

MWCOG TPB Freight Subcommittee
March 11, 2021



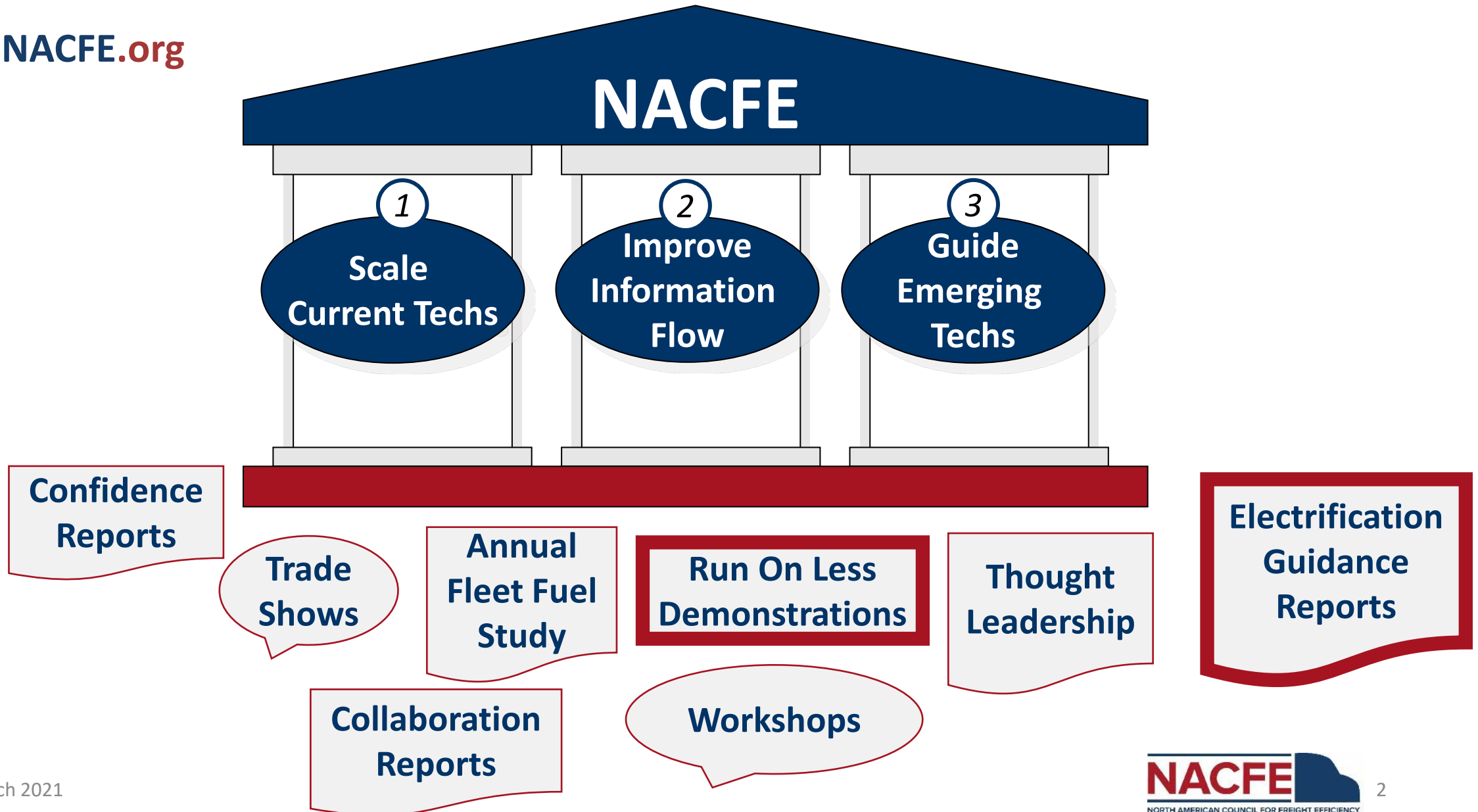
Electrification & Regional Haul Trucking

Dave Schaller
March 2021



Three Pillars of NACFE Work

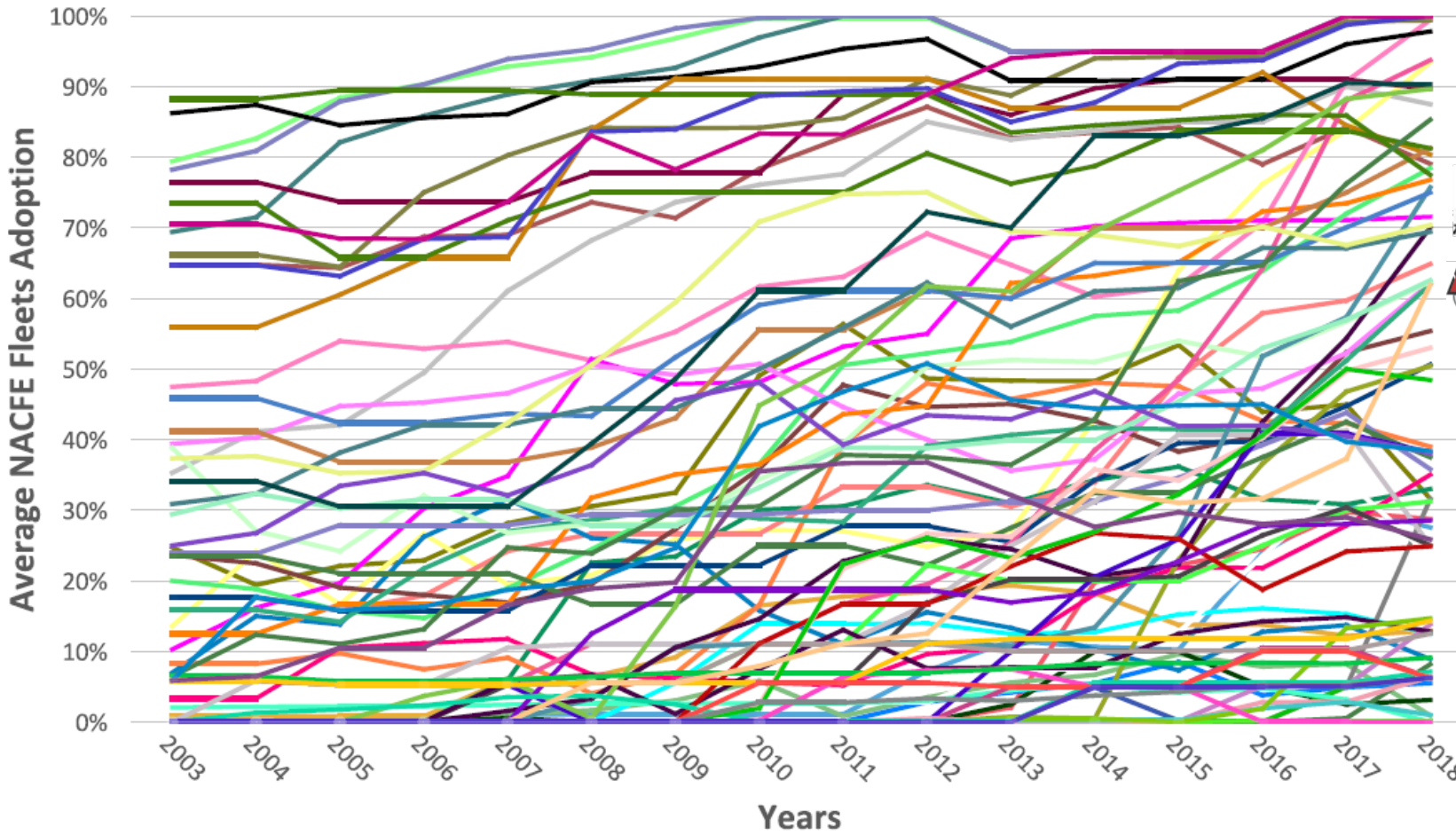
www.NACFE.org



2019 Annual Fleet Fuel Study



All Technologies



March 2021



<https://nacfe.org/annual-fleet-fuel-studies/>



Best of the Best

2017



Long Haul
7 Fleets
10.1 MPG

2019



Regional Haul
10 Fleets
8.3 MPG

2021



All BEVs
10 Fleets
New metrics!

March 2021



2021 Run on Less - Electric



IN PARTNERSHIP WITH



with title sponsors



April Announcement

- Participants' fleet, truck and location detailed
- Bootcamp registration
- Website launched

4/6/21



- 10 Webinars every other Tuesday
- Apr 20th to Aug 24th
- Learnings workshop 9/1 at ACT Expo in Long Beach

Pre-Run

- Visit all participants June & July
- Continued promotion
- Profiles up August 16th



- Starts 9/3 at ACT Expo
- Metrics and daily stories
- TMC Cleveland & SAE COMVEC Chicago 9/13
- NYC Climate Week 9/20

Post-Run

- Finale NACV Atlanta
- ATA MC&E, GreenBiz VERGE, more
- Analyses and publish reports in 2022



RUN ON LESS ELECTRIC

Support the Real-World Demonstration of Zero-Emissions Goods Movement

OVERVIEW

New technologies are emerging to help trucks deliver goods more cleanly and efficiently, and electric trucks are key to trucking's green future. To keep pace with the ever-changing industry, the **North American Council for Freight Efficiency (NACFE)** and **Rocky Mountain Institute**

ABOUT RUN ON LESS ELECTRIC September 2021

The three-week roadshow showcasing electric trucks delivering real freight on real routes will:

“A real-world electric truck demonstration with actionable data and discussions. *Real freight, real routes, real trucks & drivers.* Includes data from trucks, storytelling via videos with drivers, fleets and OEMs. An engaging electrification education series building the key actions for accelerated adoption.”

RoL-E Summary

- Ten fleet / OEM pairs across N.A. running in Sept 2021
- Battery Electric only, Classes 3-8
- Electrification Education Series May - Oct
- Dana, Meritor and Shell are Title Sponsors, others as Event Sponsors, more needed, call us!
- Many discussions held with fleet/OEM participants. Apply at www.runonless.com
- Timing; Announcement Jan 13th, reveal participants in April, visit all in June/July, Run throughout Sept with two finales.

RoL-E Possible Participants



- 30+ potential pairs
- In operation around June 1st
- Mix
 - Multiple classes and duty cycles
 - Multiple truck OEMs
 - Locations around NA
- Selection Criteria
 - Uptime, design maturity
 - Scale potential
 - Mix
 - Fleet / OEM commitment

Electric Truck Bootcamp

- 10-part virtual education series designed to:
 - increase industry awareness of electric trucks
 - provide professional development opportunities
 - convene stakeholders across the electric truck ecosystem to discuss key opportunities and challenges
- Free to attend
- April through August 2021
- Potential topics include:
 - Benefits of electric vehicle technology
 - Charging infrastructure
 - Managed/smart charging
 - Partnering with energy providers
 - Available incentives
 - Financing & innovative biz models
 - Maintenance, training, & safety
 - E-waste & responsible supply chains
 - Driver perspectives
 - Lessons learned outside N. America

Interested in sharing your expertise?

Contact Jessie Lund (jlund@rmi.org)

Fleet Electrification Waves

Electrification waves drive
RoL-E scope

1. Forklifts
2. *Yard Tractors*
3. *MD Urban Delivery*
4. *Drayage*
5. *Regional Haul Tractors*
6. Long Haul Tractors



March 2021

Guidance on Electric Trucks

1

Electric Trucks: Where They Make Sense

May 2018



MD Electric Trucks: Cost Of Ownership

October 2018

2

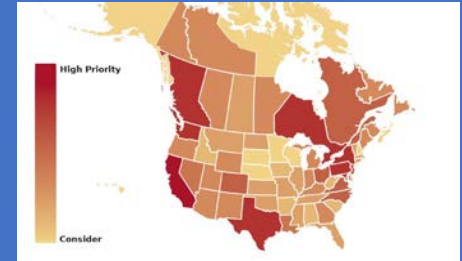
Viable Class 7 & 8 Electric, Hybrid & Alt Fuels Tractors



4

December 2019

High Potential Regions



5

November 2020

Heavy-Duty Hydrogen Fuel Cell Tractors



6

December 2020

3

Electric Trucks: Charging Infrastructure

March 2019

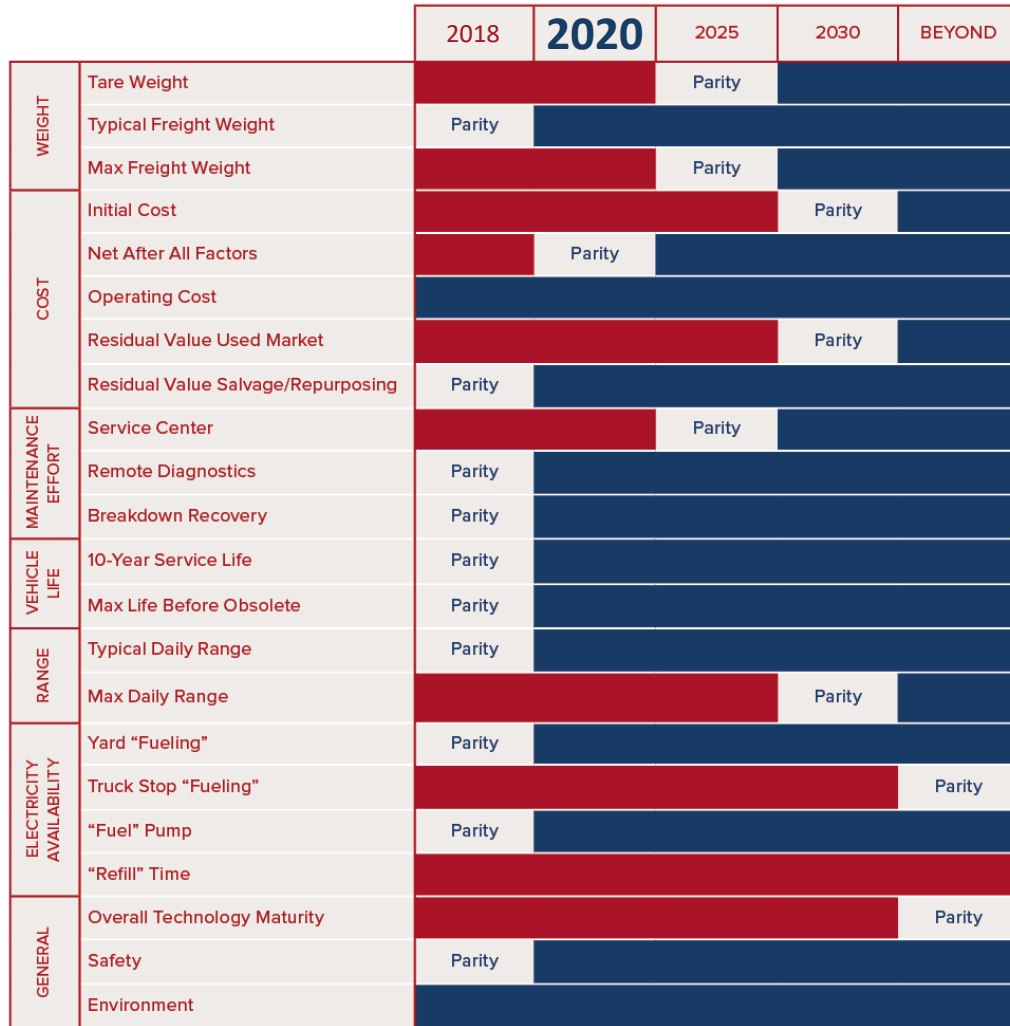


March 2021

Now Free Online at <https://nacfe.org/emerging-technology/electric-trucks-2/>

Findings: Parity To Diesel

CLASS 3 THROUGH 6 CBEV PARITY VS. DIESEL SYSTEM (NACFE)

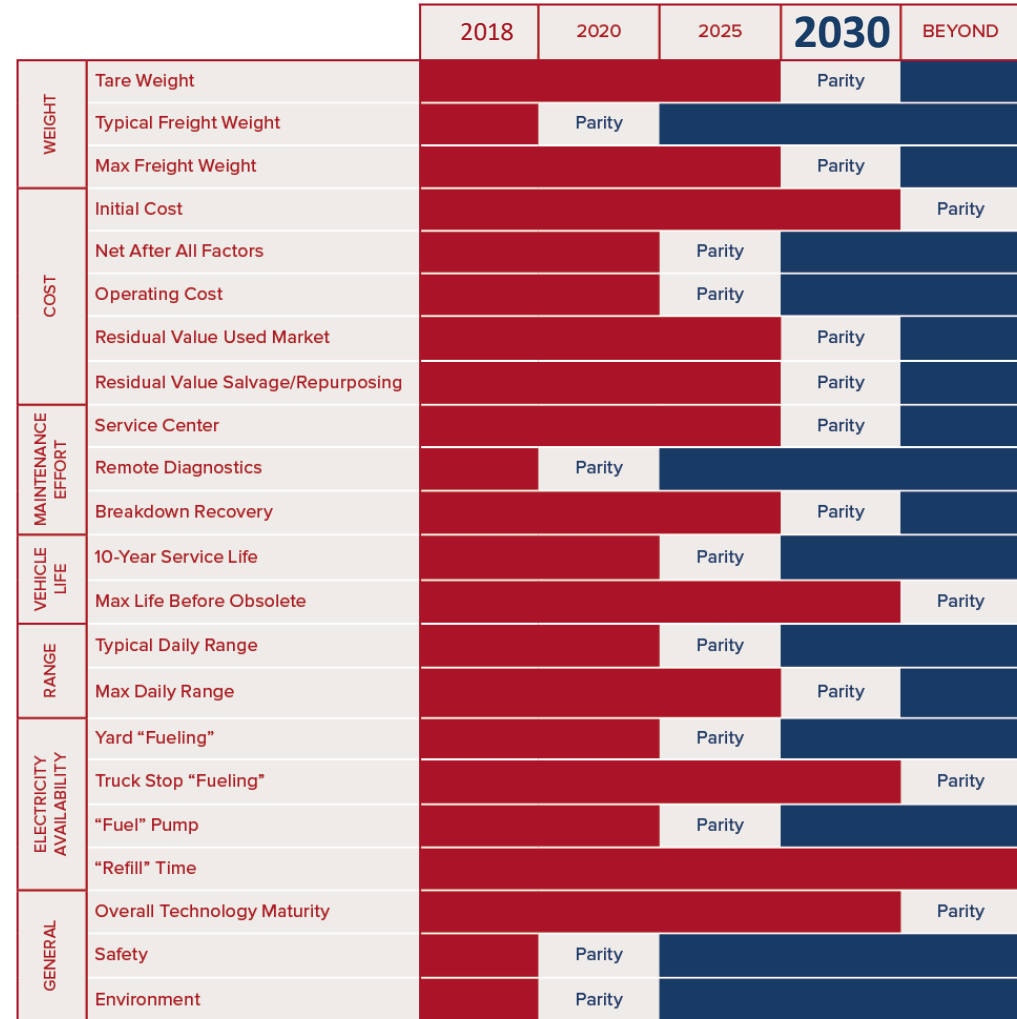


Key: Comparison to 'Equivalent' Diesel Baseline: ■ Worse ■ Parity ■ Better

Class 3 - 6

Dark Blue = EV is Better

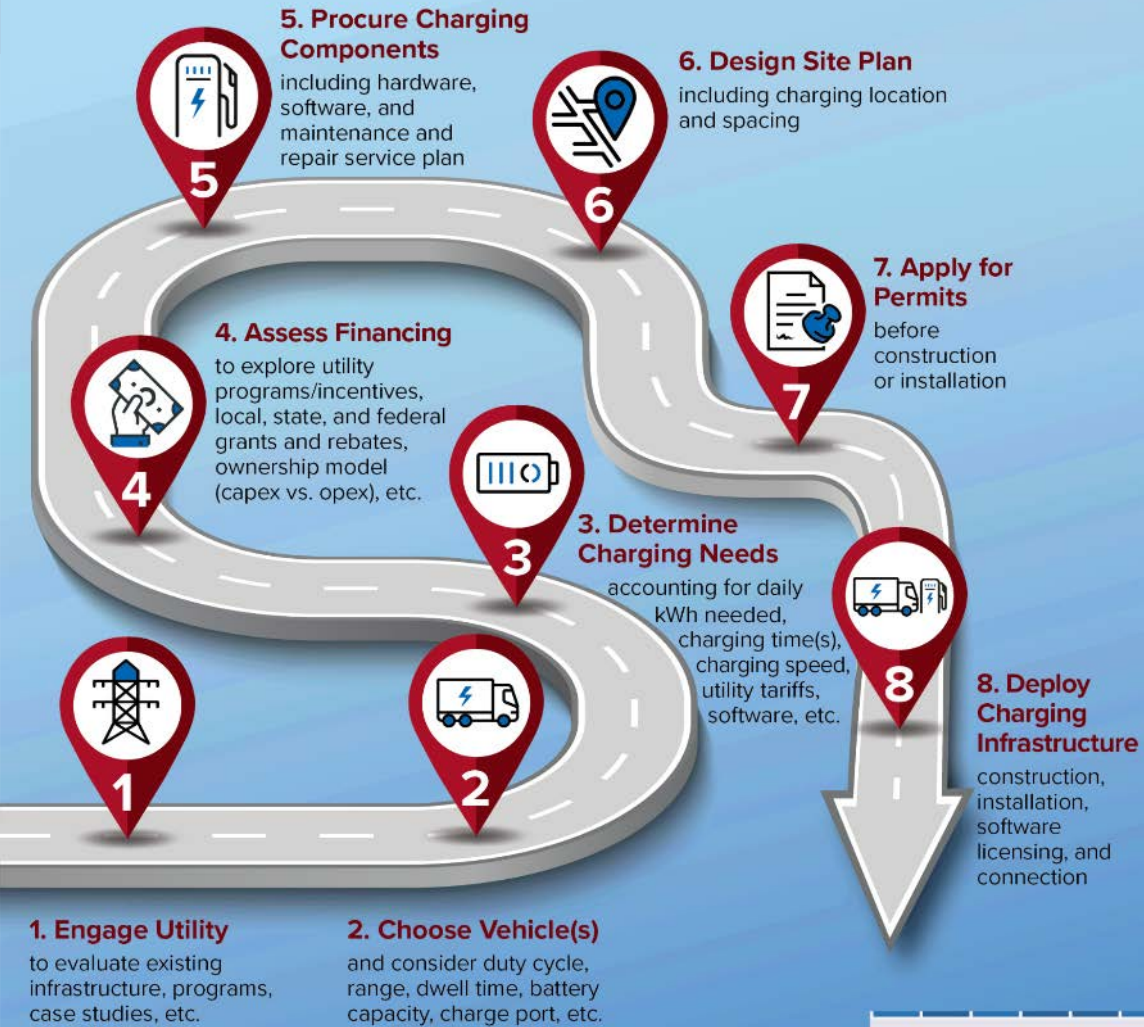
CLASS 7 AND 8 CBEV PARITY VS. DIESEL SYSTEM (NACFE)



Key: Comparison to 'Equivalent' Diesel Baseline: ■ Worse ■ Parity ■ Better

Class 7 & 8

Charging Procurement Roadmap



March 2021

Infrastructure

- Complex
- Large amount of power fast
- Involve all stakeholders early
- Time to complete with truck availability
- Be flexible

Pathways to HD Truck Charging



1) Fleet Depot Based



2) Opportunity Charging
Stores, Ports, Warehouses...



3) Shared Card Lock Locations



4) Truck Stops



5) Toll Road Rest Areas



6) Interstate Rest Areas

7) Mobile Roadside Charging (emergencies & service calls)

8) In Motion Charging

HD Tractors Green Future

PRESENT: 2020

Technology immature
Many unknowns
& challenges

"MESSY MIDDLE": 2030

Many optimized solutions
Growing infrastructure
Multi fuel choices

Innovation & maturation
Facts replace estimates
Learning curves

FUTURE: 2040

Fast charging everywhere
Long life, low cost batteries
Acceptable weights



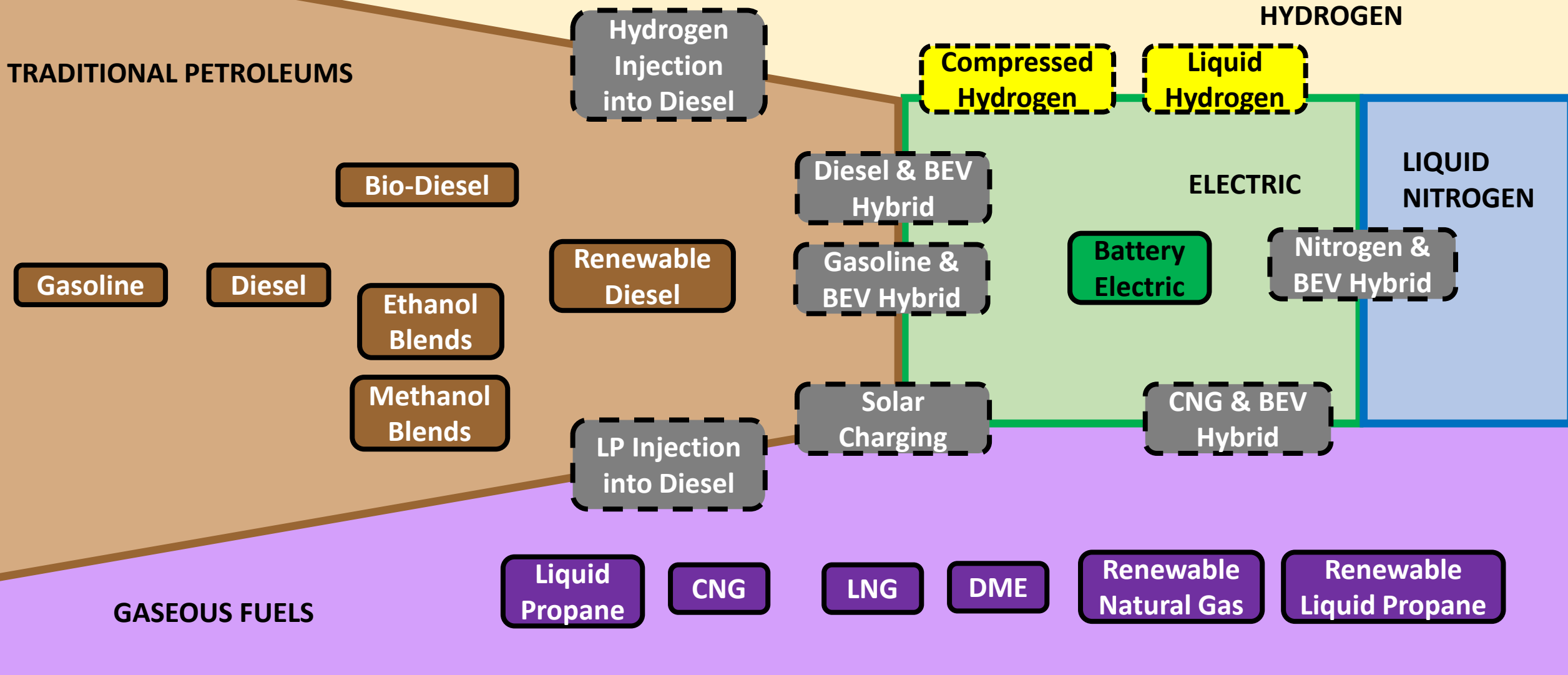
Legacy Diesels
Natural Gas

Diesel Advancements
Natural Gas
Hybrids

Battery Electric
Hydrogen Fuel Cells
Renewable Natural Gas & Diesel

CBEV from
Clean Energy

Alternative Fuels



Electric Trucks

Collaboration

- Fleets
- OEMs (Existing *& New*)
- Suppliers
- Dealerships (Sales/Service)
- Governments
- *Charging System Suppliers*
- *Utility Companies*



Run on Less Regional



Results Fleets Technologies Videos News & Events About

Day 18 of 18

Congratulations to Our Drivers!

OCTOBER 7 – 25 2019

Run on Less Regional Sets Impressive Efficiency Benchmark



RESULTS

See the results

8.3

Average MPG

\$8,249

Dollars saved

\$9,003,550,961

Annualized Potential Savings

Potential savings represents the savings that are possible across the industry if all regional-haul trucks operated at this level.

March 2021



Results Fleets Technologies Videos News & Events About

All Results

RESULTS BY FLEET

C&S Wholesale Grocers

Hirschbach

Hogan Transportation

J.B. Hunt

Meijer

PepsiCo

Ploger Transportation

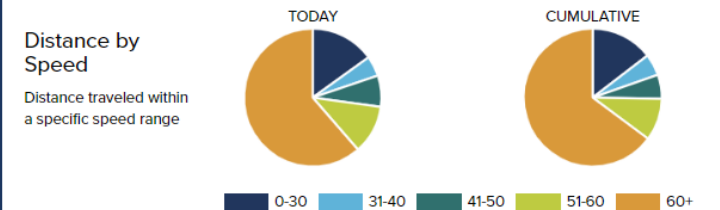
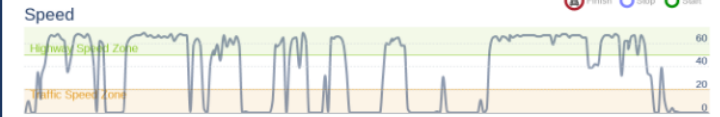
Schneider

Southeastern Freight Lines

United Parcel Service

OCTOBER 16, 2019: DAY 10 OF 18

Day 10



Run on Less Regional Reports

Conclusions

1. High efficiency requires commitment
2. Optimize performance using big data and connectivity
3. Understand and act on the variety in duty cycles
4. Drivers are attracted to regional haul
5. Return to base is ideal for electric trucks
6. Growth in Regional Haul is Good

Run On Less Data Benefits

- Run on Less Regional data analysis: [RoLR final report](#)
- NREL/NACFE Report: [Battery Electric Powertrains](#)
- Ballard/NACFE Report: [Hydrogen Fuel Cell Trucks in Regional Haul](#)
- Free [downloadable data set](#)



Electric Trucks In Regional Haul



School Buses



Transit Buses



Regional Haul Tractors

Population:
(U.S.A)

480,000

150,000

800,000

**Annual
Mileage:**
(typical)

12,000

35,000

65,000

**Total Annual
Mileage:**
(estimate)

5,760,000,000

5,250,000,000

52,000,000,000

Sources: DOE Fuels Data Center, APTA Fact Book, Reference.com, NACFE reports

Getting to Know Each Other



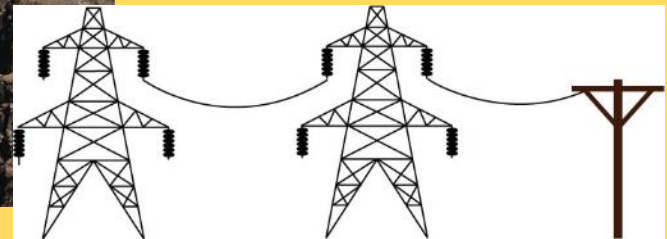
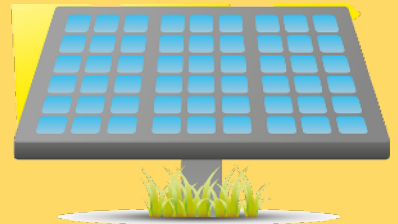
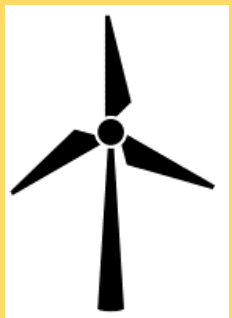
FLEETS



Primer:
FLEETS
on
UTILITIES



Primer:
UTILITIES
on
FLEETS



UTILITIES



Wave Of Changes Coming



Covid-19
Autonomous Vehicles
Driver Retirement
Electrification
IMO 2020
Hours Of Service
2 Truck Platooning
GreenHouse Gas Phase 2
Alternative Fuels
Solar
Cameras
Lightweighting
Parking Shortage
Artificial Intelligence
Driver Retention
Blockchain
BIG DATA

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