

IdaTech Briefing for HTAC

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IdaTech Overview

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IdaTech Overview and History

- Founded in 1996, IdaTech designs, develops, and manufactures extended run critical power fuel cell products for telecommunications and other high reliability applications
- IdaTech was acquired by Investec, a diversified UK based bank, in 2006 and went public on the London AIM exchange in 2007. Investec owns ~70% of the outstanding shares of IdaTech
- IdaTech's Fuel Cell products utilize advanced proton exchange membrane (PEM) technology and proprietary liquid fuel reforming for generating H₂ onsite and on demand
- The company offers 250W, 3kW and 5kW fuel cell products that provide solutions for stationary power applications requiring 100W to 15kW
- IdaTech has over 90 employees, is headquartered in Bend, Oregon with operations in the U.S, India, Mexico, Asia, and Europe
- ISO 9001:2008 Certified

IdaTech Infrastructure

Corporate Headquarters

- ISO 9001:2008 certified
- Product and technology development
- R&D and prototype development



Manufacturing Facility

- ISO 9001:2008 certified
- Volume manufacturing
- Flexible capabilities
- Low cost manufacturing
- Capacity of up to 5,000 units per year



IdaTech's Core Technologies



- Fuel Reformer

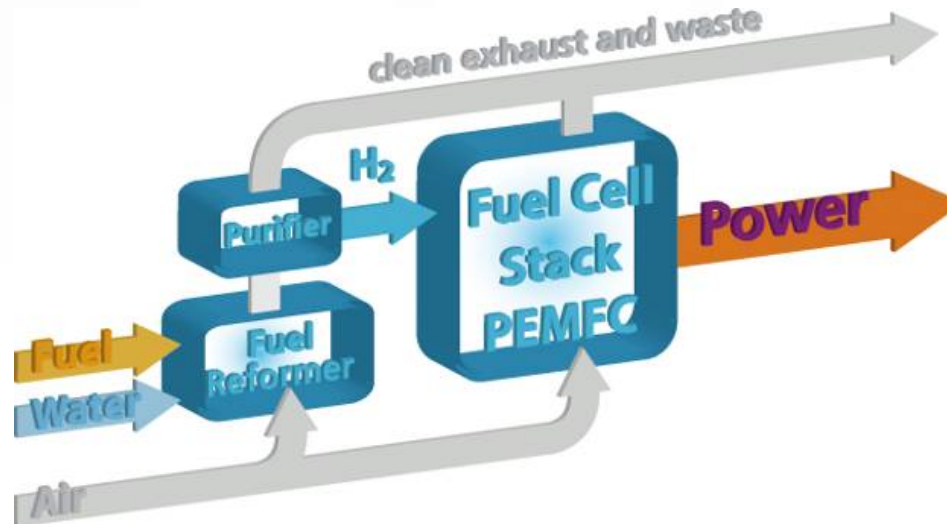


- Purifier



- Fuel Cell Stack

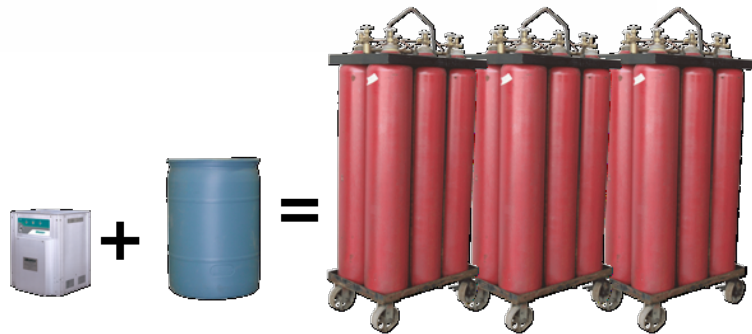
- Strong IP position
- 194 issued patents and 134 pending patents in US and key foreign countries
- Fully integrated systems for fuel reforming and purification with power generation



Fuel Reforming - Multi Fuel Solutions

- Fully integrated fuel reforming and purification
 - Multi-fuel
 - Efficient, simple, compact, reliable
 - Near zero emissions
- Overcomes the hydrogen barrier

- 24 hours of operation at 5 kW is either:



• Reformer with 120l of Water/Methanol Mix

• 18 Hydrogen Cylinders (138m³)

Application	Typical Fuel	IdaTech Capability
Stationary power	Methanol	✓
Stationary power	Natural gas	✓
Portable power	LPG	✓
APU	Diesel	✓
Military	JP8	✓
Emissions control	Diesel	✓

Markets and Products

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Industry Challenges & Solutions

Performance

Capital Cost

Adoption

Hydrogen Infrastructure

- Technology advances
- Focus on application
- Design simplification
- Global supply chain

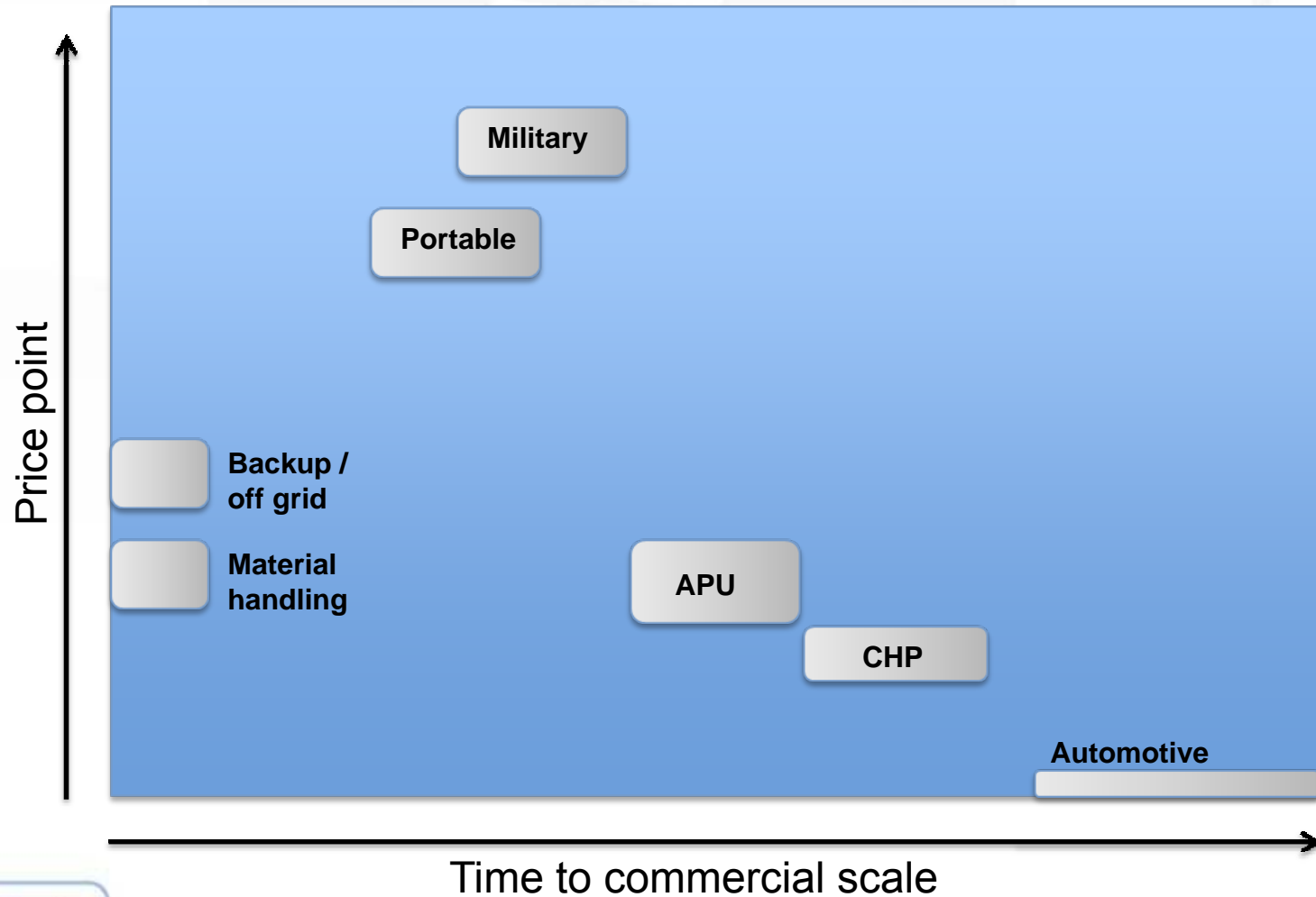
- Target highest value proposition segments
- Identify early adopters
- Gain early certification

- Reduce onsite reforming costs
- Develop local supply chains



Fuel Cell Market View

Small, low temperature PEM



Initial Target Markets

Critical Power for Wireless Telecom Sites

Target Environment

Cell sites that are susceptible to severe weather, natural disasters, and poor electric grid reliability.

Customer Value

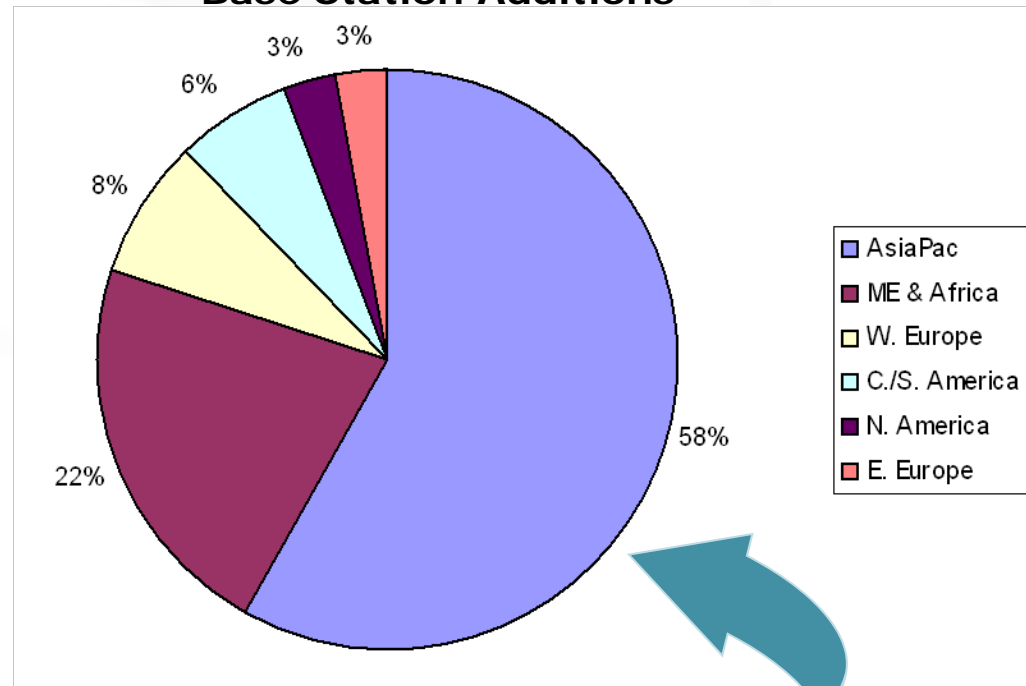
Reliable, extended run backup power solution with low lifecycle and operating costs



Telecom Market Size

- Wireless telecom opportunity
 - \$2+ billion/yr spent on DC telecom backup.
 - Expect total ~300,000 base station additions.
 - Expect 2010 total addressable telecom fuel cell market ~25,000 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)

2010 Cellular Base Station Additions



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

Traditional Telecom Power Solutions

Incumbent Technology

Batteries can be:

- Expensive to maintain
- Unreliable after aging
- Temperature sensitive
- Difficult to dispose of

Generators can be:

- Unreliable
- Difficult to site
- Maintenance intensive
- Hazardous fuel spill
- Noisy



Fuel Cell Opportunity

Fuel cells can provide unique benefits to traditional sources of power

Power = Revenue

Power = Security

Developing World

- Rapid, massive growth
- Unreliable power
- Unavailable power
- Severe climates

Developed World

- Shift to wireless
- Extreme reliability / security demands
- Push for sustainable solutions

Power sources are required that are extremely reliable, remotely controllable, autonomous and capable of extended run times

Characteristic	Genset / Battery	Fuel Cell
Reliability	-	+
Remote monitoring	-	+
Operating cost	-	+
Maintenance cost	-	+
Efficiency	-	+
Temperature range	- +	+
Weight	-	+
Environmental	-	+

Companies Pursuing the Opportunity



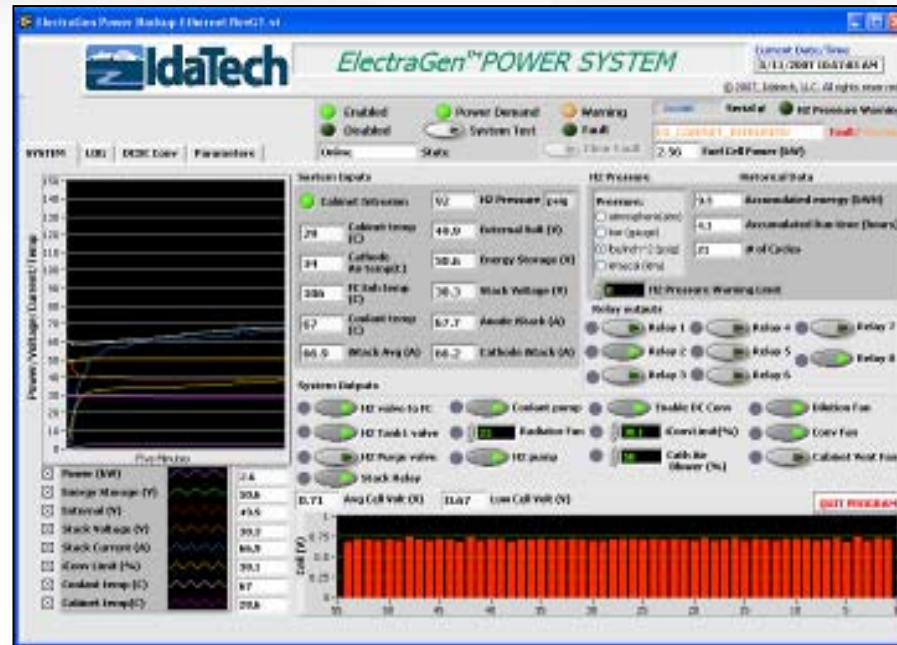
	IdaTech	Relion	Alteryg	Dantherm	Hydrogenics
Corporate	Public	Private	Private	Private/JV	Public
Location	USA/Oregon	USA/Washington	USA/California	Denmark	Canada
Typical Power increments	200 W to 15 kW	200 W to 12 kW	200 W to 10 kW	200 W to 2.5 kW	1 kW to 12 kW
Technology	Air cooled	Air cooled	Air cooled	Air cooled	Liquid cooled
Reforming capability	Yes, integrated	No, pursuing 3 rd party	No, pursuing 3 rd party	No, pursuing internal	No

IdaTech Products

ElectraGen™	ElectraGen™ XTR	ElectraGen™ XTi	ElectraGen™ H2-I	ElectraGen™ ME
				
3/5 kW	3/5 kW	3/5 kW	2.5/5 kW	2.5/5 kW
Deployed	Deployed	Deployed	Deployed	Q4 2010 Launch
Hydrogen	Methanol-Water	Methanol-Water	Hydrogen	Methanol-Water

- Cost reduction (competitive with diesel generators)
- Simplification
- Performance improvement

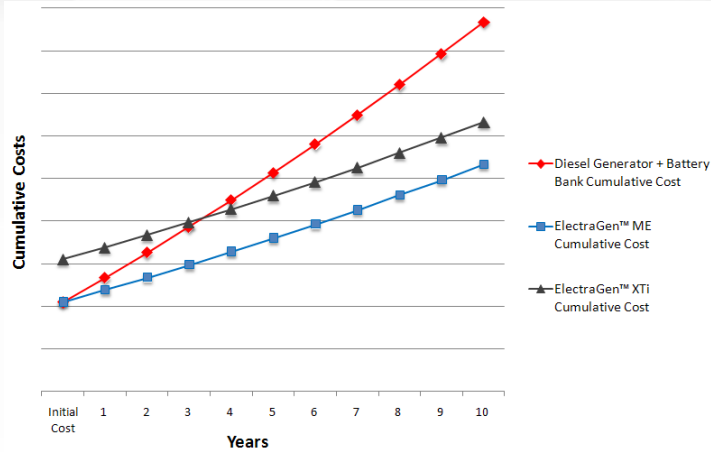
Remote Monitoring & Control



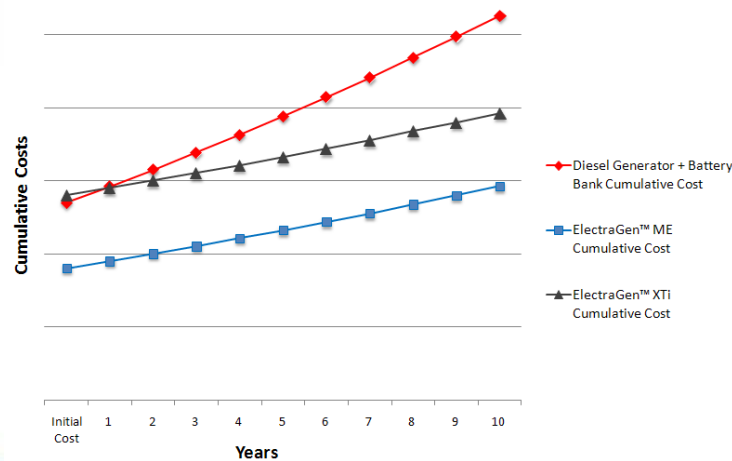
Enables central dispatch, control, monitoring of thousands of systems via wireless lines

IdaTech vs. Backup Diesel Generator

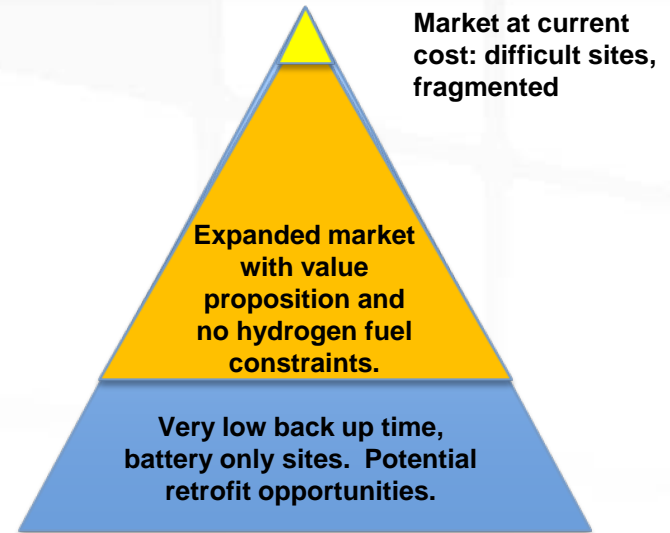
Asia Value Proposition



USA Value Proposition



Available Market



- 60X market expansion enabled by next generation value proposition
- Cost competitive with diesel generators
- Superior lifecycle costs, reliability, monitoring and control
- Eligible for mass infrastructure bids (mainstream vs niche opportunities)

Softer Advantages

Telecom Backup Power Application

Fuel Cell Advantages	Measures	ElectraGen™ ME	Diesel Generator
Clean	Nitrogen Oxides (Nox)	<0.01 g/kWh	7.5 g/kWh
	Carbon Monoxide (CO)	0.2 g/kWh	8.0 g/kWh
	Particulate matter	0 g/kWh	0.8 g/kWh
	Carbon Dioxide (CO2)	800 g/kWh	1,500 g/kWh
Quiet	Decibel rating	< 52 dB @ 1 meter	68 dB @ 7 meters
Efficient	Efficiency (%)	> 30%	10 – 25%
Low operating costs	Maintenance visits / year	1	2-4
	Theft	None	Fuel & parts
	Reliability	Few moving parts	Many moving parts

Significant Technical Adoption Cycle

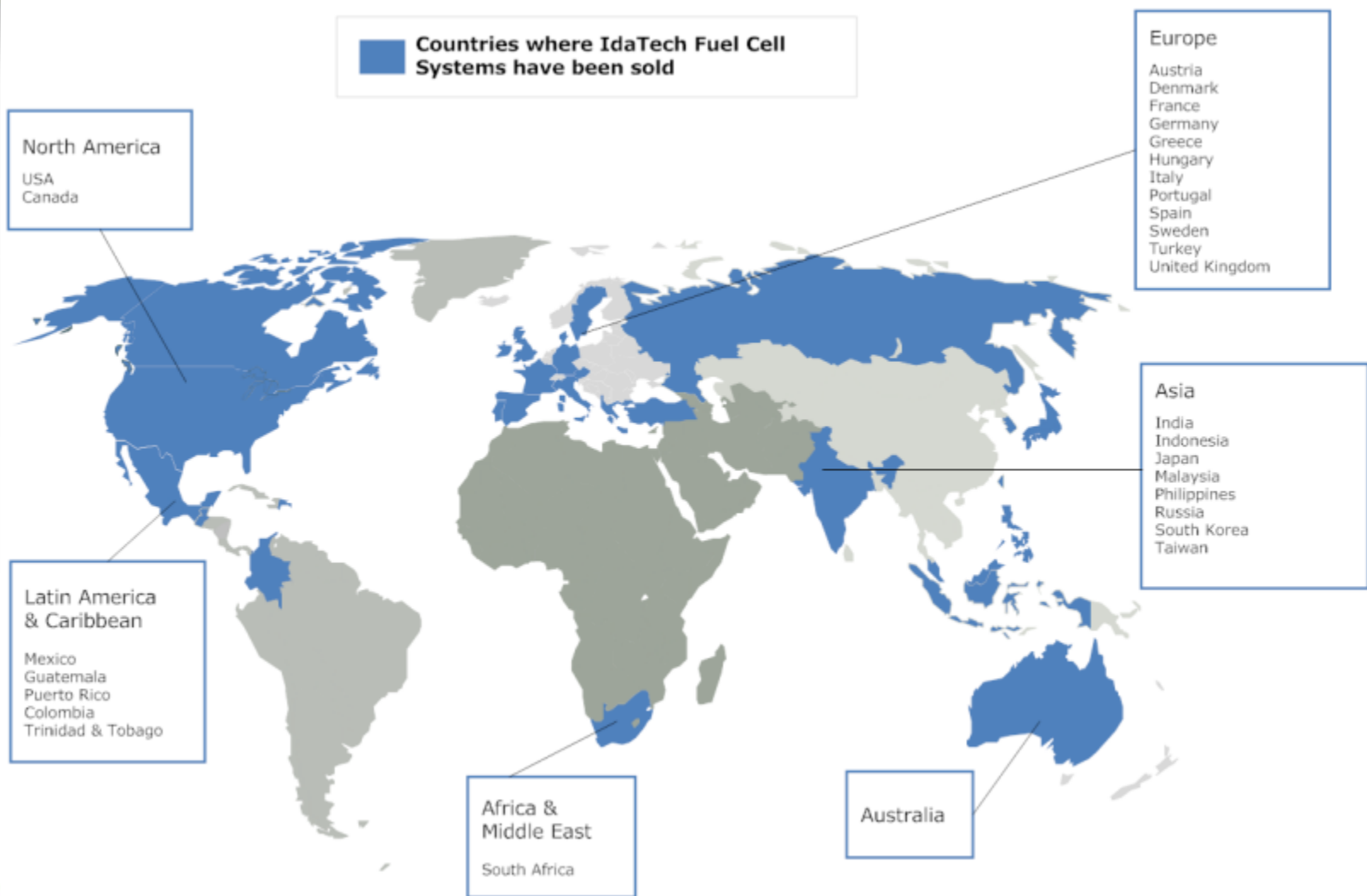
Telecoms Sector Initial Adoption and Sales Cycle



- Iterative process
- Feature changes
- Industry certifications
- Technical buy-in
- Operational buy-in
- Feature changes
- Mindset / routine changes
- Capex cycle
- Risk-reward tradeoffs
- Service mobilization

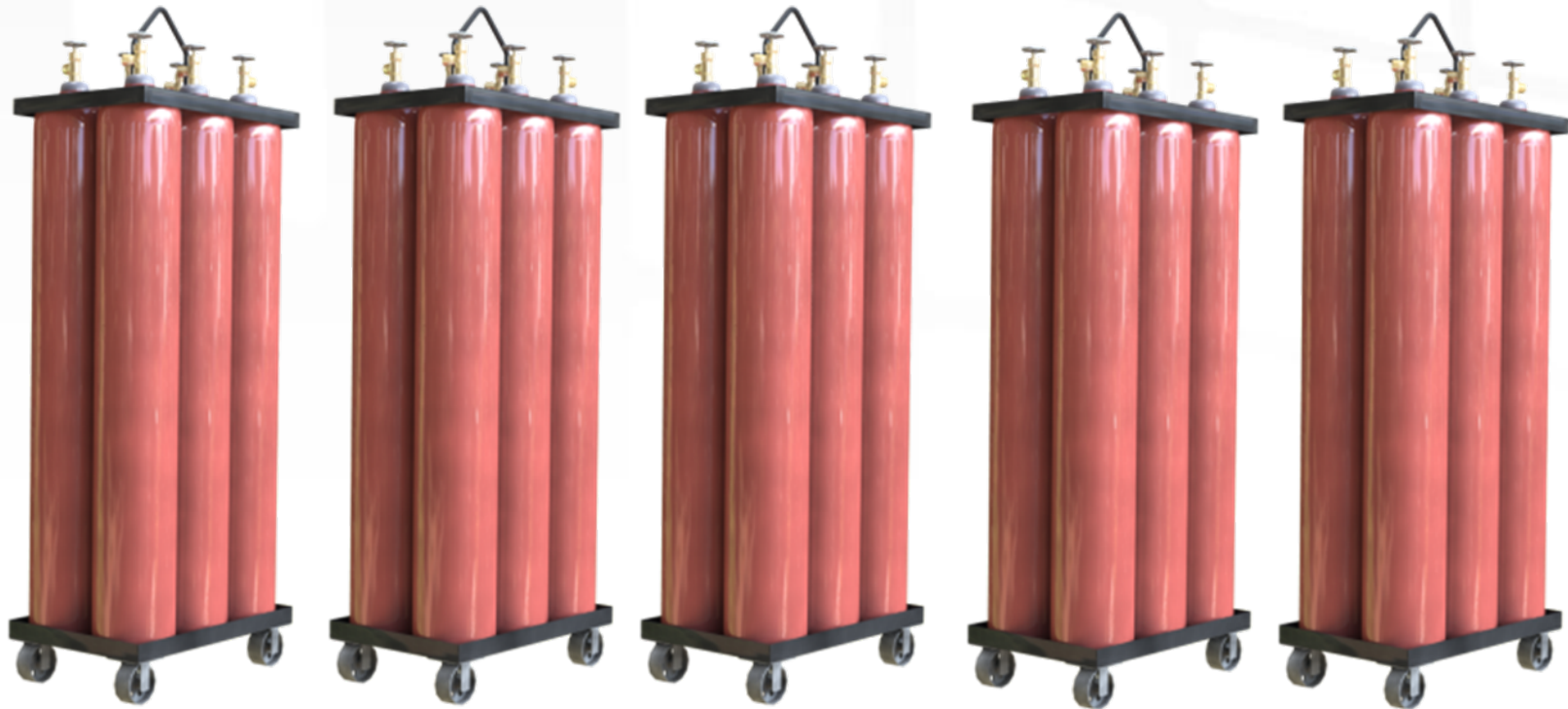
IdaTech is certified with 21 telcos, including 5 of the 10 top wireless telecom companies worldwide

~800 Systems Worldwide



The Hydrogen Challenge

Compressed H₂ is a challenge for sites requiring longer duration backup, higher power, and sites not convenient for hydrogen siting and refueling.



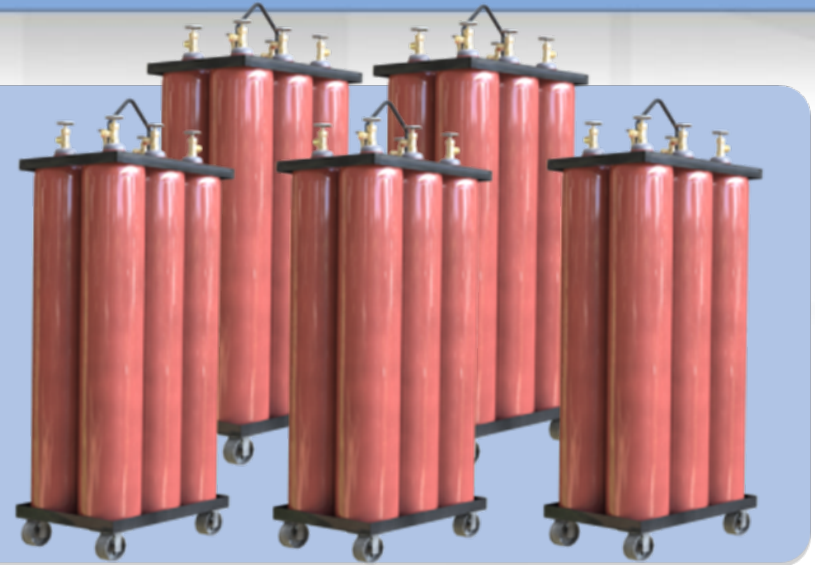
30 hydrogen cylinders \approx 50 hours @ 5kW

ElectraGen™ ME Overcomes the H2 Barrier

48 hours of Autonomy



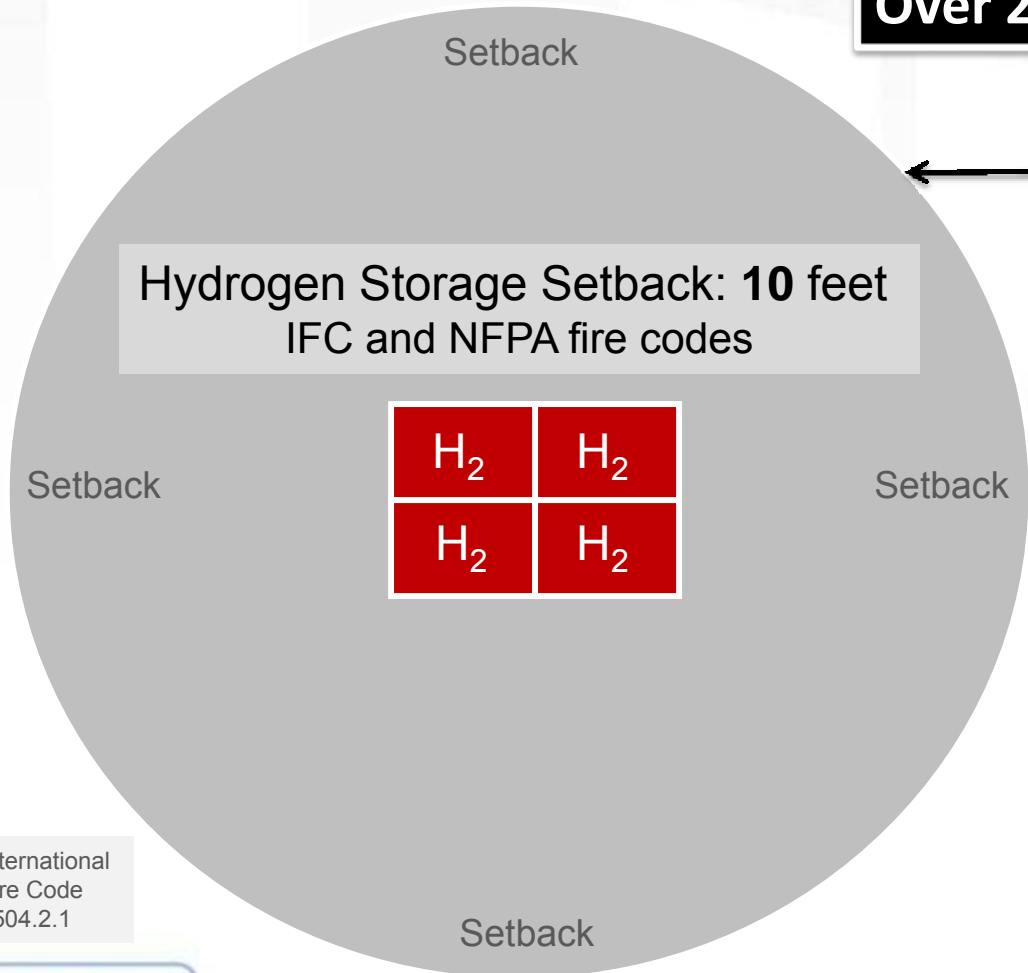
OR



Comparisons	Reformer (Methanol)	Bottled Hydrogen
First cost	Up to 50% lower than bottled hydrogen, depending upon runtime.	Competitive at 8 hours runtime or lower.
Operating cost	Essentially flat, based on fuel use.	Cylinder rental, frequent, high cost refueling beyond low power and low outage applications.
Logistics	Liquid: 59 gallons = 48 hours, easily stored, transported and refilled. Available globally.	Bulky, nearly 30 cylinders at 110 lbs each required for 48 hours. Specialty chemical with limited availability.
Footprint	About 40 square feet / 4 square meters.	> 800 square feet / 80 square meters.
Permitting	None required for less than 60 gallons.	Extensive codes and setback requirements. Regulations vary by locality.

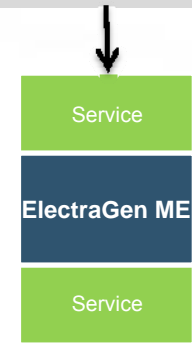
Smaller Footprint

Over 20X smaller footprint



Hydrogen Fuel Cell
Total area: **800** square feet

ElectraGen ME Fuel Cell
Total area: **40** square feet



International
Fire Code
3504.2.1



Reformer vs Compressed H2 TCO

100 hour per year run time example

Fuel Cell

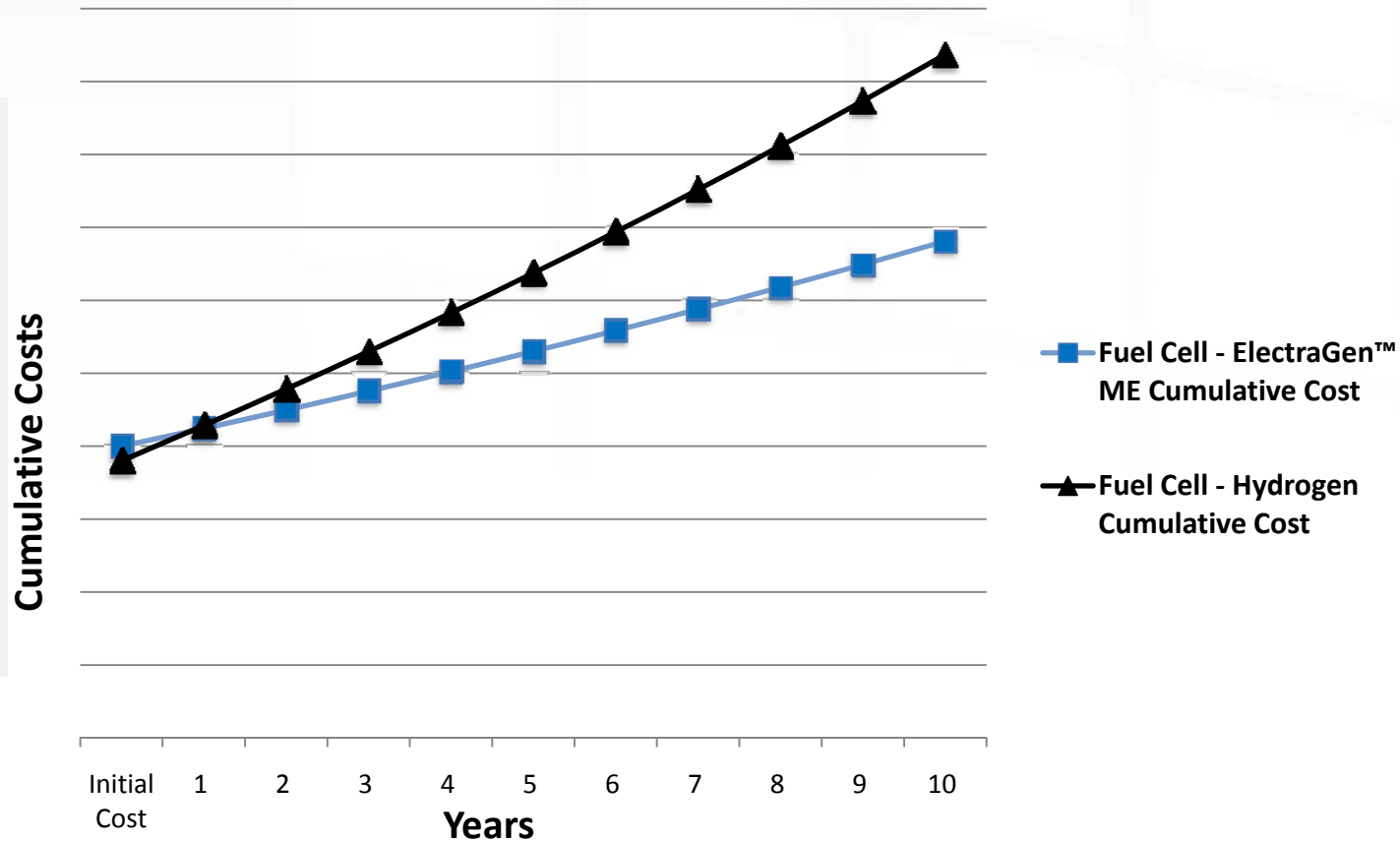
ElectraGen™ ME

- 48 hours on a fill.
- No permitting requirements

Fuel Cell

Hydrogen

- 10 hours with 6 standard H2 cylinders
- Significant permitting requirements



Renewable & Low Carbon Methanol Fuels

1. Derived from natural gas

- IdaTech's HydroPlus is derived from natural gas
- 62/38 methanol (CH_3OH) water mixture
- Distributed worldwide

2. Derived from bio-renewable resources

- By-product of biodiesel production (certified)
- Wood and farm waste (certification in process)

3. Captured from industrial processes

- Capture CO_2 from industrial emissions and convert it to bio-methanol using renewable energy (certified)
- Coal bed methane (from coal mining) used directly to produce methanol

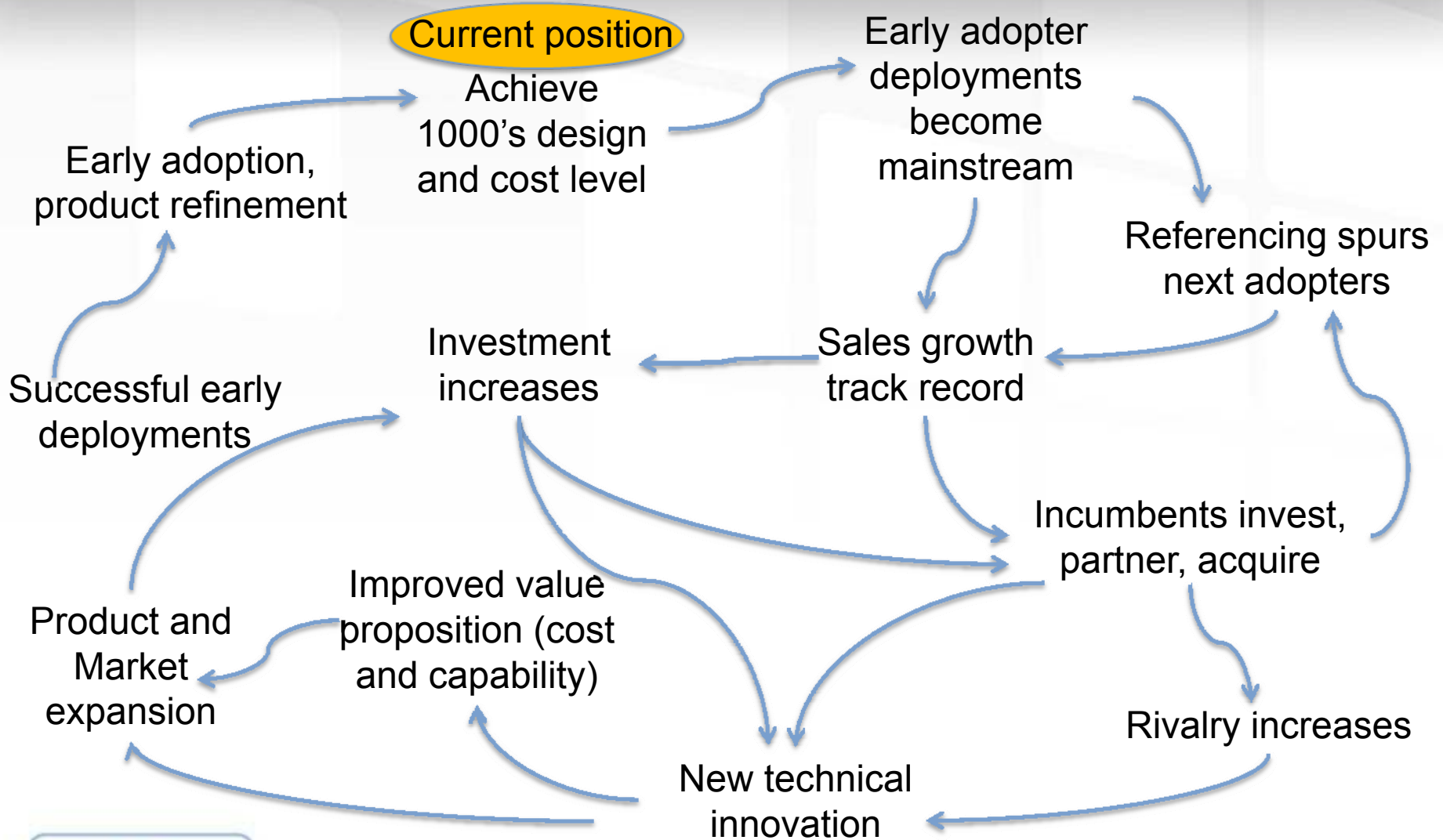


Potential Future Directions

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Positive Feedback Cycle



Summary

Highly focused on penetrating telecom market to high volume profitable growth

Reformer capability is a key enabler to final step in large scale commercialization

Technology can be leveraged to a wide range of additional products and applications,

...but expansion requires establishing a strong commercial beachhead application

Installations

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United States



Asia



India



Latin America



Europe



Thank you!