

3 Revolutions

UC Davis

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Britta K. Gross

RMI, Managing Director

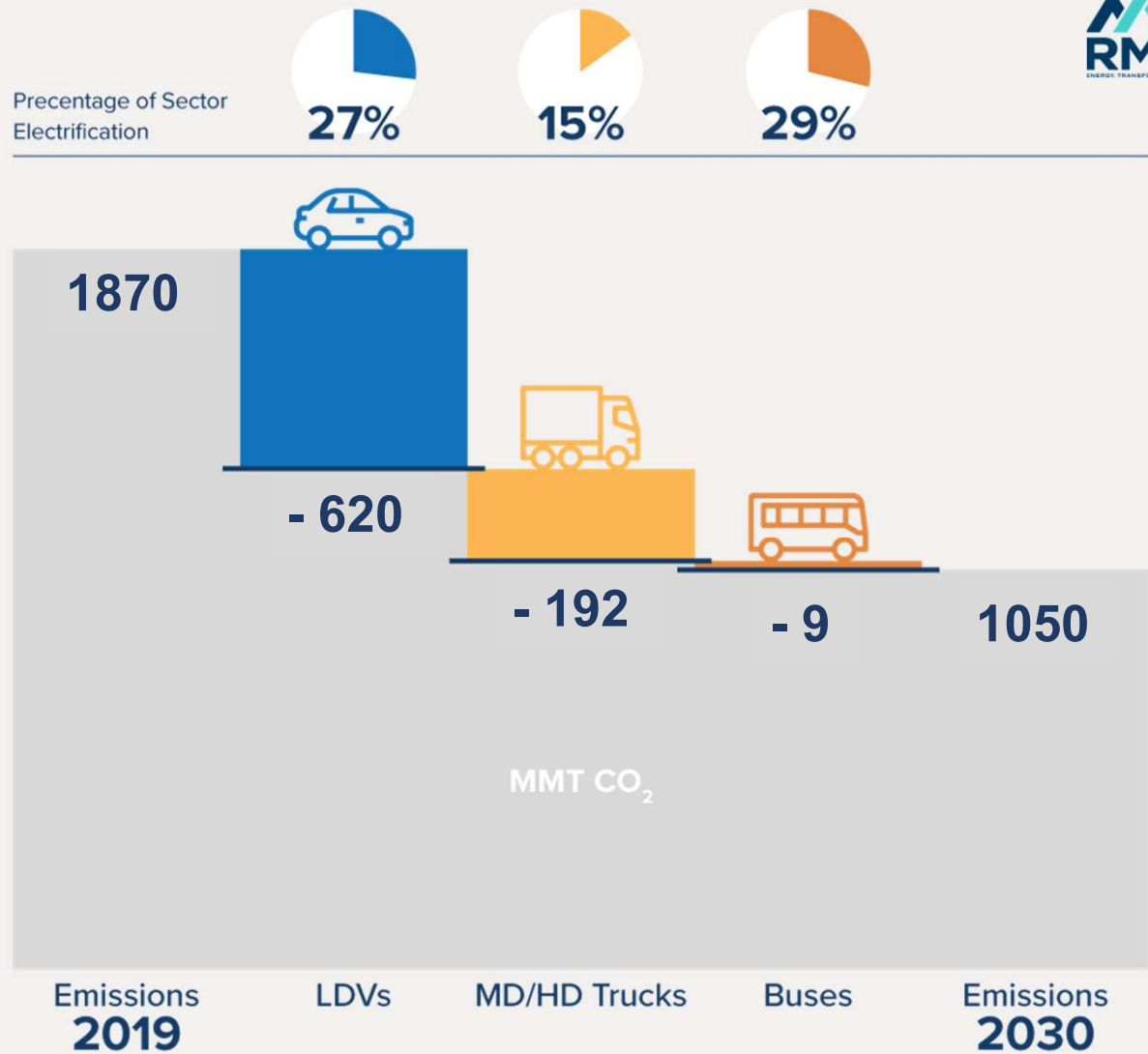


To hold climate to a 1.5°C rise, US transportation emissions must be cut by 45% by 2030

Also assumes:

- 20% VMT reduction LDV
- 50% VMT growth MD/HDV (25% fleet increase/ATA)
- 85% Carbon-free grid
 - 75% Renewable
 - 10% Nuclear
 - 15% Natural Gas

Emission reductions in the LDV sector by 2030 are critical

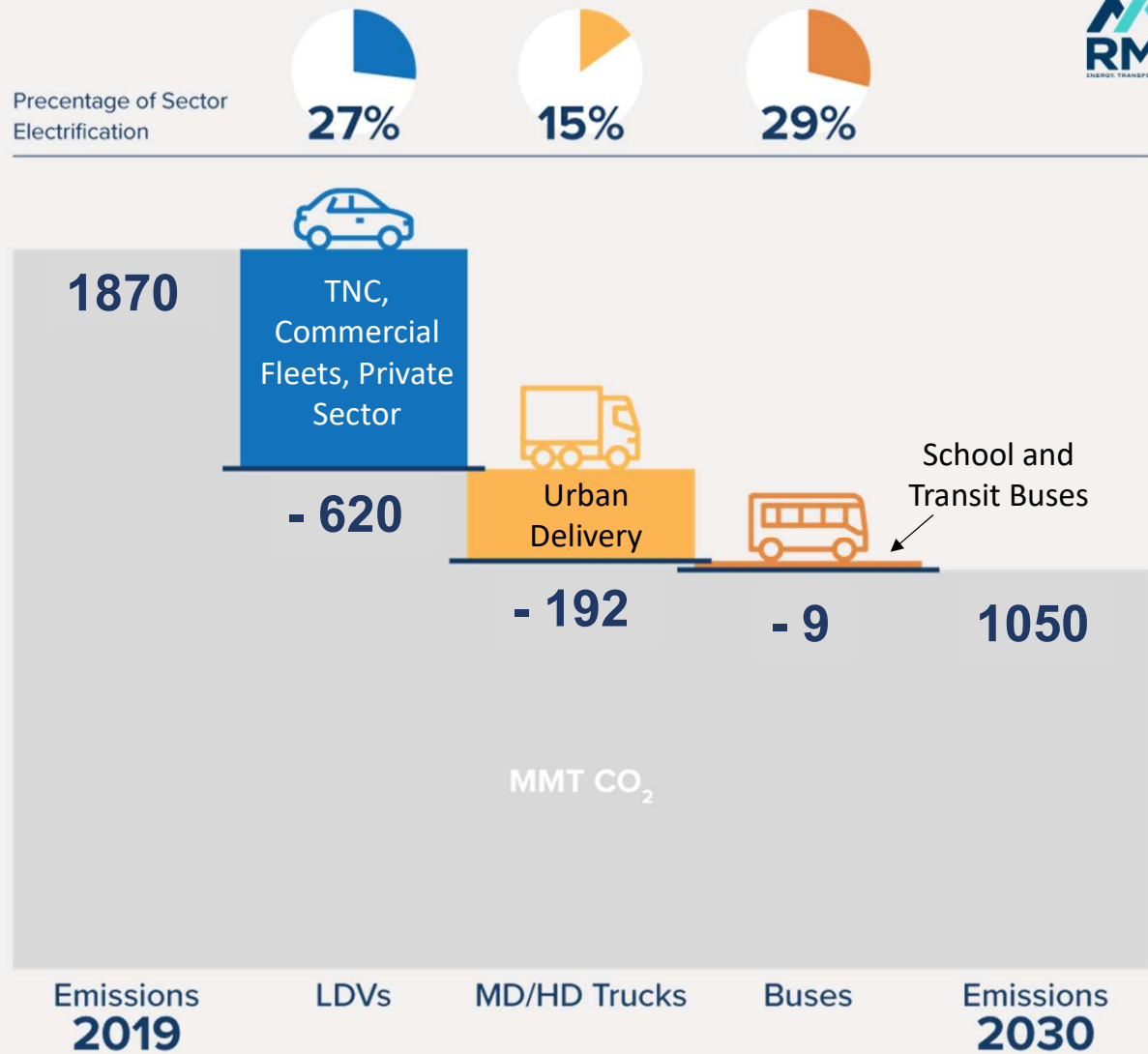


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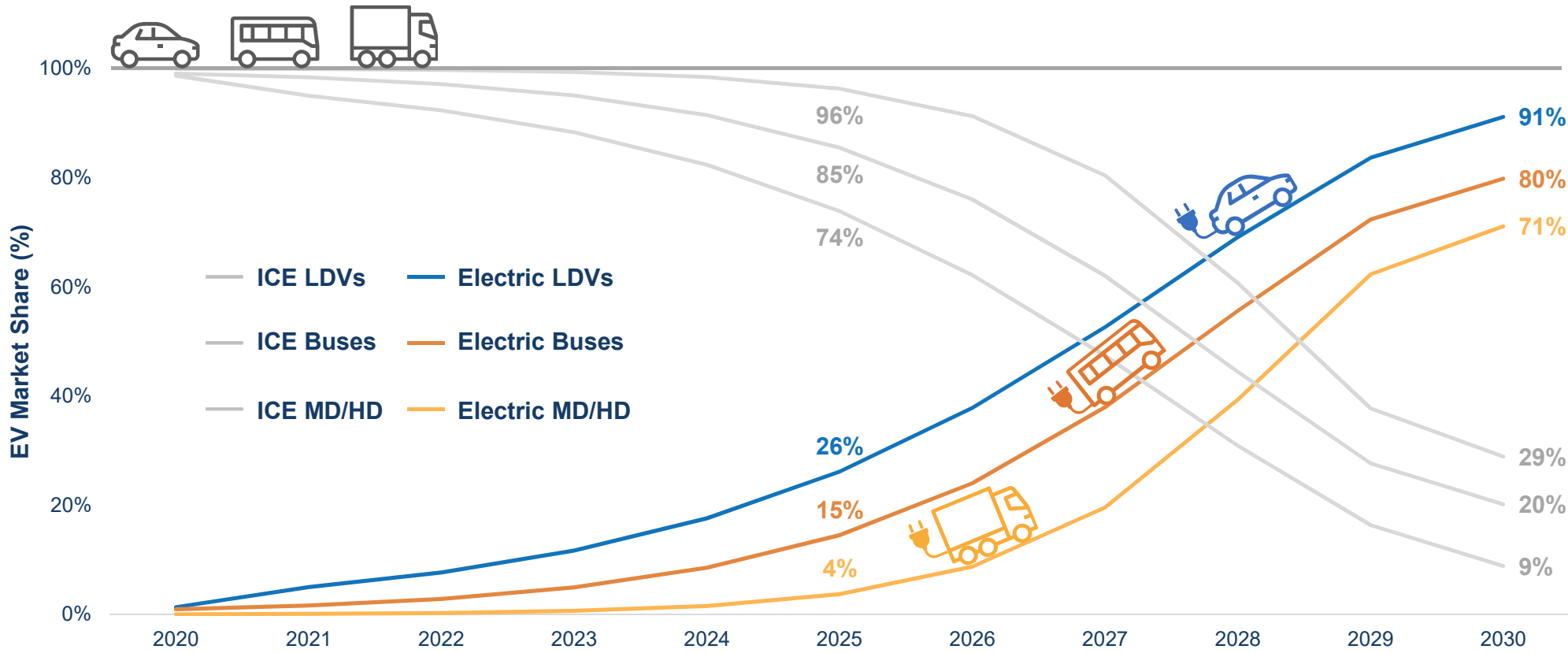


Vehicle Emissions Decrease Over Time



EV Market Share

Annual EV Sales as % of Total New Vehicle Sales



RMI's eTNC Study (published 2021)

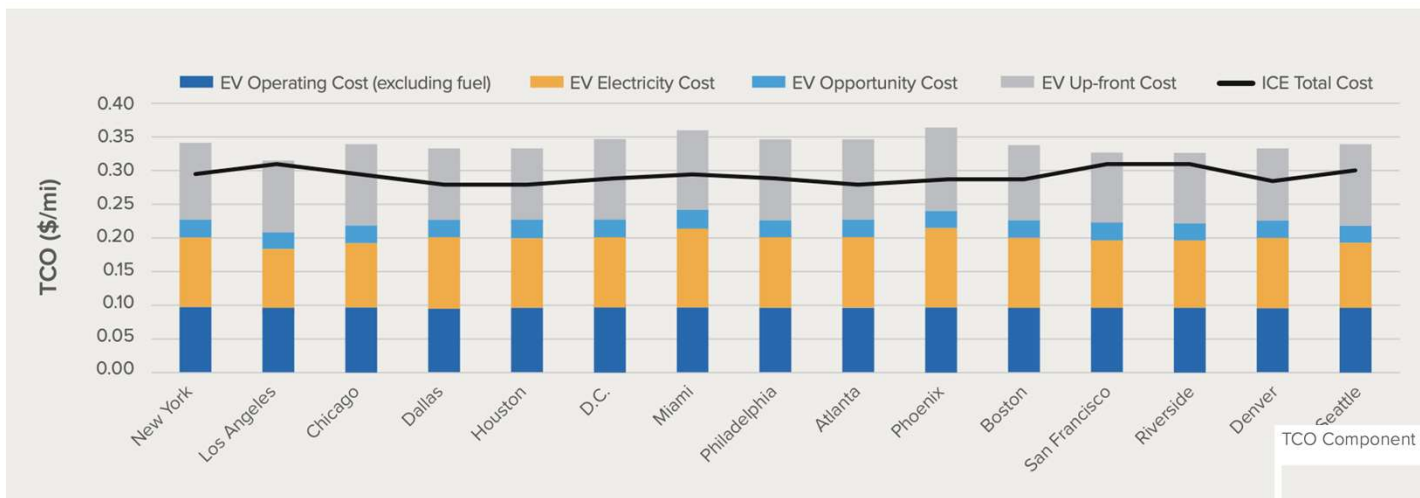
Racing to Accelerate EV Adoption: Decarbonizing Transportation with Ride-hailing

- Study leveraged GM's Maven Ride-hailing Data:
 - 6,000 ride-hailing vehicles (1,000 EVs) + 18 months → 100 million miles of data
- 1 TNC is equivalent to 3 personal vehicles
 - Fulltime eTNC = ~40,000 miles/year
- EVs drive only ~9 miles less per day than ICEs in ride-hailing (153 miles vs. 162 miles)
- EVs incur 23 minutes of additional downtime per day (6%) over ICE vehicles → \$4.30 less profit per day

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TCO Comparison across 15 Major US Metropolitan Areas



In the 15 major metros studied, EVs have no TCO advantage today:

- +1cent/mile in LA and +8cents/mile in Phoenix (higher charging costs, lower gasoline prices, no local incentives)
- the average DCFC charging price across all metro areas = \$0.36/kWh

TCO Component Breakdown in Phoenix



Key Players Are Taking Action

- **Biden** announced goal to electrify the entire federal vehicle fleet:
 - 645,000 vehicles (including the US Postal Service, the largest fleet operator in the nation, with about 200,000 vehicles)
- **California**, Massachusetts, New Jersey have stated goals to achieve 100% EV market share **by 2035**
- **\$\$\$** - investors and asset managers are divesting out of C-intensive assets
 - IESE Business School study of 8,000 companies – "the greater the probability of the Big Three [Blackrock, Vanguard, State Street] meeting with CEOs, the lower the carbon emissions recorded by the company in the following year"
 - Citi, JP Morgan Chase, and Barclays are establishing units focused on working with clients on the transition.
- **GM** announced a goal to sell only electric light-duty vehicles **by 2035** (battery, hydrogen)
- **Xcel Energy** plans to invest \$110 million to prepare for **20% EV market penetration in Colorado by 2030**
- **Uber and Lyft** have announced intentions to be **100% electric by 2030**
- **Amazon, UPS, and FedEx** have announced **large fleet electrification** ambitions

How to Move America to Electric Vehicles

From a Rudderless to a Resolute 2030 EV Vision

Four Key Actions Required:

- 1. Establish a bold national vision with targets** for transportation electrification and establish a government/industry commission to enable well-planned supply and demand-side actions.
- 2. Communicate a national industrial strategy for EVs**, including incentives for retooling manufacturing plants (engine, transmission, assembly plants) and adding new battery/cell manufacturing capacity. *[Biden: new battery/mineral supply chain review]*
- 3. Set an aggressive public/private fleet EV adoption strategy** and an implementation plan. *[Biden: federal fleet electrification goal]*
- 4. Create a nationwide education and awareness campaign** to gain consumer and fleet operator confidence in electric vehicles.

<https://rmi.org/how-to-move-america-to-electric-vehicles/>

RMI's Recent Mobility Thought leadership



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