Vehicle Fuel Economy and Greenhouse Gas Regulations

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Topics

• CAFE History and Background
• Energy Independence and Security Act of 2007
• NHTSA Proposed CAFE Rulemaking
• CA AB1493
• EPA Greenhouse Gas Proposal
• Conclusions
CAFE History

Model Year

CAR

TRUCK
Toyota’s Car CAFE Performance (’99-’08)
Toyota’s Truck CAFE Performance (’99-’08)

- Model Year: 1999 to 2008
- MPG: 19.0 to 25.0
- Toyota
- Industry Average

The graph shows Toyota’s Truck CAFE Performance from 1999 to 2008, with an estimated value for 2008.
Toyota's Overall CAFE Performance ('99-'08)

Model Year

mpg


Toyota

Industry Average

23.0 24.0 25.0 26.0 27.0 28.0 29.0 30.0

Est.
CO2 Savings from Toyota Overcompliance

Using NHTSA Summary of Fuel Economy Performance March 2008
Assumes 125,000 mile lifetime and 15% on-road FE reduction
EISA 2020 CAFE Target

35 mpg (min) combined fleet by 2020

EISA Trajectory (car + truck)
Reformed CAFE Concept

**New CAFE System (2011 model year)**

- Target based on size of vehicle
- Head-to-head fuel economy within each class is more important
- Technology needed on all size classes

**“Old” CAFE System**
- Smaller vehicles provided a benefit
- Concern about small vehicle safety
- Concern about manufacturers with greater number of larger vehicles

**Vehicle Models**

- (+)
- (-)
- (+) (-)

**Size-Based CAFE Standard**

- Flat CAFE Standard
- Size-Based CAFE Standard

**Graph**

- Smaller/Lighter
- Bigger/Heavier
- Fuel Economy
Proposed Size-Based CAFE Targets

Anti-Backsliding Standard for Domestic Car Fleet

<table>
<thead>
<tr>
<th>Model year</th>
<th>Minimum Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>28.7</td>
</tr>
<tr>
<td>2012</td>
<td>30.2</td>
</tr>
<tr>
<td>2013</td>
<td>31.3</td>
</tr>
<tr>
<td>2014</td>
<td>32.0</td>
</tr>
<tr>
<td>2015</td>
<td>32.9</td>
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</tbody>
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MPG Target for Vehicle

WB x TW (tire center @ ground)
NHTSA Proposal vs. EISA

- **NPRM Combined Standard**
- **Nominal EISA Rate (3.3%)**

NHTSA NPRM 4.5%/year
EISA Nominal Rate 3.3%/year
What Does 4% per Year Really Mean?

<table>
<thead>
<tr>
<th>Typical Cycle</th>
<th>Gen 1 Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Year 4</th>
<th>Year 5</th>
<th>Gen 2 Year 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>4% CAFE Scenario</td>
<td>Base FE</td>
<td>Minor mods.</td>
<td>Gen 1 + △%</td>
<td></td>
<td></td>
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</tbody>
</table>

22% improvement at each generation requires major modifications in mid-cycle (substantially higher cost) and/or multiple technologies at each new redesign

| 4% CAFE Scenario | Base FE | Major mods.? | Gen 1 + 22% |
Compliance Flexibilities

- NHTSA also has authority to establish a credit trading program among manufacturers
EI SA Summary

- Much more complicated regulatory program than in the past
  - 3 regulated fleets (import car, domestic car, truck)
  - Anti-backsliding standards (domestic car)
  - Reformed attributed-based structure (all fleets)
  - FFV credit phase-down
  - New inter-fleet credit transfers
- Extremely challenging compliance planning
- Final rule in November 2008
CA AB1493 (Pavley)

- Adopted in 2002 (regulations adopted in 2004)
- Vehicle ghg standards (not attribute-based)
- Requires waiver of federal pre-emption
  - EPA has thus far denied CA a waiver
  - Both Obama and McCain have expressed support for a waiver
- CA beginning to discuss “Pavley II” for 2017 and beyond
CA AB1493 Single Number Standards

- Nominal EISA Rate (3.3%)
- AB1493 (and Pavley 2 Discussion Levels)

Model Year:
- PC + LDT1 (under discussion)
- AB1493
- LDT 2 (under discussion)
- EISA

Years: 2009 to 2020

MPG: 20.0 to 66.0
States Adopting/Considering CA Standards

http://www.pewclimate.org/what_s_being_done/in_the_states/vehicle_ghg_standard.cfm

Poised to Adopt CA Vehicle GHG Standards
State-by-State Compliance Challenge

- Fleet mix varies by state
- For various reasons, consumers in some states purchase smaller or larger cars/trucks than in other states
- Toyota’s new fleet fuel economy can vary by over 5 mpg from state to state
- This can cause the stringency of the standard to vary significantly state-by-state
- Compliance could require technology application on some models in certain states that would not be needed for compliance in other states
Hypothetical Example – State-by-State Compliance

- 2011MY = 39 mpg
- 33 mpg
- +6 mpg = 15%
- +4 mpg = 11%
- 38 mpg
- 35 mpg
- 18%
EPA Adv. Notice of Proposed Rulemaking

- Supreme Court – EPA has authority to regulate GHG under the Clean Air Act
- EPA must make an “endangerment finding”
- Could trigger mobile source and stationary source regulation
- Seeking public comment (by late November)
- Possible mobile source regulation
  - Vehicle ghg limits
  - Fuel carbon limits
  - Cap-and-trade
  - Etc.
EPA Greenhouse Gas Regulation

Model Year

- Nominal EISA Rate (3.3%)
- EPA ANPRM Concept
The Net Result – Myriad Levels

- NHTSA NPRM Combined Standard
- EPA ANPRM Combined Standard
- Nominal EISA Rate (3.3%)
- Pavley 1 & 2 (est)
The Net Result – Myriad Structures/Compliance Plans

Federal Program: (nationwide requirements)
- 3 Separate Fleets:
  - Domestic. Car Anti-Backsliding
  - Reformed Structure
  - FFV Credits
  - Inter-fleet Credits
- CA + CA Adopters: (~40% of nationwide fleet)
  - 2 Separate Fleets
  - Single # Structure
  - FFV Credits if Fuel Used
  - No Inter-fleet credits

Combined Result:
- Car Reformed + LDV Single #
- Truck Single #

Import, Domestic

Another Possible Layer with EPA GHG Regulation with
- Reformed system?
- Single # system?
- Cap-and-trade?

Separate Compliance in Multiple States
Conclusions

• Toyota will continue to aggressively pursue deployment of conventional and advanced technology vehicles to reduce emissions and improve fuel economy.

• Toyota favors a single national program
  - A single set of requirements for technology planning
  - With over 60 vehicle configurations and products on various different redesign cycles, we have discrete and limited opportunities to deploy new technology.

• Planning for multiple programs, with multiple structures, with various compliance levels, with different flexibility provisions, and administered by various federal and state agencies with different statutory obligations, is an unmanageable situation.
Thank You!

Questions?