The Advanced Vehicle Research Center

Leadership in Automotive Technology and Development

Automotive Technology and Development

- US Department of Energy
  - Hydrogen Refueling Station, Design & Build Document now published online at www.avrc.com (click ‘links’)
  - Combustion Analysis Lab at NC State University
  - Ethanol Efficiency in High Compression Engines

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Ethanol Efficiency in High Compression Engines

- Vehicles have been converted to run at significantly higher compression ratios to optimize use of ethanol.

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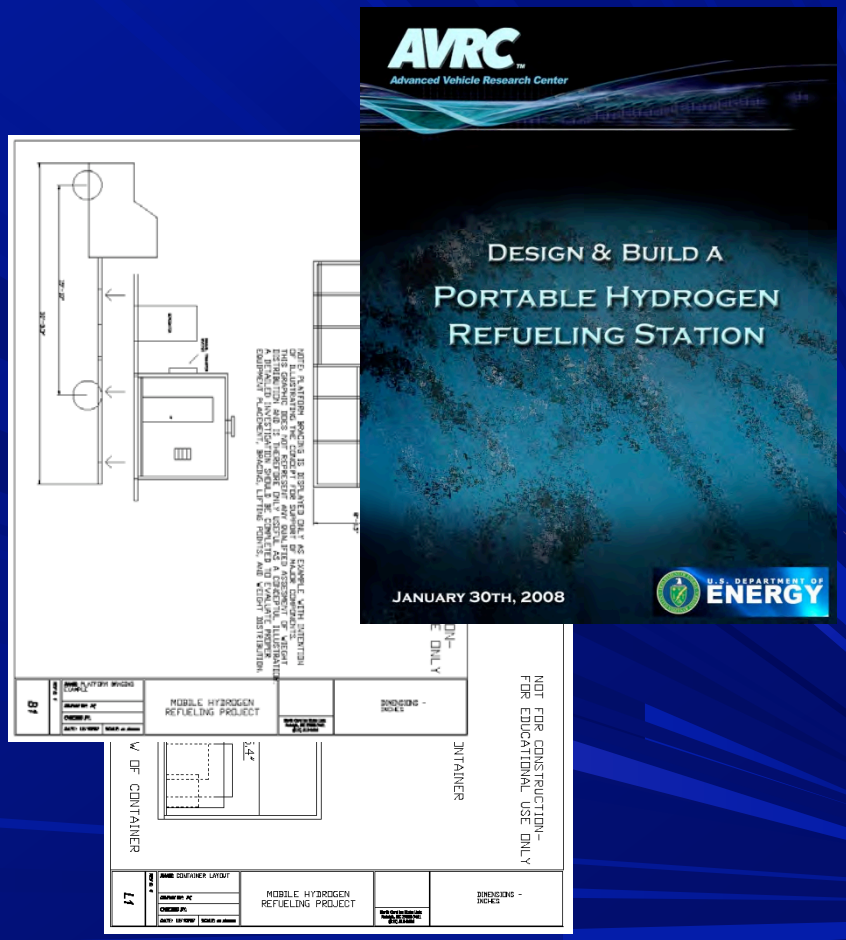
Hydrogen Refueling Station, Design and Build Document

- In January, AVRC completed a Design & Build document that will allow schools, researchers and individuals to construct a portable H2 Mobile Generation refueling Station (H2MGS) - which can be truck or trailer-mounted, built from a master bill of materials with detailed instructions.



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Hydrogen Refueling Station, Design and Build Document

- Cost of about $500,000 or less
- Changes the model for infrastructure development
- Six stations for the cost of one permanent station
- When the demand increases, move the supply

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Sodium Borohydride Fuel Cells

- University of Illinois Professor George Miley and his team are refining this technology
- Significant advantages in storage, transport, safety
- Will never be a mass market solution, best application for fleets, aerospace, military
- Works well with other technologies, incl. battery

$NaBH_4/H_2O_2$ Fuel Cells

- UIUC/NPL have developed a novel all liquid fuel cell with sodium borohydride ($NaBH_4$) as the fuel and hydrogen peroxide (H_2O_2) or air as the oxidizer
- This borohydride fuel cell design has been thoroughly tested and optimized to ensure rapid commercialization

$NaBH_4/H_2O_2$ Fuel Cells

- Development is moving rapidly
- Aerospace applications will be first
- Fleet applications next

Public Utilities and Private Sector

- Plug-in Hybrid Electric Vehicles
  - Upgrading the Hybrid Toyota Prius with 5KW Lithium Ion Battery pack
  - 100+ MPG achievable
  - Nine Completed to Date
  - V2L and V2G now in Design

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Danville, Virginia

- 14 acres at the Cyberpark
- 50 acres at $1 annual lease for testing
- 20,000 s.f. engineering building planned
- Now pre-leasing garage/office suites