

Freight Efficiency: Advances and Innovation

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Improving Freight Efficiency

How much is possible?

What if we started over with a clean sheet?

Isn't Transportation risk averse and improvements take forever?

What should be done and by whom? Fleets, OEMs, Suppliers, Government NGOs, etc.

“US heavy vehicle fuel consumption will increase 25 percent between 2010 & 2020”

- Energy Information Administration (EIA) Annual Energy Outlook (AEO) 2010

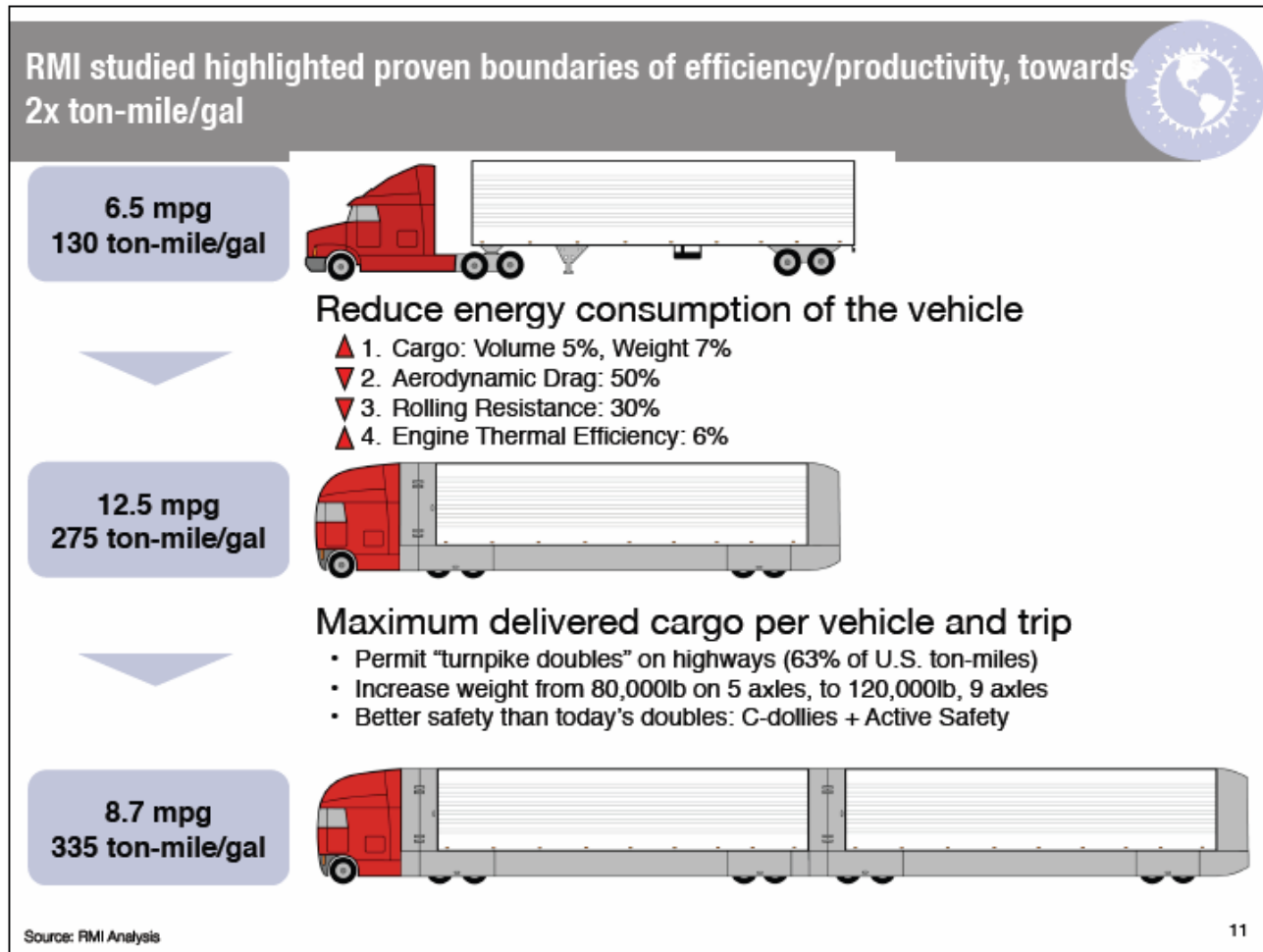
“Energy efficiency and renewable energy research, development, and deployment activities help the Nation meet its economic, energy security, and environmental challenges, concurrently.”

- Patrick Davis, DOE on advancing Presidential Priorities at 21CTP

On fuel prices - “We’re all fearful of another [fuel] price surge after the way we were slapped around a couple of years ago. You have to be more conscious and attentive.”

- Robert Ragan, senior vice president Melton Truck Lines, Tulsa, Okla

Rocky Mountain Institute – Transformational Trucking Study



DOE SuperTruck Project Overview

Project Description

Overview of Awards

Heavy Duty Demonstration Requirements

Demo Type	Efficiency	Emissions	Conditions	DOE Cooperatively Funded R&D
Diesel Engine	≥ 50% Brake Thermal Efficiency		Type: Dynamometer Profile: Class 8 Vehicle under Load Representative of a , 65 mph	Engine and Ancillary Systems Waste Heat Recovery Materials Electrification Fuels from non-food Feedstocks
Full Scale Vehicle	≥ 50% Vehicle Freight Efficiency Improvement (ton-miles/gallon) (≥20% due to ≥ 50% Brake Thermal Efficiency Diesel Engine)	≤ 2010 or prevailing Emission Standards	Type: On Road Profile: Class 8 Vehicle weighing 65,000 pounds evaluated over a test cycle proposed by the the industry team. Other Vehicle Systems	Engine and Ancillary Systems Waste Heat Recovery Fuels from non-food Feedstocks Aerodynamic Drag Reduction Rolling Resistance Reduction Powertrain Hybridization Weight Reduction

US DOE SuperTruck Awards



Cummins

- \$38.8m (total project of \$77.6m)
- Efficient Diesel, WHR, aerodynamics with Peterbilt, and fuel cell APU.



Daimler

- \$39.6m (total project of \$79.2)
- Engine downsizing, electrification, WHR, improved aerodynamics and hybridization



Navistar

- \$37.3m (total project of \$74.6m)
- Truck and trailer aero, combustion, WHR, hybridization, idle reduction and low resistance tires

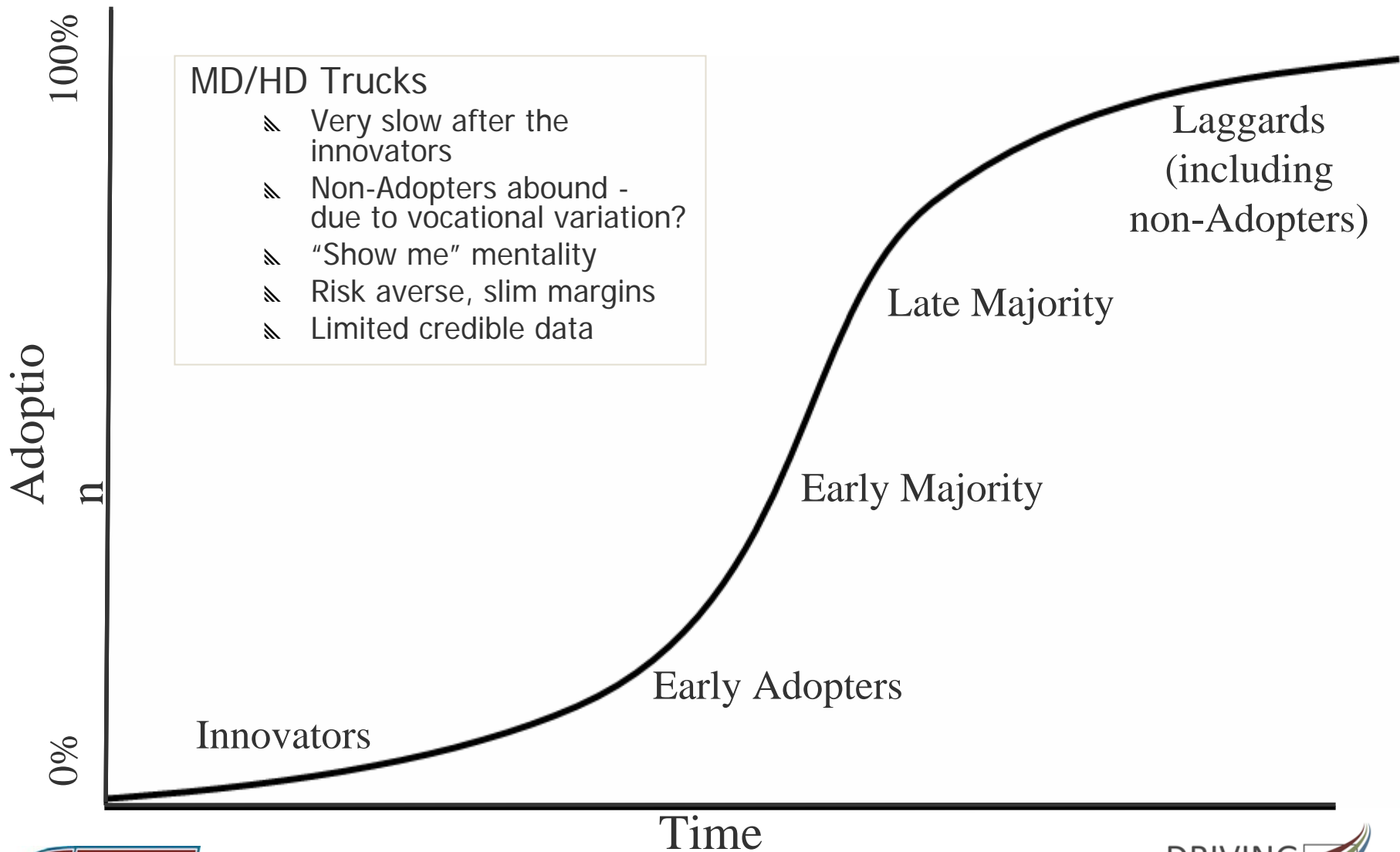
NACFE Overview

Non-profit organization dedicated to doubling the fuel efficiency of the freight transportation industry.

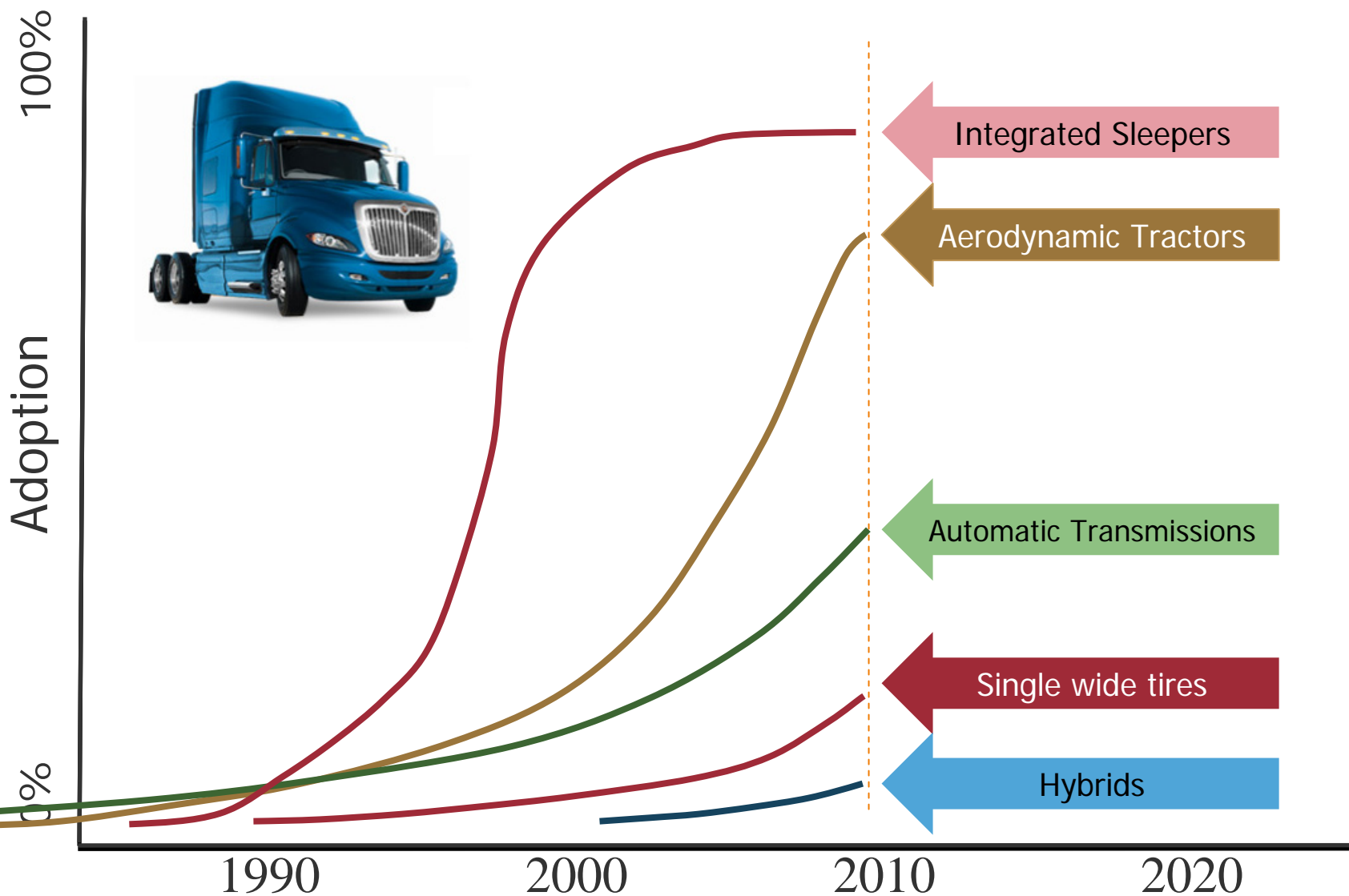
We pursue this goal in two ways:

- ⇒ Improving the Quality and Reliability of Information
- ⇒ Highlighting the Success of High Efficiency Technologies

Typical Product Adoption Curve



Truck Features – A few examples



What do Studies Reveal?

MIT Sloan School of Mgmt, HD Freight Efficiency Analysis May '09

Large, professionally managed fleets use tools such as SmartWay to learn and select new technologies.

Professional fleet managers need to be convinced one at a time due to their individual unique needs.

But many small fleets & owner operators though, have not purchased or are very slow to, due to risk aversion.

Center for Transportation Iowa St. USDOT (MTC 2006- 04) Nov '09

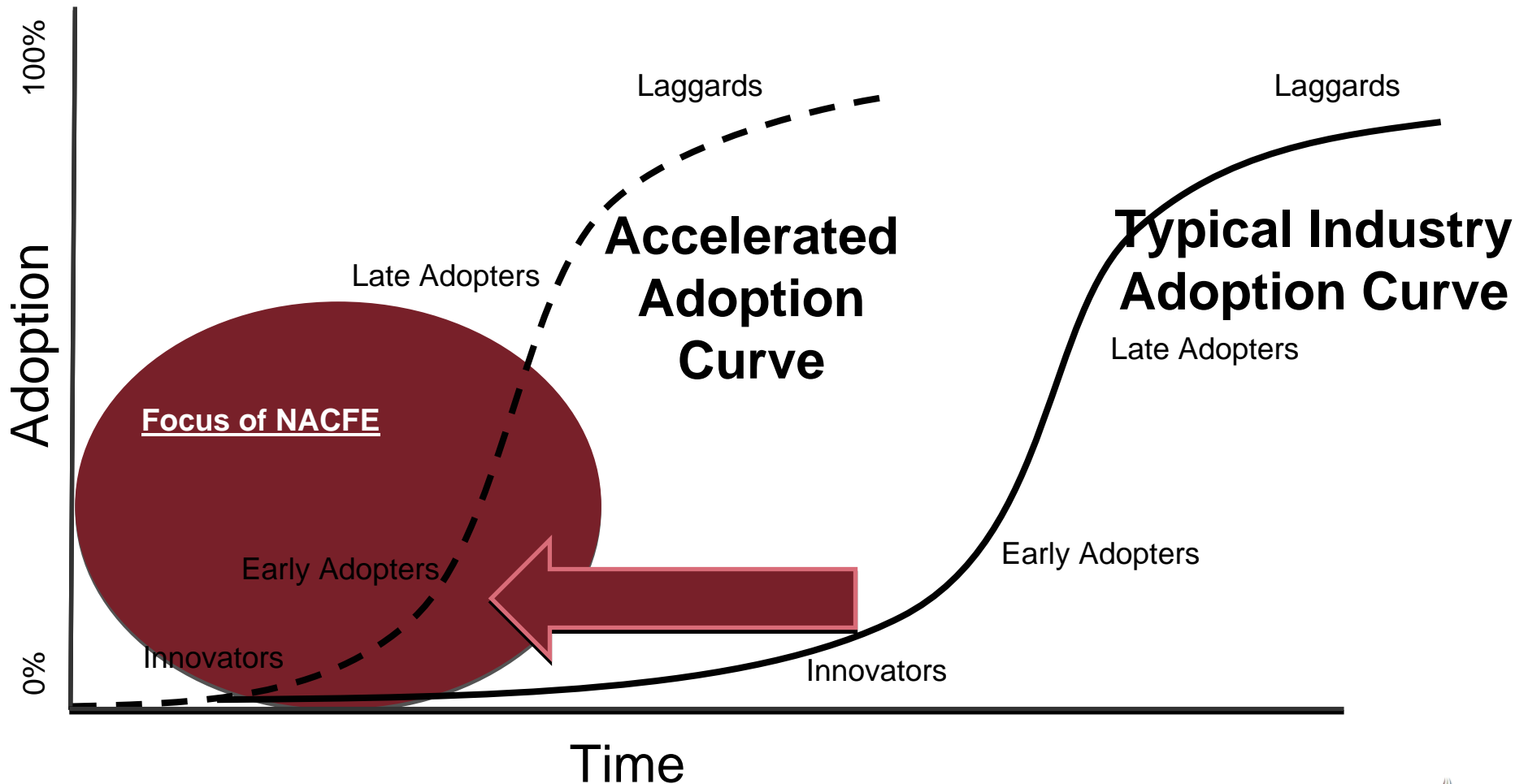
Surveyed fleets – What is the current & future state of adoption of fuel efficiency technologies?

Only 164/24,000 returned!

Results indicate a relatively low rate of adoption of existing technologies, systems and policies.

Suggests there remains a significant opportunity in CI8.

NACFE will Accelerate *Innovation* and *Early Adoption*



Questions?

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