
Regulating Fuel Efficiency— The CAFE Standards and Beyond

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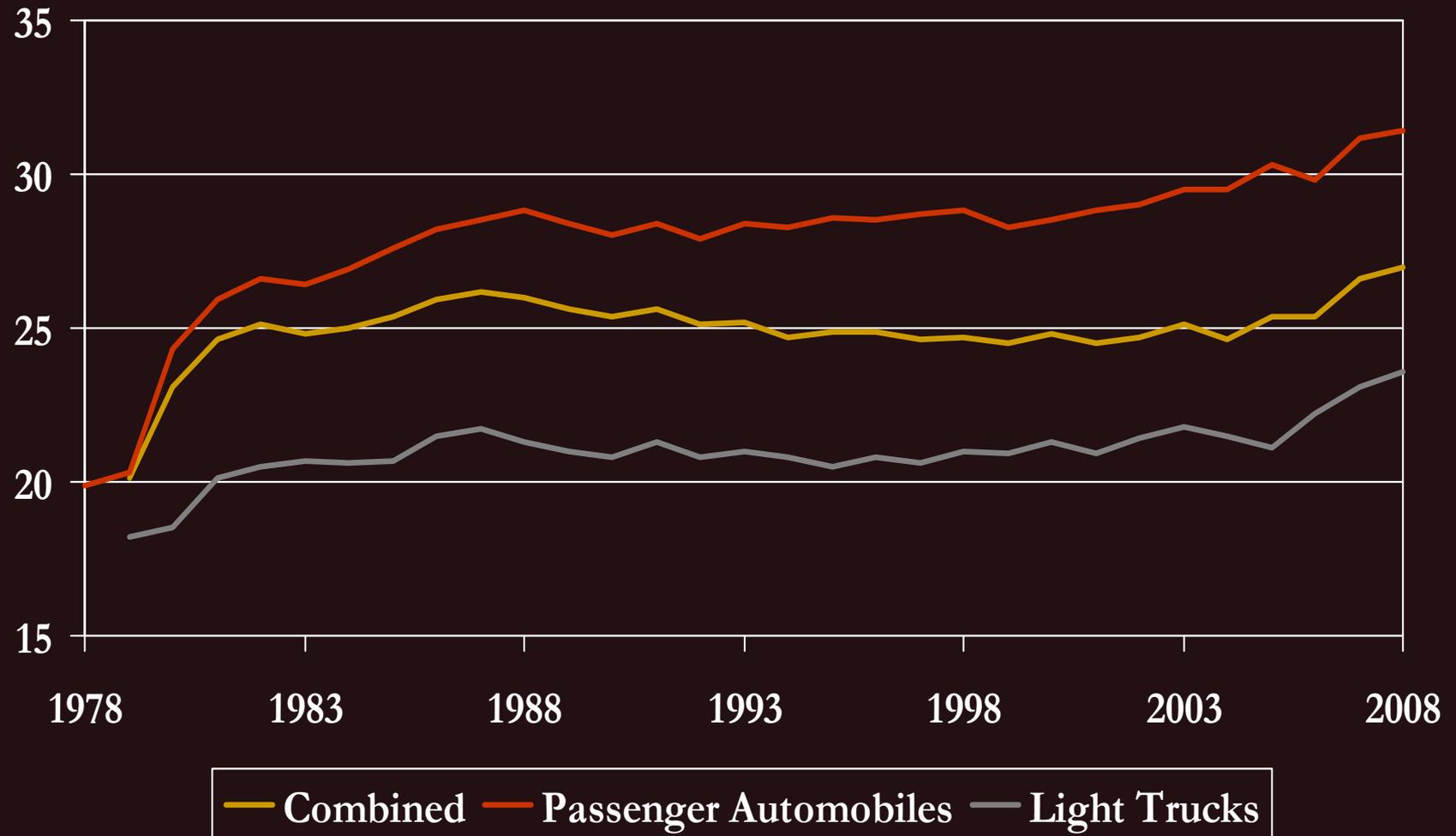
Federal Reserve Bank of Chicago – Detroit
Branch, June 4, 2009

Corporate Average Fuel Economy (CAFE)

- Established by 1975 Energy Policy and Conservation Act (EPCA)
- Administered by Department of Transportation (through NHTSA)
- Established CAFE standards for cars
- Authorized NHTSA to set standards for other vehicle classes – e.g., light trucks

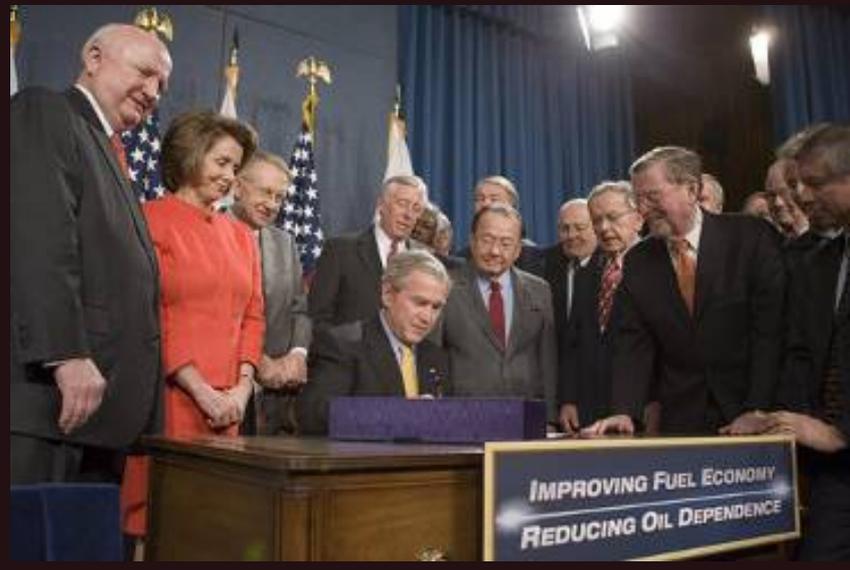


Fleet Fuel Economy Averages



New CAFE Standards Under the Energy Independence and Security Act of 2007 (EISA)

- Requires 35 mpg combined by MY2020
- Requires DOT to set interim standards for MY2011 through MY2019
- Authorizes “attribute-based” standards



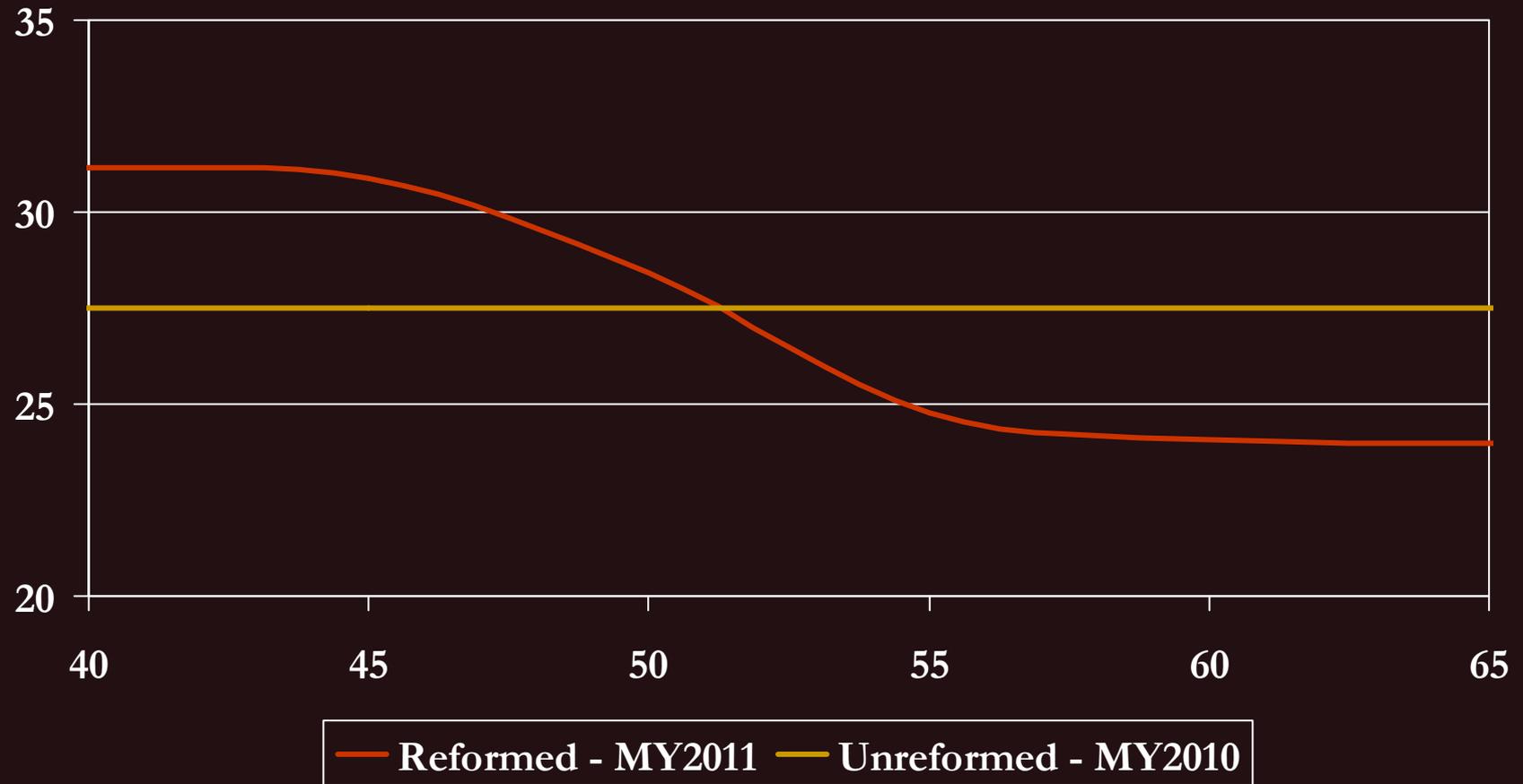
NHTSA's Considerations

- Separate standard for cars and light trucks, but one combined average for both
- Attribute-based standards will lead to different targets for different manufacturers, even though they face the “same standard”
- NHTSA will need to devise functions so that when averaged out across all makes and models, CAFE reaches target (35 mpg by 2020)

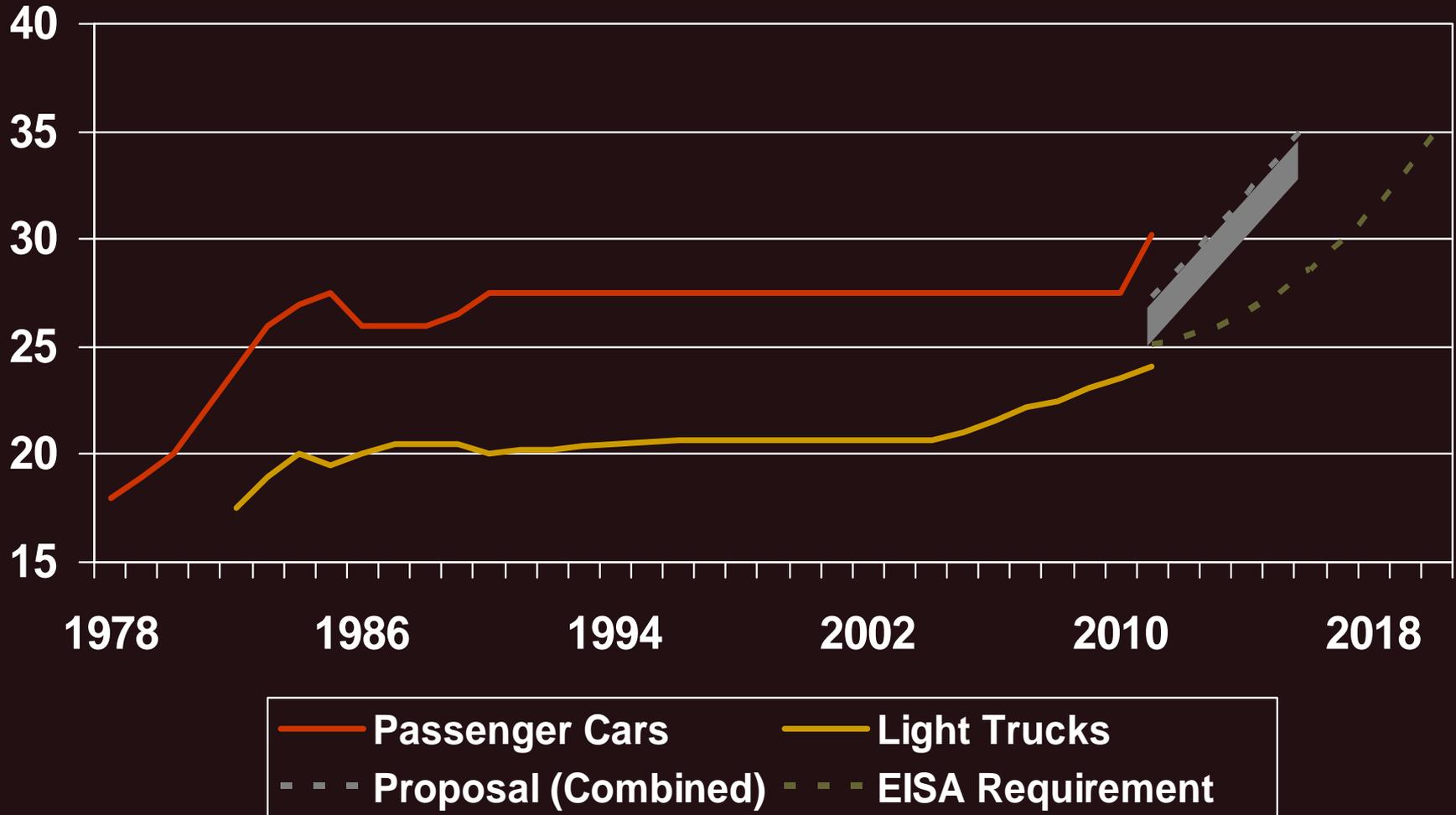
So How Would Attribute-Based Standards Work?

- Under NHTSA's MY2011 Rule:
 - Size-based standards
 - Mathematical function that defines "target" fuel economy for each vehicle based on its size (footprint)
 - No individual vehicle must meet its target, but a manufacturer's average fuel economy must meet or exceed the average of the targets

Size-Based Standards – MY2011 Passenger Car Standard



Historic and Future CAFE Standards



EPA's Proposed Endangerment Finding

- April 2009, EPA *proposes* to find:
- “Endangerment”:
 - Greenhouse gases in the atmosphere threaten the public health and welfare of current and future generations
- “Cause or Contribute”:
 - GHGs from new motor vehicles and motor vehicle engines contribute to the atmospheric concentrations of these key greenhouse gases and hence to the threat of climate change
- If findings finalized, EPA *is required* to regulate GHGs from autos – may trigger regulation of other sectors

EPA's and NHTSA's Authorities

■ EPA

- Clean Air Act – Authority to regulate greenhouse gas emissions
 - No authority to regulate fuel economy'
- Clean Air Act *requires* vehicle emissions standards if EPA completes “cause or contribute” finding
- California may petition EPA to establish state standards

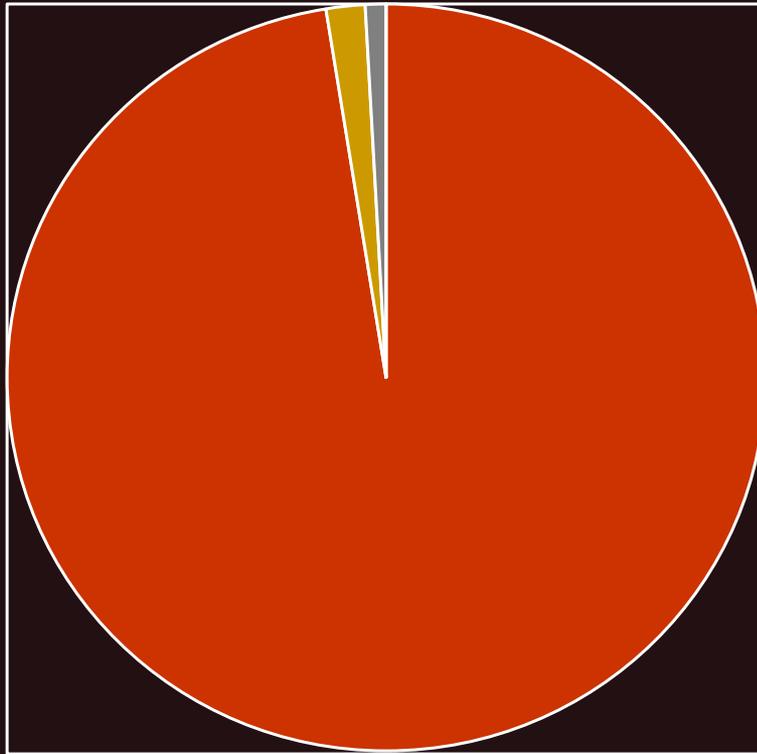
■ NHTSA

- Energy Policy and Conservation Act (EPCA) – Authority to set CAFE standards
 - No authority to regulate GHGs
- States *explicitly* preempted from setting fuel economy standards

Reduction Strategies Under CA Program

- Higher fuel efficiency (for CO₂ reduction)
 - More efficient engines and transmissions
 - Lower rolling and wind resistance
 - Lighter weight
 - Hybrids, Plug-in hybrids
- Lower-carbon alternative fuels (CO₂)
- Improved air conditioner systems (HFC-134a)
- Improved emissions control systems (CH₄, N₂O)

But CO₂ is the Key Greenhouse Gas



- Percentage of Uncontrolled CA Passenger Vehicle Emissions in 2020
 - CO₂: 97.4%
 - HFC-134a: 1.8%
 - N₂O: 0.7%
 - CH₄: 0.1%

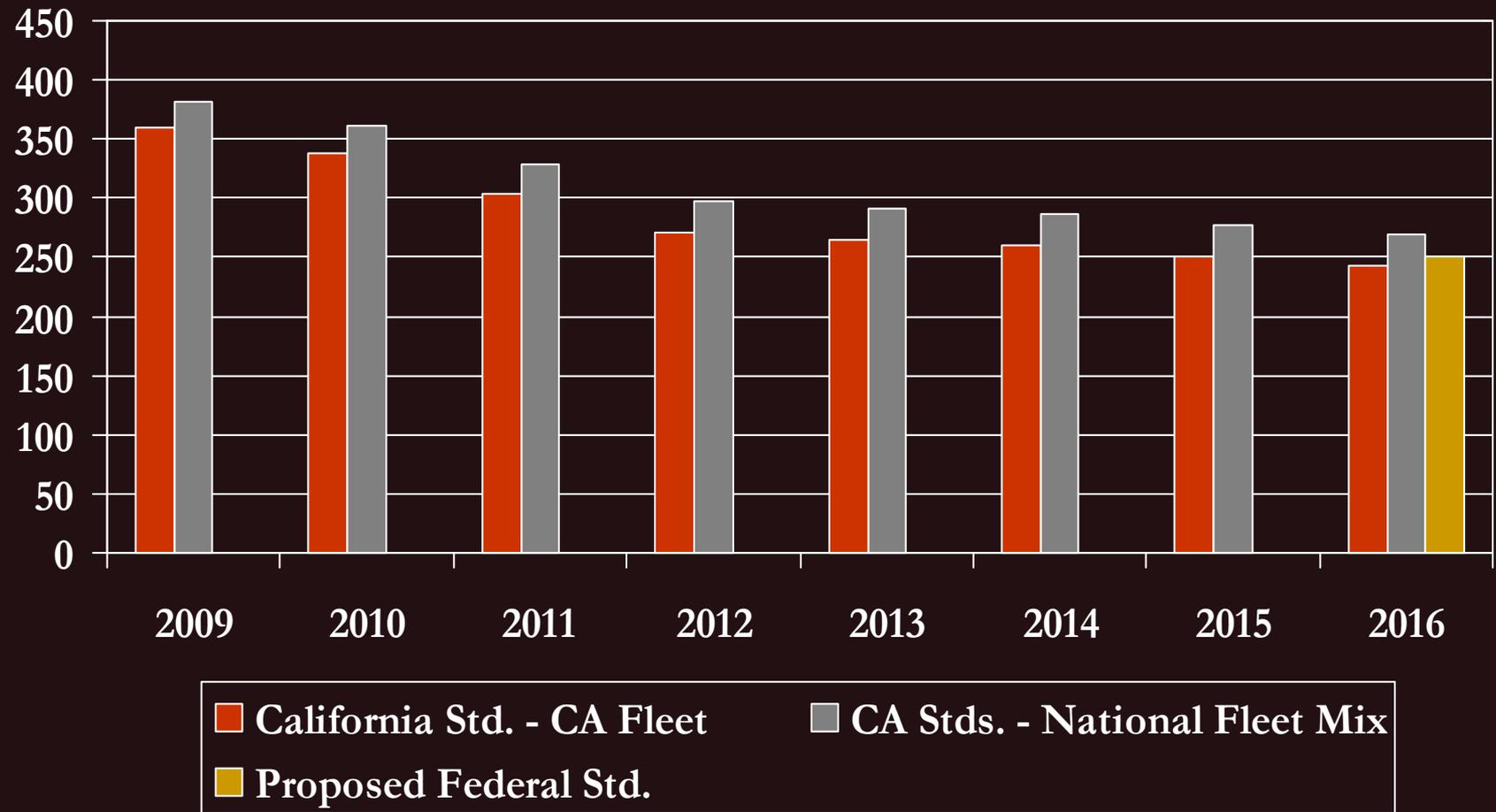
■ Carbon Dioxide ■ HFC-134a
■ Nitrous Oxide ■ Methane

The Administration Proposal

- “One national standard”
- But actually separate standards for CAFE, GHGs
 - NHTSA and EPA to coordinate, and to the extent they can, harmonize standards
- Commitments from automakers, California



CA and Federal Greenhouse Gas Emissions Standards (grams/mile)



Source: California Air Resources Board, EPA

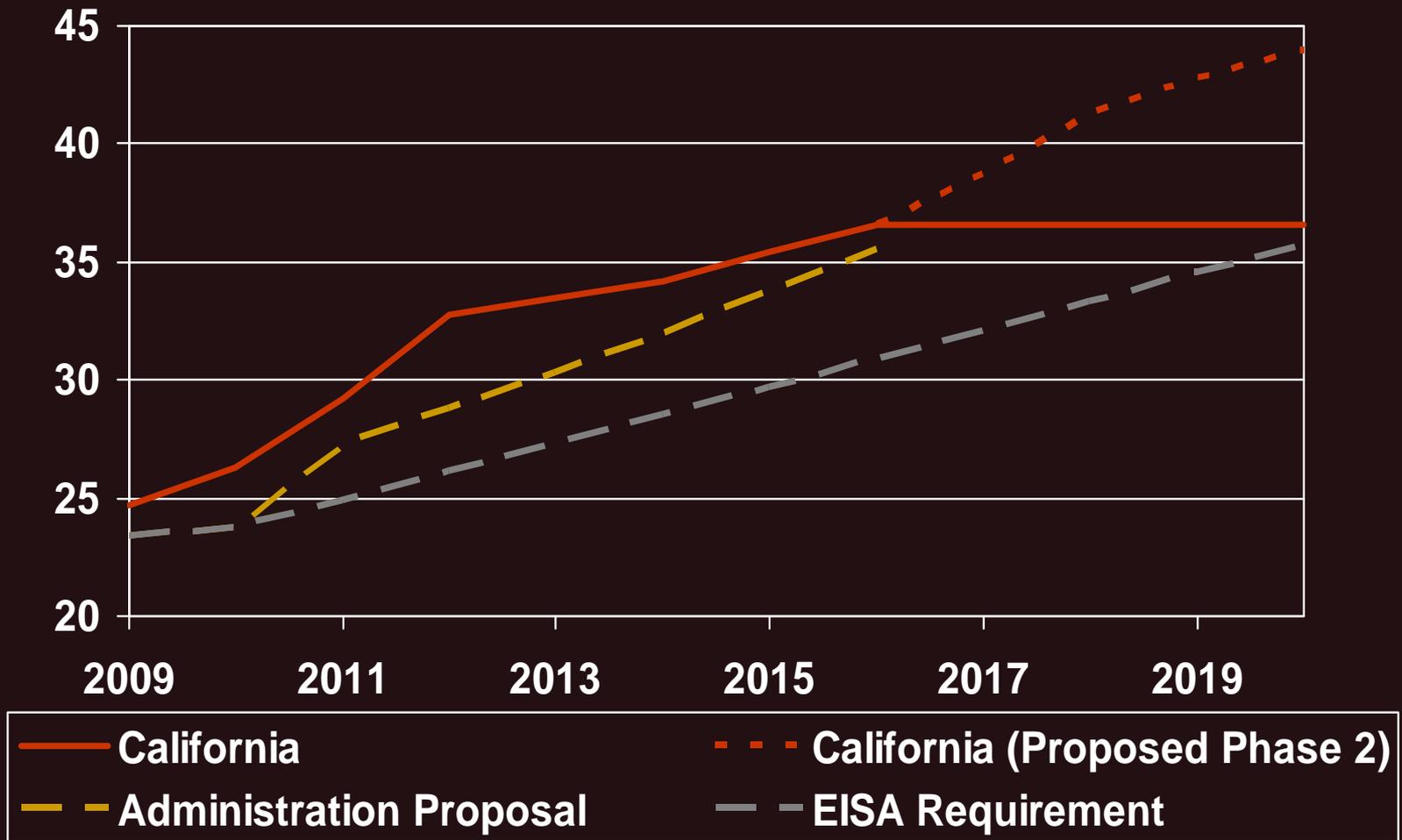
The Administration Proposal – When is 35.5 mpg not 35.5 mpg?

- Widely stated target of 35.5 mpg CAFE by MY2016
 - 35.5 mpg number derived from EPA's target of 250 g CO₂ eq./mile
 - But CO₂ is not the only greenhouse gas – EPA expects savings from HFC reductions
-

CAFE Standard Likely Below 35.5 mpg

- “If the automotive industry were to achieve this CO₂ level all through fuel economy improvements, this would equate to achieving a fleet average level of 35.5 mpg. However, it is expected that most companies would also apply some air conditioning improvements to reduce GHG emissions. This would not translate into fuel economy improvements, so on average we expect the fuel economy improvements to be somewhat below the 35.5 mpg value”

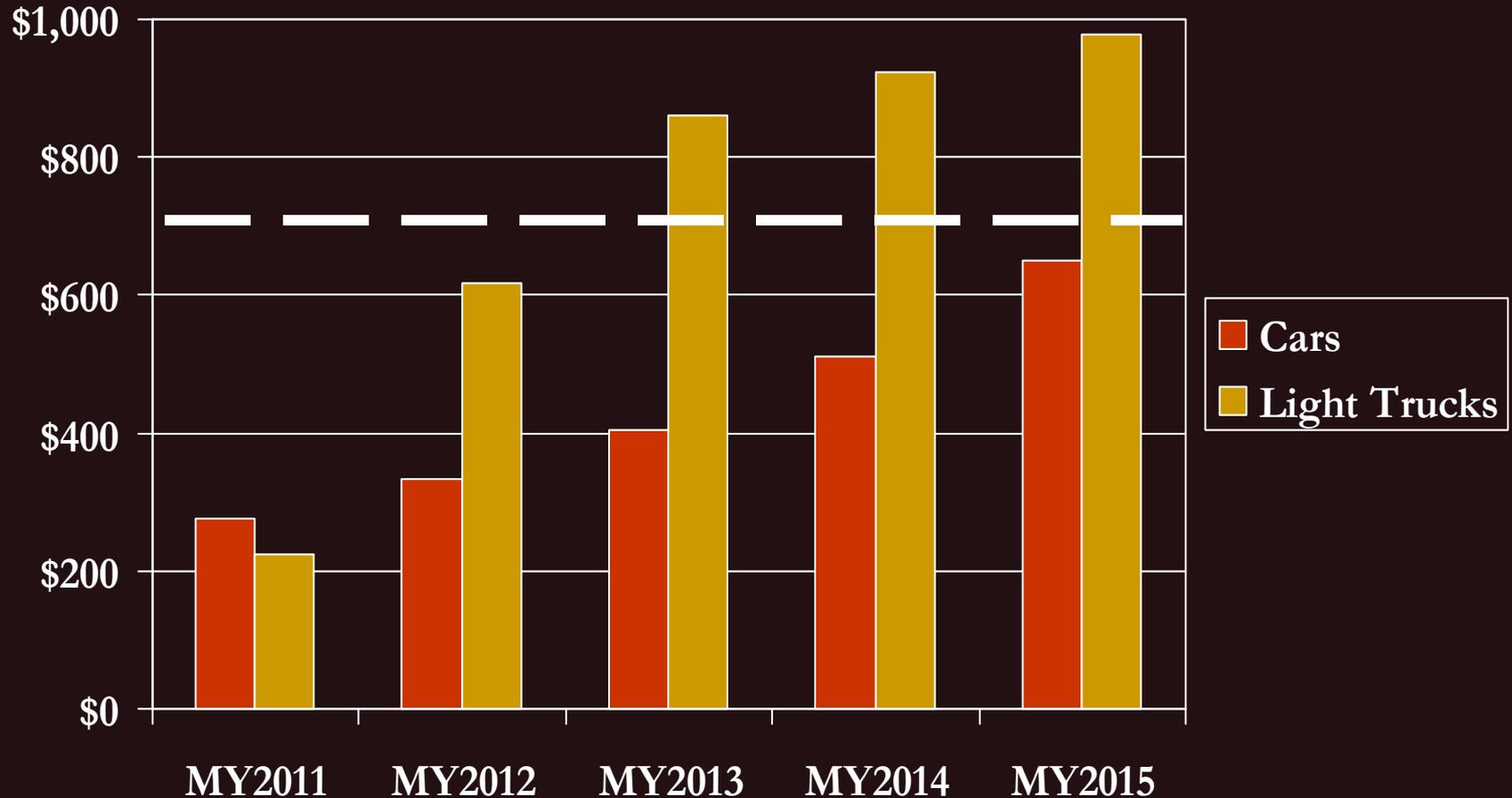
Estimated Fleet Average Fuel Economy (mpg) from CAFE and California's GHG Program



Estimated Cost of Proposal

- Obama Administration estimates \$1,300 average increase from MY2010
 - Includes \$700 increase due to EISA requirements
 - Plus \$600 additional increase from even tighter standards
- No details on how those costs were derived
 - These estimates will likely be criticized as low, but are consistent with estimates from Bush Administration April 2008 proposal

Per-Vehicle Costs to Implement NHTSA's April 2008 CAFE Proposal

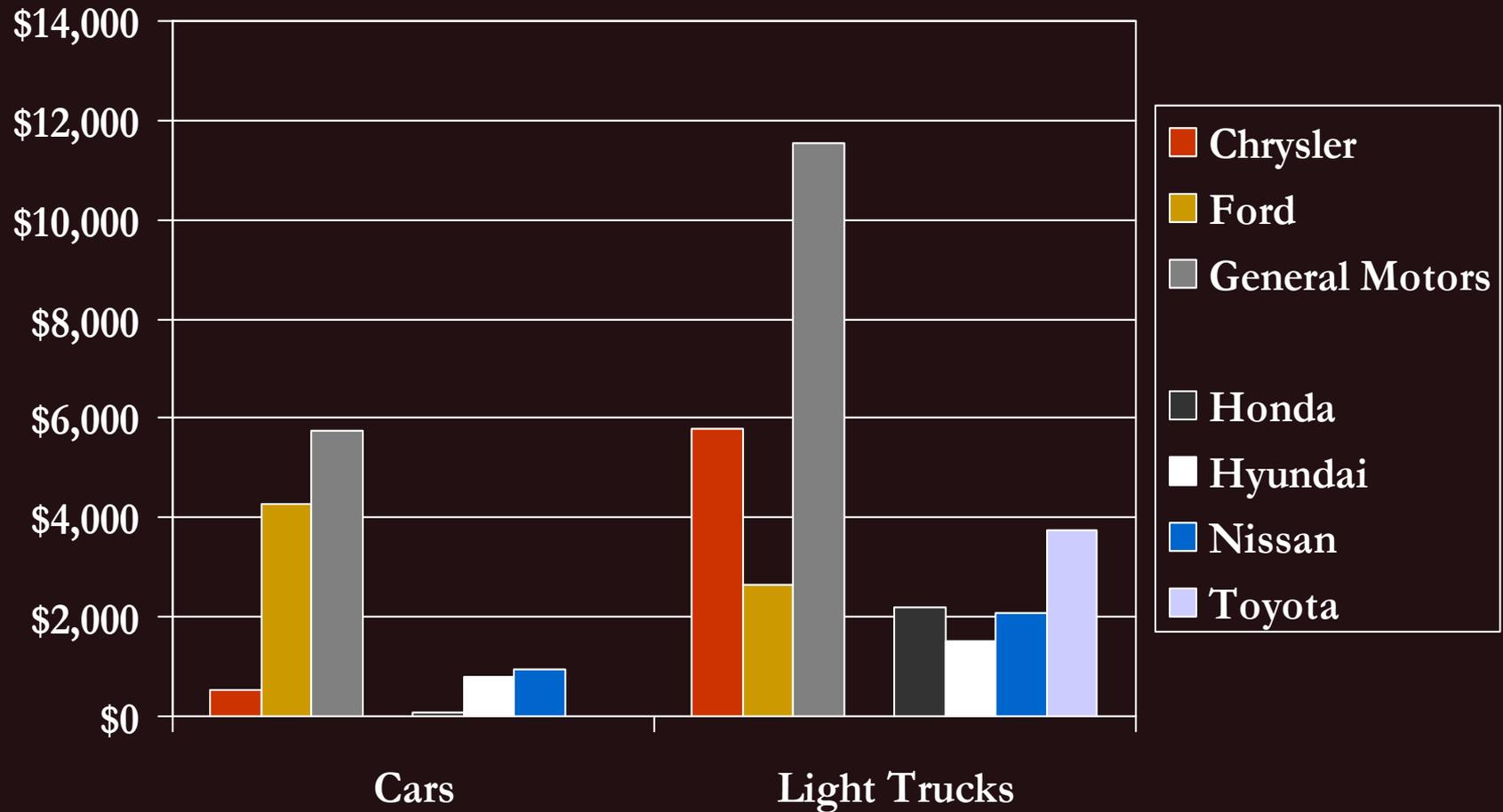


Source: NHTSA, Preliminary Reg. Impact Analysis for April 2008 Proposal

Differential Impacts on Automakers

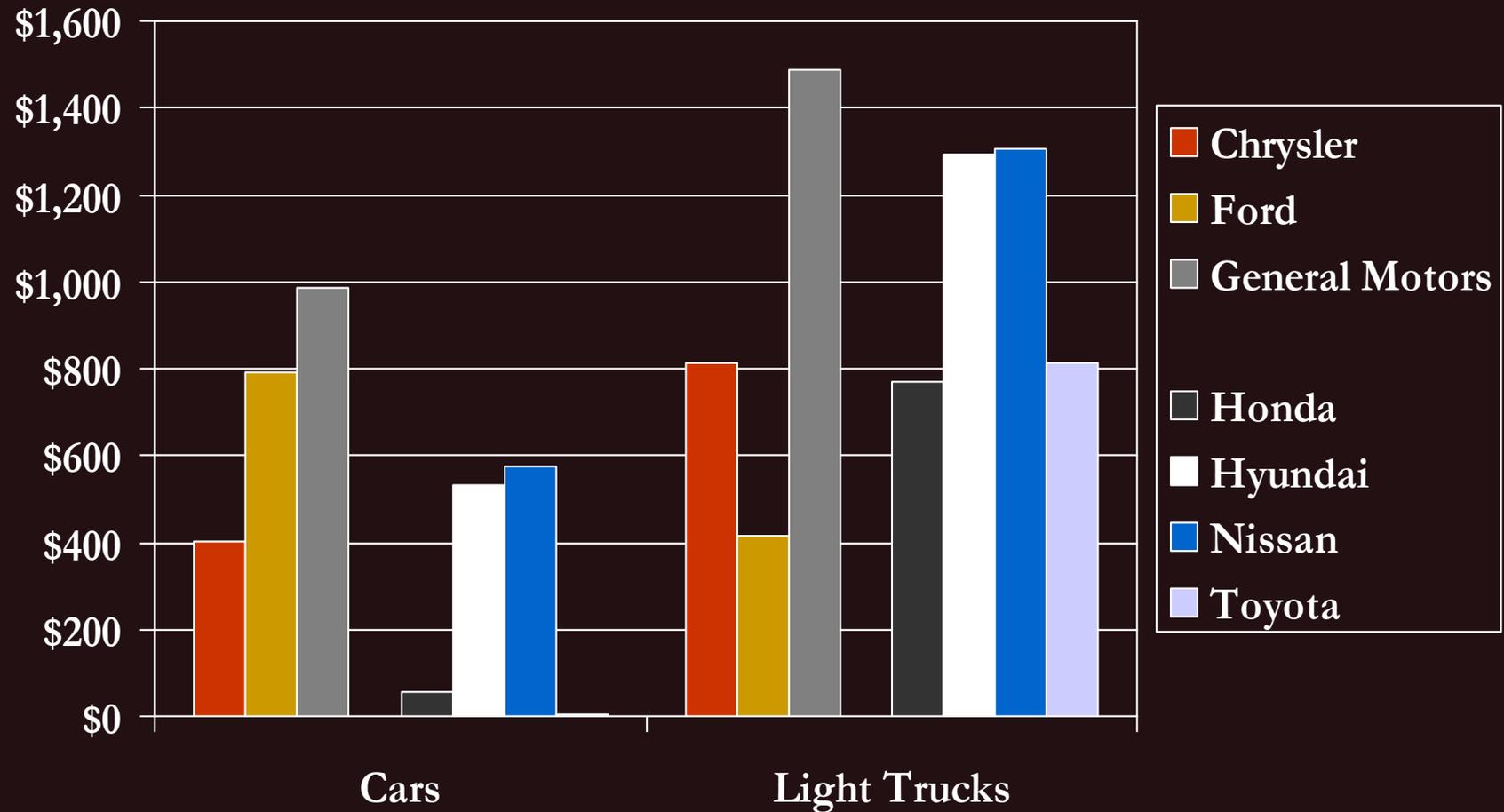
- Proposal would incorporate NHTSA's size-based "S-curve" system
 - instead of CA's class-based averages
- But because of design of S-curve, some automakers do better in some classes, worse in others
 - Unfortunately for GM, they face the biggest challenge regardless of vehicle class
 - But Nissan and Hyundai also face high per-vehicle costs in both passenger car and light truck classes

Total Costs for Each Automaker Under April 2008 Proposal (\$millions)



Source: NHTSA, Preliminary Reg. Impact Analysis for April 2008 Proposal

Per-Vehicle MY2015 Incremental Cost for Each Automaker Under April 2008 Proposal



Source: NHTSA, Preliminary Reg. Impact Analysis for April 2008 Proposal

Other Legislation Would Affect the Auto Industry

- Waxman-Markey climate change bill
 - Markup completed by the Energy & Commerce Committee May 21
 - Major regulation of greenhouse gas emissions – will likely raise gasoline prices
 - Share of allowances to automakers to develop advanced vehicles – could easily be \$3 billion per year (or more)
 - “Cash-for-Clunkers” provision to motivate auto sales and promote fuel economy
- Other bills include Low-Carbon Fuel Standard proposals (dropped from Waxman-Markey)

Thank You

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