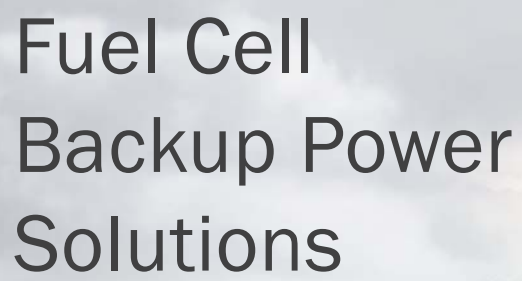


The Ballard logo is displayed in white, bold, uppercase letters on a solid blue rectangular background in the top right corner of the page.


**BALLARD**<sup>®</sup>

The text 'Fuel Cell Backup Power Solutions' is centered within a semi-transparent white rectangular box on the left side of the page. The background of the entire page is a dramatic sky with dark, heavy clouds and several bright, jagged lightning bolts striking down. On the right side, a tall, red and white lattice tower with various antennas and equipment is visible against the sky.

Fuel Cell  
Backup Power  
Solutions

The FCgen-H2PM logo is located at the bottom of the white text box. It features the word 'FCgen' in a blue, stylized font with a white outline, followed by '-H2PM' in a plain blue font.

**FCgen**<sup>®</sup> -H2PM

The tagline 'Power to Change the World' is located at the bottom left of the page, in a small, black, sans-serif font.

Power to Change the World<sup>®</sup>



Low   
Cost

Lower CAPEX compared to battery and diesel generators for 6+ hours of backup power

Attractive OPEX due to the system's long lifetime (>15 years) and low maintenance requirements

Remote capacity & functional testing, 5-year service intervals, predictive maintenance and no discharge tests

Comprehensive service packages for lifetime of FCgen®-H2PM system

Flexible   
Solutions

The FCgen®-H2PM module is designed to support critical infrastructure. It fits into a standard 19-inch rack. The modular and scalable design from 0.5kW to 60kW (and above for special requirements) allows multiple systems to be coupled in parallel to meet site power requirements. The system supplies backup power for both DC and AC with possible customization for higher output.

The modules' low weight, compact size, and ability to be integrated with existing power equipment reduces siting issues and facilitates future relocation.

Ballard's comprehensive service offer includes optional on-site support, partner training, and a start-up package.



No   
Risk

The FCgen®-H2PM is a future-proof investment.

Fuel cell backup power modules are solid state power generators with few moving parts and no degradation in standby mode regardless of temperature.

The FCgen®-H2PM system has built-in unique predictive maintenance features and automated self-testing.

10 years of experience with systems in operation within critical infrastructure and a 99.99% reliability rate. Ballard offers a service warranty of up to 15 years.

## Why Fuel Cell Backup Power?



In our increasingly connected world, power outages are severely disruptive. Reliable and cost-effective fuel cell backup power solutions ensure critical infrastructure availability during unexpected power outages.

Fuel cell backup power solutions allow operators to harden networks and improve customer satisfaction while also reducing operating costs. At the same time, the flexibility of the solutions ensures that any future legislation requirements can be met.

## Technical details about Fuel Cell Backup Power



The thousands of systems installed and millions of hours of backup power provided validate fuel cell technology and the maturity of Ballard's FCgen®-H2PM system. The fuel cell backup power solution consists of:

- ⚡ Fuel cell module (DC and AC output option)
- ⚡ Integrated ultra-capacitor module or external battery
- ⚡ Master system controller (for multiple module interconnection)
- ⚡ Module casing (such as a 19" rack or outdoor enclosure or shelter with integrated hydrogen storage)

The duration of backup power delivered can easily be increased by connecting more hydrogen cylinders to the systems on site. Solution options include an indoor or outdoor enclosure and a 'cold climate kit' for operation as low as -40°C.

## Product Portfolio

	FCgen®-H2PM 1.7kW	FCgen®-H2PM 5.0kW
TECHNOLOGY	Proton exchange membrane (PEM) hydrogen fuel cells	
MAXIMUM POWER kW	1.7kW	5.0kW
PARALLEL OPERATION	12 modules can be coupled for systems with up to 60 kW of power output	
DIMENSIONS, cm	45 x 63 x 36	50 x 57 x 62
WEIGHT	40kg	75kg

## Added Benefits



- ⚡ Recycling: The system uses recycled materials and all parts are recycled or reused in future systems
- ⚡ Zero-emission operation with no harmful or toxic substances, waste or fuel
- ⚡ The modularity means an easy scale to fit and upgrade of the solutions

Power to Change the World®

# What is a Fuel Cell Backup Power System?

A Fuel Cell Backup Power System is a cost effective, environmentally friendly, easy to install, reliable power generator that converts chemical energy (hydrogen and air) into regulated DC power, providing up to 60kW of reliable backup DC power on demand.

The intended application of this system is backup power for critical infrastructure networks like telecom, optical fiber and emergency communication networks. The system continuously monitors the DC bus voltage in standby mode and operates during power outages as soon as the DC bus voltage drops to a set point, which is defined by the customer.

CONNECT WITH  
**BALLARD**



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## Who are we?

We are Ballard - making a meaningful difference with our fuel cell technology that will continue far into the future. We are committed to develop innovative and reliable clean energy solutions.

shipped **MORE** than  
**400 MW**  
of PEM fuel cells worldwide

over  
**30 years**  
of experience WITH significant PEM IP portfolio

**thousands**  
of BACKUPED power systems at telecom & broadband SITES  
INSTALLED

### CASE STUDY I

#### Eniig Energy Group Putting fuel cell technology to commercial use

In 2007, Ballard put the first ever commercial solution based on hydrogen and fuel cell technology into service on the fiber-optic broadband network operated by the Danish power company Eniig.

Since the first installations in 2007, the Eniig network has continued to expand. Today, approximately 90 Ballard FCgen@-H2PM units have been installed, which ensures that more than 170,000 Danes can surf the internet at breakneck speeds even if the main power supply fails.

### CASE STUDY II

#### Denmark's public safety network SINE supported by fuel cell backup power systems

Ballard has developed an integrated outdoor cabinet solution for the approximately 120 critical radio stations established all over Denmark in connection with the SINE network. Rolled out during 2009, these systems continue to operate and are serviced by Ballard Power Systems Europe.

The SINE network is used by government authorities, such as the police, as well as regional emergency services, such as the ambulance service, fire-fighting service and rescue preparedness.