



**Vehicle Efficiency and Greenhouse Gases – Where  
Do We Go From Here? Part 2  
Alternative Approaches to Greenhouse Gas  
Reduction**

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# Fuel economy initiatives: Who's doing what?

- **Europe**
  - Voluntary agreement (33% gain 1995-2008)
  - Implies ~ 41 mpg in 2008
- **Japan**
  - Mandatory weight class stds (23% gain 1995-2010)
  - Implies ~ 35.5 mpg in 2010
- **U.S.**
  - *EIA projection* of 25.7 mpg by 2010 (4% from '95)
  - New light truck standard: 22.5 mpg by 2007
  - Potential for California CO<sub>2</sub> standards



## **Key issues for U.S. action:**

- **NAS CAFE Panel report: Does a 30% increase make sense?**
- **Should the CAFE system be reformed? New structure? Tradable credits?**
- **Would safety really be reduced by higher standards?**



## European, Japanese progress so far:

- **Japan: 1995-2000 fuel economy increase: 5%**  
**(23% needed by 2010)**
- **ACEA: 1995-2001 fuel economy increase: 11%**  
**(33% needed by 2008)**



## European progress, 1995-2001: more details

- **CO<sub>2</sub> emissions: 185 g/km to 164 g/km, down 11.4%**
  - Gasoline: down 8.5%
  - Diesel: down 13.1%
- **Fuel economy: 31.0 mpg to 35.1 mpg**
  - Gasoline: 29.8 mpg to 32.2 mpg
  - Diesel: 35.7 mpg to 40.6 mpg
- **Changes in key fleet characteristics**
  - Mass: 1101 kg to 1198 kg, up 8.8%
  - Engine power: 63 kW (84 hp) to 75 kW (101 hp), up 19%
- **2001 diesel market share: 39.4%**



# Technology progress in Europe: Recent introductions and increased application

- **2-step variable valve lift**
- **Valvetronic**
- **Fully variable intake manifold**
- **2<sup>nd</sup> generation common rail injection systems**
- **6-speed automatic and automated manual transmissions**
- **Electric power steering**
- **Gasoline direct-injection engines**



## European prognosis:

- Annual CO<sub>2</sub> reduction rates, 1995-2001: 1.9%
- Required for 2001-2008: 2.1%
- ACEA, European Commission confident of attainment