Electrolytic Hydrogen Production
Potential Impacts to Utilities

Electrolytic Hydrogen Production Workshop
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Electrolytic Hydrogen Production
Potential Impacts - Electric System

- Generation Resources
- On/Off Peak
- Dispatchability

- Ramp Control
- Reserves
- Plant Cycling

- Reliability
- Capacity
- Regulation
Unique Opportunities - Electric

- Increased Load (Including Compression):
  - Electrolysis: 43 – 63 kWh/kg H2
    
    \(\text{(Versus Natural Gas Reformation: 4 – 5 kWh/kg H2)}\)

- System Regulation
  - Electrolysis can deliver fast response regulation services
  - Regulation market is small; Expect to saturate quickly

- Renewables Integration
  - Increased off-peak load reduces wind curtailment
  - Dispatchability can support variability mitigation
  - Potential to enable high penetrations of renewables
Ancillary Services Markets

- Organized Markets (e.g., MISO, PJM)
  - Published pricing for capacity and “mileage”
    - 2013 Average MISO Capacity Price: $9/MW
    - 2013 Average MISO “Mileage” Price: $0.5/MWh
  - Also compensation for energy provided

- Bilateral Markets (e.g., PSCo)
  - Limited transparency in market pricing
  - Potential to offer service under utility demand response program or resource plan process (focused on more attractive interruptible service discount prices, rather than paying for regulation service)
  - FERC may be interested in regulation services in bilateral markets
Questions