CAFE: A Solution in Search of A Problem:

History, Economics, and Politics

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CAFE: A Solution in Search of a Problem

- **History**
  - Decentralized markets vs. centralized planning
- **Economics**
  - No economic justification -- no market failure
- **Politics**
  - Political “solution” in search of an economic problem

CAFE : A Brief History

- October, 1973: Nixon Wage/Price Controls turn small scale supply disruptions into large scale oil shortage and price shock
  - OPEC/World supplies flat from 1973-74
  - U.S.: only country with gasoline station queues
- Politicians all agree: “We’re running out of oil”
- All agree on policy goals:
  - Control consumption
  - Curtail imports
  - Protect consumers from gas price increases

One lonely exception: *The Economist* Dissents

In a 1974 editorial entitled “The Coming Glut of Oil,” *The Economist* editorializes:

“There is a case for arguing that the world is likely to be glutted with energy before the end of this decade.”

One Non-Issue: Global Warming

- "There are ominous signs that the Earth's weather patterns have begun to change dramatically. . ."
- "The central fact is that after three quarters of a century of extraordinarily mild conditions, the earth's climate seems to be cooling down."
  - "The evidence in support of these predictions has now begun to accumulate so massively that meteorologists are hard-pressed to keep up with it.
  - "In England, farmers have seen their growing seasons decline by about two weeks since 1950."

    "The Cooling World," *Newsweek* (April 28,1975)

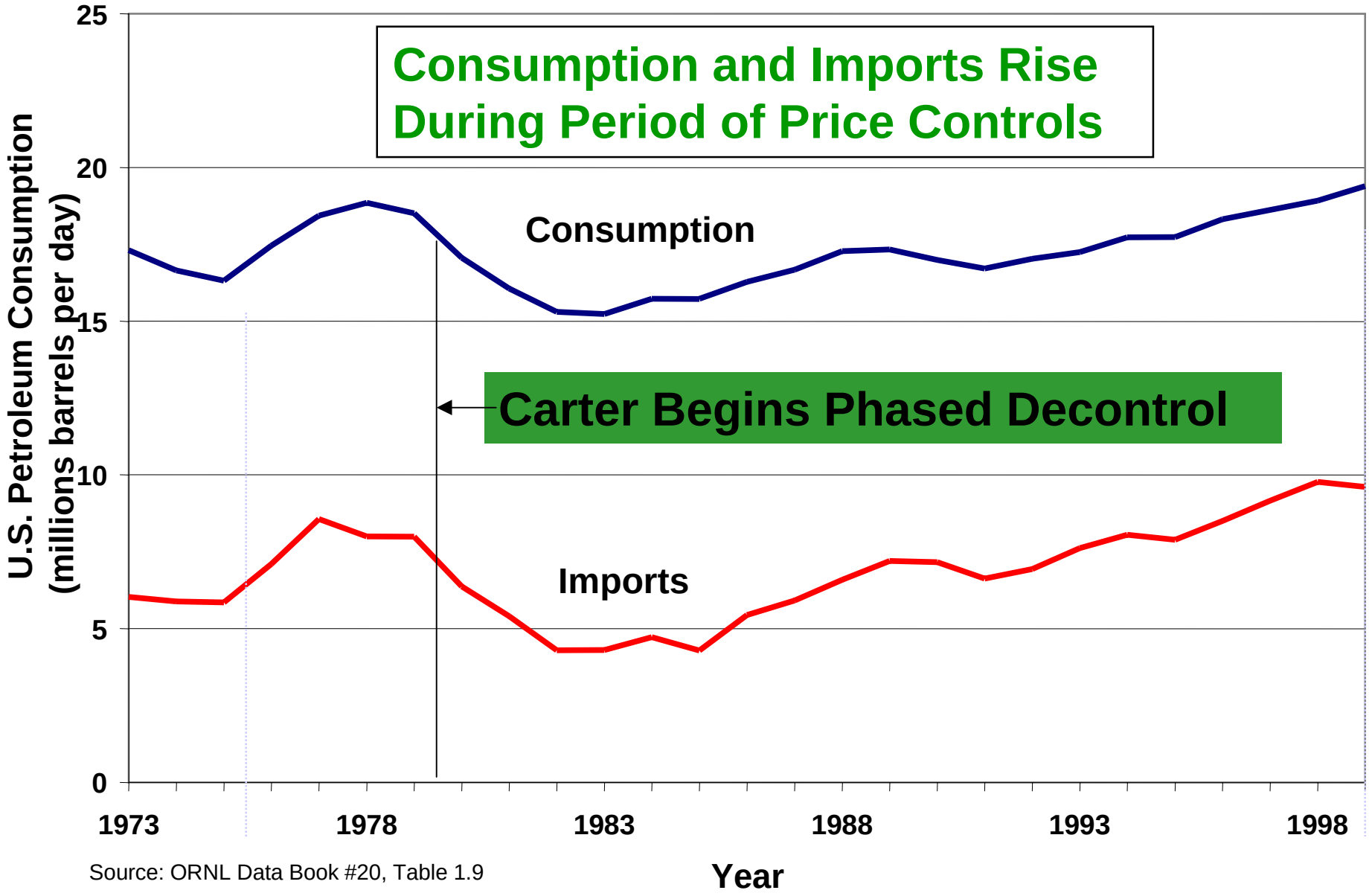
The Debate: Markets vs. Mandates

- President Ford and Chief of Staff Cheney propose elimination of oil price controls as way to spur conservation and domestic production
- Congress proposes regulations on everything from thermostats to refrigerators and autos

The Energy Policy and Conservation Act (EPCA) of 1975

- President Ford signs Energy Policy and Conservation Act in December 1975
- EPCA enacts CAFE and expands controls to “newly discovered” domestic oil
- Pres. Carter extends controls to new-new oil, adds windfall profits taxes, and adds entitlements to subsidize high-price foreign imports

U.S. Oil Consumption & Imports



Source: ORNL Data Book #20, Table 1.9

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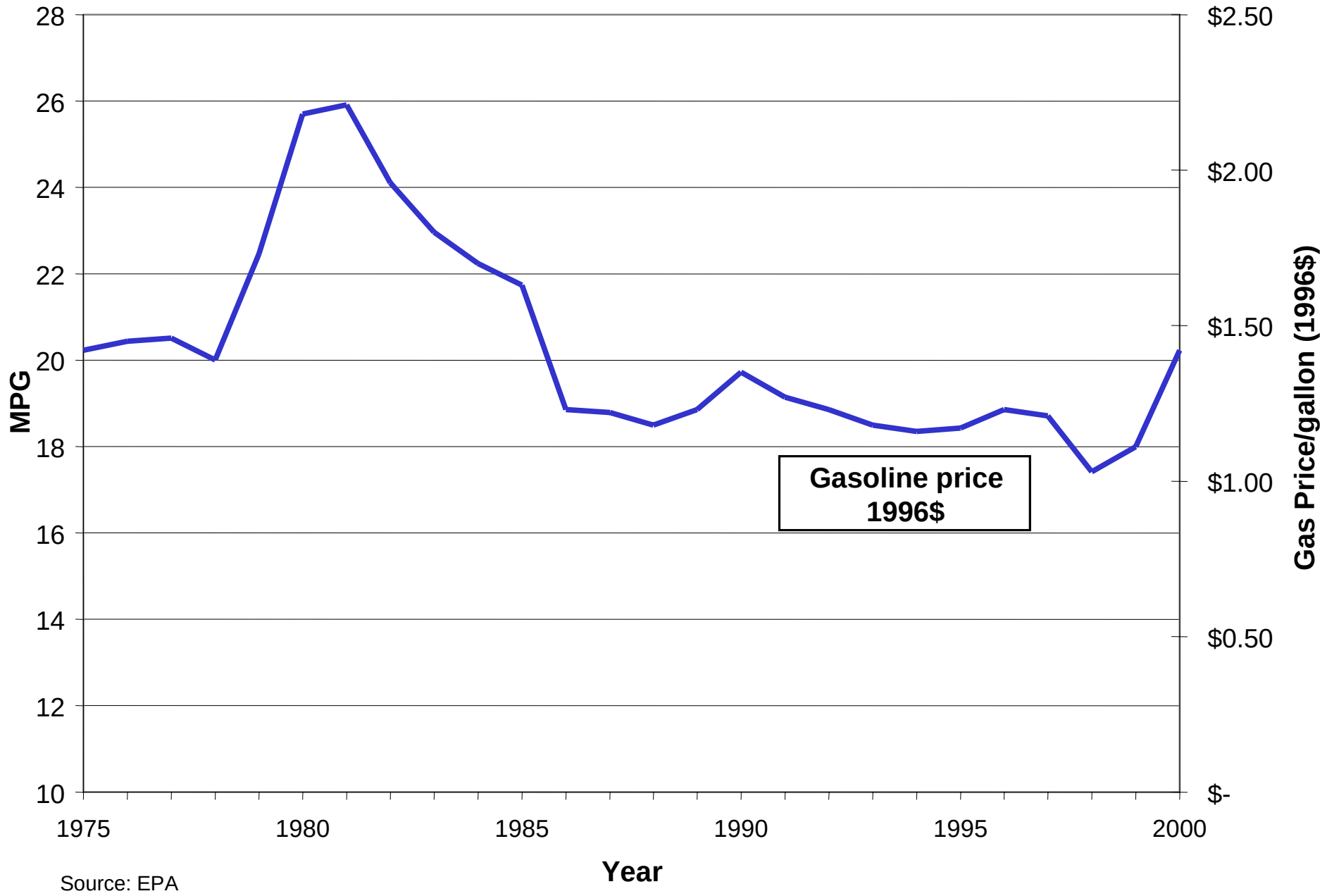
Gas Prices and CAFE Increases



Source: EPA

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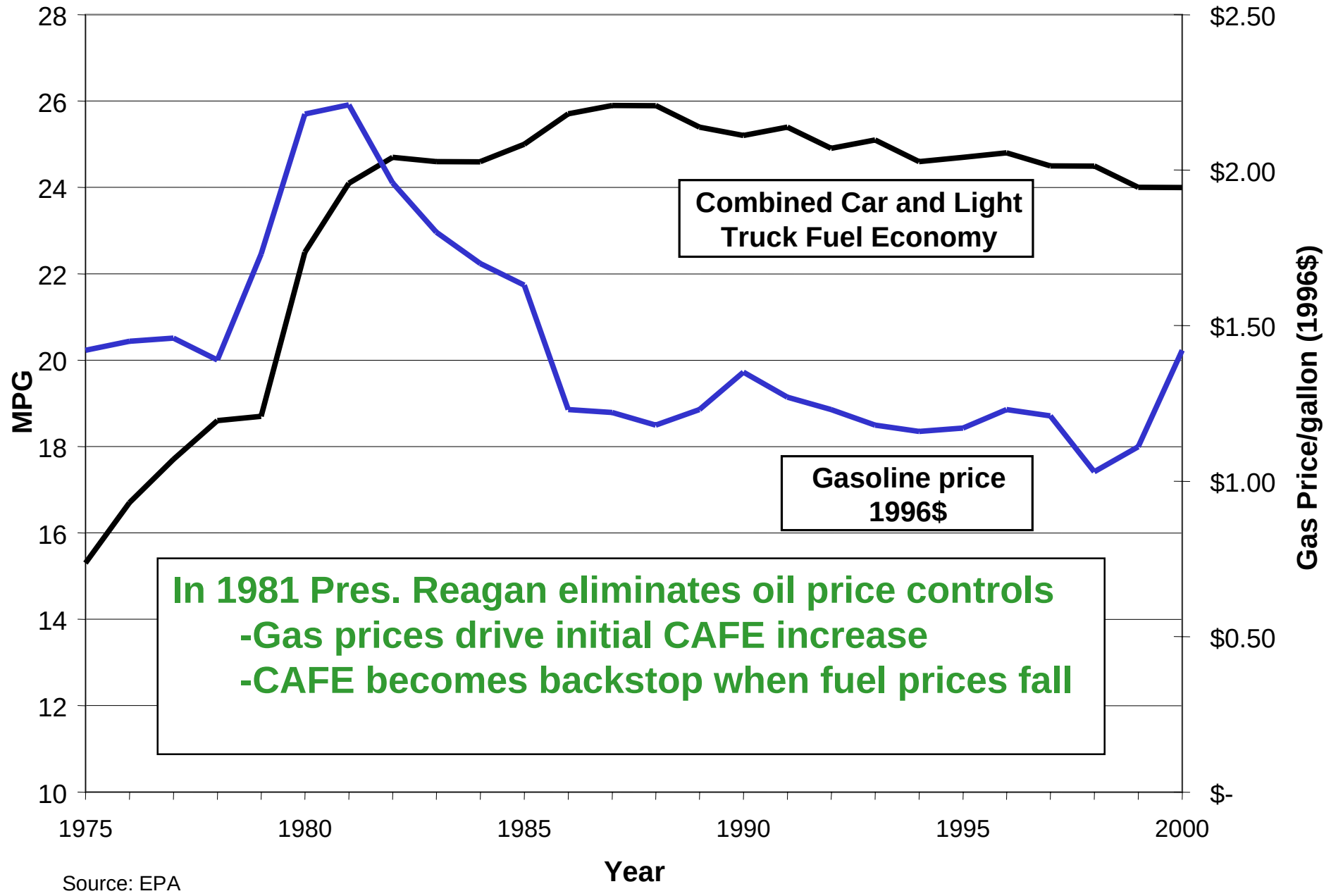

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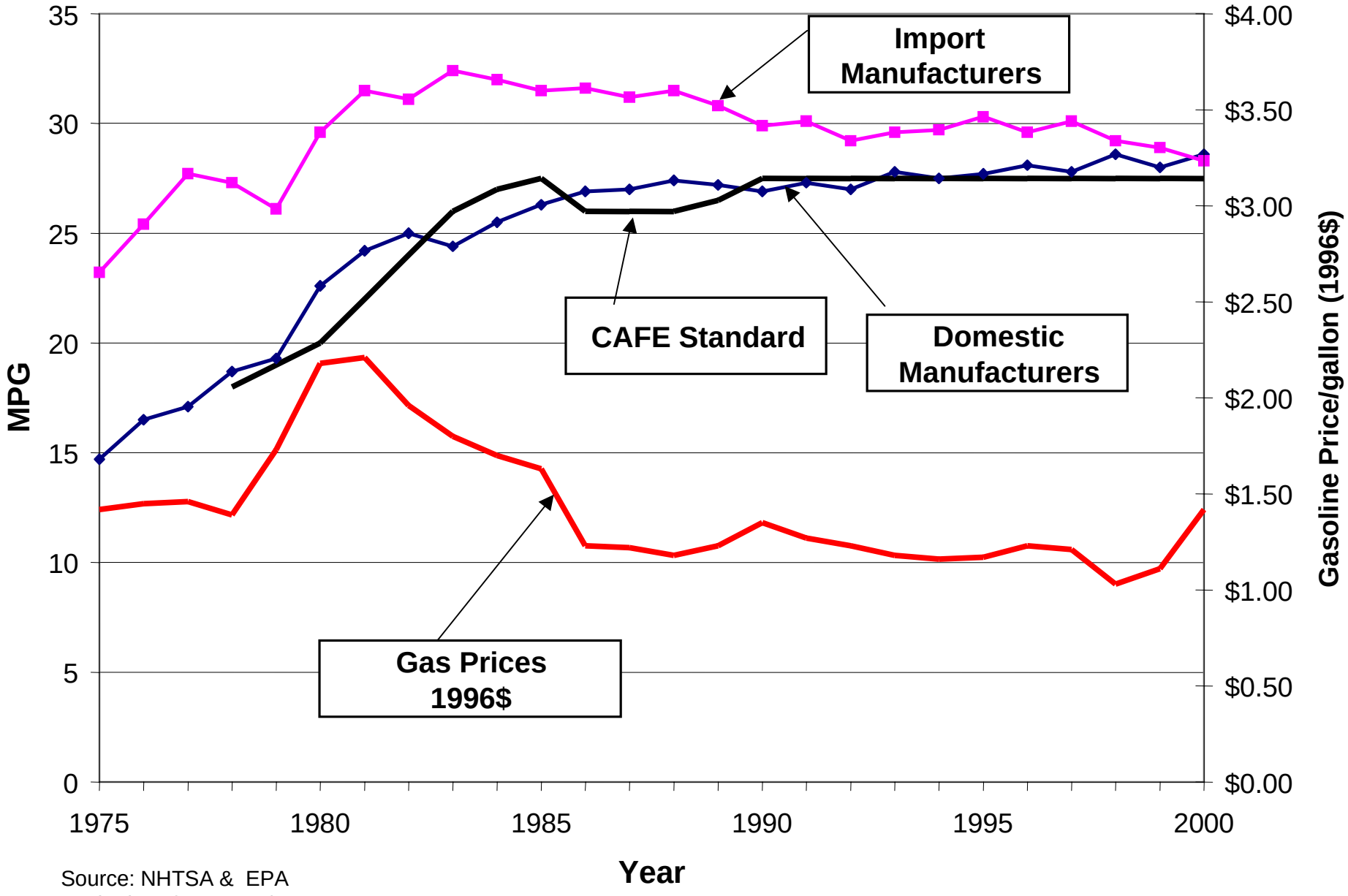
Domestic and Import Passenger Car Fleet CAFE



Source: NHTSA & EPA
Fuel prices from DOE/EIA

"Those Who Ignore the Lessons of History . . ."

- In 2000, price spikes bring back cries of "energy crisis" and calls for increased CAFE
- In 2001, history comes full circle:
  - Former Ford Chief Cheney's Task Force defers to pending Study of Fuel Economy by National Academy of Sciences (NAS)
  - Suggests 3 mpg increase would eliminate half of existing "shortfall"
- Congress rejects tighter standards
- NHTSA raises light truck standard by 1.5 mpg for MY 2005-2007 or 7.2%

Economics

- NAS “Break-Even” Analysis: consumers willing to pay for 16% to 47% fuel economy
  - Technology to be developed over 10-15 years
- Transportation Sector Externality of $0.26 per gallon of gasoline
  - $0.02 for environmental costs
  - $0.12 for oil import dependence
  - $0.12 for global warming
- Validates historical safety costs of CAFE/Weight Reduction
  - But said CAFE could be restructured to deal with the problem (i.e., CAFE standards set by weight class)
- Taxes better than mandates; yet did not reject CAFE

NAS Break Even Analysis

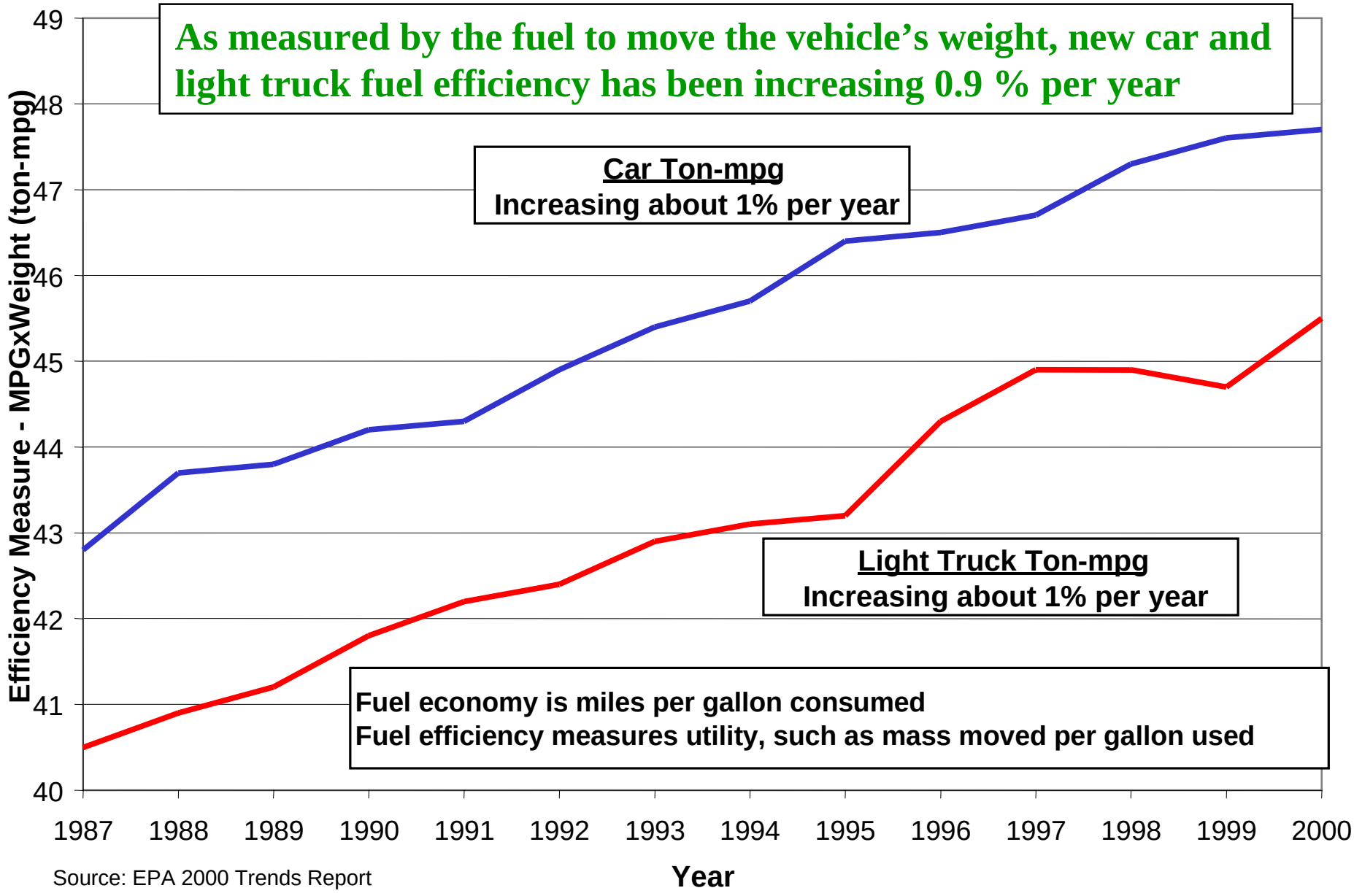
- 16% to 47% FE increases over 10-15 years
- Break-even levels defined as FE increases that will be "cost-effective" in "real world markets"
- Technology improvement = reduction in fuel required to move a vehicle of a given amount of mass **or** increase in mass moved by given amount of fuel
- NAS assumes consumers will spend technology improvements entirely on fuel economy increases
- Says fuel economy investments are "justified" to the point where "marginal costs of additional fuel saving technologies equal the marginal benefits to consumers in fuel savings"

Break-Even Analysis Violates the Equal-Marginal Principle

The Equal-Marginal Principle: Econ 101

- Consumers maximize their satisfaction or utility only when they have "equalized the marginal utility per dollar of expenditure across all goods" [Pindyck/Rubinfeld, *Microeconomics*, MIT/UC Berkeley, emphasis in original]
- Consumers don't buy fuel economy; they buy a vehicle and allocate their money to buy the car that maximizes the value per dollar of outlay
- Fully satisfied only when value per dollar spent is same across all attributes
- Fuel economy only one of the attributes

U.S. Industry Car and Light Truck Fuel Efficiency
As Measured by Fuel Economy Multiplied by Vehicle Weight



Source: EPA 2000 Trends Report

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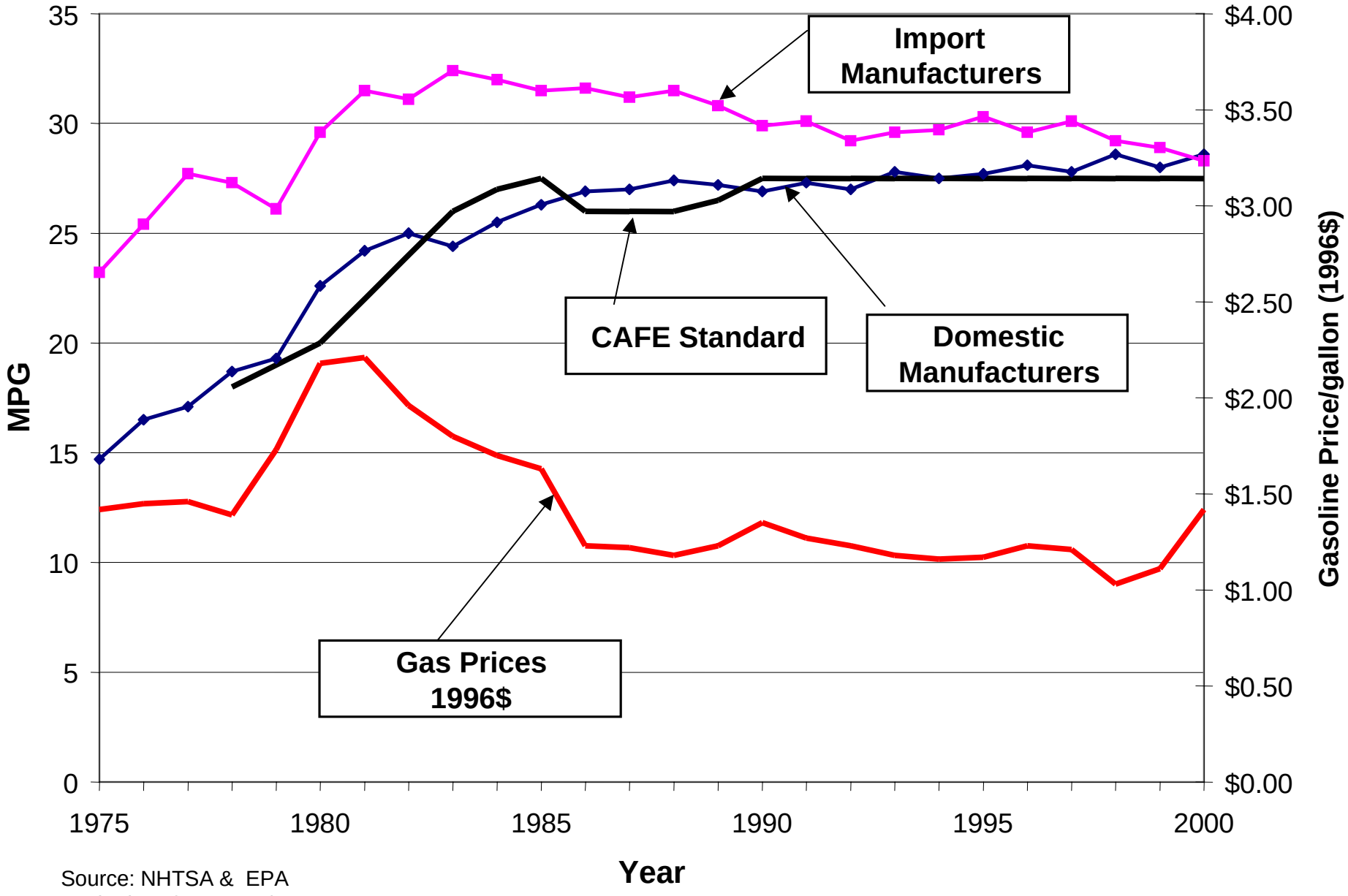
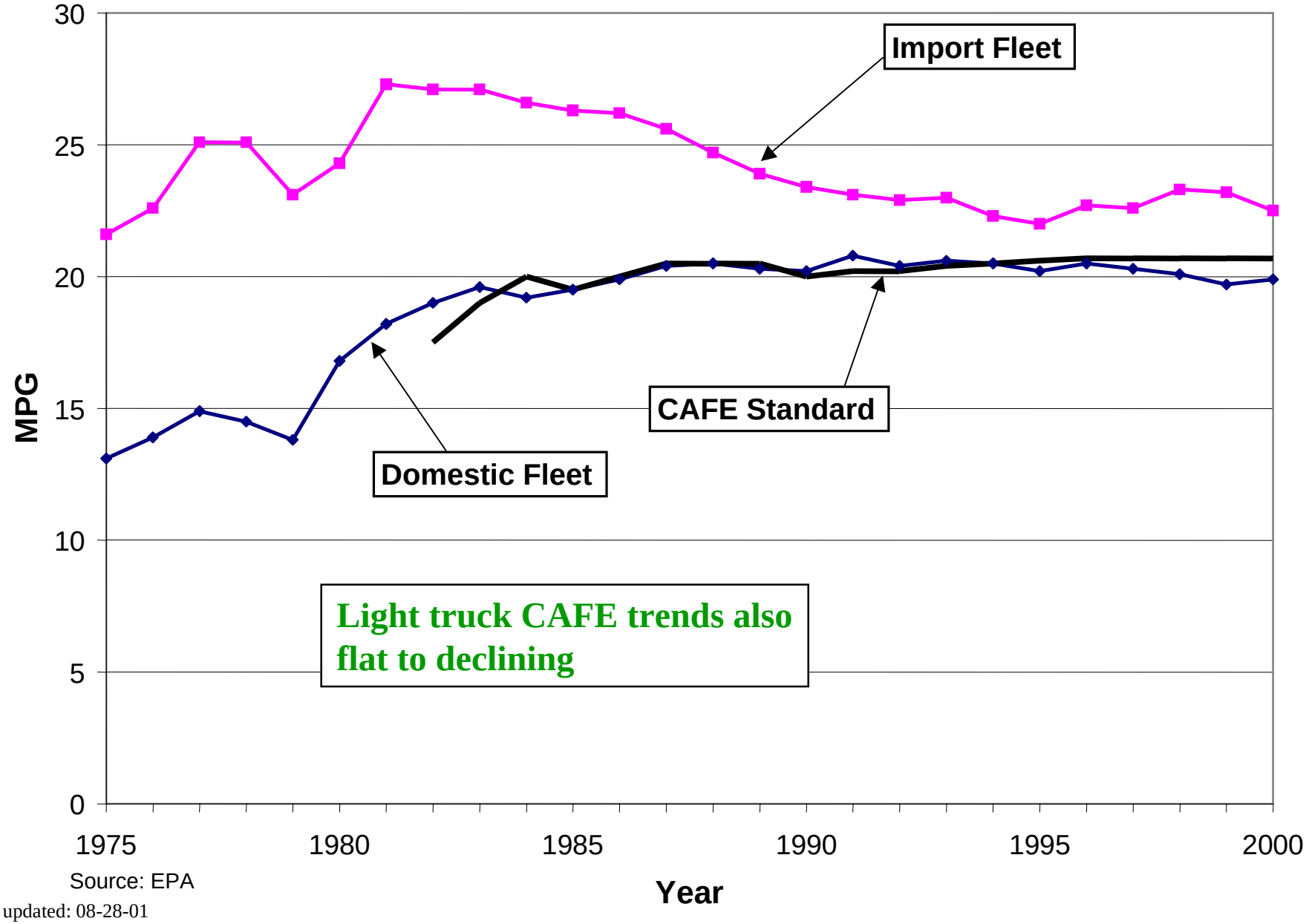


Source: NHTSA & EPA
Fuel prices from DOE/EIA

Domestic and Import Light Truck Fleet Fuel Economy



Source: EPA

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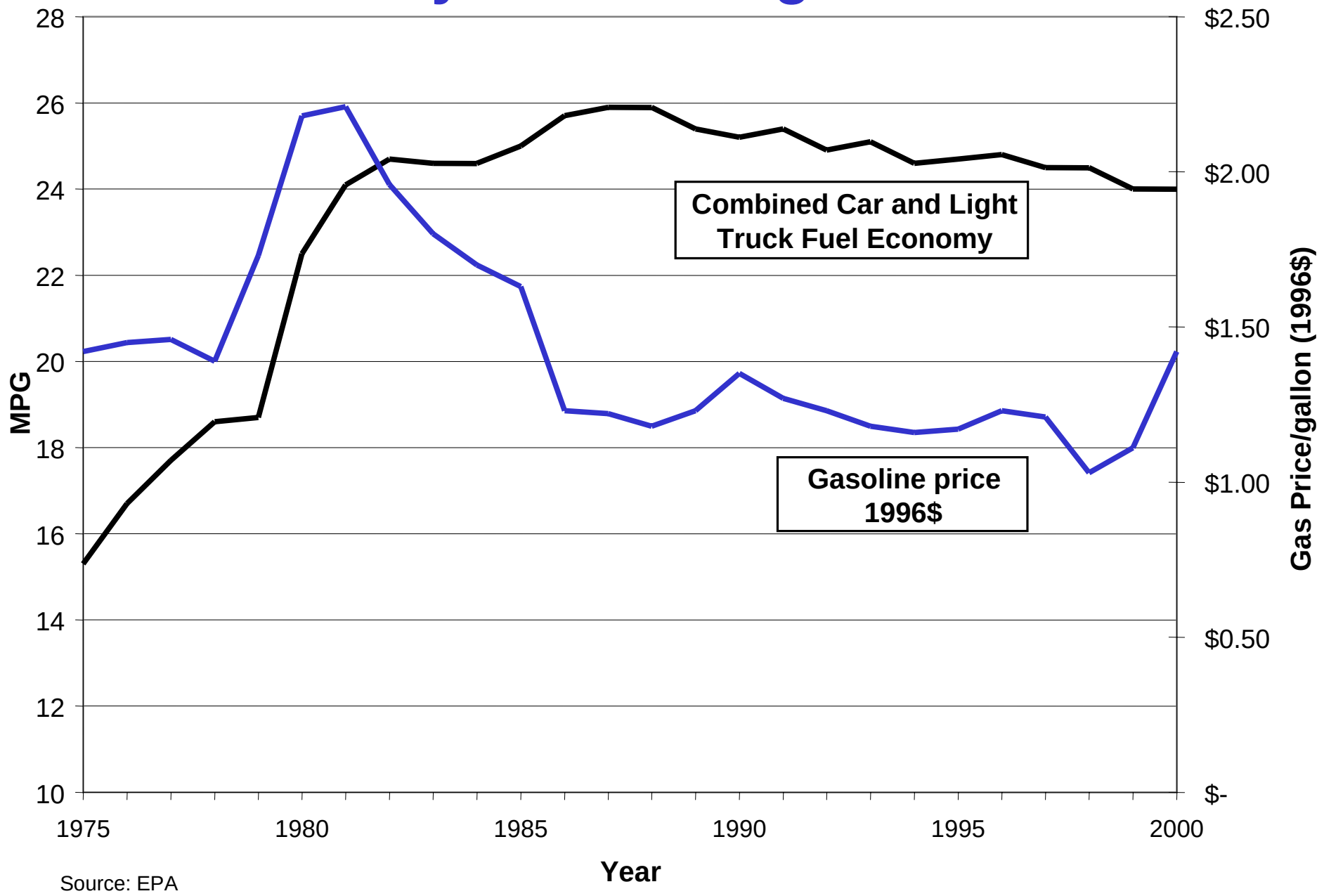
U.S. Industry Car and Light Truck CAFE



Source: EPA

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Consumer Purchase Reasons

RANK	REASON		
1	Reliability	14	Warranty Coverage
2	Well Made Vehicle	15	Dealer Service
3	Good Engine/Transmission	16	Power and Acceleration
4	Value for the Money	17	Interior Roominess
5	Durability (Long Lasting)	18	Exterior Styling
6	Safety Features	19	Quietness
7	Lease Terms	20	Future Residual Value
8	Price/Deal Offered (Lessees)	21	Cost of Service/Repairs
9	Price/Deal Offered (Buyers)	22	Interior Styling
10	Ride Comfort	23	Trade-in Value (Buyers)
11	Ease of Handling	24	Trade-in Value (Lessees)
12	Monthly Payment (Lessees)	***25***	***Gas Mileage (Fuel Economy)***
13	Manufacturer's Reputation	26	Seating Capacity

Source: MARITZ Marketing Research Inc, 2000 NVCS Report, Published October, 2000.

updated: 08-29-01

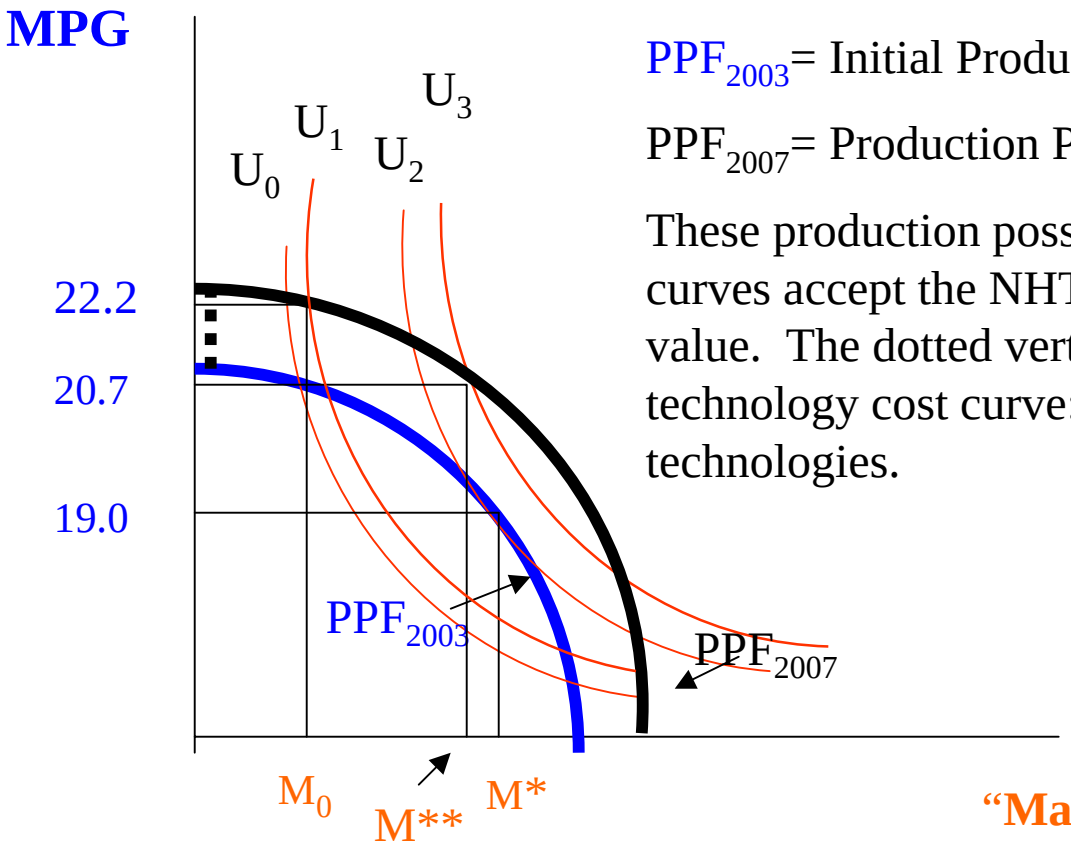
NHTSA Raises Light Truck Standard

- Sets 1.5 mpg increase or 7.2% Over Model Years 2005 through 2007
  - Finds Value of Fuel Savings Exceeds Cost of Additional Hardware for Increase (Break-even methodology)
  - Says consumers likely to spend entire amount of fuel efficiency gains on fuel economy
  - Assessments based on manufacturer projections
  - NHTSA's and manufacturers' projections biased upward over time
- Recognizes risks of higher CAFE, stating that it might adjust the 2007 standard if warranted by external conditions such as low gas prices

CBO Puts CAFE Risks in Perspective

- “Vehicles’ current level of fuel efficiency most likely reflects consumers’ trade-offs between fuel economy and other characteristics that drivers want, such as vehicle mass, horsepower, and safety.
- “The same technologies that can be used to boost fuel economy can be used to hold fuel economy constant while increasing the vehicle’s weight, mass, or power.
- “Thus, the fact that producers have done the latter rather than the former in recent years suggests that they have responded to buyers’ preferences by targeting available technologies toward other features that consumers desire.
- “Raising CAFE standards would impose costs on both consumers and automobile producers by forcing improvements in fuel economy that car buyers may not want.” [Congressional Budget Office, Nov. 2002]

Constrained Consumers Will Not Purchase More Fuel Economy



PPF_{2003}= Initial Production Possibility Frontier

PPF_{2007}= Production Possibility Frontier for 2007

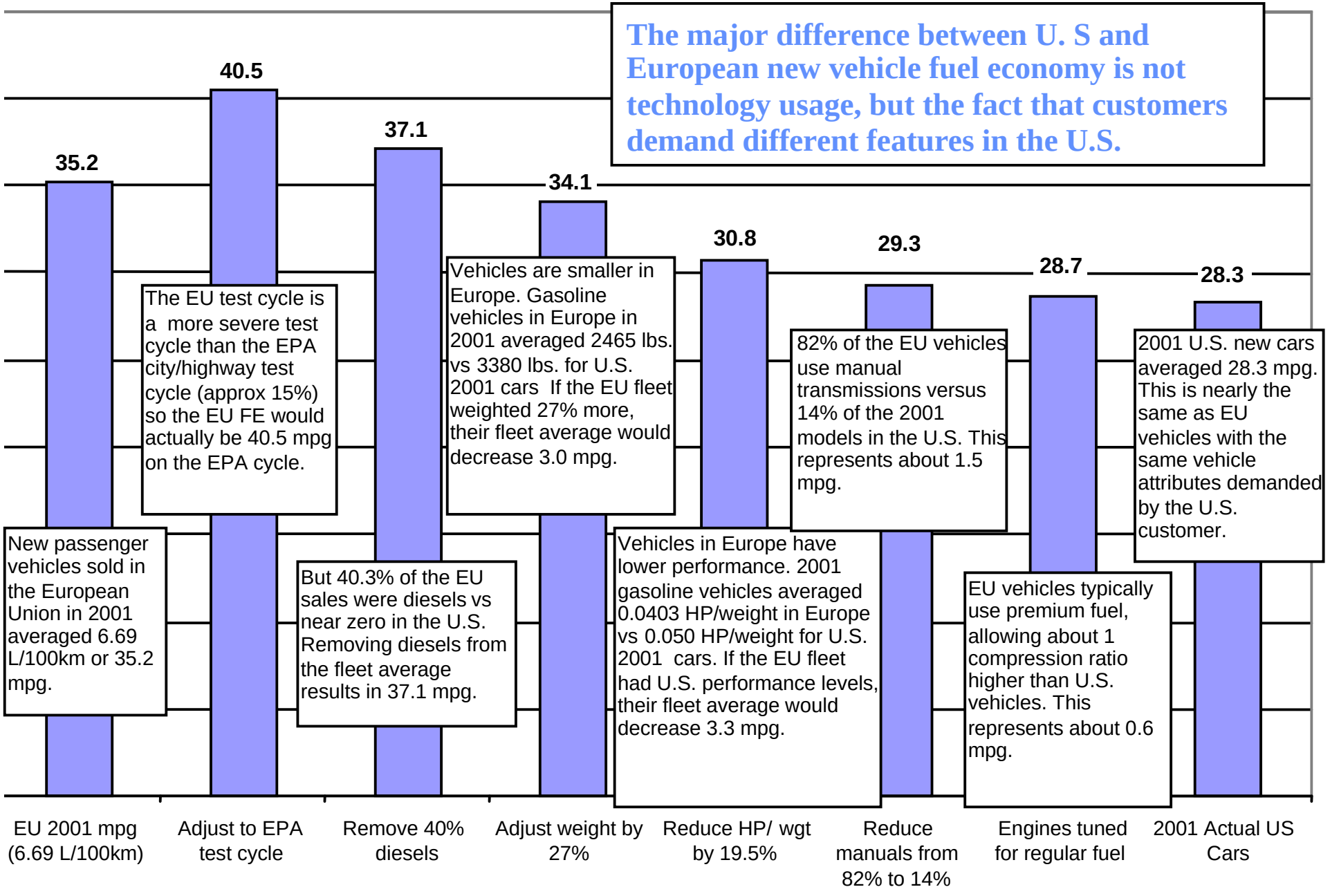
These production possibility or fuel efficiency technology curves accept the NHTSA engineering estimates at face value. The dotted vertical line represents the NHTSA technology cost curve: each dot is one of the NHTSA technologies.

Today's consumers would prefer to buy the hypothetical 19.0 mpg fuel economy and M* mass. They have been constrained to buy 20.7 mpg and M_0 mass. In 2007, these still-constrained consumers would choose only additional mass, or M**; they would keep fuel economy flat at the 20.7 mpg constraint. Forcing them to take any of the increase in fuel efficiency technology as fuel economy would impose a loss of consumer welfare -- would force them onto a lower utility curve such as U_1, where they are forced to take all of the technology advance in the form of fuel economy. This conclusion holds regardless of whether one accepts any or all of the proposed technologies on the dotted vertical line as cost-effective in an engineering sense.

Unconstrained Europeans Don't Buy The Mandated Technologies

- Even with $3 and $4 fuel prices, there is very little difference between European and U.S. fuel economy technologies
- 6.9 mpg differential (35.2 mpg in EU vs. 28.3 mpg in U.S.) explained by smaller vehicles and different features
  - Smaller vehicles
  - 40% diesel penetrations in Europe vs. near zero in U.S.
  - 82% of EU vehicles use manual transmissions vs. 14% in U.S.

European vs U.S. New Vehicle Fuel Economy



Bottom Line: Maximum Break -Even CAFE Increase is Zero

- CAFE constraint cannot be justified by an appeal to consumer choice
  - Either CAFE is binding, in which case consumer costs necessarily exceed the benefits
  - Or, CAFE is not binding, in which case it is of zero value to consumers
- Market failure required to justify CAFE

Market Failure Required for CAFE

- “We can now understand one of the fundamental results of microeconomic analysis -- that the allocation in a competitive equilibrium is economically efficient.”
- “That the economy will automatically allocate resources efficiently without the need for regulatory control.” [Pindyck and Rubinfeld, ***Microeconomics***, MIT/UC Berkeley (2001), emphasis in original]

CAFE Creates Net Negative Externalities

- NHTSA's analysis implies Light Truck Standard increases negative accident and congestion cost externalities by $500 million more than it reduces oil import and criteria pollutant externalities
  - 1.5 mpg increase raises accident and congestion externalities by estimated $885 million (NHTSA's estimates adjusted for inflation)
  - Reduces oil import and pollution externalities by $178 million (NHTSA's estimates)
  - 5 dollars worth of harm for every 1 dollar of good

"Oil Import" Premium: "Monopsony Component"

- Assumes upward sloping import supply curve allows reduced U.S. demand to affect terms of trade (cut import prices)
  - 4.5 cents per gallon per NHTSA estimate
- This requires potentially counterproductive "beggar-thy-neighbor" trade policy
  - "The monopsony premium could be negative if . . . [U.S.] attempts to exploit monopsony power evoke a retaliatory response [from OPEC carte]." [RFF]
- Reduced U.S. oil consumption increases OPEC share and market power
  - OPEC is low-cost producer

Oil Import Premium: "Oil Security"

- 3.8 cents per gallon NHTSA estimate
- "Evidence for indirect externalities between oil imports and economic performance, for increased risks of market disturbances from higher imports, or for treating military expenditures as an energy-related externality are even more questionable." [Bohi/Toman, RFF, emphasis added]
  - "Military expenditures are fixed costs -- do not vary with amount of oil imported: . . . Energy policy can do little to contribute to their reduction." [RFF]
  - "The economic harm caused by an oil price shock will occur whether or not the United States imports any oil." [RFF]
- CAFE relates to long-term levels of consumption: oil security relates to short-term changes in consumption

Oil Supply Disruptions: What Works

- First Line of Defense: Normal Market Forces
  - Rising prices discourage consumption and increase production and inventories
  - Hedging reduces risks
- Second Line of Defense: Strategic Petroleum Reserve (SPR) and Diverse Global Sources
  - Increase SPR capacity
  - Bolster Caspian Sea, West Africa, Latin America, Mexico alternatives
  - Remove barriers to production, refining, and transportation of all energy resources
- Third Line of Defense: Alternative (Dual-Fuel) Vehicles
  - For sustained disruption

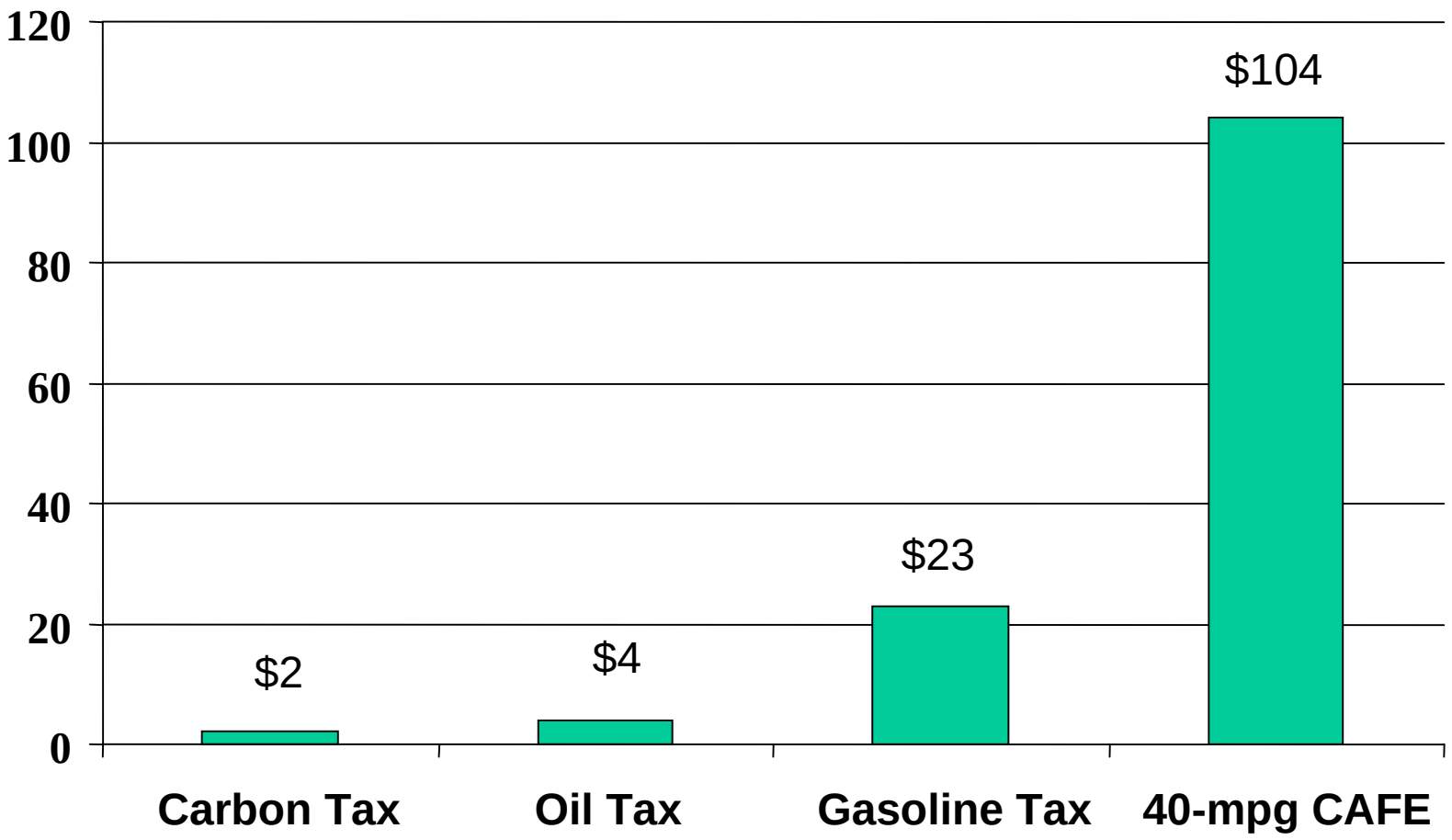
CAFE Credits for Dual-Fuel Vehicles: Insurance Policy Against Sustained Oil Supply Disruption

- CAFE law provide incentives for manufacturers to produce dual-fuel vehicles
- Dual-Fuel vehicles facilitate switch from gasoline in event of longer disruption
  - Provides insurance policy even if seldom used
- Takes decades for CAFE to affect fuel consumption of vehicle parc
- Dual-Fuel credits are only CAFE component that reduces vulnerability to oil supply disruption

What About Global Warming?

- Not a driver for increase in light truck standard
- Not a cost-effective option
- 1.5 mpg increase in light truck CAFE 56 to 70 times more costly than a gasoline tax achieving same reduction [Kleit, Penn State, 2003]
- One cent gallon gasoline tax increase would achieve more fuel savings by 2007 while “lowering rather than increasing traffic accidents and congestion” [Lutter/Kravitz, AEI/Brookings, 2003]

Cost to Reduce CO_2



Source: Charles River Associates, 1991,
"Policy Alternatives for Reducing Petroleum Use and GHG Emissions"

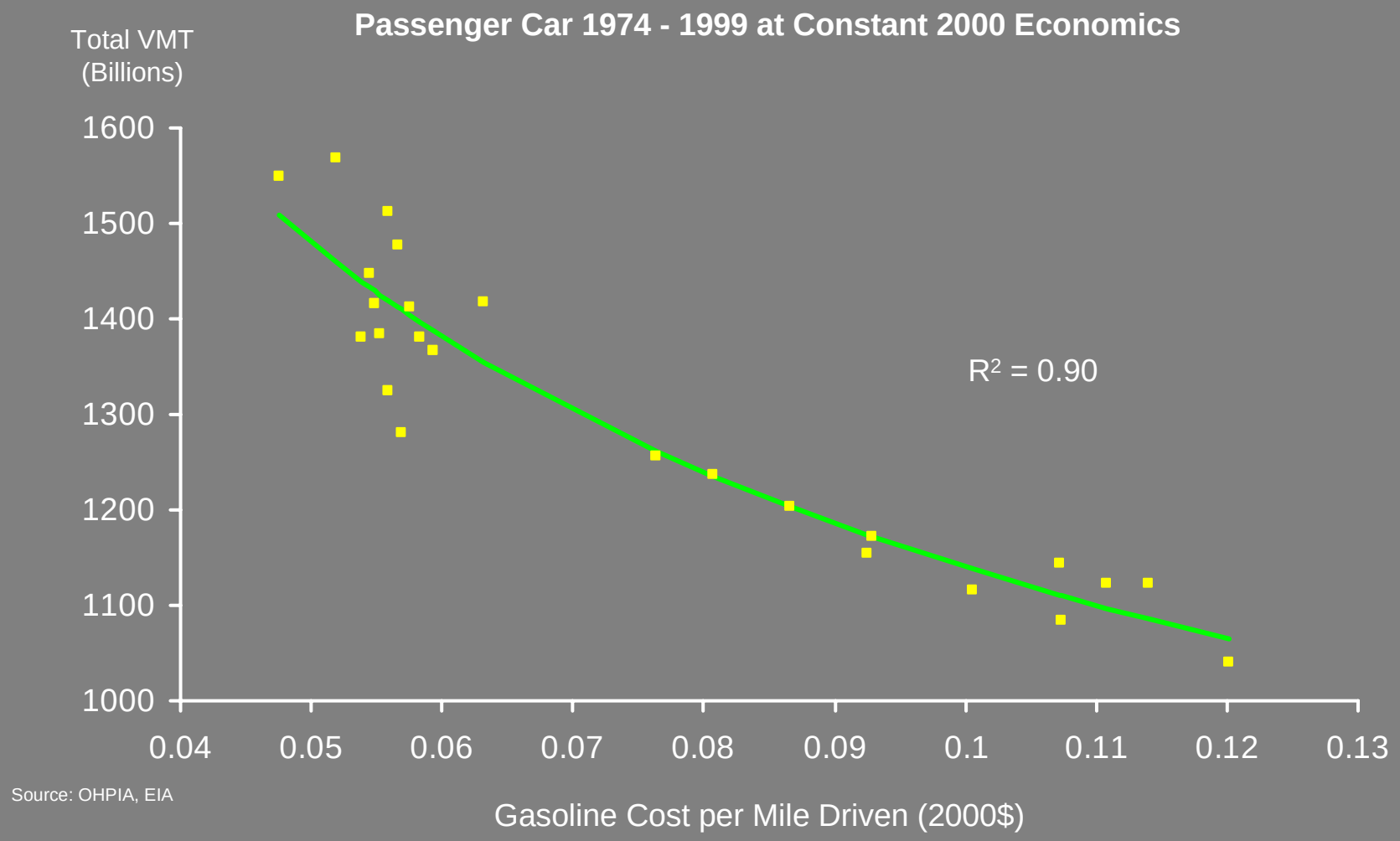
Global Climate: What Works -- Markets, not Mandates

- Rationalize regulatory/other barriers to fuel economy gains (e.g., diesel environmental rules)
- Provide incentives for Basic R&D
- Establish subsidies/taxes for alternative fuels/ vehicles
- NAS: market-based alternatives more effective and less costly than CAFE
  - CO_2 Tax
  - CO_2 Trading
  - Gas Tax

“Markets Work”

	2Q 2000 Prices	Average VMT (1997)	% Small Car Sales (1999)	% Diesel (2002)
U.S.	$1.55	12,265	29%	<1%
Europe	$3.74	8,490	64%	40%

Consumers Drive More Miles When Driving Is Less Expensive



Source: OHPIA, EIA

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Markets Beat Mandates

- When gas prices spiked in 1979-81, diesels peaked at 6% and small car sales jumped from 12% to 25% share
- Today, over 60% of SUV intenders will buy a smaller SUV or switch to a car if gasoline permanently jumps to $2.00/gal.
  - SUV penetrations would fall from 23% to 17%
  - Nearly half of SUV buyers would switch to smaller SUVs. (U of M Survey of Consumers)

CAFE: The Politics

What will Congress do next?

What will NHTSA do?

CAFE: Political Drivers

- Drivers for increased CAFE:
  - “Energy Security”
  - Global Climate (not with Bush Administration)
- Drivers constraining increased CAFE:
  - Highway Safety
  - Economy/Jobs
- Strategic Drivers
  - Economic “Game Theory”

Conclusions

- CAFE fails the test of history
  - CAFE originally conceived as a solution for petroleum shortages created by price controls
  - CAFE is the last vestige of those failed energy policies
- CAFE fails the test of economics
  - CAFE does not enhance energy security
  - CAFE is a costly, ineffectual way to address global climate concerns
  - Anything CAFE can do, the market can do much better at far lower cost
- CAFE is a political solution in search of an economic problem

Selected Bibliography

- **Congressional Budget Office**, "Reducing Gasoline Consumption: Three Policy Options," (November, 2002)
- **Randall Lutter and Troy Kravitz,** "Evaluation of NHTSA's Proposed Standards," Regulatory Analysis, AEI-Brookings, March 2003
- **Randall Lutter**, "CAFE – The Numbers Behind the Story," AEI/Brookings Joint Review, March 2002
- **Mercatus Center**, "Public Interest Comment on Light Truck Fuel Economy Standards MY 2005-2007," February **2003**
- **Alliance of Automobile Manufacturers,** Submission to NHTSA in re: Light Truck Proposal, February 13, 2003
- **General Motors,** Submission to NHTSA in re: Light Truck Proposal, February 13, 2003, Attachment 9: includes analysis of Professor Kleit