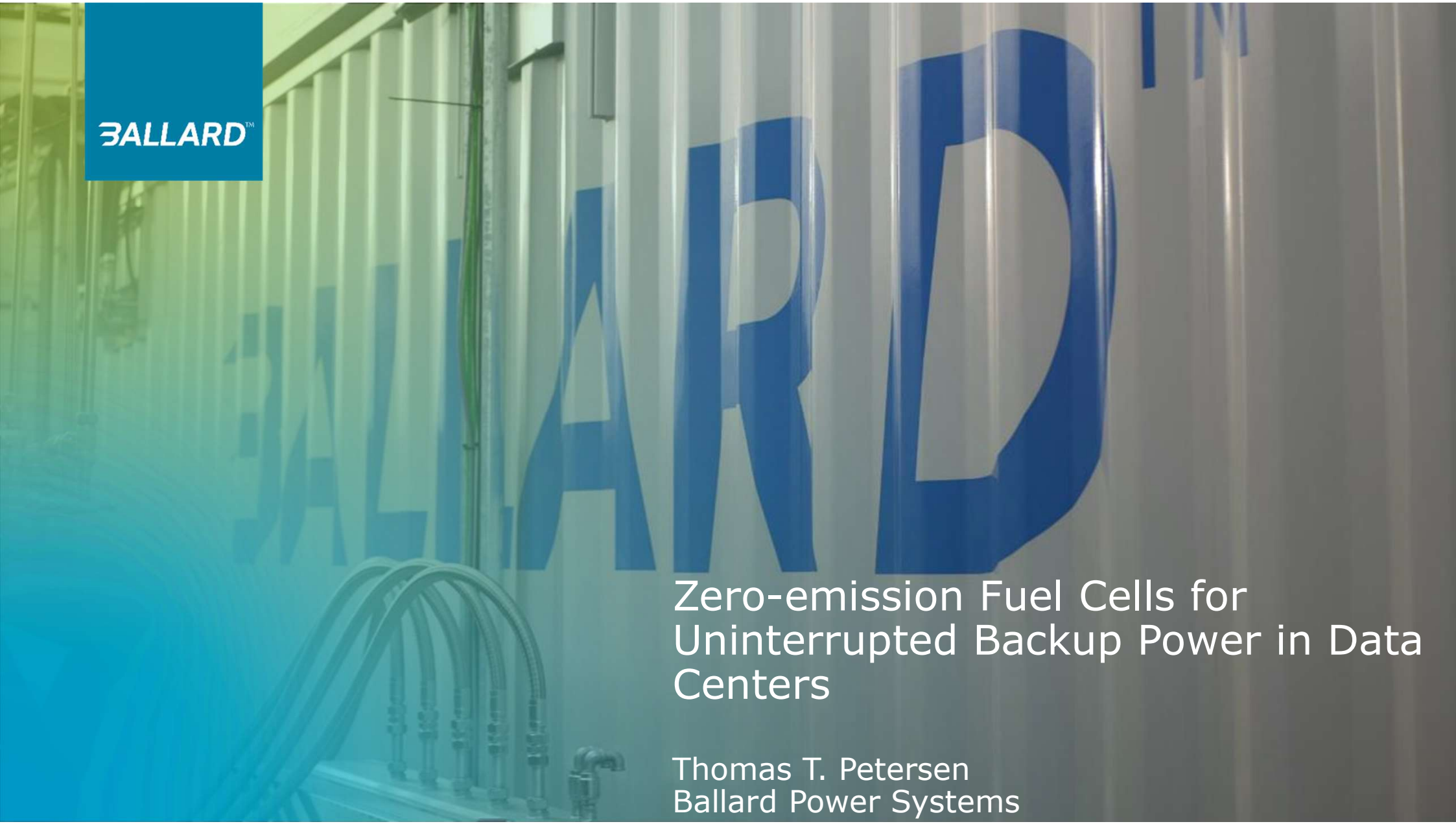
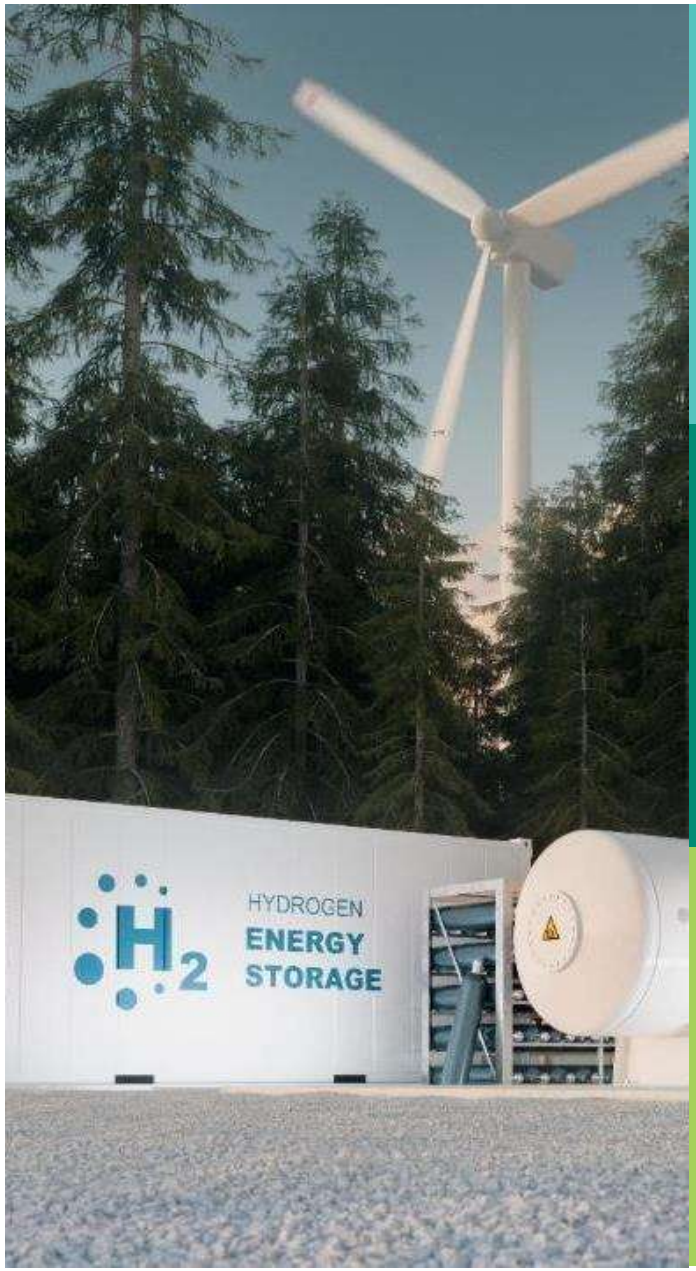


Zero-emission Fuel Cells for Uninterrupted Backup Power in Data Centers

Thomas T. Petersen
Ballard Power Systems

Ballard Power Systems

We are dedicated to accelerate the adoption of fuel cell technology



Proven

10 MW successfully deployed

Products certified to stationary fuel cell power generator requirements per EU, ATEX and CSA standards

Performance

99.9% reliability

+50% efficiency

Excellent availability

Exceptional durability

Promise

End to end support throughout the whole customer journey

Sustainable zero-emission solutions from stack supply to turnkey power solution for the end users

Benefits of fuel cell systems

- An DC electric power generator is the efficient, quiet, zero-emission energy alternative to polluting diesel generators.
- PEM fuel cell technology is well suited for intermittent power applications, cycling and rapid ramp up
- High reliability, +50% efficiency, modular
- Exceptional durability with low maintenance
- Decentralized zero-emission power generation in challenging environments
- Standby power for critical infrastructure
- Ballard is vertically integrated and offers support through the complete product life cycle

Zero-emission Backup Power in Data Centers

- Supplies reliable and uninterrupted power when a failure or outage occurs
- Fuel cell systems can eliminate use of diesel generators and secure zero-emission operation

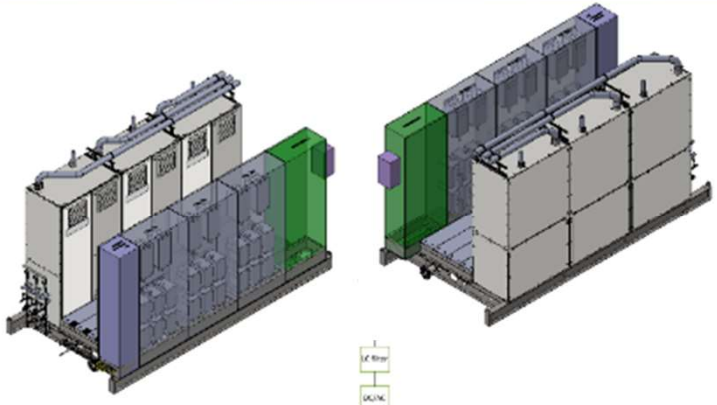
FCwave™ – PowerGen

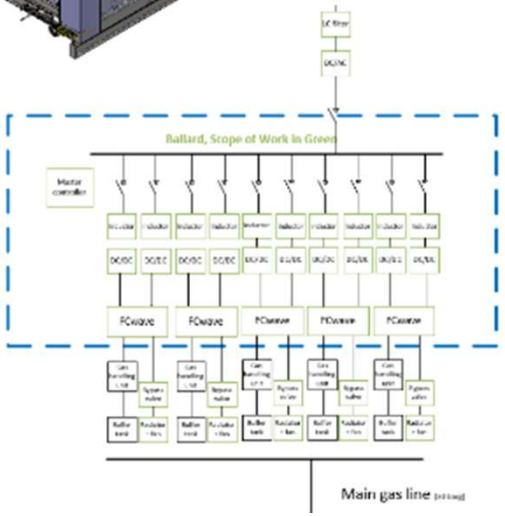
- Highly reliable in supplying seamless, uninterrupted power
- 200kW modules, scalable up to MWs, flexible integration with minimal use of space
- Uncompromising focus on highest safety, health and environmental protection standards.
- Easy installation as stand-alone modules, coupled in parallel or as containerized solution.
- Monitoring performance data remotely and planning for preventative maintenance via diagnostic connections
- Low total-cost-of-ownership, achieved through product performance optimization, common components across product platforms and low maintenance requirements

FCwave™ – PowerGen

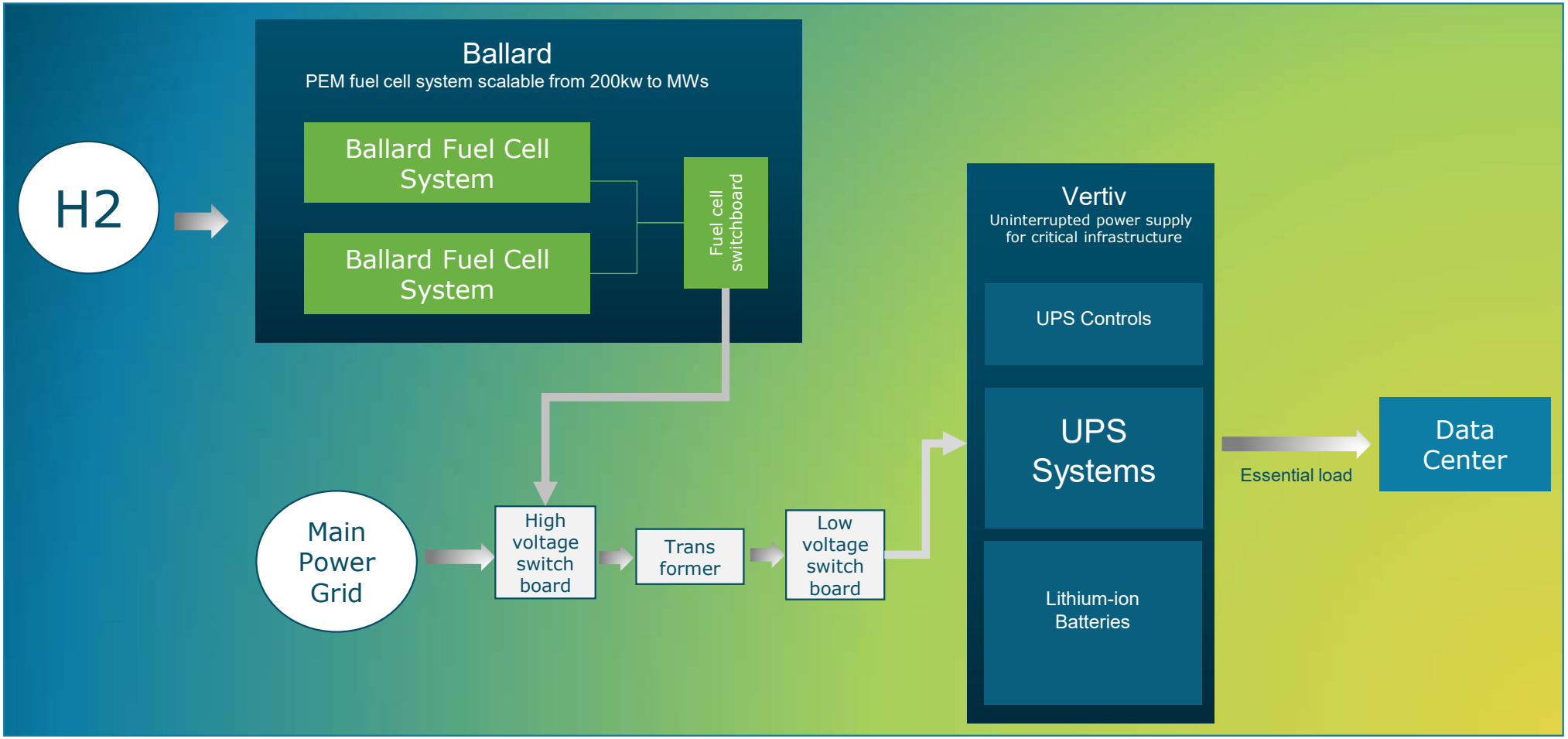
Modular 200kw-1MW block skids based on FCwave™ for indoor installations excl. but prepared for interface to cooling and power management.

- 30 stacks per MW (96% recyclable stack components)
- Scalability from 200kW to MW
- Ramp rate to 20-100% power in 10 sec
- Heatmanagement and battery subsystems can be included
- Product with full supply Service and spare parts support
- Certified to stationary fuel cell power generator requirements



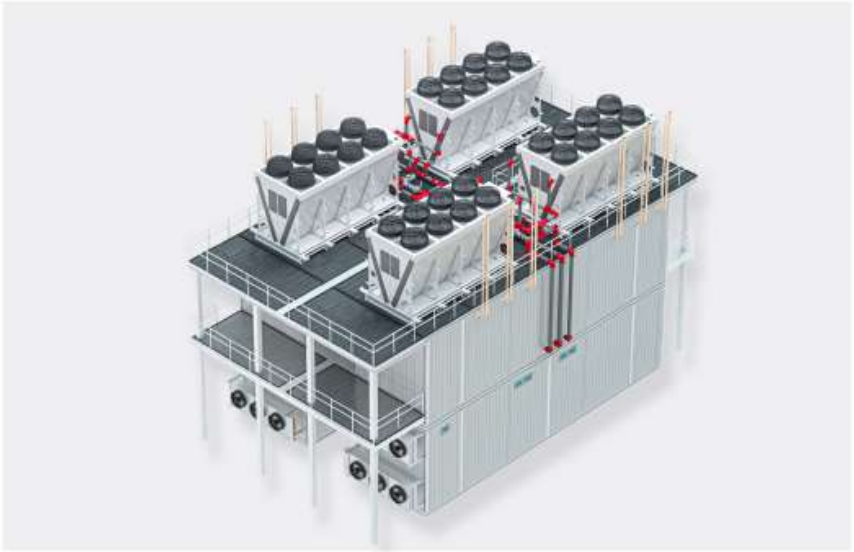


UPS with integrated Fuel Cells for zero-emission backup power



BALLARD™

Vertiv Power Module H2 - The Future of Data Centre Power



Exterior view of the Vertiv™ Power Module H2

The rise of new technologies, like generative AI, IoT, AR/VR, is increasing the need for energy in today's data centers and it is often surpassing the capacity available from existing power grids resulting in an urgent call for onsite power generation.

Crucial back-up options such as diesel generators, are becoming less viable due to the urgent need to combat global warming and the resulting sustainability regulations that are one of the prevailing challenges in data center industry today.

The Vertiv™ Power Module H2 is a sustainable alternative for meeting escalating energy demands of future data centres as well as targeting zero-emission power generation.

The Vertiv Power Module H2 is available in a range of 150kW - 3000kW based on specific requirements for backup or continuous power operation.

Advantages of Vertiv™ Power Module H2

By merging UPS and hydrogen Fuel Cell technology into a single solution, the Vertiv Power Module H2 extends the application of reliable UPS backed-up power:

- **As an alternative to Diesel Generator**
- **To prime power application with zero emissions and low CO_2 footprint**

Vertiv Power Module H2 is also retaining all the well proven benefits of a prefabricated Power Module design:

- Single-supplied complex power infrastructure solution
- Rapidly deployable and factory tested
- Simple, seamless on-site integration
- Scalable design, pay-as-you grow model

Fuel cell benefits

- Proven and established power solution for various applications
- Can support true carbon-neutral data center operation
- Increased operational reliability and energy management in data center operations when paralleled with UPS and Li-Ion batteries

Here for life™

Thank you

Ballard.com