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Effects of Tax Credits for Electric Vehicles

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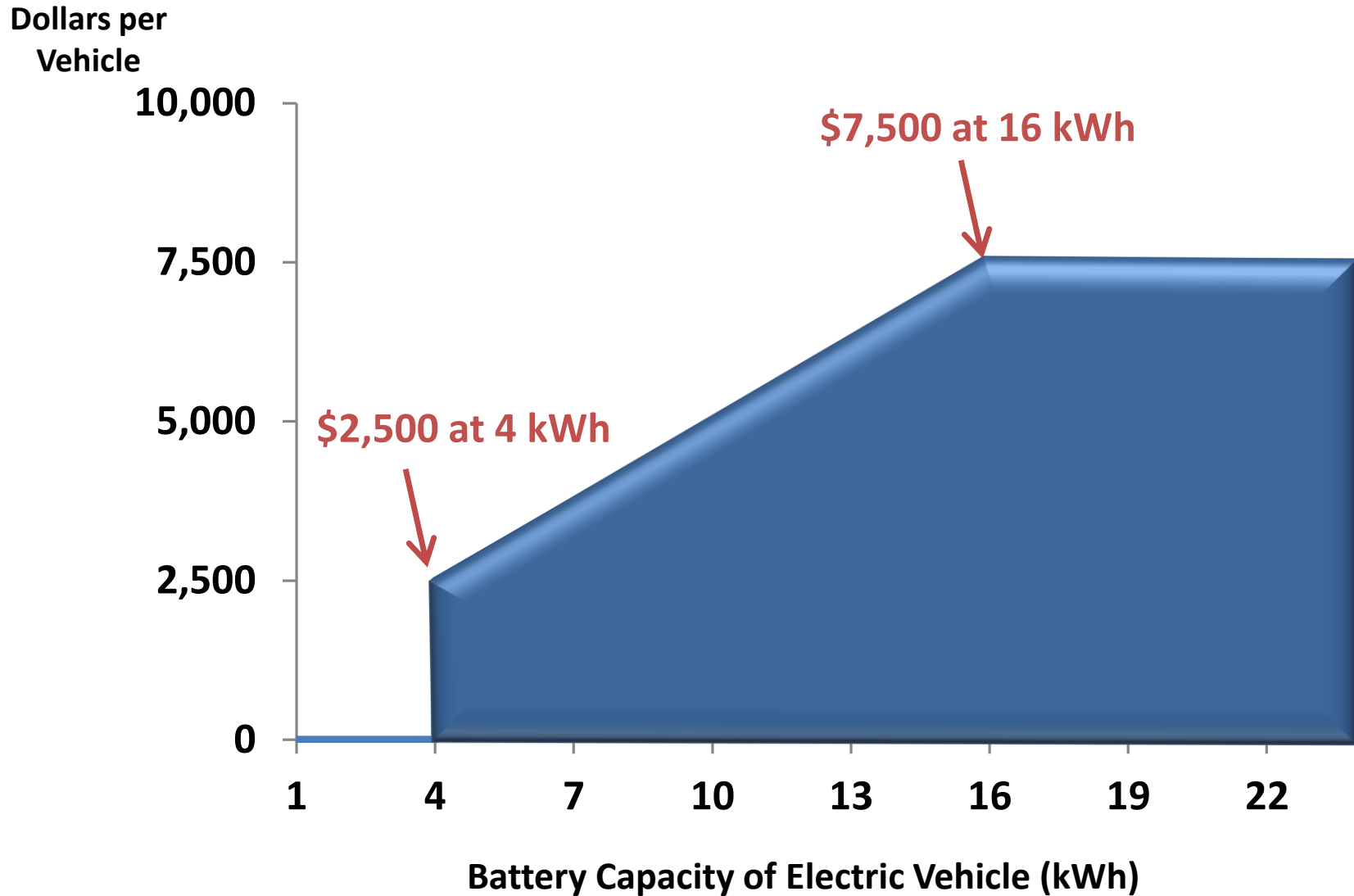
Microeconomic Studies Division

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

Tradeoffs for Electric Vehicles

- 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

- 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?

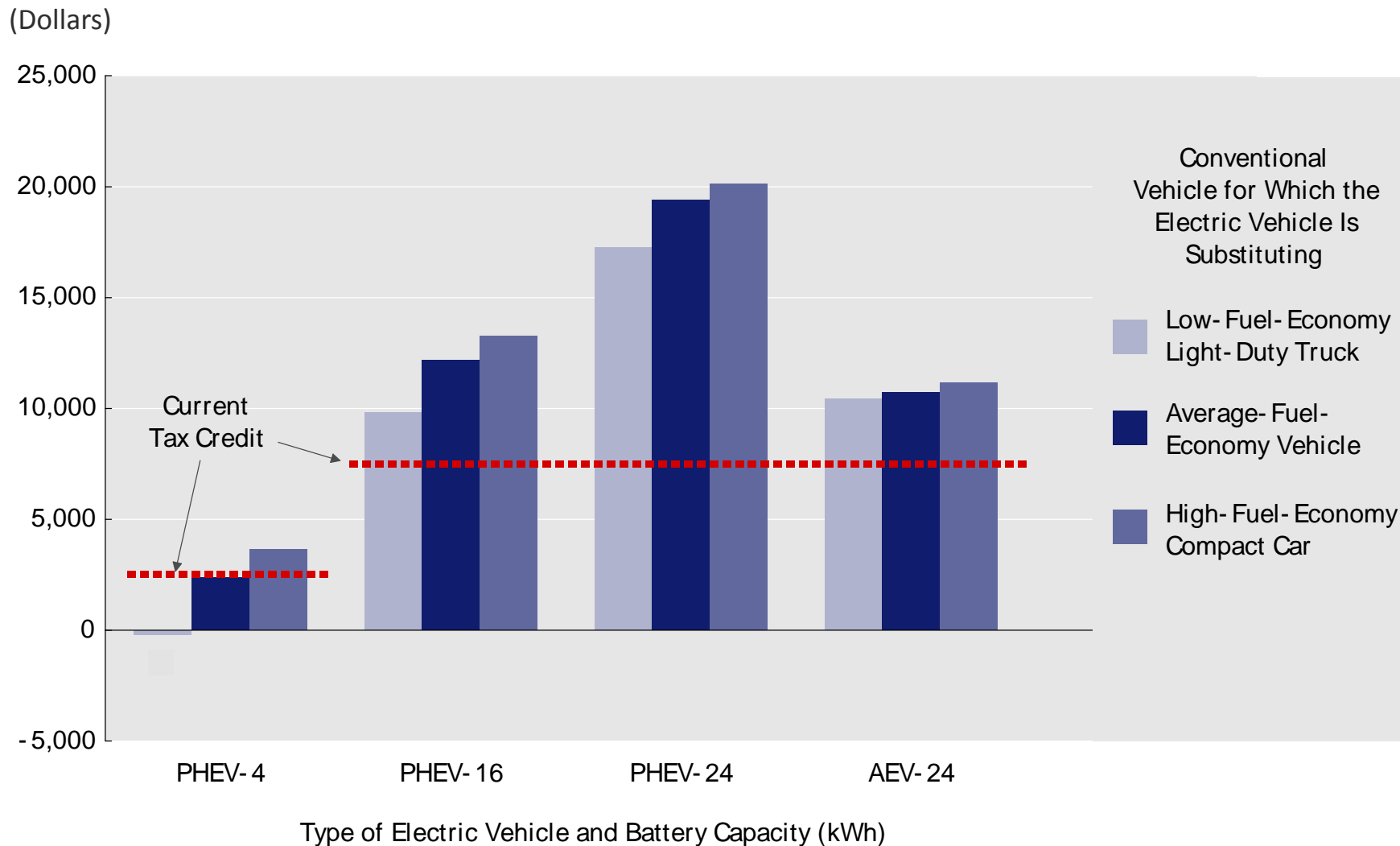
General Findings

- 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

- 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

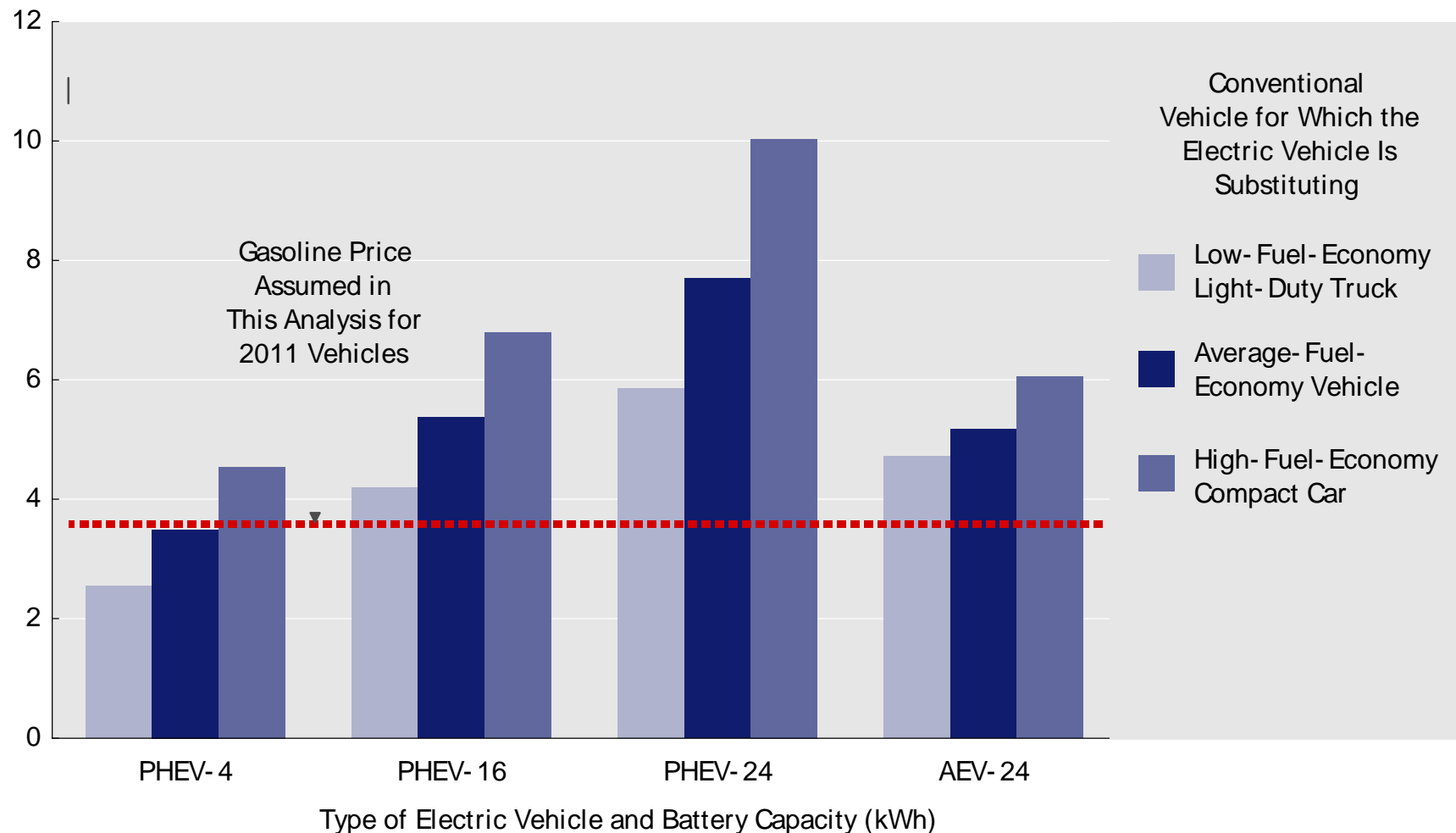


Gasoline Prices

- 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

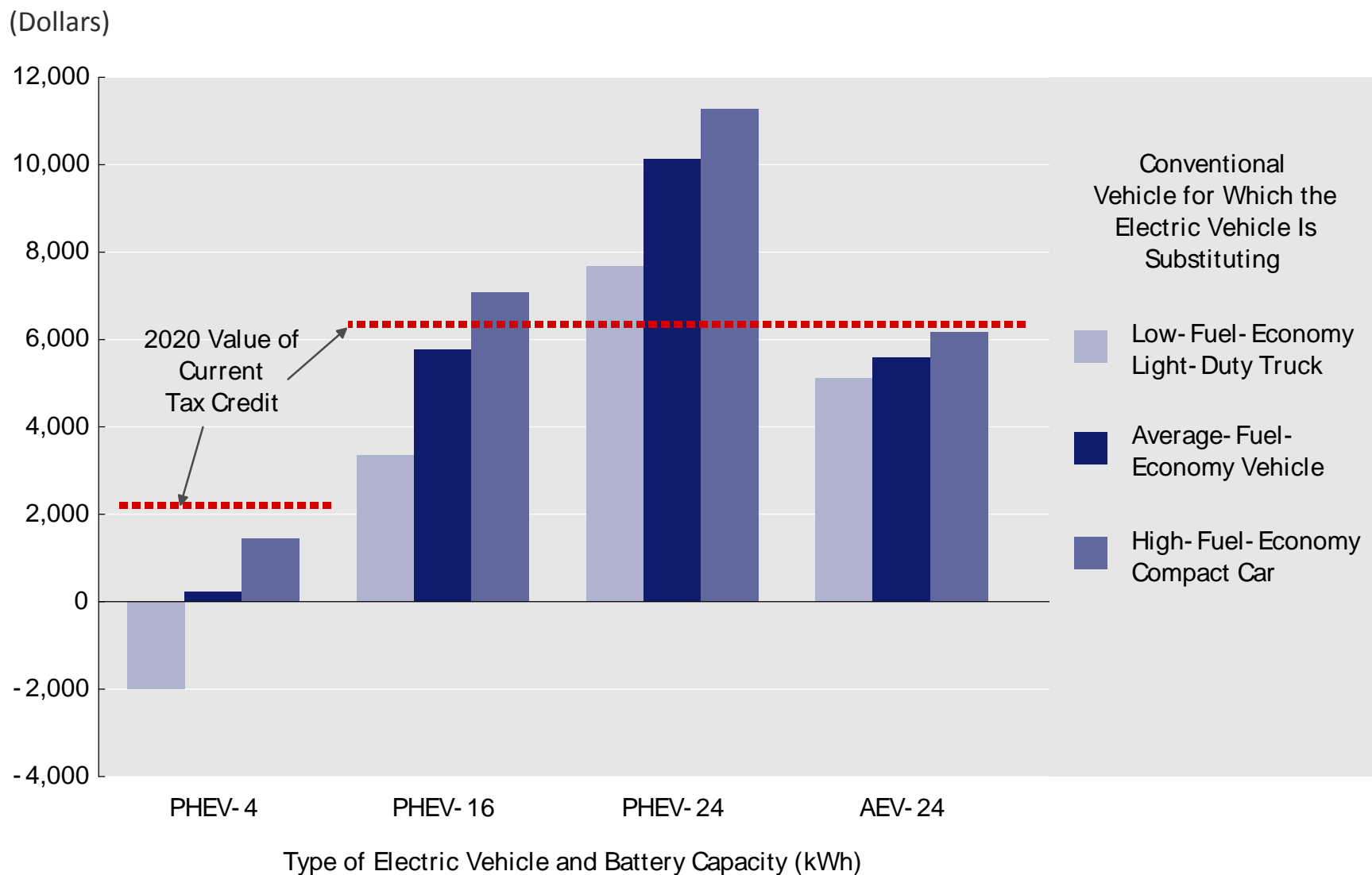
(Dollars per gallon)



Electric Vehicle Prices

- 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

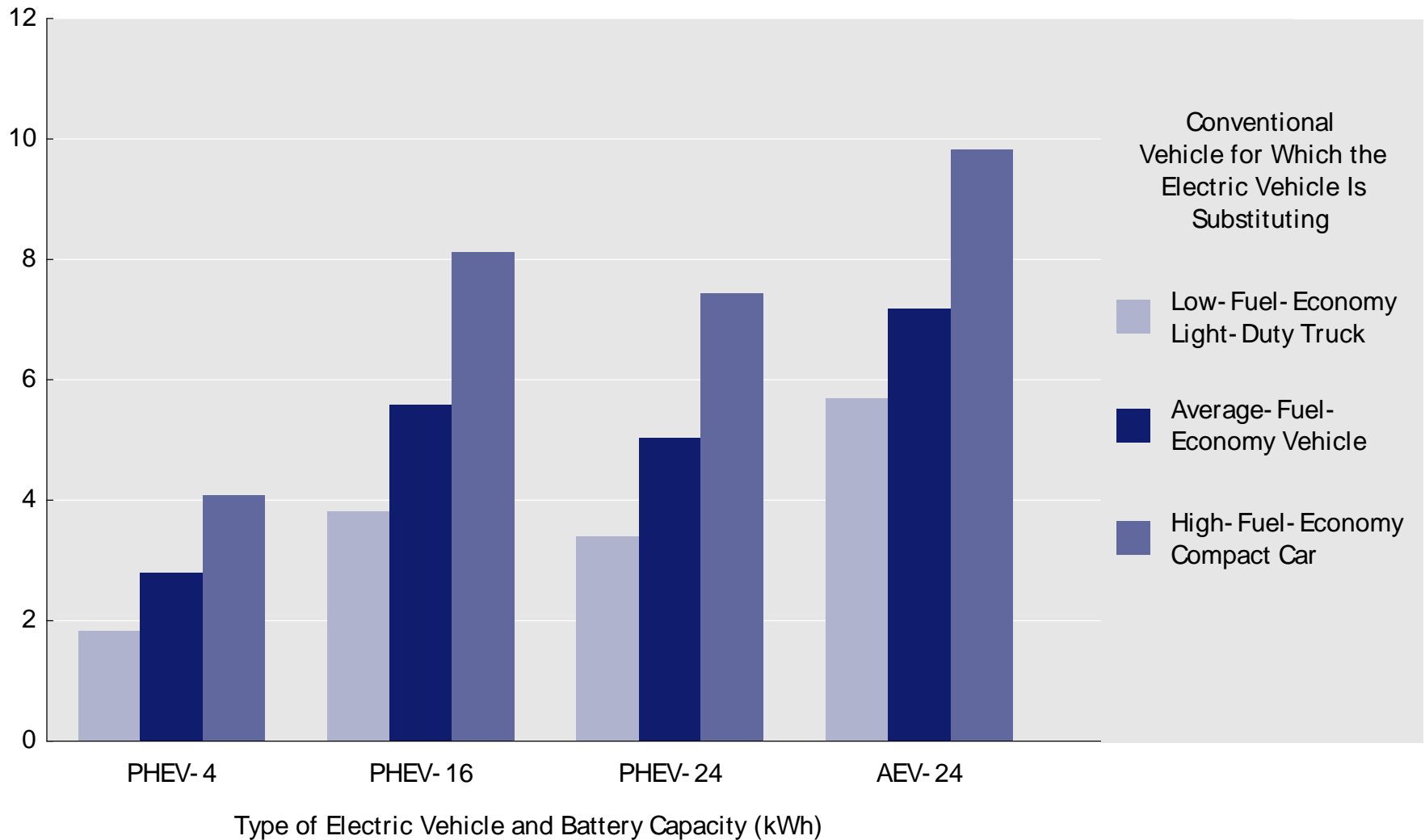
- What is the government's cost of reducing gasoline use or greenhouse gas emissions using the electric vehicle tax credits?

Cost of Reducing Gasoline Use or Greenhouse Gas Emissions

- 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.

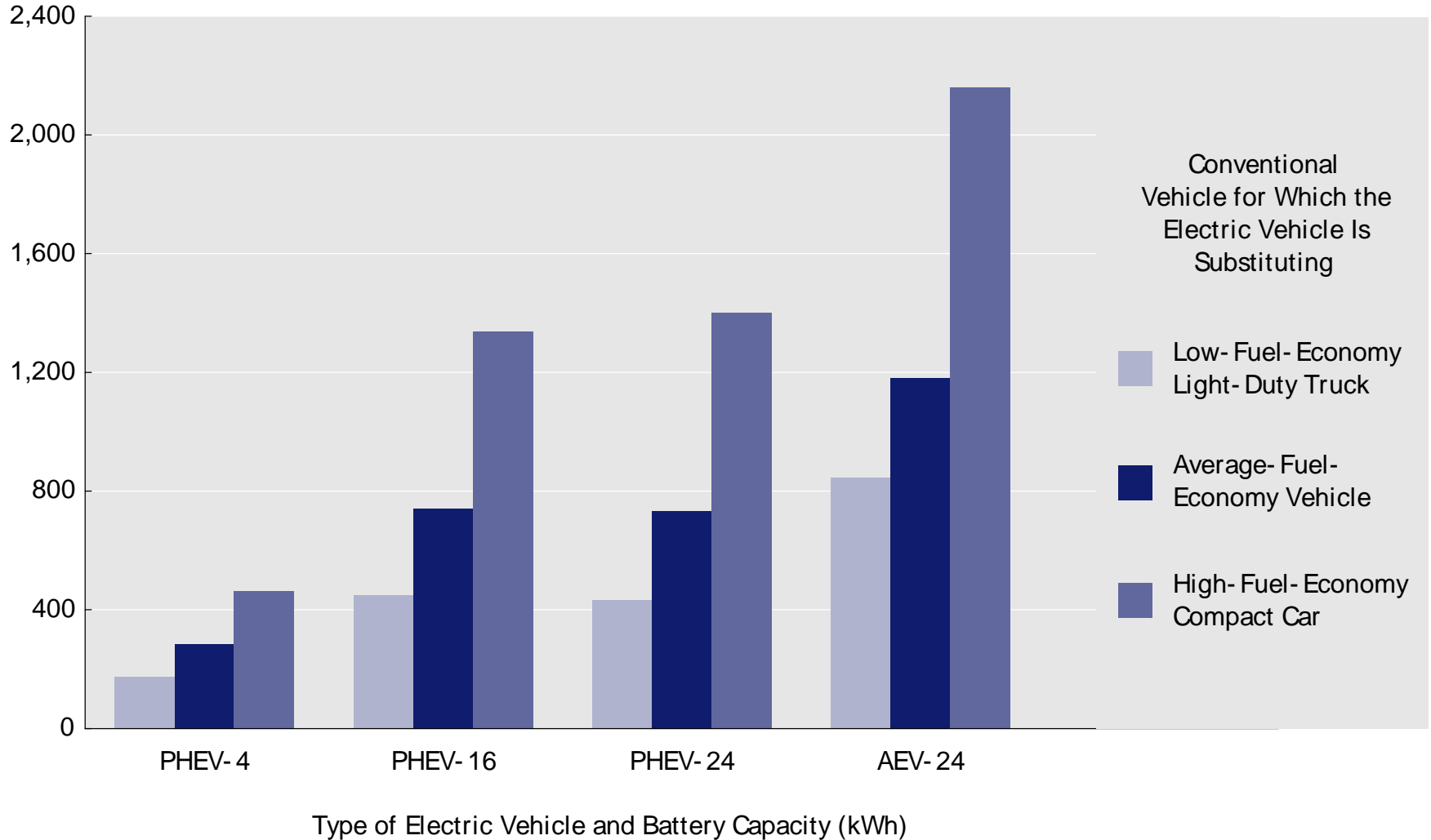
Government Cost of Reducing Gasoline Use

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



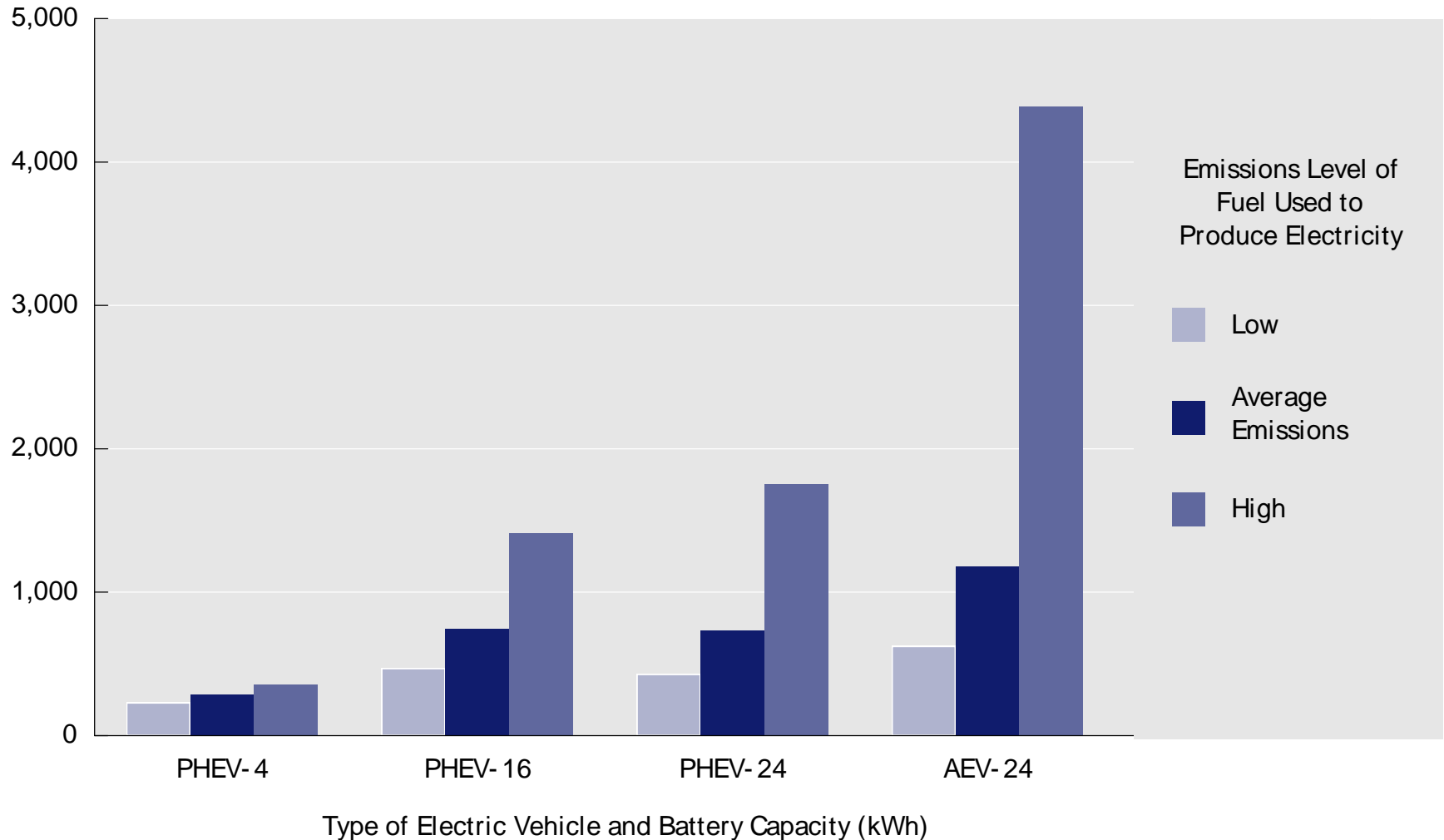
Government Cost of Reducing Greenhouse Gas Emissions

(Dollars per metric ton of CO₂-equivalent emissions reduced, direct effect only)



Costs When Electricity Is Produced Using Fuels with Different Carbon Intensities

(Dollars per metric ton of CO₂-equivalent emissions reduced, direct effect only)



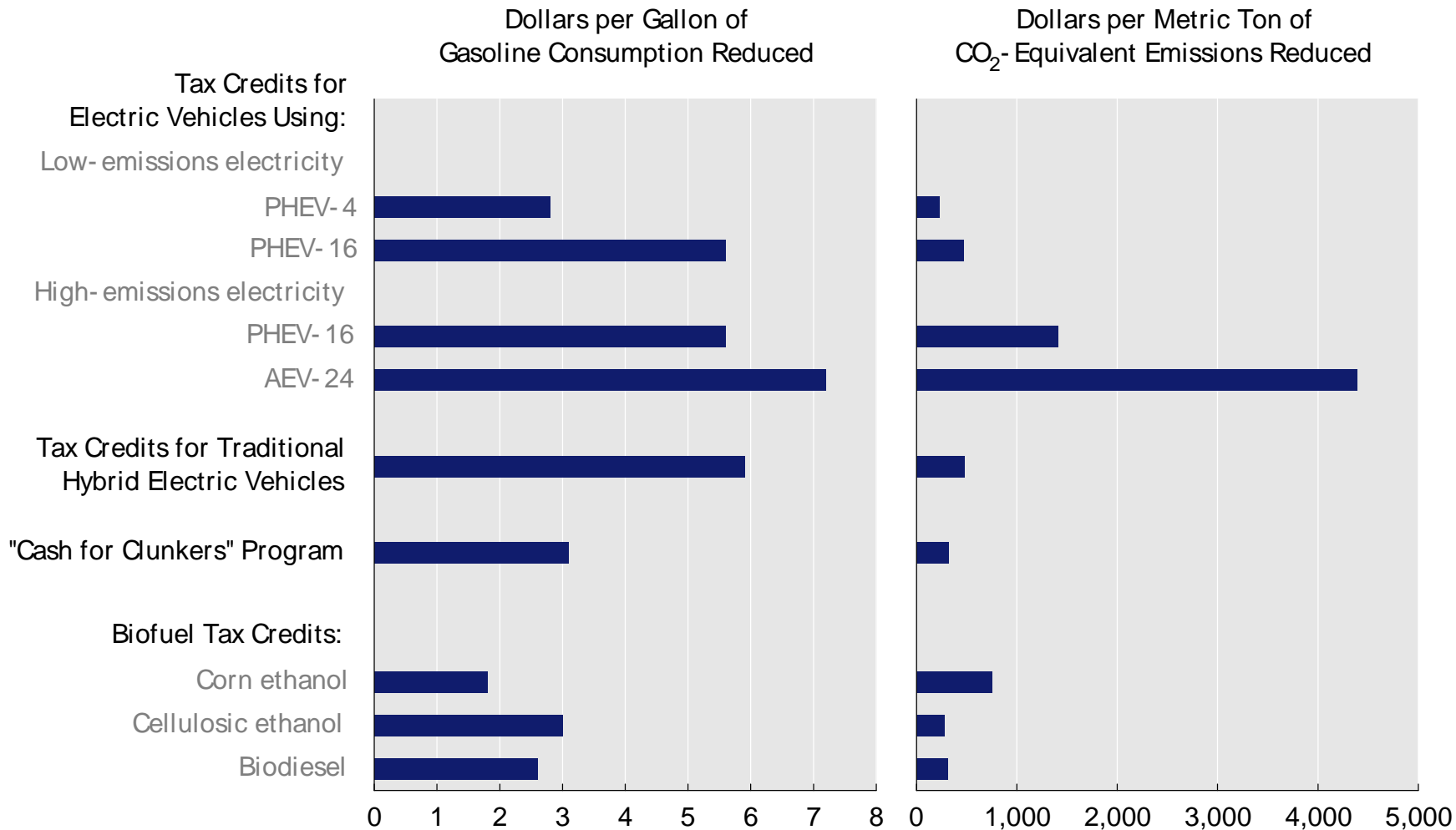
Other Factors Significantly Affecting the Cost-Effectiveness of the Tax Credits

- 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

- 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

- 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 CO₂ (reduced) for geothermal power
 - \$12 per MT (reduced) for wind power