



Passenger NG Vehicles

ARPA-E NG Vehicles Workshop
Afternoon Breakout

1/26/2012

Session Readout, Group 1: Passenger NG Vehicles

High Level Solution

- First, assume that 25% of *new* vehicles in 2022 (not all vehicles)
- Used lessons learned from PHEVs/EVs: start with bi-fuel and transition to dedicated systems once new sorbents became available
- Solved infrastructure: combination of home fueling in suburbs, urban clustering stations, and new business models
- Created strategic and multi-faceted adoption plan

Implications for Technical Areas

- New lightweight materials to reduce tank costs by 50%
- New sorbents that that enables ANG using a conformable tank and is resistant to contaminants
- External modular compressor unit
- Current technologies take things away from consumer experience in existing NG vehicles (e.g. less trunk space)—need to eliminate this

Session Insights, Group 1: Passenger NG Vehicles

- **Start with bi-fuel system and transitioned**
 - Learn from PHEVs→ EVs: people need a “crutch” initially and as the infrastructure grows, can gradually phase out old technology
 - Once sorbents were demonstrated, moved to dedicated NG system
- **Create new businesses for fueling**
 - 30% of homes could do home fueling – mostly suburbs
 - Urban clustering stations: 10 largest metro areas, particularly Midwest and Texas. Mandated 5 mile radius.
 - Create a business where people deliver fuel overnight or at work
 - Swap out modular fuel units
- **Complementary programs that support adoption**
 - DOE Clean Cities programs for permitting and local outreach
 - Tied to HVAC upgrades people already make via incentives
 - Federally-supported Zip Car program
 - Need a push from the top (OSTP)

Session Process, Group 1: Passenger NG Vehicles

- **How did you come to your solution?**
 - Attract multiple strategic market segments (suburban, urban) and vehicle types such as light duty trucks and minivans
 - Where it starts: bi-fuel technology and home fueling
- **What was the composition of your team?**
 - OEMs fully engaged early: systems level
 - Tier 1 suppliers
 - Material scientists/chemists: component-level
 - Utilities and PUCs
 - Systems safety experts: NASA (up front)
- **What techno-economic solutions would break paradigm?**
 - Prepared for unexpected developments
 - Spikes in NG price → worldwide NG markets
 - Inevitable vehicle fires (mostly oil) → proactive consumer education
 - Reduce payback period to 3 years