Hydrail Conference, Toronto
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Convergence of Smart Grid, Energy Storage and Transportation
Fuel Transition

Carbon content in fuels has decreased over time

Hydrogen is the ultimate zero-carbon fuel
Energy Industry Operates in Silos

- Natural Gas: 35%
- Transport Fuels: 36%
- Electricity: 18%
Smart Energy Networks?

- Electricity
- Natural Gas
- Transport
Energy Storage Boom
Interest is Trending Globally

Market

$1.5B in 2010 to $35B in 2020 (global)

Potential

121 MW in 2011 to 2,353 MW in 2021 (global deployment)

Investment

$544M in 2010
$1.01 B in 2011

Positive trends

Renewables growth
Grid stabilization
Load leveling
Peak electricity costs

In the last year Ontario energy storage innovators raised over $45M
Not all forms of storage are equal

- Ancillary Services
- Energy Balancing
- Community Energy Storage
- Daily Peak Shaving
- Seasonal Storage
Fuel production, storage and power are independent in time and quantity.
Electrolyzers can load follow

Hydrogenics’ HySTAT™ Provides Frequency Regulation on Ontario Grid

HySTAT™ electrolyzer provided frequency regulation by responding to real-time frequency regulation signals from the IESO on a second-by-second basis.
Hydrogen Storage

- Can be stored for long periods of time without degradation
- Can be stored in very large quantities
- Can use existing infrastructure
Fuel Cells are Efficient and Reliable

Non-Humidified Stack Advancements in Durability
And we can put it in a vehicle!
Opportunity – Jobs and Exports
Ontario Technology is World Leading

• Other jurisdictions are charging ahead with Power to Gas projects for the benefits of energy storage and to offset natural gas imports

• Position Canadian technology for emerging market opportunities
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