



# Delivering Customer Value in the Next Decade

***"2020 Vision"***



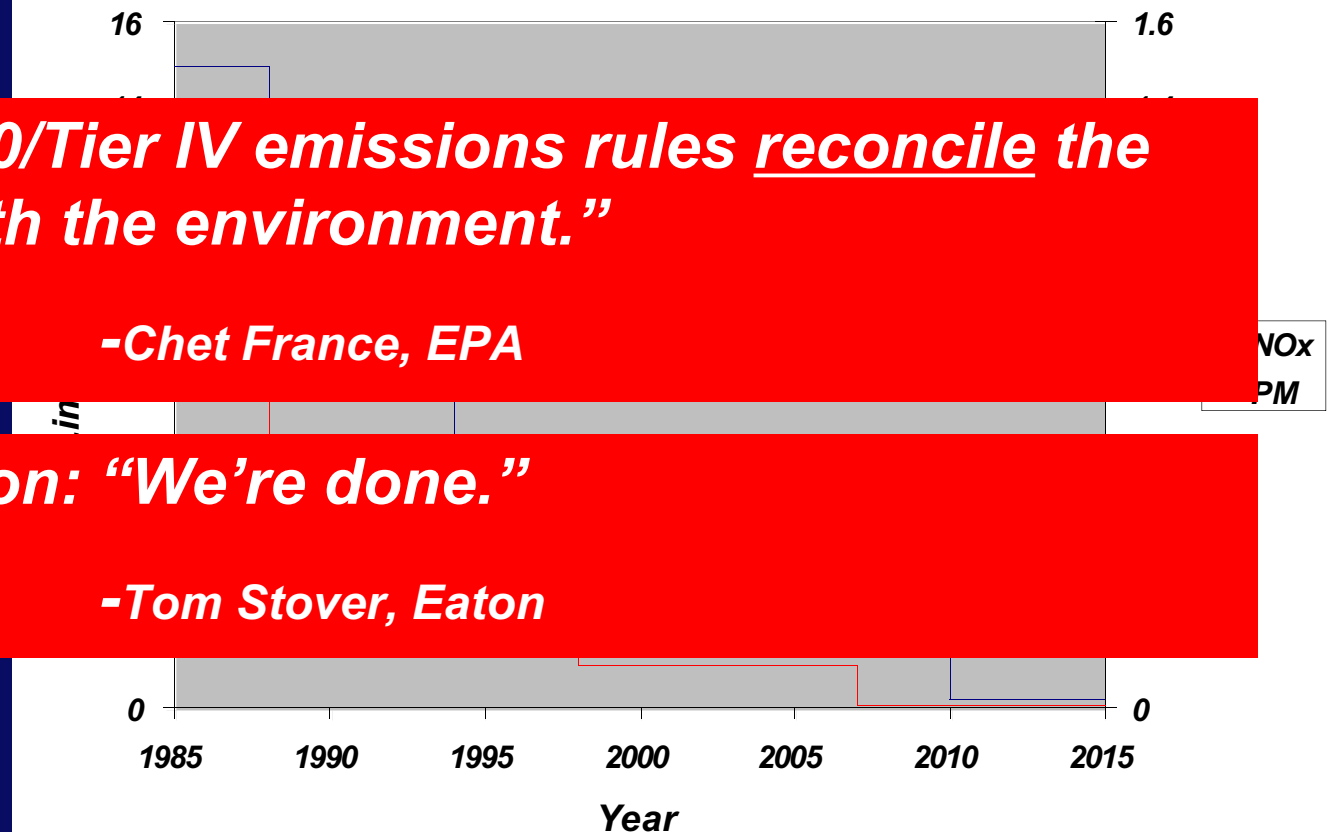
***Tom Stover  
Eaton Corporation  
Truck Technology***



# Emissions-Driven “Forced March”

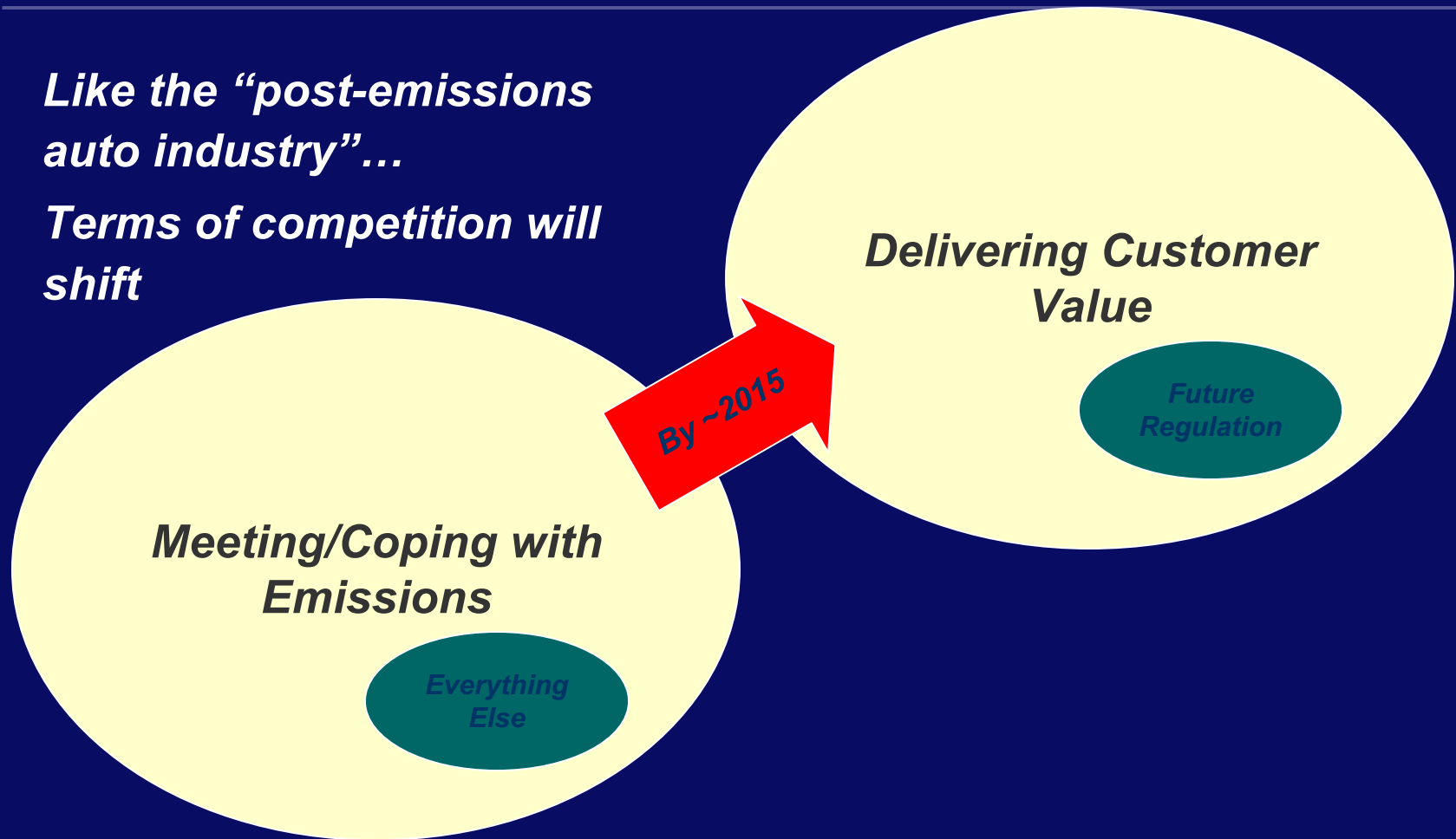
- Truck industry “forced march” since 1970’s
- Emissions charged in 3-4 years
- Price
- Com value

EPA On-Road Emissions Regulations



# Shifting Focus

- *Like the “post-emissions auto industry”...*
- *Terms of competition will shift*



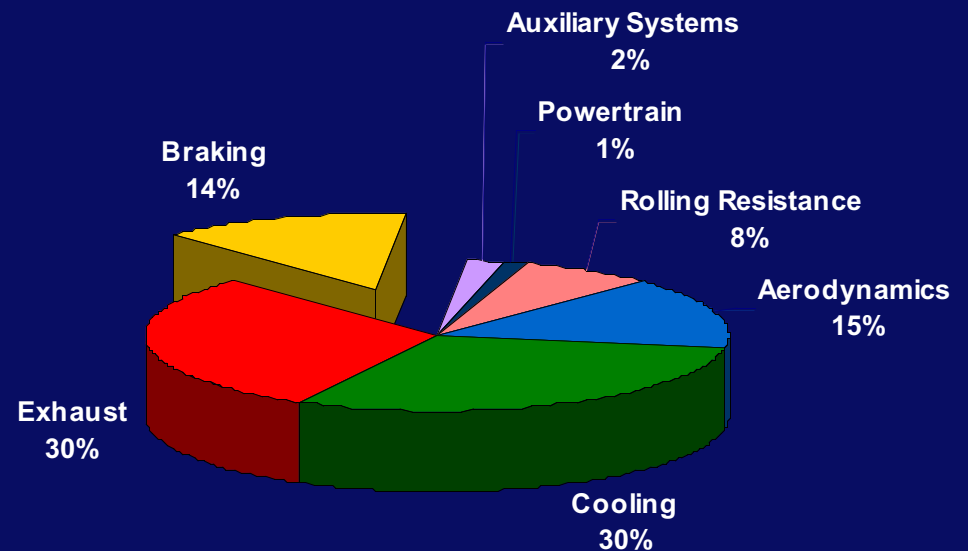
# ***The Shape of the Future, 2010 and Beyond...***

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- ***Emissions Stability***
  - ***EPA to NAFTA: "We're done..."***
- ***Fuel Costs***
  - ***Projections from \$2.80-\$3.80/gallon***
  - ***Climate change "Carbon Tax" ?***
- ***Refocus on Value***
  - ***Powertrain technology to drive down fuel cost***
  - ***Performance/Drivability/Utility/Safety***
- ***More Trucks on the Road***
  - ***Up 35% to 3.7 M Class 8***
- ***Asset Utilization***
  - ***Tonnage, Revenue, and \$\$ share increasing***
  - ***Higher annual miles for NEW trucks***

# Energy Management

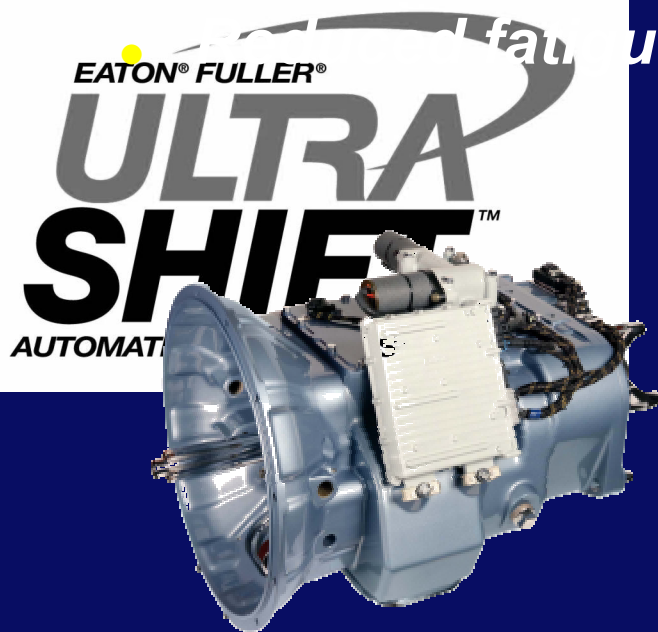
- *~20,000 gallons / truck / year*
- *Fuel will be the #1 cost for a Line Haul Fleet*
- *14% wasted as braking/retarding effort*
- *~2000+ gal/year idling*
- *5% equals:*
  - *1000 Gallons/truck*
  - *\$2500-3000/year fuel cost*
  - *2 B gallons for the Class 8 fleet*



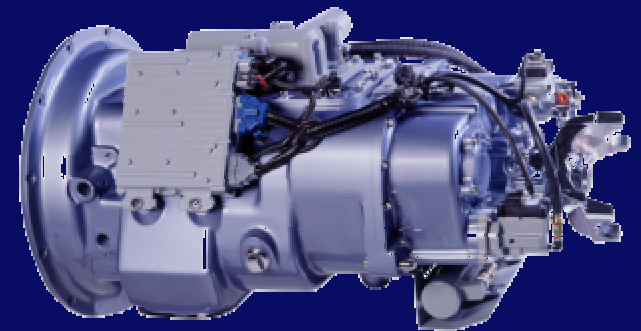
# ***Automation for Efficiency and Ease***

- ***Automated Mechanical Transmissions***
- ***Reclaim fuel efficiency lost to emissions***
- ***Take variability out of the vehicle operation***
- ***Take the gearshift out of the driver's hands...***
  - ***"Helps every driver be like my best driver..."***

***...reduced fatigue, improved safety***



**Ultrashift 10 sp**

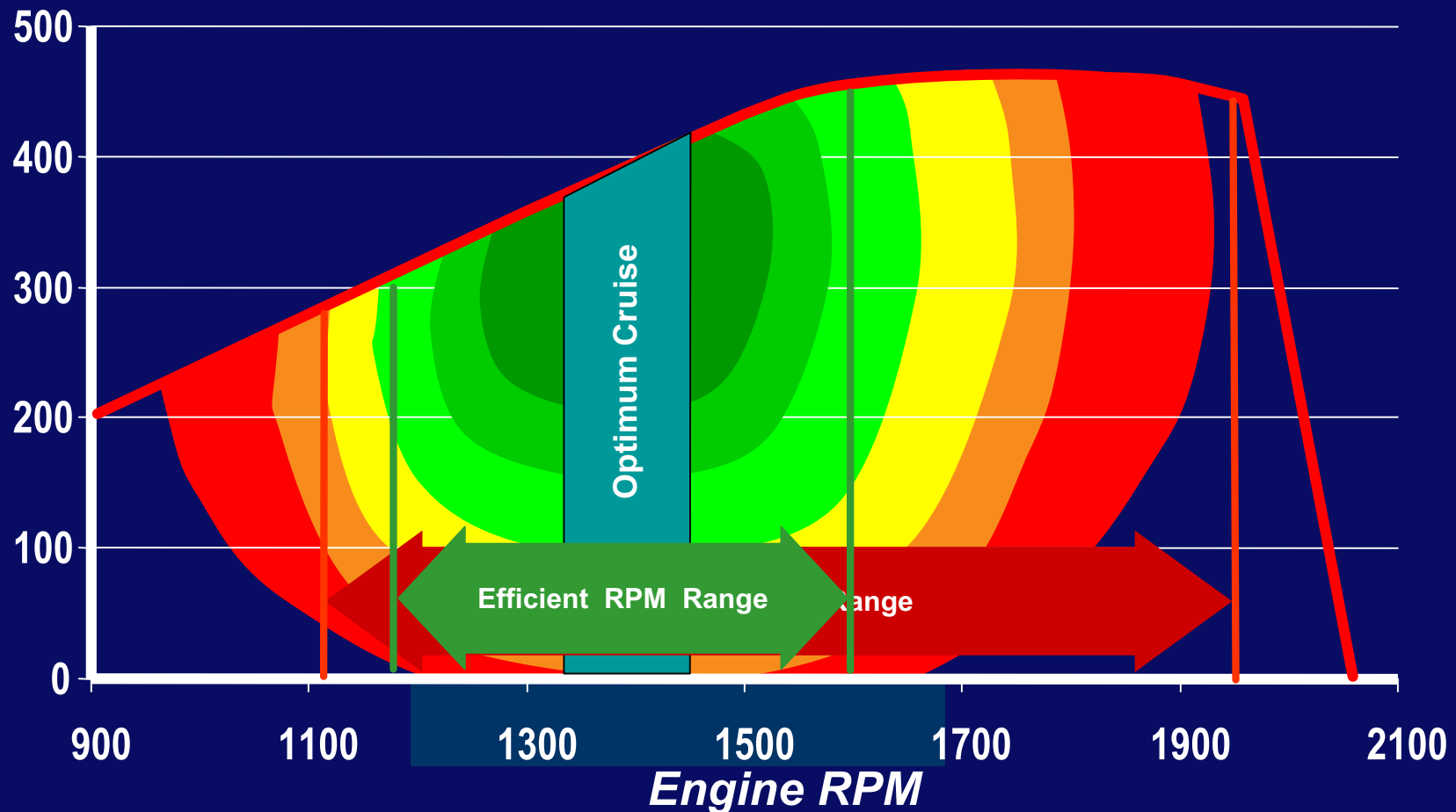


**Ultrashift 18 sp.**

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# *Close Ratios + Automation = Efficiency*

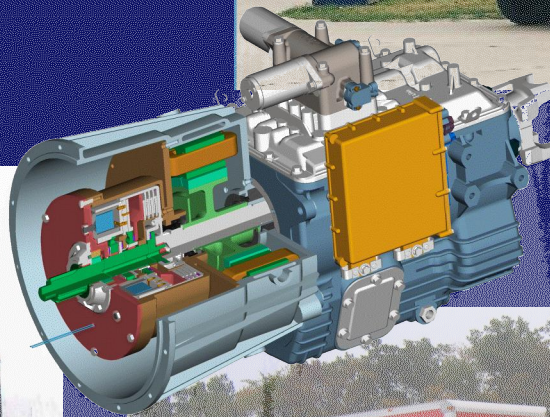
*Engine Power*





# Hybrid Electric: Clean Urban Power

- 20-60% impr. In fuel cost
- 50% reduction in NOx
- Utility Truck-High Value
- Partnerships are Key!
  - Fedex, UPS
  - DOE, HTUF, Others

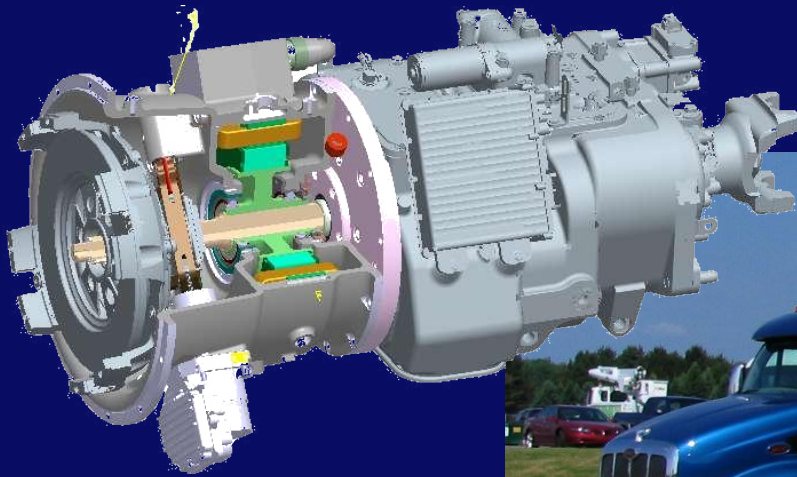


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# ***HD Hybrid with Idle Reduction***

- *~5-6% Improvement in rolling fuel*
- *~1 gallon/hr reduction in idling fuel*
- *3000-4000 gal/year*



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# Cool vs. Fuel

- *“Driver Values” vs. fuel efficiency*
- *Consider a scenario:*
  - *2 Trucks, same price*
  - *One is non-aero, but “cool”*
  - *One is aero, w/ Eaton Hybrid System*
  - *Fuel savings \$15,000+ /year*



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# Heavy Hybrid Integration

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- Partnerships are crucial
  - Engine Manufacturers
  - Vehicle OEMs
  - End-User Fleets
- R & D Funding Sources for further development
  - Other energy recovery modes
  - Advanced System Integration



**Thanks!**