



BALLARD®

Fuel Cells In Extended Duration Emergency Backup Power

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BALLARD POWER SYSTEMS

A CLEAN ENERGY GROWTH COMPANY

TSX: BLD NASDAQ: BLDP

WWW.BALLARD.COM

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About Ballard

■ CLEAN ENERGY FUEL CELL PRODUCTS...

▶ OUR COMPANY

- Approximately 335 employees
- World-leading R&D & manufacturing facilities
- Locations in Vancouver, Canada (HQ) & Lowell, MA

▶ OUR BUSINESS

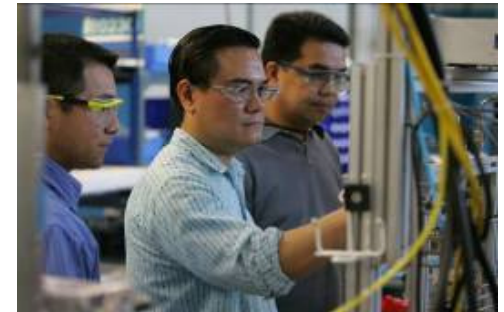
- Design, manufacture, sale & service of hydrogen fuel cell products

▶ OUR CUSTOMERS

- System integrators and OEM's addressing end-user needs: materials handling, telecom backup power, residential cogeneration, and transit buses

▶ OUR FOUNDATION

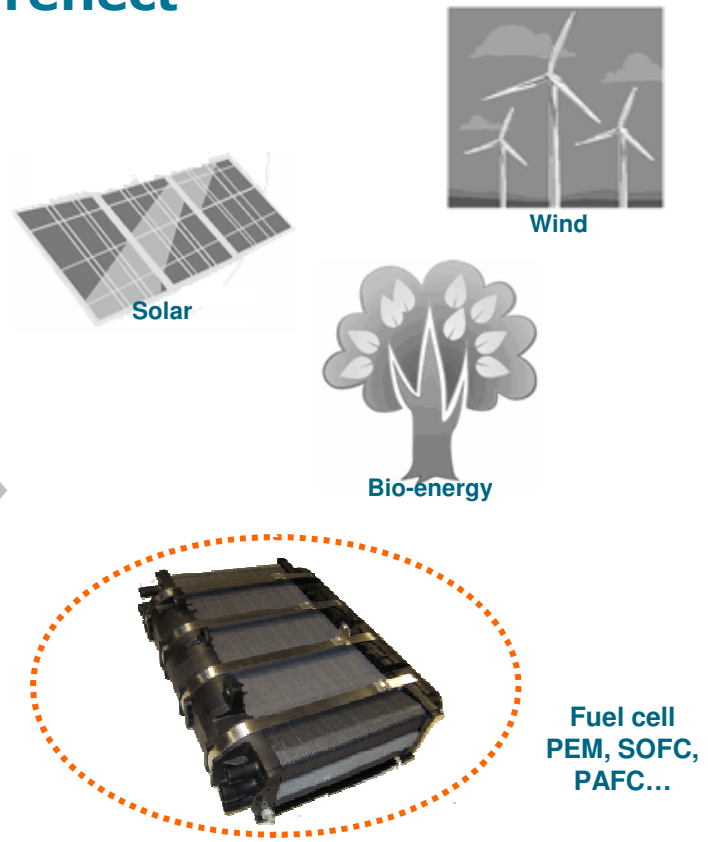
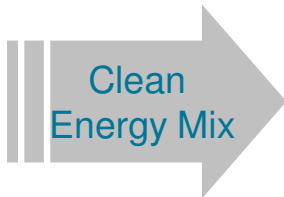
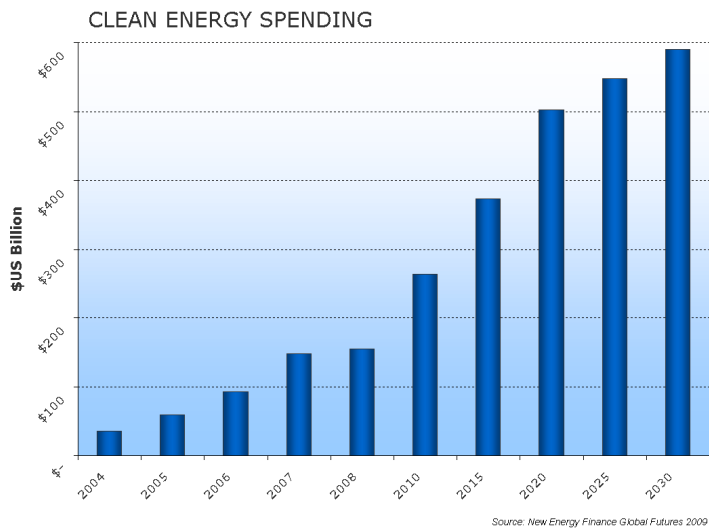
- *Technology Leadership* – 350+ Patents and patent applications
- *Production Expertise* – Shipped over 100MW Fuel Cell Products
- *Expanding Go-to-Market Capabilities* – Powered over 1,000 stationary installations and over 200 heavy and light duty vehicles



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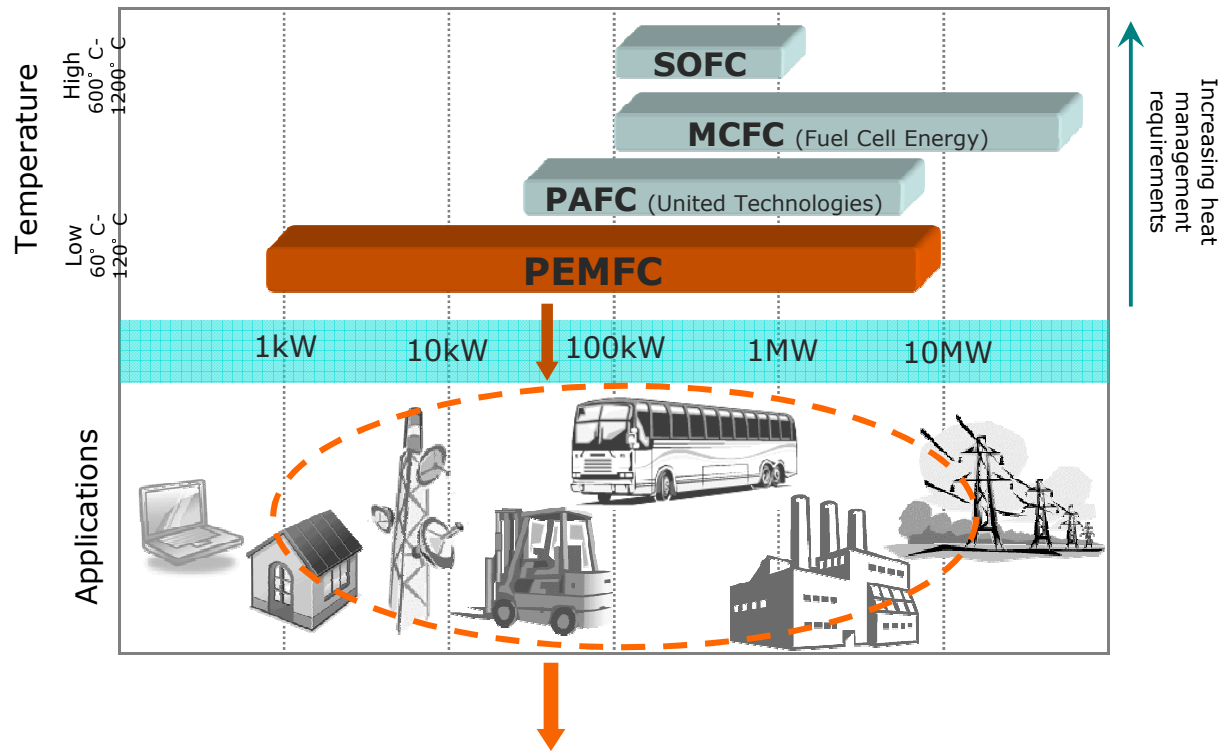
Fuel Cells and Clean Power

- Clean energy market growth will reflect a mix of energy technologies



As product costs continue to decline, fuel cells will play key roles in the clean energy space

PEM Fuel Cells



- **Ballard leverages leadership in PEM across multiple markets...**












- Compact & scalable
- Fuel flexibility
- Efficient, reliable and safe
- Fast start-up and low temperature
- Rapid response to changes in power demand
- Durable across wide variety of duty cycles

Ballard: Putting Fuel Cells to Work

■ Ballard leadership in PEM fuel cells is based on -

- ▶ **Portfolio of proven commercial solutions**
 - ▶ Fuel cell stacks, power modules and systems
- ▶ **Strong delivery capabilities**
 - ▶ Access to over 2,000 patents and licenses
 - ▶ High volume manufacturing facility
 - ▶ SI & channel partnerships
 - ▶ 100MW+ of fuel cell products shipped

■ Developing a global customer base -

	Backup Power	Supplemental Power	mCHP	Distributed Generation	Bus	Material Handling
System Integrators/OEMs						
Downstream Customers						

Backup & Supplemental Power



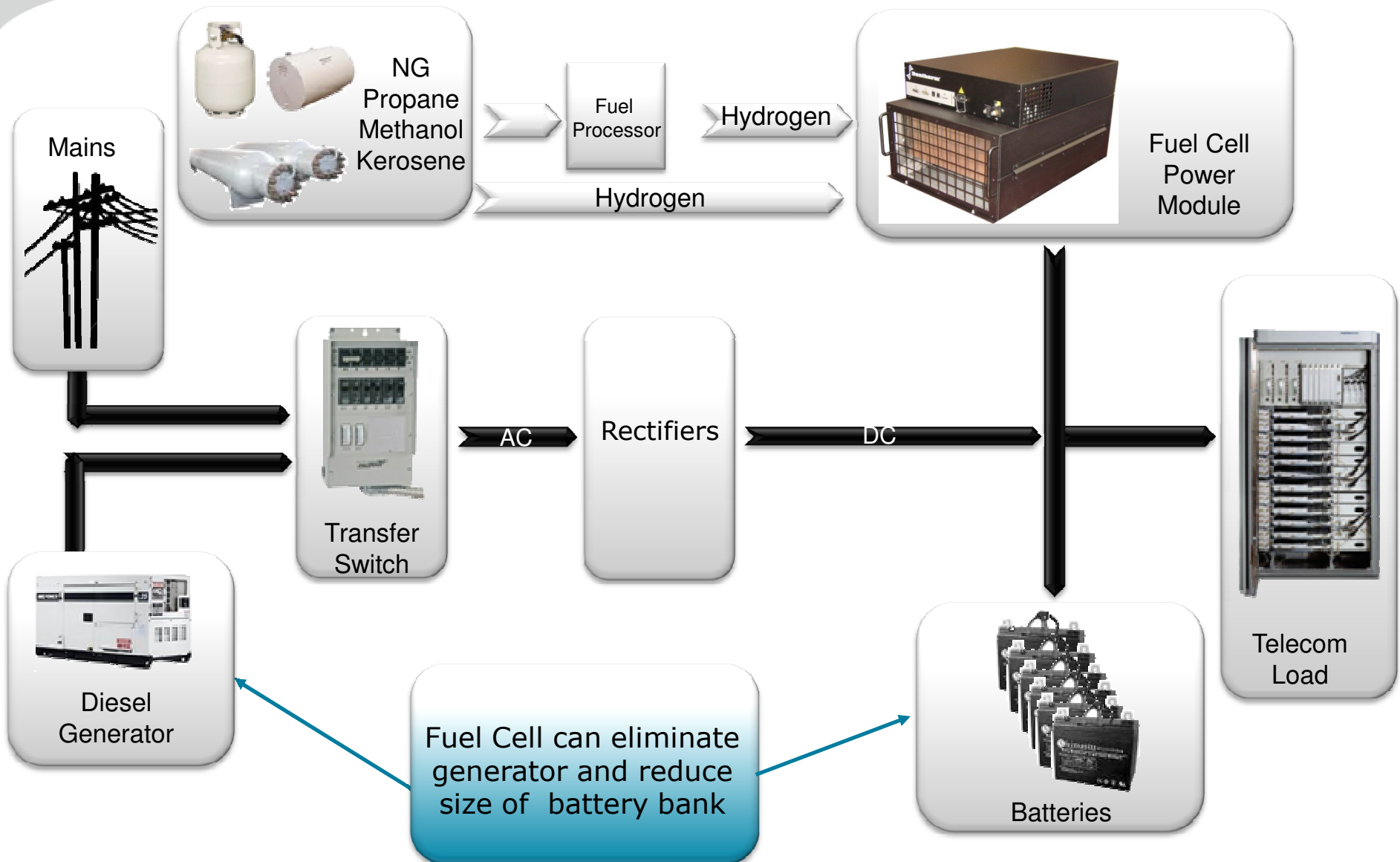
- **Initial focus on telecom**
- **Addressable market: ~\$1B+**
- **Compelling value proposition**
- **Channel access primarily through system integrators**



Recent Progress -

- ✓ Dantherm Power acquisition to accelerate backup power market development
- ✓ Deployment of Dantherm Power systems in Wind Mobile network
- ✓ IdaTech sale of 100+ systems to Hutchinson Telecom in Indonesia
- ✓ FuelWorks™ established to advance fuel processing technology

Power Topology

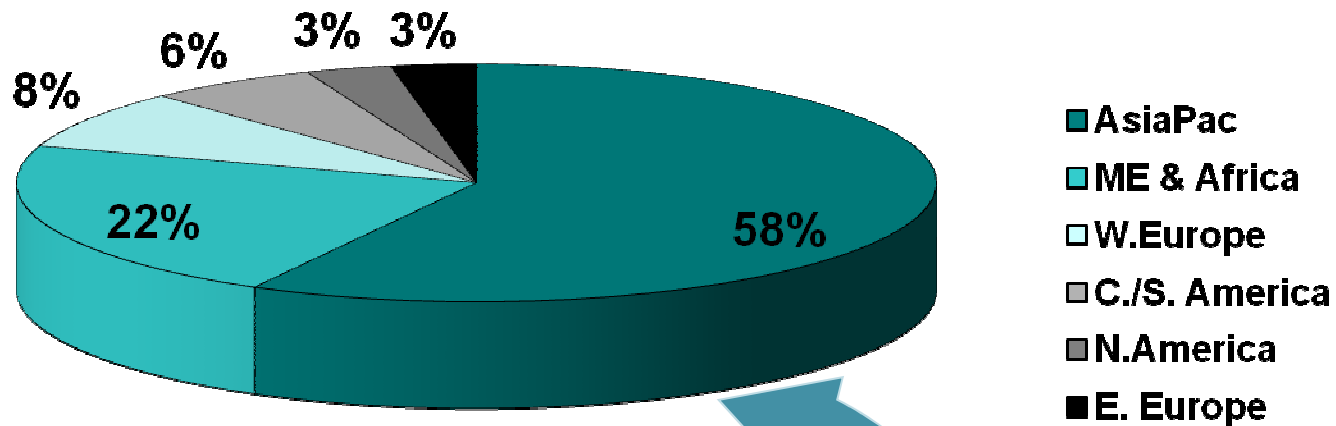


Telecom Market

- **Wireless telecom opportunity**

- \$2+ billion/yr spent on DC telecom backup.
- Expect total ~385,000 base station additions.

2010 Cellular Base Stations Additions

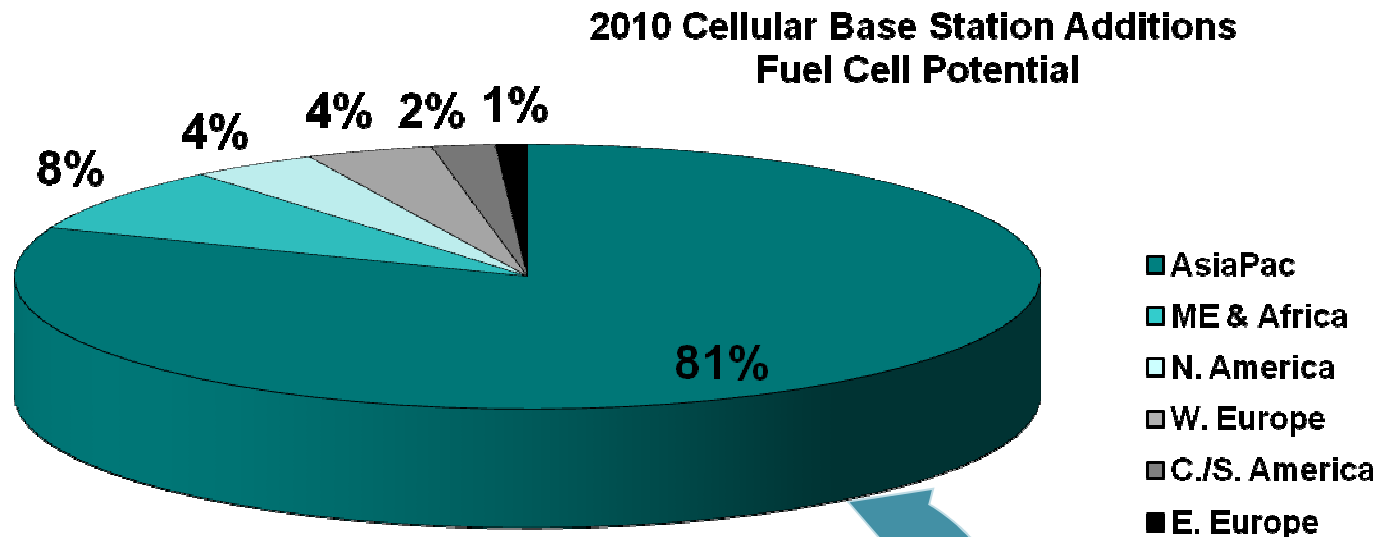


Growth in India, China, and Africa, where backup to grid needed most.

Sources: In-Stat, 2008; ABI, 2009; personal communication

Telecom Fuel Cell Market

- **Expect 2010 total addressable telecom fuel cell market ~50,000 units**
- **Best fuel cell opportunities:**
 - New sites as part of a network deployment
 - Sites where diesel generators are costly or difficult to site
 - Site upgrades where additional batteries are problematic (rooftop)



**Growth in India, China,
and Africa, where backup
to grid needed most.**

Telecom Backup Power – Application Matrix

	Emergency Backup	Supplemental Backup	Continuous Power
Frequency of Outages	Monthly or Less	Daily	Continuous operation
Outage Duration	<8 hours	4+ hours	24 hrs/day
Annual Outage Time	10's of hours	1000's of hours	Over 8000 hours
Life Time	10+ years	Competitive with incumbent	Competitive with incumbent
Target Markets	<ul style="list-style-type: none"> ➤ US, Canada ➤ EU ➤ Japan ➤ Developed economies 	<ul style="list-style-type: none"> ➤ India ➤ Rural China ➤ Indonesia ➤ South America 	<ul style="list-style-type: none"> ➤ Off-grid opportunities are everywhere; but target markets include those for Supplemental plus Africa and parts of Middle East

Emergency Backup Power Value Chain



Ballard Fuel Cell Stack

System Integrator

Operator Tower Company Managed Services Provider

Emergency Backup Power Value Proposition

Assumptions

FC fuel:

Hydrogen: \$30/kg + \$5/cyl/mo rental

Incumbent backup solution:

Batteries only - no genset

Site Power Requirement:

5 kW

Usage:

North America – 20 hours/yr (high)

Backup capacity:

8 hours

Battery replacement interval:

3 yrs

Time discount factor:

10%

Tax rebate/credit: not included

(US potential for rebate of ~30% FC capital purchases)

Up-front costs¹ (8hrs):

Batteries: \$10,800

Hydrogen Fuel Cell: \$15,876

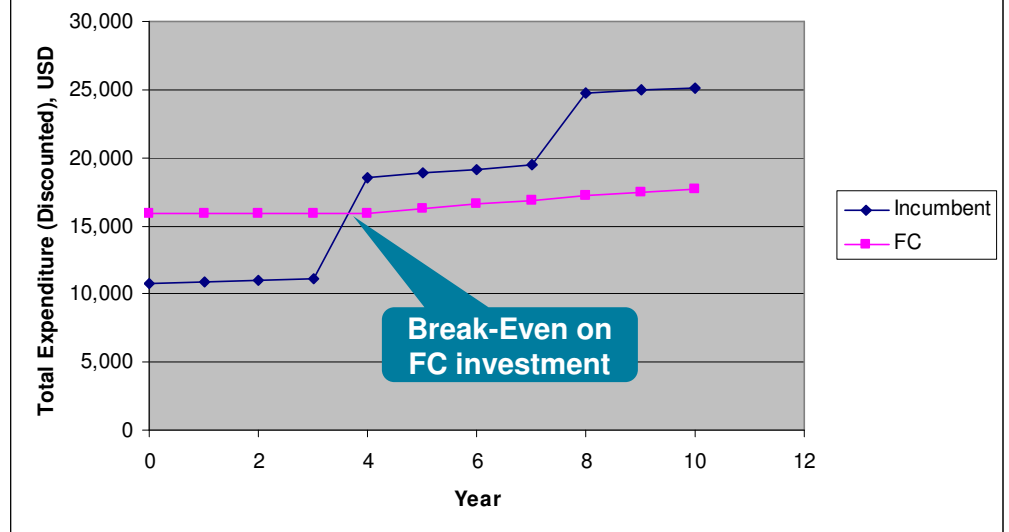
Payback:

See graph on next slide

Payback achieved by first battery replacement

@ 8-hour backup capacity

Expense Comparison - 10-year model



1. Taxes included
2. H2 air-cooled FC system based on **FCgen-1020** ACS stack, includes supercapacitor bridging (1 minute capacity @ 5kW)

Dantherm Power Investment

- Acquired controlling interest in Dantherm Power, a qualified & credible supplier for telecom backup power in Europe (January 18, 2010)
- Complementary partnership with Dantherm A/S and Danfoss A/S
- Expect to accelerate fuel cell growth in backup power



Deployed Backup Power



Denmark

134 sites **312 kW**

Germany

1 sites **2 kW**

Sweden

3 sites **8 kW**

Norway
4 sites **8kW**

Finland

2 sites **8 kW**

Turkey

1 site **2 kW**

Russia

1 site **4 kW**

China

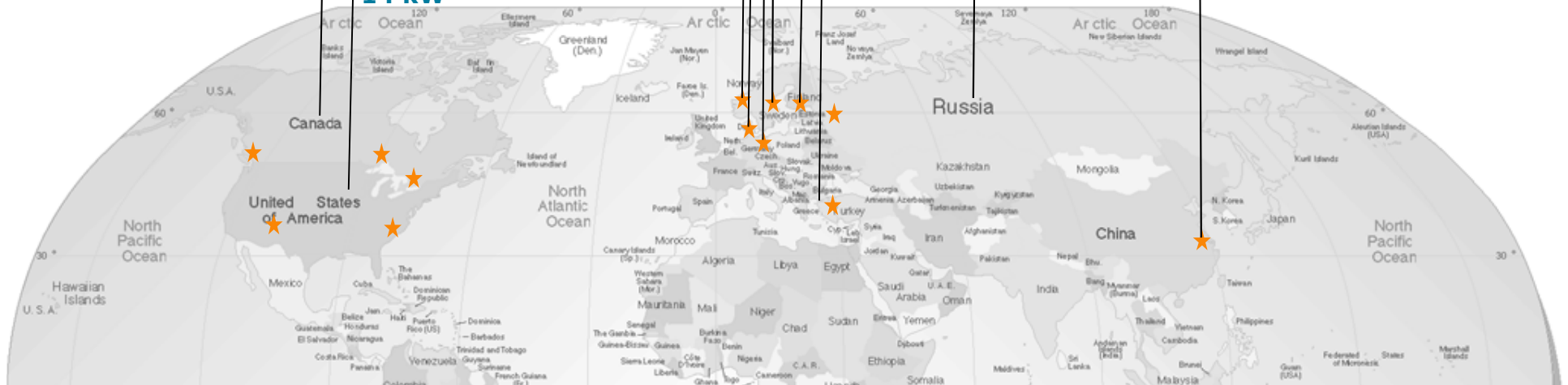
1 site **16 kW**

Canada

Vancouver 148kW 3 sites
Toronto 42kW 14 sites
Ottawa 6kW 3 sites
196kW

USA

Columbia 2kW 1 site
New Mexico 12kW 1 Site
14 kW



570 kW Installed On 169 Operational Sites

Dantherm Power at Work



- 2kW fuel cell systems for extended temporary off grid prime power (24/7) – 22kW installed on 15 sites in the Greater Toronto Area



- 2kW fuel cell systems for emergency back up power (72hr) – 246kW installed on 123 sites in Denmark



- 6kW fuel cell systems for emergency back up power (72hr) – 66kW installed on 11 sites in Denmark



Summary

- **The Commercial Mobile Radio market continues to grow, in spite of tough global economic conditions**
- **Fuel cells provide an economical alternative to batteries and generators for telecom backup power**
 - Emergency Backup: Payback achieved by the first time batteries would have to be replaced
- **Ballard's portfolio of fuel cell products are meeting the demands of the telecom industry in significant commercial deployments**

Hydrogen + fuel cells key contributor to the future clean energy landscape



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