Alternative Transportation Fuels Workshop

Brett Gipe
SMITH ELECTRIC VEHICLES

May 2013
WHAT IF I WAS HERE TO OFFER YOU A FUEL SOURCE

... 

- As old as dinosaurs
- Unhealthy as asbestos
- Available almost everywhere*
  *some places may be more complicated than others
....OR, a FUEL that could power this truck...QUIETLY, WITHOUT EMISSIONS, AND AT 75% LESS COST?!
WHAT WE’LL REVIEW TODAY....

• About Smith Electric Vehicles
• Vehicle Offerings
• Target Fleets
• Reasons for EV adoption
  • Economic
  • Sustainability / Environmental
  • Brand Enhancement
  • Driver Benefits
80+ Years Commercial EV Experience

- World’s only electric commercial vehicle manufacturer selling to major fleets in the US, Europe and Asia
- Primary focus on medium duty truck market
- Global business with manufacturing in US and Europe
- More than 625 vehicles deployed in U.S.
- >5M miles driven annually

1930

TODAY
SMITH MANUFACTURING FACILITIES

Smith US
Kansas City, Missouri

Smith Europe
Newcastle, England

Smith East Coast
(opening Q4 2013)
Bronx, New York
# Two Global Platforms

<table>
<thead>
<tr>
<th>Platform</th>
<th>Class</th>
<th>Configurations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Newton™</strong></td>
<td>Class 4-6*</td>
<td><img src="image1.png" alt="Newton Images" /></td>
</tr>
<tr>
<td></td>
<td>- Payload up to 16,200 lbs.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Up to 150 miles per charge</td>
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</tbody>
</table>

| **Edison™**  | Class 2-3    | ![Edison Images](image2.png) |
| (OUS only)  |             |                             |
|            | - Payload up to 5,100 lbs |                  |
|            | - Up to 110 miles per charge |                  |

*Class 7 in development*
NORTH AMERICA CONFIGURATION OPTIONS

A perfect fit for many product, parcel and people transport needs.
TARGET FLEETS

- Depot based, urban logistics
- Routes <120 miles
- Lots of stops & starts
- Minimal highway/stem miles
- Corporate Goals:
  - Reduce Costs
  - Sustainability / Corporate Responsibility
  - Brand Recognition
  - Driver Satisfaction
Electric Vehicles Offer a Compelling Value Proposition for Medium Duty Commercial Fleets

- Fixed Routes Less Than 120 Miles
  - No “Range Anxiety”

- Operate From Central Depots
  - No need to build distributed charging infrastructure

- Low Speeds
  - Long battery life

- Lots of Stops and Starts
  - Ideal for regenerative braking

- Poor Fuel Economy
  - Short payback periods

- High Levels of Noise, Vibration and Air Pollution
  - Zero emissions, no vibration and silent operation

- Only Viable Alternative to Diesel
  - Natural gas vehicles not competitive for these applications

The EV value proposition is ideally suited for commercial fleet vehicles, which represent over 6 million vehicles in the US, Europe and China alone
100% Route Verification: Critical to Success

Route 14 – Truck 223325 on July 17, 2012
Simulation Range Performance and Statistics

Route Conditions and Results

| Base Weight [kg] | 4,957 (10,930 lbs) |
| Payload Description | Constant Payload 1,000 lbs |
| Key on Time | 2.5 hours |
| Total Route Time | 9.25 hours |
| Distance Covered | 42.7 miles |

Operational Efficiency Results for Route

<table>
<thead>
<tr>
<th>SOC @ 42.7 Miles</th>
<th>Suitability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ideal Operation</td>
<td>0.85 kWh/mile</td>
</tr>
<tr>
<td>Typical Low Ancillary Load</td>
<td>0.98 kWh/mile</td>
</tr>
<tr>
<td>Typical High Ancillary Load</td>
<td>1.09 kWh/mile</td>
</tr>
<tr>
<td>Worst Case Operation</td>
<td>1.09 kWh/mile</td>
</tr>
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</table>

Route Observations

- This route is suitable for the operating conditions shown here.
SMITH’S APPROACH TO VEHICLE DEPLOYMENT SETS AN INDUSTRY STANDARD
**Diesel vs. Electric: Clear Separation**

### Comparing Vehicles
- Comparably priced.
- Same payloads.
- A Smith drive train has nine moving parts* and 75% lower maintenance costs.
- EVs are driver-preferred in urban environments.

*Based on incentives and miles driven.

### Comparing Fuels
- EV battery + electricity costs are comparable to diesel fuel over 3-8 years.*
- Electricity as fuel is 75% less costly than diesel.
- Batteries will enable alternative power and energy options for depots.

*Based on incentives and miles driven.

**Diesel**
- Heavy exhaust. High NVH (noise, vibration, harshness.)

**Electric**
- 100% emissions-free. Quiet. Smooth. Quick.
- Domestic. Lower cost. Stable.
ECONOMIC IMPACT

- Cost Reduction
  - Total Cost of Ownership / ROI
  - Operational Savings / Benefits
- Revenue Enhancement / New Business Growth
  - Competitive advantages
- Customer Retention
  - Competitive necessity
- Corporate and/or Government Mandates
  - Emissions / Idle Laws & Restrictions
Higher Diesel Truck Prices Are Making EVs More Attractive

U.S. Wholesale Commercial Truck and Passenger Car Prices
(Indexed to 100; 2004 = 100)

Key Drivers
- Stricter EPA emissions mandates
- State clean air mandates
- Higher CAFE standards
- California ZEV mandate
- Upcoming EPA’13 / GHG’14 regulations

Source: U.S. Bureau of Labor Statistics, U.S. Department of Labor, data re-based to January 2004. Medium Duty Trucks are Trucks, Truck Tractors, and Bus Chassis 14,001 to 33,000 lbs; Heavy Duty Trucks are Trucks, Truck Tractors, and Bus Chassis 33,001 lbs. or more; and car and Light Duty Trucks are Passenger Cars and Chassis 14,000 lbs or less.
Diesel Fuel Prices *versus* Commercial Electricity Prices in the U.S.

(Indexed to 100; 2002 = 100)

**Diesel #2 Price**

**Commercial Electricity Price**

**Standard Deviation**

- Diesel Fuel Price: 34%!
- Commercial Electricity Price: 11%!

*Source: U.S. Energy Information Administration*

(1) Standard deviation to the mean
**Electric Vehicles Offer a Lower Cost of Ownership Relative to Competition**

### Total Cost of Ownership – First 8 Years

<table>
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<tr>
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<th>Pay upfront</th>
<th>Pay over time</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Diesel Truck¹</strong></td>
<td>$65,000</td>
<td>$121,958</td>
</tr>
<tr>
<td><strong>Smith Newton w/o Incentives²</strong></td>
<td>$65,000</td>
<td>$135,227</td>
</tr>
<tr>
<td><strong>Smith Newton w/ CA HVIP Incentive² ³</strong></td>
<td>$75,000</td>
<td>$175,277</td>
</tr>
</tbody>
</table>

**Pay over time:**
- **79%**

**38% savings**

### Average Monthly Operating Cost – First 8 Years (Depreciation, Energy, Maintenance)⁴

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<tr>
<td><strong>Diesel Truck¹</strong></td>
<td>$460</td>
<td>$1,270</td>
</tr>
<tr>
<td><strong>Smith Newton w/o Incentives²</strong></td>
<td>$531</td>
<td>$1,489</td>
</tr>
<tr>
<td><strong>Smith Newton w/ CA HVIP Incentive² ³</strong></td>
<td>$531</td>
<td>$2,047</td>
</tr>
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**Pay over time:**
- **22%**

**$2,047**

### Notes:

1. Assumes 80 miles a day, 6 days a week, 52 weeks a year at 7 MPG; diesel price of $3.93/gallon growing at a 2.4% CAGR, per EIA; and maintenance costs of $0.152 per mile.
2. Assumes 100kWh battery; 80 miles a day, 6 days a week, 52 weeks a year, 1kW per mile; electricity price of $0.1003/kWh growing at 1.7% CAGR per EIA; and maintenance costs of $0.07 per mile.
3. California HVIP program provides for a $40,000 voucher for the purchase of a zero-emission truck or bus. Analysis allocates all of the voucher to the battery cost.
4. Straight line depreciation; assumes 10-year life on truck with 15% residual; 8-year life on battery with 10% residual; and 40-year life on charge point with no residual.
5. Battery cost includes $2,500 charge point.
### Staples’ View of Cost Savings with Smith Newton

<table>
<thead>
<tr>
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<th>Diesel Truck</th>
<th>Smith Newton</th>
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<tbody>
<tr>
<td>Route Length</td>
<td>100 miles</td>
<td></td>
</tr>
<tr>
<td>Fuel Efficiency</td>
<td>10mpg (1)</td>
<td>0.8 kWh/mile</td>
</tr>
<tr>
<td>Energy Price</td>
<td>$4.13/gallon</td>
<td>$0.11 kWh</td>
</tr>
<tr>
<td>Daily Energy Cost</td>
<td>$41</td>
<td>$9</td>
</tr>
<tr>
<td>Annual Energy Cost</td>
<td>$10,425</td>
<td>$2,300</td>
</tr>
<tr>
<td>Annual Preventative</td>
<td>$900</td>
<td>$250</td>
</tr>
<tr>
<td>Maintenance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Repair &amp; Maintenance Items</td>
<td>Brakes, Exhaust, Engine, Tires, Transmission</td>
<td>Brakes, Tires, Grease Fittings</td>
</tr>
</tbody>
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**78% Energy Cost Savings**
- Dramatically lower cost
- Very low price volatility

**72% Preventative Maintenance Cost Savings**
- No oil, filter or transmission fluid changes
- No urea / SCR

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“We there is virtually nothing that goes wrong with these things”
—Mike Payette, Dir. Fleet Equip., Staples

- Fewer moving parts
- 20-year electric motor life
- Regenerative braking increases brake life

We can deliver millions of dollars of savings annually across a large fleet


(1) Staples assumption. Considerably more conservative than market average data.
Well-to-wheel, including electric power generation:

A mid-duty 100% electric truck eliminates over 15 TONS of greenhouse gases per year vs. its diesel counterpart.

That’s the annual CO$_2$ absorption value of 28,000 red maple trees.
How significant is 15 tons of greenhouse gases?

One gallon of diesel weighs about 7.2 lbs. But the CO₂ it creates weighs 3x more – nearly 25 lbs!

How?

When burned, each carbon molecule captures two heavier oxygen molecules from the air. The larger volume of CO₂ then holds atmospheric HEAT... until the O₂ is freed.
1-Vehicle, 1-Day Impact

Performance is estimated from vehicle telemetry data which has been factored to account for missing or corrupted information.

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<td>Consumed</td>
<td>73</td>
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<td></td>
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<td>Regenerated</td>
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Assumptions:
- Diesel Cost per gallon: $4.00
- Electricity cost per kWh: $0.09
- EV maintenance saving / mile: $0.15
1-Vehicle

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50-Vehicle, 5-Year Impact:
Environmental Citizenry

1-Vehicle

- Traveled: 65 Miles
- Consumed: 73 kWh of energy
- Regenerated: 8 kWh of energy
- Efficiency: 1.20 kWh/mile

Assumptions:
- Diesel Cost per gallon: $4.00
- Electricity cost per kWh: $0.09
- EV maintenance saving / mile: $0.15

500-Vehicle, 10-Yr Impact:
DRIVER IMPACT

- “It’s my baby..”
- “I love driving electric..”
- “No noise and the windows are really big so you can see everything.”
- “It’s surprising how much power you have….even though it’s silent.”
- “It really gets people’s attention...”
- “I feel so much better at the end of the day...no noise, no vibrations, no fumes!”
Smith Customers Realize Measurable Marketing & PR Impact

Hundreds of Placements: National, Regional & Trades
The Industry Is At Its Tipping Point

Visionaries
Start the Trend / Pick the Winners

The Herd
Builds an Industry

Frito Lay
FedEx Express
STAPLES
Duane Reade
FreshDirect
Sainsbury’s
Coca-Cola
TNT
UPS
T-Mobile

UNITS

2010 2011 2012 2013 2014 2015

Today

2010 2011 2012 2013 2014 2015
Corporate Support for Electrification

“...costs of operating and maintaining electric vehicles are significantly less than... traditional internal-combustion-engine vehicles. In some cases we’ve achieved savings of 70% to 80%...”

– Fred Smith, CEO, FedEx, February 2011, Fortune Magazine

“The first million miles with electric trucks have been a journey of understanding and refining both how and where we use these vehicles...we are now in position to more quickly accelerate our strategy and grow the electric vehicle fleet.”

– Mike O’Connell, Senior Director of Fleet Capability North America, Frito-Lay, May 2012, PepsiCo press release

“UPS’ research and development of alternative technologies has determined it is time to explore electric-drive systems within the short-range segment of our delivery fleet...”

– Mike Britt, Director of Vehicle Engineering, UPS, August 2011, UPS press release

“The addition of...all-electric delivery trucks is the latest example of our commitment to continually improve our delivery fleet and its impact on the environment...Over time, we’ll look to increase the number of these trucks in the Staples fleet...”

– Mike Payette, Manager of Fleet Equipment, Staples, October 2010, Staples press release

“Coca-Cola is proud to partner with Smith Electric Vehicles in making our delivery fleet more efficient. Smith...will help us to accelerate conversion in New York as we continue to build a more efficient and environmentally-friendly Coke fleet.”

– Steven Saltzgiver, Director of Fleet Operations, Coca-Cola Refreshments, November 2011, Smith press release
Thank You!