PHASING IN U.S. CHARGING INFRASTRUCTURE

A Roadmap for Zero-Emission Medium- and Heavy-Duty Infrastructure Buildout

The market for zero-emission medium- and heavy-duty vehicles (ZE-MHDVs) is taking off, and with it, the need for **reliable** and **accessible charging infrastructure.**

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CALSTART has developed a model and roadmap for how the U.S. can implement a national buildout of infrastructure at the scale and speed needed to support rapid adoption of ZE-MHDVs by targeting priority areas first.

In this roadmap, infrastructure buildout meets the pace and volume of ZE-MHDV market growth set by the **Global Memorandum of Understanding on Zero-Emission Medium- and Heavy-Duty Vehicles (Global MOU)**, which the U.S. signed in 2022. The Global MOU, co-led by the Government of The Netherlands and CALSTART's Global Commercial Vehicle Drive to Zero campaign and program (Drive to Zero), calls for 30 percent new commercial vehicle sales being zero-emission by 2030 and 100 percent being zero-emission by 2040. This adoption rate is 45 percent deeper than the vehicle penetration rates assumed by EPA's proposed Phase 3 Greenhouse Gas Emissions Standards for Heavy-Duty Vehicles.

This roadmap uses a **phase-in strategy**, meaning industry meets the buildout challenge first in priority launch areas where:

1. Industry concentrates and demand on the grid can cluster and aggregate.
2. Industry and government have prioritized investment.
3. Supportive policy actively takes measures to incentivize the ZE-MHDV transition and/or maximize social and equity co-benefits.
4. Energy will cost less and capacity is favorable near-term.

By prioritizing these factors, buildout through 2035 begins in **hubs** in key industry clusters, then along **corridors** in critical regions, and finally in **nodes** to create a national network.

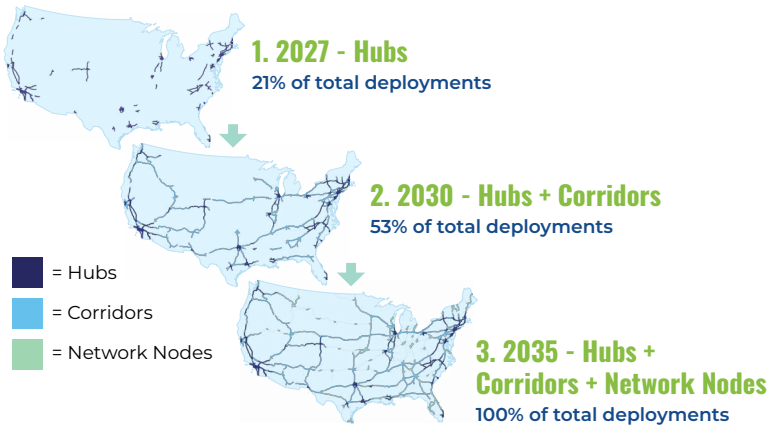
WHY THE PHASE-IN STRATEGY WORKS

- In industry hubs in urban centers, near ports, or at distribution centers, fleets can manage charging with favorable rates and available onsite storage, or can take advantage of shared or multi-use charging centers.
- Along important corridors, connector sites between hubs can drive up infrastructure utilization to mitigate near-term capacity constraints.
- Nationally, utilities and regulatory bodies can focus on supportive policies to target deployment in priority nodes, linking up the hubs and corridors to make a national zero-emission freight network.

Overall, this approach meets rapid adoption scenarios by enabling:

- Faster deployment through priority launch areas.
- Utilities, government, and investors to target their actions.
- Focused, cost-effective implementation, leading to greater utilization and reduced per-vehicle infrastructure costs.
- Grid modernization planning that unleashes private investment.

It is increasingly clear that the U.S. transportation and energy systems will decarbonize only when and where they are integrated. This roadmap shows that change is possible through focused, intentional action and investment.



For more information, please visit: **https://calstart.org/zev-infrastructure-phase-in**

PRIORITY LAUNCH AREAS FOR PHASE-IN OF INFRASTRUCTURE TO MEET RAPID ZE-MHDV ADOPTION

QUESTIONS ABOUT ZE-MHDV INFRASTRUCTURE?

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