The Road to Hydrogen – Challenges Ahead in Technology and Manufacturing

Rick Zalesky
President, Hydrogen Unit
Chevron Technology Ventures

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CTV Hydrogen Strategy

- Develop organizational capability to be a market leader should hydrogen be adopted in the fuels portfolio
- Leverage hydrogen as an extension of our existing businesses
- Ensure CVX is positioned to actively participate in the development of hydrogen technologies and related regulations and legislation
- Enhance CVX’s reputation as a leader in fuel processing
Chevron Hydrogen Energy Stations
Integrated Hydrogen Energy Stations: Scalable, Distributed Manufacturing Technology

- Convergence and integration
- Molecular-scale design
- Advanced materials
- Digital control technology

*Hydrogen may be leading the way into a fundamental shift in manufacturing technology*
Current Storage Technologies are Inadequate for the Future

105 kg at 6,000 psi in a footprint 28’ long x 5.5’ wide x 7’ high
What’s Required: New Technical Approaches

• Thermally and mechanically integrate the reformer to maximize heat recovery, minimize heat loss, and minimize balance of plant
• Design the reformer to operate at pressure required for purification step
• Balance heat load to achieve passive temperature control and minimize the number of control loops
What’s Required: New Design Concepts

Process Connections and Dimensions

- Reformate to PSA
- Combustor Air
- PSA Off-gas
- Combustor Exhaust
- Water
- Natural Gas

Dimensions:
- 1.6 m
- 2.0 m
- Φ 0.2 m