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## Agenda

# Hydrogen Internal Combustion Engines 2007 Where do we go from here?

A WestStart - FTA One-Day Symposium that expands on the  
Hydrogen Internal Combustion Engines Symposium 2006



Organized by  
***WestStart-CALSTART***  
and the  
***Federal Transit Administration***



Dated 1/30/2007

## Program Agenda

**Tuesday, February 13, 2007**

- 7:00 a.m. **Registration and Continental Breakfast**
- 8:00 a.m. **Welcome and Symposium Opening**  
Lawrence Wnuk PhD, Senior Director, WestStart-CALSTART
- 8:15 a.m. **Symposium Objectives**  
Walter Kulyk, Director, Office of Mobility Innovation  
Federal Transit Administration
- 8:30 a.m. **Where do we go from here?**  
*Internal combustion engine commercial strategies*
- Paths Forward to Hydrogen**  
Fred Silver, Vice President, WestStart-CALSTART
- Vehicle Technologies Program - BMW**  
Wilhelm Hall, General Manager, Environmental Engineering  
BMW of North America
- Hydrogen ICE Technologies - Ford**  
Robert Natkin, H2ICE Project  
Ford Motor Company
- 9:45 a.m. **Break – Network Session**
- 10:00 a.m. **Setting the Stage**  
*Research activities*
- HCNG and Hydrogen MD/HD Engine Programs**  
Sandeep Munshi Ph.D., Senior Scientist - Engine Research  
Manager - Hydrogen Technologies, Westport Innovations
- LACMTA HCNG Emissions Program**  
Neil Mulligan, Executive Vice President, City Engines
- Research Update: Hydrogen Projects Argonne National Lab**  
Thomas Wallner Ph.D., Hydrogen Research Specialist  
Argonne National Laboratory
- 11:15 a.m. **Poster Review Session**  
*Review delegation tours the posters.*  
Walter Kulyk, Director, Mobility Innovation, FTA and delegation  
*Authors attend Posters for dialogue with Symposium attendees*

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## Hydrogen Internal Combustion Engines 2007 ... Where do we go from here?

12:15 p.m. **Lunch – Network Session**

12:30 p.m. **Luncheon Keynote –**

### **Making Hydrogen a Primary Fuel and Energy Carrier**

Tom Mutchler, General Manager, Integrated Businesses  
Air Products and Chemicals, Inc

1:30 p.m. **Hydrogen Infrastructure Build-out**

*Transitioning the infrastructure to hydrogen*

### **Waste Hydrogen and HICEs on the Vancouver H<sub>2</sub> Highway**

Colin Armstrong, Director of the Integrated Waste Hydrogen  
Utilization Project (IWHUP), Sacré-Davey Innovations

### **California Hydrogen Clusters**

Matt Miyasato Ph.D., Technology Demonstration Manager  
South Coast Air Quality Management District

### **Shell Hydrogen Infrastructure Roll-Out Plans**

Pana Ratanabanangkoon, Business Development Manager  
Shell Hydrogen LLC

2:45 p.m. **Break – Network Session**

3:00 p.m. **Broadening the Perspective**

*Commercial focus and alternative paths*

### **HICE Emissions and Near-ZEV Performance**

Christopher White PhD., Consultant, Hydrogen Engine Laboratory  
for Jay O. Keller PhD, Manager, Energy Combustion and  
Hydrogen Energy Department, Sandia National Lab Livermore

### **Hybrid Hydrogen ICE Vehicles**

Andy Abele, Executive Director for Strategic Development  
Quantum Fuel Systems Technologies Worldwide

### **Applying Stationary HICE Technology**

Avtar Bining PhD, ARICE Program Manager  
California Energy Commission

4:15 p.m. **Pathways Panel – Moderated Audience Participation**

*Expand on next step ideas with the attendees*

Walter Kulyk, Director, Mobility Innovation, FTA and the  
WestStart-CALSTART Team of Panelists with representatives  
from CARB, CEC, AQMD, Fleets and Private Sector

5:00 p.m. **Wrap-up**

*Review of key symposium pathway points, possible next steps*

Fred Silver, Vice President, WestStart-CALSTART

6:00 - 8:00 p.m. **Welcome Reception**

*Joint event with Clean Heavy-Duty Vehicle Conference 2007*

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## Hydrogen Internal Combustion Engines 2007 ... Where do we go from here?

### A Message from the Federal Transit Administration

The Symposium is intended to foster communication among public agencies as well as the private sector surrounding projects and technology involving internal combustion engines (ICE) fueled by hydrogen or hydrogen blends. Encouraging such dialogue will also help us explore the possible near-term roles that HICE and ICE fueled with hydrogen-blends might play in the Administration's vision for 'transition to hydrogen' as a transportation fuel.

### A Message from California and WestStart-CALSTART

WestStart-CALSTART is assisting the Federal Transit Administration in compiling a strategy and paths forward that involve the HICE or HCNG-ICE work efforts. This Symposium and the session topics, the invited speakers and poster sessions are offered to help focus the dialogue about performance, analysis and accomplishments with a goal of understanding prudent future directions and desirable next steps for hydrogen internal combustion engine (HICE), HCNG-ICE and related technologies.

For more information contact: Lawrence Wnuk, 626-744-5600, [lw nuk@calstart.org](mailto:lw nuk@calstart.org)

*The Symposium organizers express our gratitude to the following organizations for their support of the Symposium*

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#### Symposium



**Westport**  
INNOVATIONS INC.

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#### Luncheon



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#### Associate

