Overcoming Roadblocks to Building Hydrogen Fueling Infrastructure

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Leadership in Hydrogen Fuel Infrastructure

- Worlds largest producer of merchant hydrogen ~50% share
- Active since 1993
  - Built over 75 hydrogen stations
  - Approaching 50,000 fuellings
  - 14 countries
- Strong and broad technology position and responsible for many firsts.
  - Energy Park
  - 350 bar
  - 700bar
  - Class1 div1 dispenser
  - CA Hydrogen Highway

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Leadership in Hydrogen Fuel Infrastructure

- Turnkey Systems Integrator
- Have at our disposal
  - Methane conversion technologies
  - Gas clean-up technologies
  - Gasification
  - Electrolysis
  - Renewables
- Supplier of the most cost effective molecule to the marketplace

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Project Development Issues

- Historically has taken 2-3 years to contract a station
  - Adds project costs
  - Delays deployment, lose of momentum
- The transition is developmental NOT commercial. Commercial fuelling is covered by insurance and places liability on station owner/operator.
  - Developing new frontier technology in the public view. Are there still unknowns?
  - Hydrogen fuelling is relatively inexperienced vs. gasoline. Particularly hydrogen above 3000psi
- Inability to agree on Liabilities, Indemnifications and Warranties within traditional comfort zone.

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Path Forward to a Forecourt Model

- Finalized Codes and Standards
  - Basic Codes and Standards are written
  - Component listing needs to occur
  - Experience
  - AP participates on all major code bodies
  - Design to the strictest parameters
- Developing volume applications from which to base risks.
- Numerous independent owners willing to participate with affordable coverage.
- Can this liability be covered through an insurance instrument to share risks.

Liability Insurance Landscape

- Marsh
  - Largest insurance broker in the world
  - Access to entire global insurance marketplace
- Search focused on liability insurance for retail distribution of hydrogen (i.e. independent fuel stations)
- Current state of insurance for independent fuel stations is highly fragmented
- There are a few insurers that have some volume (i.e. Nationwide)

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Liability Insurance Landscape

- There are a few leaders but more followers in the insurance marketplace
- Overall, insurers are very conservative when it comes to emerging risks
- Need for greater understanding of hydrogen risk characteristics, but expectation is this can be overcome
- Some insurers have experience with alternative fuel sources (i.e. ethanol)

Market Challenges

- Insurance 101 – what is required to make a risk insurable?
    - Law of large numbers – not enough units (policyholders) to achieve critical mass
    - Predictability of losses – not enough historical/empirical data for financial modeling
    - Spread of risk – reinsurance (one method to spread risk) current treaties typically exclude hydrogen

Governmental Assistance with liability insurance marketplace

- Need
  - Fuel station owners lack tools to deal with emerging risks
- Precedent
  - Vaccine Act, TRIA, etc...
- Recommendation for assistance
  - Premium Rebate
  - Reinsurance "backstop"

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