

Fuel Cells in Telecommunications

J. Blanchard
December 2011

ReliOn Overview



Markets

Backup, grid supplement, and off grid power systems for critical communications infrastructure spanning telecom, transportation, government, utility, and OEM customers throughout the world.

Products

Purpose designed product portfolio of 175W to 2.5kW building blocks providing solutions up to 30kW for target markets. Broad range of hydrogen storage solutions supported by major industrial gas companies.

Team

50 highly educated and trained staff. Direct marketing and selling augmented with key channel partners, integrators, and OEMs. Over 125 cumulative years telecommunications experience on Sr. Management team.

Technology

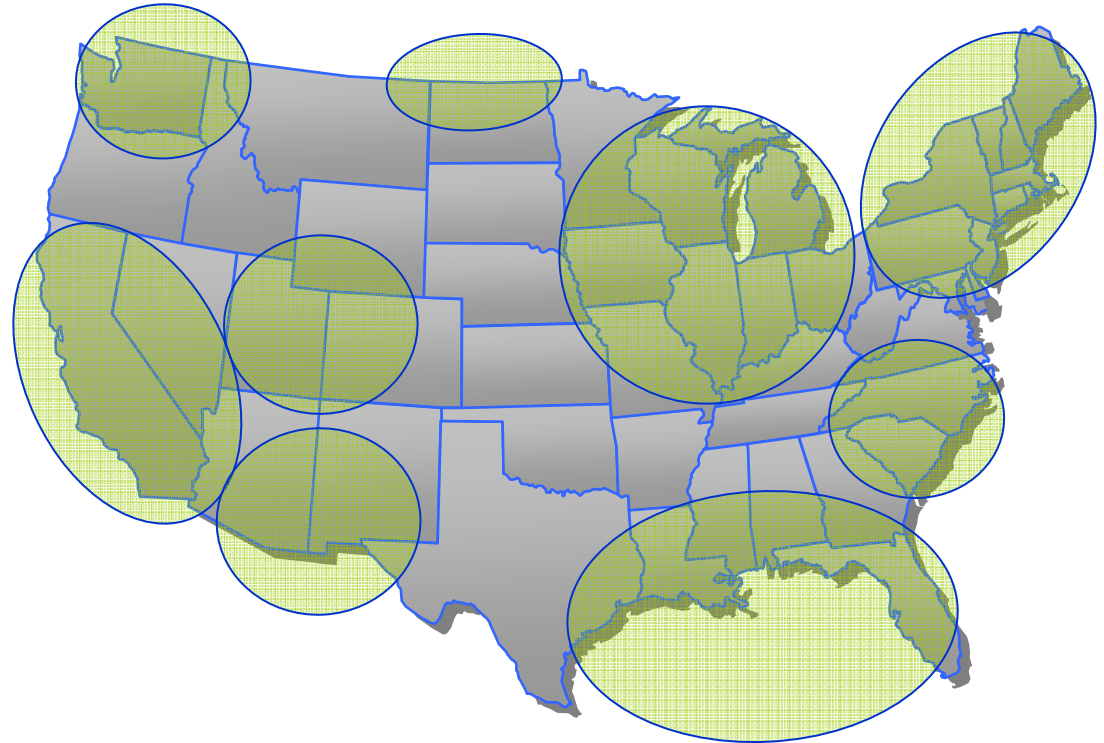
Fundamental technology company with strengths in materials science, electrochemistry, thermal management, and power electronics. Ongoing R&D programs with a broad and growing Intellectual Property portfolio.

Current Market Deployments



- ReliOn

- >3.9MW of Deployed Capacity at ~1,350 Sites
- More than 100 Customers in 28 Countries
- 10s of Millions of Installed System Hours
- 99.8% Availability Verified in Independent Tests



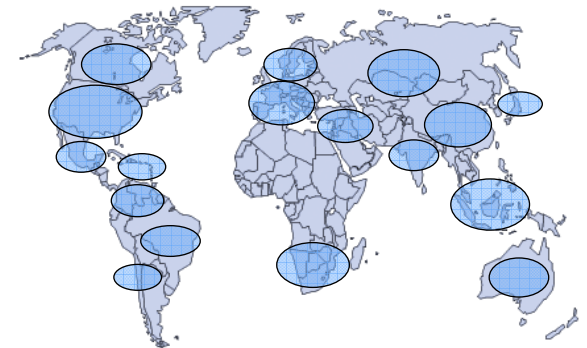
- Overall Telecom Market

- Thousands of Sites
- Volume deployments across the globe

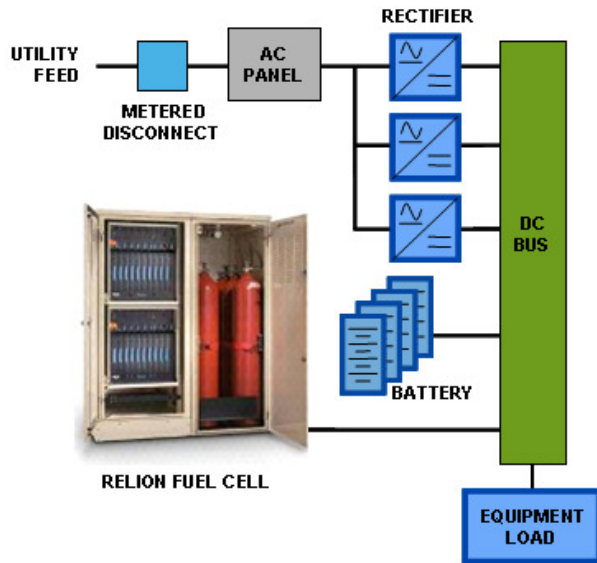
- Hydrogen/Fuel

- Improvements being made with supply, logistics, and services

- Continue to work on Total CAPEX/OPEX models

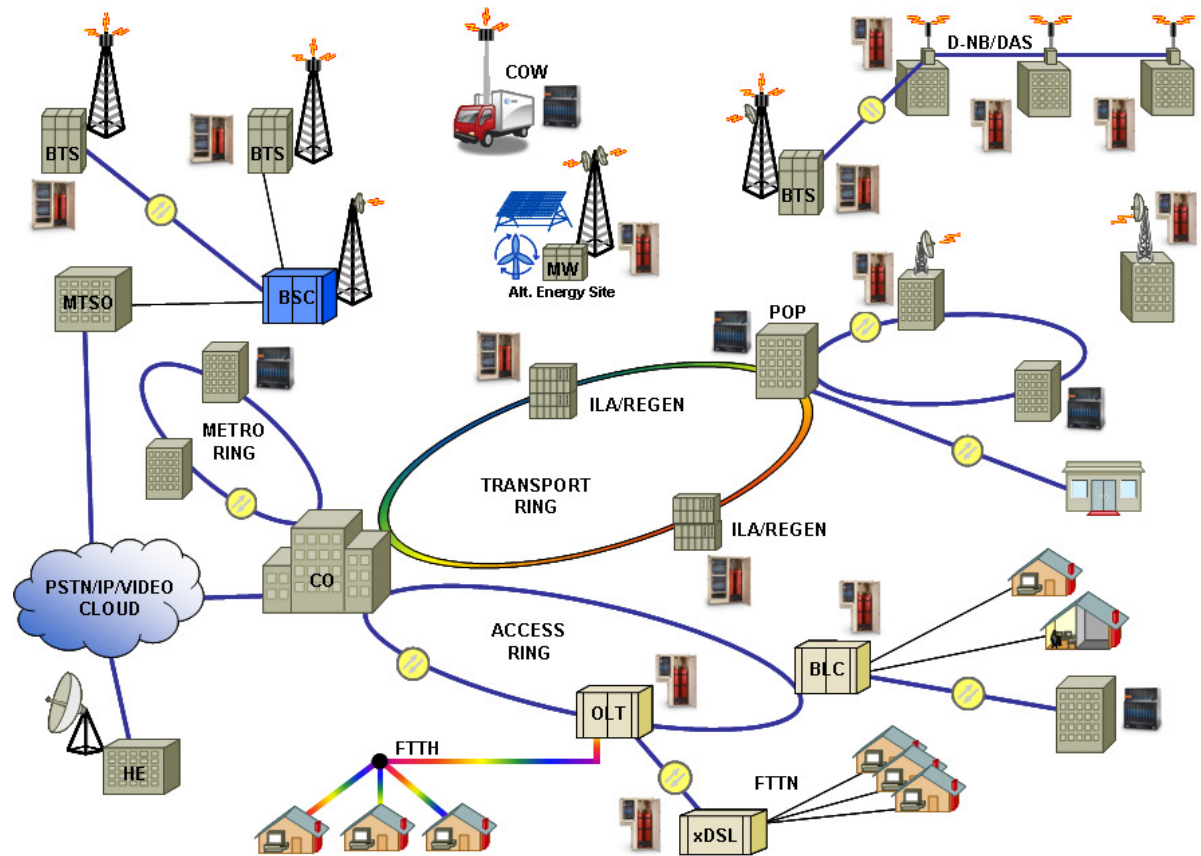


Telecom Power Solutions



- Urban/Remote/Rooftop/Portable
- Backup/Grid Support/Hybrid

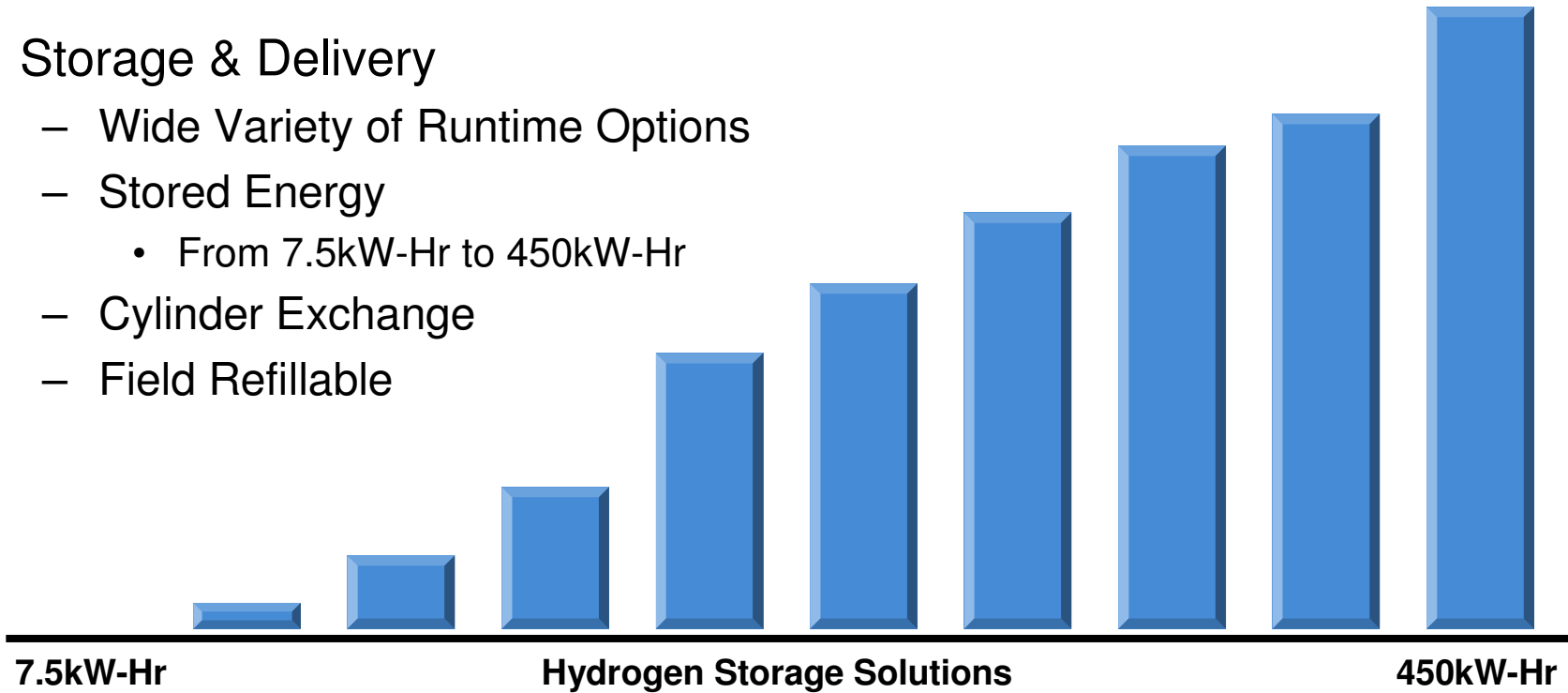
- Simple Parallel Bus Connection
- Backup for Grid & Rectifiers



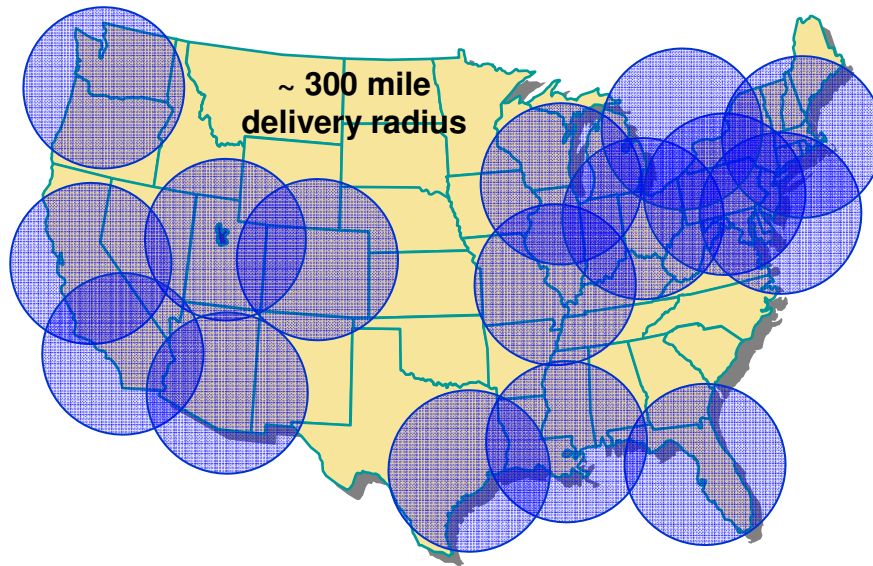
ReliOn E-2500

Hydrogen Solutions

- Storage & Delivery
 - Wide Variety of Runtime Options
 - Stored Energy
 - From 7.5kW-Hr to 450kW-Hr
 - Cylinder Exchange
 - Field Refillable



Bulk Hydrogen Refueling



16 cylinder specs

- 52”L x 56”D x 72”H
- 14.4 kg / 5,961scf / 216kWhr @ 2,150psi
- 19.4 kg / 8,031scf / 291kWhr @ 3,000psi
- Approx. weight 6,200 lbs

- Market Drivers
 - Longer run-time, expanded range of power solutions, improved economics
- DOE Market Transition Program
 - Enable significant volume of fuel cell sites to be manufactured and deployed
 - Improve CAPEX and OPEX model
 - Trigger development of bulk storage and delivery infrastructure
 - Validate the field refill or “bumping” of hydrogen storage
 - Construction engaged throughout 2010 & 2011
- Installation of 500+ extended run-time fuel cell sites
- Provide viable alternate backup power solution for carriers

Typical Site Installations



Typical Site Installations



- Commercialization is Now
- Adoption Increasing
 - Value proposition has improved
 - Field performance has been positive
- Hydrogen Solutions Are More Available
 - Refillable storage
- Not a 100% Solution
 - Recognition that Fuel Cells are not a panacea
 - Very good solution for:
 - Backup power to hundreds of hours of runtime
 - Grid supplement with reasonable duty cycles
 - Hybrid with other power sources and storage systems



Thank You

**For more information:
jblanchard@relion-inc.com
www.relion-inc.com
509-228-6500**