



# Hydrogen Expo 2009 Seminar Forum Program

as of March 26, 2009

The Seminar Forum is located in the Exhibit Hall of the Columbia Metropolitan Convention Center. Admission is free for all conference delegates and expo-only attendees.

April 1, 2009

- 11:00am- Kareem Afzal, Project Engineer, PDC Machines Inc.  
11:30am PDC Machines – Enabling Tomorrow's Hydrogen Economy Today
- 11:30am- Robert McGillivray, Director Renewable Energy, Power Systems Group, Hydrogenics  
12:00noon Hydrogen, Fuel Cells, and Renewable Energy
- 12:00noon- Dr. Stephen Herring, Tech Director High Temperature Electrolysis, DOE Nuclear Hydrogen Initiative  
12:30pm Results of the High Temperature Electrolysis Integrated Laboratory Scale Experiment, Sept-Oct 2008
- 12:30pm- Brian Weeks, Associate Director, Advanced Energy Systems, Gas Technology Institute  
01:00pm Hydrogen Fueling for Tomorrow's Hydrogen Vehicle Fleets
- 01:00pm- Denis Van Decker, Project Leader, Alternative Energy Tech, Sarnia-Lambton Economic Partnership  
01:30pm The "other" centre of Hydrogen activity in Canada
- 01:30pm- Bradley J. Smith, Asset Development and Operation Manager, Shell Hydrogen  
02:00pm Safety – A Continuous Improvement Process
- 02:00pm- CJ Guo, Senior Technology Advisor, Shell Hydrogen  
02:30pm Clean and Green H<sub>2</sub> as Sustainable Future Fuel
- 02:30pm- Gary Stiles, Specialty Gas Sales Manager, Airgas National Welders  
03:00pm Hydrogen and More
- 03:00pm- Bob Kelly, Business Development Manager, Air Products  
03:30pm Partnering for Progress: Supply Chain Gains Moving to Early Adoption
- 03:30pm- – *Break* –  
04:00pm
- 04:00pm- "Teen Forum Show" Panel Discussion and Radio Broadcast  
05:00pm

Presentation details:

Kareem Afzal, PDC Machines Inc.

## **PDC Machines – Enabling Tomorrow's Hydrogen Economy Today**

PDC Machines has become the leading equipment packaging and integration provider for the hydrogen infrastructure economy over the past 10 years. In business for over 30 years serving the high pressure industrial gas and specialty chemical industries, PDC's dynamic innovation is leading the way to economical system solutions for an emerging and burgeoning hydrogen economy. Come see how PDC has led the way with its leadership and dedication to an evolving industry.

Robert McGillivray, Hydrogenics

## **Hydrogen, Fuel Cells, and Renewable Energy**

Hydrogenics is a world leader in both electrolytic hydrogen generation and PEM fuel cell systems. This presentation will show how Hydrogenics' products can provide energy security, eliminate air contaminants and greenhouse gas emissions, while saving money over the life of the product. The presentation will also highlight case studies where renewable energy sources, such as wind and run-of-the-river hydro power, are combined with electrolyzers and fuel cells to provide a stable, reliable energy source for communities.

Dr. Stephen Herring, DOE Nuclear Hydrogen Initiative

**Results of the High Temperature Electrolysis Integrated Laboratory Scale Experiment, Sept-Oct 2008**

The High Temperature Electrolysis Integrated Laboratory Scale experiment was operated continuously at the Idaho National Laboratory for 1080 hours in September and October 2008. The experiment contained three modules, each containing four stacks of 60 cells, manufactured by Ceramtec, Inc. of Salt Lake City. The experiment also included heat recuperators to recover heat from the hydrogen and oxygen streams and hydrogen recycle to maintain chemically reducing conditions on the hydrogen-side electrode. The peak net hydrogen production rate was 5.7 normal m<sup>3</sup>/hour, at the beginning of the experiment, with an test-average net production of 1.2 Nm<sup>3</sup>/hour.

Brian Weeks, Gas Technology Institute

**Hydrogen Fueling for Tomorrow's Hydrogen Vehicle Fleets**

Hydrogen fueling stations in service today were installed to support demonstrations of emerging hydrogen-fueled vehicle technologies with little thought about the per-unit fuel cost of hydrogen. In response to anticipated growth in fleet sizes infrastructure providers must design stations that can support larger numbers of vehicles with hydrogen at lower per unit costs than today's stations offer.

GTI has experience in hydrogen infrastructure that utilizes reformation, electrolysis, and delivered hydrogen. This presentation will review some existing station configurations and discuss challenges that GTI sees in hitting cost and volume targets needed for the economic viability of hydrogen-fueled fleet operations.

Denis van Decker, Sarnia-Lambton Economic Partnership

**Sarnia-Lambton – The "other" centre of Hydrogen activity in Canada**

Sarnia-Lambton, Canada – uniquely positioned to be a leader in the Hydrogen Economy. A major centre for petrochemical, energy and hydrogen production. There are two hydrogen pipelines and skilled labour working in commercial and research activities.

Bradley J. Smith, Shell Hydrogen

**Safety - A Continuous Improvement Process**

Hydrogen Refueling Station (HRS) safety is one of the first concerns expressed by the public regarding the hydrogen transportation effort, and safety is the first priority of those developing and operating these systems. Despite our efforts to overcome safety concerns, real-world experience has a way of identifying weaknesses in our approach and pointing out the need for continuous improvement in HRS design and operations. A systematic approach to HRS safety will be presented along with learnings derived from a recent HRS fire.

CJ Guo, Shell Hydrogen

**Clean and Green H<sub>2</sub> as Sustainable Future Fuel**

One of the key challenges for H<sub>2</sub> as a sustainable fuel is it needs to be 'clean' and ultimately 'green', and yet to be cost competitive given the constraints on resources H<sub>2</sub> will be made from. 'Clean H<sub>2</sub>' entails H<sub>2</sub> from fossil resources with low life-cycle carbon footprint in relatively short to medium terms. 'Green H<sub>2</sub>' represents ultimate sustainable low-carbon fuel as H<sub>2</sub> is generated from renewable resources (such as biomass, wind, solar, hydro) and possibly nuclear energy. CCS is critical for the former while substantial technology development and/or policy incentives are required for the latter to achieve cost competitiveness with alternative solutions.

Bob Kelly, Air Products

**Partnering for Progress: Supply Chain Gains Moving to Early Adoption**

As the Hydrogen economy is poised for early adoption, one key milestone for success will be the safe and economical introduction of a fueling infrastructure. With more stations commissioned globally than any other company, Air Products utilizes strategic partnerships to maximize safety and reliability while striving to reduce the final cost of fueling. These partnerships have been based on learnings from real life projects and enhanced by over fifty years of innovation, technical expertise and experience in the industrial hydrogen market. This presentation will illustrate Air Products offerings for a wide range of fueling applications from small demos to full scale deployments.