

Heavy-Duty Zero Emission Truck Transition Plan: Preliminary Zero Emission Pathway

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April 12, 2022

Agenda Item 16

File No. 2022-0094



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SAN DIEGO**
Waterfront of Opportunity

Maritime Clean Air Strategy – Health Equity for All

Heavy-Duty Truck Zero Emission Goals

- **40%** zero emission truck trips by **June 30, 2026**
- **100%** zero emission truck trips by **end of 2030**
- **Develop** a Heavy-Duty Zero Emission Truck Transition Plan by **June 30, 2022**



Operating Profile of Trucks

Information on **255** trucks was gathered from the fleet manager surveys and truck driver surveys

- Average age of the fleet is **6 to 7 years**
(California average is 10 years)
- **100%** of trucks park in parking lots following daily operations
- **100%** of trucks have a period when they are not in use for more than 1 hour during the workday

License Plate Reader Data Tenth Avenue Marine Terminal:

Number of Trucks	Proportion of Truck Trips
43	40%
94	60%
228	80%
2,874	100%

355

Average daily mileage per day

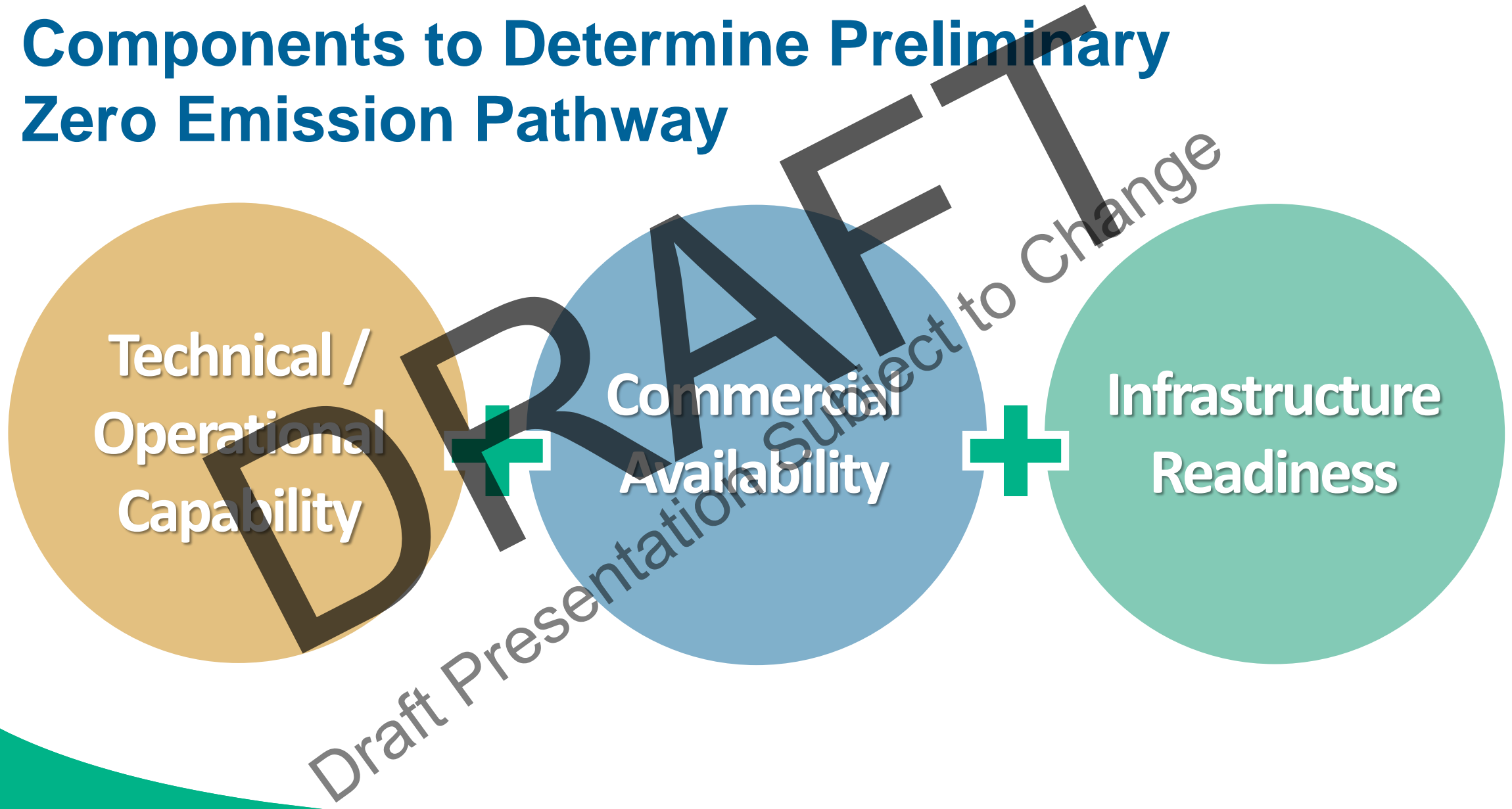
California average is 150-200 miles

472,000

Average odometer reading

California average is ~340,000 miles

Components to Determine Preliminary Zero Emission Pathway



Technical Capability Assumptions



- Truck turn-over occurs at the earlier of **800,000 miles or 18 years** *(Senate Bill 1 Standard)*

- Baseline battery electric truck can achieve range of **200 miles in 2026** and **344 miles in 2030**

(Based on current manufacturer specifications and 85% useable battery capacity)



- Baseline fuel cell electric truck have maximum range of **500 miles in 2026** and **800 miles in 2030**

(Zero Emission Technology Inventory and manufacturer specifications)

- **With / Without Opportunity Charging** for Battery Electric Trucks

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Zero Emissions Truck Technologies

Battery
Electric



Fuel Cell
Electric

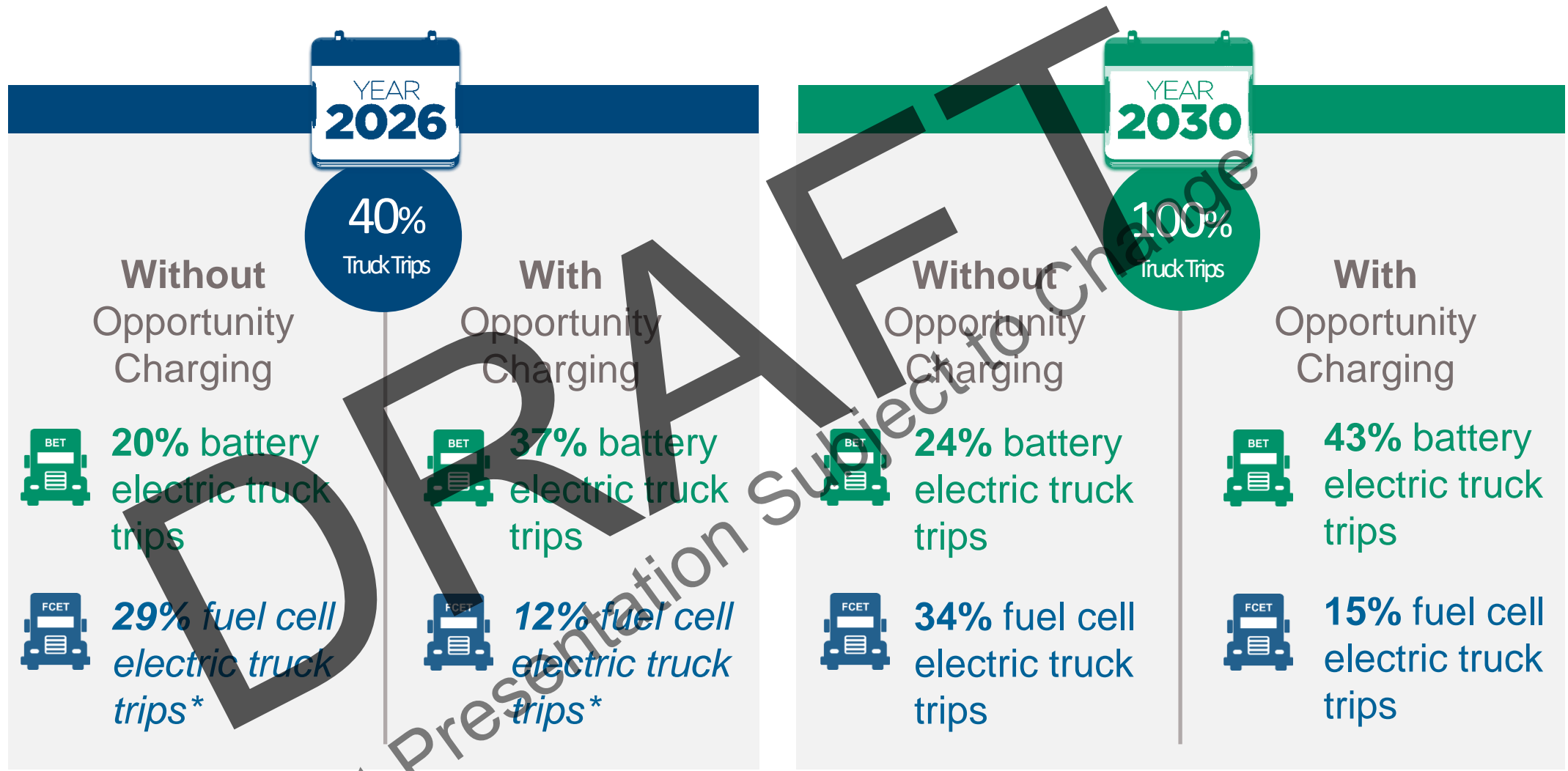


- Best suited for shorter or mid-range distances
- Vehicles commercially available today
- Established electricity rates
- Infrastructure installation is more mature

- Capable of longer range distances
- Commercial availability expected in mid-2020s
- Fuel price is expensive and uncertain
- Infrastructure is limited but expected to grow

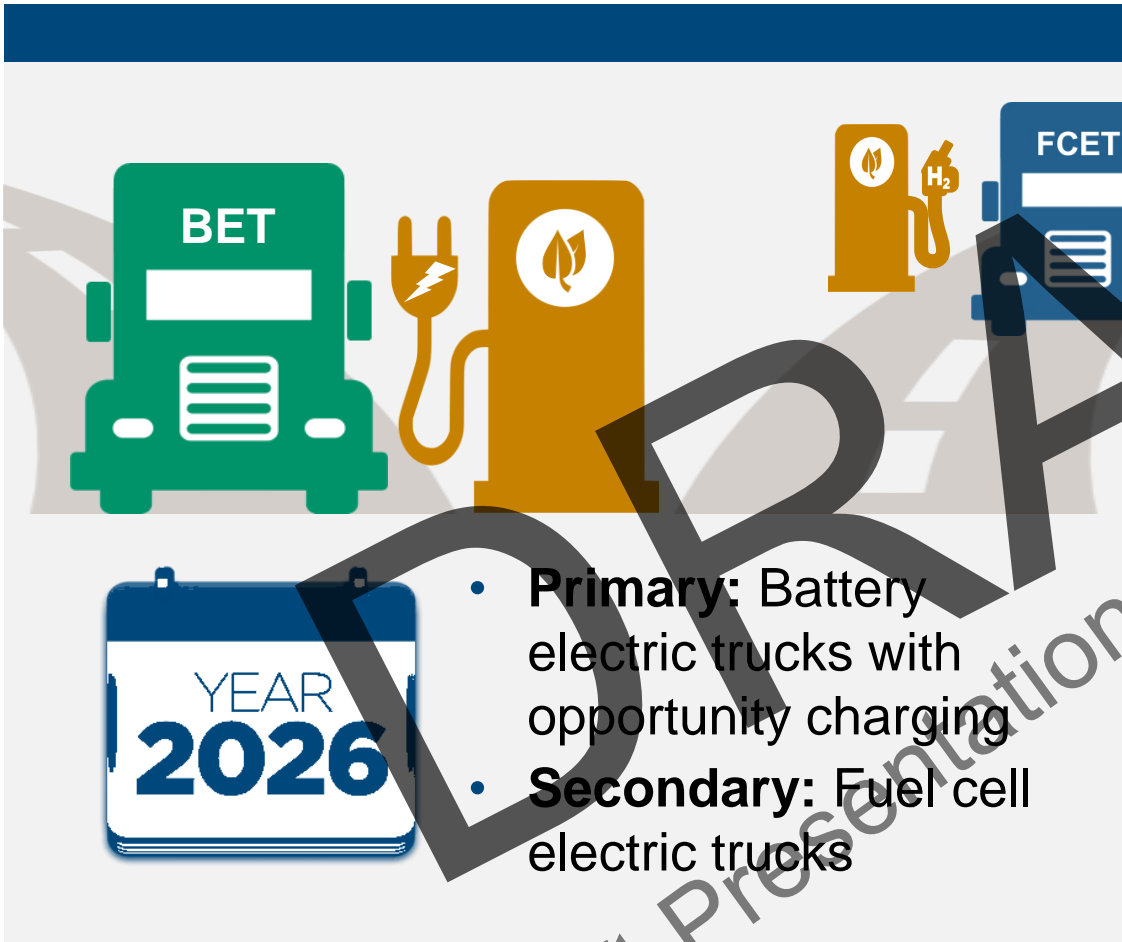
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Preliminary Technical Results



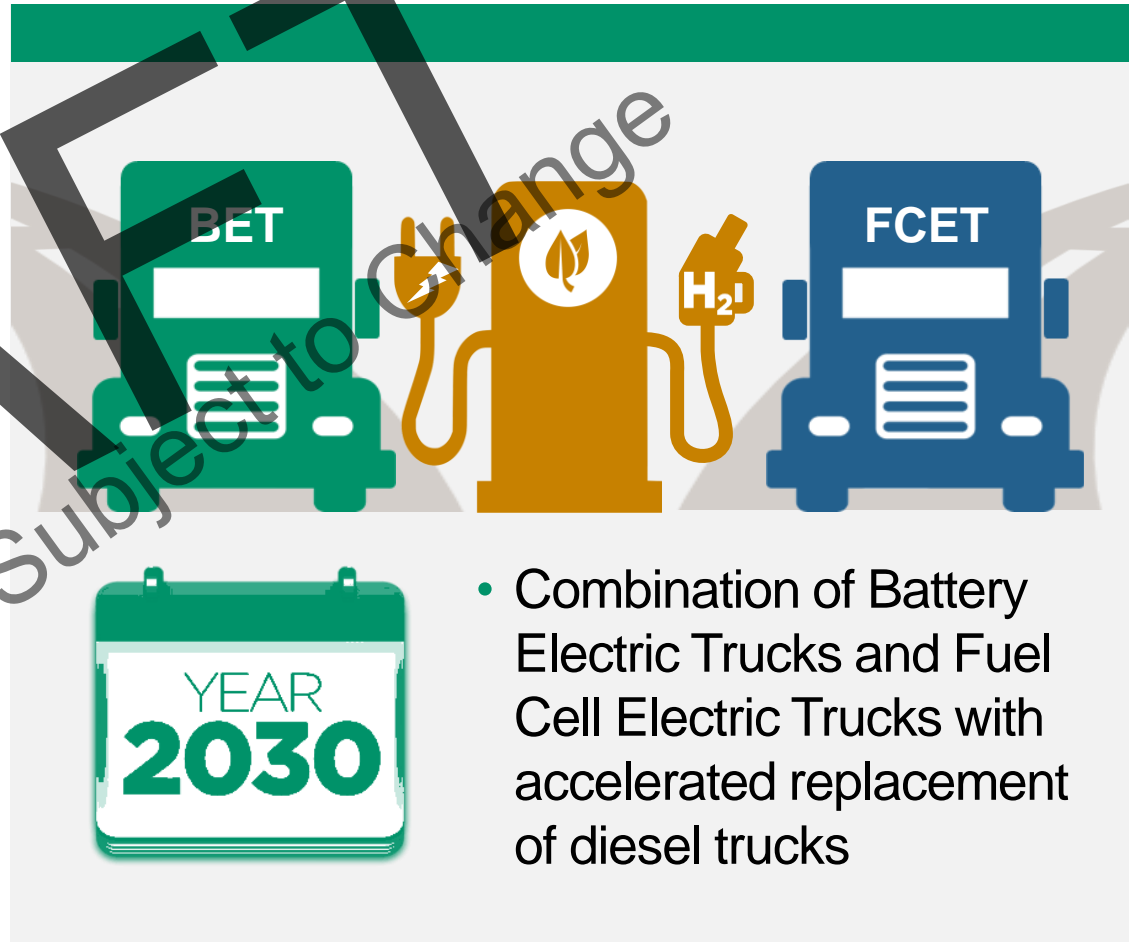
*Less certainty for commercialization of fuel cell electric trucks and infrastructure

Preliminary Zero Emission Pathway



The diagram for the year 2026 shows a green truck labeled 'BET' (Battery Electric Truck) on the left, a yellow charging station with a lightning bolt icon in the middle, and a blue truck labeled 'FCET' (Fuel Cell Electric Truck) on the right. A yellow hydrogen pump icon with 'H₂' is positioned between the charging station and the FCET. Below the truck icons is a calendar icon with 'YEAR 2026' written on it.

- **Primary:** Battery electric trucks with opportunity charging
- **Secondary:** Fuel cell electric trucks



The diagram for the year 2030 shows a green truck labeled 'BET' on the left, a yellow charging station with a lightning bolt icon in the middle, and a blue truck labeled 'FCET' on the right. A yellow hydrogen pump icon with 'H₂' is positioned between the charging station and the FCET. Below the truck icons is a calendar icon with 'YEAR 2030' written on it.

- Combination of Battery Electric Trucks and Fuel Cell Electric Trucks with accelerated replacement of diesel trucks

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Challenges

	<p>Cost barriers</p>
	<p>Electric vehicle and hydrogen fueling infrastructure</p>
	<p>Truck availability and specialty options</p>
	<p>Awareness / Operational changes</p>

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Next Steps

- Continue stakeholder engagement
- Develop strategies for implementation
- Present Final Transition Plan in June 2022

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