

DAY 1: WORKSHOP

DELVING INTO ELECTRIFICATION
WITHIN THE INDUSTRIAL LIFT
TRUCK MARKET



Nader Gubein
National Accounts Manager
Big Joe





Automotive

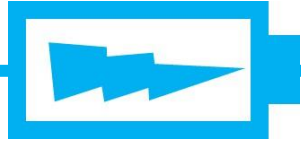


Industrial





FORKLIFTS 101



Congratulations!







The original Macintosh

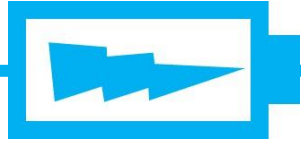




BAND AID



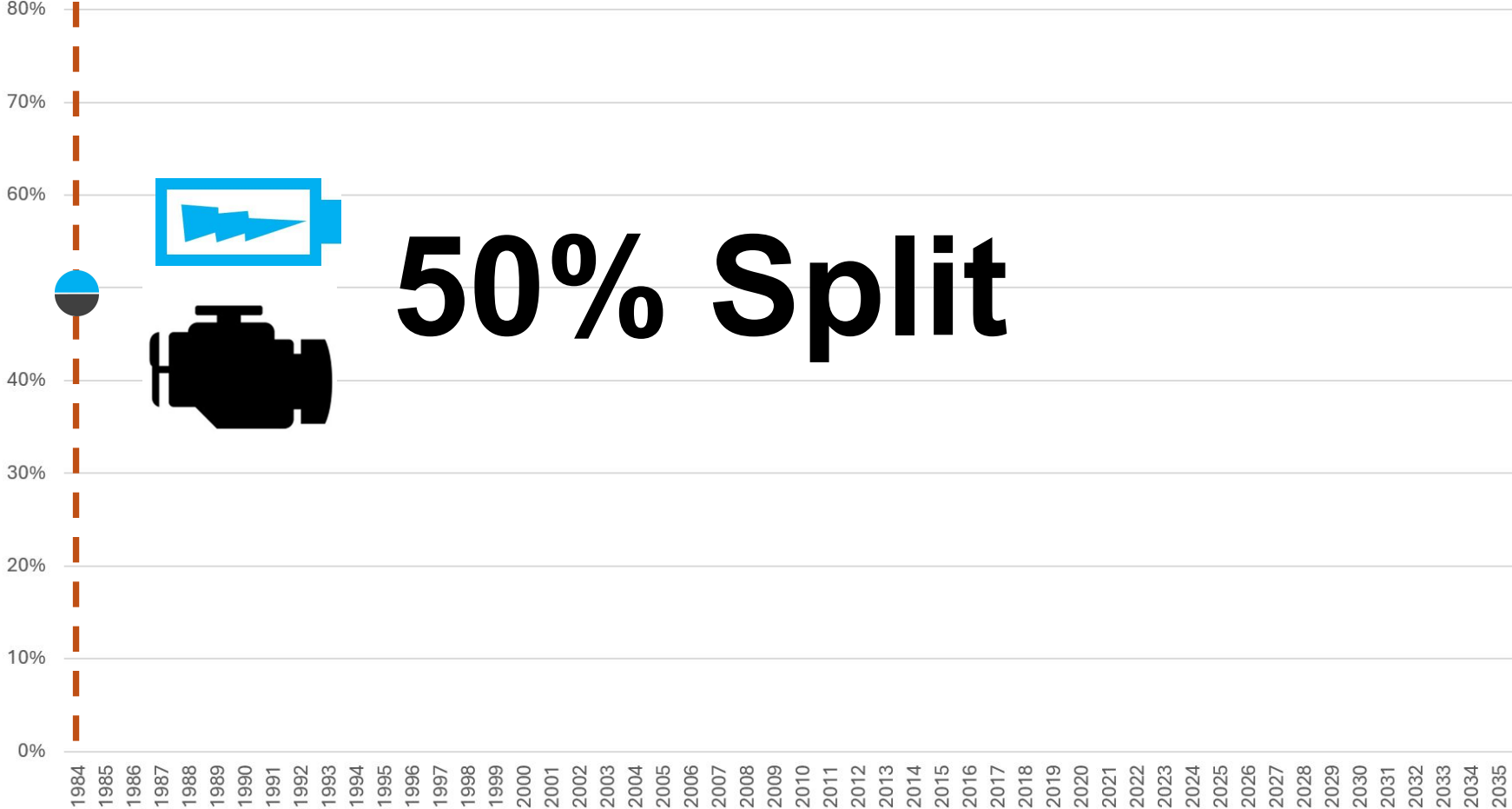
FORKLIFTS 101



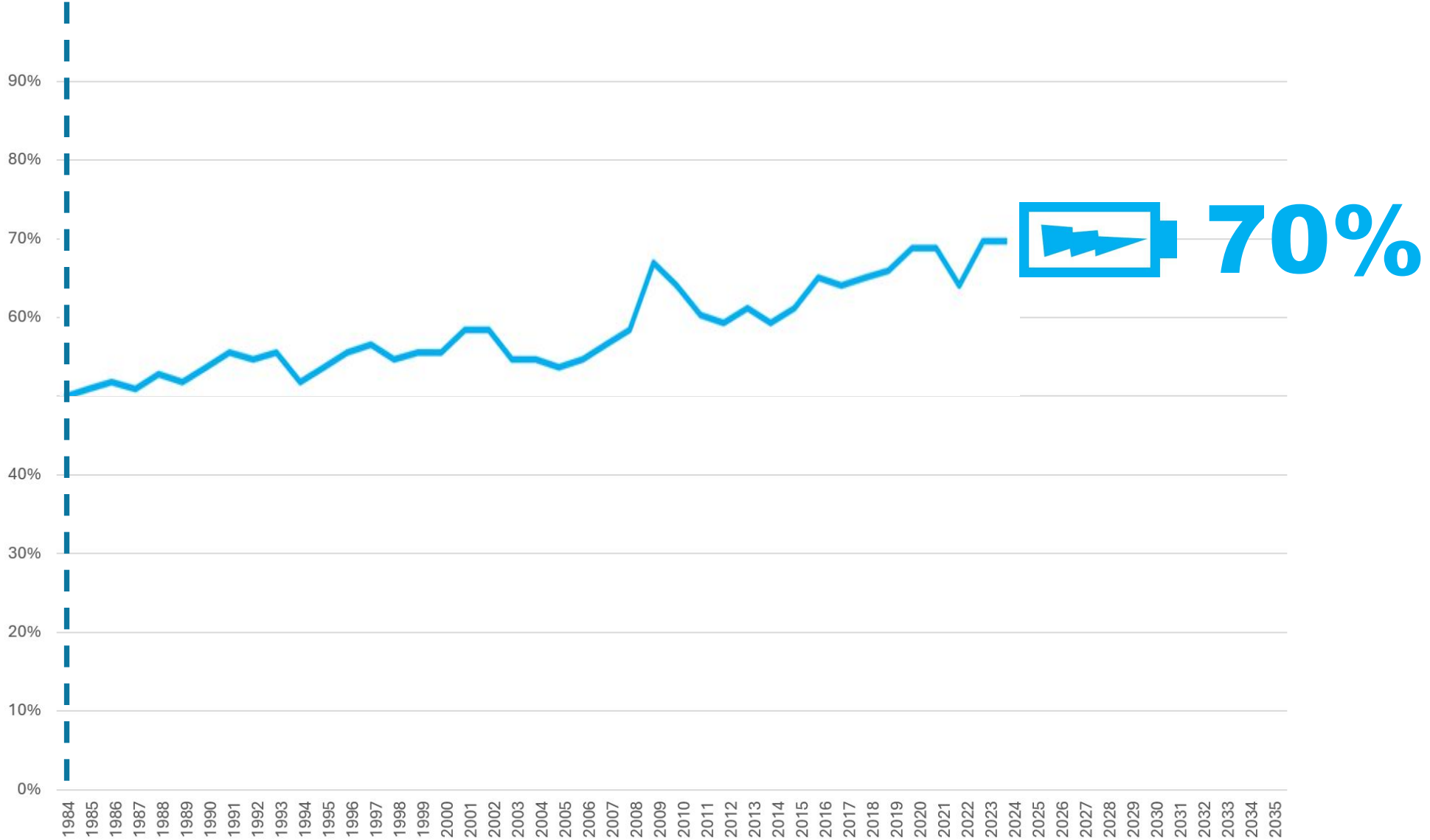


OVERALL Market – Classes 1 through 5

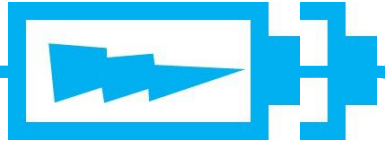
1984



OVERALL Market – Classes 1 through 5



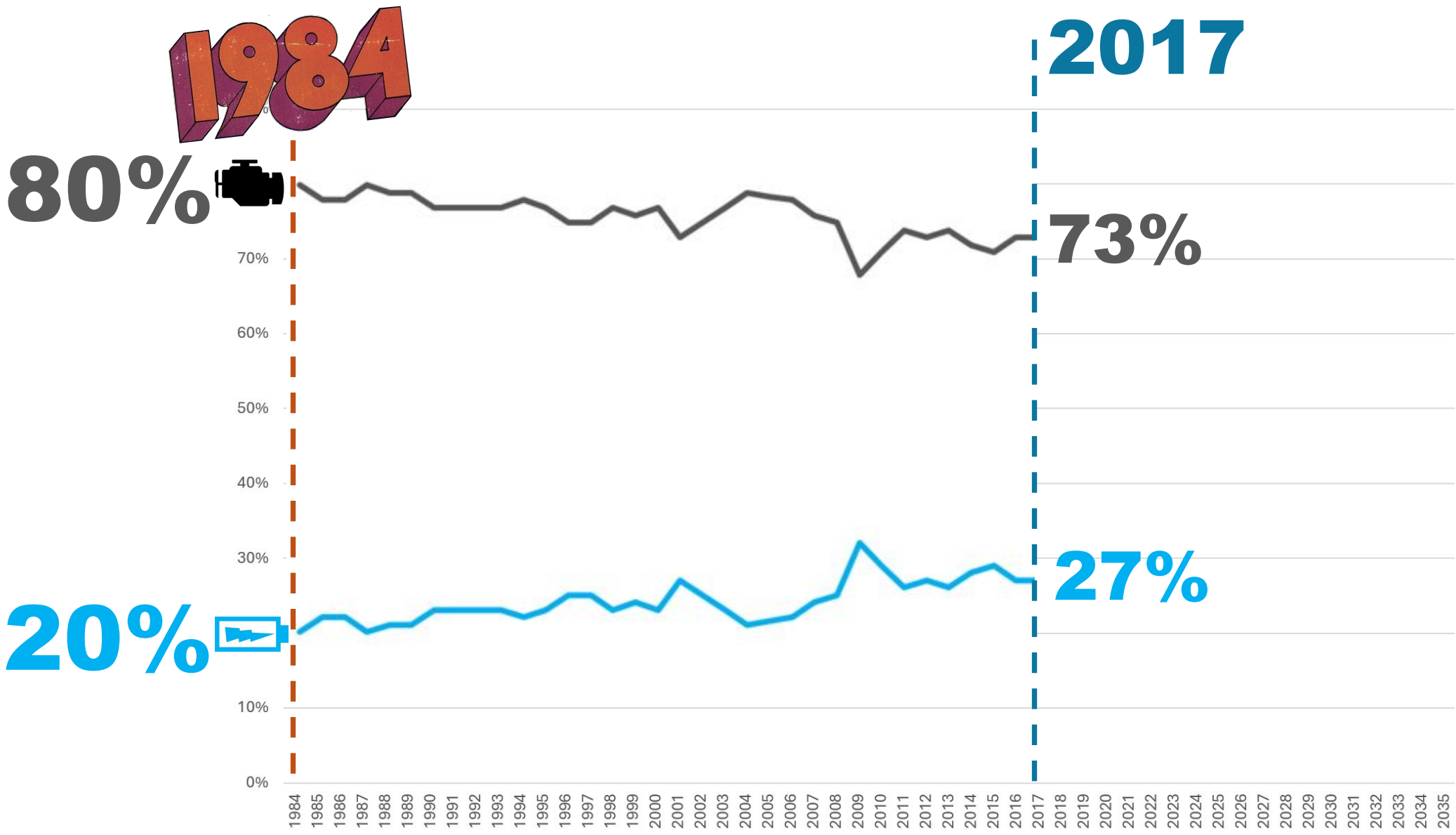
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VS



Class 4/5 vs. Class 1 Sit-Down CB





Electrification Drivers



Class 1 Electric Forklift Design Improvements

- Efficiency Gains
- Performance Gap Reduction
- Total Cost of Ownership

Electrification Drivers



Class 1 Electric Forklift Design Improvements

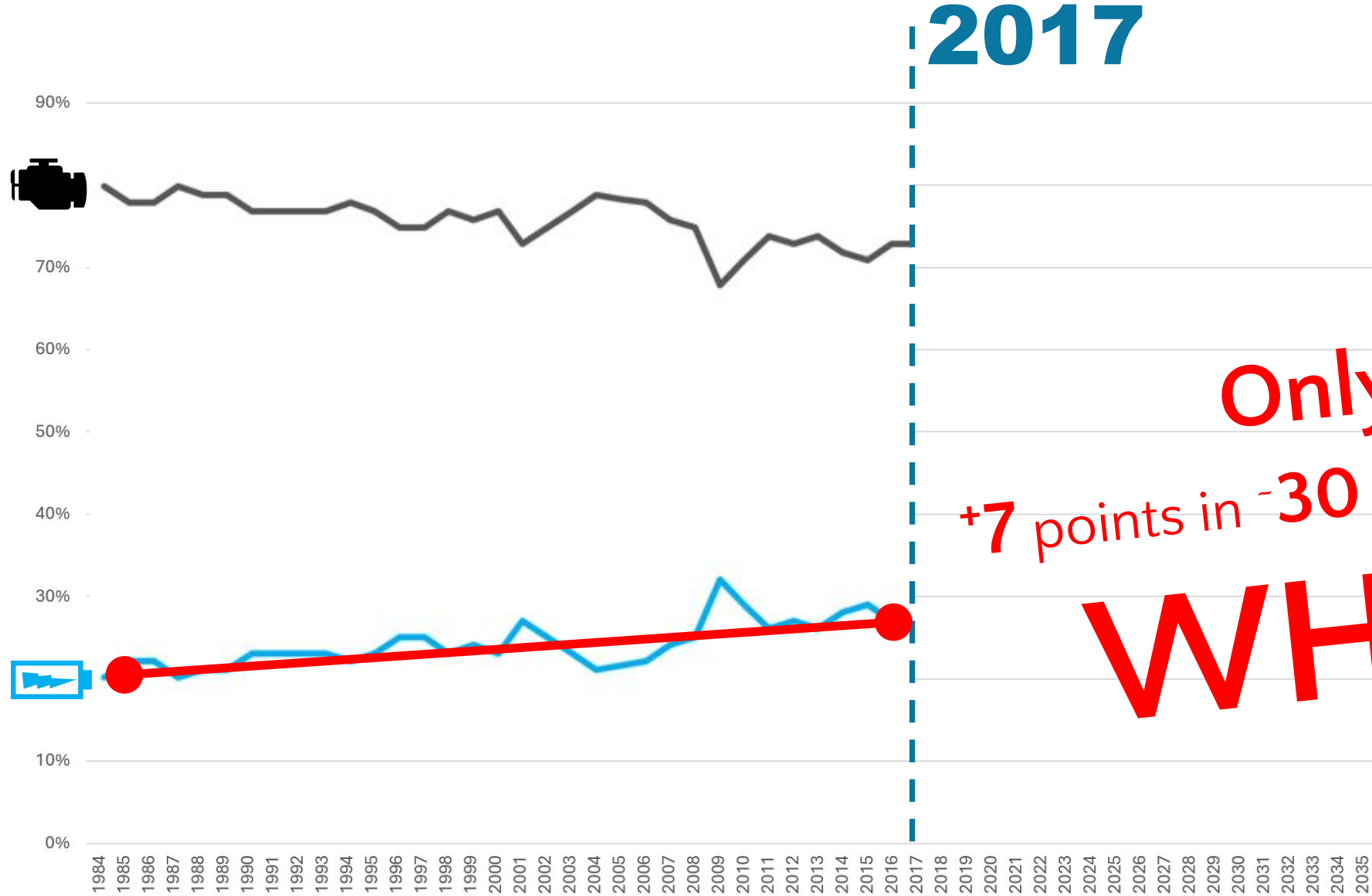
- Efficiency Gains
- Performance Gap Reduction
- Total Cost of Ownership

Market Drivers

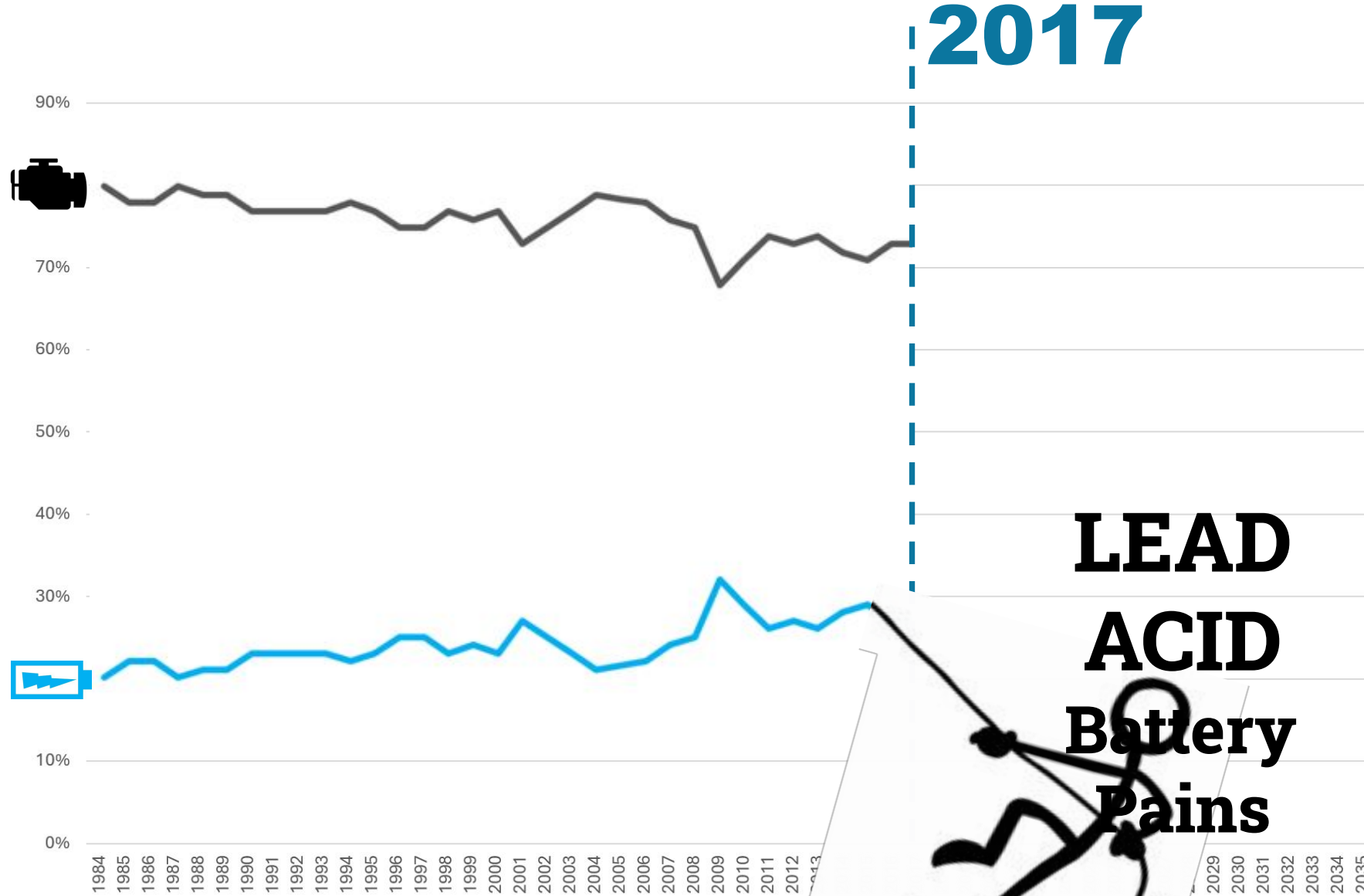
- Sustainability/Green Thinking
- Fuel Cost Volatility
- Legislative Pressure (Govt)



Class 4/5 vs. Class 1 Sit-Down CB



Class 4/5 vs. Class 1 Sit-Down CB



**LEAD
ACID
Battery
Pains**



A technician in a grey shirt and black gloves is working on a lead acid battery in the engine compartment of a truck. The technician is using a red tool to connect or disconnect a cable. The battery is a large, dark, rectangular unit with multiple cells. The background shows the interior of the truck's engine bay, including various hoses and components. The text 'LEAD ACID BATTERY PAINS' is overlaid in large, bold, yellow letters at the top of the image.

LEAD ACID BATTERY PAINS

- High Maintenance
- Performance Limiting
- Multiple Batteries per Truck
- Charging Challenges
- Productivity Limiting
- Facility Real Estate
- Ventilation
- PPE (Protective Equipment)
- Safety – Battery Exchange



Electrification Drivers

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LI-ION



**LEAD
ACID**

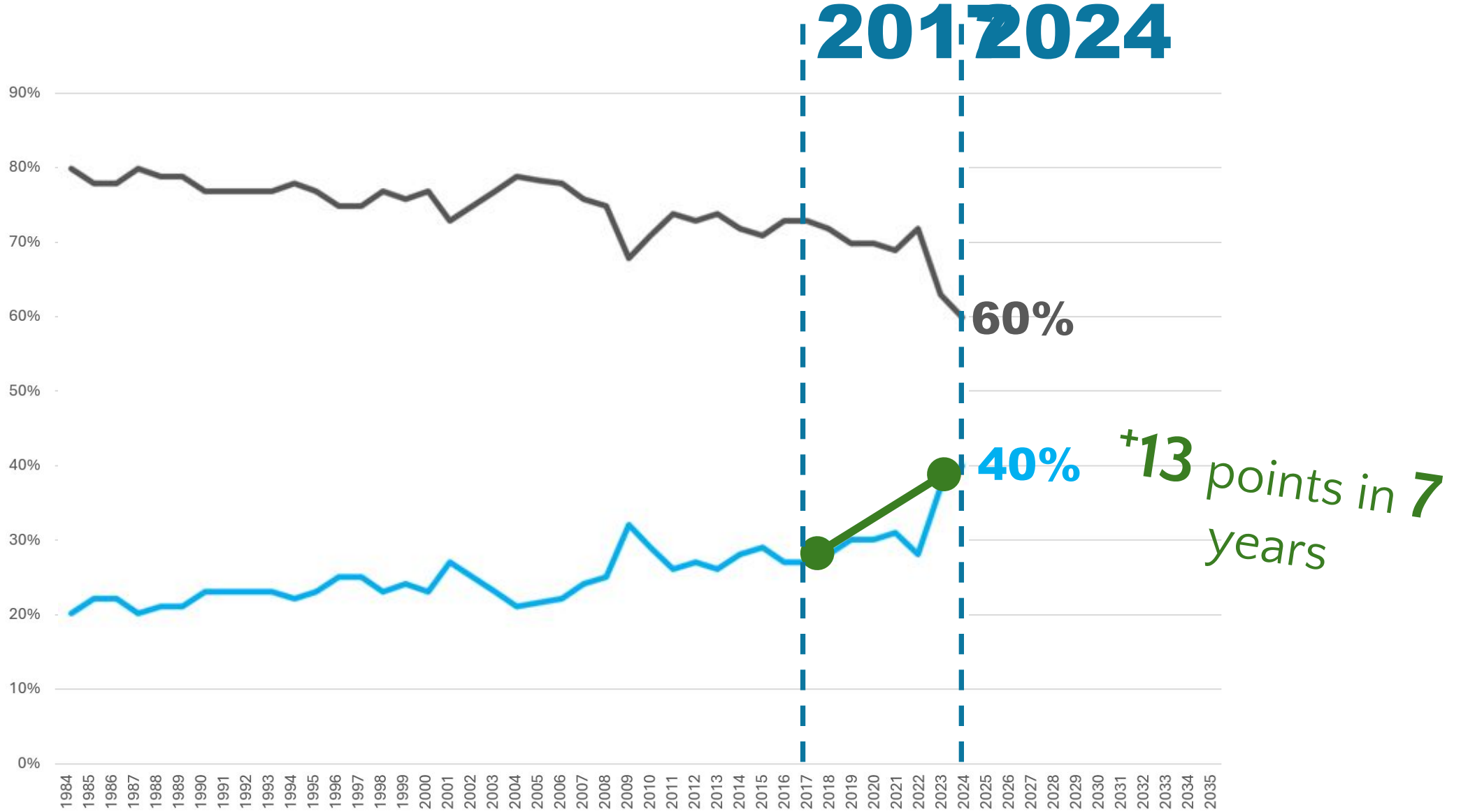


**LITHIUM
ION**

3rd Party Lithium Battery Box Replacement (BBR) Solutions



Class 4/5 vs. Class 1 Sit-Down CB



3rd Party Lithium Battery Pains



- Battery Supplier Proliferation
- Supplier Volatility
- Service Confusion (Truck vs. Battery)
- Canbus “Handshake” and EWS
- OEM Approvals (Capacity Nameplate)
- High Price
- **Limitations on Dealer Sales Maturity**
- **Truck Design Limitations**
- **Operator Ergonomics and Comfort**







"Skate to where the puck is going,
not where it has been."

— Wayne Gretzky

Market Transition to Integrated Lithium Battery Solutions

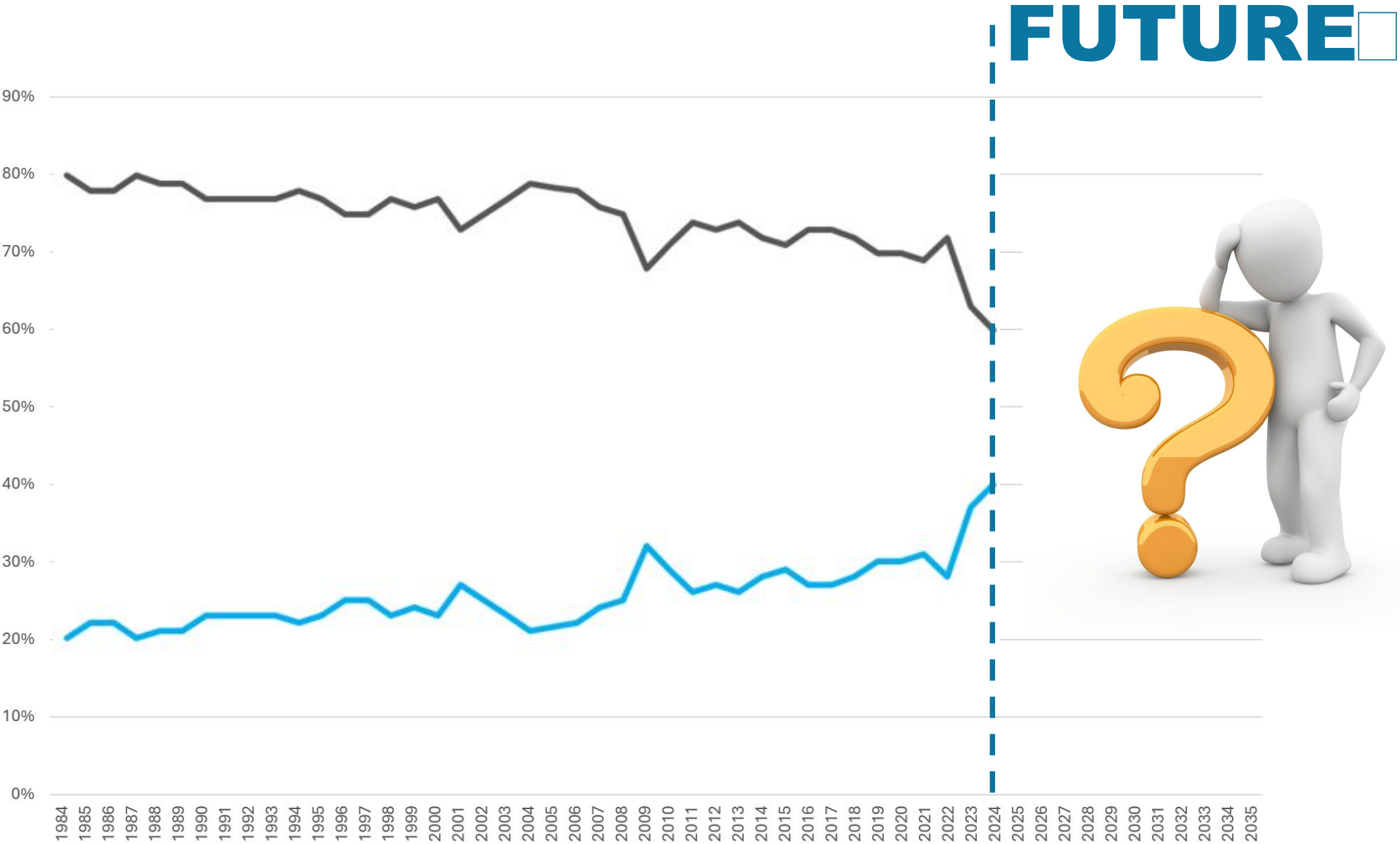
Internal
Combustion



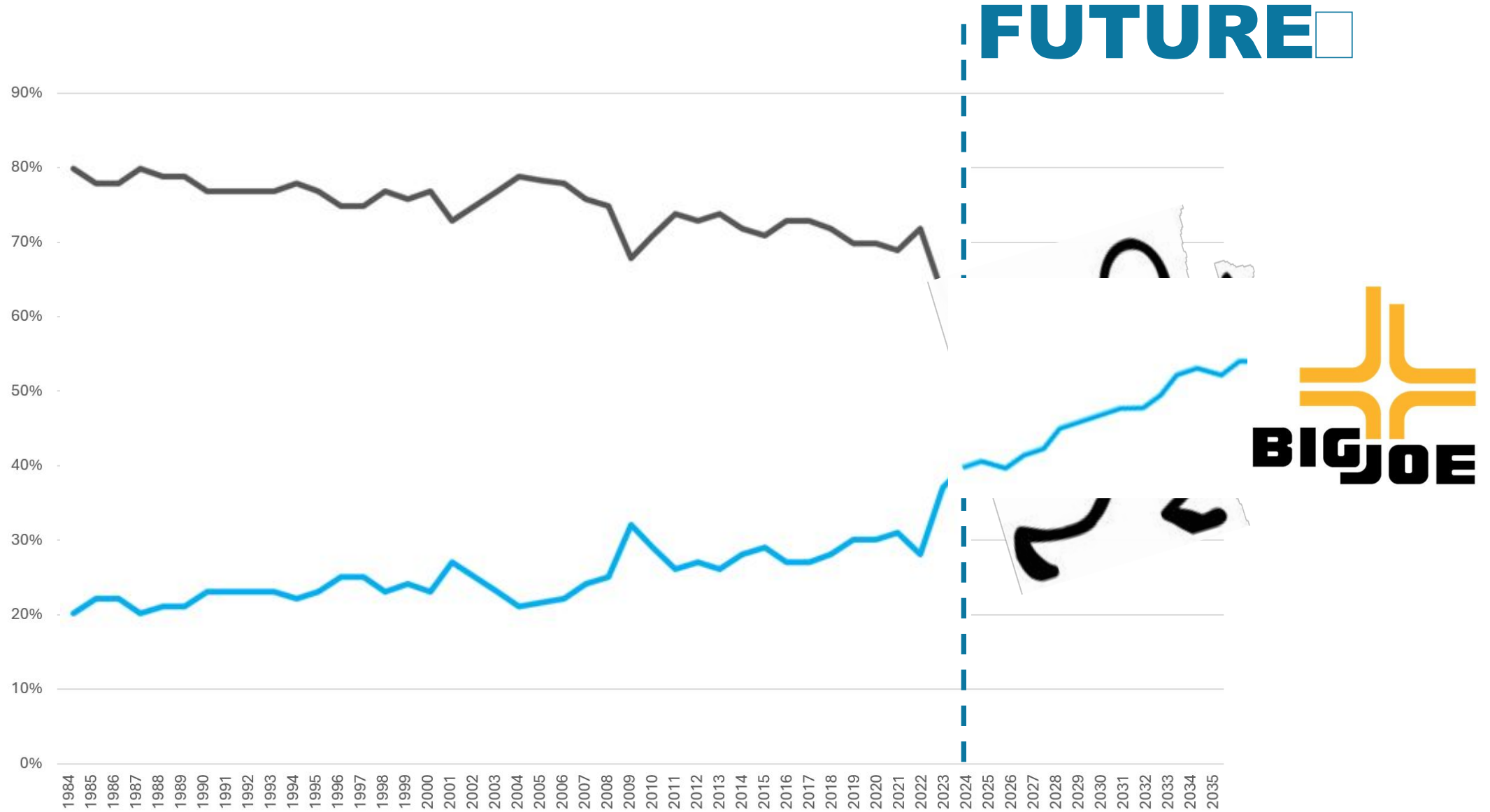
Purpose-Built Integrated
L-I-O-N



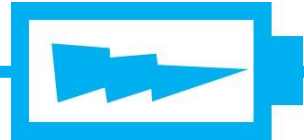
Class 4/5 vs. Class 1 Sit-Down CB



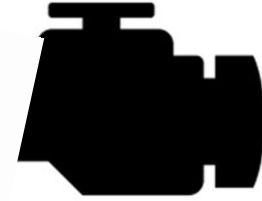
Class 4/5 vs. Class 1 Sit-Down CB



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inconceivable!

Thank you!



Nader Gubein

National Accounts Manager

ngubein@bigjoeforklifts.com

972.743.2386

BIGJOE