



# Corporate Electrification

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Speaker: Steve Chriss, Director of Energy Services, Walmart

## Corporate Electrification

**Steve W. Chriss**  
**Director, Energy Services**

**National Governors Association:  
Southeast Regional Transportation  
Electrification Workshop**  
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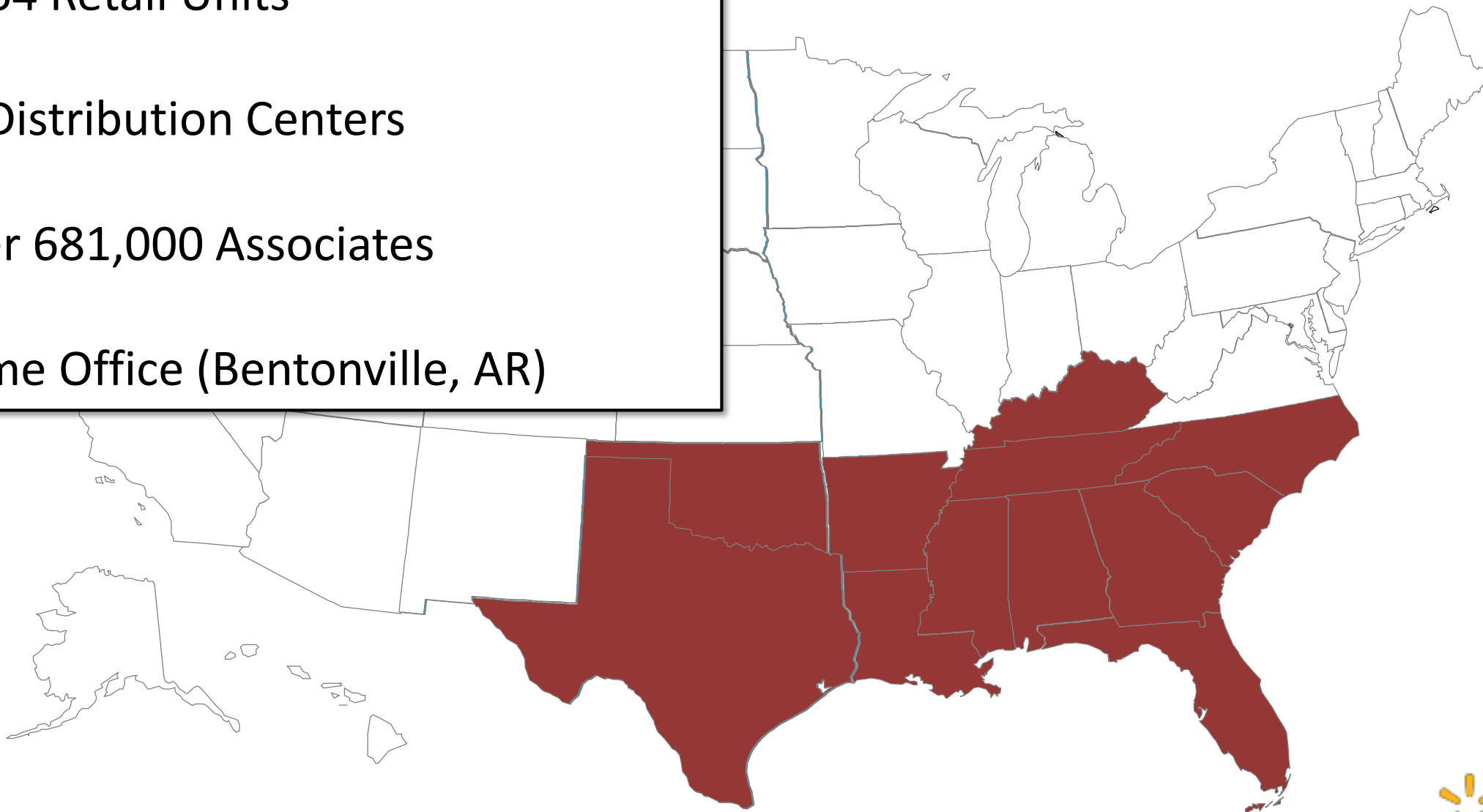
## Walmart in the United States

- 5,355 Retail Units
- 176 Distribution Centers and Other Transportation and Logistics Facilities
- Over 1.5 Million Associates



## Walmart's Footprint in the Southeast Region (inc. Puerto Rico)

- 2,464 Retail Units
- 69 Distribution Centers
- Over 681,000 Associates
- Home Office (Bentonville, AR)



## 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

### BUILDING ON OUR SUSTAINABILITY GOALS

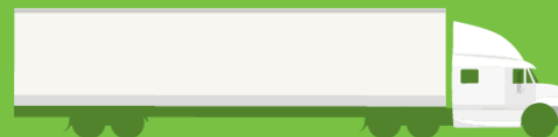


**BE SUPPLIED BY  
50% RENEWABLE ENERGY**

As of 2015, 25% of our operations were powered by renewable energy

Walmart ✱

### BUILDING ON OUR SUSTAINABILITY GOALS



**REDUCE GREENHOUSE GASES BY**

**18%**

We are the first retailer to set science-based targets for emissions reductions

Walmart ✱



# Walmart's Logistics Network

## Stores

- 5,355 Retail Units
- 5 Formats
- 38,000 – 185,000 ft<sup>2</sup>
- 1.5 Million Associates
- Walmart.com

## Distribution Centers

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

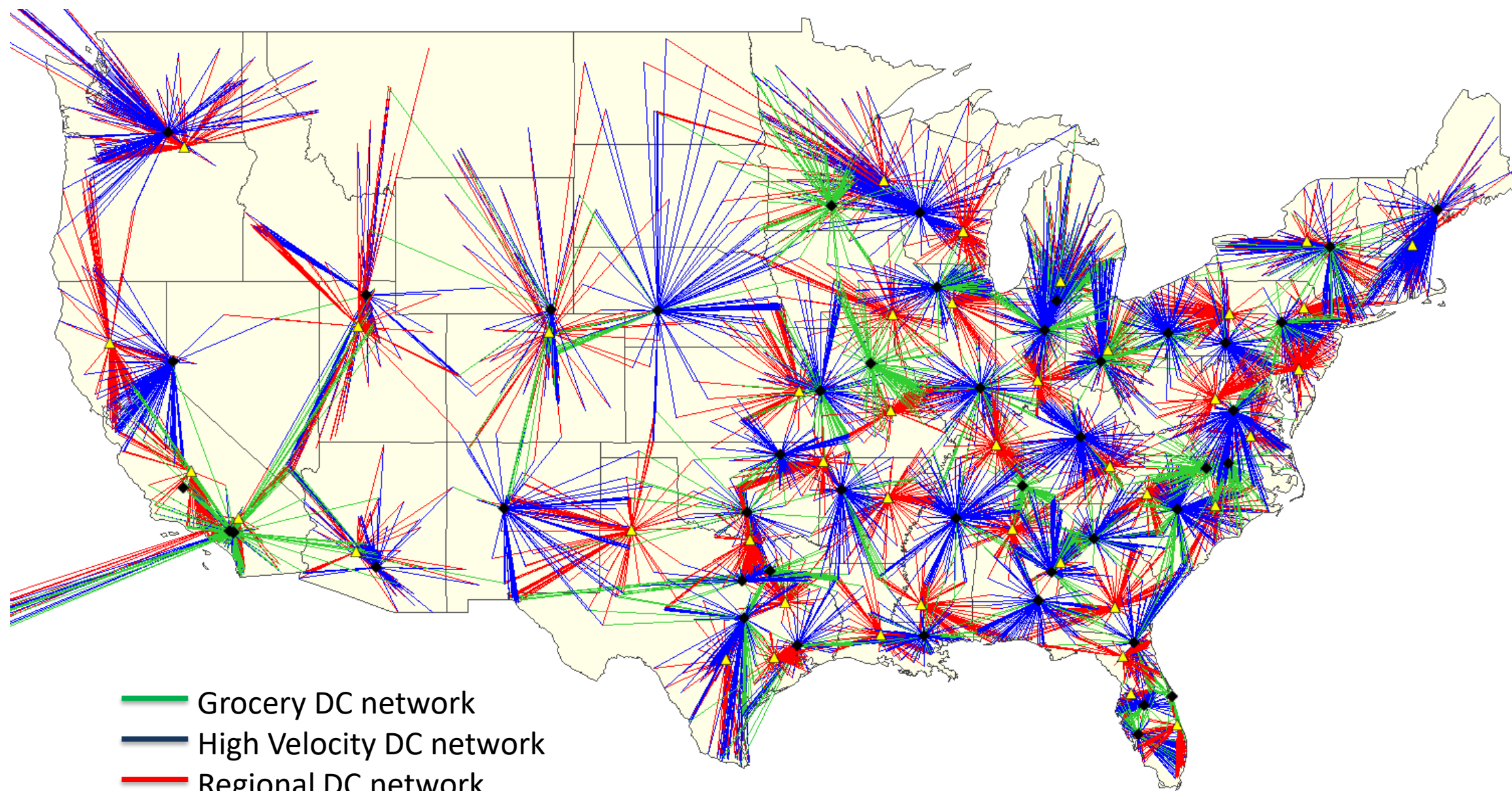
## Transportation

- 8,200 Drivers
- 6,500 Tractors
- 60,000 Trailers
- 750 Million Miles / Year





# Walmart's Logistics Network



## 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



Thank you!

