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## Effects of Tax Credits for Electric Vehicles

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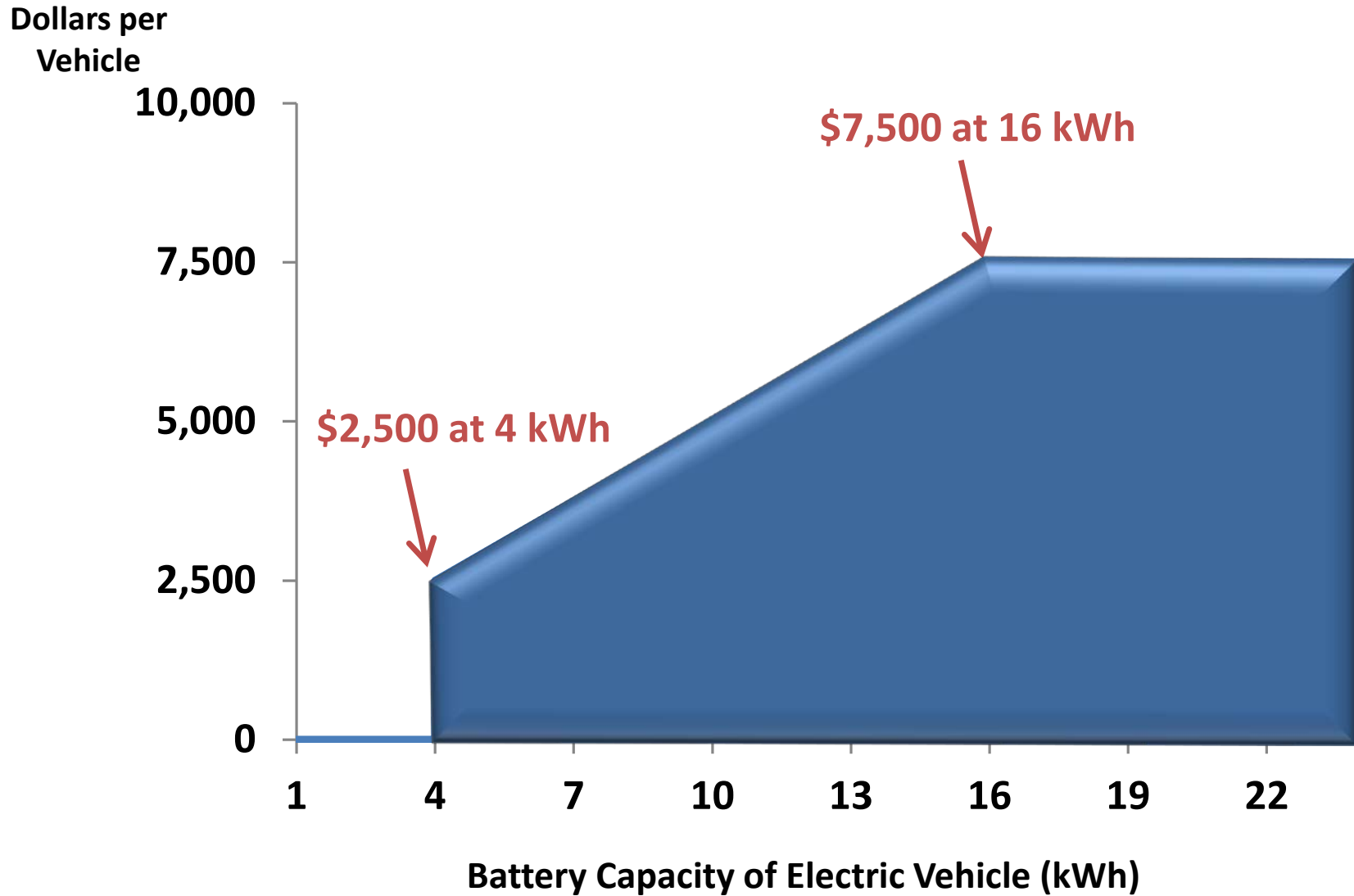
This presentation provides information published in *Effects of Federal Tax Credits for the Purchase of Electric Vehicles* (September 2012), [www.cbo.gov/publication/43576](http://www.cbo.gov/publication/43576).

# Tradeoffs for Electric Vehicles

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- Lower operating costs for the driver than other, comparable vehicles but more costly to purchase.
- Lower gasoline use and fewer greenhouse gas emissions in the transportation sector but greater emissions in the electric utility sector.

# Federal Tax Credits Available on Electric Vehicles



# Basic Questions

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- Are the tax credits large enough to make electric vehicles cost-competitive with conventional vehicles and traditional hybrids?
- How effective are the electric vehicle tax credits at reducing gasoline consumption and emissions of greenhouse gases, and at what cost to the government?

# General Findings

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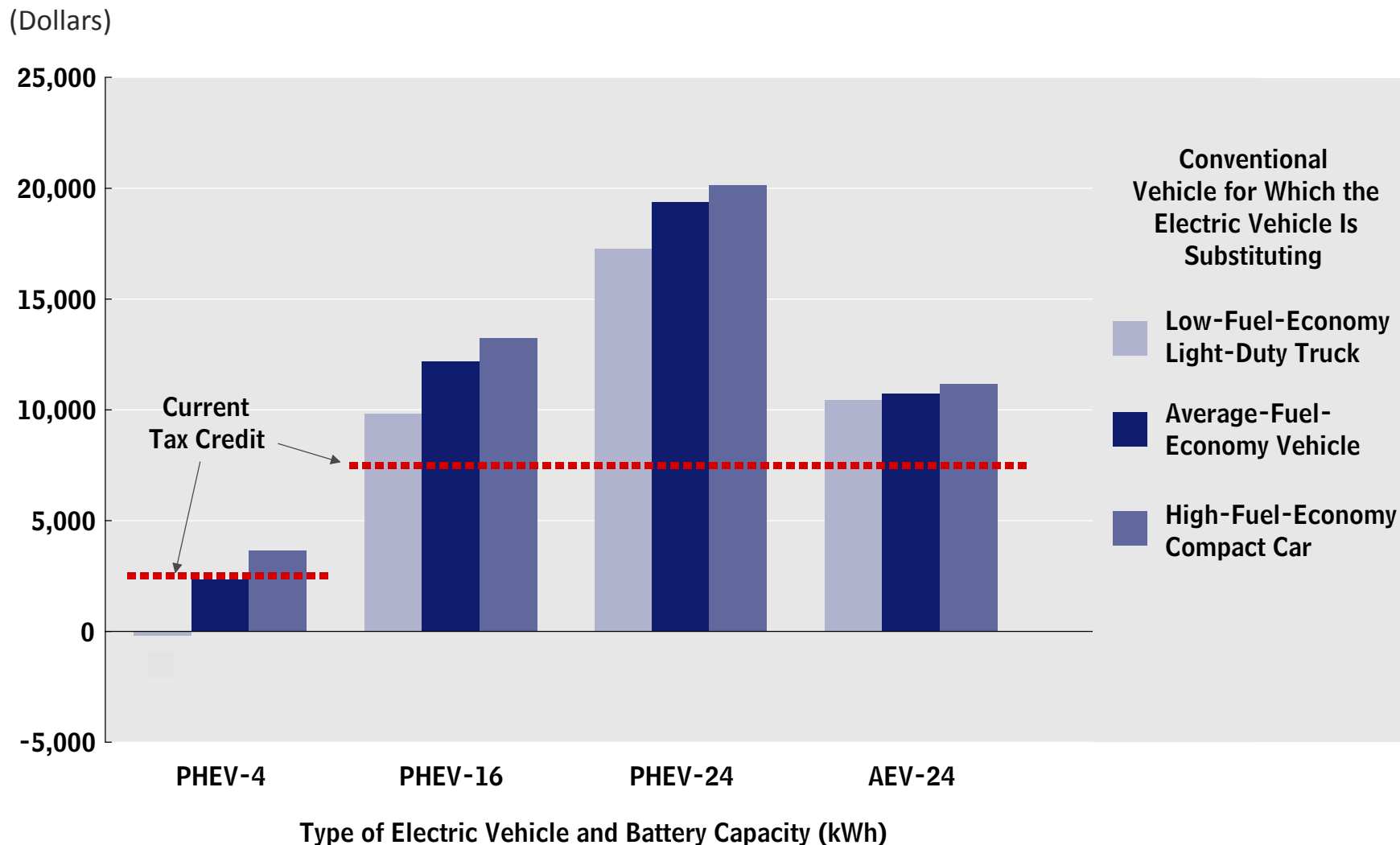
- At current vehicle prices, federal tax credits alone generally do not offset the higher lifetime cost of driving electric vehicles.
- Electric vehicle tax credits probably do not reduce gasoline use and greenhouse gas emissions in the short term but could in the longer term depending on CAFE standards; the cost of those reductions might be higher than those of other policies.

# Federal Tax Credits for Electric Vehicles

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- How large do the tax credits need to be to offset the greater lifetime cost of buying and operating electric vehicles?

# Tax Credits Necessary for Electric Vehicles to Be Cost-Competitive at 2011 Vehicle Prices



# Gasoline Prices

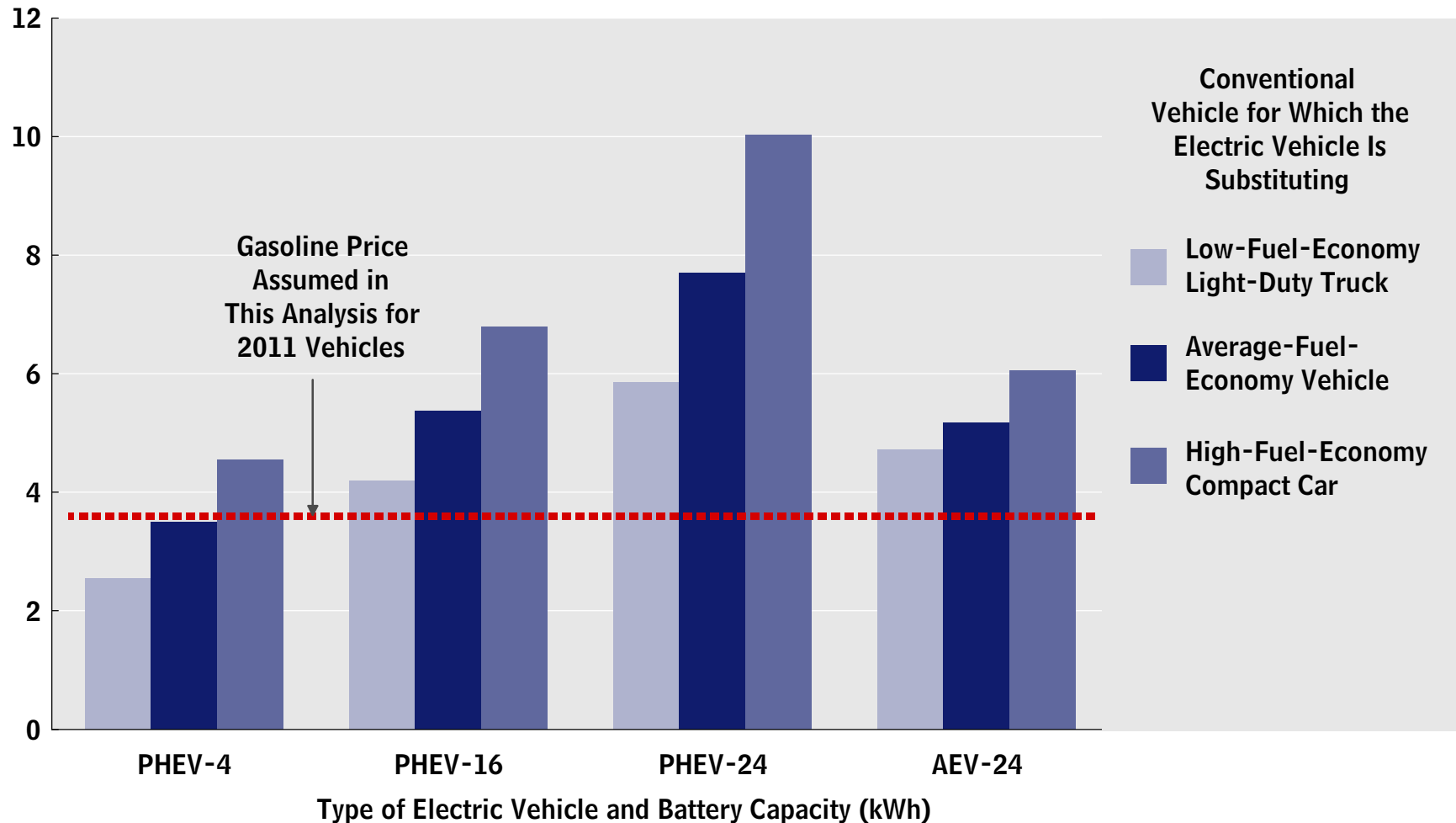
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- How high do gasoline prices need to be to offset the greater lifetime cost of buying and operating electric vehicles?



# Gasoline Prices Necessary for Electric Vehicles to Be Cost-Competitive at 2011 Vehicle Prices

(Dollars per gallon)

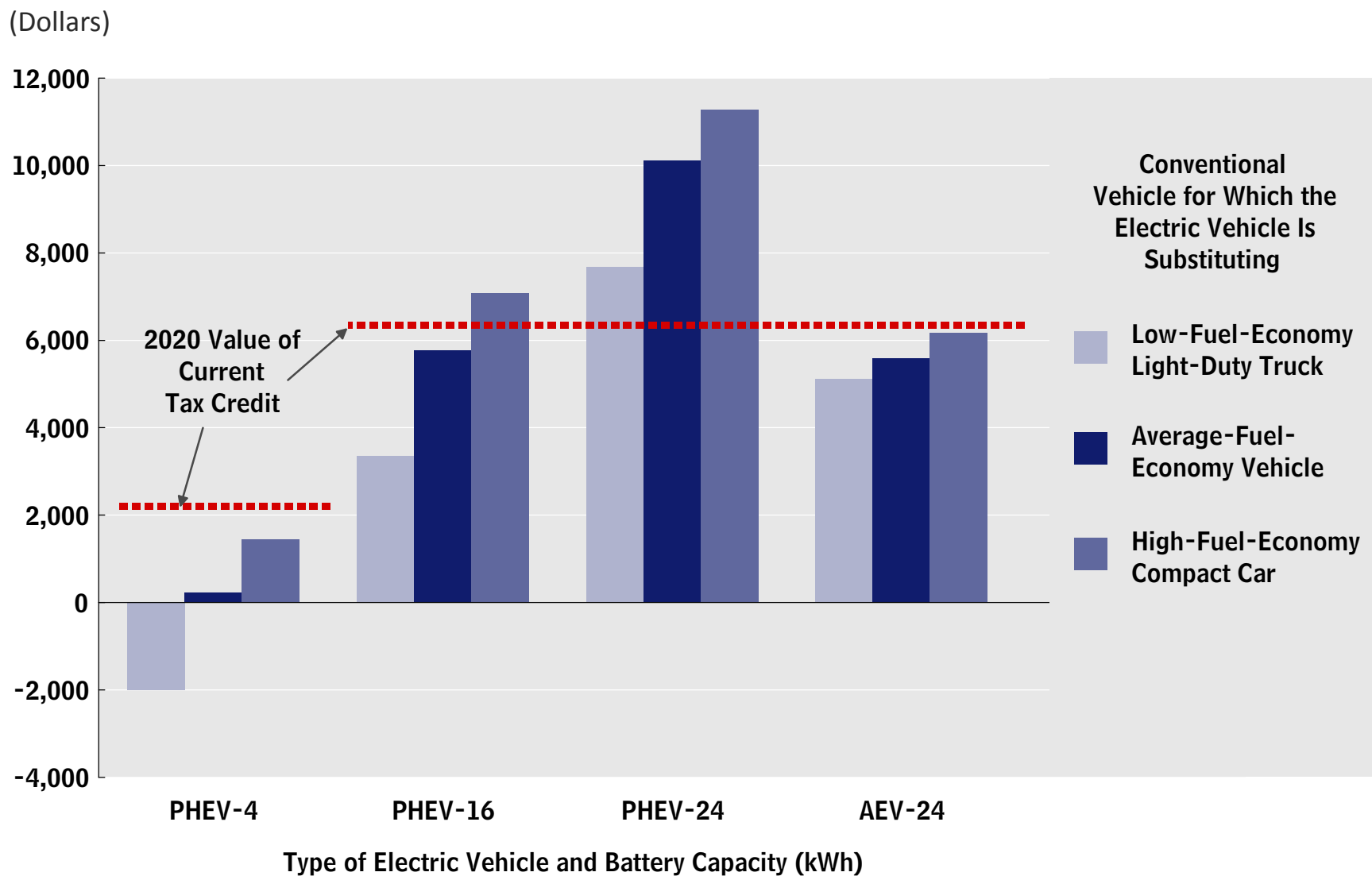


# Electric Vehicle Prices

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- How will expected decreases in the relative cost of buying electric vehicles effect the tax credit necessary for those vehicles to be cost-competitive with others in the future?

# Tax Credits Necessary for Electric Vehicles to Be Cost-Competitive at 2020 Vehicle Prices



# Cost of Reducing Gasoline Use or Greenhouse Gas Emissions

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- What is the government's cost of reducing gasoline use or greenhouse gas emissions using the electric vehicle tax credits?

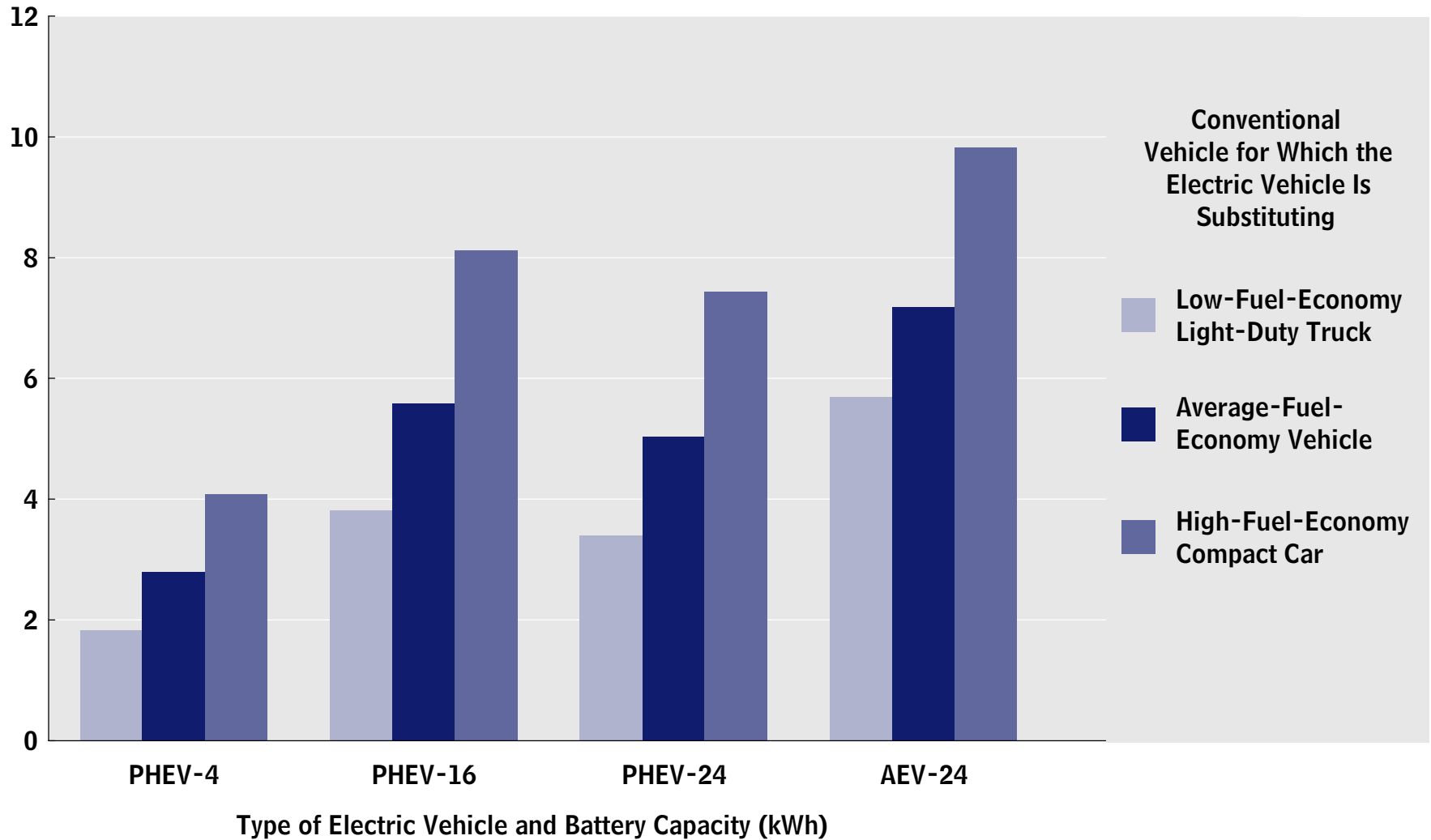
# Cost of Reducing Gasoline Use or Greenhouse Gas Emissions

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- Because of CAFE standards, selling more high-fuel-economy vehicles will probably allow more low-fuel-economy vehicles to be sold.
- Electric vehicles will probably have little effect on gasoline use or greenhouse gas emissions while existing CAFE standards are in place.
- Promoting electric vehicle use might have effects in the future when CAFE standards are revised.

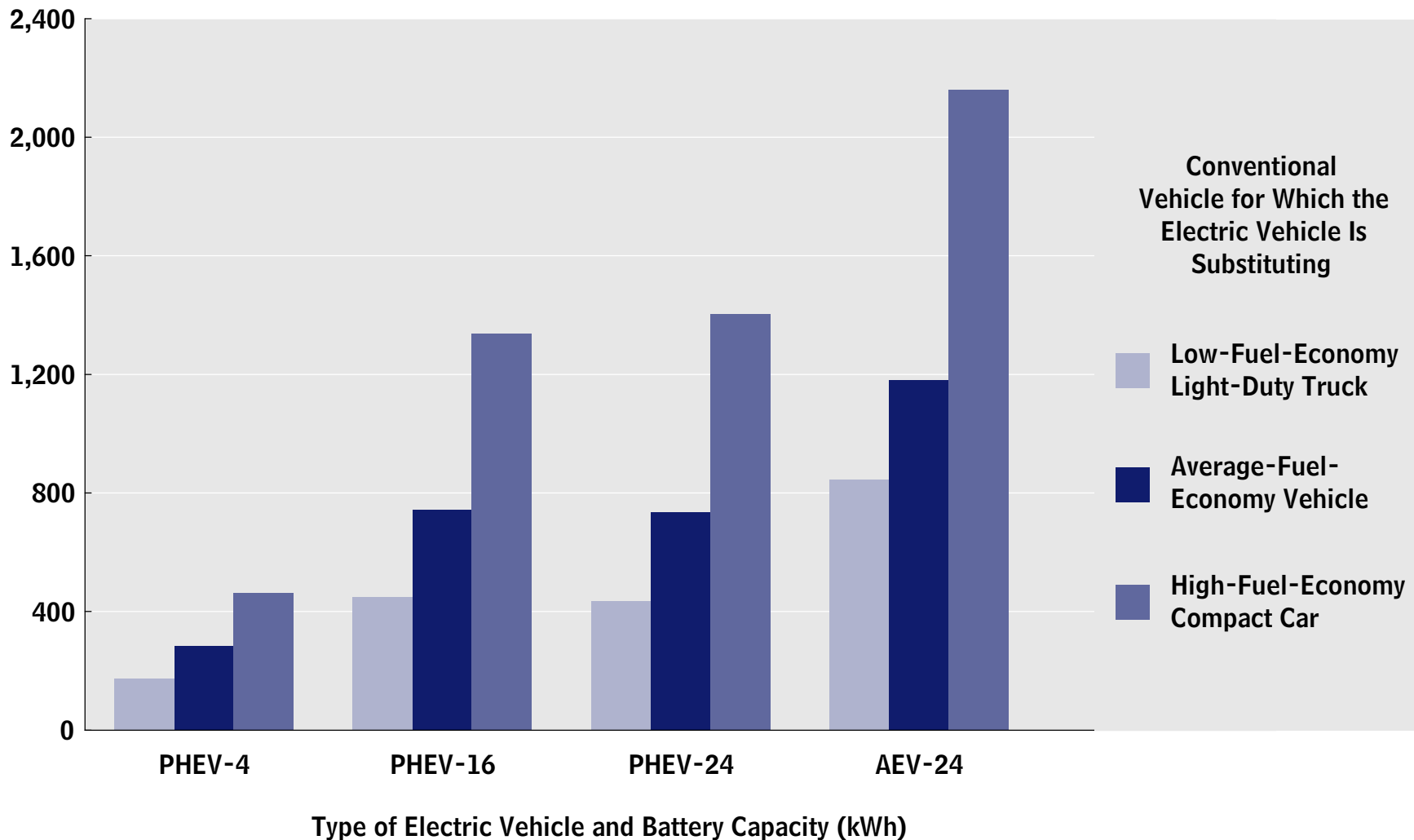
# Government Cost of Reducing Gasoline Use

(Dollars per gallon of gasoline consumption reduced, direct effect only)



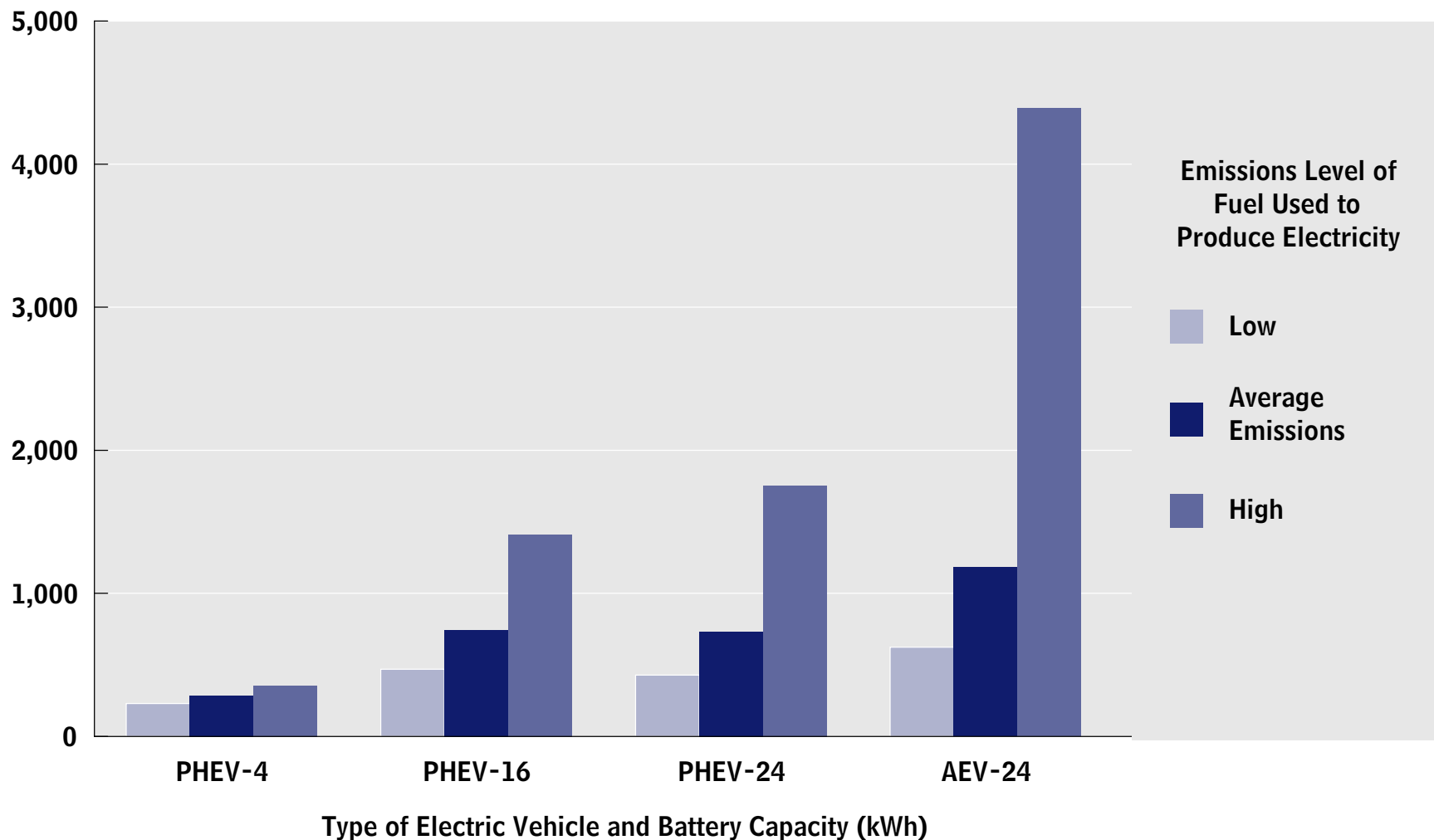
# Government Cost of Reducing Greenhouse Gas Emissions

(Dollars per metric ton of CO<sub>2</sub>-equivalent emissions reduced, direct effect only)



# Costs When Electricity Is Produced Using Fuels with Different Carbon Intensities

(Dollars per metric ton of CO<sub>2</sub>-equivalent emissions reduced, direct effect only)





# Other Factors Significantly Affecting the Cost-Effectiveness of the Tax Credits

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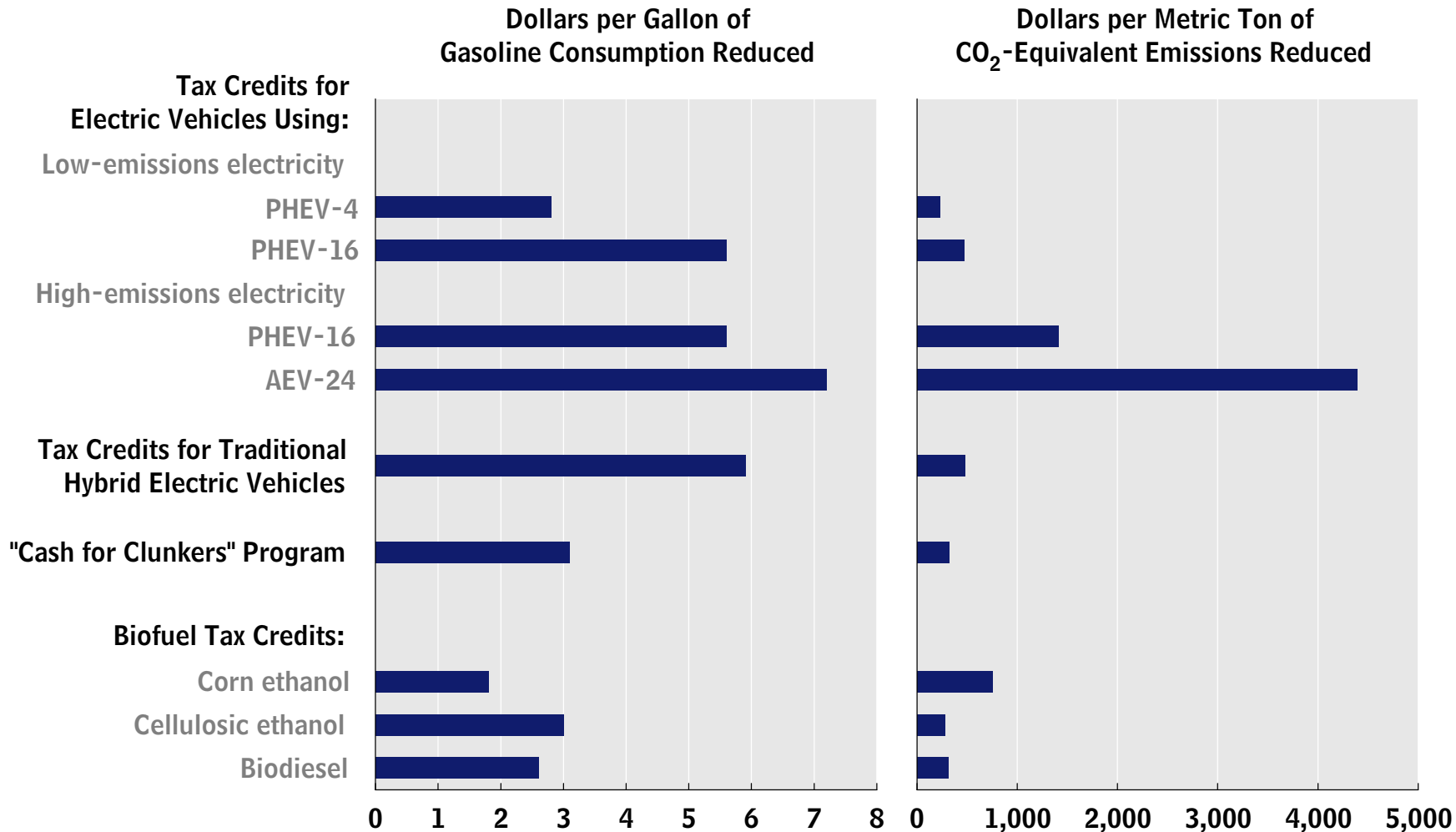
- Reductions reflect only those over the life of the vehicle; reductions from increased CAFE standards last longer.
- Calculations of the government's cost consider each reduction in isolation; actual costs are probably lower.
- Additional sales of other high-fuel-economy vehicles will further reduce gasoline use and greenhouse gas emissions.
- A key assumption underlying the estimates is that the tax credits are responsible for an estimated 30 percent of electric vehicle sales.
- CAFE probably prevents the tax credits from having any short run impact on gasoline use or greenhouse gas emissions.

# Cost of Reducing Gasoline Use or Greenhouse Gas Emissions

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- How does the government's cost of the electric vehicle tax credits compare with the costs of other programs that reduce gasoline use or greenhouse gas emissions?

# Costs Compared with Those for Other Transportation Policies



# Costs Compared with Those for Broader Policies

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- Gasoline Tax
  - 30 to 55 cents per gallon to reduce gasoline use
  - 20 to 30 cents per gallon to reduce greenhouse gas emissions
- Cap and Trade or Carbon Tax
  - Broad based; the costs of lowering emissions are not directly comparable
- Production Tax Credit on Renewable Generation
  - \$8 per MT CO<sub>2</sub> (reduced) for geothermal power
  - \$12 per MT (reduced) for wind power