Alternative Fuels and Technologies for the Trucking Sector

Panel Presentation of Jim Bruce, V.P. UPS Corporate Public Affairs

Washington, D.C.
A Culture of Commitment

Three enduring values:

*Unparalleled Service*…
*Be Responsible*…
*Be Efficient*…

A commitment *to maintain and improve upon* what we started over 100 years ago.

Today, UPS is the world’s largest package delivery company.
Why UPS Cares About Alternative Fuel Vehicles -- UPS Energy Consumption

- About 1 billion gallons of fuel per year for mobile vehicles, including aircraft
- About 400 million gallons of diesel fuel
- About 100,000 trucks worldwide
- Tenth largest airline in the world
- 220 countries
UPS Fleet of Plug-in Electric Package Cars, New York City, 1930’s
UPS Alternative Fuel Fleet

Total Alternative Fuel Vehicles (U.S. & International): 2,484

U.S. Alternative Fuel Fleet: 1,403
- Compressed Natural Gas Vehicles: 920
- Hybrid Electric Vehicles: 380
- Liquid Natural Gas Vehicles: 93
- Propane Vehicles: 7
- Electric Vehicles: 2
- Hydraulic Hybrid Vehicles: 1

International Alternative Fuel Fleet: 1,081
- Compressed Natural Gas Vehicles: 85
- Hybrid Electric Vehicles: 1
- Propane Vehicles: 912
- Electric Vehicles: 29
- Ethanol Vehicles: 44 (Brazil)
- Biomethane Vehicles: 10

Updated: 07/13/2012
UPS Alternative Fuel Fleet

Projected Additions for 2012/2013:

Package Cars: 152
• 110 Electric (EV)
  • 102 EVI (California)
  • 6 EFA-S (Germany)
  • 2 Enova (California)
• 40 Hydraulic Hybrid (HHV)
• 2 Hybrid Electric (HEV) Hong Kong

Tractors: 25
• 25 LNG tractor additions have grant approval

Shifters: 13
• 9 Compressed Natural Gas (CNG)
• 4 Propane

CURRENT ALTERNATIVE FUEL FLEET: 2484

Total Projected Additions: 190 (120 in 2012; 90 known for 2013) for a total of 2694

This does not include the impact of vehicles being removed from the fleet
An “All-of-the-Above” Strategy

“As the folks here at UPS understand, we’ve got to have an all-out, all-in, all-of-the-above strategy that develops every source of American energy.”

-Barack Obama, Jan 26, 2012
UPS Deploying 40 Hydraulic Hybrids in 2012 – up to 35% improved fuel economy
The UPS Plug-in Electric Vehicle, Pre-Brown, Delivery of 100 in 2012, in California, from EVI
Where To Use Alternative Fuel Vehicles?

- Centrally fueled? Hub and spoke?
- Number of vehicles on site?
- Daily vehicle miles traveled: fuel savings?
- Available alternative fuels; cost today, future?
- Emissions profile?
- Terrain? Horsepower/torque requirements
- Stop and go, or over the road?
- Ambient temperatures?
- Financial assistance programs?
- Fueling infrastructure availability and cost?
- UPS required internal rate of return?
The Patchwork Quilt of Alternative Fuels for Ground Transportation

- **80,000 pounds**
  - Heavy Trucks

- **26,000 pounds**
  - Medium Trucks

- **3,000 pounds**
  - Light Trucks

- **3,000 pounds**
  - Automobiles

**Trip Range**
- 100 miles
- 200 miles
- 300 miles
- 400 miles
- 500 miles
- 600 miles

**Vehicle Weight**
- Ing ONLY
- Ing, some flexibility
- CNG, hybrid electric, hybrid hydraulic, propane, e-85
- Bio-fuel
- Diesel
Progression of Light/Medium Duty Trucks

- Petroleum
- Hybrid electric, hydraulic hybrid, CNG
- Plug-in EV
- Fuel Cell?
UPS Heavy Over the Road
LNG Tractor Trailer

UPS Alternative Fuels: What’s On Our Menu?
Key Variables for Class 8 Over the Road Tractors

- LNG costs today and in the future
- Initial vehicle cost
- Daily vehicle miles traveled – hub to hub distance
- Financial incentives – State, Federal
- Fueling infrastructure availability, cost sharing
- Terrain may dictate engine (e.g., diesel vs. spark)
- UPS required internal rate of return
UPS Major Hubs

UPS Alternative Fuels: What’s On Our Menu?
Heavy Truck Corridors Align With NG Pipelines
The “Energy Security Corridor”
Las Vegas, NV to Ontario, CA
Summary: UPS and Alternative Fuel Vehicles

There is no blanket solution to replacing petroleum.

UPS is fuel neutral, has tested just about everything.

Will use a variety of alternative fuel vehicles depending on the vehicle, load hauled, and the mission, e.g., long-haul, stop and go, type of fuel available.

Largest per vehicle user of oil -- heavy, long-haul trucks. LNG is the only current option.

Initial vehicle cost should come down with more manufacturers and larger production volumes.

Federal and State government incentives/assistance for vehicles and fueling infrastructure is key.

Many believe electric drive is inevitable for many types of trucks.