Advanced Grid Research
OFFICE OF ELECTRICITY
US DEPARTMENT OF ENERGY

NACFE
NORTH AMERICAN COUNCIL FOR FREIGHT EFFICIENCY

Plugged In and Trucking

Dave Schaller

July 15, 2020

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

 # 3

Electric Trucks: Charging Infrastructure

March 2019

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

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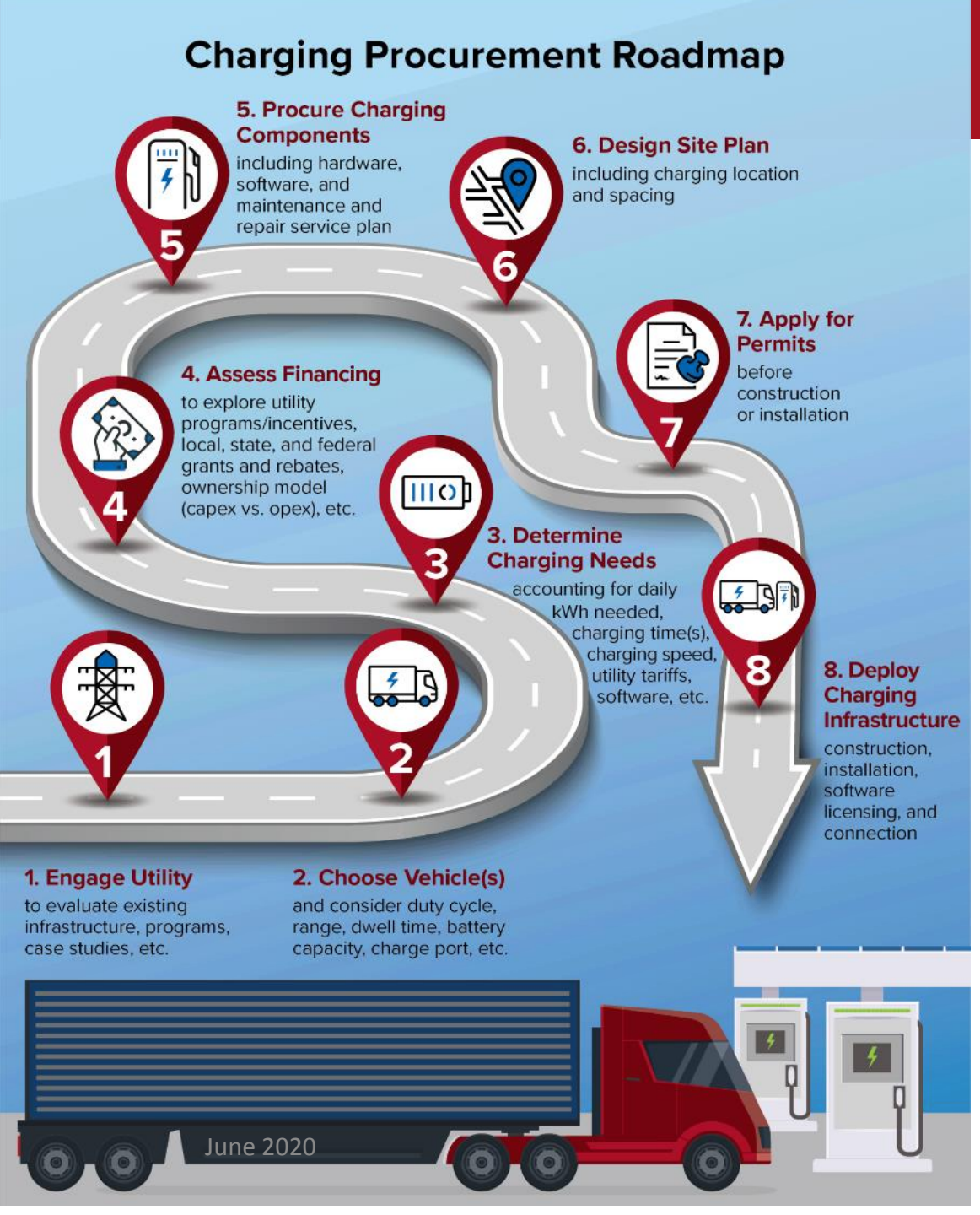
Infrastructure



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

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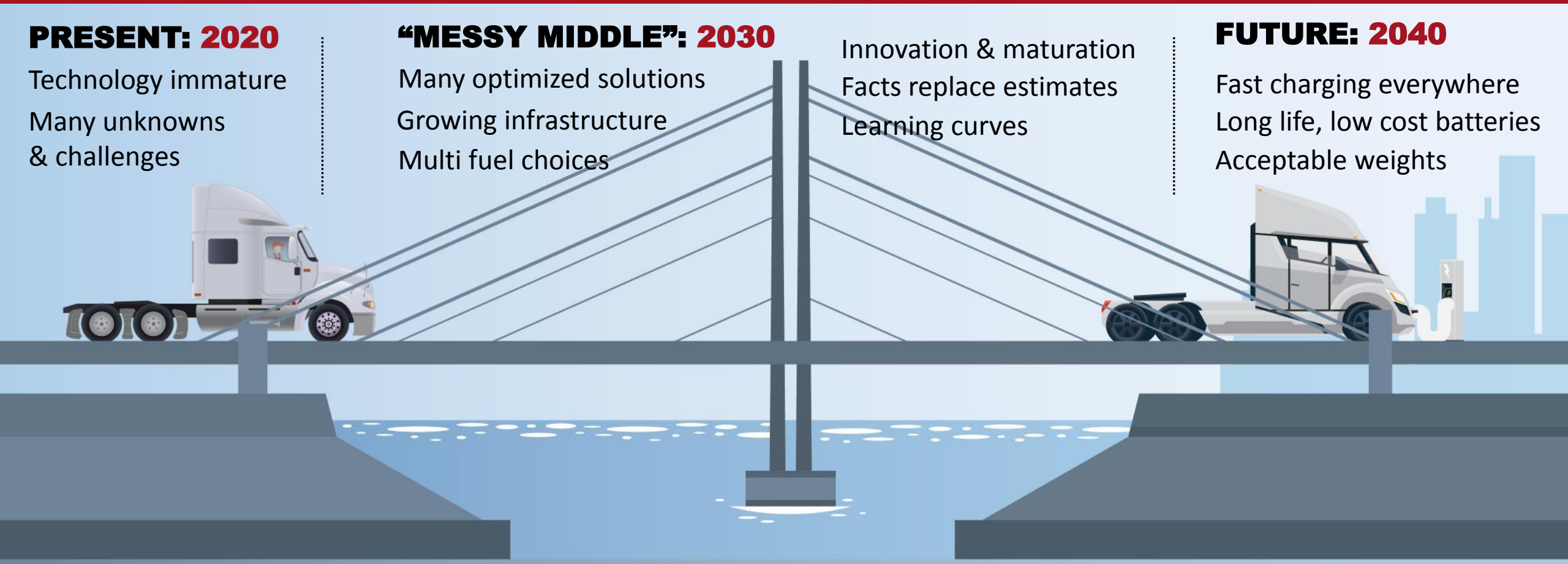
HD Tractors Technology Bridge



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

Battery Electric
Hydrogen Fuel Cells
Renewable Natural Gas & Diesel

CBEV from
Clean Energy

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Getting to Know Each Other

FLEETS

2 Pager: UTILITIES on FLEETS

ROCKY MOUNTAIN INSTITUTE

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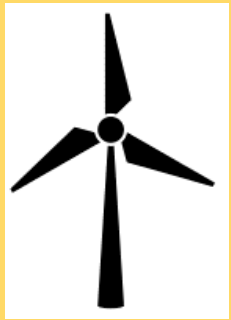
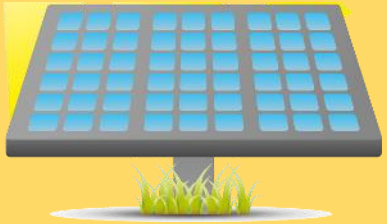
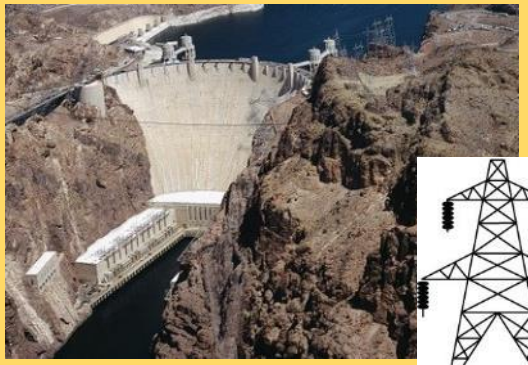
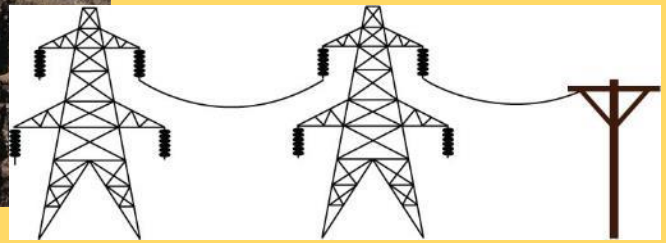
2 Pager: FLEETS on UTILITIES









UTILITIES

June 2020

Why Consider Electrification Now?

Financial

- Incentives are/will be available that can cover some of the costs of conversion

Facilities

- Obtain required power levels BEFORE your neighbors
- Obtaining power/infrastructure can take years
- Might be easier to relocate than upgrade
- Physical layout of your lot will change

Change is Coming: Even with diesel

- Regulations & tech changes for NOx & GHG

Electric Trucks

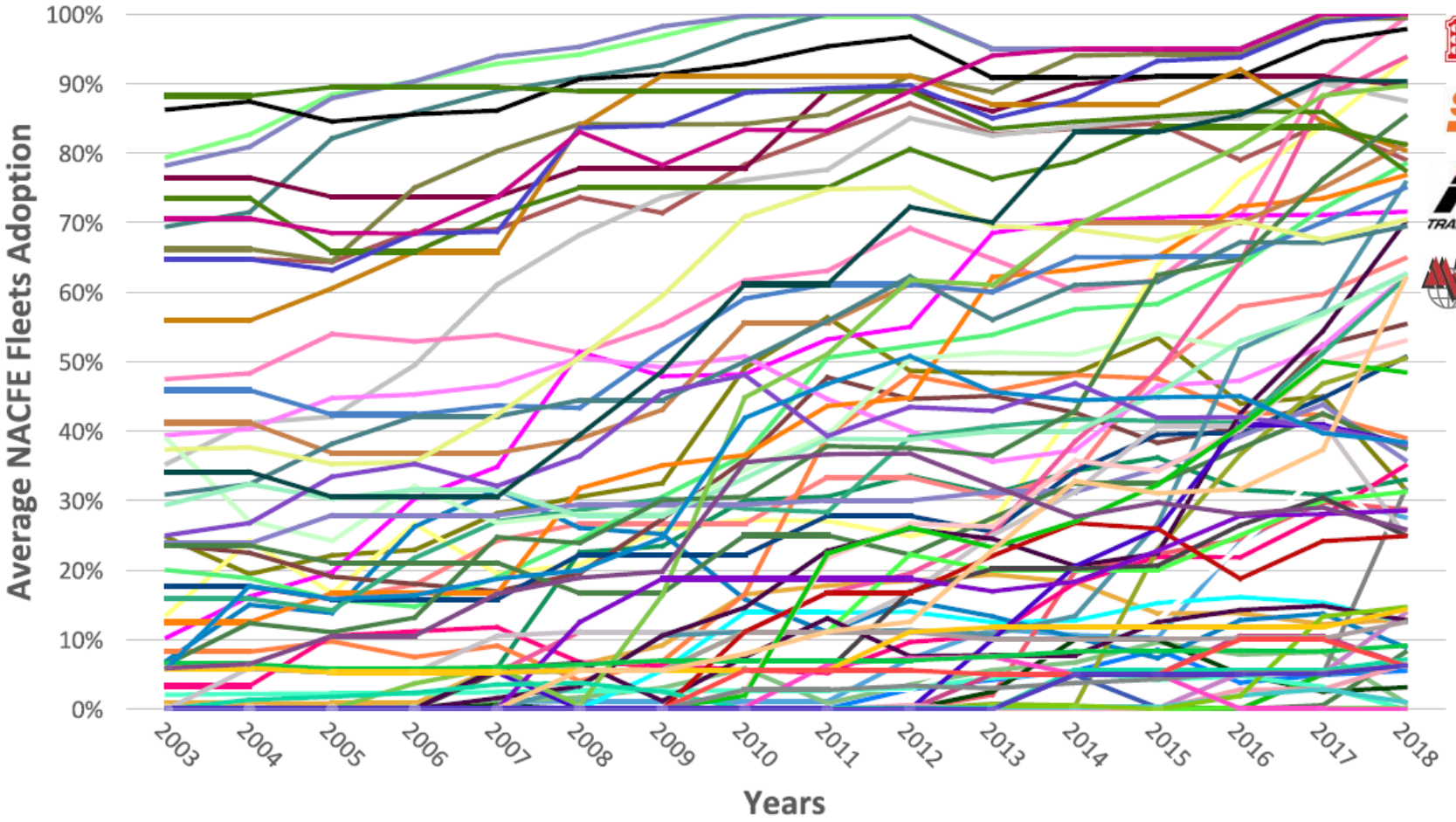
Collaboration

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

Electrification Forecasts

Organization	Study	Scenario	% EV Sales 2030 MD Vehicles	% EV Sales 2030 HD Vehicles	Geography
NREL	Electrification Futures Study (EFS) (2018)	Reference	0.3%	0%	US
		Medium	9.5%	3.3%	US
		High	20.0%	13.5%	US
BNEF	EV Outlook 2019	Long-term EV Outlook	12.5%	7.6%	Global
McKinsey	New reality: electric trucks and their implications on energy demand (2017)	Late adoption	11%	0%	US
		Early adoption	18%	2%	US

2019 Annual Fleet Fuel Study



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

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Supporting Research

Trucking Industry Operations

- Regional Haul Overview: More Regional Haul: An Opportunity for Trucking
- Fleet purchasing reluctance: Barriers to Adoption of Fuel Efficiency Technologies
- Fleet Technology Adoption: Annual Fleet Fuel Study

Run On Less Regional

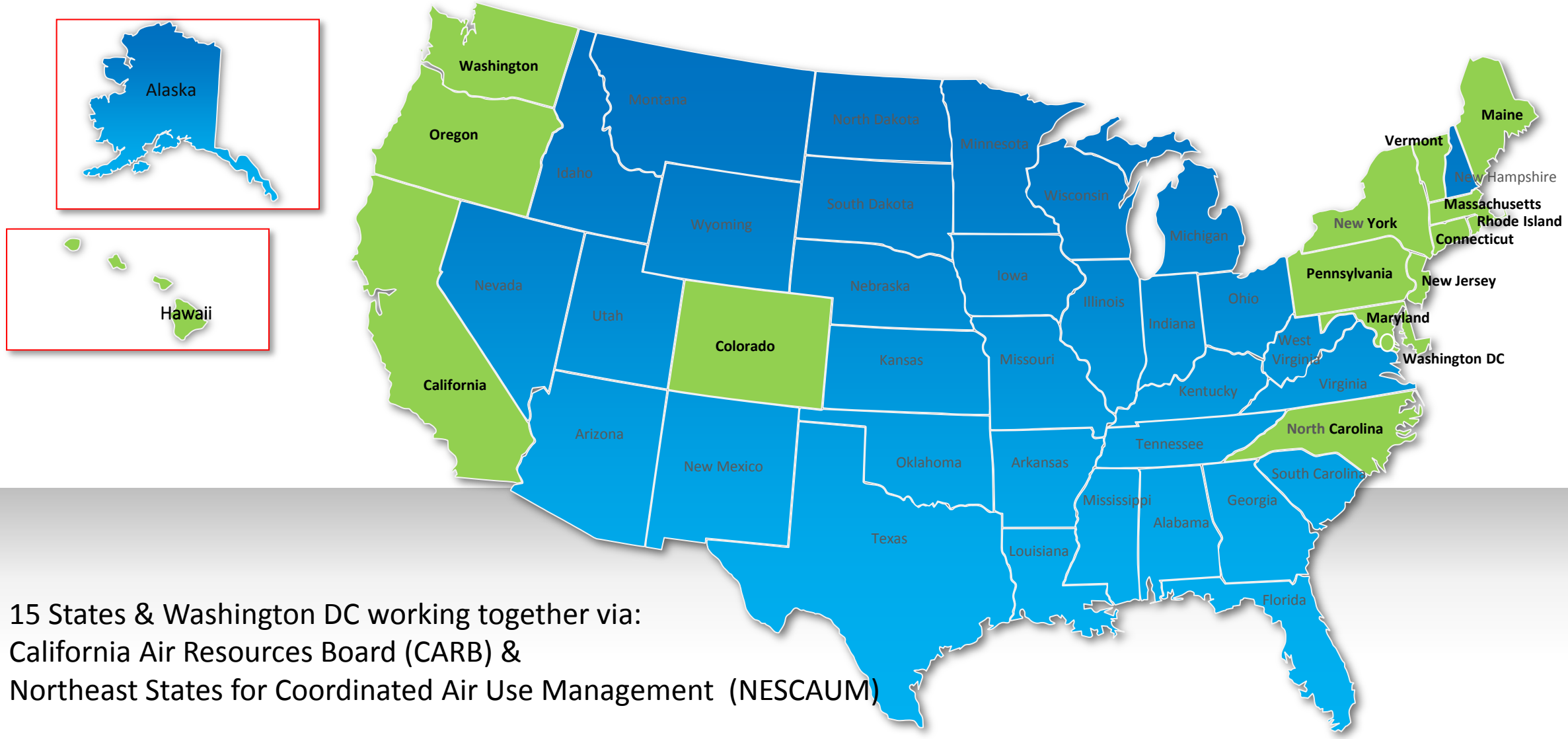
- Run on Less Regional data analysis: RoLR final report
- NREL/NACFE Report: Battery Electric Powertrains
- Ballard/NACFE Report: Hydrogen Fuel Cell Trucks in Regional Haul
- Free downloadable data set

More work is underway:

Should we collaborate with you?

RUN ON LESS REGIONAL

Transition to Zero-Emission Trucks (& Buses)



15 States & Washington DC working together via:
California Air Resources Board (CARB) &
Northeast States for Coordinated Air Use Management (NESCAUM)

Memorandum Of Understanding signed July 14th, 2020

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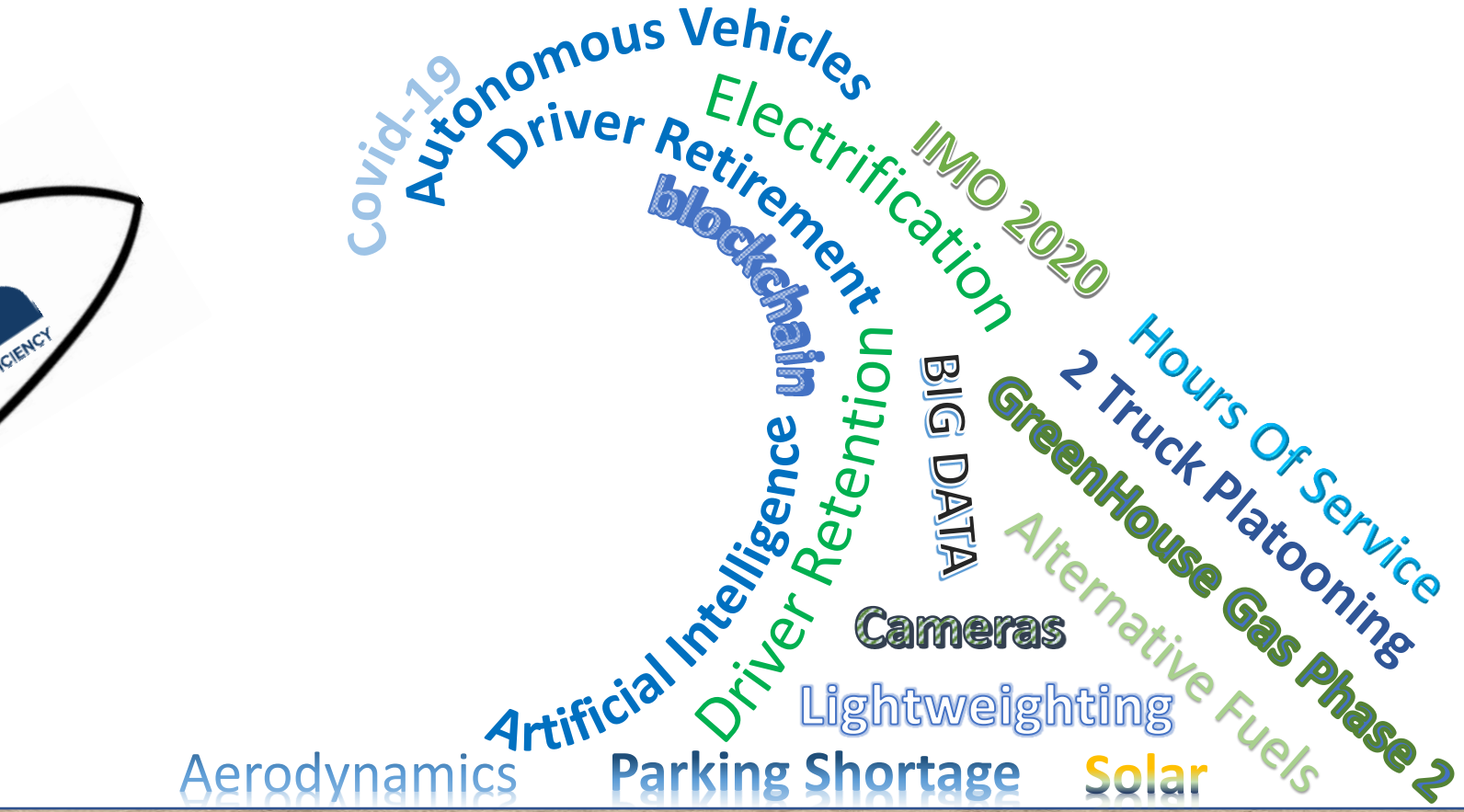
Wave Of Changes Coming



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