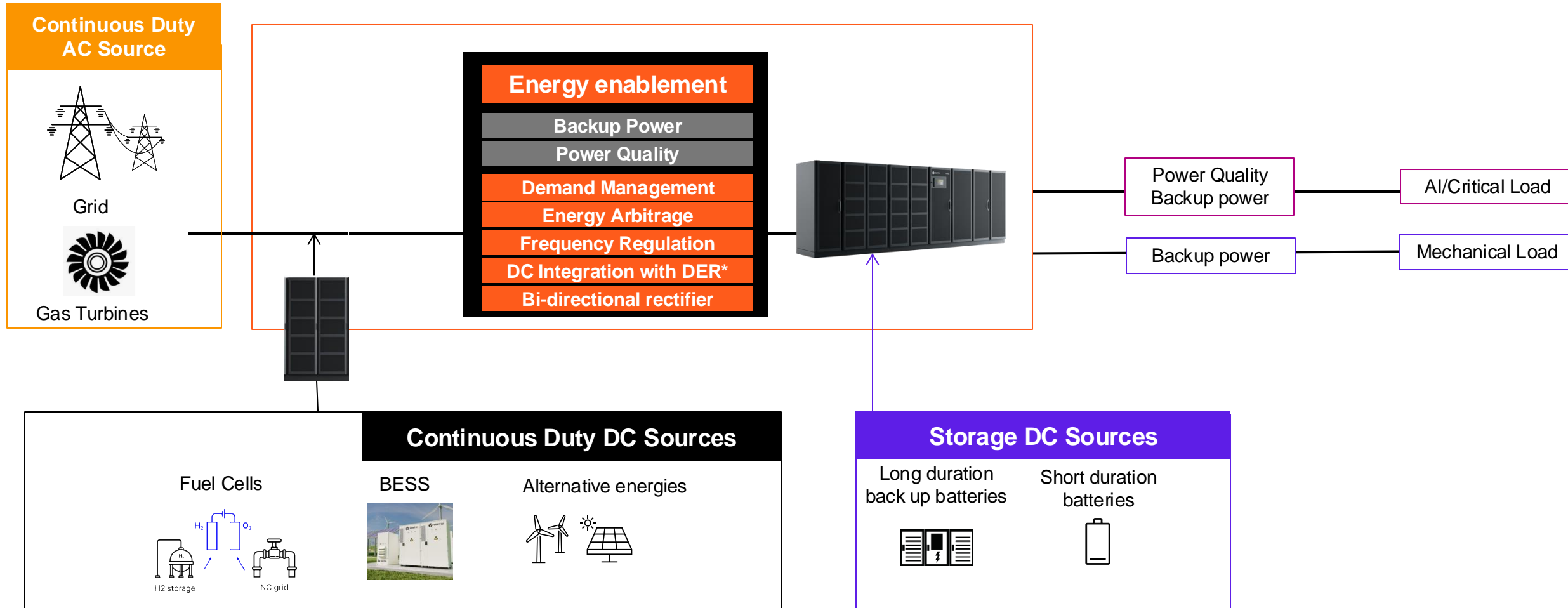
In times of low demand or high supply, energy is stored and released at times of high demand or low supply.

Alternatively, consumers can price and carbon arbitrage adjusting consumption according to market price changes or renewable participation.



From power protection to energy enablement

An evolving UPS function and new converters enable new AI driven demands and a changing energy environment



4

What's next

Future investments to further enhance power innovations

New engineering innovation area

to boost development capabilities and enabling faster prototyping and testing

New engineering reliability site

to increase product reliability through precise and extreme conditions testing

Witness test and demo center renovation

to enable hands-on product demos for customer trust

Customer Experience Center renovation

to enhance customers engagement with interactive solutions

Bologna offices renovation

to support investment in research and development and product innovation

