Truck Decision Choice Project

Lew Fulton, Dominique Meroux, Marshall Miller, Chris Yang,

STEPS Workshop
June 1, 2016
Truck Decision Choice Project

• The trucking sector has historically been poorly represented in long-term energy/technology models.

• Many of these energy and scenario models only deal with highly aggregated heavy-duty and medium-duty trucks.

• We are developing a better set of cost and performance projections for trucks of different types and technologies.
  • Breaking out categories (long haul, short haul, delivery, vocational, etc.) with different duty cycles, different average travel per year, and different fuel use and refueling profiles.
  • Interviewing and surveying logistics and trucking firms to better understand their purchase criteria, truck use patterns, resale strategies, etc.
  • Developing a logit model of choice, with future scenarios for alt-fuel truck sales consistent with ARB Vision framework.

• At this time all input values are preliminary – we’re still calibrating and updating parameter values.
Decision Choice Model Input Parameters

• Capital Cost
• Operating costs (fuel use, maintenance)
• Environmental perception
• Uncertainty (Risk)
• Incentives/Subsidies
• Vehicle Range
• Refueling Time
• Station Availability
• Carbon Tax
Truck HD Fleet Categories

• Fleet categories can strongly affect decision factors
• Long haul, short haul, drayage (port)
  – Range, station availability
• Fleet size (large, medium, owner operator)
  – Risk
  – Payback period
Trucking Shareholders Contacted

- Fleets
  - Swift, UPS, RediMix, Fritolay/PepsiCO, Walmart, Total Transportation Services Inc.

- OEMS
  - Penske, BYD/Supreme, Hino, Ford, Kenworth

- Infrastructure
  - Love’s / Trillium, NexGen

- Planned Work
  - More interviews
  - NorCal MEMA public fleets workshop
  - Fleet decision choice questionnaire
Interview Takeaways

• Cost is paramount
• Payback period (1.5 to 3 years but prefer < 2)
• Secondary Markets (trade back to OEM, keep for salvage)
• Must meet performance requirements (range, power)
• Fuel availability (Own stations, return to “home”)
• Driver retention
• Environmental PR (outside mandatory regulations)
• Test fleets for large fleets (10-100 new technology vehicles)
2030 Long Haul Market Shares – Various Conditions
2030 Short Haul Market Shares – Similar Conditions

2030 Cumulative Costs by Fuel Type - Short Haul, 3-year Payback, 125,000 mi / yr, 5% subsidy, 5% GreenPR, Reference Oil, Low CI, Carbon Tax

- Carbon Price/Tax
- Subsidy/Incentive
- Uncertainty
- GreenPR
- Refueling_Inconvenience
- Maintenance
- Fuel_Cost
- Capital_Cost

- H2
- EV
- LNG
- CNG
- Diesel HEV
- Diesel

UC DAvis
SUSTAINABLE TRANSPORTATION ENERGY PATHWAYS
2030 MD Delivery Market Shares – Similar Conditions
Next Steps

• Continue to tune monetary value of factors
• Determine more accurate input parameter values for all trucks types (e.g. capital cost and fuel economy versus time)
• Differentiate sub-categories of trucking fleets that have different choice factors
• Calibrate to present market shares
• Include other truck classes (buses, heavy-duty vans and pickups, vocational trucks, etc.)
• Identify policy levers that would deliver truck market shares aligned with sustainability goals