

ZERO - EMISSIONS

The logo for CAL FLEET ADVISOR features the text in a bold, white, sans-serif font. The words "CAL FLEET" are on the top line and "ADVISOR" is on the bottom line. The text is centered within a white graphic element consisting of a thick, curved line that forms a partial circle around the top and sides of the text. Below the text, there are two white geometric shapes: a diagonal line on the left and a trapezoidal shape on the right, resembling a stylized road or a warning sign.

**CAL FLEET
ADVISOR**

ZEV Myths Uncovered

Technology

**CAL FLEET
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True or False?

There's a big difference between how Battery-Electric and Hydrogen Fuel Cell trucks work.

Powertrain Options

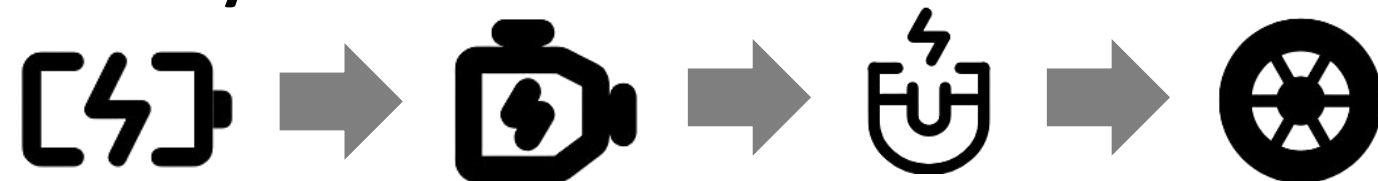
Internal Combustion



Hydrogen Fuel Cell



Battery-Electric



True or False?

ZEVs are safer than internal combustion vehicles.



Fire Risk

Battery Electric – 25 fires per
100,000 vehicles*

Internal Combustion – 1,500 fires
per 100,000 vehicles*

Fire type risks

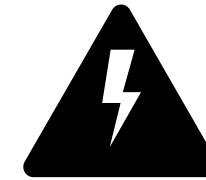
Heavy Duty Vehicle risk



Daily Operation

Hazardous Materials

Electrical Safety



Maintenance

Hazardous Materials

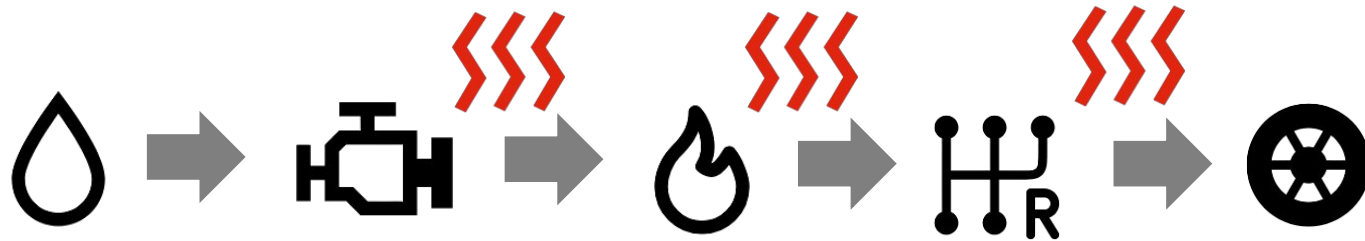
Electrical Safety

True or False?

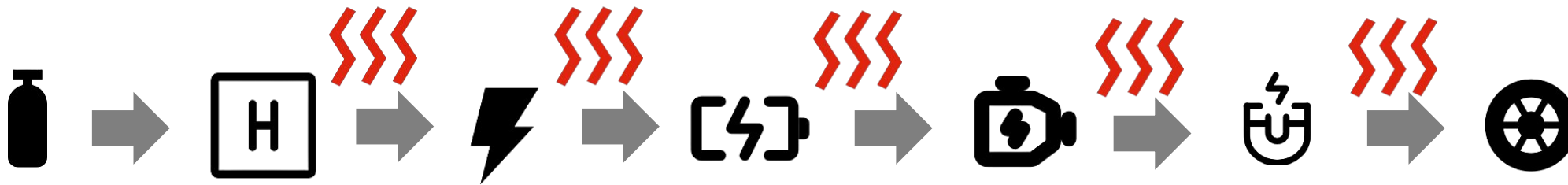
ZEVs and Internal Combustion Vehicles have similar efficiency.

Powertrain Options

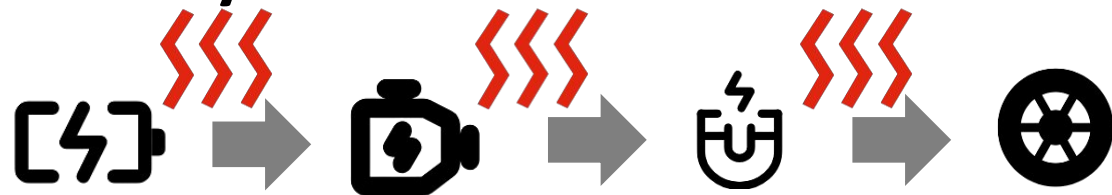
Internal Combustion



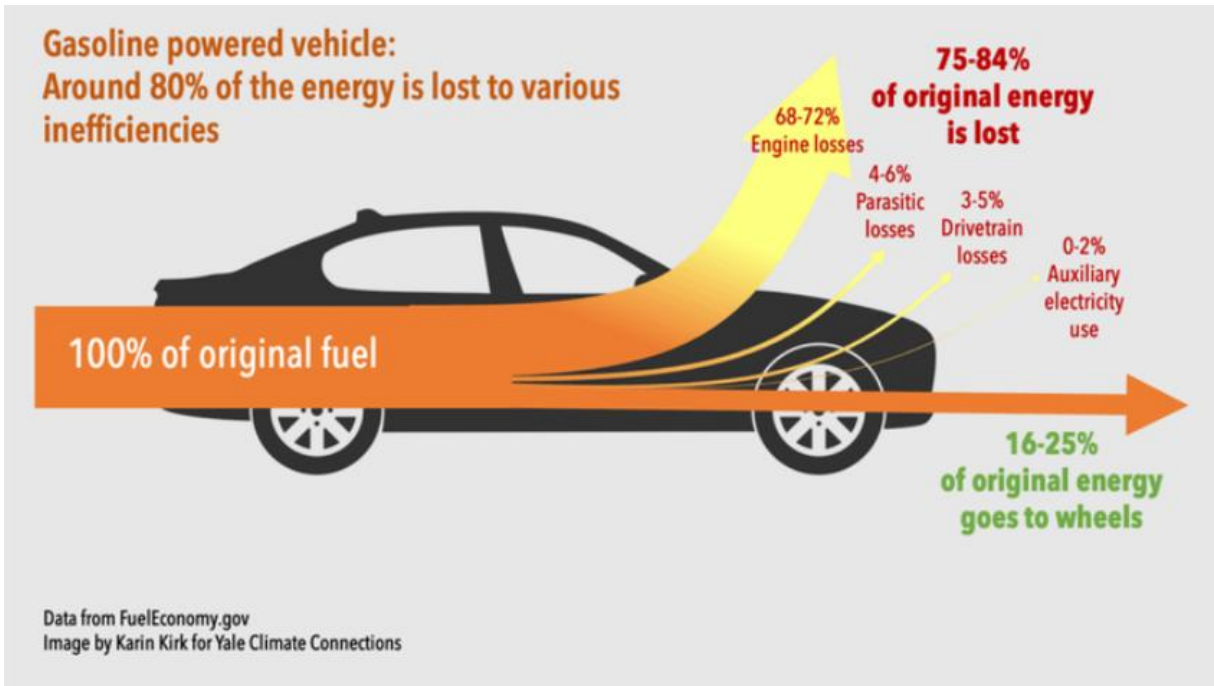
Hydrogen Fuel Cell



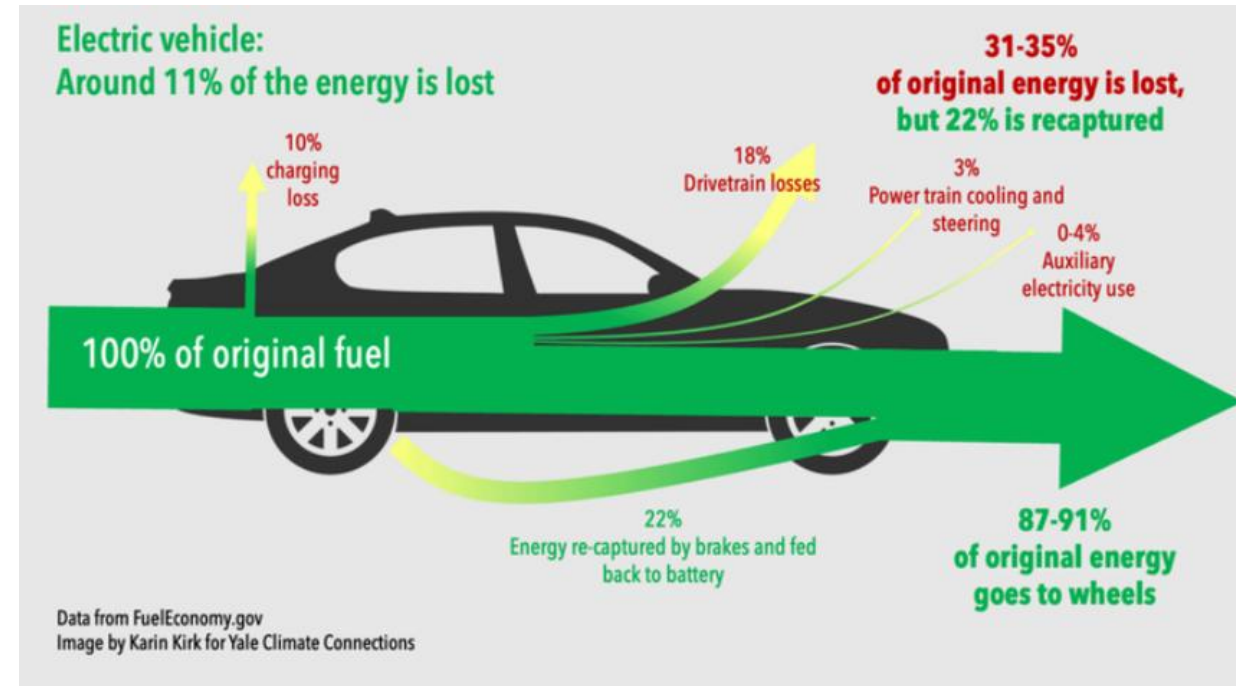
Battery-Electric



For every \$5 spent on energy...



About \$1 goes to the wheels
About \$4 is wasted as heat



About \$4.50 goes to the wheels
About \$.50 is wasted as heat

Operations



True or False?

ZEVs don't have enough range for commercial use.

- Average Semi Truck miles per day: About 240 miles
- Average Delivery Truck miles per day: About 47 miles
- Average Van miles per day: About 43 miles
- Commercial ZEV published ranges:
 - BEV Vans: 150 – 250 miles
 - BEV MD Trucks: 150 – 250 miles
 - BEV HD Trucks: 200 – 500 miles
 - H2 HD Trucks: 400 – 500 miles

Miles per day calculations assume operating 52 weeks a year, 5 days a week

True or False?

ZEVs don't have enough power for commercial use.

- ZEV electric motors have a higher power density than internal combustion engines
- Torque is available from zero rpm
- Minimal transmission power losses
- Models available with 1,000+ hp

| Example HD Truck | Diesel | Electric |
|------------------|-----------------|--------------|
| Power | 405-455hp | 455hp |
| Torque | 1450-1850 lb/ft | 4,051 lb/ft |
| Transmission | 12-13 speed | 2 speed auto |

True or False?

ZEVs are heavier than Internal Combustion Vehicles.

Weight



- These all have the same energy:
 - 1 gallon/6 pounds of gasoline
 - .88 gallon/6.2 pounds of diesel
 - 1kg (2.2lbs) of Hydrogen
 - 183 pounds of batteries
- Comparative tractor curb weights:
 - Diesel Day Cab: 15,000 – 20,000 lbs
 - Diesel Sleeper: 18,000 – 25,000 lbs
 - BEV Day Cab – 20,000 – 25,000 lbs
- ZEV 82,000lb weight limit

True or False?

ZEVs take a long time to charge or fuel.

Charging/Fueling



- **HD Fuel Cell Vehicles** take about 10-20 min to fuel
- **HD Battery Electric Vehicles** take up to 2 hours to fast charge
 - Best practice – charge vehicles slowly overnight
 - Opportunity charging on breaks/downtime
 - Smaller vehicles can charge faster
 - New technologies coming soon

HVIP

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CORE

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Finances



True or False?

ZEVs cost more to buy than combustion vehicles.

- Some lower GVWR vehicles cost the same – Combustion or EV
- **HD Trucks**
 - New Diesel Trucks: \$150,000 - \$220,000
 - New BEV Trucks: \$250,000 - \$450,000
- **HVIP Incentive (up to 90%):**
 - Class 2b base incentive: \$7,500
 - Class 8 BEV base incentive: \$120,000
 - Class 8 BEV drayage/refuse voucher: \$150,000
 - Class 8 BEV small business voucher: \$330,000
- **HD Trucks (with incentive):**
 - Diesel Trucks: \$150,000 - \$220,000
 - HVIP BEV Trucks: \$130,000 - \$300,000
 - Small Business BEV Trucks: \$25,000 - \$120,000
- **All figures exclude taxes and fees**

True or False?

ZEVs cost more to run.

Operating Costs



| Fuel Costs Comparison – Loaded HD Tractor Trailer | Diesel | Battery Electric | Hydrogen Fuel Cell |
|---|---|---|--|
| Efficiency | 7 miles per gallon | .59 miles per kWh | 7 miles per kilogram |
| Fuel Cost per mile | \$5/gal: \$0.71 \$8/gal: \$1.14 | \$0.30/kWh: \$0.51 \$0.12/kWh: \$0.20 | \$9/kg: \$1.29 \$25/kg: \$3.57 |
| Annual Cost: 15,000 miles/year | \$5/gal: \$10,650 \$8/gal: \$17,100 | \$0.30/kWh: \$7,650 \$0.12/kWh: \$3,000 | \$9/kg: \$19,350 \$25/kg: \$53,571 |
| Annual Cost: 50,000 miles/year | \$5/gal: \$35,500 \$8/gal: \$57,000 | \$0.30/kWh: \$25,500 \$0.12/kWh: \$10,000 | \$9/kg: \$64,500 \$25/kg: \$178,500 |



Next Steps



True or False?

Adding ZEVs to my fleet is too hard.

Cal Fleet Advisor



- Administered by CALSTART on behalf of CARB
- Funded by HVIP
- Provide free Technical Assistance to all California MHD fleets
- Prioritize small fleets, drayage, and disadvantaged communities



How We Help



- **Provide** technical assistance to help fleets overcome electrification challenges
- **Address** YOUR specific needs – not a one-size-fits-all approach
- **Focus** on straightforward solutions to your issues
- **Learn** from other fleets and apply their experience to help you



Q&A

Scan Here to get no-cost help today!



www.CalFleetAdvisor.org

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