



Drivers, Status and Momentum for Zero Emission Trucks

Transitioning Freight Fleets to Zero Emission Trucks
June 16, 2022

Agenda

- CALSTART Role and Global Drive to Zero
- Zero Emission Momentum Growing
- What's Driving It
- Critical Steps to Grow the Market
- Growth Path
- The Road Ahead





CALSTART is a consortium of over 300 members to advance and accelerate clean transportation solutions

GOALS



- Mitigate climate change
- Reduce air pollution
- Reduce oil dependence
- Create high-quality jobs

STRATEGIC PILLARS



CONNECT. We connect our industry members with each other and our government and NGO partners to actively form partnerships that advance the industry.



ACCELERATE. We create and support pilot activities to validate technology and products and speed their entry to the market.



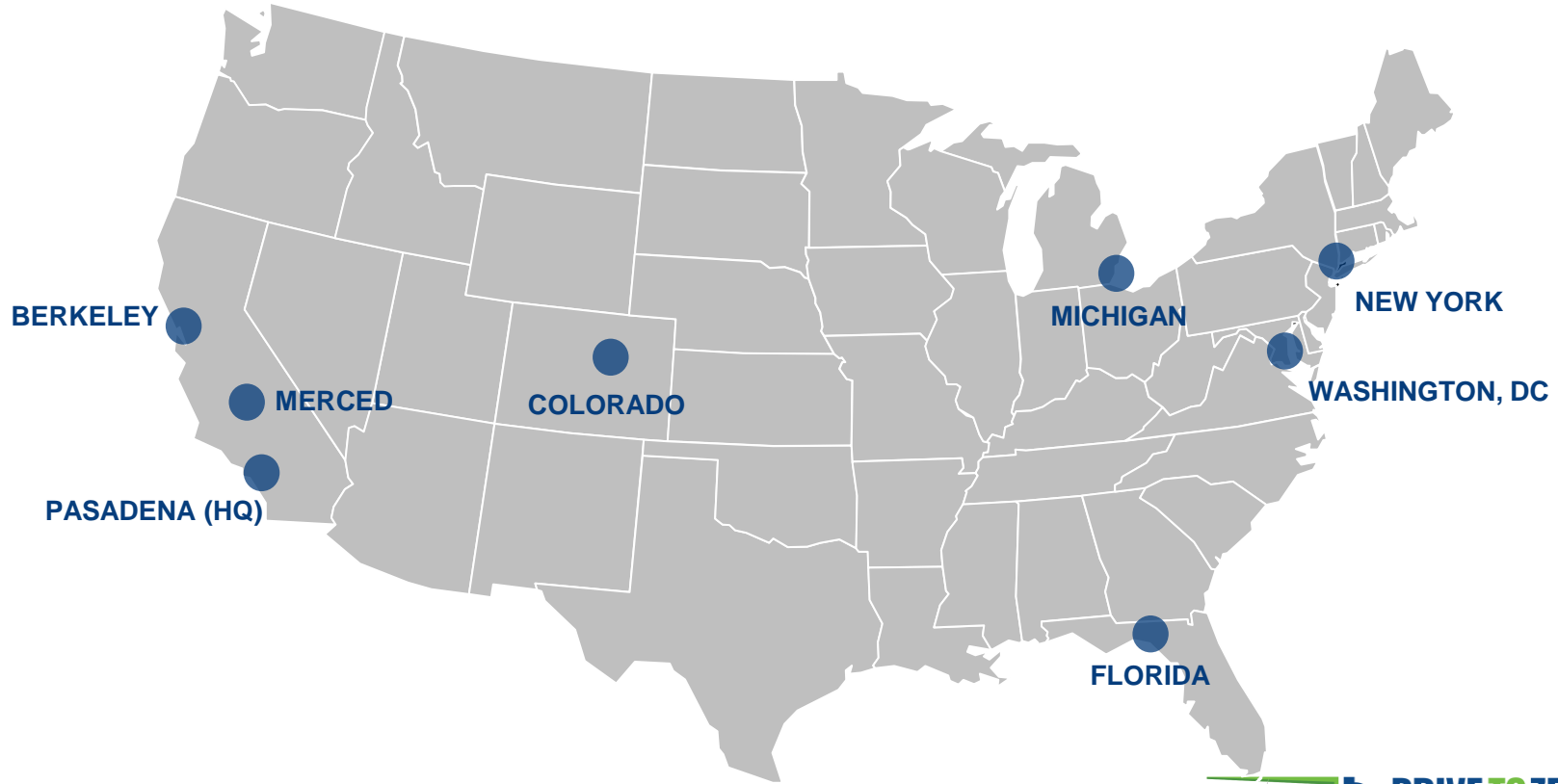
INFORM. We share information with policymakers, industry and stakeholders to shape new opportunities and regulations to grow the industry.



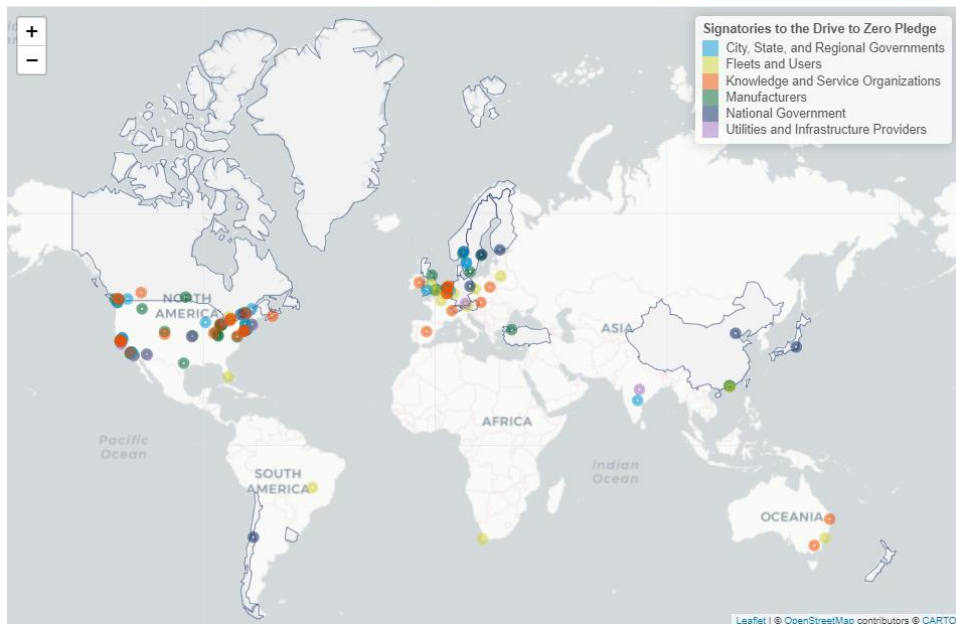
INFLUENCE. We work with our partners to become leading global examples that create more competition and encourage others to do better and move faster.



Already a national organization, CALSTART is becoming global



Drive to Zero is a global network of 150+ industry and government partners committed to accelerating the growth of zero-emission commercial vehicles



2025

Near- and zero-emission commercial vehicles cost-competitive and commercially viable in first-success applications and early-mover regions by 2025.

2040

Zero-emission commercial vehicles dominate new vehicle sales by 2040.

ZEROING IN ON:
**ZERO-EMISSION
TRUCKS** SHOWCASE +
RIDE AND DRIVE



38 products available now
500+ attendees



www.calstart.org/cctupdate

CCTU

CLEAN COMMERCIAL TRANSPORTATION UPDATE

JUNE 28TH, 2022

11:00 AM | PACIFIC
1:00 PM | CENTRAL
2:00 PM | EASTERN
8:00 PM | CENTRAL EUROPEAN



EDISON
INTERNATIONAL



Home Editor's Picks

Electric Commercial Vehicle Options Will Almost Double This Year

June 03, 2020 by Trucks.com, @trucksdotcom



Volvo's VNR Electric truck model is one of the new electric commercial vehicles going into production. (Photo: Volvo)

Editor's note: Written by Cristiano Façanha, global director of green commercial vehicle accelerator Calstart's Global Commercial Vehicle Drive to Zero program. This is one in a series of periodic guest columns by industry thought leaders.

FUEL SMARTS

Number of Zero-Emissions Commercial Vehicle Models Expected to Double by 2023

June 2, 2020 • by Deborah Lockridge and John G. Smith



Model availability to double by 2023

Total cumulative vehicle models, U.S. & Canada



The number of available and announced models of zero-emission commercial vehicles in the U.S. and Canada is on track to rise nearly 78% by the end of 2020 compared to the end of last year.

Graphic: Calstart

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Zero-Emission Medium- & Heavy-Duty Vehicle Models To Increase 78% This Year In US & Canada



5 juin 2020

June 6th, 2



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Articles 1811

L'Amérique du Nord s'apprête à lancer un nombre record de camions zéro émission

Il y a 1 minute ☐ Laisser un commentaire



170 nouveaux modèles en 2020

D'ici la fin 2020, les États-Unis et le Canada s'apprêtent à lancer près de 170 nouveaux modèles de camions et d'émission (ZE), soit une augmentation record de 78%. L'an dernier, 95 véhicules industriels « propres » étaient Amérique du Nord.

Government Business Technology Equipment Safety Fuel Logistics

Government Business Technology Equipment Fuel

Jerry Hirsch | Contributing Writer June 3, 2020 1:30 PM, EDT

Number of Electric Commercial Vehicle Offerings Surge, Calstart Says

By the editors of Today's Trucking
trucknews.com

News Covid-19 Products Opinion In Depth Business Tips Events Video Careers Digital Archive Test Drives

News / Sustainability

Zero-emission truck models surge, orders hold steady during Covid-19

by John G. Smith
June 2, 2020



Lion
BYD



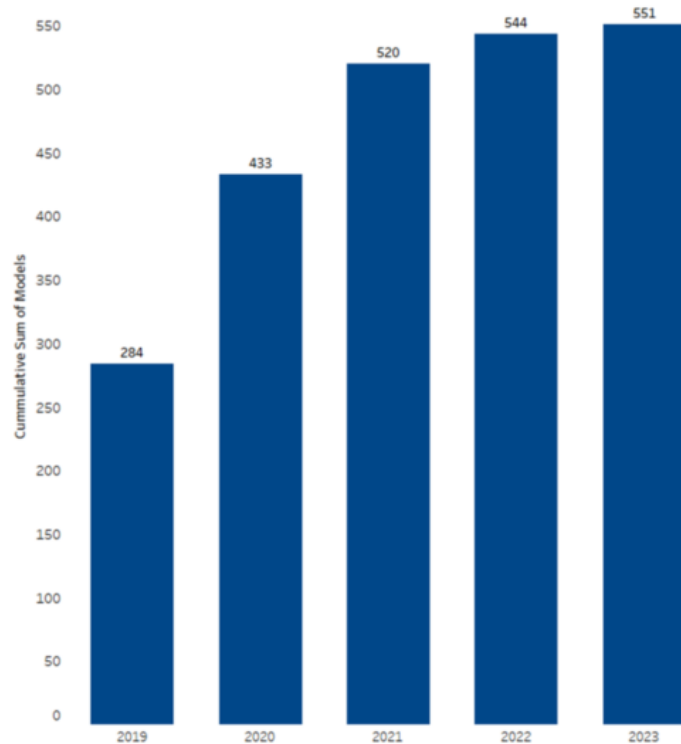
Peterbilt
Volvo



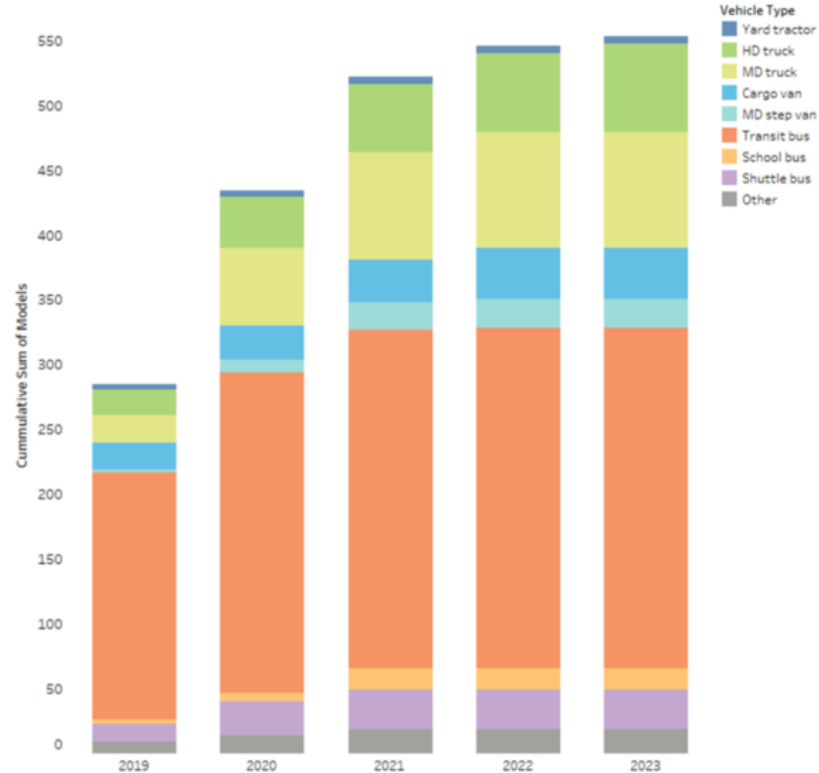
Global ZE-MHDV Model Availability Grows 26% from 2020 to 2022 Amid Pandemic



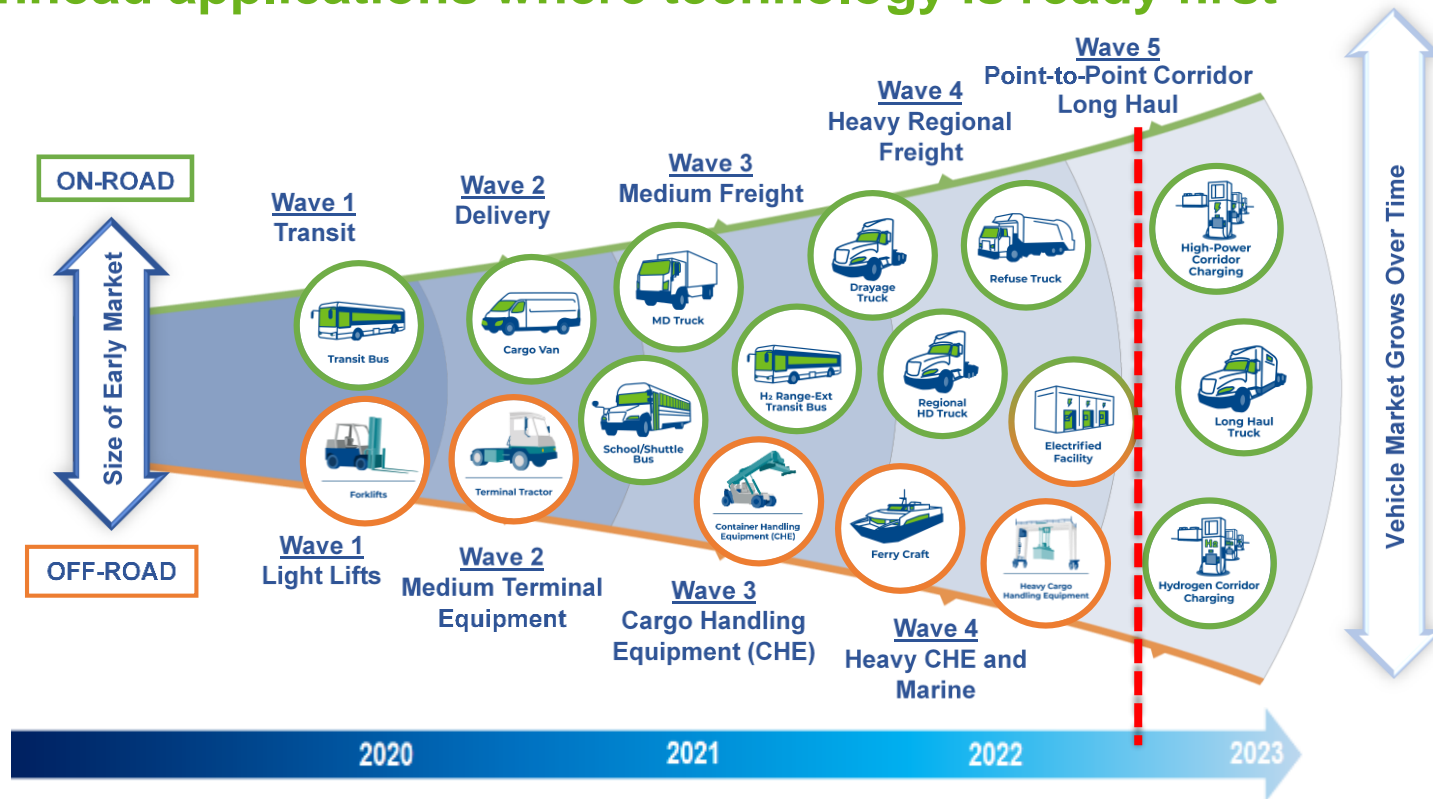
Total ZE-MHDV Models Available



Total ZE-MHDV Models Available by Vehicle Type

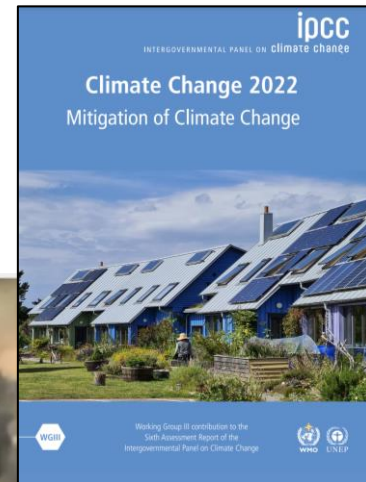
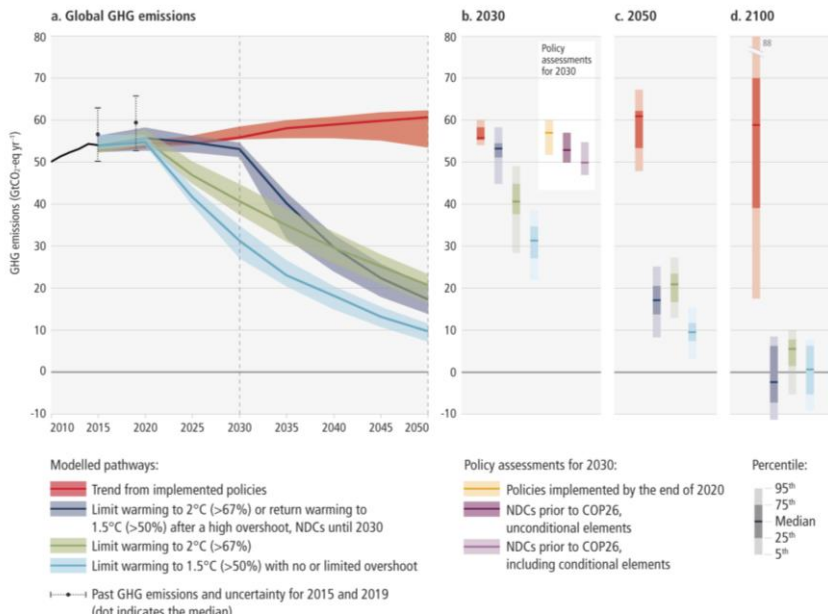


Zero-emission vehicles are coming in waves, taking foothold in beachhead applications where technology is ready first



Urgent Action Needed Within Five Years Climate Change Crisis; Air Quality Needs

Projected global GHG emissions from NDCs announced prior to COP26 would make it likely that warming will exceed 1.5°C and also make it harder after 2030 to limit warming to below 2°C.



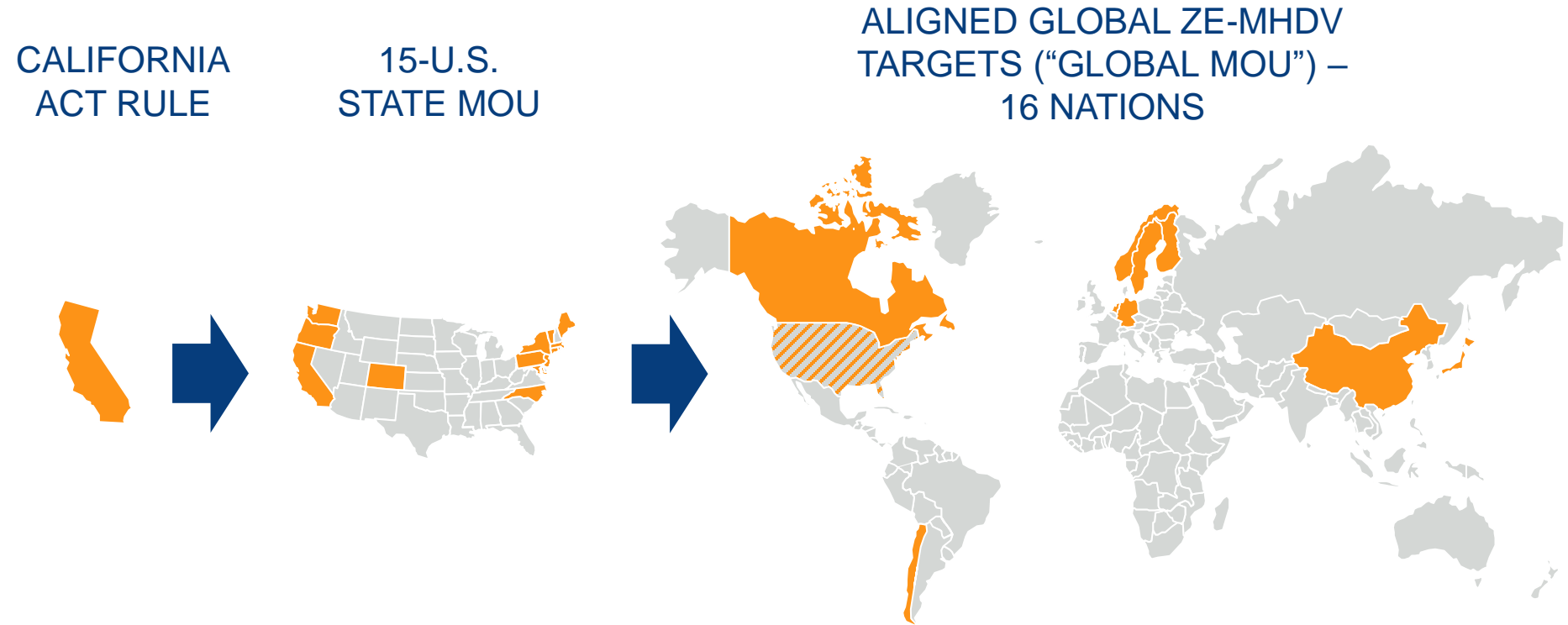
Advanced Clean Trucks (ACT) ZEV Sales Requirements

- Applies to manufacturers with >500 annual California sales
- Percent of California sales must be zero-emission starting in 2024
 - ~100,000 ZEVs by 2030
 - ~300,000 ZEVs by 2035
- Advanced Clean Fleet (ACF) rule coming end of 2022 requiring fleet purchases and turn over

Model Year (MY)	Class 2b-3	Class 4-8	Class 7-8 Tractors
2024	5%	9%	5%
2025	7%	11%	7%
2026	10%	13%	10%
2027	15%	20%	15%
2028	20%	30%	20%
2029	25%	40%	25%
2030	30%	50%	30%
2031	35%	55%	35%
2032	40%	60%	40%
2033	45%	65%	40%
2034	50%	70%	40%
2035+	55%	75%	40%



California ACT has become the basis of a US State and now emerging Global Standard



Global MOU – the first international agreement on zero-emissions trucks and buses

Share of new MHDVs that are zero emissions

100% by 2040

30% by 2030



Austria



Canada



Chile



Denmark



Finland



Portugal



Uruguay



Switzerland



Luxembourg



Netherlands



New Zealand



Norway



Scotland



Wales

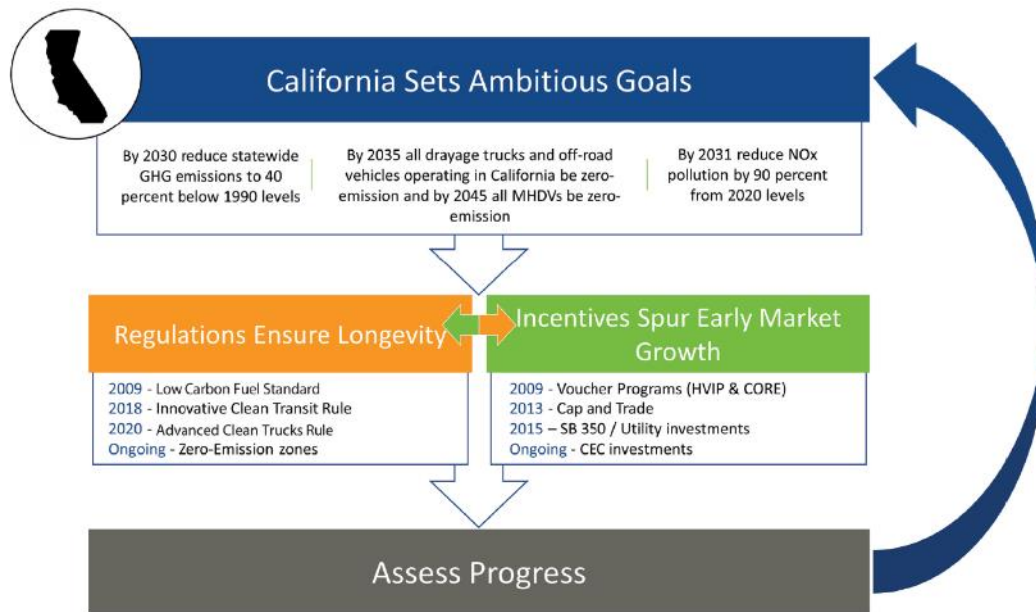


United Kingdom



Turkey

Our work with California has built the foundation for our global activities



Source: Building a Beachhead: California's path to accelerating zero-emission commercial vehicles
<https://globaldrivetozero.org/publication/building-a-beachhead-californias-path-to-accelerating-zero-emission-vehicles/>

CALSTART designs and manages smart incentives for leading regions in the United States



- CALSTART has managed HVIP since 2010
- HVIP has deployed over 9,000 all-electric and hybrid vehicles and low-NOx engines, with total voucher funding over \$622 million through November 2021.



Chicago has \$11.3M electric truck voucher; \$1.425M NG/Elec infrastructure; \$1.275M Green Taxi (NG) – sold out all funds
New \$20M funding coming



Truck Voucher Incentive Program

- Launched in 2020, the Clean Off-Road Equipment (CORE) program encourages California fleets to purchase zero-emission off-road equipment.
- In its first year, CORE distributed \$44 million with more than 70% of vouchers supporting communities disproportionately impacted by air pollution. \$164 million to deploy zero-emission off-road equipment to become available in 2022

New York \$14.5M voucher program for hybrid, electric and NG trucks – sold out all funds. New \$18.4M launched Sep/19



Through a first-of-its-kind, California's Energy Infrastructure Incentives for Zero-Emission Commercial Vehicles (EnergIIIZE Commercial Vehicles) will provide \$50 million worth of incentives for electric charging and hydrogen fueling infrastructure to support fleets with zero-emission MHDV acquisitions.



Funds

Infrastructure Investment and Jobs Act (IIJA)
invests \$550 Billion over 5 years – roads,
bridges, mass transit, corridors

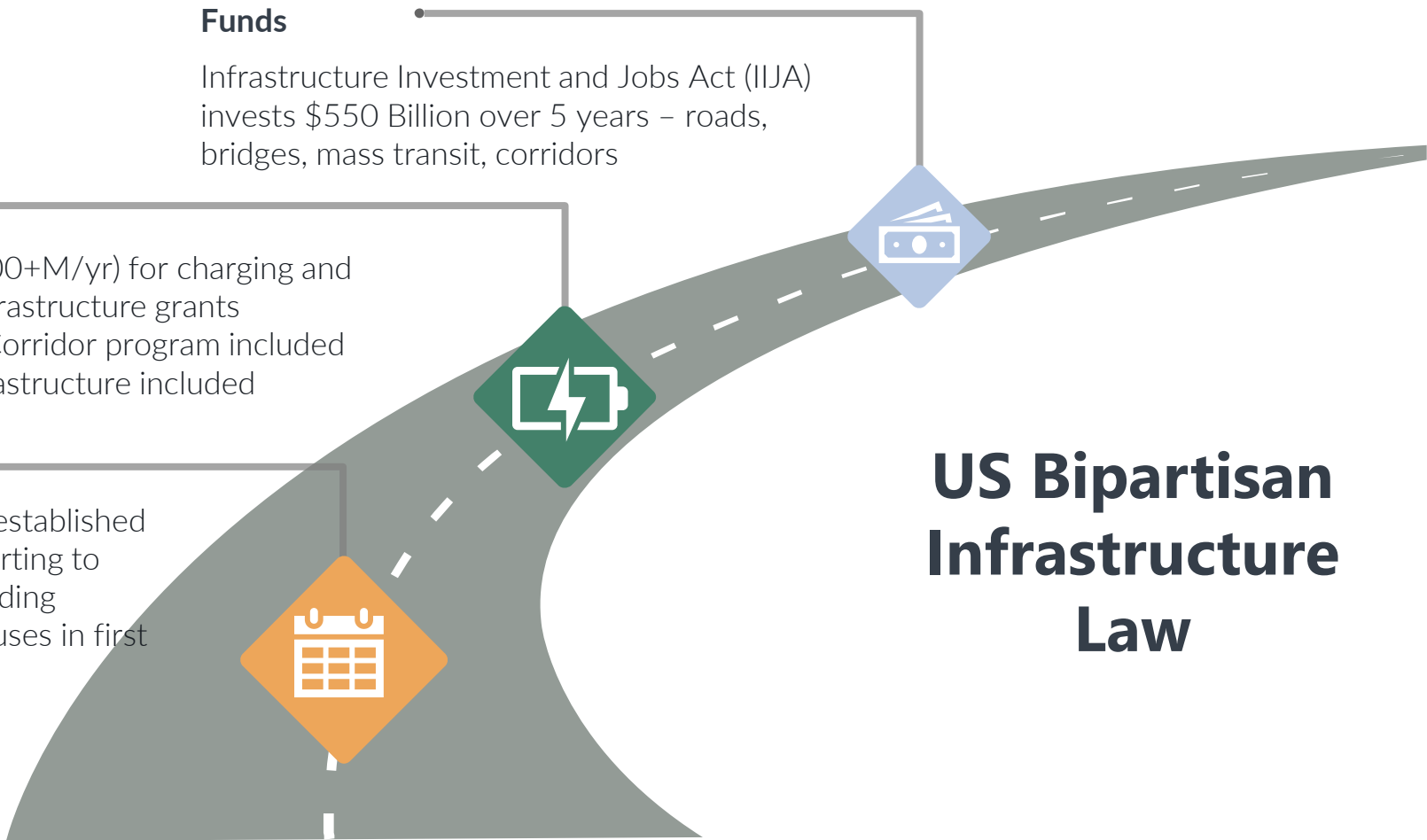
EVs

\$2.5 B (300+M/yr) for charging and
fueling infrastructure grants
Alt. Fuel Corridor program included
MHD infrastructure included

Timing

Framework established
Agencies starting to
program funding
EV school buses in first
wave

US Bipartisan Infrastructure Law



Tackling barriers to ZECV deployment and uptake requires strong policy, regulatory and investment support

BARRIERS	SOLUTIONS
<ul style="list-style-type: none">• High vehicle upfront cost• Limited vehicle availability• Limited availability and access to charging infrastructure• Limited fleet awareness• Lack of competitive zero-emission fuel pricing• Limited service and support networks.	<ul style="list-style-type: none">• Supporting policy actions (carrots and sticks) ✓• Incentives, Benefits ✓• Zero Emission Areas, fleet rules, regulations ✓• Infrastructure investments ✓• Pilot projects ✓

Zero-emission
trucks will
achieve cost
parity by 2030

Source: Welch et al (2020): Moving Zero-emission Freight toward Commercialization

Figure 2-5. TCO for cargo vans (12T) and medium-duty trucks (19T)

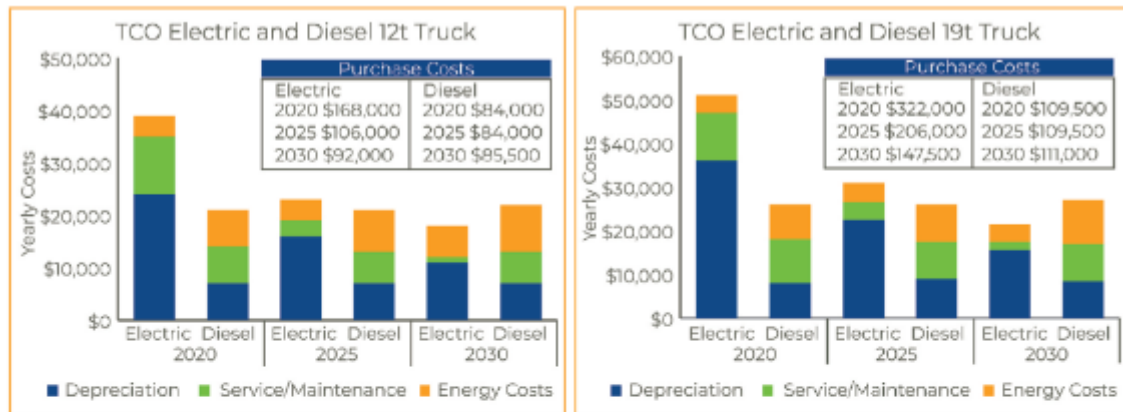
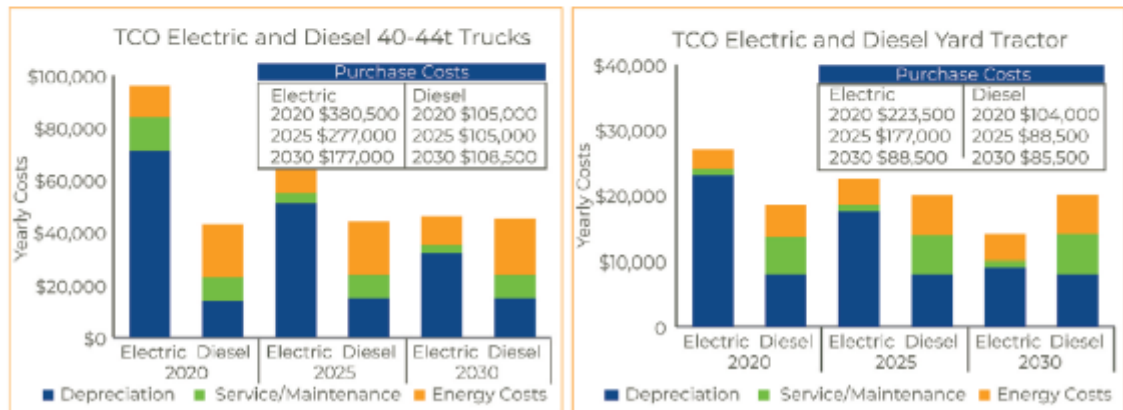
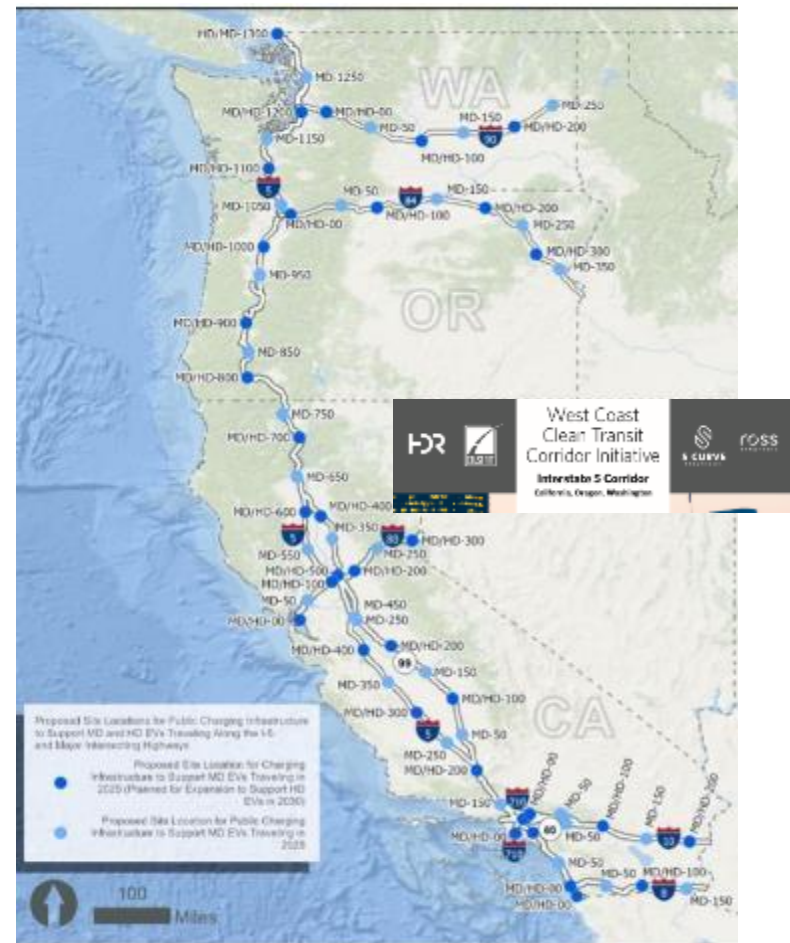
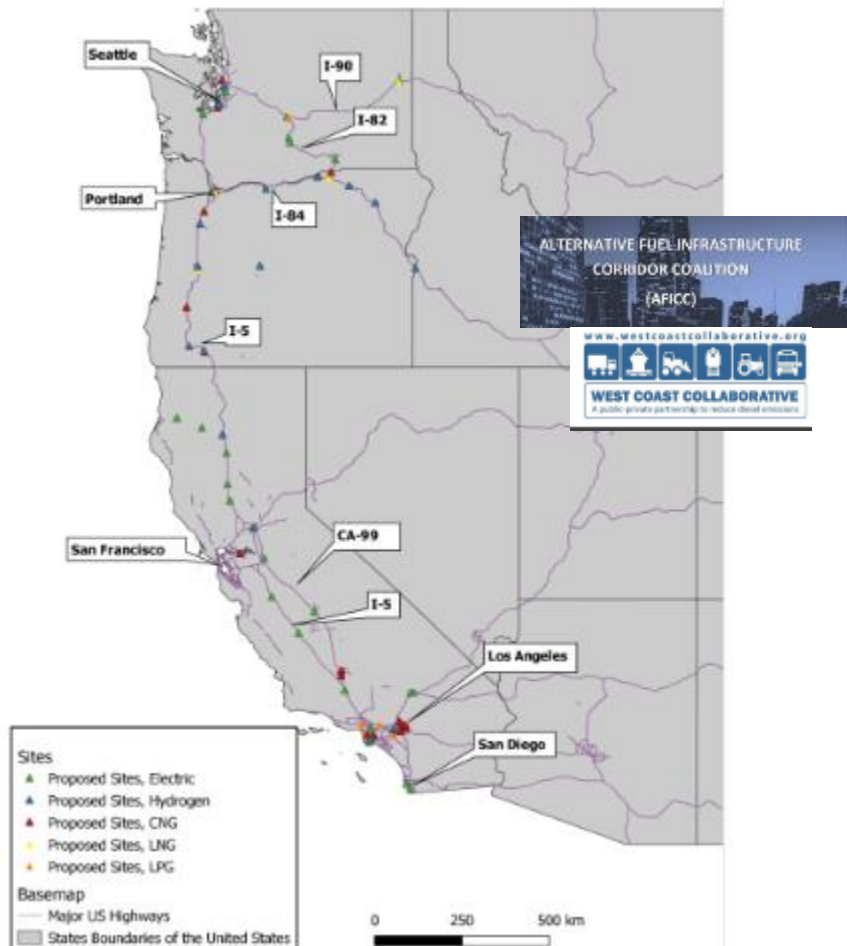


Figure 2-6. TCO for heavy-trucks (40-44T) and yard tractors

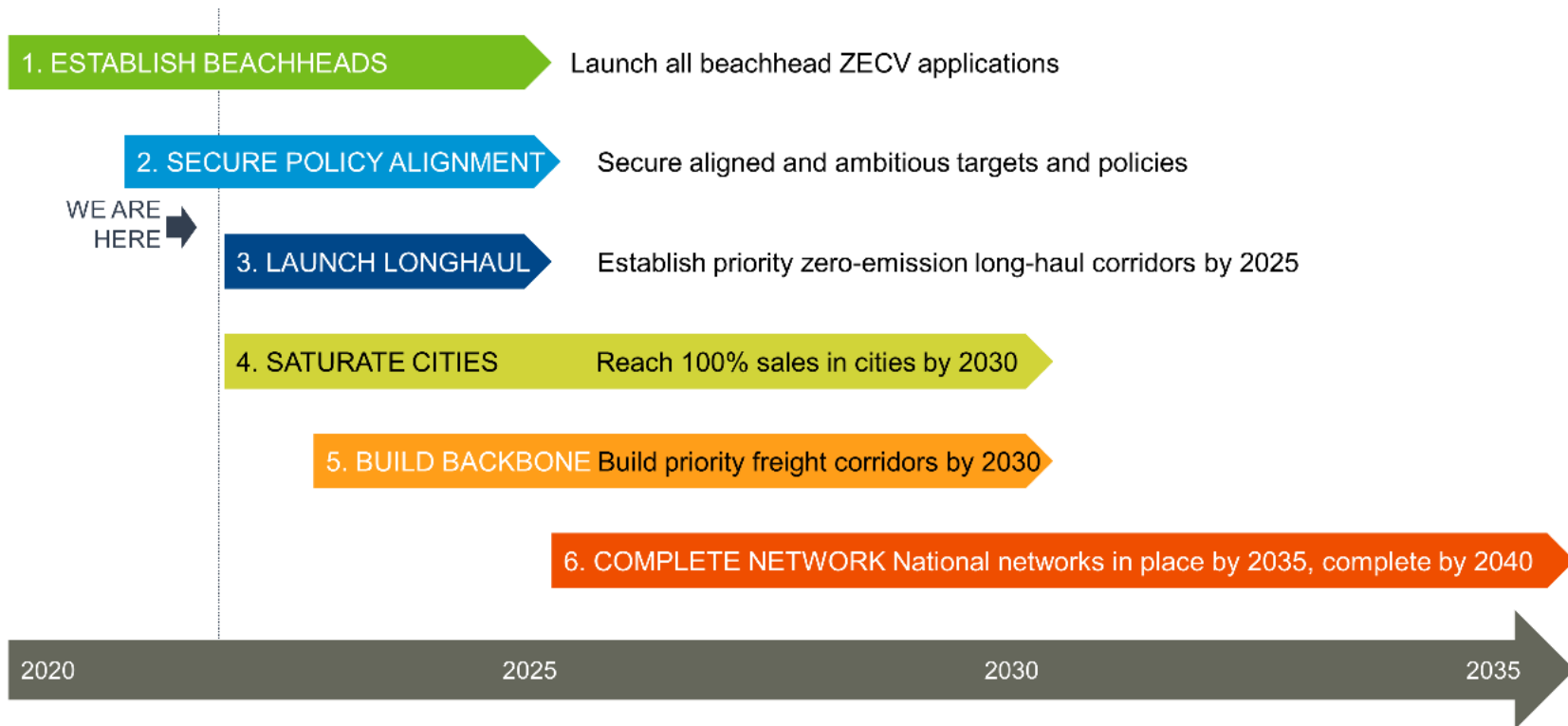


Clean Fuel Corridor Planning – Utility and Agency Involvement



The Road Ahead

6-stage strategy to enable 100% ZE-MHDVs by 2040





Thank you!

Bill Van Amburg
Strategic Advisor to CALSTART
bvanamburg@calstart.org

Cristiano Façanha
Global Director, CALSTART
cfacanha@calstart.org

For more information:
www.globaldrivetozero.org



@TeamDriveToZero