Corporate Electrification

Steve Chriss, Director of Energy, Walmart

#WeTheStates
Corporate Electrification

Steve W. Chriss
Director, Energy Services

National Governors Association:
Southeast Regional Transportation Electrification Workshop
March 11, 2019
Walmart in the United States

- 5,355 Retail Units
- 176 Distribution Centers and Other Transportation and Logistics Facilities
- Over 1.5 Million Associates
Walmart’s Footprint in the Central Region

- 1,214 Retail Units
- 35 Distribution Centers
- Over 337,000 Associates
Walmart’s 2025 Energy Commitments

• In 2005 we set an aspirational goal to be powered 100% by renewable energy

• On November 4, 2016 we announced new sustainability goals for 2025 that build on our existing energy goals
  • Be supplied by 50% renewable energy
  • Use a combination of energy efficiency and renewable energy to reduce emissions in our operations by 18 percent
  • Target is science-based, which is the level of decarbonization needed to keep global temperature increase below 2°C compared to pre-industrial temperatures
Walmart’s Logistics Network

Stores
- 5,355 Retail Units
- 5 Formats
- 38,000 – 185,000 ft²
- 1.5 Million Associates
- Walmart.com

Distribution Centers
- 176 Facilities
- 18 Formats
- 75-100 Stores / DC
- 250 Mile Radius

Transportation
- 8,200 Drivers
- 6,500 Tractors
- 60,000 Trailers
- 750 Million Miles / Year
Walmart’s Logistics Network

- Grocery DC network
- High Velocity DC network
- Regional DC network
Walmart’s Fleet is Integral to Walmart’s Sustainability Efforts

**Fleet Efficiency = Cases Shipped / Gallons of Fuel Burned**

**Historical Fleet Efficiency Goals vs. 2005 Baseline:**
- 25 Percent Increase by 2008 – Reached 38%
- Double U.S. Fleet Efficiency by 2015 – Reached 102.2%

**2015 Compared to 2005 Baseline:**
- Delivered 1 Billion More Cases
- Drove 465 Million Less Miles
- Equates to a One Year Savings of $1 Billion
Walmart’s Fleet is Integral to Walmart’s Sustainability Efforts

Alternative Fuels, Including Electricity, are the Next Step in Our Fleet Sustainability Journey
Fleet Electrification: Two Paths Forward

**Yard Trucks**
- Best option near-term
- Currently available in the market
- Don’t require national infrastructure
- Captured asset
- Short term demos in California and ongoing long term test in Kansas

**Over the Road Trucks**
- Longer-term focus
- Current availability is very limited
- Initial hypothesized usage is for distribution centers in densely-populated areas with shorter trips (e.g. Houston, Southern California, Northeastern U.S.)
Fleet Electrification: Managing Adoption

**Internal Factors**

- **Our logistics operation is demanding and dynamic**
  - Real time route optimization and trucks can be out for up to 5 days
  - Can’t sub-optimize routing and efficiency for charging
- **Significant incremental capital cost**
  - Electric yard trucks are 3X the cost of diesel yard trucks and OTR cost is TBD
- **Range anxiety for OTR trucks**
  - Battery range of 300 to 500 miles vs. diesel range of > 1,000 miles
- **Charge times**
  - Estimated fast-charge time of 1-1.5 hours vs. diesel fueling in 10 minutes

**External Factors**

- **Standards**
  - Multiple options for chargers and power requirements are not sustainable
  - Finite space at distribution centers
- **Reliability and resiliency of the grid**
  - Electrical system uptime becomes extraordinarily critical, as an extended outage would shut down both distribution center and fleet
- **National charging network**
  - OTR requires off-site charging and must be fast and reliable
- **Utility factors**
  - Incentives for equipment and infrastructure costs
  - Rates