

FOIA MARKER

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Series/Staff Member: Kathleen (Katie) McGinty
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Folder Title:
CAFÉ [Corporate Average Fuel Economy] [Folder 2] [2]

Stack:	Row:	Section:	Shelf:	Position:
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To: Sylvia Matthews
From: Katie McGinty
Re: CAFE

Am faxing materials that lay out an approach to CAFE that I think strikes the right balance between the interests of labor, industry, and the enviros. Key point is that there is wide national support for increased CAFE -- BUT -- (1) the Governor should not insist on a particular mpg target by a particular date and (2) CAFE should be seen as just one part of a larger strategy to propel the US auto industry into the lead in developing and marketing the auto technologies of the future.

I have had several very good meetings with the UAW. When they have testified before us on CAFE, they have opposed the specific numbers that have been proposed -- they consider 40 mpg by 2001 to be technologically infeasible. HOWEVER, they have made clear to me that they do support enhanced efficiency requirements. They want the auto industry to move forward and for US manufacturers to lead the world in producing the most efficient -- and the next generation of auto technologies. They know that their long-term best interests lie in the auto industry being pushed in this direction. BUT, they want to know that the government is prepared to work in partnership with industry and will ensure that workers are not left high and dry -- that they will receive the training they need to help move the industry forward.

Please call if you have any questions or I can get you anything further. I thought I'd send this on now because we've had trouble reaching each other, but I'm happy to discuss. I would like to explain to you the origin of the confidential memo I have attached. It comes from a very reliable source. Please hold it close. Thanks!

P.S. - With regard to NAs
study, best strategy is NOT
to argue the numbers, but to
cite it as support for notion that
we can do better re: efficiency.
J.

MEMORANDUM

To: Katie McGinty
From: Jonathan Sallet
Re: Questions and Answers
Date: August 17, 1992

I have reviewed the Questions and Answers. They are, as I said yesterday, excellent. I offer these additional thoughts:

Environmental Extremism:

- * The last sentence of the fourth paragraph is a little hard to track. I suggest: "If despoiling the environment creates economic growth, then why isn't Eastern Europe a thriving, vibrant economy instead of a polluted wasteland?"
- * Move the Reilly quote to the beginning: "Even William Reilly, George Bush's Administrator of the Environmental Protection Agency can't stomach this one. He says emphatically, 'No,' that Al Gore is not an environmental extremist."

Global Marshall Plan:

- * I would stress leadership a little more (although I believe that your main emphasis on market-creation is exactly correct). Something like this: "In sum, Al Gore has issued a call for leadership, a call that the Clinton-Gore Administration will heed; a call that the so-called 'environmental president' has ignored. But that does not mean that the United States can -- or should -- be the principal financier for a global recovery program. Instead, Al Gore says '[t]he financial resources must now come from Japan and Europe and wealthy, oil-producing states.' To those resources, we must add an Administration with environmental understanding and vision."

Disincentives for Pollution and Waste

- * I like the thought, contained in an earlier draft, that combined the effect of the middle-class tax cut (pro-family) and the effect of a pollution tax (pro-environment). Aren't we better off if

polluters pay their fair share so that the middle-class tax burden can be reduced?

Liberal

- * Consider the following as a lead in to the sentence that discusses the death penalty:

"This election is a choice between the politics of fear and the politics of hope. The Bush-Quayle campaign, adrift, without purpose, detached from the American people, has decided it can win only through fear and only by dividing America. But that won't wash. Because fear doesn't produce leadership, it won't create jobs, it can't make American strong again."

"The Clinton-Gore ticket offers hope -- a chance to look to the future, an opportunity to bring America together, a program to rebuild America's economy. It's all about jobs and the ability of families to prosper. Which is why the Bush-Quayle campaign wants to talk about other issues. But, even on those other issues, the Bush-Quayle campaign is simply wrong."

DRAFT #3~~**CONFIDENTIAL**~~**M E M O R A N D U M****DATE:** August 6, 1992**DETERMINED TO BE AN ADMINISTRATIVE****SUBJECT: CAFE / JOBS / POLITICS****MARKING INITIALS:** MAY **DATE:** 3/3/2017**Summary**

I am worried that the campaign is vulnerable in the industrial centers of the Midwest because of Clinton-Gore support of CAFE proposals which would jeopardize hundreds of thousands of jobs at the auto companies and their enormous supply chain. While large CAFE increases are very popular nationally, they are very unpopular in the automotive and steel communities. Ample evidence will demonstrate that while increases in fuel efficiency are feasible, increases to 40-45 mpg by 2001 would be very risky without major technological breakthroughs -- which simply cannot be assumed. Obviously, to the extent there are other pro-manufacturing, pro-auto industry messages, the CAFE problem is diminished. To date, however, there is no pointed, pro-auto employment message.

I do not recommend that the campaign abandon its support of CAFE increases. I do recommend that it focus on the major difference with Bush-Quayle. The issue could be framed as follows: the Administration is opposed to any increase in CAFE while Clinton-Gore want to push the industry to the maximum extent possible, short of threatening jobs. The campaign should downplay support of specific CAFE increase proposals which have been developed, with the best of intentions, without an adequate understanding of their impact on the largest industrial sector of our economy.

Background

This is not an attempt to lobby the campaign. This is a personal, not a corporate memo. I want to offer my help in devising a strategy for what is likely to be an attack point by Bush-Quayle, especially in the Midwest.

The White House has already asked the Big Three to supply data on the jobs impact of the Bryan or Boxer CAFE bills. The National Academy of Sciences' National Research Council study has indicated that these bills are infeasible. Owen Bieber has testified to the effect that they would threaten jobs.

I believe the following:

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- 1) Modest increases in fuel economy are feasible. However, CAFE is not by any stretch of the imagination the optimum policy prescription for conserving gasoline.
- 2) Future fuel economy mandates will have a dramatic competitive effect among the domestic companies and especially with the Japanese companies. CAFE, especially as currently structured, is a policy that appears to have been developed by MITI. It gives the Japanese, with their very high energy prices and therefore a fleet of predominantly small vehicles, a decided advantage over the Big Three when gasoline here is cheaper than bottled water.
- 3) Distrust is so deep on both sides of this issue that there is very little constructive dialogue. The National Academy of Sciences' study is the best, non-biased attempt to deal with the merits of this issue.

History of the CAFE Debate

CAFE was enacted in 1975, two years after the first oil crunch, over the strenuous objections of the Big Three. At the time, the UAW supported the proposal since they believed it would force the American companies to build small cars in the United States, rather than import them. I remember a closed session of the Senate Energy Committee at the time at which Scoop Jackson said: "We are saving these dumb bastards from themselves."

The original CAFE law was structurally flawed in that it front-loaded the increases, thus forcing the companies to apply technology which they had not debugged. It also required that all companies achieve the same mileage standards irrespective of the type of vehicles they sold. So the Japanese, with a fleet of little cars, had no trouble meeting this standard, while the Big Three had to discontinue many of its product lines prematurely, incur massive write-offs, and bring to market products in the early '80s which were very disappointing to the customer. New emissions standards were introduced in tandem with CAFE, and the diametrically opposed regulations resulted in compromise engine controls with many driveability complaints.

By the mid-80s, it was clear that GM and Ford would not meet the 27.5 mpg standard because the price of oil had collapsed and the public still wanted to buy their larger cars. Chrysler's car fleet was almost entirely four-cylinder, so we met the standard. When GM and Ford petitioned the Reagan Administration to reduce the standard to 26 mpg, Chrysler protested vehemently. It was to

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no avail, and the Congress failed to override the presidential action.

There was a slight shift in CAFE policy at the beginning of the Bush Administration. Bush denied a GM and Ford request to roll back the standard yet again, and let the 27.5 mpg stand. Later in 1989 momentum began to build in the Congress for CAFE increases. Senator Dick Bryan of Nevada introduced a bill calling for 40 mpg by 2000. This bill has enjoyed the enthusiastic support of the environmental community, especially the Sierra Club. The UAW and I tried to work with Senator Bryan to develop a compromise which would not threaten American jobs, but resistance from the White House and from within the industry, made compromise impossible. Neither was any interest in compromise expressed by the environmental community.

In 1990 there was a cloture vote in the Senate on the Bryan bill which failed by several votes. In 1991 and 1992, the focus on CAFE revolved around the energy bill. An attempt to add CAFE to the energy bill, along with an ANWR provision, failed to receive a majority vote in the Senate. The House has not voted on CAFE in many years.

CAFE Arguments

Proponents of large CAFE increases argue that they can be achieved with little cost to the consumer and without significant downsizing of today's fleet. Whether new technologies will be discovered over the next several years to make these gains possible is open to significant speculation. But you can't run the nation's largest industrial sector based on hopes. Two-thirds of the significant improvement in CAFE performance from 13.5 mpg in 1975 to 28 mpg today came from reduction in the weight of vehicles. The average vehicle in 1975 weighed about 4,000 lbs., the average vehicle today slightly over 3,000 lbs. Much of this weight reduction was made possible by a repackaging of the vehicle to front-wheel drive which eliminated the drive train running to the back wheels, etc. Absent a major technological breakthrough, weight will continue to be the main issue in increasing fuel efficiency. And absent some major materials breakthrough, weight will be directly correlated to size.

Modest improvements in CAFE are feasible given adequate time to change product design from the ground up and to evolve engine and transmission technology.

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A breakthrough in the emissions control of two-stroke engines would be the type of breakthrough which could yield several miles-per-gallon in improved fuel efficiency, but even this breakthrough is weight related. Because a two-stroke engine is significantly smaller per horsepower of output it would allow for repackaging of the engine compartment (making it smaller with less heavy structural supports) which would allow for the reduction of several hundred pounds from the car's weight. Unfortunately, two-stroke engines emit a relatively high-level of NO_x, a regulated pollutant. Even if the emission problem is solved (and there is no assurance that it will be), it would take years to get the full benefit of the two-stroke technology since companies would need to totally redesign all of their vehicles which could only be achieved (from a pure resource standpoint) over a period of five-to-fifteen years, depending on the vehicle.

Policy Alternatives

The campaign should develop a comprehensive strategy for dealing with auto/manufacturing issues. There are lots of people anxious to help, not the least of which is the Michigan delegation. Clyde Prestowitz at the Economic Strategy Institute could be very helpful, among others.

On CAFE, the National Research Council study believes a fleet average of 31 mpg in 2001 is achievable with a high degree of confidence, and 33 mpg with a low degree of confidence.

This study also says: "The existing system for setting fuel economy standards -- the corporate average fuel economy (CAFE) system -- has serious defects that warrant careful examination."

I have never met an economist who disagrees that if conservation of petroleum is our goal (and not war with the auto industry or "small is beautiful"), then raising the price of that which you hope to conserve is the obvious and most efficient mechanism. There are 170 million vehicles on the road today. Changing the CAFE law does not cause any of those vehicles to be operated more efficiently. It does not encourage car pooling or mass transit. It does not encourage the use of alternate fuels. Its benefits are very slow to be felt because it requires the turnover of the entire fleet. Arguments are made, with some validity, that the more fuel-efficient the vehicle, the more people tend to drive, thus reducing the conservation benefits of the program. Our experience of the late '70s and early '80s should guide us. When the price of gasoline went up, people wanted to buy more fuel-efficient cars. Car pooling took hold,

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etc., etc. Because of increased prices and the conservation reaction to them, our economy is significantly more fuel-efficient than it was ten or fifteen years ago. However, there is no doubt that we could become much more efficient if we had the financial incentive to do so.

Gasoline taxes or oil import fees yield such enormous revenue that they could fund a truly massive public works program concentrated on the transportation sector: metropolitan light rail; bullet trains; modernization of bridges, exit ramps, etc.; smart highways and vehicles; etc. These taxes could provide millions of jobs for the very people in our society whom we desperately need to employ, those with lower education and skill levels. These jobs could provide training in trades for our less-educated work force.

I know that fuel taxes are not popular. I also know that they could be made acceptable to the public in exchange for tangible benefits which would result from improving our transportation network. Rather than a quantum increase in fuel taxes, a gradual and sustained tax increase in fuel taxes would be preferable.

Suggested CAFE Comments

"I believe in conservation, and unlike the Bush Administration, I intend to do something about it. I have great faith in the genius of the American auto industry. They have made tremendous strides in increasing fuel efficiency over the past fifteen years, and I believe they are capable of significant further progress. I want to work with the industry and its workers to devise a strategy that makes us less dependent on foreign oil. I want to push the industry, not make excuses for it like the current Administration. I'm going to be a partner with the industry in helping to develop technologies and materials that will allow for continued progress in fuel efficiency.

"I believe fuel economy can be increased and should be increased. In contrast, George Bush blocked every attempt to develop workable increase in the fuel efficiency laws. I will work with the industry and its workers to develop a program which challenges the industry, and protects U.S. jobs."

To: Al
From: Katie



Please review this memo. It's written by Wirth. We need to discuss whether you want to go ahead with the idea of an op/ed in Detroit newspapers. I would not recommend doing this week -- now that you are not going and Clinton is (he should not be put in the position of having to respond to your editorial -- if you agree, I will make this clear to Wirth). However, I do believe this is still a valuable idea. Polls show overwhelming support for increased CAFE. In addition, I have had some very good discussions with the UAW. Contrary to popular belief, they do NOT oppose increased CAFE. They testified against Bryan because they thought 40 mpg too ambitious. (That's alright -- you don't need to die for this specific mpg and you are on record in Commerce Committee markup as calling the Bryan bill "imperfect".) What they do want to hear is that government is ready to work with the auto industry to ensure that we are moving ahead and that the Japanese don't leapfrog us by producing the next generation of automotive technologies. They want the auto industry to be pushed -- but not out of business. I think you can combine the editorial perhaps with a visit to GM facilities that are producing electric cars. They seek to gain by CA implementation of Clean Air act requirement of "zero emission" vehicles. Bush/Quayle are currently sitting on those regs. Overall point is CAFE as part of ensuring US industry in front in the years to come -- not left in dust of other countries producing first more efficient cars, then alternatively fueled cars and finally non-combustion cars (electric, hydrogen, fuel cell, etc.)

Please call to discuss.

Al - have also attached
latest iteration of
Open on form issues FYI.


Elimination of CO₂ from transportation could involve several pathways, only one of which would actually "eliminate the internal combustion engine."

Renewable liquid fuels from biomass could be integrated with modified existing engine technology. While these engines would have some emissions, net CO₂ would be zero if renewable biomass feedstocks were grown on a sustainable basis. Another engine option could be gas turbines fueled with biomass derived gaseous fuels. A very aggressive program could replace the automobile fleet in a 25 year period with renewable-fueled combustion engines. The main issue is the economics and institutional changes involved with obtaining enough fuels from biomass. This would potentially involve huge land areas with biomass plantations and may encroach upon food production.

Another pathway would be solar derived hydrogen vehicles (still internal combustion, but non-fossil fuel). The solar-hydrogen transportation system has been studied by Robert Williams of Princeton. By using direct current photovoltaic electrolysis of water, enough hydrogen could be produced from a relatively small land area, assuming significant increases in fuel economy from other technologies. Another promising pathway is biotechnology; MITI is examining how microbes and seaweed might produce hydrogen in commercially viable amounts. The "hydrogen economy" would build upon the existing infrastructure of natural gas pipelines. Either combustion technology or hydrogen fuel cell electric vehicles could be used.

The most obvious non-combustion option would be electric battery-powered cars, where the electricity could be generated from renewable sources such as solar thermal, photovoltaic, wood and other biomass, wind, waste, hydroelectric, or geothermal. These renewable resources bases are geographically constrained in some cases, and electricity generated from renewables would also be valued for non-transportation use. Basing personal transportation on electricity generation implies a significant increase in generating capacity, even accounting for large efficiency increases for other electric end-uses.

This leaves a final option -- an expansion of nuclear power for electricity generation. A portfolio approach to renewable and nuclear electric generation for transportation energy needs, combined with photovoltaic hydrogen, could be envisioned. However, revamping the entire U.S. transportation system within 25 years is extremely ambitious, even visionary. A transition policy -- relying on renewable liquid fuels and renewable electric generation, expanding PV-derived hydrogen, and inherently safe nuclear fission and ultimately fusion -- would be critically needed. Expanded mass transit (electric based) and increased automobile fuel economy are important early transition policies. Twenty-five years as a target date is useful, but the important issue is establishing a trajectory for technology transition.

ALTERNATIVE ENERGY NETWORK ONLINE TODAY

A Daily Executive Summary Covering World News on Alternative Energy & Fuels

LEGISLATIVE & POLITICAL REPORT

HOUSE HEARING TOUTS GEOTHERMAL ENERGY AS VITAL DOMESTIC RESOURCE

A House subcommittee, holding a hearing recently to tout the benefits of geothermal energy, heard that heat energy equal to 45 billion barrels of oil could be recovered from known low-temperature geothermal resources in the U.S. This is the equivalent of approximately 19 years worth of oil imports.

Marrienne Guffanti of the U.S. Geological Survey told the Science Committee that current applications of geothermal resources use less than one-tenth of a percent of the identified sources. Committee chairman, Rep. James Scheuer (D-NY) said that the total U.S. geothermal resource base represents about 20 times the amount of available coal, which itself can be counted on for several hundred years.

DOE Deputy Assistant Secretary Robert San Martin told the committee that "the most dramatic expansion" in the direct use of geothermal energy lies in heat pump technology which can reduce energy consumption by about one-third. Over 150,000 geothermal heat pumps have been installed in business and residential buildings nationwide and the market for them is growing about 10 to 20 percent annually, he said.

Witness John Lund of the Oregon Institute of Technology's Geo-Heat Center called geothermal a domestic resource of enormous significance, saying geothermal energy represents 300 times the energy available in U.S. oil and natural gas.

(THE ENERGY REPORT: 8/3)

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SCIENCE & TECHNOLOGY REPORT

NEW SOLAR GENERATOR IS CHEAPER AND SMALLER THAN CURRENT MODELS

The Pyron company of La Jolla, California says it can produce solar power at one-quarter the cost of today's most efficient solar panels, using about one-third of the space used by the smallest existing solar plants.

Pyron's Solarmarine system uses a shallow pond of water to float a large disk of newly developed lenses with converter cells beneath them. The lenses bend sunlight down to the cells, eliminating the need for costly machinery to keep lenses angled toward the sun.

A 200-kilowatt plant would have a diameter of about 40 yards and would produce enough electricity for 200 dwellings. Pyron is building a small test unit in Germany and plans to build a larger prototype in California.

Solarmarine is designed for areas within 38 degrees of latitude from the equator -- as are other more expensive solar concentrator plants. Pyron's new system would be more expensive than conventional nuclear or coal-fired plants, but cheaper than diesel generators that supply electricity to remote sites, making them a potential option for less industrialized nations.

(WALL STREET JOURNAL: 8/7)

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INTERNATIONAL REPORT

JAPANESE GROUP TO DEVELOP NATURAL GAS PUMP

According to the Japan Digest, Japan is betting on natural gas cars, and even though there are only 67 natural gas vehicles in Japan at the moment, the country is expending big bucks to develop fueling equipment for natural gas vehicles. Earlier reports have described infrastructure planning within cities and on highways to add both natural gas and electric refueling capabilities at selected fueling stations.

Sanyo Electric Co., Ltd. has joined with Japanese natural gas companies in Tokyo, Osaka, Toho and Saibu in a pact to spend 560 million yen (\$5.2 million) over the coming three years to develop equipment that can fuel a natural gas powered vehicle in three to five minutes.

(TORONTO GLOBE AND MAIL: 8/5)

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EDITORIALS, REVIEWS AND ASIDES

EVEN McDONALD'S WANTS INTO ELECTRIC CAR MARKET

Southern California Edison says that McDonald's has suggested the idea of installing quick-recharge stands for the coming wave of electric cars at its restaurants. The customers could recharge themselves with a Big Mac during the 12 minutes or so it would take to "quick charge" their automobile.

The Big Three's support of electric vehicles (EVs) was more than evident when the U.S. Advanced Battery Consortium, made up of Chrysler, Ford and GM awarded a contract for \$18.5 million to Ovonic Battery Company for development of a nickel metal hydride battery for EVs. USABC expects to award more contracts before fall.

A recent Southern California Edison survey showed that 89 percent of its respondents believed EVs would be good for short commutes and errands and nearly 50% said they would buy one even if they had to spend \$1,000 per year on battery replacement. Ninety-two percent said they'd feel good about helping clean up the air.

Also in California, Hughes Aircraft, which is developing charging systems for GM's Impact, and Pacific Gas & Electric have joined forces to test an EV refueling station at PG&E's San Ramon facility.

(ELECTRIC PERSPECTIVES: JULY/AUGUST 1992)

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M E M O R A N D U M

DATE: March 18, 1991

TO: Al

FROM: Katie

SUBJECT: CAFE markup

Al, I've listed a few concerns with the Bryan bill if you would like to mention them (see below). You should also know that the following amendments may be offered.

1. Danforth - Alternative Fuels. YOU SHOULD VOTE AGAINST THE AMENDMENT. This amendment would open a huge loophole in CAFE standards by allowing manufacturers to earn CAFE credits by building their cars such that they are capable of being run on alternative fuels. The modification is very simple and inexpensive and does not guarantee that the vehicle in fact will be run on alternative fuels.

2. Stevens -

* Competitiveness. I continue to be concerned about the potential competitiveness implications of this legislation. The fact that this bill would require Japanese companies to achieve fuel economy levels 5 to 6 mpg higher than traditional domestic firms gives some of its supporters comfort. They reason it will confer a competitive advantage upon U.S. firms because those firms will have a lower standard to achieve. That might not turn out to be an advantage. Putting the backs of only the Japanese against that wall creates the risk that they may succeed. Then where will U.S. firms be? By this legislation we may be putting U.S. companies at an even greater competitive disadvantage in the future than they are combatting today.

* Perverseness. Some consequences of this legislation make little sense. Under this bill, even though "Company A" achieved a CAFE 8 mpg greater than "Company B", Company A could be fined while Company B was earning credits. As a matter of public policy, it does not make sense to punish superior performance and reward inferior performance.

(Nissan's 1996 CAFE target under S. 279 would be 37 mpg. A company that a 1988 CAFE under 23 mpg would have a target of 27.5 mpg. Nissan would be fined at 36 mpg while the other firm would earn credits at 28 mpg.)

* New Entrant Loophole. The bill creates a large loophole for new entrants, that is companies entering the U.S. market after the base year. Companies in Taiwan and Malaysia are examples. Since there is nothing explicit in the bill about treatment of those who were or in the market in 1988, I assume they would come in at the floor standard -- 27.5 mpg -- and could compete in any market segment. With little CAFE restraints, there would be a high probability they would win market share from existing manufacturers. If new entrants took shares from the Big Three in the subcompact or compact segments, they would jeopardize the ability of the domestic firms to offset their large car sales and achieve their CAFE targets. They would also offset any fuel savings anticipated by having more companies meet higher requirements, since their standard would only be 27.5 mpg.

Some "new entrants" might look very familiar to us. Companies like Mercedes, Volvo, and Honda, already well established in the U.S. passenger car market, could well become "new entrants" in the truck market.

The solution to this problem would be to set a new entrant's vehicles at the average fuel economy for all vehicles in the same market segment. That, of course, is how standards would be set for all vehicles under a size-class approach (an approach which would not hold competitiveness risks for U.S. companies or perverse consequences of S. 279).

* Gaming potential. There is nearly unlimited potential for "gaming" under this approach. Offshore joint ventures between low and high mileage foreign manufactures would no doubt appear. Low mileage companies would market -- under their own names -- vehicles manufactured by high mileages companies. The lower fuel economy standard of the low mileage company would become, in effect, a saleable asset. The bill might stimulate more marketing creativity than engineering creativity, with no real energy savings.

o Workability and Effectiveness: The UPI approach lacks a mechanism for dealing with new entrants into the US automotive market and the practice of "rebadging" (selling one manufacturer's product under another's name).

As to the new entrant problem, we could possibly solve it by setting some CAFE floor that the new entrant would have to meet. We likely would determine that floor by requiring the Secretary to compare the new model with similar models already in the US market. We would thereby keep the notion of size-class standards alive. However, we would NOT thereby help Nissan -- Nissan already is in both the US car and truck markets.

The rebadging problem, however, defies solution. UPI encourages this practice because standards are set on a manufacturer - by - manufacturer basis. A manufacturer that has a higher target to achieve therefore has a strong incentive to have a manufacturer with a lower CAFE requirement sells his big gas guzzlers. Note that the ultimate effect of this game is that Bryan will not achieve the 40 mpg he says he will. In fact, manufacturers may not have to improve their fuel economy at all:

For example, assume that there are two manufacturers in the market. The first has a 40mpg target, the second a 20 mpg target. The first guy produces 2 models -- one that achieves 50 mpg and one that achieves 30 mpg. The second guy produces one 15 mpg model and one 25 mpg model. If the first guy asks the second to produce his 30 mpg model, he has a much easier time of making his target, and in fact, can produce some gas guzzlers whose poor mpg performance will be offset by his 50 mpg winner. The second guy is psyched to do this 'cause now he has a 30 mpg model in his line, which means he can produce alot more 15 mpg models and still meet his 20 mpg target.

If standards were instead developed on a model by model (rather than a manufacturer by manufacturer) basis, this problem would NOT arise.

3. OUR AMENDMENT:

As currently drafted, the bill retains Bryan's numbers. We need to decide whether we want to be the ones to carry more responsible numbers. However, if we are trying to do something real here and build a coalition behind our amendment, we need to keep in mind that, for the most part, Senators who have a problem with the Bryan bill oppose it primarily because the numbers are too ambitious -- they are not particularly concerned that the UPI screws the Japanese or is not very workable (in fact, they are probably pleased that it is not workable!). It is only a few Senators (Hatfield, Packwood, Ford?) who have imports in their states that are concerned.

As to our mechanism for getting to the 34 and 40 mpg targets, we direct DOT, through a rulemaking, to devise a mechanism that best promotes the following goals:

- (1) maximizing overall energy conservation;

(2) encouraging all manufacturers to adopt fuel efficient technologies;

(3) preserving competition in the auto industry;

(4) minimizing the opportunities for manufacturers to adopt strategies that do not result in actual improvements in average fuel economy.

CAFE Saves More Oil Than We Import From The Entire Persian Gulf

The Biggest Single Step to Curbing Global Warming and Saving Oil

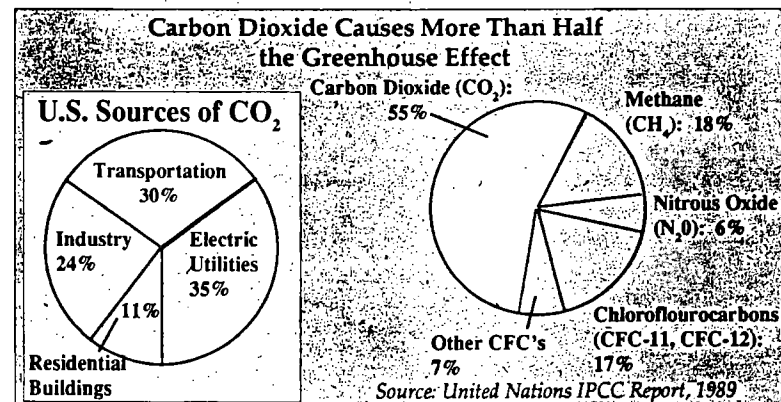
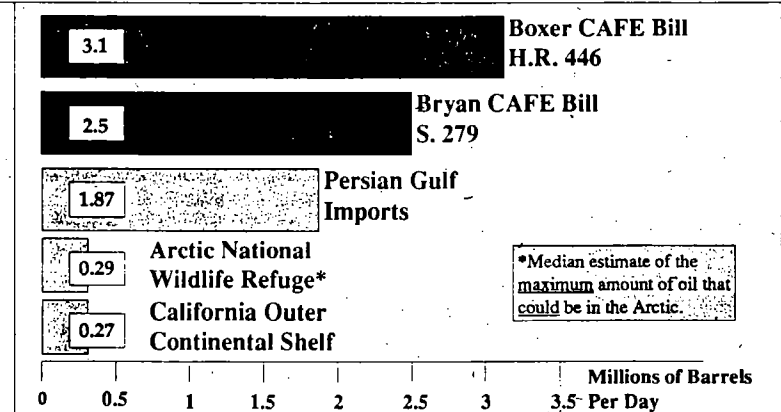
The biggest single step Congress can take right now to curb global warming and ensure a safe energy future for America is to pass the Motor Vehicle Fuel Efficiency Acts of 1991, S. 279 by Senators Richard Bryan (D-NV) and Slade Gorton (R-WA) and H.R. 446 by Representative Barbara Boxer (D-CA).

Raising automobile fuel efficiency is like finding a new source of oil under Detroit. Over 40% of the oil we use in this country goes into our cars. Getting more miles out of a gallon of gas means lessening our dangerous reliance on oil, lowering levels of carbon dioxide (CO₂) urban pollution, reducing pressure to drill in sensitive environments and saving consumers money.

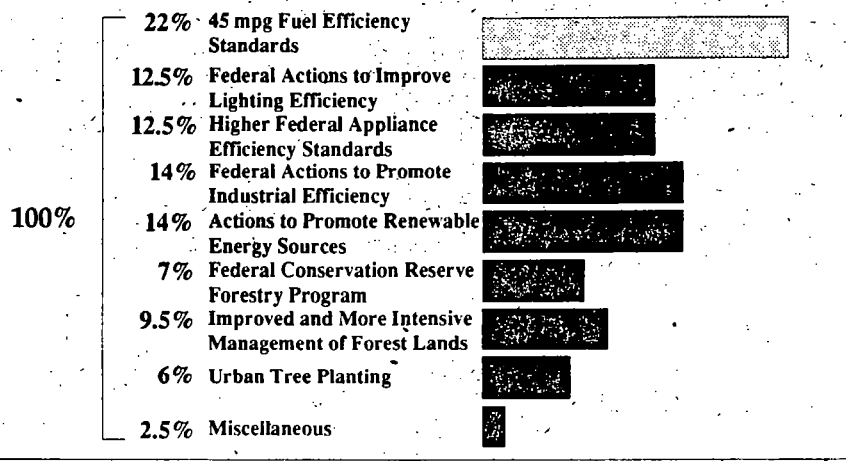
The current Corporate Average Fuel Economy or "CAFE" standards, passed in 1975, have been a great success. They require that new cars average 27.5 miles per gallon (mpg) and light trucks average 20.2 mpg. S. 279 would increase CAFE standards 40% by model year 2001, and H.R. 446 would achieve a 60% increase in the same timeframe. This translates into 40 miles per gallon (mpg), and 45 mpg respectively. Since CAFE is an average standard, vehicles can be produced which fail to meet the standard, as long as enough vehicles exceed the standard to balance it out. These bills would save this country millions of barrels of oil each day and would prevent hundreds of millions of tons of CO₂ from entering the atmosphere annually.

CO₂ is the major contributor to the greenhouse effect, accounting for over half of the global warming problem. As the world's largest source of CO₂, the U.S. must play a leading role in curbing the emission of greenhouse gases—particularly those emitted by motor vehicles. Each gallon of gasoline burned pumps 19 pounds of CO₂ into the atmosphere, and the average car emits a total of about 50 tons of CO₂ over its full life.

CAFE Saves Oil : More Oil Than Persian Gulf Imports, Potential Arctic National Wildlife Refuge, and California Outer Continental Shelf Production Combined.



IMPROVING FUEL EFFICIENCY TO 45 MPG IS THE BIGGEST STEP TO CURBING GLOBAL WARMING EMISSIONS 20% BY THE YEAR 2000.



Source: Natural Resources Defense Council

Questions & Answers

Q. Can we improve fuel economy without sacrificing safety?

A. Absolutely. Both the Center for Auto Safety and Ralph Nader support increasing the CAFE standard to 45 miles per gallon and say we can do so safely. They have always supported auto safety improvements, whereas the auto companies have consistently opposed steps to improve auto safety, such as airbags.

The auto manufacturers claim that higher CAFE standards can only be achieved by making "mini-cars." But they said the same thing in 1974 when a Ford spokesperson testified that a 27.5 mpg standard would result in a "product line consisting of either all sub-Pinto-sized vehicles or some mix of vehicles ranging from a sub-sub-compact to perhaps a Maverick." Obviously, they were wrong. At that time, the proposed 27.5 CAFE standard represented a 100% increase. The Bryan and Boxer bills only call for a 40-60% increase. Current CAFE legislation requires an increase in the average efficiency of the fleet of automobiles, not every individual vehicle. Manufacturers could use existing technologies (see below) to increase fuel efficiency, rather than making "Pintos and Mavericks."

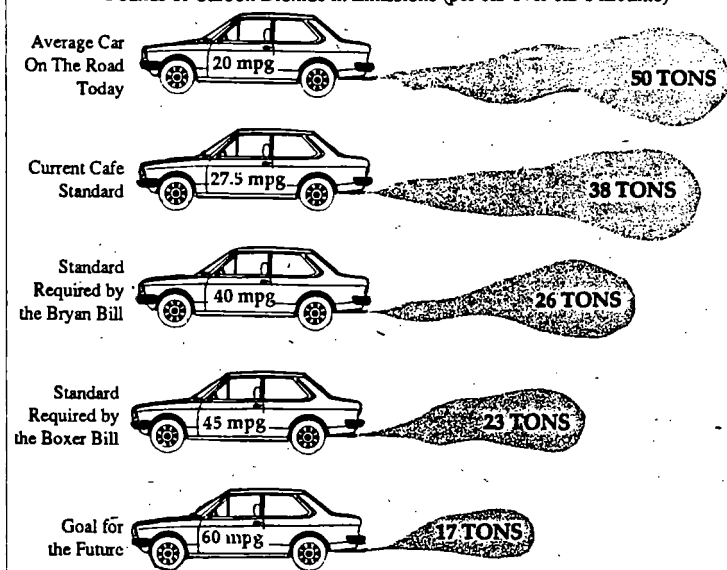
Q. What technologies are currently available that will help get the average new automobile to 45 mpg by the year 2000?

A. There are many technologies available which will help increase fuel economy. Auto manufacturers have yet to fully exploit the fuel-saving advantages of current technology. If manufacturers used current fuel saving technologies on the entire fleet instead of only on certain cars, they would already be most of the way to the new CAFE targets. In fact, if every 1990 car in each size class (large, compact, etc.) was as fuel efficient as the best vehicle in that class, the 1990 auto fleet would get 34.4 mpg instead of 27.8. Here are some currently available technologies:

- * Front wheel drive vehicles don't have bulky drive shafts, so they are lighter and require less fuel to operate. Front wheel drive also allows for a more efficient layout of the car, allowing better aerodynamic design. If the approximately two million autos that still use rear wheel drive were converted, the fuel efficiency of each would rise 12.5%.
- * Four valve per cylinder engines operate highly efficiently. If auto manufacturers did nothing else but convert their vehicles to multivalve engines, the fleet fuel efficiency would jump 6%.
- * Transmission improvements such as electronically controlled gear shifting, automatic transmission with four or five speeds rather than three speeds, and continuously variable transmissions (CVT) like the Subaru Justy's, are currently available technologies that could be used to significantly improve auto fuel efficiency. These technologies enable engines to operate at optimal efficiency more of the time. Taken together, these transmission improvements could increase the fleet average by 3 to 4 miles per gallon.
- * Lighter materials can safely reduce the load that the engine carries. The Office of Technology Assessment found that light-weight materials can be just as strong as steel. According to OTA, 35 pounds of composite plastics or 45 pounds of aluminum could have a strength similar to 100 pounds of steel.

Auto Efficiency and Carbon Dioxide Output

Pounds of Carbon Dioxide in Emissions (per car over car's lifetime)



Source: Environmental Action Foundation

Replacing engine blocks and transmission housings with aluminum greatly reduces vehicle weight. Every 10% reduction in weight yields a 6.6% average improvement in fuel economy, and these advances could raise fleet efficiency by 2.5 mpg. Department of Transportation crash tests show that passenger safety is primarily a function of vehicle design, not size or weight.

* Better aerodynamic designs, like that of the Ford Taurus, can cut down on wind resistance that eats up fuel and improve fleet performance by 1.4 mpg.

* Improved engine designs using off the shelf technology could raise the fleet average from 3 to 6 mpg. Much greater improvements are on the horizon within a few years. The highly efficient two-stroke engine not only improves fuel economy by as much as 30% but costs up to 25% less to produce than a conventional engine. A two-stroke plant is being built in Michigan so this technology should be available soon, as will direct injection diesel engines, "idle-off" engines and other gas-saving engine improvements.

Q. The auto companies are claiming that tighter CAFE standards will mean that truck owners won't be able to buy the vehicles they need. Is this true?

A. No. First, trucks will not have to meet the same CAFE standard as cars, but a lower one of 30 mpg by 2000 under the Bryan bill and 34 mpg under the Boxer bill. Second, many fuel efficiency technologies are available for use in trucks. But few have been applied to date because the CAFE standard for trucks has remained at only 20.2 mpg for 10 years. One such technology, a new General Motors truck transmission, will replace an 18-year-old model and will be 20% more efficient.

The heavy duty pickups which are the biggest gas guzzlers represent only 1/9th of the truck fleet. So even if they remain largely unchanged, there is still a lot of room for improvement in the smaller trucks, minivans and Jeeps.

When CAFE standards were set in 1975, manufacturers chose to start marketing a large line of small, light trucks such as Jeeps and minivans as a way to avoid the more stringent CAFE and safety standards set for cars. These light trucks (under 10,000 pounds) now account for 1/3 of the automotive fleet, so it is imperative that their fuel efficiency be improved to reduce our oil consumption.



*Global Warming
Science
Concern*



INTERGOVERNMENTAL PANEL ON
CLIMATE CHANGE

POLICYMAKERS SUMMARY

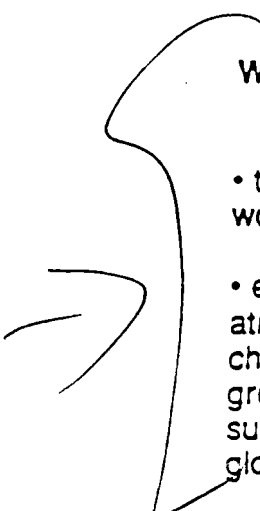
OF THE
SCIENTIFIC ASSESSMENT OF
CLIMATE CHANGE

Report to IPCC from Working Group 1

June 1990

Executive Summary

We are certain of the following:

- 
- there is a natural greenhouse effect which already keeps the Earth warmer than it would otherwise be.
 - emissions resulting from human activities are substantially increasing the atmospheric concentrations of the greenhouse gases: carbon dioxide, methane, chlorofluorocarbons (CFCs) and nitrous oxide. These increases will enhance the greenhouse effect, resulting on average in an additional warming of the Earth's surface. The main greenhouse gas, water vapour, will increase in response to global warming and further enhance it.

We calculate with confidence that:

- some gases are potentially more effective than others at changing climate, and their relative effectiveness can be estimated. Carbon dioxide has been responsible for over half the enhanced greenhouse effect in the past, and is likely to remain so in the future.
- atmospheric concentrations of the long-lived gases (carbon dioxide, nitrous oxide and the CFCs) adjust only slowly to changes in emissions. Continued emissions of these gases at present rates would commit us to increased concentrations for centuries ahead. The longer emissions continue to increase at present day rates, the greater reductions would have to be for concentrations to stabilise at a given level.
- the long-lived gases would require immediate reductions in emissions from human activities of over 60% to stabilise their concentrations at today's levels; methane would require a 15-20% reduction.

Our judgement is that:

- Global - mean surface air temperature has increased by 0.3°C to 0.6°C over the last 100 years, with the five global-average warmest years being in the 1980s. Over the same period global sea level has increased by 10-20cm. These increases have not been smooth with time, nor uniform over the globe.
- The size of this warming is broadly consistent with predictions of climate models, but it is also of the same magnitude as natural climate variability. Thus the observed increase could be largely due to this natural variability; alternatively this variability and other human factors could have offset a still larger human-induced greenhouse warming. The unequivocal detection of the enhanced greenhouse effect from observations is not likely for a decade or more.
- There is no firm evidence that climate has become more variable over the last few decades. However, with an increase in the mean temperature, episodes of high temperatures will most likely become more frequent in the future, and cold episodes less frequent.
- Ecosystems affect climate, and will be affected by a changing climate and by increasing carbon dioxide concentrations. Rapid changes in climate will change the composition of ecosystems; some species will benefit while others will be unable to migrate or adapt fast enough and may become extinct. Enhanced levels of carbon dioxide may increase productivity and efficiency of water use of vegetation. The effect of warming on biological processes, although poorly understood, may increase the atmospheric concentrations of natural greenhouse gases.

To Improve our predictive capability, we need:

- to understand better the various climate-related processes, particularly those associated with clouds, oceans and the carbon cycle
- to improve the systematic observation of climate-related variables on a global basis, and further investigate changes which took place in the past
- to develop improved models of the earth's climate system.
- to increase support for national and international climate research activities, especially in developing countries
- to facilitate international exchange of climate data

Based on current model results, we predict:

- under the IPCC Business-as-Usual (Scenario A) emissions of greenhouse gases, a rate of increase of global mean temperature during the next century of about 0.3°C per decade (with an uncertainty range of 0.2°C to 0.5°C per decade); this is greater than that seen over the past 10,000 years. This will result in a likely increase in global mean temperature of about 1°C above the present value by 2025 and 3°C before the end of the next century. The rise will not be steady because of the influence of other factors.
- under the other IPCC emission scenarios which assume progressively increasing levels of controls, rates of increase in global mean temperature of about 0.2°C per decade (Scenario B), just above 0.1°C per decade (Scenario C) and about 0.1°C per decade (Scenario D).
- that land surfaces warm more rapidly than the ocean, and high northern latitudes warm more than the global mean in winter.
- regional climate changes different from the global mean, although our confidence in the prediction of the detail of regional changes is low. For example, temperature increases in Southern Europe and central North America are predicted to be higher than the global mean, accompanied on average by reduced summer precipitation and soil moisture. There are less consistent predictions for the tropics and the southern hemisphere.
- under the IPCC Business as Usual emissions scenario, an average rate of global mean sea level rise of about 6cm per decade over the next century (with an uncertainty range of 3 - 10 cm per decade), mainly due to thermal expansion of the oceans and the melting of some land ice. The predicted rise is about 20cm in global mean sea level by 2030, and 65cm by the end of the next century. There will be significant regional variations.

There are many uncertainties in our predictions particularly with regard to the timing, magnitude and regional patterns of climate change, due to our incomplete understanding of:

- sources and sinks of greenhouse gases, which affect predictions of future concentrations
- clouds, which strongly influence the magnitude of climate change
- oceans, which influence the timing and patterns of climate change
- polar ice sheets which affect predictions of sea level rise

These processes are already partially understood, and we are confident that the uncertainties can be reduced by further research. However, the complexity of the system means that we cannot rule out surprises.

Auto ind. recycled arguments!

The Auto Industry on Fuel Efficiency: Yesterday and Today

FORD MOTOR COMPANY:

1974: "This proposal would require a Ford product line consisting of either all sub-Pinto-sized vehicles or some mix of vehicles ranging from a sub-sub-compact to perhaps a Maverick." (1)

1989: "As a result, if the standards in S.1224 are adopted, the inevitable result would be a significant reduction in vehicle size." (2)

CHRYSLER MOTORS CORPORATION:

1974: "In effect, this bill would outlaw a number of engine lines and car models, including most full-size sedans and station wagons. It would restrict the industry to producing sub-compact-size cars -- or even smaller ones." (3)

1989: "[With S. 1224], one half our sales in the United States would have to be vehicles sized similar to the Chevrolet Sprint and Suzuki Forsa, where as one half of present sales are represented by entries such as Dodge Dynasty, Chrysler New Yorker, and Plymouth Acclaim (replacing Reliant). The net result would be to shift 50% of our buyers from five to six passenger midsize vehicles offering 110-119 cu. ft. of interior space to four passenger mini compact vehicles offering less than 85 cu. ft. of interior space." (4)

GENERAL MOTORS CORPORATION:

1974: "This legislation would have the effect of placing restrictions on the availability of 5 and 6 passenger cars -- regardless of consumer needs or intended use of vehicles. It is not only an unjustified interference with individual freedom, but an extreme and unusual way for a free society to achieve its goals." (5)

1989: "Thus, absent any unforeseen technological developments, CAFE targets of the magnitude of those in S.1224 would force us to consider drastic measures, such as cutting production of our larger, family-sized cars." (6)

REFERENCES:

1. Ford Motor Company Statement on S. 1903, Hearing on Energy Conservation Working Paper Before the Senate Comm. on Commerce, 93rd Cong., 2nd. Sess. (p. 177).

2. Ford Motor Company Statement on S. 1224, Hearing on Corporate Average Fuel Economy Before the Senate Comm. on Commerce, 101st Cong., 2nd Sess., testimony of Helen O. Petrauskas, Vice Pres., Environmental & Safety Engineering.

3. S. 1903, op. cit., testimony of Alan G. Loofbourrow, Vice President, Chrysler Motors Corporation. (p. 141).

4. S. 1224, op. cit., testimony of Mr. R.R. Bolz, Vice President, Advance Product and Operations Planning, Chrysler Motors Corporation.

5. S. 1903, op. cit., statement of H. L. Duncombe, Jr., Vice President, General Motors Corporation. (p. 195).

6. S. 1224, op. cit., testimony of Dr. Marina N. Whitman, Vice President and Group Executive, Public Affairs Group, General Motors Corporation.

HOW DO WE GET TO 45 MPG BY 2000?*

The following assessment assumes the industry takes two technology leaps, one that leads to a fleet fuel economy some time between 1990 and 2000 of 38.5 mpg, and a second that yields a fleet fuel economy by 2000 of 45 mpg. The first technology leap would use a very high fraction of "off-the-shelf" technology, while the second leap would use more technology that is close to, but not yet in, production. Technologies already in production are noted with a **.

FIRST TECHNOLOGY LEAP (With 1987 as base year)

<u>Technology</u>	<u>% Fuel Economy Gain</u>	<u>% Market Penetration (Over 1987 Levels)</u>	<u>Fleet % Fuel Economy Gain</u>
Front wheel drive**	12	20	2.4
4 valve per cylinder (4 & 6 cyl. engines)**	5-10	80	6.0
Intake valve control**	4	40	1.6
4-speed automatic/CVT**	7.5	40	3.0
Electronic transmission control**	1.5	85	1.3
Reduced drag**	3.4	100	3.4
Additional drag reduction**	3.4	80	2.7
Tires**	.5	100	.5
Lubricants**	.5	100	.5
Accessories**	1	100	1.0
Engine improvements			
-Roller cams**	1.5	30	1.2
-Low friction rings/pistons**	1.5	30	1.2
-Throttle body fuel injection**	3	10	.3
-Multipoint fuel injection**	7	10	.7
-Multipoint fuel injection (over throttle body)**	3	40	1.2
-Overhead cam**	8	40	2.4
Weight reduction (10%)**	6.6	30	5.3
TOTAL			34.7

RESULTING FUEL ECONOMY = 38.5 MPG; AVERAGE WEIGHT = 2700 LBS.

SECOND TECHNOLOGY LEAP

<u>Technology</u>	<u>% Fuel Economy Gain</u>	<u>% Market Penetration (Over Previous Levels)</u>	<u>Fleet % Fuel Economy Gain</u>
Advanced weight reduction	3.3-6.6	80	4.0
Advanced drag reduction	1.7-3.4	100	2.6
Advanced intake valve control	4-7	20	1.1
2-stroke engine (over 4-valve, 4-stroke)	10-15	40 (in small cars)	4.0
CVT (over 4-speed auto.)**	3-5	40 (in small cars)	1.3
6-speed manuals	2	25	.5
Advanced tires/oils	2-3	100	2.5
Electric power steering	1-2	50	.8
TOTAL			16.8

RESULTING 2000 FUEL ECONOMY = 45 MPG; AVERAGE WEIGHT = 2525 LBS.

* Based upon "Developments in the Fuel Economy of Light-Duty Highway Vehicles", prepared for the Office of Technology Assessment by Energy and Environmental Analysis, Inc., August 1988.

N.B.--THIS ANALYSIS IS NOT MEANT TO PREDICT EXACTLY HOW THE INDUSTRY WILL SEEK TO COMPLY WITH A STANDARD THAT WOULD SEEK TO ESTABLISH A NEW AUTOMOTIVE FLEET FUEL ECONOMY BY 2000 OF 45 MPG. RATHER, THIS ASSESSMENT IS MEANT TO SHOW BOTH THE "DOABILITY" OF THIS TARGET AS WELL AS TO ILLUSTRATE ONE WAY THE INDUSTRY COULD MEET SUCH A TARGET.

Table 1-1 — Fuel Economy Technologies and Design Improvements

Weight reduction. Includes three strategies: substitution of lighter weight materials (e.g., aluminum or plastic for steel); improvement of packaging efficiency, i.e., redesign of drivetrain or interior space to eliminate wasted space; and technological change that eliminates the need for certain types of equipment or reduces the size of equipment.

Aerodynamic drag reduction. Primarily involves reducing the drag coefficient by smoothing out the basic shape of the vehicle, raking the windshield, eliminating unnecessary protrusions, controlling airflow under the vehicle (and smoothing out the underside), reducing frontal area, etc.

Front wheel drive. Shifting from rear to front wheel drive, which allows: mounting engines transversely, reducing the length of the engine compartment; eliminating the transmission tunnel, which provides important packaging efficiency gains in the passenger compartment; and eliminating the weight of the propeller shaft and rear differential and drive axle. Now in wide use.

Overhead cam engines. OHC engines are more efficient than their predecessor pushrod (overhead valve, OHV) engines through their lower weight, higher output per unit displacement, lower engine friction, and improved placement of intake and exhaust ports.

Four valve per cylinder engines. Adding two extra valves to each cylinder improves an engine's ability to feed air and fuel to the cylinder and discharge exhaust, increasing horsepower/unit displacement. Higher fuel economy is achieved by downsizing the engine; the greater valve area also reduces pumping losses, and the more compact combustion chamber geometry and central spark plug location allows an increase in compression ratio.

Intake valve control. Shift from fixed-interval intake valve opening and closing to variable timing based on engine operating conditions, to yield improved air and fuel feed into cylinders and reduced pumping loss at low engine loads.

Torque converter lockup. Lockup eliminates the losses due to slippage in the fluid coupling between engine and transmission.

Accessory improvements. Adding a two-speed accessory drive to more closely match engine output to accessory power requirements, plus design improvements for power steering pump, alternator, and water pump.

Four- and five-speed automatic transmissions, and continuously variable transmissions. Adding extra gears to an automatic transmission increases fuel economy because engine efficiency drops off when its operating speed moves away from its optimum point, and the added gears allow the transmission to keep the engine closer to optimal speed.

Electronic transmission control. Electronic controls to measure vehicle and engine speed and other operating conditions allow the transmission to optimize gear selection and timing,

keeping the engine closer to optimal conditions for either fuel economy or power than is possible with hydraulic controls.

Throttle body and multipoint fuel injection. Fuel injection allows improved control of the air/fuel mixture and thus allows the engine to continually adjust this mixture for changing engine conditions. Multipoint also reduces fuel distribution problems. In wide use.

Roller cam followers. Most current valve lift mechanisms are designed to slide along the camshaft; shifting to a rolling mechanism reduces friction losses.

Low friction pistons/rings. Lower friction losses result from better manufacturing control of tolerances, reduced ring tension, improved piston skirt design.

Improved tires and lubricants. Continuation of longstanding trends towards improved oil (in near-term, substitution of 5W-30 oil for 10W-40 oil), and tires with lower rolling resistance.

Advanced engine friction reduction. Includes use of light-weight reciprocating components (titanium or ceramic valves, composite connecting rods, aluminum lifters, composite fiber-reinforced magnesium pistons), improved manufacturing tolerances to allow better fit of moving parts, available post-1995.

Electric power steering. Used only for cars in the minicompact, subcompact, and compact classes.

Lean burn. Operating lean improves an engine's thermodynamic efficiency and decreases pumping losses. Requires a new generation of catalysts that can reduce NO_x in a "lean" environment.

Two-stroke engines. Unlike a conventional engine, there is a power stroke for every ascent and descent of the piston, thus offering a significantly higher output per unit of engine displacement, reduced pumping loss, smooth operation, and high torque at low speeds, allowing engine downsizing and fewer cylinders (reduced friction losses). Also, operates very lean, with substantial efficiency benefits (if NO_x problems are solved). Compliance with stringent emissions standards is unproven.

Diesel engines. Compression-ignition engines, or diesels, are a proven technology and are significantly more efficient than gasoline two-valve engines even at constant performance; new direct injection turbocharged diesels offer a large fuel savings. Although the baseline gasoline engine will improve in the future, a portion of the improvements, especially engine friction reduction, may be used beneficially with diesels as well. Use may be strongly limited by emissions regulations and consumer reluctance.

Electric hybrids. Involves combining a small electric motor for city driving and a diesel for added power and battery charging. The small size of the diesel eases emission limitations, and the substantial use of the electric motors reduces oil use.

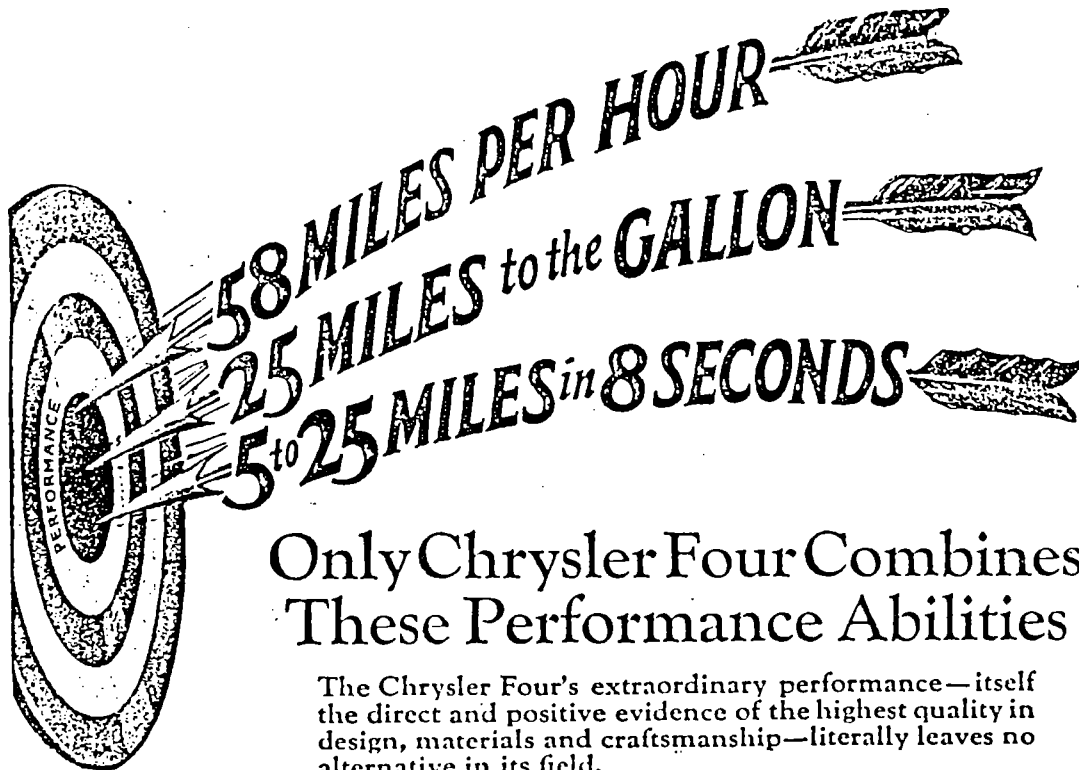
SOURCE: Office of Technology Assessment, 1991.

However, a significant *reduction* in average vehicle size and performance could offer a substantial benefit in increased fuel economy; and measures to change consumer preferences (especially economic incentives such as gasoline taxes and rebates on high fuel economy vehicles) might be attractive components of a fuel conservation strategy.

To be successful, however, a fuel economy strategy featuring smaller, less powerful cars requires far more change in consumer attitudes than one based on technological changes only; the latter affects primarily a vehicle's price and, in the case of improved aerodynamics, its aesthetics, whereas the former can strongly affect a vehicle's basic utility, comfort, and driving enjoyment.

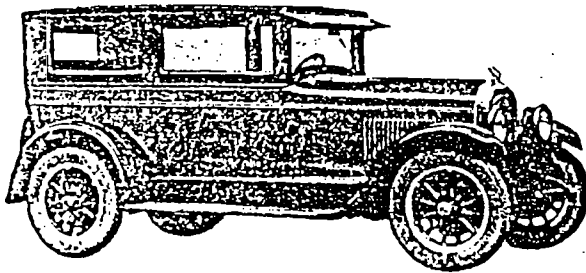
For Content + Amusement

NATIONAL GEOGRAPHIC - DECEMBER 1925



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CHRYSLER FOUR

Suppliers say U.S. car fleet can get 41 mpg in 10 years

By Lindsay Chappell
AUTOMOTIVE NEWS STAFF REPORTER

U.S. auto suppliers believe domestic cars could meet fuel economy goals of 33 mpg by 1995 and 41 mpg by 2000 and that suppliers themselves will be instrumental in helping the Big 3 achieve that economy.

The position stands in stark contrast to the U.S. automakers, who are reluctant to commit to specific numbers.

A new survey of domestic component producers indicates they believe they would have no problem with a 45 percent improvement in corporate average fuel economy numbers.

U.S. automakers have committed to improving fuel economy in the '90s, but they are pushing for a system of flat percentage increases on a company-by-company basis. That system, they say, will prevent producers of larger vehicles from being penalized.

The supplier targets of 33 mpg and 41 mpg are still lower than those being proposed in a number of bills before Congress this year, however. At least three bills will

What's most important piece for better mpg?

A.T. Kearney asked 95 U.S. suppliers which components need most development to improve fuel economy. These are their top responses:

Fuel Systems	29%
Electronics	14%
Tire Design	11%
Multi-valve engine	9%
Combustion chamber design	8%
High-temp engine material	7%
Valve train design	6%
Transmission gear ratios	5%
Continuously variable trans.	3%

reach the Senate this fall requiring the industry to have an average fuel efficiency of 45 to 50 mpg in 10 years.

"The survey results are surprising because of the attitude it reveals among the supplier industry," said Earl Landesman, principal with A.T. Kearney Inc., the international automotive consulting firm that conducted the study. "They're very gung-ho to

meet the challenge. The public has the impression that the auto industry is running out of steam on improving fuel efficiency because there hasn't been much progress in the past two years. But here's the supplier industry saying that it's their responsibility, too, and they can do it."

Kearney asked 95 suppliers with combined revenues of \$30 billion what mpg targets they considered realistic and how they would meet them.

Suppliers feel weight reduction is the answer.

"They're very determined that the answer is vehicle weight reduction," Landesman said of the survey results. "Everybody tends to look at the powertrain for the answer, but the majority think that weight reduction is the first key."

Weight reduction would be achieved with new plastic compounds, developed jointly between suppliers and the carmakers, and lighter metals for chassis components, castings and wheels, according to the survey answers.

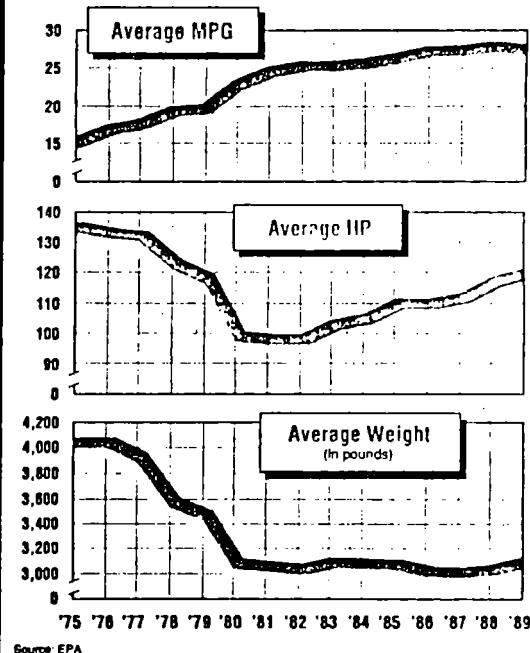
Further efficiency will come from engine enhancements, the development and wider use of alcohol-based fuels, improved aerodynamics and, only as a last resort, vehicle downsizing.

A majority said that while they did not want to return to the "econo-box days of the early 1980s" or sacrifice vehicle performance, the industry must take a position on both fuel efficiency and emission control before the government legislates a position for it.

The survey participants predicted that if Congress forces automakers to meet a 50 mpg industry standard in the coming decade, Japanese carmakers, producers of small European vehicles, plastics manufacturers and automotive electronics producers will be the biggest winners. The biggest losers would be the Big 3, European luxury car producers, steel companies and stamping, castings and forging

Car fleet fuel efficiency

Figures are for model years; '89 is preliminary.



companies, the survey said.

Average industry fuel economy improved dramatically between 1975 and 1982 as the auto industry was rocked by escalating gasoline prices, import sales competition and a U.S. recession. Average vehicle fuel economy increased by 28 percent between 1975 and 1979, by another 28 percent between 1979 and 1982, and by 10 percent between 1982 and 1988. In 1989 it will actually decrease a bit, ac-

cording to figures from the Environmental Protection Agency.

While the suppliers expressed confidence that meeting tougher industry requirements would boost their own revenues and either increase or not affect their earnings, they acknowledged their OEM counterparts would be so lucky. The majority foresaw an increase in automaker profits if fuel efficiency technology must be implemented.

The Dallas Morning News

Thursday, September 27, 1990

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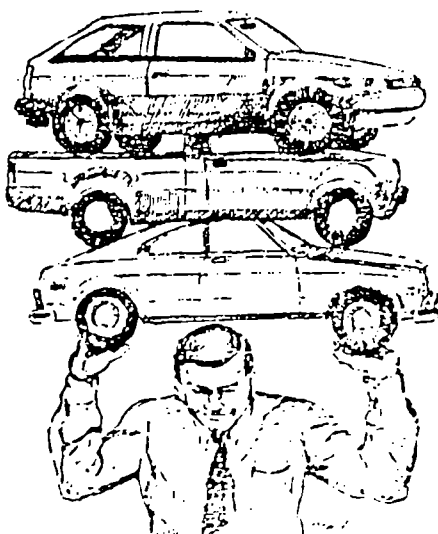
LOST OPPORTUNITY

Senate defeat of gas mileage bill is shameful

Congress this week had its first opportunity to reduce the nation's dependence on foreign oil since the start of the Persian Gulf crisis. But the lawmakers said, "No thanks." Despite all the recent political rhetoric about the need to encourage energy conservation, the Senate in effect killed a bill that would have required automakers to improve the fuel efficiency of their fleets. If the world ran on hypocrisy, Congress would be quite a power source.

As matters stand, though, the world runs on oil — a fact that seems to have escaped lawmakers' attention. The defeated measure would have required new cars sold in this country to attain a level of fuel use averaging about 40 miles to the gallon by 2001, up from the current average of about 28 mpg. The higher standard eventually would have saved about 3 million barrels of oil a day. Americans now import approximately 7 million barrels every day.

Those benefits didn't impress the Senate, however. What did touch the politicians were the Chicken Little cries of the auto in-



dustry. "It can't be done," the manufacturers wailed. "If you pass that measure, Americans will be driving around in mini-compacts." Nonsense! The auto industry made the same warning 17 years ago, when Congress approved a 100 percent improvement in gas mileage. Obviously, the down-sizing never turned out to be as severe as predicted.

A further improvement in gas mileage could have been achieved by altering the design of the engine combustion system to em-

phasize fuel efficiency over power. True, that would have meant forcing drivers to wait a second or two longer to go from 0 to 60 miles per hour. But it would have been a small price to pay for increased independence from foreign oil and despots like Saddam Hussein. It's time that lawmakers got their priorities in order and put meaning to their words.

The gas guzzler and its supporters won a very big victory on Capitol Hill the other day. The champagne corks must have been popping in Detroit's corporate board rooms — not to mention Saddam Hussein's palace.

The Orlando Sentinel, Sunday, September 16, 1990

The Orlando Sentinel

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Get going on fuel economy

Even with oil prices on the rise and eventual shortages of gasoline a virtual certainty, automakers keep opposing more sensible mileage standards.

They suffered a deserved setback on Friday. The Senate agreed to consider a proposal that would require a 40 percent improvement in the fuel efficiency of cars and light trucks by the year 2001.

The goal is unquestionably worthy. But its advocates can win only by tough lobbying to offset massive opposition from the automotive industry and its unions.

The industry claims stricter mileage standards would require smaller cars — and restrict customer choice — in the next decade. Sorry, but those aren't sufficient reasons to resist better mileage.

The argument for greater efficiency is much more compelling — to reduce dependency on foreign oil, lower our trade deficit, fight inflation and improve air quality.

Detroit's executives are reading from an old script. For decades, they have raged at every congressional effort to improve fuel efficiency and reduce toxic emissions. They have testified time and again that

one goal or another was unreasonable, impossible or prohibitively expensive.

Thank heavens Congress refused to be intimidated. It doubled average vehicle fuel economy — to 27.5 miles per gallon for passenger cars — between 1975 and 1985.

But whatever the negativism of people who produce cars, people who buy them are not above reproach. Too many thoughtless people sustain the demand for the gas-guzzler vehicles.

Proof: The Association of International Automobile Manufacturers recently polled drivers on the proposed fuel economy improvements. About 48 percent of the respondents wanted efficiency levels to stay where they are — at the 27.5 mpg average output. Only 40 percent favored an increase to 40 mpg, and 8 percent wanted to lower the standards.

A vote on the Senate bill could come early in the week, and the House has a companion measure. The need to approve them is urgent.

Mandating better fuel economy is one of the most effective ways to deal with the oil crises that keep coming back to haunt us.

THE CLEVELAND PLAIN DEALER

CITY'S LARGEST NEWSPAPER CLEVELAND, FRIDAY, SEPTEMBER 7, 1990

Cleveland Plain Dealer

Going farther with less

Eric Raymond is one of those diehards who refuse to believe a good thing is unachievable. The expert hang glider this week set his solar-powered plane down nine miles short of Kitty Hawk, when poor weather prevented his proceeding further. Yet, he still claimed victory in his cross-continental odyssey. Solar power to feed the electric motor for his takeoffs and landings and the heat-driven columns of air on which he rode took him and his ultralight aircraft 2,407 miles, and that's a lot of gas saved.

America-boosters like to talk of this nation's can-do spirit, but would be hard-pressed to find it when it comes to alternative-energy research. Over the past decade, there's been a precipitous drop in government funding and, consequently, research on solar, wind, ethanol and other alternative sources of power.

At the same time, the nation's sense of urgency about conserving both electricity and gas has vanished even as a military confrontation is threatened over oil. Power — read, "gas guzzlers" — is in. Restraint is out.

Congress, reconvening in the midst of this energy nonchalance, has a chance to make a forceful statement: passage of a tightened average fleet-mileage standard for automobiles. The proposal from Sen. Richard H. Bryan, a Nevada

Democrat, would phase in 40% tougher fuel-economy standards over the next ten years. A similar proposal, offered to head off global warming (since car exhaust is a major contributor to U.S. emissions of carbon dioxide, a greenhouse gas) was excised from the Clean Air Act rewrite earlier this year.

It could be the tide has turned. Coming amid events that have underscored the collapse of U.S. energy policy in the '80s, debate on Bryan's proposal this month will be the Senate's first crack at remedying the matter. Auto makers have consequently stepped up their lobbying to stop it, proffering the dreaded "drop in living standards," "change in lifestyle," "hostage to your little car" scenarios.

Hogwash. Little doesn't mean less, although it may require more imagination and determination to get farther on littler — as Eric Raymond, who went windsurfing when high winds helped stymie his journey's last leg, has just shown. It should not be beyond this nation's inventiveness to drive on, using less gas and more "other," in whatever shape — retooled cars, alternative fuels, more efficient combustion — that "other" may take. Littler might even be more fun — and will surely make the fun last longer.

Cheers & Jeers

JEERS ... to Dean R. Keller, plant director at Cleveland State University, for his horrible sense of humor. At a roast for a departing colleague, Keller decided to parody the CSU students holding a sit-in to protest the university's removal of Raymond A. Winbush as vice president for minority affairs and his

JEERS ... to both the Willowick officials and residents who engaged in a nasty debate at a recent City Council meeting regarding the planned condemnation of a house inhabited by an 80-year-old resident. Residents criticized and taunted Mayor A. Donald Fitzgerald, Councilman Don Hitz and other

A-10 The Atlanta Journal AND CONSTITUTION MON., SEPTEMBER 24, 1990

THE ATLANTA CONSTITUTION

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James M. Cox, Chairman 1950-57 — James M. Cox Jr., Chairman 1957-74

Make fuel-efficient cars mandatory

Will the United States react with any degree of intelligence to the challenge posed by this oil crisis? The answer may begin to take shape today, when the Senate is scheduled to consider a bill raising the fuel-efficiency demanded of cars sold in the United States.

The bill, sponsored by U.S. Sen. Richard H. Bryan (D-Nev.), would require automakers to build fleets averaging at least 40 miles per gallon by the year 2001. The current standard, 27.5 mpg, has not been increased since 1985.

Mr. Bryan's bill is opposed by the Bush administration. That may seem odd, given that the president believes this energy crisis so crucial that it requires opening environmentally sensitive areas to oil exploration.

How can this crisis justify dumping environmental concerns, yet not justify smarter use of oil we already have?

Through Transportation Secretary Samuel Skinner, the administration has offered three arguments for opposing the Bryan bill. First, the standards are supposedly unreachable, a claim also made by the auto industry. The credibility of that argument is undermined by the fact that it echoes precisely the complaint of automakers 15 years ago, when auto-efficiency standards were first imposed. They claimed then that the standards being imposed were unreachable; in practice they were reached with very little difficulty.

The second argument is also familiar. To require better fuel efficiency is to put the U.S. auto industry at a disadvantage, the complaint goes. That doesn't make much sense, given that the same rules would apply to all

automakers, foreign and domestic. It's discouraging that after all this time, the U.S. auto industry still evinces such little confidence in its abilities.

Finally, Mr. Skinner professes deep concern for the safety of the American motorist who might be forced, under the Bryan bill, to drive smaller, and thus less safe, automobiles. "It should be called the highway fatality bill," Mr. Skinner has said.

If motorist safety is really such a priority, why isn't the administration pushing for a rollback of the speed limit to 55 mph, a move that would save hundreds of lives each year and in the process cut gasoline consumption by 10 to 15 percent?

The fact that such a move isn't even considered demonstrates the real thinking behind the administration's position. The problem is not safety; the problem is a deep reluctance to ask anything of the American people or American business. The government will not ask us to drive slower; it will not ask Detroit to stop building "muscle cars." It will simply ask us for our young sons and daughters, so they can be placed in the line of fire in some far-off land.

That particular sacrifice, you see, can be sold as evidence of America's strength. It's politically popular. Being forced to drive smaller or less powerful cars, on the other hand, might be considered evidence of our decline, and thus be unpopular.

What malarkey. If the Senate votes down the Bryan bill, it will prove nothing more than our common stupidity.

The Mountain West's first newspaper

DESERET NEWS

Founded June 15, 1850 Salt Lake City, Utah

In our opinion

Richard B. Laney, Editorial Page Editor, 237-2186

Auto industry must raise its car mileage standards

With the Iraq crisis posing a major threat to the world's oil supplies and gasoline prices soaring for American motorists, the earlier resistance of U.S. auto manufacturers to building high-mileage cars may come back to haunt the nation. But don't count on the auto industry to learn the latest lesson, either.

After the oil embargo of the early 1970s shocked the nation and sent motorists scrambling to buy fuel-efficient Japanese cars, Congress passed laws establishing Corporate Average Fuel Economy standards, or CAFE. The mileage performance for all autos produced by a manufacturer had to meet a certain combined minimum average.

Japanese producers met those levels, but the U.S. auto industry fought them at every turn as the requirements rose over the years. The industry won delay after delay from Congress and finally stalled the standard at 27.5 miles per gallon. A year-and-a-half ago, American automakers even tried to get the level rolled back to 26 mpg.

Experts and analysts warned about the growing dependence on foreign oil and urged higher mileage standards. But Detroit produced bigger and bigger cars as the price of oil declined — and U.S. consumers kept buying them while ignoring American-made, small, fuel-efficient models — although they have continued to purchase the Japanese ones, per-

haps because of quality.

Now that the oil crisis has once again burst on the country, one would think the auto industry would recognize the need for small cars and high fuel efficiency. But guess what?

An energy security bill now before Congress would raise the fleet average to 33 mpg by 1995 and 40 mpg by the year 2004. But automakers are fearful the government will "over-react" to the Iraq crisis and adopt those standards.

"Over-react" by taking common sense steps to cope with reality? Detroit was badly beaten by Japan as a result of the previous oil crisis. It may not survive another such lesson.

A start on lowering fuel consumption has to be made somewhere — and soon. Even if the Iraq conflict blows over and things return to what passes for normal, the oil issue will remain. The U.S. balance of payments, strategic interests and domestic economy are all tied to oil.

Ways must be found to reduce the dependence on foreign oil, if for no other reason than the fact that the world's supply of oil has limits — and those limits are in sight.

Wells are going to start running dry in another 25-30 years. Americans cannot keep driving big cars and pretending that they can live life the way it was in the oil-rich 1960s. Iraq's Saddam Hussein has driven this lesson home a few years sooner than it might have come otherwise.

COMMENT

N.Y. TIMES

NOV 22 1981

Note
Date

The 100 M.P.G. Car

By SHERWOOD L. FAWCETT

It is not only possible, it is practical to build a car that gets 100 miles per gallon. At Battelle Memorial Institute, we have just completed a study of what could be done using today's technology to yield a highly fuel-efficient, lower-cost automobile that meets all current and anticipated United States legal, safety and environmental requirements.

Our engineers were told to start with a clean piece of paper and design a vehicle that we called Pertran, for Personal Transportation. We specified that Pertran should deliver 100 miles per gallon in city driving as well as in the country, carry four adults and their baggage comfortably, have all the safety characteristics of today's cars, mix safely with normal traffic, have a sticker price of about \$6,000 (1981 dollars) in mass production and have a 100,000-mile life.

Our conclusion was that there is no technological reason we cannot have a Pertran vehicle with the present state of the art. The cost of manufacturing the vehicle, however, is less certain.

The Pertran as conceived will, not surprisingly, bear a striking resemblance to today's automobile. It will be light-weight — slightly more than 1,000 pounds. Streamlined, even underneath, it will be relatively long, somewhat narrow and high. The engine will be relatively small — 25 horsepower — and will be supercharged to about 37 horsepower for higher accelerations and hill climbing.

The vehicle has a variable-speed transmission, controlled by a micro-processor that always adjusts the speed of the engine to operate at a maximum fuel efficiency. The transmission also contains a small flywheel to store and recover power lost during braking in urban driving and use it during the next acceleration.

Weight and cost requirements will be met by extensive use of aluminum, plastics and composite materials, as

well as steel. It will likely have a pseudo-aircraft type structure using stressed skins with internal supports.

The philosophy of Pertran is to design a safe car, not just a car that meets regulations. Considerable attention has been given to adequate frontal crush distances between the front bumper and the passenger. This longer distance from bumper to firewall — about 50 inches — helps account for the length and height of the vehicle.

Although the technology is available to build a fuel-efficient, cost-effective automobile and some public acceptance appears to exist, the odds are against its near-term appearance. Traditionally, the auto industry makes small evolutionary changes rather than bold, innovative advances using new technology.

The cost of introducing a new design is not only large, but there is also the problem of uncertain financial returns. The industry needs an incentive to take financial risks to advanced technology for a new fuel-efficient automobile design.

The Federal Government might be able to supply just such an incentive.

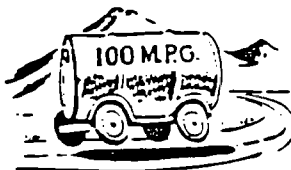
My preference would be a Congressionally authorized prize to the organization that succeeds in commercially producing a radically new automobile like Pertran.

The prize might be a *Micro Car* Government-guaranteed fixed price to the winning manufacturer

of up to \$20,000 per vehicle. This prize might apply to the first 10,000 vehicles sold to the public for the targeted sticker price of \$6,000. If this were the case, the Government would pay a premium of \$14,000 (\$20,000 minus \$6,000) for the first 10,000 vehicles, resulting in a total \$140 million prize.

The competition would be for a period of at least three years but less than five years. Should more than one company meet the requirements, the organization that best met or exceeded the criteria would be judged the winner by the Government.

With this type of prize incentive program, the Government would help an enterprising organization reduce the initial financial risks and assist in building a production base for doubling or even tripling the fuel economy of the American automotive fleet. ■



Sherwood L. Fawcett is president and chief executive of the Battelle Memorial Institute.

Consumer Savings at gas pump state by state

FOR IMMEDIATE RELEASE
May 1, 1991

Contact: Brian Erwin
Sierra Club
415/923-5593

Charles Mendler
Energy Conservation
Coalition
202/745-4874

ANNUAL PETROLEUM SAVINGS PER HOUSEHOLD IN 2010 WITH BRYAN-GORTON BILL S. 279

STATE	# OF HOUSEHOLDS* IN 2010	ANNUAL SAVINGS IN 2010 IN \$ MILLIONS**	\$ SAVINGS PER HOUSEHOLD
AL	1,832,440	\$1,275.1	\$695.85
AK	214,720	125.4	\$584.02
AZ	1,562,820	933.9	\$597.57
AR	1,101,660	786.2	\$713.65
CA	12,597,720	7,409.0	\$588.12
CO	1,544,520	1,357.8	\$879.11
CT	1,468,880	825.1	\$561.72
DE	297,680	205.1	\$688.99
FL	6,004,840	8,668.1	\$1,443.52
GA	2,823,080	2,208.8	\$782.41
HI	430,660	131.5	\$305.35
ID	442,860	276.9	\$625.25
IL	5,275,280	2,962.1	\$561.45
IN	2,533,940	1,691.8	\$667.66
IA	1,326,140	765.1	\$576.94
KS	1,166,320	637.8	\$546.85
KY	1,687,260	1,174.6	\$696.16

"Petroleum Savings"
Sierra Club
Page 2

LA	1,899,540	1,174.2	\$618.15
ME	561,200	360.5	\$642.37
MD	2,069,120	1,186.0	\$573.19
MA	2,708,400	1,443.2	\$532.86
MI	4,140,680	2,446.7	\$590.89
MN	1,975,180	1,161.7	\$588.15
MS	1,121,180	787.0	\$701.94
MO	2,400,960	1,683.9	\$701.34
MT	370,880	278.4	\$750.65
NE	750,300	408.4	\$544.32
NV	508,740	392.2	\$770.92
NH	491,660	298.5	\$607.13
NJ	3,468,460	1,946.8	\$561.29
NM	656,360	468.8	\$714.24
NY	8,296,000	3,503.8	\$422.35
NC	2,981,680	2,216.3	\$743.31
ND	302,560	198.7	\$656.73
OH	5,006,880	2,921.6	\$583.52
OK	1,511,580	975.9	\$645.62
OR	1,344,440	556.6	\$414.00
PA	5,492,440	4,300.2	\$782.93
RI	455,060	170.1	\$373.80
SC	1,494,500	1,003.9	\$671.73
SD	326,960	232.0	\$709.57
TN	2,259,440	1,305.3	\$577.71

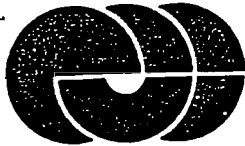
"Petroleum Savings"
Sierra Club
Page 3

TX	7,339,520	5,244.4	\$714.54
UT	639,280	458.3	\$716.90
VT	256,200	139.9	\$546.06
VA	2,718,160	1,876.5	\$690.36
WA	2,216,740	1,292.2	\$582.93
WV	863,760	346.9	\$401.62
WI	2,219,180	1,258.9	\$567.28
WY	214,720	229.4	\$1,068.37
TOTAL	111,676,360	73,611.5	\$659.15

* Source: U.S. Bureau of the Census, Current Population Reports, series P-25, No 437, No. 986 which projects an 11% increase in households between 1990 and 2000. Even though projections for the rate of growth of new households is expected to decrease, this number was doubled to account for the years 2000 to 2010.

** Figures provided by Charles Mendler, Energy Conservation Coalition

- Based on:
1. Gasoline consumption per state based upon gas tax data provided by Motor Vehicle Manufacturers Association, Facts and Figures 1988; Deborah Gordon, Union of Concerned Scientists.
 2. 3.18 Mbbl/Day Petroleum saved nationally in 2010 by cars and light trucks: John DeCicco, American Council For An Energy-Efficient Economy, February 1, 1991.
 3. \$1.51 per gallon of gasoline in 2010: Department of Transportation projections.



Re: Nat. Academy of Sci Rpt.

ENERGY CONSERVATION COALITION
6930 CARROLL AVE, 6TH FL TAKOMA PARK, MD 20912

April 22, 1992

Dear Editorial Board Writers:

New information has been released regarding automobile fuel economy. The undersigned members and advisors of the Energy Conservation Coalition urge you to write an editorial on this important topic. The report, Automotive Fuel Economy - How Far Should We Go?, was released on April 7 by the National Academy of Sciences - National Research Council (NRC). The report confirms two key positions environmental and consumer advocates have stressed in the debate over improving car and light truck fuel efficiency.

First, the technology already exists to achieve significantly higher fuel economy (miles per gallon - MPG).

Second, these improvements can be made safely.

This study was requested by the Bush Administration during congressional consideration of Senators Richard Bryan (D-NV) and Slade Gorton's (R-WA) S. 279 and Rep. Barbara Boxer's (D-CA) H.R. 446 bills to increase the Corporate Average Fuel Economy (CAFE) of new cars. These bills require 40 and 60 percent improvements, respectively, of the average new car from the current 27.5 mpg required CAFE standard. (The Bryan-Gorton bill received 57 votes in the Senate in 1990 on an effort to shut off an auto industry-sponsored filibuster).

We believe that the report provides critical evidence that counters the auto industry's long standing arguments against improving fuel economy. This letter provides our insight in to several key areas discussed in the NRC report.

Technology Improvement Makes 40+ MPG Feasible

The NRC finds, relying solely on existing technology currently in mass produced vehicles, that the U.S. can achieve a potential fuel economy average of 37.5 mpg by 2006 (NRC, p. 4). This is a 35 percent improvement over the 1990 average of 27.8 mpg. The NRC's findings are all the more remarkable given the very restrictive and narrow parameters of the study. The report finds that "additional fuel economy increases could be obtained if the constraints and assumptions embodied in the definition of the 'technically achievable' levels were relaxed". (NRC, p. 154) We believe that a less myopic evaluation of current and emerging technologies will demonstrate that such improvements in fuel economy can be achieved by the end of the century.



The report discusses other developments that should be factored in when policymakers consider appropriate targets for fuel economy legislation. For example, the NRC notes that "the lean-burn feature may lead to a 10 percent increase in fuel economy benefit." (NRC, p. 206) The fact that this was not included in the report's summary table is part of the reason why they estimate a future fuel economy of 39-44 mpg for subcompacts even though you can today buy a lean-burn Honda Civic that is rated at 55-61 mpg.

In addition, including the effect of alternative fuel credits and restraining the dangerous and inefficient muscle car trend (performance adjustments) would push the NRC's estimate up to 41 mpg, even without including emerging technologies. As shown in the attached chart, inclusion of lean-burn or other new technologies discussed in the report would push the achievable average fuel economy up to 43 mpg. Considering CAFE credits, emerging technologies and alternative fuels in the NRC's analysis would have made the report more consistent with other fuel economy analyses and facilitated easier comparison.

Benefits of Improved Efficiency Outweigh Costs

The NRC outlines a long list (NRC, p. 23) of societal benefits from reduced automotive fuel consumption, such as: reduced consumer expenditures, conservation of resources, enhanced national security, enhanced economic security, improved balance of payments, improved environmental quality, enhanced diffusion of technology and increased economic efficiency. We are confident that policymakers will concur that the benefits of improving auto efficiency to reduce U.S. dependence on oil, reduce carbon dioxide emissions (the principal greenhouse gas), and improve U.S. competitiveness outweigh the costs.

The media response to the report seemed captured by the apparently high cost of the fuel economy technologies and the impact on consumers. Regretfully for consumers, the NRC only put half the picture forward in the executive summary. In fact, the report clearly states that "higher fuel economy also benefits consumers by lowering the total amount they must pay for fuel during the lifetime of the vehicle." (NRC, p. 157) The report goes on to say that "in a number of instances, the lifetime fuel cost savings exceed the initial purchase price, which means that higher fuel economy would offer a net benefit to the consumer under those conditions." (NRC, p. 157) The attached chart echoes the above NRC statement by calculating the consumer savings less the technology costs listed by the NRC.

Fuel Economy Gains Consistent with Improved Safety

The NRC found improvements in fuel economy need not impair safety: "improved design and the incorporation of new technology can enhance both crash avoidance and crashworthiness potential, while improving fuel efficiency." (NRC, p. 63) The report recognizes the historical trend toward improved safety and states

that "this overall trend of improving safety will no doubt continue regardless of U.S. policy on fuel economy." (NRC, p. 47) The NRC pointed out that increased CAFE standards could improve vehicle safety by diminishing the market for muscle cars. The NRC report provides considerable evidence to refute the hype employed by Detroit and the Bush Administration in their efforts to defeat strong CAFE standards.

The report concludes that there need not be significant downsizing or shift to smaller cars since "lightweight materials would allow a reduction in vehicle weight without a proportionally similar reduction in size." (NRC, p. 54)

Improved Fuel Economy Single Biggest Step to Curb Global Warming

The NRC supports arguments made by the environmental community that improved fuel efficiency is one of the single biggest steps to curbing global warming. The report states that "the U.S. fleet of light trucks and automobiles accounts for about one-fifth of the total U.S. CO2 emissions, and any improvements in fuel economy, assuming an equal number of miles traveled, would lead to concomitant reductions in CO2 emissions." (NRC, p. 71) The report goes on to state that "by reducing the demand for hydrocarbons," fuel economy improvements "will also reduce the hydrocarbon emissions from the entire fuel cycle." (NRC, p. 26) The NRC acknowledges that significant environmental benefits need to be kept in mind when policymakers examine CAFE and other measures to improve fuel economy. (NRC, p. 23-5)

Improved Fuel Economy Needed to Improve U.S. Competitiveness

Throughout the report the NRC is sensitive to the plight of the U.S. auto industry. However, it is also concerned about competitiveness. The NRC clearly warns U.S. automakers to "confront the fact that the Japanese appear to have targeted improved fuel economy as an area deserving particular emphasis." (NRC, p. 90) The report goes further by stating that "fuel economy requirements that are set too low could leave the nation and its automotive industry seriously disadvantaged if world opinion embraces the concept that carbon dioxide emissions must be cut sharply and swiftly to forestall excessive global warming." (NRC, p. 156)

Market Mechanisms Should Complement, Not Replace, CAFE

The report acknowledged problems with the existing CAFE law and urged that gas taxes and other market mechanisms be considered either in concert with or instead of the CAFE regulatory approach. We agree that there may be ways to improve the CAFE law. We also believe that various market approaches could heighten incentives to rapidly achieve 40-45 mpg levels of fuel efficiency. However, the various suggested market approaches do not have a track record for achieving significant fuel economy improvements, and fuel tax increases face significant political difficulties. Given these

facts, it is essential to retain CAFE standards as a regulatory backstop. CAFE has worked for 15 years creating a market for fuel efficiency (going from 14 to 28 mpg) where none previously existed.

In sum, we feel that this report can add productively to the effort to improve fuel economy. We believe that greatly improving fuel economy is the biggest single step to curbing global warming. Furthermore, we believe that U.S. cars can achieve 45 mpg cost-effectively and safely.

Sincerely,

Clarence Ditlow

Clarence Ditlow, Executive Director
Center for Auto Safety

Nancy Hirsh

Nancy Hirsh, Director
Energy Conservation Coalition

Ruth Caplan

Ruth Caplan, Executive Director
Environmental Action Foundation

Carol Werner

Carol Werner, Director
Global Climate Change Program
Environmental and Energy Study Institute

Glenn Sugameli

Glenn Sugameli, Counsel
National Wildlife Federation

Janet Hathaway

Janet Hathaway, Senior Attorney
Natural Resources Defense Council

Dan Becker

Dan Becker, Director
Global Warming & Energy Program
Sierra Club

David Hamilton

David Hamilton, Energy Lobbyist
U.S. Public Interest Research Group

"Technically Achievable" Fuel Economy for MY 2006 Vehicles with Practical Parameters

	NAS Report Ranges of Technically Achievable Fuel Economy (MPG)	Alternative-Fuel Vehicle Credits ¹ (MPG)	1987 Acceleration Rates ² (+5% MPG)	New Technology ³ (+6% MPG)	Adjusted Ranges of Technically Achievable Fuel Economy (MPG)	Per Car Gasoline Savings ⁴	Savings Less NAS Costs	
							Bottom Cost	Top Cost
High Confidence	33.8	+ 2.0	+ 1.7	+ 2.0	39.5	\$ 1,831	\$ 1,331	\$ 581
Low Confidence	37.5	+ 2.0	+ 1.9	+ 2.3	43.7	\$ 2,249	\$ 1,249	\$ -251

¹ All manufacturers have said they will use the 1.2 MPG CAFE credit available for flexible-fuel vehicles (FFVs: cars that run on alcohol or gasoline) that goes into effect in 1993 and is included in the Bryan bill. California requires that 5% of all vehicles sold in 2001 have zero emissions. These Zero Emissions Vehicles (ZEVs) which qualify for unlimited Dedicated Fuel Vehicle credits under the current CAFE law and the Bryan bill, will give manufacturers another .8 MPG credit in 2001. By 2003, California requires 10% ZEVs and some Northeast states will follow suit. By 2006 manufacturers will earn 3-4 MPG per year in CAFE credits.

² There is a direct tradeoff between faster acceleration time and efficiency (10% faster acceleration reduces efficiency 4.54%). Manufacturers have used engine improvements for faster acceleration since 1984 so that 1990's models have faster acceleration than 1960's muscle cars.

³ Correcting for just two new technologies that were omitted from NAS' analysis, two-strokes and lean burn engines, adds another 6% improvement. Lean burn is currently used in the Honda Civic VX. This assumes each technology carries a 20% improvement, with two-strokes achieving 10% market penetration and lean burn achieving 20% penetration. The total benefit is 6%.

⁴ Savings calculated assuming 110,000 mile life of car and fuel price \$1.25/gal. These savings do not include the environmental, health, national security and trade deficit reduction benefits of improved fuel efficiency and reduced oil consumption.

Source: Center for Auto Safety

Research/Strategy/Management

ENERGY, ENVIRONMENT AND THE PUBLIC'S PRIORITIES

Energy policy and environmental issues are the focus for this national study of 1,200 adults conducted jointly by the Washington, D.C., Republican and Democratic polling firms of Research/Strategy/Management, Inc., and Greenberg/Lake, Inc. Personal interviews, completed by telephone, were conducted between the seventh and eleventh of December 1990. The margin of error for most reported aggregate results is plus or minus three percentage points. Project director for R/S/M, Inc., is Dr. Vincent J. Breglio; Ms. Celinda Lake is the project director for Greenberg/Lake, Inc. This study is the third in a series of national surveys on energy policy. Previous studies were conducted in October 1988 and November 1989

A QUICK LOOK AT KEY FINDINGS

The following present a few of the most notable findings:

1. Reducing Oil Dependence. Offered alternative approaches for dealing with U.S. dependence on foreign oil supplies -- one based on increasing the oil supply through new exploration and development and the other based on reducing demand for fossil fuels through increased efficiency -- three out of four Americans believe reducing demand makes more sense than increasing supply.

2. Global Warming. Seven out of ten persons (69%) feel the United States should join now with other industrial countries and limit carbon dioxide emissions from fossil fuels released into the air rather than wait for more scientific evidence on the accuracy of global warming predictions. Three out of four persons (73%) say they would be willing to pay more for fossil fuels if the added cost was earmarked to prevent serious consequences from global warming.

3. Automotive Energy Standards. Increasing federal fuel economy standards to 40 mpg by the year 2000 is not only popular (84% support it) but also represents a strongly held point of view (63% strongly favor versus only 6% strongly opposed).¹ Among those who favor the increase, 89% say they would still be in favor of higher fuel economy standards even if a new car cost the buyer \$500 more as a result.
4. Energy Research Priorities. Americans continue to stress the development of renewable energy sources such as solar or wind as their top priority. Seventy-five percent (75%) would give it the largest or next largest share of Department of Energy's research dollar and more than half (59%) believe different energy sources such as solar and wind should be emphasized more than other strategies to meet America's energy needs for the future. Energy conservation runs a close second as a research priority with two out of three persons (67%) assigning it top shares of the Department's energy research budget.
5. Home/Building Energy Efficiency. Utilities should be encouraged to invest in energy efficiency improvements in their customers' homes and buildings. Clearly, nine out of ten persons (86%) favor requiring federal and state regulators to provide incentives to utilities for such improvements. A similar number (91%) favor requiring conformity to federal standards for energy efficiency for new homes financed by FHA or VA mortgages.

1. The ratio of strongly held positive opinion (strongly favor) to strongly held negative opinion (strongly oppose) is a measure of attitude intensity. In this case, the intensity of feeling on the question of fuel economy standards measures 10.5 to 1. Opinions expressed with intensity ratios equal to or larger than 4 should be noted.

6. Other Energy Alternatives. Three additional energy policy alternatives stand out because of their broad appeal and high measure of favorable intensity. These include:
 - * incentives to use or develop alternative fuels such as fuels produced from grains;
 - * tax credits for consumers who use renewable energy sources such as solar or wind power;
 - * tax rebates for new cars that get better mileage than the federal standard.

Conversely, public opinion runs nearly as broad and strong in opposition to the following:

- * developing oil reserves on publicly-owned land if this might cause some environmental damage;
- * using coal if this caused some environmental damage;
- * building more nuclear power plants.

Additional highlights and findings from this national study are presented in the following sections.

MOOD OF THE COUNTRY

Anxious about conflicts abroad and disturbed by a slowdown in the economy at home, the year 1990 draws to a close with the majority of persons (57%) believing the country has gotten off on the wrong track. Few of the good feelings and positive expectations fueled by the remarkable events out of central and eastern Europe measured in last year's study remain intact. Indeed, a drop of seventeen points has occurred in the percentage of people who say the country is generally going in the right direction (47% to 30%). Still, George Bush receives overall job approval from a strong majority of Americans (60%). This represents an eight point decrease from his approval rating in our study one year ago (68% to 60%).

On the national domestic agenda, improving education, reducing the deficit and providing affordable health care are mentioned most often as top priority items. Energy and environmental concerns are less salient in the thinking of most persons.

For more detail on the mood of the country refer to Table 1.

FREDERICK/SCHNEIDERS INC.

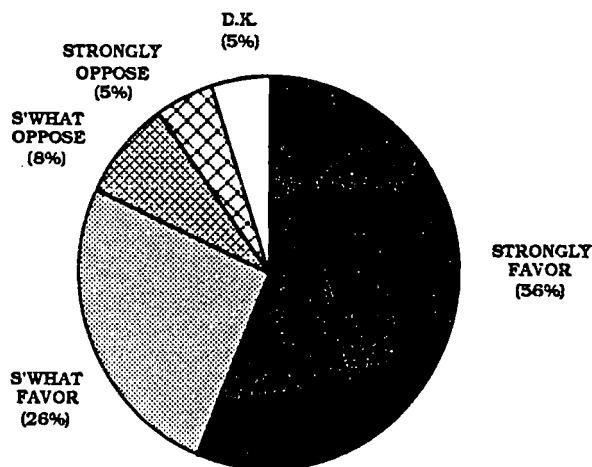
FROM: Greg Schneiders
DATE: January 7, 1992
RE: Energy Survey Results

Frederick/Schneiders has completed the nationwide telephone survey of 752 adults commissioned for the Energy Conservation Coalition. The interviewing took place between December 11 and December 13. The margin of sampling error for data derived from the entire sample is plus or minus 3.5% at the 95% confidence level. The two subject areas explored in the survey were increased CAFE standards and alternative fuels.

CAFE STANDARDS

Four-out-of-five (82%) Americans favor raising CAFE standards to 45 MPG by the year 2000, including a majority (56%) who "strongly" favor this proposal. Support for higher CAFE standards is strong in all regions of the country. Women (85%) are slightly more likely than men (79%) to favor the higher standards and those under age forty (86%) are also slightly more likely than older Americans (80%) to favor raising CAFE standards.

**SUPPORT FOR RAISING CAFE STANDARDS
TO 45 MPG BY THE YEAR 2000**



CAFE, Q.

Research/Strategy/Management

The five policy options are:

- * Requiring new homes financed by FHA and VA mortgages to meet federal standards for energy efficiency;
- * Providing incentives to use or develop alternative fuels, such as fuels produced from grains;
- * Re-establishing federal tax credits for consumers who use renewable energy sources such as solar or wind power;
- * Requiring federal and state regulators to provide incentives to utilities for investing in energy efficiency improvements in their customers' homes and buildings.
- * Providing a tax rebate for new cars that get better mileage than the federal standard.

At the other extreme, opposition to "Adding a federal gas tax of \$.50 per gallon phased in over several years and earmarked for an environmental trust fund" and "Building more nuclear power plants in the United States" runs both wide (more than six out of ten oppose) and deep (intensity ratio of nearly four to one in strong opposition).

Strong opposition to the \$.50 per gallon gas tax relaxes to moderate support for a \$.10 per gallon federal gas tax. A majority of persons (56%) favor adding a federal gas tax of \$.10 per gallon earmarked for an environmental trust fund. However, the intensity ratio of 1.0 suggests an equal balance of strong opposition and support for such action.

Energy policy alternatives associated with the possibility of environmental damage drives opposition to exceptionally high levels. More than seven out of ten people oppose (approximately half strongly oppose) the following options:

- * Developing oil reserves on publicly-owned wilderness lands, even if this caused some environmental damage;
- * Opening more off shore areas along both coasts to oil drilling, even if this caused some environmental damage;
- * Increasing use of coal even if this caused some environmental damage.

Tables 8, 9 and 10 provide additional information on the full range of energy policy alternatives tested.

Research/Strategy/Management

TABLE 8

FUEL ECONOMY STANDARDS AND PUBLIC OPINION

QUESTION: Federal fuel economy standards require that auto companies produce cars that, on average, get 27.5 miles per gallon. Would you favor or oppose an increase in federal fuel economy standards for auto companies requiring that cars, on average, get 40 miles to the gallon by the year 2000?

	<u>Nation</u>	<u>Northeast</u>	<u>Midwest</u>	<u>South</u>	<u>West</u>
Strongly favor	63	63	61	61	68
Somewhat favor	21	23	22	23	14
Somewhat oppose	7	7	9	5	10
Strongly oppose	6	4	6	6	6
Don't know/Refused	3	3	2	5	2

QUESTION: Would you still favor this proposal if you knew that a new car would cost the buyer \$500 more?

	<u>Nation</u>	<u>Northeast</u>	<u>Midwest</u>	<u>South</u>	<u>West</u>
Yes, still favor	89	90	90	89	87
No, change mind	9	9	9	10	10
Don't know/Refused	2	1	1	1	2

QUESTION: "Detroit auto makers are doing their best to develop fuel efficient cars that get more miles to the gallon than the current federal standard of 27.5."

	<u>Nation</u>	<u>Northeast</u>	<u>Midwest</u>	<u>South</u>	<u>West</u>
Strongly agree	13	10	13	15	13
Somewhat agree	26	25	26	26	27
Somewhat disagree	20	20	19	20	18
Strongly disagree	33	36	36	30	32
Don't know/Refused	8	9	6	8	10

QUESTION: "Detroit auto makers are doing their best to sell customers fuel efficient cars that get more miles to the gallon than the current federal standard of 27.5."

	<u>Nation</u>	<u>Northeast</u>	<u>Midwest</u>	<u>South</u>	<u>West</u>
Strongly agree	14	13	13	14	15
Somewhat agree	24	22	24	29	19
Somewhat disagree	21	22	22	20	21
Strongly disagree	32	32	34	29	33
Don't know/Refused	9	11	8	7	11

Range of Energy Policy Steps

Research/Strategy/Management

TABLE 9

NATIONAL ENERGY POLICY: OIL AND GAS POLICY ALTERNATIVES
(Ranked from Most Favored to Least Favored)

RANK	QUESTION	STRNG FAVOR	SMWHT FAVOR	SMWHT OPPOSE	STRNG OPPOSE	DON'T KNOW	INTEN.
1	Providing incentives to use or develop alternative fuels such as fuels produced from grains.	65	24	5	3	3	21.7
2	Increasing federal fuel economy standards for auto companies requiring that cars, on average, get 40 mpg by the year 2000.	63	21	7	6	3	10.5
3	Providing a tax rebate for new cars that get better mileage than the federal standard.	52	30	8	8	2	6.5
4	Providing a cash benefit for scrapping older, less fuel efficient cars.	34	38	11	14	3	2.4
5	Adding a tax penalty on new cars getting fewer miles to the gallon than the federal standard.	39	23	14	21	3	1.9
6	Adding a federal gas tax of \$.10 per gallon earmarked for an environmental trust fund.	23	33	17	24	3	1.0
7	Imposing a tax on all crude oil imported into the U.S.	21	29	21	25	4	.8

Research/Strategy/Management

TABLE 9 (Con't)

NATIONAL ENERGY POLICY: OIL AND GAS POLICY ALTERNATIVES
(Ranked from Most Favored to Least Favored)

RANK	QUESTION	STRNG FAVOR	SMWHT FAVOR	SMWHT OPPOSE	STRNG OPPOSE	DON'T KNOW	INTEN.
8	Providing tax breaks to oil companies for the exploration and development of new oil and natural gas wells.	17	33	17	29	3	.6
9	Accelerating oil development in the wilderness areas of Alaska's North Slope.	18	29	17	29	7	.6
10	Adding a federal gas tax of \$.50 per gallon phased in over several years and earmarked for an environmental trust fund.	12	25	18	42	2	.3
11	Opening more off-shore areas along both coasts to oil drilling, even if this caused some environmental damage.	8	17	21	51	2	.2
12	Developing oil reserves on publicly owned wilderness lands, even if this caused some environmental damage.	5	14	21	58	2	.1

ECC -- NATIONWIDE
Master Questionnaire

JOB 264
December 1991

Actual sample: 752

REGION

Northeast	162	22%
Midwest	183	24%
South	251	33%
West	156	21%

1. Currently, federal law requires that automobile manufacturers produce cars that, on average, get 28 MPG. It has been proposed that this fuel economy standard be raised from 28 MPG to 45 MPG by the year 2000. Would you strongly favor, s'what favor, s'what oppose or strongly oppose raising the standard?

Strongly favor	415	55%
S'what favor	200	27%
S'what oppose	57	8%
Strongly oppose	39	5%
Don't Know	41	5%

IF STRONGLY OR SOMEWHAT FAVOR IN Q1

2. Would you favor raising the fuel economy standard to 45 miles per gallon even if it meant that new cars would cost an additional \$500?

Yes, favor	500	81%
No, oppose	95	15%
Don't Know	20	3%

3. American auto manufacturers oppose raising fuel economy standards to 45 MPG. They say that their industry is already in trouble because of the economic recession and that this proposal would be very hard on the industry and the thousands of workers they employ. Having heard this, would you still favor raising the fuel economy standard to 45 miles-per-gallon?

Favor	445	72%
Oppose	130	21%
Don't Know	40	7%

DOE Study Finds Relationship Between Auto MPG and Hydrocarbon Emissions

Requiring new automobile fleets to average 40 mpg—the level proposed by the Bryan fuel-economy bill—could reduce smog-producing hydrocarbon emissions more than will be accomplished by the 1990 Clean Air Act amendments, according to a draft Department of Energy study.

"Our analysis indicates that increases in MPG will produce large reductions in tailpipe emissions, moderate reductions in running loss emissions and small reductions in diurnal emissions," say the study's authors, Mark DeLuchi, Quanlu Wang and David Greene.

The study, done by DOE's Oak Ridge National Laboratory, has not been publicly released. Written last June, the draft is being circulated for outside scientific review. A copy was obtained in Washington by A/WPR.

Study Could Affect Debate

The findings, if sustained by the peer review process, could add a major new dimension to the debate over legislation by Sen. Richard Bryan, D-Nev., to require an automaker's car line to average 40 mpg by 2001, up from the current CAFE standard of 27.5 mpg.

Heretofore, urban air quality has not been part of the fuel-economy debate, which finds environmentalists pushing for a CAFE increase to cut emissions of carbon dioxide, the major global warming gas, and help the U.S. trade deficit by reducing the need for imported oil. Automakers argue that higher mpg cars would be less safe because they would be smaller.

The air-quality argument has been missing largely because a 1983 study by EPA failed to find any significant relationship between pollutants and a vehicle's mpg. Until now, there was no data to counter the 1983 report.

Tailpipe HCs Must be Cut

Following a hard-fought battle between environmentalists and the automakers, Congress mandated cleaner tailpipe emissions in the 1990 air act revision. Beginning with the 1995 model year, emissions of hydrocarbons must be .25 grams per mile (gpm) or less. This is .16 gpm lower than the present tailpipe standard.

"Vehicle [hydrocarbon] emission reductions due to MPG improvement are large in perspective," the DOE study said. "Increasing automobile MPG from 28 to 40 and reducing tailpipe emissions, [hydrocarbon] emissions of automobiles are reduced by .1629 gpm." Similar hydrocarbon reductions would occur by requiring light trucks to average 30

mpg, up from the current CAFE standard of 21 mpg, the study added.

"The calculated relationships between vehicle fuel economy and vehicle HC emissions show that HC tailpipe emissions, running loss emissions and diurnal evaporative emissions all decrease with increases in vehicle fuel economy," the study said.

"The reduction in tailpipe HC emissions is mainly due to engine downsizing," it said. "The reductions in diurnal evaporative emissions and running losses result from the use of smaller fuel tanks by vehicles with higher MPG."

The study said that with smaller engines, automakers could employ less costly pollution control equipment to meet tailpipe standards. In recent years, however, the trend has been toward larger engines, especially among Japanese manufacturers, whose CAFE numbers have been declining.

John DiCicco, a research associate with the American Council for an Energy Efficient Economy, was among the outside reviewers of the study. He described it as "very pathbreaking work. It's very much in line with what expectations would be. In a way, they're conservative" with estimates of hydrocarbon reductions, he said.

Study Supports Higher CAFE

Dan Becker, the director of global warming and energy for the Sierra Club, said the findings provide "even more of a reason for enacting tougher CAFE standards. There's no excuse now for not acting."

Quanlu Wang said he and his co-authors are incorporating into the study suggestions made by outside reviewers and hope to have a final version ready for publication in late February or early March. He said the comments to date have not changed the basic finding that hydrocarbon emissions are lower with higher mpg vehicles.

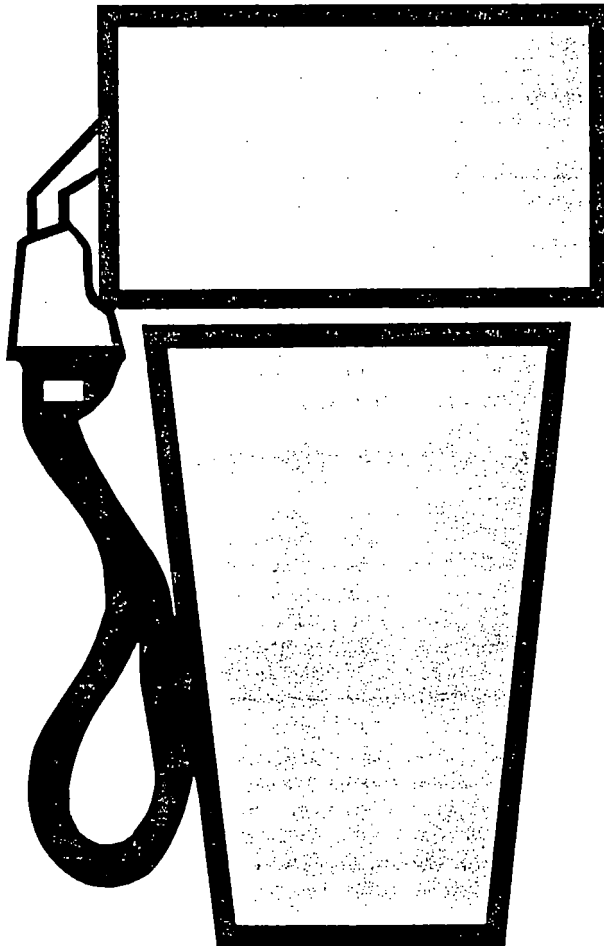
The study probably will not be popular with Bush administration policymakers, who have adamantly opposed increases in the CAFE standard. The White House and Energy Department have advocated a national energy policy stressing new sources of petroleum ahead of energy conservation.

S.1081 Available

Copies of S.1081, the Water Pollution Prevention and Control Act under consideration by the Senate Environment and Public Works Committee, are available from BPI. The packet includes a section-by-section summary of the proposed revisions to the Clean Water Act. Send \$35 plus \$3.50 for postage and handling to: Documents Division, BPI, 951 Pershing Drive, Silver Spring, MD, 20910-4464 (301-587-6300).

Improving Automobile Fuel Economy

NEW STANDARDS, NEW APPROACHES



CONGRESS OF THE UNITED STATES
OFFICE OF TECHNOLOGY ASSESSMENT

good example of
Technology improvements
available.

stroke's remaining emissions control problems, especially for application to larger cars where the NO_x emission standards can be limiting. A further tightening of NO_x standards if Tier II standards go into effect will further complicate prospects for this engine.

Diesel engines. Diesel engines represent a proven technology available now to improve fuel economy substantially. However, diesels have not been very successful in the U.S. market for reasons that include performance limitations (most diesels have been significantly less powerful than competing gasoline engines), costs, noise, smell, delayed starting, emissions, and reliability problems associated with some domestic models. Although the 1990 Clean Air Act amendments allow diesels to meet a 1.0-g/mi NO_x standard compared to a 0.4-g/mi standard for gasoline (spark ignition) engines,³ it is questionable whether this degree of leniency would persist if diesels began to take a major share of the new-car market; and in 2004, diesels must meet the 0.4-g/mi standard (or 0.2 g/mi if Tier II standards are applied). Were NO_x catalysts capable of operating in a "lean," oxygen-rich environment developed, diesels could likely meet stringent NO_x standards. According to European manufacturers, diesels are significantly more efficient than gasoline four-valve engines even at constant performance: 15 to 18 percent more for naturally aspirated diesels, 24 to 28 percent more for turbocharged diesels, and 35 to 40 percent more for direct injection turbocharged diesels.⁴ And although the baseline gasoline engine will improve, a portion of the improvements, especially engine friction reduction, may be applied beneficially to diesels as well.

Electric hybrid vehicles. Vehicles that combine an electric motor for city driving with an internal combustion engine for added power, when needed, and battery charging may represent a viable fuel economy alternative. In a version designed by

Volkswagen, an 8-hp electric motor powers the car at speeds up to 30 mph and a 1.6-liter diesel engine provides more power for highway driving and other purposes. The weight of the extra engine and batteries (nearly 300 pounds) cuts down on acceleration and fuel economy, but the Volkswagen prototype can still deliver nearly 100 mpg of hydrocarbon energy fuel economy, and 60-mpg (total) fuel efficiency.⁵ This type of vehicle represents an interesting opportunity because its use of the electric motor during much of the urban cycle may allow the onboard diesel—or a two-stroke engine—to comply with stringent NO_x standards, such as those in California.

A SPECIFIC EXAMPLE OF THE APPLICATION OF FUEL ECONOMY TECHNOLOGY: HONDA'S NEW CIVIC VTEC-E MODEL

Honda Motors recently announced a new engine that combines Honda's variable valve timing and lift control (VTEC) with lean burn. The combination of technology will be available in model year 1992 in a hatchback model called the Civic VTEC-E, as a 49-state model. The Civic VTEC-E will also be available in California; but this model does not use lean burn. Rather, it uses a high EGR (exhaust gas recirculation) rate but maintains the mixture at a stoichiometric air/fuel ratio. California's stringent NO_x emissions standards are met with use of a three-way catalyst. The Civic VTEC-E in both Federal and California versions has performance very similar to the standard Civic, and the VTEC-E engine and standard DX engine are both rated at 92 hp. However, the Civic VTEC-E provides a substantial increase in fuel economy over the DX model.

Detailed EPA test data were not available at the time of this analysis and preliminary data provided by Honda are used instead. The 1992

³Temporarily for cars and light trucks below 3,750 pounds.

⁴Energy and Environmental Analysis, Inc., February 1991, op. cit.

⁵Ibid.

Civic model is somewhat larger and more aerodynamic than the 1991 Civic (for which detailed data are available), but differences are not large, so that a comparison between a 1992 Civic VTEC-E and a 1991 Civic DX is valid. Table 3-1 shows the relevant data. The 49-State Civic VTEC-E has approximately 44-percent better fuel economy than the 1991 DX, with near-equal acceleration performance, while the California model has 34-percent better fuel economy. The lean burn feature accounts for the 10-percent difference in benefit between the California and 49-State model.

This large increase in fuel economy comes not only from the engine but also a range of other technologies, some made possible by the VTEC engine characteristics. Items unrelated to the engine include:

- 5-percent weight reduction due to reduced options;
- improved aerodynamics due to the addition of an air-dam and removal of one external mirror;
- reduced rolling resistance through use of special tires;
- reduced accessory loads from use of a "smart" alternator; and

- use of fuel-efficient lubricants.

These features, however, are responsible for less than 10 percent of fuel economy gain, and the EEA sensitivity coefficients reveal that 8 to 9 percent is appropriate for the non-engine/transmission-related benefits.

This suggests a 35-percent gain is possible from the engine/transmission/driveline combination (25 percent for the California car). Honda has reduced the axle ratio by about 16.5 percent between the VTEC-E and the DX. Normally this would reduce performance significantly, but the VTEC engine's variable valve timing enhances low-speed torque. At 2,500 rpm, the torque of the VTEC engine is about 10 percent higher than that for the DX engine. The maximum 92 hp rating is attained at 5,500 rpm in the VTEC engine, while it is attained only at 6,000 rpm in the DX engine. Hence, it appears the VTEC engine provides about 10 percent more power across the entire usable speed range to 5,500 rpm. A wide-ratio transmission with shift indicator light provides further fuel economy benefits, at some expense to shift quality and performance.

The engine also has other enhancements beyond VTEC, such as roller cams, low-friction pistons/rings, and other unspecified friction-reduction technologies. Honda claims that only 10 to 15 percent of the total fuel economy increase is due to the VTEC/lean burn combination. This claim, however, doesn't include the drivetrain optimization made possible by the engine's increased torque output. EEA estimates that at constant performance, the VTEC/lean burn combination may be capable of a 20- to 25-percent increase in fuel economy. This combination cannot meet current California or future Federal emissions standards. Without the lean burn feature, it appears that a 10- to 15-percent benefit may still be possible with VTEC technology, while maintaining all other vehicle attributes constant. This engine can meet both California and future Federal NO_x standards.

Table 3-1 — Comparison of the Civic VTEC-E and DX Models

	1991 Civic	1992 Civic
Test weight (lb)	2,500	2,375
C _D	0.33	~0.32
Frontal area (m ²)	1.80	~1.85
Engine displacement (cm ³)	91	91
Horsepower	92 @ 6,000	92 @ 5,500
Axle ratio	3.89	3.25
Transmission	M-5	M-5 wide ratio/SIL
Acceleration time, 0-100 kph (secs)	10.6	10.5
City fuel economy (mpg)	36.5	53 (48.5) ^a
Highway fuel economy (mpg)	47.7	67 (62) ^a
Combined fuel economy (mpg)	40.8	59 (54) ^a

^aCalifornia VTEC-E in parentheses. All VTEC-E fuel economy data are approximate.

SOURCE: Energy & Environmental Analysis, Inc., 1991.

Stats
on
Cape

BRYAN BILL—
S—

34.5 '96
40 yz '01

NEW ACEEE STAT

2005 OIL SAVED

2.5 M/B/D

GAS SAVED IN 1st PHASE
(Bryan's #s)

48 BIL GAL
1996 to 2001

2001 OIL SAVED
(ACEEE's #s)

1.6 M/B/D

CO|▲|2-▲- REDUCTIONS

2005

440 MIL TONS/YR

2001

280 MIL TONS/YR

Window: 13 - 36

End: ENTER

EXXON VALDEZ TRIPS

34.5 '96 760/YR

BOXER BILL—

45 yz '01

2005 OIL SAVED

3.1 M/B/D

2001 OIL SAVED

1.6 M/B/D

48 BIL GAL
1996 to 2001

CO|▲|2-▲- REDUCTION

2005

554 MIL TONS/YR

2001

280 MIL TONS/YR

EXXON VALDEZ TRIPS

943/YR

VOTE HISTORY

CQ VOTE NUMBER: 235

CR VOTE NUMBER: 235

DATE: : 09/14/90
BILL NUMBER : S 1224
VOTE TYPE : Motion to limit debate or invoke cloture.

SHORT TITLE : MOTOR VEHICLE FUEL EFFICIENCY ACT/CLOTURE

OUTCOME: PASSED 68-28 MAJORITY: THREE-FIFTHS
DEMS FOR: 45 DEMS AGAINST: 9
REPS FOR: 23 REPS AGAINST: 19

VOTE DESCRIPTION:

MITCHELL MOTION TO INVOKE CLOTURE TO PROCEED TO CAFE (CORPORATE AVERAGE FUEL ECONOMY) BILL. BILL INCREASES FUEL EFFICIENCY REQUIREMENTS--K AS CAFE--FOR CARS AND LIGHT TRUCKS BY 40% BY THE YEAR 2001. ALSO INCREASES PENALTY FOR EFFICIENCY VIOLATIONS.

ISSUE CODES:

1. Transportation -- Highways and Motor Vehicles
2. ENERGY-UTILITIES -- PETROLEUM FUELS
3. Energy-Utilities -- Conservation (General)
4. Environment -- Air

MEMBER VOTES:

GORE, ALBERT JR.	Y	SASSER, JAMES R.	Y
HELMS, JESSE A.	N	KENNEDY, EDWARD M.	Y
NUNN, SAMUEL A.	Y	BENTSEN, LLOYD M.	JRY

VOTE HISTORY

CQ VOTE NUMBER: 246

CR VOTE NUMBER: 246

DATE: : 09/24/90

BILL NUMBER : S 1224

VOTE TYPE : Motion to table or recommit.

SHORT TITLE : MOTOR VEHICLE FUEL EFFCY ACT/JOB LOSS ASSISTANCE

OUTCOME: PASSED 49-46

MAJORITY: SIMPLE

DEMS FOR: 17 DEMS AGAINST: 36

REPS FOR: 32 REPS AGAINST: 10

VOTE DESCRIPTION:

BRYAN MOTION TO TABLE SIMON AMDT CONCERNING JOB TRAINING PROGRAMS FOR AUTO WORKERS ADVERSELY AFFECTED BY THE CAFE (CORPORATE AVERAGE FUEL ECONOMY) BILL. AMDT REQUIRES THE SECY OF LABOR TO CREATE PROGRAMS OF READJUSTMENT & JOB TRAINING FOR THOSE WORKERS.

ISSUE CODES:

1. Labor -- Manpower Training
2. Transportation -- Highways and Motor Vehicles
3. ENERGY-UTILITIES -- PETROLEUM FUELS
4. Energy-Utilities -- Conservation (General)

MEMBER VOTES:

GORE, ALBERT JR.	N	SASSER, JAMES R.	N
HELMS, JESSE A.	Y	KENNEDY, EDWARD M.	N
NUNN, SAMUEL A.	Y	BENTSEN, LLOYD M.	JRN

VOTE HISTORY

CQ VOTE NUMBER: 247

CR VOTE NUMBER: 247

DATE: : 09/24/90
BILL NUMBER : S 1224
VOTE TYPE : Amendment to a bill.

SHORT TITLE : MOTOR VEHICLE FUEL EFFICIENCY ACT/CREDIT CAP

OUTCOME: PASSED 55-40 MAJORITY: SIMPLE
DEMS FOR: 24 DEMS AGAINST: 29
REPS FOR: 31 REPS AGAINST: 11

VOTE DESCRIPTION:

DANFORTH AMENDMENT TO CAFE BILL PERMITTING THE SECRETARY OF TRANSPORTATION TO EXEMPT ALCOHOL OR NATURAL GAS POWERED AUTOMOBILES FROM THE REQUIRED FUEL EFFICIENCY STANDARDS.

ISSUE CODES:

1. Energy-Utilities -- Conservation (General)
2. Energy-Utilities -- Alcohol Fuels and Biomass
3. Energy-Utilities -- Natural Gas and Gas Products
4. Transportation -- Highways and Motor Vehicles
5. Technology -- Energy (Non-Nuclear)

MEMBER VOTES:

GORE, ALBERT JR.	N	SASSER, JAMES R.	N
HELMS, JESSE A.	Y	KENNEDY, EDWARD M.	N
NUNN, SAMUEL A.	N	BENTSEN, LLOYD M.	JRY

VOTE HISTORY

CQ VOTE NUMBER: 248

CR VOTE NUMBER: 248

DATE: : 09/25/90
BILL NUMBER : S 1224
VOTE TYPE : Motion to limit debate or invoke cloture.

SHORT TITLE : MOTOR VEHICLE FUEL EFFICIENCY ACT/CLOTURE

OUTCOME: FAILED 57-42 MAJORITY: THREE-FIFTHS
DEMS FOR: 42 DEMS AGAINST: 13
REPS FOR: 15 REPS AGAINST: 29

VOTE DESCRIPTION:

MOTION TO INVOKE CLOTURE ON CAFE (CORPORATE AVERAGE FUEL ECONOMY)
BILL. BILL PROVIDES FUEL EFFICIENCY, ENERGY INDEPENDENCE, AND
ENVIRONMENTAL BENEFITS.

ISSUE CODES:

1. Transportation -- Highways and Motor Vehicles
2. ENERGY-UTILITIES -- PETROLEUM FUELS
3. Energy-Utilities -- Conservation (General)
4. Environment -- Air

MEMBER VOTES:

GORE, ALBERT JR.	Y	SASSER, JAMES R.	N
HELMS, JESSE A.	N	KENNEDY, EDWARD M.	Y
NUNN, SAMUEL A.	N	BENTSEN, LLOYD M.	JRY

VOTE HISTORY

CQ VOTE NUMBER: 244

CR VOTE NUMBER: 244

DATE: : 10/23/85
BILL NUMBER : HR 3244
VOTE TYPE : Motion to table or recommit.

SHORT TITLE : TRANSPORTATION APPROPRIATIONS, FY86

OUTCOME: FAILED 46-48 MAJORITY: SIMPLE
DEMS FOR: 15 DEMS AGAINST: 30
REPS FOR: 31 REPS AGAINST: 18

VOTE DESCRIPTION:

ANDREWS MOTION TO TABLE EVANS AMENDMENT: MODIFIES CURRENT LAW SO THAT AUTO MANUFACTURERS ARE NOT ENTITLED TO EARN FUEL ECONOMY TAX CREDITS FOR EXCEEDING CAFE STANDARD REDUCED TO LEVEL BELOW STANDARD ORIGINALLY ESTABLISHED FOR THAT YEAR.

ISSUE CODES:

1. Fiscal -- Appropriations
2. Transportation -- Highways and Motor Vehicles
3. Taxes -- Business and Corporate
4. Taxes -- Pollution Penalties and Incentives
5. Technology -- Environmental
6. ENERGY-UTILITIES -- PETROLEUM FUELS
7. Environment -- Air

INTEREST GROUPS:

1. CONSUMER FEDERATION OF AMERICA - NO

MEMBER VOTES:

GORE, ALBERT JR.	Y	SASSER, JAMES R.	Y
HELMS, JESSE A.	Y	KENNEDY, EDWARD M.	N
NUNN, SAMUEL A.	N	BENTSEN, LLOYD M.	JRN

ADDITIONAL COMMENTS:

Proponents of the amendment claimed that it would maintain an incentive for auto manufacturers to improve fuel economy and meet the original CAFE standard while allowing them to enjoy the tremendous benefits of the standard's reduction from an average 27.5 mpg to 26 mpg for the 1986 model year. The CAFE credit provisions allow auto makers the flexibility needed to meet the annual Congressionally established standards and do not unduly weaken the incentives for achieving these goals -- as long as the standards are not reduced. Granting credits for exceeding a reduced standard, however, would reward auto manufacturers for failure and significantly reduce the incentives to meet and exceed the fuel economy standards. It would be unconscionable

for Congress to allow automakers to benefit from exceeding a CAFE standard which was lowered at their own request.;;Opponents of the amendment stated that the federal government should not be attempting to legislate the business practices of U.S. auto manufacturers or to influence consumer preferences. American consumers have a wide variety of automobiles to select from and may buy a highly fuel-efficient auto, produced domestically or abroad, if they so choose. The DOT Deputy General Counsel expressed the Department's opposition to this proposal. This issue is not appropriate to this bill, and Congress should not be endeavoring to legislate on such a complex matter without the benefit of the usual committee process.;

That is not the same thing as saying now that we should, even as we stand today, have an energy policy based on just that attempt. That is what this amendment would do—attempt, to try to make it seem as if we are somehow in a material way, getting at the energy problem by just this piece of legislation that has been offered.

I mentioned earlier that the stock market today had a tough day. They are off about 58 points. They are revising the Dow Jones Industrial numbers. But that would be a 52-week closing low on the stock market.

I know my colleague from Michigan is on the floor. I know he has an amendment he wants to offer, and I know of two colleagues wanting to speak on a pending amendment. I am told the Danforth amendment. So I will not talk at length. I will just speak briefly now.

But I think the stress we are seeing in the financial markets—I talked earlier about the great pressure that our companies are under, the automobile industry, and elsewhere—in terms of raising capital—we are finding it very difficult. Interest rates were up again today. There are signs that the Japanese are raising their interest rates and are cutting down on the flow of capital to the United States which we to a great extent have been depending upon.

We cannot lose sight of the fact that this amendment imposes a new \$62.5 billion cost on the automobile industry in order to meet the technical requirements in this bill, assuming that they can be met. Most of the experts do not think they can be, and argue strongly to the contrary. But even to try is going to cost that kind of money, and it certainly is not there. We do not have that kind of money to spend.

On the safety issue, I know my colleague will be addressing that, but it is clear as a bell from the insurance industry, from the Department of Transportation itself, the Department of Highway and Safety Administration, that if we go down this track by imposing these kinds of very sharp increases in mileage requirements, it means smaller cars, it means less safe cars. There is just no way around that. That is a direct and known tradeoff. The data is there for us to see.

The last point I would like to make at this time is this: It is important for people to realize, to think there is somehow magic technology out there to reach for. I pointed out that gasoline prices per gallon in other countries, Japan and parts of Europe, are as much as \$3 and \$4 a gallon. If there was a technology that could get this much higher fuel efficiency out of cars, the private sector, American producers and foreign producers, would be building those cars and selling them to those markets where a vast amount of money could be made because so much more money could be saved with gas at that higher price per gallon. If there were a technological

way to do this, it would be done. We would see that happen.

The fact is that the mile-per-gallon averages in Europe and Japan are only slightly above what we have here. So the notion that somehow or another there is a technological windfall out there, if we went the \$62.5 billion, if we could find it, not worry about the tradeoff on safety, reduction in car size, not worry about the increased emissions going up into the atmosphere because of the tradeoffs in that area, we are fooling ourselves.

So this amendment sounds great but there is tremendous difficulty associated with it. It is going to cause great damage. I hope the Senate will decide not to proceed with it.

I yield the floor.

Mr. BURNS. Mr. President, I would like to associate myself with the amendment to the CAFE bill offered by Senator DANFORTH of alternative fuel vehicles. I would also like to commend Senator RIEGLE of Michigan, who is right on target. There is not a vast amount of technology out there when we talk about fossil-fuel-based fuels and trying to achieve a better miles per gallon on automobiles today. We do it at the risk of safety.

As I stated the other day, I do not know how many Senators here have taken a cutting torch and removed people from a small car after an accident. You cannot even recognize them. I also had a daughter who was involved in an accident—broad-sided by a truck. Had she been driving a little bitty car, that young lady might not be with us today.

Under the Alternative Fuels Act, the total amount a manufacturer can boost its overall CAFE rating by making flexible fuels vehicles is limited. For model years 1993 through 2004, the maximum increase is limited to 1.2 miles per gallon; and for the years 2005 through 2008, it is limited to 0.9 miles per gallon, limits on the CAFE increases.

It would not affect the way in which the credit for a flexible fuel car is calculated. We need this amendment if automobile companies are going to truly begin to design and build alternative fuel vehicles.

Consumers currently have no real choice in the marketplace, even if they want to contribute to lessening of our dependence on foreign oil. Nearly half—when I say nearly half, it is getting close—of our oil needs right now are coming in from foreign sources. We have heard it stated over and over again on the floor of this body. We in Montana are very proud of our vast fuel-based resources. I do not care if you want to talk about coal, oil and gas, ethanol or methanol, Montana is rich in alternative fuel resources.

In addition, our State, along with others in the West and the intermountain West are seemingly poised to provide alternative energy answers to America's energy needs in the foreseeable future. It is clear to me, since I

have joined the U.S. Senate, that alternative fuels are the fuels of the future. Our traditional fuels are important; do not mistake me. But in the long-term future of this country, alternative fuels are certain to play an even more crucial role.

I believe the time is right for the forward movement in this Congress and in this administration. The President has offered his clear air legislation which calls for alternative fuels use in a way not contemplated 10 years ago. In addition, the Energy Committee has been moving forward on its own alternative fuels agenda.

The Senate Finance Committee recently agreed to an amendment to the budget reconciliation bill, clarifying that the ethanol used in the manufacture of ETBE, ethyl tertiary butyl ether, qualifies for the alcohol fuels credit. This is a major step forward for this important fuel octane enhancer.

We are making progress. But more needs to be done. And we in the West, who have not always fully shared in the progress that has been made elsewhere need to begin now to offer the solutions to the problems that will soon confront all of us.

WIFE, women involved in farm economics, has worked diligently for the past several years in raising the American consciousness to the virtues of grain based alcohol fuels. It is in grass-root efforts such as theirs that true changes will be accomplished. In the meantime, we need to do what we can to help move the process forward. This amendment will help to do that.

Mr. President, I yield the floor.

Mr. GORE addressed the Chair.

The PRESIDING OFFICER. The Senator from Tennessee is recognized.

Mr. GORE. Mr. President, I rise to speak about the problem this bill is intended to address. We have had a great deal of debate about the details and which approach is better. We have had some debate about whether we should move forward and do something or wait and do nothing.

But I think it is important to step back from the details just for a moment and look at the larger problem within which this debate takes place. It is not just a problem defined by the recent events in the Persian Gulf, but let us take those events as a starting point. In response to the invasion of Kuwait by Iraq, we have put together a very impressive military policy. The President has also coordinated a very impressive diplomatic policy.

What we do not have is an energy policy. We have not had one for quite a long time. The recent events in the Persian Gulf merely underscore the need which has existed since well before the invasion of Kuwait by Iraq. We are more dependent on foreign sources of energy today than we were when the great energy crisis of 1973 hit. We are more dependent on foreign energy sources today than we were

when the second energy crisis of 1979 hit.

When you compare what we are doing with energy to other nations around the world, with whom we now compete in the world economy, the comparison is really striking. We have about 2 percent of the world's people. We are consuming more than 25 percent of the world's energy. Well, you might say that includes a comparison with all of the developing nations which do not use a lot of energy per capita. Well, look at the comparison between us and the Federal Republic of Germany, or Japan, or any of the other industrial nations with which we are competing everyday in the world marketplace.

The fact is, for every unit of gross national product that we produce, we use twice as much energy to get that unit of gross national product as our competition uses. That does not make good sense. It is something that simply cannot be allowed to continue.

So I hope that the President of the United States, building upon his success in this diplomatic policy, building upon the Nation's unprecedented support for our military deployment to the sands of Saudi Arabia, would not come before the Nation and introduce a national energy policy, which would emphasize the new efficiency with which we use energy, emphasize conservation to save energy, knew technologies that can substitute for some of the ones that are so wasteful in the environmental that is destructive today.

The President has been asked why he does not talk about this, and he decided to announce his policy on the spot. You may have seen it; it was up at Kernebankport. Here is the full text of the President's stirring call for a national energy policy. "I call on all Americans to conserve."

Mr. President, even that was a statement some in the television audience had difficulty hearing because of the sound of that high-powered motorboat in the background. The words themselves were so thin and so weak and so faint as to make a mockery of the phrase "energy policy."

The fact is, we as a nation need leadership. We also need followership. I think those of us in the legislative branch of Government understand how difficult it will be to put in place meaningful energy policies, and the President understands that, as well. But we need leadership from the President in articulating and selling to the American people a national energy policy that makes sense.

At this moment in our history, as we mobilize our military resources in Saudi Arabia and in the Persian Gulf, it is easier to see clearly why it was a mistake 10 years ago to abandon the policies that were encouraging the development of alternatives to the wasteful technologies that we use so much today.

When you stop and think about it, we arrived at this point after two crises, which I mentioned, that were both followed by a wave of national awareness and concern and a new sense of urgency and demands from all over our Nation that we not allow ourselves to be so dependent on foreign oil.

The first crisis of the early seventies forced reductions, and we relaxed a little and forgot that sense of urgency. In 1979 the same thing happened all over again. After that sense of urgency waned, then we went right back to the false complacency that characterized our policy up until the invasion of Kuwait.

What is different this time is that even now after the events in the Middle East, even after the price of oil has reached an all-time high, \$35 a barrel on Friday; I do not know what the closing quote was today—

Mr. RIEGLE. Up \$3.

Mr. GORE. Up \$3; \$38, I am advised by my colleague.

Even after the price rises began, this time we still do not have leadership from the White House to catalyze the development of a national energy policy. That is just wrong. I have to quote my favorite philosopher, Yogi Berra, who said "It's *deja vu* all over again."

How many times do we have to go through this kind of rude surprise and economic shock before we get the kind of policy that can be sustained over time—to save energy and avoid this kind of dangerous overdependence?

I just think it is time to start recognizing the fundamental linkages between energy policy, national security policy, economic health, and environmental quality. For the last 10 years we had leadership that has chosen to ignore those linkages. During the 1980's, development of energy-efficient and alternative energy technologies suffered from inattention and sometimes even outright hostility from the executive branch of the Government.

I hear in Mr. Sununu's derisive statements about conservation an echo of what James Watt and Anne Burford used to say about conservation. I really do not understand where this hostility comes from, where the derision comes from, where the absolute determination to stifle any kind of meaningful energy policy comes from. I think it is irresponsible to delay any further important decisions about securing our energy future. And it is just not happening.

The current exercise that the Department of Energy has under way to develop its so-called national energy strategy seems to be nothing more than paper at this point. There are some awful good people over at DOE who would like to do more. But 2 years after this administration has come to office and 10 years after its predecessor began the effort to destroy national energy policy, we are still waiting and still hoping for a real national

energy policy to emerge from the current exercise. I hope it does. It would be a refreshing break from the administration's usual style of dodging the hard decisions on energy and opting instead for recommendations that ultimately translate into inaction.

I would like to say just another word about this question of efficiency which is linked to conservation. We made some great strides after the first two oil shocks on efficiency. But then, in 1986, efficiency gains leveled off and they have not gone up since that time.

What caused this slowdown? Well, lower energy prices did, and also a decreased Federal commitment to conservation. In short, our Nation's leadership has failed, or refused, to fill the policy vacuums created by cheap energy.

In a few areas, we lead the world in energy-efficient technology—appliances, lighting products, windows, and a few other examples. But the sad truth is today other nations, notably Japan, are developing and marketing their own technologies that are better in this area than ours because more attention has been paid to it.

The same is true in the development of renewable energy sources like solar and biomass. The same is true of a number of promising new energy technologies, especially voltaic where we are losing the lead to the Japanese who recognized the tremendous world market potential for that technology. We really have to reverse this trend and recapture the lead.

Of course, in the transportation sector, because it accounts for such a large fraction of the energy we use, we need to pay attention to efficiency improvement there as well. That is what this debate is all about. There will be amendments. Let us look at the amendments. Let us try to get the best bill we can. But given a choice between doing something and doing nothing, it seems to me, especially in these circumstances, that choice is pretty clear.

U.S. TRANSPORTATION SECTOR ENERGY USE

If there is an economic sector in the United States where improvements in energy efficiency can simultaneously benefit our Nation's economy, environment, and national security, it is our Nation's transportation sector.

So, one of the first steps to demonstrate U.S. leadership in attaining energy security and protecting the global environment must be to increase the efficiency of our transportation sector, in which each American consumes more energy than a person in almost any other country consumes in all economic sectors combined. We do not need to speed development of environmentally sensitive areas to produce more oil for our vehicles; we do not need to be so dependent on the Middle East for our energy supplies; we can produce that oil, so to speak, in an environmentally and economically sound way, through increased energy

efficiency, including increased vehicle fuel efficiency.

We need to send clear signals to the manufacturers: we want efficiency improvements to continue, we want you to invest in the R&D needed to meet increased efficiency standards, we want the U.S. automotive industry to be the most competitive in the world, and we want the energy, economic, and environmental rewards that an efficient passenger vehicle fleet will bring.

GROWTH IN VEHICLE MILES TRAVELED

Mr. President, let's define the problem—the problem here is defined as, "How can we reduce the amount of oil consumed in our transportation sector, and therefore the amount of pollution and energy consumption associated with our Nation's vehicles?" Now, there are two key components to the answer. One component is the efficiency of our automobiles and trucks. But another component, just as important as the first, is the total number of miles that our Nation drives. As an illustration, if we require vehicles to be twice as efficient, but at the same time, the amount of miles driven in this country doubles, then we will still be consuming the same amount of oil as we are today. We will still be pumping the same amount of pollutants into the atmosphere, and we will still be dependent on foreign oil supplies.

Well, that is exactly what is happening. The number of vehicle miles traveled in the United States grew 2.7 percent each year between 1980 and 1986, and it is estimated that the number of vehicle miles traveled will grow about 2.5 percent per year between now and the year 2000. That means, even if we were to pass legislation today, requiring a 40-percent increase in the efficiency of our vehicles by the year 2000—about 40 mpg for new cars, and 30 mpg for new light trucks—the amount of gasoline consumed by cars and light trucks will remain approximately constant.

Looking further into the future, the Federal Highway Administration projects that in urban areas, the total number of miles traveled by vehicles will increase 50 to 80 percent by the year 2010.

Addressing the growth in vehicle miles traveled is not the subject of today's debate, but it is an issue that we must ultimately address if we truly intend to reduce our Nation's dependence on foreign oil.

RECENT TRENDS IN VEHICLE FUEL EFFICIENCY

As far as vehicle fuel efficiency is concerned, let me review some of the facts. After dramatic improvements in the 1970's, and general stability in the 1980's, average new vehicle efficiency in 1988 was actually lower than the standards set originally for 1985. The average new vehicle produced in the United States got 27 miles per gallon in 1988; the average Asian import got 32 miles per gallon. The trend away from improved vehicle fuel efficiency has been hastened by another trend

during the 1980's, back toward higher horsepower; in effect, the fuel efficiency wars of the 1970's have been replaced by the horsepower wars of this decade.

PROBLEMS ASSOCIATED WITH INEFFICIENT VEHICLES

Clearly, improvements in vehicle fuel efficiency are long overdue, and they make sense for a variety of reasons:

Oil imports cost our trade balance \$40 billion in 1988; for every 1-mile-per-gallon increase in overall car and light truck fleet efficiency, we could reduce oil imports by 320,000 barrels per day—even at only \$25 per barrel, that's \$3 billion off our trade deficit each year.

Our national security is threatened by an overreliance on those oil imports to fuel the majority of the entire U.S. transportation sector.

Our competitiveness in international markets is compromised by energy-inefficient products in a world where continued depletion of finite oil resources can only lead to increased fuel costs.

Our vehicle fleet contributes as much as one-third of U.S. carbon dioxide emissions—overall, our Nation emits more carbon dioxide than any other nation in the world.

Last but not least, urban air quality in many cities is not coming into compliance with standards deemed necessary to avoid adverse impacts on human health. Among the major pollutants addressed by the Clean Air Act, the two that have proven most difficult to control—carbon monoxide and ozone—are largely due to our automobiles. Over 100 urban areas are not meeting air quality standards for one or both of these pollutants.

MARKET-BASED INCENTIVES FOR INCREASED VEHICLE EFFICIENCY

This challenge will require imaginative, far-reaching, and unprecedented new programs. New CAFE legislation is a start, but I would like to see a series of new programs that dovetail with CAFE mandates, which would demonstrate to the world that our Nation at least is ready to take the lead in developing an energy-efficient economy.

I am thinking about a series of programs in which consumers pay fees for actions that lead to increased energy consumption, and get money back for actions that conserve energy. Through a series of fees and rebates, a revenue-neutral program would give consumers market incentives to use energy efficiently, and thereby to benefit our economy, national security, and to protect and restore the environment.

In the case of automobiles, fees collected from the purchase of new vehicles with low fuel efficiency would go to pay for rebates on vehicles with high fuel efficiency. Over time, this concept could be applied to other energy-consuming products and, in general, to other products with a significant impact on the global environ-

ment, from electric stoves to ozone-depleting refrigerators.

This type of market-based program would aim squarely at reducing energy consumption and minimizing emissions of pollutants. At the same time, such market incentives would encourage the development, and introduction, of the technologies and techniques of sustainable development.

VEHICLE FUEL EFFICIENCY IMPROVEMENTS

One could expect vehicle efficiency improvements to come into the market much more quickly as a result of such a program, because consumers would be demanding fuel-efficient cars and trucks. A market-based incentive program would allow consumers, not just the Government, to put pressure on the automakers to make efficiency improvements. As we all have learned, that is the most effective kind of pressure.

Basically, such a program would work as follows: At the time of purchase, a consumer buying a car that has a fuel economy lower than an established standard would pay, to the dealer, a fee based on the amount by which the car's fuel economy was below the standard. The fee would be transferred from the dealer to a trust fund. Purchasers of vehicles with fuel economies greater than the standard would receive a rebate from that fund. The program would be overseen by, for example, the EPA, to ensure that revenue flowing into and out of the fund was regulated in a manner that guaranteed the fund would remain revenue-neutral.

ENERGY EFFICIENCY IMPROVEMENTS FOR APPLIANCES AND BUILDINGS

The concept could be extended to other energy-consuming products, such as new appliances—refrigerators and water heaters, for example—and to new buildings. In all cases, a fee or rebate would be based on the relative level of energy used by the product over its lifetime.

In addition to energy efficiency, the concept could be applied to encourage the purchase of technologies that do not rely on ozone-depleting chemicals—charging fees on appliances, for example, that rely on ozone-depleting chemicals, and awarding rebates for the purchase of alternative technologies that do not pose a threat to the ozone layer.

This is a serious matter, though, Mr. President, and before closing I simply would like to say that on Saturday morning in my home town of Carthage, TN, population 2,000, I went over to a breakfast for the 1175th Quartermaster Unit. A lot of the members of that National Guard unit probably thought a few years back the chances were pretty slim they would be called up and sent to the desert of Saudi Arabia. But along with many other units in Tennessee, they were called up and this was a good-bye ceremony, where their wives and husbands and children and parents came, and I

shared that morning with them and helped serve breakfast and we shared some words together and the chaplain had a moving prayer and it was a moving ceremony all the way around. I thought about this debate while I was there with them Saturday morning.

Now, Monday, here we are talking about this same subject. And I will just tell you if the National Guardsmen and National Guardswomen from Carthage, TN, are going to have to go over to Saudi Arabia because of Saddam Hussein threat to Kuwait and his threat to the oil fields, it seems to me like we can do a better job in this country of promoting energy efficiency and supplementing that military policy which has called them to the desert and supplementing that diplomatic policy which has seen notable successes by our Secretary of State and President with an energy policy that begins to address some of the difficult decisions that have been put off for 10 years.

So this matter is an important one, and I wanted to try to put it into that larger context, and I look forward to the debate on this bill and on the amendments as that debate proceeds.

I yield the floor, Mr. President.

The PRESIDING OFFICER. The Senator from Missouri.

AMENDMENT NO. 2755

Mr. DANFORTH. Mr. President, I ask unanimous consent that there be a vote on my amendment concerning flexible fuel vehicle credits this evening.

The PRESIDING OFFICER. Without objection, it is so ordered.

Mr. DANFORTH. Mr. President, I further ask unanimous consent that it now be in order to order the yeas and nays on that amendment.

The PRESIDING OFFICER. Without objection, it is so ordered.

Mr. DANFORTH. Mr. President, I ask for the yeas and nays.

The PRESIDING OFFICER. Is there a sufficient second?

There is a sufficient second.

The yeas and nays were ordered.

The PRESIDING OFFICER. The Senator from Vermont.

Mr. LEAHY. Mr. President, I rise in support of S. 1224, the Motor Vehicle Fuel Efficiency Act of 1990.

It is interesting that Saddam Hussein and his Iraqi army have mobilized the United States Congress and American people faster than any time in recent memory. In fact, his invasion of Kuwait was such an unlawful and unjustified attempt to dramatically alter the balance of power in the Middle East that it virtually guaranteed the kind of unity of reaction, and his use of Western hostages and human shields has sickened freedom-loving people around the world.

I think President Bush has wisely used the proper mix of diplomatic pressure and the threat of military force to build a consensus in the United Nations by diplomatic and eco-

nomie and military pressure to push Saddam Hussein out of Kuwait.

But this crisis is not just about the sovereignty and sanctity of nations. It is also about oil. Some people have even called it a threat to our way of life.

Mr. President, there is something about our way of life that is going to have to change in light of the Iraqi invasion of Kuwait, and that is dependence on foreign oil and the way we use and, unfortunately, the way we misuse national resources.

The United States currently imports about 45 percent of its oil. That is more than we imported before the oil embargo of 1973. We ought to be ashamed of ourselves for that.

Mr. President, I believe it is time to get serious about energy conservation. And that is going to mean more than one line in a Presidential speech or a congressional speech.

Yet the administration opposes this bill that is sensible before us, and instead of stressing conservation, it wants to open up the Arctic National Wildlife Refuge to drilling. It is allowing its Forest Service staff to push a plan to squeeze a few more barrels out of our precious public lands. A lot of the things that it wants to do, a lot of areas where it wants to drill, notwithstanding the danger to the environment, would get us less oil than we could get by just stressing good, sensible, and reasonable conservation methods.

So the proposals they have made are wrong headed. The most effective means of reducing foreign reliance on oil and protecting our environment is to develop a national energy policy where energy conservation is the primary component. We have a long way to go.

But Senator BRYAN's Motor Vehicle Fuel Efficiency Act is a good place. The Senator from Nevada has worked tirelessly on this important piece of legislation. Senator BRYAN deserves our thanks.

We cannot continue to pretend that fossil fuels are renewable resources. Let us learn this lesson today for having squandered our chance to learn from the oil crisis of the 1970's. Do we want our successors to be standing here 4 years from now, 6 years from now, 10 years from now, saying in 1990 the U.S. Senate had a chance to act and did nothing about it?

I do not want the next Senator who represents Vermont in my place to be standing up here and saying, "Just awhile ago they could have done something to cut our dependence on foreign oil and they did not."

I want you to know, Mr. President, that Vermont's voice, at least as I represent them, will be to stand up for this very sensible conservation method. It is a good method. It makes sense environmentally and economically.

Furthermore, it should be very obvious to everybody in this country by

now, it does a great deal to protecting our national security. We put ourselves in a position that we allow our dependence on imported oil to make it possible for a handful of countries that would otherwise be insignificant on the world picture to be able to shape our foreign policy, our economic policy, domestic policy, in a way no countries have been able to do in the past 100 years. Let us at least diminish that. Let us take back that part of our national security, take back that part of our economic security, take back that part of our domestic security, by cutting out our dependence on imported oil. That is why I support this bill.

I commend the Senator from Nevada and those who joined with him to bring this bill before us.

Mr. BRYAN. Mr. President, we have a couple of housekeeping matters which I believe my distinguished colleague, the senior Senator from Michigan, and I can agree on. One is to perfect what Senator DANFORTH intended to accomplish, to which there is no objection. In that vein, I ask unanimous consent that a vote on the Danforth amendment No. 2755 occur this evening upon disposition of the Simon amendment, and that no further amendments be in order to the Danforth amendment No. 2755.

The PRESIDING OFFICER. Without objection, it is so ordered.

AMENDMENT NO. 2756

Mr. BRYAN. Mr. President, I believe that we have agreement on the Bryan-Gorton amendment which incorporates the provisions of the NHTSA reauthorization act. I believe we have agreement on that. I ask unanimous consent that amendment be added to the bill.

The PRESIDING OFFICER (Mr. LEAHY). Without objection, it is so ordered.

Mr. BRYAN. Mr. President, I need to ask at this time to refer back to the Simon amendment for purposes of offering a motion to table procedurally, if I may.

The PRESIDING OFFICER. The Chair has to apologize to the Senator from Nevada. Could he restate his request?

Mr. BRYAN. The Senator from Nevada apologizes to the Chair. What we need to do procedurally is to get back on the Simon amendment for a moment so that a motion to table would be in order. That, of course, will occur tonight with a rollcall vote, as we discussed with the Senator from Michigan.

The PRESIDING OFFICER. Is the Senator from Nevada asking that the Bryan amendment be agreed to?

Mr. BRYAN. Yes.

The PRESIDING OFFICER. The question is on agreeing to the amendment.

The amendment (No. 2756) was agreed to.

SENATOR GORE

ITEM #: 2531 ()
uniform percentage increase in cafe proposals CON

TOP/SUBTOPIC (1): environment/air

TYPE OF DOC.: issue

CREATE DATE: APR-15-91

UPDATE DATE: MAR-31-92

AIDE: EA

PCD: 00

I understand your concern about S. 279, the Motor Vehicle Fuel Efficiency Act, which addresses corporate average fuel economy (CAFE). I have concerns about the legislation, and I voiced those concerns at the time of my vote in the Senate Commerce Committee last year. This is a very complex issue which directly impacts our nation's economic competitiveness, energy security, balance of trade, and environmental quality. You may be assured that I will keep your views on this issue closely in mind.

SENATOR GORE

ITEM #: 2132 ()

s. 279, motor vehicle fuel efficiency act PRO

TOP/SUBTOPIC (1): environment/air

TYPE OF DOC.: issue

CREATE DATE: DEC-20-89

UPDATE DATE: JAN-21-92

AIDE: EA

PCD: 00

I am a cosponsor of S. 279, the Motor Vehicle Fuel Efficiency Act, which would require new standards for corporate average fuel economy (CAFE). S. 279 has been referred to the Senate Commerce, Science, and Transportation Committee.

This is a very complex issue which will directly impact our nation's economic competitiveness, energy security, balance of trade, and environmental quality. As a member of the Senate Commerce Committee, I assure you that I will continue to monitor and review the progress of S. 279 with your views in mind.

John CAFE

9/6/92

FROM: JOSEPH ROMM
RE: CAFE DEBATE ON "MEET THE PRESS"

CAFE is NOT primarily about protecting the environment, and so the media and the Republicans should not be allowed to cast CAFE as part of the environment versus jobs debate.

CAFE is about NATIONAL SECURITY. The reduced pollution is a side benefit. The first response to any question about CAFE should mention the PERSIAN GULF WAR. Most people think the Gulf War was about oil (as the nonresponse to Bosnia suggests). Note: "CAFE" is jargon to most, and should be avoided. Emphasize the need for "energy efficient cars."

The second response to any question about CAFE should put it in the context of the TRADE DEFICIT. The trade deficit in oil is now \$50 billion. Under the Bush Energy Plan, it would rise to \$80 billion. As long as we have a large trade deficit, scarce domestic capital will continue to be sucked out of the country, and the dollar will continue to decline, which means our standard of living relative to other nations will continue to decline.

BACKGROUND: CAFE was put in place in 1975 to reduce dependence on Middle East oil. In 1977, oil imports peaked at 46%, declined to 28% in 1982 but soared again after after Reagan's 1985 roll-back of CAFE. *Persian Gulf imports leaped 500% from 1985 to 1989.*

In February 1991, James Baker told the House Foreign Relations Committee of 5 post-Gulf war challenges. Four were regional, "And a fifth and final challenge, Mr. Chairman, concerns the United States. We simply must do more to reduce our energy dependence...." Baker said a U.S. energy strategy "should involve energy conservation and efficiency." But when Bush addressed Congress in March 1991, he said "tonight let me outline four key challenges to be met." The fifth challenge—to reduce energy dependence—was gone.

At the end of the war Bush proposed the National Energy Strategy (NES) which included no significant measures to decrease oil use. It concluded, "The National Energy Strategy review ... revealed that our Nation and the world are likely to depend more on Middle East oil suppliers under any realistic scenario for the foreseeable future."

SOUND-BITES: "America's superpower status is put in jeopardy by our growing dependence on Middle Eastern oil and our rising trade deficit in oil. President Bush's energy policy would make our energy dependence and trade deficit grow. We need a national commitment—like President Kennedy's commitment to put a man on the moon—to become energy independent, and that means a whole new generation of fuel efficient cars. Such a plan will also help the environment by reducing air pollution, including the threat posed by global warming."

Joseph J. Romm is author of *The Once and Future Superpower: How to Restore America's Economic, Energy, and Environmental Security*, published this month by Morrow. He holds a Ph.D. in physics from M.I.T.

JOSEPH ROMM
A STRATEGY FOR DEALING WITH CAFE

- **FOCUS ON MISGUIDED BUSH ENERGY POLICY**, which has no plan to decrease oil use. BITE: "By its own admission, the Bush energy strategy will *increase* dependence on Middle East Oil, *increase* the trade deficit, and *increase* America's CO2 emissions."

- **FOCUS ON BENEFITS OF RAISING CAFE STANDARDS TO 40 MPG.**

(1) It would reduce dependence on Persian Gulf Oil. In 1985, Gulf oil imports were at one-tenth of their 1977 peak. That year, Reagan rolled back new-car fuel standards. *Imports of Persian Gulf oil surged 500% from 1985 to 1989.* By 2005, raising CAFE to 40 mpg would save about two million barrels of oil per day—more oil than we now import from the Persian Gulf.

(2) It would reduce the trade deficit. The trade deficit in oil alone is now \$50 billion a year. BITE: "Under the Bush National Energy Strategy the trade deficit in oil alone will reach \$80 billion a year by the year 2000!" CAFE should eventually save about \$20 billion a year.

(3) In the 1980s, CO2 emissions from U.S. transportation activities rose 20%. Absent CAFE, they are projected to rise 20% more. CAFE would help reduce global warming.

- **FOCUS ON FAILED BUSH ECONOMIC POLICIES.** BITE: "President Bush believes it is not possible to have a strong economy and clean environment at the same time. So far he has given us neither." Bush holds the record for the most manufacturing jobs lost for any post-WWII President, so his views on how to save those jobs have no credibility. Under Bush, we have been losing one domestic auto parts supplier every 18 hours.

- **FOCUS ON NEW VISION FOR AMERICAN INDUSTRY.** President Bush had great faith in American technological skill in the Gulf War, but he does not believe that the American automobile industry can build environmentally friendly cars. Perhaps that's because we have a national strategy for building the best military technology, *but we have no strategy for building the best civilian technology.* The other industrialized nations have committed to reduce CO2 emissions, guaranteeing a huge market for clean cars. If we don't build them, others will. Japan's Prime Minister has said that environmental technologies will do for Japan in the next two decades what fuel-efficient cars and consumer electronics did in the last two decades.

President Kennedy inspired a nation by saying we would put a man on the moon by the end of the 1970s; his vision made America the world leadership in aerospace technology. Where is the leadership today needed to restore America's auto industry to world leadership—while protecting the environment? CAFE is a red herring; rollbacks of CAFE did not save the U.S. auto industry from losing ground to Japan since 1985. The issue is who has a vision for achieving a revitalized economy, a reduced trade deficit, energy independence, and a clean environment.

Joseph J. Romm is author of *The Once and Future Superpower: How to Restore America's Economic, Energy, and Environmental Security*, published this month by Morrow. He holds a Ph.D. in physics from M.I.T.

The Republican "Analysis" of CAFE standard employment impact.

The JEC/GOP present what they purport to be an "analysis" of the potential employment impact of CAFE standards. But when you look beyond the absurd aura of specificity and accuracy, this section of their "study" is really a complete fabrication, that does not resemble in any fashion an economic analysis.

1) The Republicans have already conceded that they messed up the CAFE proposal [Washington Post]. This concession was smart, because they would not want to invite further scrutiny.

2) The source of the CAFE "job losses" is the Motor Vehicles Manufacturers Association (MVMA). While the GOP staff on the JEC purports to be unbiased and objective, they take data from a trade association, which should invite some skepticism from objective analysts. Trade associations data is often accurate and indispensable in economic analysis, but should always be verified.

3) The real problem with the CAFE analysis is not the structure and timing of the proposal, on which the Republican staff erred, nor the use of trade association data, which in this case is probably accurate. The problem is that they took a number that has some relevance to conduct economic analysis and then proclaimed it to be economic analysis.

In arguing against CAFE standards, the MVMA

- determines which automobile assembly plant currently manufacture cars and light trucks that would not meet the proposed standard -- in this case 40 MPG;
- determines the number of workers currently employed in those plants;
- Adds up the national total (142,000) and labels them "jobs at risk."
- THATS ALL FOLKS!

The MVMA figure is merely a data point. MVMA is careful to call this figure "jobs at risk" and offers the following arguments:

"Limitations on the production of larger cars, light trucks, and vans would result in elimination of jobs -- and even plant closings -- at many of the facilities that now produce these vehicles. Assembly plants currently producing family- and mid-size cars, light trucks and vans -- threatened by unreasonable increases in CAFE -- have a combined labor force of 142,000 employees in 18 states. In additional countless jobs would be at risk at numerous supplier firms dependent

on those assembly plants for business. The jobs displaced by CAFE would not be offset by increased production of small cars because overall sales would be lower and smaller/lighter cars require less labor to build than larger models."

From this data -- the JEC/GOP concludes that "such a CAFE standard would kill approximately 166,000 jobs in auto manufacturing, and at least 150,000 jobs in general manufacturing, for a total job loss of 316,000 [MVMA is cited here]."

Even the MVMA tries to discuss an intelligent economic analysis -- albeit to generate skepticism -- which would have to take into account the potential for these plants to manufacture cars with higher mileage, a mix in the shift of automobiles and the manufacturing base, etc. The JEC/GOP analysis just blithely calls this number "jobs killed."

This is unbelievably dishonest. By this "logic," no cars are currently produced with MPG under the current standard of 27.5 MPG. But CAFE stands for "Corporate Average Fuel Economy, and many people are now at work producing cars that do not attain the standard (in fact, they work at the plants cited by MVMA). But according to the GOP logic, these people don't currently exist. Thus, they are saying that Bill Clinton can even "kill" jobs that are already dead according to their analysis! That is some trick, and exposes the grotesque distortions of the entire GOP analysis.

Mike Stanton

MVMA 775-2700

Model Year 1991 Car And Light Truck Assembly Plants

City, State • Company (Number of Employees)
Models Produced

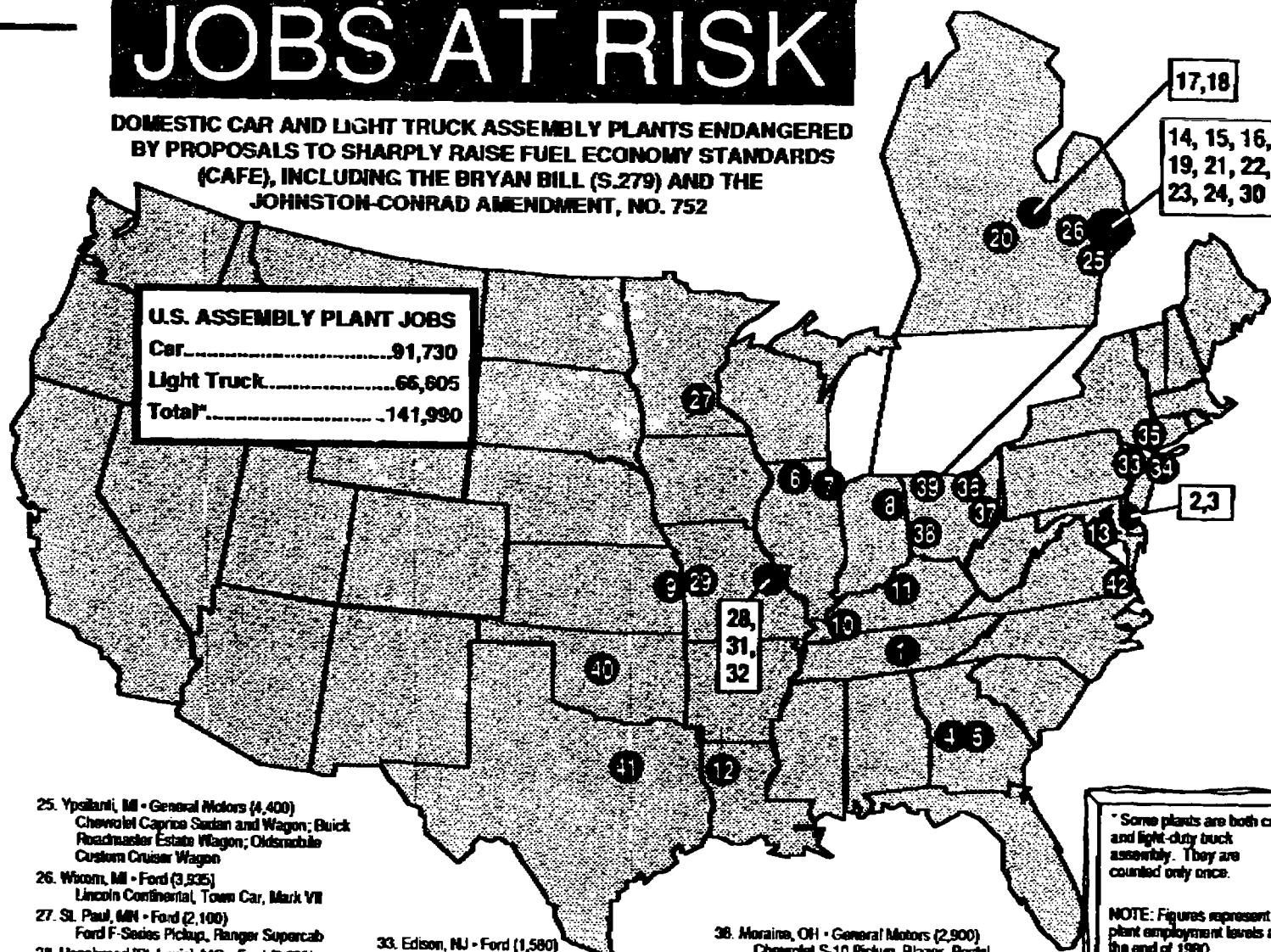
1. Spring Hill, TN • General Motors (4,500)
Saturn
2. Newark, DE • Chrysler (3,500)
Chrysler LeBaron; Dodge Spirit;
Plymouth Acclaim
3. Wilmington, DE • General Motors (3,520)
Chevrolet Corsica, Beretta
4. Atlanta, GA • Ford (2,785)
Ford Taurus; Mercury Sable
5. Doraville, GA • General Motors (2,500)
Oldsmobile Cutlass Supreme
6. Belvidere, IL • Chrysler (3,700)
Chrysler New Yorker Sedan, New Yorker
Landau, Imperial, Fifth Avenue; Dodge
Dynasty
7. Chicago, IL • Ford (2,810)
Ford Taurus; Mercury Sable
8. Fort Wayne, IN • General Motors (2,700)
Chevrolet C/K Pickup; GMC C/K Sierra
Pickup
9. Kansas City, KS • General Motors (2,200)
Pontiac Grand Prix
10. Bowling Green, KY • General Motors (1,120)
Chevrolet Corvette
11. Louisville, KY • Ford (3,825)
Ford Ranger, Explorer, Mazda Navajo
12. Shreveport, LA • General Motors (2,400)
Chevrolet S-10 Pickup, S-10 Blazer;
GMC Sonoma Pickup, S-15 Jimmy
13. Baltimore, MD • General Motors (3,500)
Chevrolet Astro; GMC Safari
14. Dearborn, MI • Ford (2,390)
Ford Mustang
15. Detroit, MI • General Motors (400)
Commercial Chassis; Recreational Chassis;
Specialty Vehicle Chassis
16. Detroit-Hamtramck, MI • General Motors (3,505)
Buick Riviera; Oldsmobile Toronado;
Cadillac Eldorado, Seville, Allante
17. Flint, MI • General Motors (4,000)
Chevrolet Blazer, Suburban; GMC
Jimmy, Suburban
18. Flint, MI • General Motors (5,000)
Buick LeSabre; Oldsmobile 88 Royale
19. Lake Orion, MI • General Motors (5,800)
Cadillac DeVille; Oldsmobile 88 Regency
20. Lansing, MI • General Motors (7,420)
Buick Skylark; Oldsmobile Cutlass Catala;
Pontiac Grand Am
21. Pontiac (East), MI • General Motors (3,000)
Chevrolet C/K Pickup; GMC Sierra C/K Pickup
22. Pontiac (West), MI • General Motors (2,100)
Chevrolet S-10 Pickup, S-10 Blazer;
GMC Sonoma Pickup, S-15 Jimmy
23. Warren, MI • Chrysler (3,000)
Dodge Full-size and Mid-size Pickup
24. Wayne, MI • Ford (1,865)
Ford F-Series Pickup, Bronco
25. Ypsilanti, MI • General Motors (4,400)
Chevrolet Caprice Sedan and Wagon; Buick
Roadmaster Estate Wagon; Oldsmobile
Custom Cruiser Wagon
26. Wisconsin, MI • Ford (3,535)
Lincoln Continental, Town Car, Mark VII
27. St. Paul, MN • Ford (2,100)
Ford F-Series Pickup, Ranger Supercab
28. Hazelwood (St. Louis), MO • Ford (2,690)
Ford Aerostar
29. Kansas City, MO • Ford (3,990)
Ford F-Series Pickup, Tempo; Mercury Topaz
30. Detroit, MI • Chrysler
1992 Jeep Grand Cherokee
31. St. Louis (No. 2), MO • Chrysler (3,000)
Chrysler Town & Country; Dodge Caravan CV,
Grand Caravan; Plymouth Grand Voyager
32. Wentzville, MO • General Motors (5,500)
Buick Park Avenue; Pontiac Bonneville,
Oldsmobile 88 Royale
33. Edison, NJ • Ford (1,580)
Ford Ranger
34. Linden, NJ • General Motors (2,100)
Chevrolet Beretta, Corsica
35. Tarrytown, NY • General Motors (4,100)
Chevrolet Lumina; Pontiac Trans Sport;
Oldsmobile Silhouette
36. Lorain, OH • Ford (5,185)
Ford Econoline Van, Econoline Club Wagon,
Thunderbird, Mercury Cougar
37. Lordstown, OH • General Motors (7,170)
Chevrolet Chevy Van, Sportvan, Cavalier;
GMC Rally Van, Vandura; Pontiac Sunbird
38. Moraine, OH • General Motors (2,900)
Chevrolet S-10 Pickup, Blazer, Postal
Vehicle; GMC Sonoma Pickup, Jimmy;
Oldsmobile Bravada
39. Toledo, OH • Chrysler (5,300)
Jeep Cherokee, Comanche, Grand Wagoneer
40. Oklahoma City, OK • General Motors (5,100)
Buick Century; Pontiac 6000; Oldsmobile
Cutlass Ciera
41. Arlington, TX • General Motors (3,800)
Buick Roadmaster, Chevrolet Caprice;
Cadillac Brougham
42. Norfolk, VA • Ford (1,740)
Ford F-Series Pickup

JOBS AT RISK

DOMESTIC CAR AND LIGHT TRUCK ASSEMBLY PLANTS ENDANGERED
BY PROPOSALS TO SHARPLY RAISE FUEL ECONOMY STANDARDS
(CAFE), INCLUDING THE BRYAN BILL (S.279) AND THE
JOHNSTON-CONRAD AMENDMENT, NO. 752

U.S. ASSEMBLY PLANT JOBS

Car.....91,730
Light Truck.....66,605
Total.....141,990



* Some plants are both car and light-duty truck assembly. They are counted only once.

NOTE: Figures represent plant employment levels at the end of 1990. Moreover, higher CAFE puts at risk more than final assembly line jobs. The potential adverse impact on the motor vehicle industry in terms of passenger car related jobs alone has been estimated to be between 150,000 and 300,000.

SOURCE: MVMA, (8-91)

CAFE MYTHS & FACTS

EMPLOYMENT IMPACT

MYTH

Large increases in Corporate Average Fuel Economy (CAFE) standards for cars and light trucks would not affect employment in the motor vehicle and related industries.

FACT

Large CAFE increases would force automakers to downsize vehicles and scale back or eliminate production of selected models of full- and mid-size cars, vans, sport utility vehicles and pick-up trucks. As a result, the model mix of vehicles available to consumers would shift radically. In 1990, small cars constituted 29 percent of the new car fleet, mid-size cars made up 52 percent and large cars 19 percent. If proposed CAFE standards requiring a 40 percent improvement by 2001 were enacted into law, known technologies would provide only a minor share of that required increase. The market shift required would be radical because it is estimated that the small car share of the new car fleet would have to triple to 82 percent, the mid-size segment would have to be trimmed to 13 percent and larger models would be limited to only 5 percent of the new car fleet. Market shifts of such magnitudes will have a substantial adverse employment impact for the following reasons:

- Restricted availability of domestically produced family-size cars and light trucks will cause many consumers to keep their older, less fuel-efficient cars longer, resulting in lost sales. Such sales declines cause shutdowns at assembly and supplier plants, the closing of car and light truck dealerships and employee layoffs throughout the entire industry.
- Limitations on the production of larger cars, light trucks, and vans would result in elimination of jobs — and even plant closings — at many of the facilities that now produce those vehicles. Assembly plants currently producing family- and mid-size cars, light trucks and vans — threatened by unreasonable increases in CAFE — have a combined labor force of 142,000 employees in 18 states. In addition, countless jobs would also be at risk at numerous supplier firms dependent on those assembly plants for business. The jobs displaced by CAFE would not be offset by increased production of small cars because overall sales would be lower and smaller/lighter cars require less labor to build than larger models.
- U.S. jobs are concentrated in the production of domestic manufacturer-produced family-size cars and trucks, while foreign firms have dominant positions in the small car and truck segments. Dramatic shifts in the mix of cars would hit domestic full-line manufacturers particularly hard. Many of their most competitive products are mid- and full-size cars and trucks, which have fuel economy ratings that fall significantly below standards included in congressional proposals.

THE POINT

One in every seven jobs in the United States is tied to the motor vehicle industry or related industries. Efforts to conserve fuel must be balanced against their impact on American workers. Proposed increases in CAFE will result in thousands of layoffs, leading to further declines in the U.S. tax base and increased demand for unemployment benefits.

CAFE MYTHS & FACTS

CONSUMER
CHOICE

MYTH

Proposed increases in Corporate Average Fuel Economy (CAFE) standards will not affect the choice of cars and light trucks available to consumers.

FACT

To meet today's CAFE standards, manufacturers are already using those technologies capable of achieving the greatest gains in fuel economy. Unrealistic CAFE increases that have been proposed would force automakers to scale back production or eliminate selected models of full- and mid-size cars, vans, sport utility vehicles and pick-up trucks — vehicles that are critical to the needs of larger families, tradesmen, farmers and those who car pool. Secretary of Energy James Watkins has concluded that a proposed 40 mile per gallon (mpg) CAFE requirement could not be achieved without "significant changes to the size mix and performance" of today's vehicles. And Secretary of Transportation Samuel Skinner has determined such an increase in CAFE "would radically curtail the choice of new vehicles available to American consumers."

Under the current 27.5 mpg CAFE standard, small cars constitute 32 percent of the new car fleet, mid-size cars make-up 50 percent and family-size cars 18 percent. If a proposed 40 mpg CAFE requirement is enacted into law, one manufacturer estimates that about two-thirds of the new car fleet would have to be small cars. Family-size cars would be restricted to only about a five percent share of the fleet, and mid-size cars would be trimmed to about 29 percent.

Cars in the 40 mpg fuel economy range are available today, but they have weight, size and interior space far smaller than the average car. The average 40 mpg car is 16 percent smaller and weighs about 1,250 pounds less than the average car purchased. It is no surprise that these vehicles meet the needs of less than three percent of car buyers.

THE POINT

Unrealistic CAFE standards would require fundamental changes to the mix of vehicles offered by manufacturers, resulting in cars and trucks that do not meet the needs of many consumers. Higher CAFE standards would inevitably move the market toward smaller, lighter cars. The objective of higher fuel economy should be weighed against the legitimate needs of consumers to choose the vehicle that fits their needs. Cars today that achieve over 40 mpg clearly do not meet the needs of the vast majority of American car owners.

Consumers now have the option of choosing from among 600 models of cars, light trucks and vans designed to meet their transportation needs. But the restrictions necessary in order for manufacturers to meet proposed higher CAFE will limit the ability of families, farmers and tradesmen to purchase the car of their choice. Restricted supplies of family-size cars and utility vehicles will drive up prices of those models and motivate consumers to keep their older, larger and less fuel efficient cars longer.

CAFE MYTHS & FACTS

**VEHICLE
DOWNSIZING**

MYTH

Dramatic increases in Corporate Average Fuel Economy (CAFE) can be achieved without building cars and light trucks smaller and lighter.

FACT

New car fleet fuel economy has been doubled since 1974 to over 28 miles per gallon mainly by reducing the weight of the average car by 1,100 lbs. As a result, today's new cars weigh, on average, 25 percent less than comparable cars did 17 years ago.

The Secretaries of the U.S. Departments of Transportation and Energy, have stated that a 40 percent increase in the CAFE standard cannot be reached without "substantial reduction in vehicle size and weight."

At the March 20, 1991 hearing of the Senate Energy Committee, experts from the Office of Technology Assessment and Energy and Environmental Analysis, who have analyzed the industry's capability to dramatically increase fuel economy, testified that a 40 percent increase in CAFE standards cannot be achieved by technology alone and will require downsizing.

THE POINT

Size and weight clearly are the factors which most directly affect vehicle fuel economy. Further weight reduction to achieve a substantial CAFE increase will require further downsizing.

Reducing weight by the use of more aluminum, plastic or aerospace materials — such as titanium and magnesium, which are far more expensive than steel — would add hundreds of dollars to the price of the average vehicle.

While today's average car is 1,100 pounds lighter than its mid-1970's counterpart, manufacturers were able to maintain sufficient interior occupant space, by converting to front wheel drive, despite the fact that the exteriors of the cars were made smaller. If automakers have to further reduce the weight of the average car by 800 to 1,000 pounds to dramatically increase CAFE, interior space will have to be decreased significantly.

Vehicles must be made to fit the needs of the average size family. If the majority of cars don't, most consumers won't buy them. Small, light-weight cars are now available that get 40-50 mpg, but they represent only three percent of sales.

CAFE MYTHS & FACTS

OIL
IMPORTS

MYTH

Legislation to require a sharp increase in Corporate Average Fuel Economy (CAFE) standards for new cars and light trucks will reduce U.S. reliance on imported oil.

FACT

1974 — Average new car fuel economy was 14.2 miles per gallon, and the United States imported 35% of its oil.

1990 — Fuel economy levels have doubled for passenger cars to 28.2 mpg, but the United States now imports 42% of its oil.

THE POINT

New U.S. cars today are twice as fuel efficient as 1974 models. History shows, however, that increases in CAFE alone will not reduce U.S. oil imports, because our nation's dependence on foreign oil is linked to OPEC pricing policies, not to CAFE.

In 1986, OPEC countries increased production and cut the price of crude oil in half. As a result, U.S. oil imports rose and domestic oil production fell. OPEC can continue to adjust its production and pricing policies to maximize its share of U.S. oil consumption, despite increases in the fuel efficiency of U.S. cars and trucks.

CAFE MYTHS & FACTS

AVAILABLE
TECHNOLOGY

MYTH

Major increases in Corporate Average Fuel Economy (CAFE) — up to 45 miles per gallon for cars and 35 mpg for light trucks — are achievable with available technology.

FACT

Although the greatest gains in improving automobile fuel economy from 14 to over 28 miles per gallon have come from reducing the weight of the average car by 1,100 pounds, available technologies have also been put into widespread use. For example:

- All cars have been more aerodynamically designed
- Fuel injection is in 98 percent of today's new cars
- Over 80 percent have front wheel drive
- Nearly two-thirds have automatic overdrive transmissions with lock-up converter clutches
- The engine size of the average car has been reduced by nearly 40 percent

For light trucks, the opportunities for downsizing or applying some of the known fuel economy technologies are more limited than for cars because their cargo carrying capacities and towing capabilities require more powerful engines and heavier structures.

THE POINT

Many known technologies are already widely used and their fuel economy gains have already been made. While most will spread across all car model lines, the fleet average fuel economy improvements gained will be limited because you can only convert once to such technologies as front wheel drive or fuel injection.

New technologies being discussed — light weight aerospace materials and two-cycle engines, for example — will significantly increase the price of the average vehicle and yield only small fuel economy improvements.

The Senate Environment Committee's clean air bill (S.1630) includes a provision that would set limits on the average amount of carbon dioxide (CO₂) emissions from passenger cars. These CO₂ standards are the equivalent of a 33 mpg CAFE standard in 1996 and a 40 mpg standard in 2000.

Achieving these standards would require massive changes in product plans, vehicle design and fleet mix. The following analysis assumes that domestic manufacturers will take the actions -- technology and mix shifts -- necessary to achieve the proposed standards. Based on these actions, the impact on employment in the domestic auto industry and its domestic parts suppliers is calculated.

Technology

The levels of the CO₂ standards in S.1630 apparently are based on a Department of Energy (DOE) study that estimates manufacturers can achieve a 17.1 percent improvement in CAFE by 1995 (about 32 mpg for the average domestic manufacturer) and a 44.7 percent improvement by 2000 (about 39 mpg for the average domestic). The DOE study assumes these improvements can be made through expanded use of available technology without affecting the size and/or performance of cars.

All manufacturers are planning to continuously improve the fuel economy of their vehicles as new technologies are incorporated and new models are introduced. However, industry analyses indicate that the DOE study has overestimated significantly the benefits of many of the identified technologies and failed to take into account that today's cars already incorporate many of these technologies. Based on these analyses, we have concluded that the maximum achievable benefit through incorporation of the technologies cited in the DOE study would be a 7 to 8 percent improvement by 1995 (about 29 mpg) and an additional 13 to 14 percent improvement by 2000 (about 33 mpg). Neither estimate may be an accurate assessment of industry capability because both ignore the effect of meeting anticipated new safety and emission control requirements, the impact on cost and the degree of customer acceptance. Nevertheless, we have elected to use these estimates for the purposes of this analysis as an upper bound on what is technologically feasible.

Mix Shifts

Manufacturers also can satisfy the higher CAFE standards by attempting to convince consumers to purchase smaller, higher fuel economy cars. There are limits, however, as to how many additional small cars can be sold by domestic manufacturers. First, consumers are unlikely to favor such a radical change in the mix of products. Second, this is a very competitive market segment. Considerable excess capacity for small cars presently exists in the United States and around the world, and domestic manufacturers have a lower share of the small car market relative to other market segments. This lower market share is despite concerted efforts -- including substantial incentives -- over the last five years or so to increase sales of small cars in order to meet CAFE standards.

If manufacturers cannot achieve the level of technological improvement assumed by DOE or encourage consumers to purchase a sufficient number of small vehicles, they have no choice but to restrict the sales of larger, lower fuel economy vehicles in order to meet the CAFE standards.

Employment Impacts

Actions taken by manufacturers to meet higher fuel economy standards will reduce auto industry employment in the United States. These projected employment declines can be explained as follows:

The costs of new fuel economy technology are not expected to be recovered by consumers in fuel savings. This will raise the cost of new car ownership, which will lower overall demand for cars.

Fewer workers are involved in the production of smaller cars. Therefore, a shift to smaller cars also will reduce the number of industry jobs for any volume level.

Jobs associated with the production of larger cars will decline even if domestic manufacturers are able to increase significantly their sales of small cars. The loss in domestic volume will be somewhat offset, however, by a projected increase in the number of transplants (vehicles built in the United States by foreign manufacturers).

We project that the higher fuel economy standards would result in a loss of 200,000 auto industry jobs in 1996 (from a projected level of 800,000) for 1996 and 210,000 jobs in 2000 (from a projected level of 750,000). These results together with the projections from our sensitivity analysis are summarized in the chart below and described in more detail in the attachments.

Employment Effects of Increased CAFE

	<u>1996</u>	<u>2000</u>
<u>BAE projected employment in Motor Vehicle and Equipment Industry</u>	800,000	750,000
Employment Loss from higher CAFE standards:		
Base Case	(200,000)	(210,000)
Alternative 1 (no cost for technology)	(177,000)	(173,000)
Alternative 2 (increased small car share)	(139,000)	(159,000)
Alternative 3 (mix leads to volume decline)	(240,000)	(315,000)

January 30, 1990
E:\common\jobs2

Alternative Scenarios for 40 mpg Base Case

Alternative 1

Assuming no decline in overall industry volume for the increased cost of new technology

	<u>Domestic Industry</u>			<u>Foreign Industry</u>		
	<u>Small</u>	<u>Midsize</u>	<u>Large</u>	<u>Small</u>	<u>Midsize</u>	<u>Total</u>
1989 MY Vol. (000)	1,520	3,993	1,492	1,702	1,137	
2000 MY Vol. (000)	2,827	1,242	214	3,913	1,719	
Volume Change (000)	1,307	(2,751)	(1,278)	2,211	582	
Transplant Increase				1,106	281	
U.S. Jobs/Car	0.066	0.073	0.081	0.033	0.037	
Jobs Impact (000)	86	(201)	(104)	36	10	(173)

Alternative 2

Assuming domestic industry can capture 53 percent of the small car market (highest share in the last ten years)

	<u>Domestic Industry</u>			<u>Foreign Industry</u>		
	<u>Small</u>	<u>Midsize</u>	<u>Large</u>	<u>Small</u>	<u>Midsize</u>	<u>Total</u>
1989 MY Vol. (000)	1,520	3,993	1,492	1,702	1,137	
2000 MY Vol. (000)	3,193	1,403	242	2,873	1,242	
Volume Change (000)	1,673	(2,590)	(1,250)	1,171	105	
Transplant Increase				586	33	
U.S. Jobs/Car	0.066	0.073	0.081	0.033	0.037	
Jobs Impact (000)	110	(189)	(101)	19	2	(159)

Alternative 3

Assuming that industry volume declines by an additional 30 percent, as consumers decide to hold onto older vehicles, rather than buy a smaller vehicle with less utility

	<u>Domestic Industry</u>			<u>Foreign Industry</u>		
	<u>Small</u>	<u>Midsize</u>	<u>Large</u>	<u>Small</u>	<u>Midsize</u>	<u>Total</u>
1989 MY Vol. (000)	1,520	3,993	1,492	1,702	1,137	
2000 MY Vol. (000)	1,781	782	135	2,443	1,083	
Volume Change (000)	261	(3,211)	(1,357)	743	(74)	
Transplant Increase				382	(37)	
U.S. Jobs/Car	0.066	0.073	0.081	0.033	0.037	
Jobs Impact (000)	17	(234)	(110)	13	(1)	(315)

**Projected U.S. Employment Impact of a 40 mpg CAFE Standard in 2000
(Base Case)**

	<u>Domestic Industry</u>			<u>Foreign Industry</u>		
	<u>Small</u>	<u>Midsize</u>	<u>Large</u>	<u>Small</u>	<u>Midsize</u>	<u>Total</u>
1989 MY Vol. (000)	1,520	3,993	1,492	1,702	1,157	
2000 MY Vol. (000)	2,344	1,118	193	3,522	1,547	
Volume Change (000)	1,024	(2,875)	(1,299)	1,820	390	
Transplant Increase				910	195	
U.S. Jobs/Car	0.066	0.073	0.081	0.033	0.037	
Jobs Impact (000)	68	(210)	(105)	30	7	(210)

Assumptions

- Cumulative 22 percent improvement in fuel economy through incorporation of engine, transmissions and other technology improvements. This does not consider the negative impact of other regulatory actions, or the acceptability of these changes by customers.
- 10 percent across-the-board decline in industry volume, reflecting higher consumer costs for new technology not recovered in fuel savings.
- Domestic industry share of small car market remains at present levels (42 percent). Middle and large/luxury car volume reduced proportionately to achieve ⁴⁰33 mpg CAFE level.
- Bureau of Labor Statistics (BLS) projection of auto industry jobs in 2000 (750,000). The BLS projection takes into account past and anticipated increases in productivity.
- Adjusted jobs/car factors developed in PTC Working Paper No. 160 by Andrew M. Kleit, February 1988. Kleit's factors (small - 0.123 jobs/car; mid-size - 0.137 jobs/car; and large - 0.152 jobs/car) imply a labor force of 1.4 million. Adjusting Kleit factors for BLS employment projections yields the following jobs/car factors: small - 0.066; mid-size - 0.073 and large - 0.081.
- All cars sold by domestic manufacturers assumed to be domestically produced (effect of two-fleet rule in EPCA ignored). In fact, the way EPCA works domestic manufacturers would have a far more difficult time meeting higher CAFE levels than assumed in this analysis.
- Half of projected increases in foreign small and midsize volume assumed to be built in U.S. (transplants represent 20 percent of import sales in 1989). Labor content of transplants assumed to be half of domestically produced car (note Kleit's adjusted factor for small cars would be 0.027).

Alternative Scenarios for 11 May Base Case

Alternative 1

Assuming no decline in overall industry volume for the increased cost of new technology

	<u>Domestic Industry</u>			<u>Foreign Industry</u>		
	<u>Small</u>	<u>Midsize</u>	<u>Large</u>	<u>Small</u>	<u>Midsize</u>	<u>Total</u>
1989 MY Vol. (000)	1,320	3,993	1,492	1,702	1,157	
1996 MY Vol. (000)	2,056	1,811	444	2,813	2,478	
Volume Change (000)	536	(2,182)	(1,048)	1,113	1,321	
Transplant Increase				357	661	
U.S. Jobs/Car	0.070	0.078	0.087	0.035	0.039	
Jobs Impact (000)	38	(170)	(91)	20	26	(177)

Alternative 2

Assuming domestic industry can capture 53 percent of the small car market (highest share in the last ten years)

	<u>Domestic Industry</u>			<u>Foreign Industry</u>		
	<u>Small</u>	<u>Midsize</u>	<u>Large</u>	<u>Small</u>	<u>Midsize</u>	<u>Total</u>
1989 MY Vol. (000)	1,320	3,993	1,492	1,702	1,157	
1996 MY Vol. (000)	2,451	2,158	529	2,176	1,917	
Volume Change (000)	931	(1,835)	(963)	474	760	
Transplant Increase				237	380	
U.S. Jobs/Car	0.070	0.078	0.087	0.035	0.039	
Jobs Impact (000)	65	(143)	(84)	8	15	(139)

Alternative 3

Assuming that industry volume declines by an additional 10 percent, as consumers decide to hold onto older vehicles, rather than buy a smaller vehicle with less utility

	<u>Domestic Industry</u>			<u>Foreign Industry</u>		
	<u>Small</u>	<u>Midsize</u>	<u>Large</u>	<u>Small</u>	<u>Midsize</u>	<u>Total</u>
1989 MY Vol. (000)	1,320	3,993	1,492	1,702	1,157	
1996 MY Vol. (000)	1,758	1,548	380	2,407	2,119	
Volume Change (000)	238	(2,445)	(1,112)	705	962	
Transplant Increase				353	481	
U.S. Jobs/Car	0.070	0.078	0.087	0.035	0.039	
Jobs Impact (000)	17	(191)	(97)	12	19	(260)

**Projected U.S. Employment Impact of a 33 mpg CAFE Standard in 1996
(Base Case)**

	<u>Domestic Industry a/</u>			<u>Foreign Industry</u>		
	<u>Small</u>	<u>Midsize</u>	<u>Large</u>	<u>Small</u>	<u>Midsize</u>	<u>Total</u>
1989 MY Vol. (000)	1,520	3,993	1,492	1,702	1,137	
1996 MY Vol. (000)	1,953	1,720	422	2,674	2,354	
Volume Change (000)	433	(2,273)	(1,070)	972	1,197	
Transplant Increase				486	398	
U.S. Jobs/Car	0.070	0.078	0.087	0.035	0.039	
Jobs Impact (000)	30	(177)	(93)	17	23	(200)

a/ Including captives; about 700,000 in 1989

Assumptions

- 8 percent improvement in fuel economy through incorporation of engine, transmissions and other technology improvements. This does not consider the negative impact of other regulatory action, or the acceptability of these changes by consumers.
- 5 percent across-the-board decline in industry volume, reflecting higher consumer prices for new technology that cannot be recovered in fuel savings.
- Domestic industry share of small car market remains at present levels (42 percent). Middle and large/luxury car volume reduced proportionately to achieve 33 mpg CAFE level.
- Bureau of Labor Statistics (BLS) projection of auto industry jobs (1993 estimate of 800,000 jobs is interpolation between present level and forecast for 2000). The BLS projection takes into account past and anticipated increases in productivity.
- Adjusted jobs/car factors developed in FTC Working Paper No. 160 by Andrew W. Kleit, February 1988. Kleit's factors (small - 0.123 jobs/car; mid-size - 0.137 jobs/car; and large - 0.152 jobs/car) imply a labor force of 1.4 million. Adjusting Kleit's factors for BLS employment projections yields the following jobs/car factors: small - 0.070; mid-size - 0.078 and large - 0.087.
- All cars sold by domestic manufacturers assumed to be domestically produced (effect of two-fleet rule in EPCA ignored). In fact, the way EPCA works, domestic manufacturers would have a far more difficult time meeting higher CAFE levels than assumed in this analysis.
- Half of projected increases in foreign small and midsize volume assumed to be built in U.S. (transplants represent 20 percent of import sales in 1989). Labor content of transplants assumed to be half of domestically produced car (note Kleit's adjusted factor for small cars would be 0.02')

John CAFE

■ Opinion Dynamics

August 20, 1992

Memorandum

To: Sam Popkin

Fr: John Gorman

Re: The Environment Issue

As you requested, I'm putting down some thoughts about the environment as a political issue.

First of all, the most important thing about the environment as an issue is to think of it as having many different sides and facets. I noted, for example, that one weekend report on a Clinton speech said that he talked about "protecting the environment and conserving resources". These are two different aspects of the issue and have different resonances with different audiences.

On the simplest level, it may be possible to talk about two issue clusters:

- Environmental protection is the majoritarian stance in the country. There is no real issue involved unless people, like Quayle, are actually willing to come out against protecting people from threats to their air and water. This is health issue; it is child issue. Indeed, one can tell if one is on the true path of environmental protection if one can reach the conclusion that "we need to do this to protect the health of our children..."

- Environmentalism is murkier and is the "issue" that the Republicans seem to want to pin the ticket with. The things that make environmentalism iffy for the ticket are its reliance on long-term expert models and the quasi-religious nature of some its proponents.

Over the last 20 years even the best science has, unfortunately, been the subject of a lot of ridicule. The public has increasingly come to believe that scientists think "everything causes cancer" so, in fact, it becomes less and less worthwhile to pay attention. The constant "scares" from various whackos about everything from apples to zucchini makes people feel that same skepticism toward "environmental" pronouncements that they do toward political ones.

"Conserving resources" falls into this same pattern because it relies on assumptions about resources running out and on the ability of the government, rather than the consumer, to make decisions about products. The last resource we were supposed to conserve was oil—since then we've had an oil glut and a depression in the oil states caused by falling prices. People will always pay lip service to "conservation", but any probing shows that most people want to consume. (A good place to paraphrase the Popkin motto: Never tell the public how selfish they are; never underestimate how selfish they are.)

Coupled with this, the sentimental, unrealistic and often extreme views of some environmentalists—animal rights groups, "gaia" worshipers, and so on, make many people uneasy.

Popkin 2

The demographics of all this are fairly easy since they involve primarily age and sex. At one extreme, it is difficult to find a college educated woman under 40 who isn't an "environmentalist". (Republican convention attendees only possibly excepted.) On the other hand, people over 60 tend to care very little about either environmental protection or environmentalism. Men in the lower half of the income scale are particularly likely to be negative on both environmental protection and environmentalism, while men in the upper half are more likely to be negative on environmentalism but strong on environmental protection.

Given all of this, what's a Democratic campaign to do?

First of all, the best strategy is concentrate on "environmental protection". The buzzwords are health and safety. WE PUT YOUR HEALTH AND SAFETY FIRST!

The principal environmental concern of the American people is clean water. If I could, I would never give a speech on any other topic and I would attempt to find as many anecdotes, horror stories and Bush failures in the area as possible. People are more concerned about drinking water than swimming or boating water, but to some extent it's all the same. The Jersey Shore, San Diego, back to Boston Harbor, Lake Michigan...

I should note that most people believe that water pollution problems are principally "legal" in nature. I.e. Companies broke the law to dump poison into the water... Oddly enough in many statewide surveys the Attorney General rather than the state department of environmental protection is seen as the appropriate person to bring about clean water. Much of the public thinks prosecution, not regulation, is the way to go.

The second concern is clean air. This brings us to dangerous territory since air more than water involves restrictions on activity people enjoy. Air problems are associated with cars and industrial smokestacks—for some reason smokestacks are seen as a necessary, not illegal, place to put stuff into the air, but outfall pipes are seen as an illegal, unnecessary, way to put stuff into the water. Smokestacks aren't "good" by any stretch of the imagination, but they are needed... Again, we need to talk to men here so the idea is to help industry reduce emissions first—source reduction, new processes, and so. Let's be forward looking and talk about creating jobs rebuilding our industries. Let's talk about sharing our love of driving with our kids in cars that don't put as much pollution into the air.

The third major place people care about the environment is, oddly enough, national and state parks, wilderness and so on. While the murkier "species" issues sometimes cloud this issue, people love the National Park System and see it as a major environmental concern. For many of them the main concern is finding a camping spot (and they hate the environmentalist view that people should be kept out of the wild). This is a particularly male thing, and I'm sure it underlies much of Bush's annual trek to Montana when he'd rather be in his mansion by the sea. We might make a ritual bow to this issue.

The other major concern is solid waste disposal. This is one where the environmentalists have weighed in with lots of talk about "wasteful packaging" (moralistic) and running out of space for landfills (both silly and apocalyptic). This is primarily a NIMBY issue. Most people grew up thinking the solid waste issue was who would carry out the cans on Tuesday night. Now they have to actually pay for waste disposal and the landfill neighbors want more money too. This is dangerous territory for a national campaign since it treads on state and local toes, but the idea is to find economical ways to deal with solid waste—new innovative methods, etc.

Popkin 3

The main points I would make to the candidates are:

1) Health and safety, health and safety.... We are in the environmental protection business. If you can't say the problem poses a threat to "your child's health" then you should think twice about saying it.

2) Don't be apocalyptic. Most people see us making some progress on cleaning things up and the constant scare tactics of some groups are wearing thin. Talk about the progress that citizens and states have made and how with a President who actually cares about the issue we can make even faster progress. Be hopeful not threatening!

3) Be practical! Middle aged men, in particular, need to hear that you aren't planning to let young women run environmental experiments using their jobs as the guinea pigs. (There is a component of sexual and age stereotyping involved in how the different groups view each other that we don't need to explore in this memo. However, if you are thinking of talking about a Secretary of the Interior or a head of EPA make them middle aged men with business backgrounds—no young women.)

I know this is brief but I hope it helps. If you have any questions, please call.

08-11-1992 08:00

617 484 0809

OPINION DYNAMICS

P.03

*file -
CAFE***■ Opinion Dynamics**

August 11, 1992

Memo**To:** Sam Popkin**Fr:** John Gorman**Re:** CAFE Standards

As you requested, a few thoughts on mandatory fuel economy as an issue.

First of all, most people support standards. A national poll in January showed:

Mandatory fuel efficiency and air pollution standards that would increase the cost of a new car by several hundred dollars but would reduce air pollution significantly.

	<u>Favor</u>	<u>Oppose</u>
1992	66%	31
1991	71%	28
1990	70%	27

Furthermore, by a 61% to 16% margin people say they would be more likely to support a Presidential candidate who supports a law requiring that all cars meet stricter mileage standards by 1995.

From other research it is clear that people can be persuaded that some federal regulation in this area is unreasonable, but on the whole they cannot be moved to outright opposition. I.e. it is possible to argue that "companies should be given time to comply with federal mileage standards so that the economic impact will be reduced".

However, the majority of people agree:

1) Better mileage and pollution standards are inevitable. The best argument in favor is: Look, we all know that we need to clean up and conserve; we can either get ahead of the process or we can play catchup. Gore to Quayle, "Dan, don't you think that in 20 years your son will want to be driving a cleaner, more efficient car. Why are you against developing the products our kids will want and need?"

2) The Japanese and the market will force them anyway. The argument goes: Finally some American car makers are recognizing that they have to make better products first instead of waiting for the Japanese to take all the customers away. I remember when the companies were all in Washington claiming that airbags were a terrible thing—now they're advertising them to get customers.

One Kendall Square, Building 200
Cambridge, Massachusetts 02139
(617) 494-1254
Fax: (617) 494-0909

08-11-1992 08:00

617 494 0909

OPINION DYNAMICS

P.04

3) Fuel efficiency is the best way to reduce pollution since it means not making it in the first place rather than trying to scrub it out of the exhaust. It is a form of source reduction...

I should note that the rationale for mileage standards should always be pollution control, not energy savings. People still have bitter memories of what they consider the energy shortage scam of the 70s: "Once prices went up it turned out there was plenty of gas..."

■ *Opinion Dynamics*

MEMORANDUM

TO: Stan
 FROM: Joe
 RE: Michigan Political Draft
 DATE: August 9, 1992

THE RACE

The path to victory in Michigan is clearly outlined in this survey. Clinton will win if he can maintain his current lead among the traditional Democratic coalition that is currently supporting him by overwhelming margins: union households (65 to 28 percent), middle income white voters (56 to 36 percent), least educated voters (60-34) and blacks (80 to 17 percent). This all adds up to winning back the Reagan Democrats, who now support Clinton by 75 to 18 percent. Maintaining support among these groups is tantamount to victory.

But there is reason for concern. Clinton leads by smaller margins among other critical groups who are less solid in their support and not as opposed to Bush. Primarily, this a male problem, who currently back Clinton by only 51 to 43 percent (women favor the Governor by 58 to 34 percent). College men and older men give Bush small majorities while younger men support Clinton by just 9 points. Seniors are another area of concern, where Clinton leads by just 48 to 41 percent. Clinton also runs less well, but still ahead, among college educated and upper income voters and in the Western part of the state.

Not surprisingly, Bush's current vote represents those who favor the status quo. He leads among voters whose income has stayed even in the last year or gone up and among professional and white collar workers. His strongest constituency comes from voters who want a president who will support family values (73 to 20 percent) or a strong leader (51 to 44 percent). At the moment, Bush garners only 79 percent of the Core GOP support.

MESSAGE: ECONOMY

Michigan voters are clearly concerned about the economy and their immediate futures. Almost half (48 percent) say that their incomes have fallen behind the cost of living in the last year. Urban voters, non-college voters and voters in the Central region appear hardest hit by declines in income. As to the type of candidate they want as president, 44 percent want someone who will get the economy moving and another 13 percent want someone who will

put the middle class first. Voters under 30 and college women are most anxious in this area - over half want a president who will get the economy moving.

Bush has virtually no credibility in this area. His job performance is an abysmal 28 percent excellent or good. Only 22 percent believe he has good ideas as to how to get the economy moving again and voters overwhelmingly believe Clinton (55 percent) will improve the economy as opposed to Bush (27 percent). Men, however, are less certain that Clinton is up to the job giving Clinton only a 13 point advantage in this area with college men giving Bush an 11 point advantage.

POTENTIAL PITFALLS

As long as the race remains focused on the economy and change, Clinton will retain the upper hand. Clinton exceeds his vote margin in comparisons with Bush on every economic and change issue tested except dealing with taxes, where his margin is only 14 percent. Only when the debate returns to values and "traditional" Republican issues like crime and family values does Bush show any life.

This fact is more disturbing in the light of voters perceptions of Clinton where there is already doubt concerning his persona and tax background. Voters break even on the idea of Clinton inspiring confidence with large numbers of older and college educated voters rejecting this idea outright. A small plurality of voters already believe that Clinton is too ready to raise taxes and the "politician" label is already attached - 61 percent think that describes Clinton well (slightly under 64 percent for Bush).

GORE SHIFTERS

Voters who move towards Bush as a result of the Gore arguments are the traditional Michigan stereotype: anti-Japan, anti-Mexican trade agreement and government regulations have hurt the U.S. auto industry. They are Democrats (57 percent), younger (70 percent - 56 percent young no college) and 35 percent are union members. They are most concerned with Gore as a foreign aid enthusiast who ignores the impact of his environmental policies on costs to middle class families and competitiveness in the auto industry.

However, while these voters are suspicious of Clinton on taxes and the idea of his being too much of a politician, these shifters hate Bush and are probably unlikely to move his way. Over half rank Bush below 50 degrees mean on the favorability scale and 77 percent say he has done only a fair or poor job. Their ratings of Bush on his positive traits are remarkably negative. These

voters want to get the economy moving (54 percent) and they doubt that Bush is the mechanism for that change. While the arguments against Gore have some merit with these voters, it is doubtful they will reject the Clinton argument for the middle class, responsibility and competitiveness for more of George Bush.

TARGETS

Clinton must maintain his current strong support among traditional Democratic groups - blacks, unions, women and downscale voters. Keeping the focusing on the economy and change is crucial, although part of that argument must continue to portray Bush as out of touch and incapable of understanding the everyday needs of regular people.

- **BLACKS** (9 percent of electorate): Clinton's support among the black community already reaches 80 percent with 62 percent very certain of their vote. Bush (mean score 25 degrees) and the Republican party have nothing to offer these voters. 62 percent believe their incomes have fallen behind the cost of living and 52 percent believe Bush is doing a poor job. Any contrast with Bush is a successful one - the major question here is how to keep these voters motivated and ensure a high turnout.

- **UNION HOUSEHOLDS** (32 percent of electorate): Another traditional component that is firmly in the Clinton camp (65 to 28 percent). These are economy moving/middle class first voters who are second only to blacks in their margin of support for Clinton and rejection of Bush. Three quarters believe Bush is "out of touch" and provide lopsided margins to Clinton on virtually every comparison with Bush.

Bush does run ahead of Clinton in some areas: crime, family values and moral standards. And there is little doubt that he can cut into Clinton's margin somewhat by portraying the Democratic ticket as regulatory extremists who will save the environment at the expense of industry. But even these attacks against Gore move only 18 percent of union voters (with foreign aid, not regulations, topping the list of concerns). And while they overwhelmingly believe a trade pact with Mexico will cost the U.S. jobs (67 percent), Clinton's stand on the pact makes little difference. In fact, he scores higher by supporting the treaty with some standards (75 percent much/somewhat more Clinton) than he does opposing the treaty to save jobs (68 percent).

- **WOMEN** (53 percent of electorate): Interestingly, there is little differentiation between the various female demographic groups. Clinton has about a 25 point lead among both older and younger women, college and non-college women, as well as working women and women who work at home. Maintaining the gender gap is crucial. To do so, Clinton must focus on improving the economy and representing the middle class - i.e. understanding the day to day struggles

people are now enduring.

While older and college women are more intense in their distaste for Bush (not to mention Quayle - 48 percent of college women rank Quayle at between 0 and 25 on the thermometer), younger women are more favorable toward Clinton, seeing him as a steady leader who stands up for his beliefs. This is in sharp contrast to Bush who has no vision for the future and doesn't seem to care about regular people. 57 percent of younger women think Bush is out of touch. But there is some ambivalence toward Clinton among younger women who are one of the few groups that break double digits when given the Perot option (12 percent). There are doubts about Clinton's honesty and the omnipresent "politician" label is 10 points higher among younger than older women.

There is also a stark contrast between older and younger women on the environment - best exemplified by the fact that 64 percent of younger women agree that environmental regulations are necessary even if they hurt industry while only 47 percent of older women agree with that statement. Similar divisions occur on Gore attacks and the "environmentalist" descriptions. Only when the attack is framed in the context of excessive costs to the middle class do a majority of non-college and younger women express serious doubts.

• **SENIORS** (16 Percent of electorate): While these voters currently give Clinton a slight margin (48 to 41 percent), they are much less likely to believe that Clinton stands up for his beliefs or that he is a steady leader. He has a negative differential of 16 points on the "confidence" question among these voters. Seniors already have an impression of Clinton as a big spender and someone who is ready to raise taxes. And while they rank Clinton ahead of Bush on some key issues, they lag well behind the mean score on improving the economy, cutting spending, being on your side and dealing with taxes.

These are, however, Republican voters (49 percent), one quarter of whom describe themselves as conservatives. Nevertheless, three quarters think Bush is doing only a fair or poor job. Only 15 percent are college graduates.

• **YOUNGER MEN** (31 percent of electorate): This is another group that is Republican leaning in party identification (46 percent Republican, 38 percent Democrat) but currently gives Clinton a 9 point margin (54 to 43 percent). This is a better educated, higher income but blue collar bunch that sees Clinton and Gore as best representing their needs and being more in touch with their concerns and fears. But their Republican leanings and conservative inclination suggest a good number of younger men are still up for grabs.

Bush actually scores better among younger men in both the

character traits and comparisons with Clinton than he does with the overall electorate. But in the crucial areas of "Understands problems facing your family", "on your side" and "shares your values" Clinton either runs even or ahead of his overall margin. Indeed, 70 percent believe that Bush is "out of touch with people like you" and a strong majority reject the idea that Bush "cares about people like you".

This is a group where the distinction between "environmentalist" and "environmental extremist" will cause problems. An environmentalist scores 65 percent more likely on the vote, but an extremist garners only 45 percent more likely (mostly respondents who already back the ticket) and 27 percent say that makes them less likely to support the Clinton/Gore team.

None of the arguments against Bush stand out - close to half of younger men have serious doubts about each statement and 12 percent move toward Clinton as a result. But the Gore arguments resound as well, particularly the foreign aid and environmental extremist arguments resulting in close to half (47 percent) of younger men saying they are less likely to vote for Clinton (a shift of 15 percent).

Most of the group have some education beyond a high school degree (69 percent) but they are mostly blue collar worker (41 percent) and strongly union (36 percent). This is a relatively affluent group (34 percent make over \$75,000) and conservative group (40 percent either conservative or somewhat conservative).

Engler to attack Clinton's call for high fuel efficiency

By Peter Luke
Grand Rapids Press News Service

8-18-92

PA6

HOUSTON — Desperate to keep worried blue-collar independents in the fold, Michigan Republicans will portray Democrat Bill Clinton as an environmental extremist who would wreck the state's auto industry.

Gov. John Engler will press that view tonight in his speech to the Republican National Convention, charging that the Democratic ticket's policies would doom thousands of automotive jobs.

Specifically, Engler will target Clinton's embrace of higher fuel-efficiency standards for the Big Three automakers.

"It's a major issue because it's right on the political fault lines in Michigan," Engler said Monday. "The auto workers of Michigan understand exactly what unrealistic environmental regulation will do."

Engler's five-minute address is scheduled for sometime between 7:30 and 8:30 p.m. His brief moment in the national spotlight is dimmed by the fact that major television network coverage begins an hour later. Viewers may be able to see his appearance on CNN or PBS stations.

Steve Gools, spokesman for the Michigan Democratic Party, called the issue a "fifty-five of attack" for a party with "miserable" economic record of its own.

The GOP fears recession-battered workers, many of them Democrats who embraced the social conservatism of Ronald Reagan and George Bush, may now blame Bush for their economic woes and vote for Clinton.

The main point of the Republicans' attack: Clinton's and Gore's support for increasing Corporate Average Fuel Economy (CAFE) standards from the current 27 miles per gallon to 40 miles per gallon by the year 2000, and 45 miles per gallon in 2020.

Engler, quoting Motor Vehicle Manufacturers Association assertions, said raising the standard that much and that swiftly would slash automobile employment by 43,000 jobs in Michigan alone.

Michigan would be hard hit because a large percentage of the autos assembled in the state are big, gas-thirsty sedans that automakers would have to phase out to meet the higher fuel standard.

The state's vulnerability was underscored by General Motors Corp.'s announcement in January that it would close its Willow Run assembly plant in Ypsilanti, idling more than 4,000 workers by 1995. The plant makes large rear-wheel-drive sedans like the Chevrolet

let Caprice.

"If you think it's bad now..." said Ronald Kaufman, White House political director. He noted that the Democrats' CAFE standard would idle Lincoln and Cadillac workers in Wisconsin and Detroit as well.

"I would take this issue to any auto worker or anyone who cares about an auto worker's family," he said.

Engler predicted the campaign would do just that with anti-Clinton advertising tailored for Michigan and the industrial Midwest.

The Bush campaign has already used the auto theme successfully this year, thrashing conservative Pat Buchanan's primary insurgency with ads attacking his ownership of a Mercedes-Benz.

Republicans are further bolstered by Michigan Democrats voicing the same criticisms of the higher fuel standards.

Gools counters that Michigan has lost tens of thousands of manufacturing jobs during the last 12 years of Republican rule in the White House. He also noted that Vice President Dan Quayle, as a congressman in the late '70s, opposed the federal bailout that saved the Chrysler Corp. from bankruptcy.

file CAFE

Katy McGinty
Russell Senate Office Building, Room 393
Washington DC 20510
29 September 1992

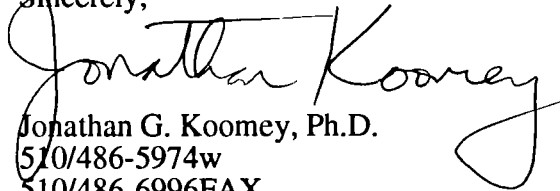
Dear Ms. McGinty,

Howard Geller at ACEEE suggested that I send you a copy of the paper by me, Deborah Schechter, and Deborah Gordon on the costs of improving the fuel economy of the 1992 Honda Civic hatchbacks. The paper has been submitted for publication to the National Research Council's Transportation Research Board

This example shows that both fuel economy and safety of automobiles can be improved at attractive costs, without sacrificing performance or amenity. This example, which can be easily grasped by ordinary people, is in direct contradiction to statements made by President Bush, who claims that increasing fuel economy *must* sacrifice safety. As Kenneth Boulding's first law states: "anything that exists is possible".

I must emphasize that this work was done on my own time--I show my affiliation so that people can reach me and to demonstrate that I am an experienced energy analyst. The Union of Concerned Scientists is a non-profit group that cannot take endorse political candidates. We are supplying this information to you so that the public policy debate can continue on a more informed basis. Please feel free to contact me if you have questions.

Sincerely,



Jonathan G. Koomey, Ph.D.
510/486-5974w
510/486-6996FAX
510/524-4078h

Submitted for publication by the National Research Council's Transportation Research Board
Committee on Energy Conservation and Transportation Demand

COST-EFFECTIVENESS OF FUEL ECONOMY IMPROVEMENTS IN 1992 HONDA CIVIC HATCHBACKS

Jonathan G. Koomey*, Deborah E. Schechter[¥], and Deborah Gordon[¥]

*Staff Scientist
Energy Analysis Program
Energy and Environment Division
Lawrence Berkeley Laboratory, Building 90-4000
University of California
Berkeley, CA 94720

[¥]Union of Concerned Scientists
2397 Shattuck Ave, Suite 203
Berkeley, CA 94704

September 1992

The work for this paper was completed on Jon Koomey's personal time. The time of Deborah Schechter and Deborah Gordon was paid for by a grant from the Energy Foundation. The views expressed here do not necessarily represent the views of the Lawrence Berkeley Laboratory or of the Union of Concerned Scientists.

COST-EFFECTIVENESS OF FUEL ECONOMY IMPROVEMENTS IN 1992 HONDA CIVICS

Jonathan G. Koomey*, Deborah Schechter[‡], and Deborah Gordon[‡]

*Energy Analysis Program, Lawrence Berkeley Laboratory

[‡]Union of Concerned Scientists

ABSTRACT

For many years, U.S. automakers and policymakers have resisted policies to increase automobile fuel economy, arguing in part that such increases were neither technically feasible nor economically justified. This paper analyzes such assertions for the 1992 Honda Civic hatchback. With the new Honda, an automaker has, for the first time, produced a car that is virtually identical to a previous year's model in size, vehicle amenity, engine power, and performance, but that offers substantially increased fuel economy and improved safety. We assess the cost of improving the Civic's fuel economy using actual retail costs, after correcting for differences in cosmetic features. This calculation shows that the Civic's fuel economy was improved by 56% from 1991 to 1992, at a cost per conserved gallon that is 30% less than the direct cost to society of the saved gasoline.

COST-EFFECTIVENESS OF FUEL ECONOMY IMPROVEMENTS IN 1992 HONDA CIVICS

Jonathan G. Koomey*, Deborah Schechter[¥], and Deborah Gordon[¥]

*Energy Analysis Program, Lawrence Berkeley Laboratory

[¥]Union of Concerned Scientists

I. INTRODUCTION

For many years, U.S. automakers and some analysts (e.g., Shin 1989) have argued that policies to increase automobile fuel economy were neither technically feasible nor economically justified. This paper applies Kenneth Boulding's first law ("Anything that exists is possible") to analyze such assertions in the case of the 1992 Honda Civic hatchback. With the new Honda, an automaker has, for the first time, produced a car that is virtually identical to a previous year's model in size, vehicle amenity, engine power, and performance, but that offers substantially increased fuel economy.

This paper first describes the characteristics of the 1991 and 1992 Honda Civics and demonstrates their equivalence in vehicle amenity. Second, it presents the fuel economy technologies Honda used to improve the efficiency of the Civic by more than 50%. Third, it describes the methodology for estimating the cost of conserved energy (CCE) for these efficiency improvements. Fourth, the paper presents the results of our CCE calculations. The paper concludes by discussing the potential effect of gas taxes and "feebate" policies to change both consumer and manufacturer behavior related to energy efficiency choices for these Civics.

II. CHARACTERISTICS OF HONDA CIVICS

This section describes the level of vehicle amenity of the 1991 Civic DX and the 1992 Civic DX and VX. Examination of the specifications of these vehicles and actual test drives reveal that fuel economy gains were achieved with negligible impact on performance, driveability, and comfort. We can conclude from the results of this section that the cars are equivalent in terms of consumer utility.

General description

The 1992 model year Honda Civics represent a "new generation" of Civics. Honda completely redesigned the engine, body style, suspension, aerodynamics, and other major features of this model, but kept total interior space constant and improved performance. In addition, Honda added a new hatchback, the VX, to its Civic line. The VX is similar to the mid-cost Civic DX hatchback, except that the VX is optimized for fuel economy.

Table 1 presents specifications and features of the 1991 and 1992 Civic DX and VX hatchbacks. The major difference among the 1991 Civic DX, the 1992 DX, and the 1992

Table 1: Specifications/Features of Honda Civic Models

Specifications/Features	1991 DX	1992 DX	1992 VX
Fuel Economy			
Miles per gallon (city/hwy)	31/35	35/40	48/55
Miles per gallon (composite)	32.7	37.1	50.9
Engine, Drive Train			
Horsepower (@ rpm)	92 @ 6000	102 @ 5900	92 @ 5500
Torque (lb-ft @ rpm)	89 @ 4500	98 @ 5000	97 @ 4500
Valve train	SOHC, 16-valve	SOHC, 16-valve	VTEC-E
Fuel induction	Dual-point Fuel Injection	Multi-point Fuel Injection	Multi-point Fuel Injection
Drive-train type	Front-wheel Drive	Front-wheel Drive	Front-wheel Drive
Transmission	5-Speed Manual	5-Speed Manual	5-Speed Manual
Final drive train ratio	3.89	4.06	3.25
Exterior Dimensions			
Wheelbase (in)	98.4	101.3	101.3
Length (in)	157.1	160.2	160.2
Width (in)	66.3	66.9	66.9
Curb weight (lbs)	2158	2178	2094
Coefficient of drag	0.33	0.32	0.31
Interior Dimensions			
Headroom front/rear (in)	38.2/36.6	38.6/36.6	38.6/36.6
Legroom front/rear (in)	38.6/36.6	42.5/30.5	42.5/30.5
Cargo volume (cu. ft)	16.9	13.3	13.3
Passenger volume (cu. ft)	73	77.2	77.2
Fuel capacity (gal)	11.9	11.9	10
Safety			
Driver airbag	not available	standard	standard
Cost (1992 \$)			
Invoice (dealer cost)	8171	8663	9258
Manufacturers suggested retail price (MSRP)	9563	10140	10840

Sources: American Honda Motor Co., Inc. 1990, 1991. USAA 1991a, 1991b

(1) 1991 costs adjusted to 1992 \$ assuming 4% inflation.

VX is the improved fuel economy of the 1992 vehicles. The 1992 DX is about 13% more fuel efficient than the 1991 model, while the 1992 VX has 56% higher fuel economy.¹

The 1992 DX and VX are slightly larger than the 1991 DX, as shown by the interior and exterior dimensions listed in Table 1.² Additionally, the 1992 models are equipped with a driver-side airbag, resulting in improved safety over the 1991 DX. It is also noteworthy that the fuel tank of the VX is nearly two gallons, or 16%, smaller than those of the 1991 and 1992 DX. However, the improved fuel economy of the VX means that a VX owner would still have to refuel less often than an identical DX owner.

Performance

Other than fuel economy differences, operational and performance variations among the three cars are minimal. The 1992 VX and the 1991 DX are both rated at 92 horsepower. However, maximum horsepower is achieved at 5500 rpm in the VX and at 6000 rpm in the 1991 DX. Thus, the VX engine provides slightly more power at engine speeds up to 5500 rpm, which includes the range in which most drivers operate. The 1992 DX reaches a maximum horsepower of 102 at 5900 rpm. However, in comparison to the VX, the horsepower difference is likely to go unnoticed unless one drives at engine speeds greater than 5500 rpm (which few drivers ever do).

Another important indicator of vehicle performance is torque. Torque can be described as the quality that allows the driver to accelerate quickly from a stoplight. A vehicle's ability to accelerate is directly related to its torque. The 1992 DX and the VX both provide slight torque improvements over the 1991 DX. The 1992 DX supplies 98 ft-lbs at 5000 rpm, while the 1991 DX supplies 89 ft-lbs at 4500 rpm. The VX is likely to have the best "pickup" at engine speeds comparable to those commonly encountered in everyday driving, as it attains 97 ft-lbs of torque at only 4500 rpm (Keebler 1992b).

Driveability

The comparison of features and specifications has focused on the differences between the three vehicles on paper. However, before one can conclude that the Civic hatchbacks are identical in terms of the service they provide, one must also evaluate the cars on the road. A series of drivers who test-drove the VX found that, in general, it handled well and that performance was impressive. Some drivers found that they had to adjust their driving styles to take advantage of the taller gearing of the VX (Maio 1992, Passino 1992). Several drivers also noted occasional engine "stumble", or hesitation, during quick acceleration in lean burn operation (Keebler 1992a). This hesitation occurs as the engine adjusts to a lower air/fuel ratio. All but one *Automotive News* reviewer believed that this effect would not adversely influence the average driver's perception of the vehicle's performance, and the reviewer who found the stumble unacceptable was a driver who

¹This estimate is for the "49 state" VX sold in all states but California. The stricter emissions requirements in that state made Honda abandon the lean burn technology for VXs sold there, though the California VX still uses the basic VTEC-E engine and the other efficiency technologies found in the 49 state VX. This compromise reduced the efficiency improvement to about 51% relative to the 1991 DX, or to 46.5 mpg composite.

² The exception is cargo volume which is 3.3 cubic feet less in the 1992 models. However, passenger volume was increased by more than 4 cubic feet in the 1992 Civic hatchbacks. Thus, the total interior volume is nearly equal in the 1991 and 1992 models we evaluate.

admittedly preferred high performance vehicles (Keebler 1992b). For typical Civic drivers (who do not seek high power), we can conclude from these reviews that the performance and driveability of the VX is equivalent to that of the 1991 and 1992 DX.

Comfort and amenities

Although the primary specifications and performance of the Civic models are essentially identical, minor differences exist in the cosmetic features of the DX and VX hatchbacks. The features and their estimated costs are shown in Table 2. The 1991 and 1992 DX models are both equipped with an adjustable steering column, rear cargo cover, rear windshield wiper, and bodyside moulding, while the VX lacks these features but has a tachometer and lightweight alloy wheels. The cargo area cover adds utility to the vehicle because it hides any cargo and makes it appear that the vehicle has a trunk. The lightweight alloy wheels are cosmetic in that they look "sportier", but they also affect fuel economy due to their lighter weight.

Safety

The 1991 DX model does not have a driver's side airbag, while both 1992 Civic models do. This technology improves the safety of the vehicle significantly. For example, the United Services Automobile Association (USAA) Casualty Insurance Company reduces the premium for Medical Payments Coverage (MPC) by 60% relative to the 1991 DX for owners of either the 1992 DX or VX (Blackstone 1992). There is no difference in the premium for MPC between the 1992 DX and VX, which indicates that the slight difference in weight of these two vehicles has a negligible affect on safety.

III. FUEL ECONOMY TECHNOLOGIES

As discussed above, the 1992 VX provides a 56% improvement in fuel economy over the 1991 DX. This is achieved by the use of technological improvements that increase the efficiency of converting fuel energy to usable work and reduce the amount of work required to move the vehicle.

The technological differences responsible for the improved fuel economy in the VX include:

- lean-burn VTEC-E engine
- changes in axle and gear ratios
- multi-point fuel injection
- decreased vehicle weight
- improved aerodynamic characteristics
- low rolling resistance tires
- reduced idle speed
- shift indicator light

Table 3 summarizes these fuel economy technologies and presents estimated contributions to fuel efficiency and costs associated with each approach. The primary technological improvements are described in detail in Appendix A. More details on particular technologies are available in Bleviss (1988).

The largest percentage improvements come from transmission/gearing and engine modifications. This fact is noteworthy because changing engine and transmission characteristics does not affect safety or vehicle size. In fact, all of the efficiency improvements used in the 1992 VX have no effect on safety or size. Only weight reduction may have an effect on safety, depending on from where the weight is removed. The fact

Table 2: Cosmetic Differences and Associated Costs

	1991 DX	1992 DX	1992 VX	Cost to add feature (1992\$) (1)
Rear wiper/washer	yes	yes	no	300
Body side moulding	yes	yes	no	150-160
Tachometer	no	no	yes	150-300
Adjustable steering column	yes	yes	no	0 (2)
Cargo area cover	yes	yes	no	159
Wheel type	steel covers	center caps	lightweight alloy	240-320 (3)
MSRP correction added to DX (4)				365
MSRP correction added to VX (4)				614

Sources: American Honda Motor Co., Inc. 1990, 1991; Maio 1992.

(1) Figures represent estimated MSRP costs of adding the specified features. Estimates are in some cases crude because these particular items are not available as actual options (with the exception of the cargo area cover, which is available as an option on the VX).

(2) Cost to replace steering column = \$272 for both DX and VX, according to Miao 1992b. Incremental cost therefore = 0 for tilt steering column.

(3) Indicates cost of lightweight alloy wheels (4) above that of steel covers or center caps.

(4) To correct for differences in costs of cosmetic features, the mean cost of each option that exists on the DX but not on the VX has been added to the cost of the VX, and the mean cost of each option that exists on the VX but not on the DX has been added to the cost of the DX. The only exception to this rule is that only half the cost of the alloy wheels has been added to the cost of the DX, because part of their benefit is to increase fuel economy, and part is cosmetic. These MSRP costs are adjusted to reflect the standard 17% markup when estimating invoice costs. See Table 4 for details on how these numbers are used in the CCE calculations.

Table 3: Technologies Used to Increase Fuel Economy in 1992 VX

Technology	Fuel Economy	
	Improvement (%) '91 DX to '92 VX	Cost (1992 \$/car) (1)
Multi-point fuel injection	1.5	56-162
Low rolling resistance tires	1	21-22
VTEC-E engine		
variable valve timing	2.5	108 -164
lean burn	5 -10	0 - 500
reduced friction	1.5	35-65
roller cam followers	1	19-54
Weight reduction	2.5	88-130 (2)
Aerodynamic improvements	1.5	37-65 (3)
Gearing and drive ratio changes	21	N/A (4)
Reduced idle speed/rpm	3	N/A (4)
Shift indicator light	5	N/A (4)
Total	45.5 - 50.5 (5)	364 - 1162

Sources: Green and Duleep. 1992, Harrington 1992, National Research Council 1992, SRI International 1991.

(1) All costs taken from SRI (1991) and Green and Duleep (1992). They represent retail costs to the consumer. Both sources used a variety of information including cost figures from vehicle manufacturers and component suppliers, and information on cost components such as production costs, fixed costs, and markups for overheads, taxes, and dealer profit.

(1) Most cost estimates adjusted from 1988 and 1990 \$ based on 4.1% implicit price deflator for GNP for 1989 and assumed 4% annual deflator for 1990 to 1992.

(2) Cost based on 5% weight reduction.

(3) Cost based on 10% aerodynamic improvement.

(4) N/A = not available.

(5) Totals do not add to 56% due to synergistic effects of fuel economy technologies.

that USAA charges the same premium for Medical Payments Coverage for the 1992 DX and VX indicates that the small differences in weight between these two vehicles does not affect safety at all.

Capital costs of fuel economy improvements

The costs of the technologies listed above are not readily available and vary widely depending on the source of the estimate. Cost estimates are further complicated by the fact that several of the technologies may overlap. For example, the variable valve feature of the VTEC-E engine permits the use of lean burn technology and changes in drive ratio. Thus, an estimate of the cost of variable valve timing may also include the cost of lean burn technology and drive ratio changes.³ Despite these complications, we provide estimated costs of fuel economy technologies in Table 3. The total estimated costs of these technologies range from \$364 to \$1162.⁴

Applicability of Civic VX improvements to other vehicles

Not all technologies used to improve the efficiency of the Civic can be immediately transferred to other new cars. Keebler (1992a) reports that "heavy vehicles have poor driveability when calibrated with lean-burn fuel strategies", which implies that this strategy, as currently implemented, may not be directly transferable to the larger cars in the U.S. fleet. Lean-burn technology results in increased formation of nitrogen oxides (NO_x) and may not be viable in some vehicles until improved NO_x catalysts are developed. According to Sanger (1991), Honda engineers believe it will be "several years ... before they can transfer the technology to larger, less efficient engines".

The gearing changes used in the VX are directly applicable only to manual transmission automobiles, though similar changes in automatic transmissions could also improve fuel efficiency. The other options (representing about 1/4 of the 56% efficiency improvements in the VX) should be applicable to most of the fleet.

IV. METHODOLOGY

The purpose of the calculations in the next two sections is to estimate the costs and benefits of improving the fuel economy of the 1991 Civic DX to the level of the 1992 Civic DX and VX models. Actual retail costs are used to estimate the cost of improving fuel economy, while projections of motor gasoline prices are used to estimate the levelized fuel price.

Definition of cost effectiveness

By cost effective, we mean that the costs of investing in automobile efficiency are lower than the costs avoided by this investment. The cost of an efficiency improvement is usually assessed by calculating the *Cost of Conserved Energy* (CCE). The costs avoided by the efficiency investment include the *direct cost* of the unused fuel, and whatever *social or external costs* are associated with the consumption of gasoline that are not included in the

³For this reason, we have estimated the cost of lean burn technology to be \$0 to \$500.

⁴This range neglects axle and gear ratio improvement costs which were unavailable. In principle, the capital cost of axle and gear assemblies should not vary significantly as gear ratios change.

gasoline price. Whenever the CCE is lower than the avoided direct costs plus external costs (\$/gallon), we can say that an efficiency investment is cost effective.

Cost of Conserved Energy

The Cost of Conserved Energy or CCE (\$/gallon) is calculated using Equation (1)⁵:

$$\text{CCE (\$/gallon)} = \frac{\text{Capital Cost (\$)} \times \frac{d}{(1-(1+d)^{-n})}}{\text{Annual Energy Savings (gallons)}} \quad (1)$$

where d is the discount rate and n is the lifetime of the automobile. The numerator in the right hand side of Equation 1 is the annualized cost of the conservation investment. Dividing annualized cost by annual energy savings yields the CCE, which can be compared to the levelized price of fuel (in \$/gallon).

Discount rate

The discount rate in our calculations is 7% real. This value roughly corresponds to the current cost of capital for consumers seeking an auto loan (11% to 12% with inflation). We also perform sensitivity analysis using real discount rates of 3% and 10%.

Miles driven

We use an estimate of 10,200 miles travelled per year for a typical U.S. automobile in 1988, taken from Davis and Morris (1992). The source cited by Davis and Morris is the U.S. Department of Energy's Residential Transportation Energy Consumption Survey.

Vehicle lifetime

We use an estimate of automobile lifetime of 13.3 years derived from a retirement curve for vehicles presented in Davis and Morris (1992). This curve applies to vehicles bought during the 1978-89 time period.

Rated fuel economy

We use the city and highway fuel economy as listed on the EPA sticker for each car.⁶ We weight the city and highway fuel economy sticker values to estimate composite fuel economy for our cost effectiveness calculations. This weighting assumes that 55% of driving is city driving and 45% is highway driving, as specified in the Energy Policy and Conservation Act passed in 1975 (EPCA 1975).

Consistency of comparison

⁵For more details on such calculations, see Meier et al. (1983) or Koomey et al. (1991).

⁶Fuel economy estimates based on the EPA test procedure have been found to diverge from actual performance. This divergence was significant enough to induce EPA to reduce the sticker fuel economy relative to the test procedure values to account better for real-world conditions. EPA reduced the city fuel economy estimates from the test procedure by 10% and reduced the highway estimates by 22% to calculate the fuel economy rating on the sticker.

All fuel prices and capital costs are in 1992 dollars. We use a real discount rate (without inflation) to levelize the prices, and use the same real discount rate to calculate the cost of conserved energy. The comparison between the initial capital expense and the levelized fuel price is therefore a consistent one.

Fuel prices

Motor gasoline prices are taken from the Annual Energy Outlook (US DOE 1992), and are levelized using a 7% real discount rate (using the method from Kahn (1988)). According to the forecast, the cost of motor gasoline will be \$1.27/gallon in 1992 and \$1.61 in 2005.⁷ Levelized over this period (which corresponds to the lifetime of our Honda Civic purchased in 1992), the cost of gasoline is \$1.40/gallon.

This price includes roughly \$0.25-0.30/gallon of state and federal gasoline taxes, which are used to fund mostly highway construction and maintenance.⁸ Society does not avoid the construction and upkeep of roads if automobiles are more efficient, so a societal cost comparison should not include these costs in the avoided cost of fuel. This price does not include the external costs associated with gasoline combustion, many of which are avoided by a more efficient car (see below).

We show comparisons with the levelized fuel price with and without taxes. The case with taxes provides an understandable reference point, and represents the case where external costs roughly equal the level of state and federal taxes. The case without taxes represents the case where external costs are assumed to be equal to zero.

Invoice cost vs. Manufacturer's Suggested Retail Price

Invoice cost is also known as "Dealer cost". It is the average price charged to the dealer by the auto manufacturer. Manufacturer's Suggested Retail Price (MSRP) is also known as "Sticker Price", and is supposed to represent the price of the car to the consumer. We choose in this analysis to rely on MSRP as an "official" price, but also show the invoice cost in our tables. The invoice cost and MSRP are taken from USAA (1991a, 1991b) and documents from a local Honda dealer. The invoice cost and MSRP for the 1991 DX have been adjusted to 1992 dollars assuming 4% inflation.

The MSRP is somewhat arbitrary. Good bargainers have been known to purchase autos at or below the invoice cost. Auto manufacturers also give "volume incentives" to dealers that sell more than a target number of cars. Therefore, invoice cost and MSRP based on the sale of a single car may not actually reflect the true cost to the dealer.

Automobile pricing is a complicated process and the market price of a vehicle may have little to do with actual production costs. For example, anti-lock braking systems provided as an option on many cars are currently underpriced on the vehicle "sticker" in order to encourage the purchase of these safety-enhancing mechanisms (Rinek 1992).

⁷The Annual Energy outlook reports fuel prices in 1990 dollars, which we have adjusted to 1992 dollars by assuming 4% inflation in each of the two intervening years.

⁸Of the current 14.1 cents/gallon federal gasoline tax, 10.1 cents are used for highways, 1.5 cents fund transit services, and 2.5 cents are devoted to budget deficit reduction per the Budget Reconciliation Act of 1990, which extends through 1995. State taxes in California are roughly 16 cents/gallon.

Airbags

The 1992 Civics both have airbags, while the 1991 DX does not. Airbags are unrelated to fuel economy, and their cost should not be included in our assessment of the incremental cost associated with improving the efficiency of the 1991 DX. According to Maio (1992), the MSRP cost of an airbag is \$800 in a new Honda Civic, and \$1200 to replace an airbag that has been "blown" in a collision (all capital costs are in 1992\$). We subtract \$800 from the MSRP cost of the 1992 DX and VX to correct for this added cost.⁹

Correction for cosmetic differences

The cargo cover is available as an option on the VX for \$159. Costs for the other cosmetic differences shown in Table 2 can only be roughly estimated based on the estimates of the parts department of a local Honda dealer.

We add the average cost of hatch cover, body side moulding, and rear wiper/washer to the cost of the VX (no correction is made for the cost of the adjustable steering column, since the cost of the steering columns in the DX and the VX are the same). We add the average cost of tachometer and 1/2 of the cost of alloy wheels¹⁰ to the cost of 1991 and 1992 DX.

These cosmetic differences result in an additional MSRP cost of \$365 on both DX models, and \$614 on the VX. With this correction and that for the airbag (subtracted from the cost of the 1992 DX and VX), we have created a consistent comparison and can draw conclusions about the actual cost to improve the efficiency of the 1991 DX to the level of the 1992 VX. These additions result in what we refer to as our "Full Correction Case", which represents our best estimate for the full cost to society of the fuel economy improvements in the VX as compared to the DX.

These cost corrections make the comparison a more consistent one. They should be viewed as approximate for three reasons:

- 1) Actual costs for these options are speculative, since the features available on the VX are not available on the DX, and vice-versa.
- 2) Actual production costs for standard features may be quite different from the costs for installing such features as options after the car is manufactured.
- 3) Separating the cost of the alloy wheels attributable to cosmetic differences from that attributable to fuel economy is problematic.

To account for the fact that some options are not available on specific models in the showroom, we also show a comparison between the 1992 DX and the 1992 VX that only corrects for the feature that is actually an option (the hatch cover). We refer to this case as the "As Available" comparison.

⁹The invoice cost for the airbag is calculated by multiplying the MSRP cost of the airbag times the ratio of the invoice and MSRP cost for the entire car. The MSRP markup thus calculated is 17%.

¹⁰Only half the cost of the alloy wheels are added to the DX because some fraction of their cost is attributable to their lower weight and the rest is attributable to their "sporty" appearance. We choose 1/2 arbitrarily, since we had no way to separate these two attributes of the wheels.

Comparison of estimated technology costs with retail cost difference

When we compare the estimated costs of fuel economy technologies (Table 3) to the retail cost difference we find after correcting for the cost of the airbag and all the cosmetic differences, we see that the results are comparable. The mean of the engineering cost estimates for the VX efficiency improvements (Table 3) is \$763, while the cost difference between the 1991 DX and the 1992 VX in Table 4 (based on the "Full Correction" case) is \$726. In view of the rather large range of error to be expected in such a comparison, we can conclude that the engineering costs and our retail cost calculation give roughly the same result, which gives us confidence that our calculations are of the correct approximate magnitude.

V. COST EFFECTIVENESS OF FUEL ECONOMY TECHNOLOGIES*Cost of improving 1991 DX efficiency to 1992 DX and VX levels*

In this calculation, we estimate the cost of improving fuel economy of the 1991 Honda Civic DX to the levels of the 1992 Civic DX and VX. This comparison answers the question "Can a particular vehicle's fuel economy be improved substantially at a cost less than the cost of fuel, while keeping vehicle amenity constant, and not reducing safety?".

Table 4 shows the results of this calculation. The MSRP cost of an airbag (\$800) has been subtracted from the cost of the 1992 Civics, which makes the 13% efficiency improvement for the 1992 DX achievable at negative net cost. Engine torque also increased relative to the 1991 DX in this case. This result implies that Honda improved the fuel economy and power of this vehicle, and reduced its initial cost, all at the same time.

After subtracting the cost of the airbag, the additional incremental cost for the VX is about \$477. The correction for cosmetic differences increases the incremental capital cost of moving from the 1991 DX to the 1992 VX by \$249. This \$726 cost translates to a cost of conserved energy of about \$0.77/conserved gallon, which is about 45% less than the levelized price of gasoline with taxes and 30% less than the price without taxes.

Cost of the consumer's choice: 1992 DX vs. 1992 VX

We also investigate the actual efficiency choice available to consumers on the showroom floor (1992 DX vs. 1992 VX). We show two cases: (1) the "As Available" case, which corrects only for the cost of the hatch cover in the VX, and (2) the "Full correction" case, which uses the cost estimates for all the cosmetic differences from Table 2. Table 4 shows the results of this calculation, which indicates that the cost of conserved energy relative to the 1992 DX (based on MSRP) is comparable to the levelized price of gasoline with taxes and roughly 25% to 30% higher than the levelized price of gasoline without taxes.¹¹

¹¹Different consumer preferences about the worth of various accessories could change this assessment. If the consumer finds body side moulding to be a frill, or is not interested in the rear wiper, this could make the VX more attractive. If the consumer finds the tachometer to be a frill and doesn't care about the sportier look of the alloy wheels, this assessment would make the 1992 DX relatively more attractive.

Table 4: Cost of Conserved Gasoline for 1992 Honda Civic Hatchbacks

				Changes in mpg, fuel use, and capital costs			
	91 DX	92 DX	92 VX	Costs Fully Corrected 91DX to 92DX	Costs Fully Corrected 91DX to 92VX	Costs As Available 92DX to 92VX	Costs Fully Corrected 92DX to 92VX
<i>EPA mpg estimates</i>							
Miles/gallon (city)	31	35	48	13%	55%	37%	37%
Miles/gallon (highway)	35	40	55	14%	57%	38%	38%
Miles/gallon (EPA composite)	32.7	37.1	50.9	13%	56%	37%	37%
Fuel used (gallons/year)	312	275	200	-37	-112	-75	-75
Invoice cost (IC, in 92 \$)	8171	8663	9258	492	1087	595	595
MSRP cost (92 \$)	9563	10140	10840	577	1277	700	700
Invoice cost adjusted for airbag+cosmetic difs (92 \$)	8474	8282	9084	-192	610	727	802
MSRP cost adjusted for airbag+cosmetic difs (92 \$)	9928	9705	10654	-223	726	859	949
Annualized incremental invoice cost (\$/year)	999	976	1071	-23	72	86	94
Annualized incremental MSRP cost (\$/year)	1170	1144	1256	-26	86	101	112
CCE based on invoice cost (92 \$/gallon)				-0.61	0.64	1.15	1.26
CCE based on MSRP cost (92 \$/gallon)				-0.71	0.77	1.36	1.50
<i>Other parameters</i>							
Real discount rate	7%						
Auto lifetime	13.3						
Capital recovery factor	11.8%						
City driving percentage	55%						
Highway driving percentage	45%						
Miles driven/year	10200						
Invoice cost of airbag (1992 \$)	683						
MSRP cost of airbag (1992 \$)	800						
Levelized cost of gasoline w/taxes (92\$/gal)	1.40						
Levelized cost of gasoline w/o taxes (92\$/gal)	1.10						

(1) 1991 DX costs adjusted to 1992\$ assuming 4% inflation.

(2) Source of invoice and MSRP costs: USAA 1991a, 1991b.

(3) Automobile lifetime derived from retirement curve in Davis and Morris (1992).

(4) Composite mpg calculated assuming city and highway percentages are 55% and 45%, respectively (EPCA 1975).

(5) Annual auto mileage from Davis and Morris (1992).

(6) MSRP cost of airbag from Maio 1992. Invoice cost of airbag calculated from MSRP cost using average markup of 17% (from total Civic costs).

(7) Levelized cost of gasoline calculated using a 7% real discount rate and the fuel price forecast contained in U.S. DOE 1992 over the period 1992-2005, based on the method from Kahn 1988. This price includes roughly \$0.30/gallon of state and federal taxes.

(8) Cost of airbag subtracted from 1992 DX and VX models.

(9) Mean cost of hatch cover, body side moulding, adjustable steering column, and rear wiper/washer added to cost of VX in Full Correction case. Mean cost of tachometer and 1/2 of cost of alloy wheels added to cost of 1991 and 1992 DX. Invoice cost for options calculated from MSRP costs in Table 2 using same markup as for airbag (see note 6). In the As Available case, only the cost of the hatch cover is added to the VX, because that is the only option that can actually be purchased by a new car buyer.

Sensitivity of results to discount rate

Table 5 summarizes the effect of using 3% real and 10% real discount rates on the cost to society of employing the technologies in the 1992 VX relative to the 1991 DX. This range corresponds to that typically used in cost-benefit analyses. As expected, the cost of conserved energy goes down in the 3% case and up in the 10% case relative to the case using the 7% real discount rate. Note also that the levelized gasoline price also changes (the levelization procedure is a type of present-valued average, which depends on the discount rate). The CCE never exceeds the levelized price (with or without taxes), which indicates that our finding of cost-effectiveness for the VX compared to the 1991 DX is robust with respect to assumed discount rates.

In assessing the consumer choice between the 1992 DX and the 1992 VX, we find that the 10% real discount rate pushes the CCE over the levelized fuel price with taxes by roughly 20-30%. The 3% real case produces a CCE that is roughly 10-20% lower than the levelized fuel price with taxes. The CCE is from 15% to 70% higher than the fuel price without taxes in the 3% real and 10% real cases, respectively.

Limitations of cost effectiveness calculations

These calculations were done without explicit accounting for external societal costs. External costs include all costs to society that are not included in the market price of gasoline, such as increased health costs, damage costs to agriculture, and damage costs to physical structures due to air pollution from automobiles; increased national security costs from imported oil; and increased environmental damage from acid rain, carbon dioxide emissions, and other pollutants. In practice, exact numerical values for these externalities are difficult to calculate.¹² Many authors have attempted to assess these costs in monetary terms, and in general, they find that such costs are probably substantial (Bohi 1982, Broadman 1986, Cannon 1990, DeLuchi 1987, Hall 1991). We do not estimate these costs here, but simply note that accounting for them would improve the relative cost effectiveness of efficiency improvements compared to the consumption of gasoline alone.

VI. POLICY IMPLICATIONS*Implications for society*

We have shown that improving the fuel economy of a particular vehicle (the 1991 Civic DX) was not only possible, it was cost effective from society's perspective. The efficiency improvements in the 1992 Civic VX were achieved at a cost of conserved energy that is about 45% less than the levelized cost of gasoline with taxes, and 30% less than the levelized cost of gasoline without taxes (relative to the 1991 DX). This empirical evidence indicates that for small cars similar to the Civic, improvements in fuel economy can be achieved at attractive costs.

Implications for consumers

The 1992 Civic DX and VX deliver comparable performance, but the VX delivers higher fuel economy at a cost of conserved energy that is comparable to the avoided cost of fuel. A consumer deciding between the vehicles will have little, if any, direct economic

¹²See Koomey (1990) for a discussion of the pitfalls of estimating monetary values for externalities.

Table 5: Sensitivity of Cost of Conserved Energy to Choice of Real Discount Rate

	<i>Real discount rate</i>	<i>Levelized gasoline price 1992\$/gal</i>	<i>Fully Corrected CCE 1992 \$/gallon 91 DX vs 92 VX</i>	<i>As Available CCE 1992 \$/gallon 92 DX vs 92 VX</i>	<i>Fully Corrected CCE 1992 \$/gallon 92 DX vs 92 VX</i>
CCE based on invoice cost (1992 \$/gallon)	3%	1.411	0.55	0.98	1.08
CCE based on MSRP cost (1992 \$/gallon)	3%		0.65	1.16	1.28
CCE based on invoice cost (1992 \$/gallon)	7%	1.404	0.64	1.15	1.26
CCE based on MSRP cost (1992 \$/gallon)	7%		0.77	1.36	1.50
CCE based on invoice cost (1992 \$/gallon)	10%	1.398	0.80	1.43	1.57
CCE based on MSRP cost (1992 \$/gallon)	10%		0.95	1.69	1.86

(1) Assumptions for auto lifetime, mileage travelled, and other parameters are the same as in Table 4.

(2) Levelized cost of gasoline calculated using appropriate real discount rates and the fuel price forecast contained in U.S. DOE 1992 over the period 1992-2005, based on the method from Kahn 1988.

incentive to choose the VX, even though society as a whole will avoid external costs if she chooses the more efficient vehicle.

According to estimates from Honda Corporation, less than one percent of new car sales this year are represented by the VX (Leestma, 1992). In part, this result might be explained by the fact that the Civic VX employs new technologies that consumers are unfamiliar with and durability is unproved. Another explanation by way of anecdotal evidence may regard the behavior of car dealers on the showroom floor. The dealer may target those consumers willing to pay \$700 more to buy the VX rather than the DX, and suggest they purchase the Civic Si which at \$1,300 more than the VX offers power options and a significant fuel economy penalty. Because dealers make a large profit on options they add, identifying consumers that are willing to pay more can mean greater profits.

Externalities and policy intervention

If one believes that externalities are an issue, then there is a rationale for government intervention (based on classical microeconomic analysis of market failure). Economists have debated for years over which policy mechanism is the most efficient way to correct for externalities, with most economists arguing that a gasoline tax is the preferred policy (Griffin and Steele 1986). Another mechanism that has been proposed is the "feebate", which puts fees on inefficient cars, gives rebates to efficient cars, and uses the fees to pay for the rebates (Koomney and Rosenfeld 1990, Griffin and Steele 1986).

Gas taxes affect both the efficiency of vehicles chosen by consumers, and the usage of those vehicles. Feebates only affect their efficiency. However, gas taxes are more politically difficult to adopt, at least in the United States. We briefly discuss these two policy options here.

Gas taxes: Gas taxes in the range of \$1 to \$4 per gallon are common in Europe and Japan. These taxes in part reflect the preference of these countries to reduce dependence on imported petroleum, in part reflect an assessment of other external costs associated with motor gasoline consumption, and in part reflect a desire to raise revenue. Taxes internalizing external costs that are only a fraction the size of the European taxes (say \$0.25/gallon) would tip the balance of cost effectiveness (from the consumer's perspective) in favor of the VX relative to the 1992 DX.

Feebates: We examine the financial impact of two currently proposed feebate strategies on the consumer's choice between the 1992 DX and VX:

- (1) The California legislature is considering a feebate program called "DRIVE+", which would offer a rebate based on vehicle carbon dioxide emissions (a measure of fuel efficiency) on the order of \$0.20 per gallon of gasoline or \$21 per metric tonne of carbon dioxide.¹³ If adopted, consumers buying new Civics could be

¹³ DRIVE+, as currently conceived, would also offer feebates on vehicle emissions of air pollutants. A fee or rebate depending of the car's emissions rating ("low-emission vehicle", "ultra-low-emission vehicle, etc.) in accordance with 1994 emission specifications would be added to the carbon dioxide feebate detailed above to arrive at the financial incentive or disincentive offered to the consumer. Senator Gary Hart (D-Santa Barbara) is the sponsor of this feebate legislation—SB 431.

eligible for rebates. The Civic VX would have a \$160 greater rebate than the DX due to its higher fuel efficiency rating.¹⁴

(2) The State of Maryland recently enacted¹⁵ feebate legislation that would adjust the vehicle titling tax based on a vehicle's fuel economy (other states are interested in adopting similar legislation). Under this feebate program, those purchasing a new Civic VX would be eligible for an \$800 rebate while a DX buyer would only receive a \$200 rebate.¹⁶ It is important to note that this \$600 difference in rebates is roughly two thirds of the difference in the first costs between these models.

Either gas taxes or feebates may persuade consumers (and therefore manufacturers) to choose (and produce) more efficient vehicles such as the Civic VX. Choices caused by such policy intervention will result in benefits to both the consumer and to society.

VII. CONCLUSIONS

Honda has demonstrated that modest efficiency improvements (13%) can be achieved at negative net cost in their 1992 Civics. Efficiency improvements of 56% can be achieved at a cost of conserved energy that is 45% less than the cost of the saved gasoline with taxes, and 30% less than the cost of the saved gasoline without taxes. All of the fuel efficiency improvements in the 1992 VX involve technologies that do not change safety or vehicle amenity. These results suggest that the difficulty and cost of improving fuel economy in new compact and subcompact automobiles may be lower than has been suggested by U.S. automakers.

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¹⁴ We only considered the CO₂ feebate in this calculation because the emission feebate component depends on the model's emission status starting in 1994 which has not yet been determined.

¹⁵ The State of Maryland's fuel efficiency feebate policy was passed by the legislature and signed into law by the governor in 1992. However, the federal government is currently challenging the state law based on preemption language in the federal fuel economy statute. Maryland's Attorney General maintains that the state has the right to enact the law. Further action is expected to break this deadlock in 1993.

¹⁶ Note that even though the Civic's feebates are computed at \$800 and \$200, the Maryland's program limits feebates to be capped at one percent of the new car sales price (\$100 for the DX and \$110 for the VX). However, other states are considering feebate legislation that calculates feebates based on fuel efficiency levels without limitation.

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APPENDIX A: MORE DETAIL ON FUEL ECONOMY TECHNOLOGIES

This section describes in detail each of the fuel economy technologies used in the Civic VX.

VTEC-E Engine

The Honda Variable Valve Timing and Lift Electronically Controlled (VTEC-E) engine is a 4-valve per cylinder, variable valve engine optimized for fuel economy. It is a completely different engine than that found in the 1991 and 1992 Civic DX hatchbacks. The VTEC-E engine has variable valve timing and uses lean burn technology. Additional modifications to reduce engine friction contribute further to the improved fuel economy of the VTEC-E engine.

Variable valve timing: Conventional engines use fixed valve timing and lift (height of intake valve) at all engine speeds. At light loads when lower power is required, fixed valve timing results in pumping losses, or efficiency losses due to the use of energy to pump air and fuel into the cylinder and push out the products of combustion. Pumping losses occur because, in order to reduce power, air and fuel input must be decreased using a throttle that produces a pressure differential between intake and exhaust valves on the engine cylinder, resulting in a loss of efficiency. Thus, closing the intake valve at light loads would reduce the pressure differential and decrease pumping losses. This is the principle on which variable valve timing operates. In the VTEC-E engine, the valve cycles are electronically controlled to promote more complete combustion at lower engine speeds, thus reducing fuel requirements. At low rpm, one of the two intake valves in each cylinder of the VTEC-E engine is nearly closed. This creates a swirling motion in the combustion chamber. The mixing and turbulence caused by this motion, combined with central placement of the spark plug, shorten combustion time and assure more complete combustion. Combustion time is also lessened by reducing the surface to volume ratio of the combustion chamber. The use of variable valve timing also enhances low speed torque. At higher rpm, when more power output is required, both intake valves are activated simultaneously with full lift to provide power comparable to engines without variable valve timing (Honda Motor Co. 1991). Honda estimates that this feature produces a 2.5% increase in fuel economy (Harrington 1992).

Lean burn technology: A lean burn engine is operated with air in excess of that required for complete combustion (a high air/fuel ratio). Fuel economy increases with the addition of excess air to the combustion chamber, as more air results in more complete combustion of fuel, improves the efficiency of converting fuel energy into usable work (thermodynamic efficiency), and decreases pumping losses. The use of variable valve timing and electronic control enabled Honda to incorporate lean burn technology in the 1992 Civic VX. At low engine speeds, the VTEC-E engine can operate at air/fuel ratios as high as 25:1, compared to the stoichiometric ratio of 14.7:1 at which there is just enough air to theoretically achieve complete combustion. At low rpm, the swirl motion, discussed above, creates turbulence and results in the formation of a rich mixture (lower air/fuel ratio) to be maintained in a vortex near the spark plug, while the total air/fuel ratio in the combustion chamber remains lean. At higher speeds, the ratio decreases to approximately stoichiometric via electronic control. This return to stoichiometric conditions at high rpm resolves a problem common to lean burn systems where wide open throttle power decreases because less fuel is burned. Another problem associated with lean burn is an increase in nitrogen oxide (NO_x) emissions. In order to meet more stringent NO_x emission standards in California, Honda modified the VX to use exhaust gas recirculation (EGR) instead of excess air to dilute a stoichiometric air/fuel ratio. Using EGR, exhaust gases are

recirculated into the combustion chamber to reduce NO_x emissions by lowering combustion temperature. EGR also improves fuel economy by using energy from the waste stream. However, lean burn is more efficient than EGR. The lean burn characteristic of the VTEC engine has been estimated to account for a five to ten percent improvement in fuel economy over the 1992 DX (Harrington 1992). Although the lean burn technology is used successfully in the Civic VX, it had been largely dismissed by researchers as "speculative" prior to the release of the Civic VX and was not considered viable in larger cars due to uncertainty about the performance of nitrogen oxide catalyst technology in such applications (OTA 1991).

Reduced engine friction: Useful energy is lost due to friction between engine components including pistons and rings, valve train, and crankshaft. Engine friction has been reduced in the VTEC-E engine by the use of coated pistons and special low-friction piston rings. Honda estimates that reduced engine friction in the VX contributes to a 1.5% fuel economy improvement (Harrington 1992).

Roller cam followers: Intake and exhaust valves are operated by a camshaft in contact with a cam follower. The VTEC-E engine uses roller cam followers that reduce valve train friction by replacing the sliding contact between the roller cam and camshaft with a rolling contact. According to Honda, they increase fuel economy by approximately one percent in the VX (Harrington 1992).

Changes in axle or drive ratio

This is defined as the ratio of revolutions of the drive shaft, or transaxle, to the revolutions of the wheels. Generally, a low ratio means less engine wear and better fuel economy than a higher ratio. However, a lower ratio will also result in slower acceleration and decreased performance. The VTEC-E engine's variable valve timing enhances low-speed torque, meaning that torque is higher at lower rpm than in the standard Civic engine. This advantage allows a reduction in drive ratio without compromising performance (Honda Motor Co. 1991). The drive ratio of the VX is 16% lower than that of the 1991 DX and 20% lower than that of the 1992 DX. In general, a 10% decrease in the axle ratio can improve fuel economy by 4% (Gillis 1991).

Changes in gear ratio

Automotive transmissions vary the ratio of engine speed to vehicle speed, allowing the engine to operate in the optimal speed range and the automobile to operate over a wider range of speeds. The wider, or taller, the ratio range of the gears in the transmission, the more the engine can operate over a wide range of speeds and loads without sacrificing performance. The VX operates at wider gear ratios than the 1991 and 1992 DX. The combination of axle and gear ratio changes accounts for a 21% improvement in fuel economy (Harrington 1992).

Multi-point fuel injection

Fuel injection systems provide more control over addition of fuel and more complete fuel atomization than carburetors. Such systems result in improved fuel economy, lower emissions, and increased power. The 1991 Civic DX is equipped with a dual-point fuel injection system using two injectors to inject fuel at essentially the same place as from a carburetor. This system has been replaced by multi-point fuel injection in the 1992 Civics. One injector is used for each cylinder (four cylinders in the case of the Civic hatchbacks) and fuel is injected upstream of the intake valves. Multipoint fuel

injection allows control of the air/fuel ratio at each cylinder and results in improvements in power, fuel economy, and emissions. It is estimated to provide a 1.5% improvement in fuel economy over dual-point fuel injection (Harrington 1992).

Weight reduction

Lighter vehicles require less energy to overcome inertial forces. The 1992 Civic VX is about 84 pounds (4%) lighter than the 1992 DX and 64 pounds (3%) lighter than the 1991 DX due to the use of lightweight alloy wheels, a lighter engine block, and other minor modifications (Honda Motor Co. 1991). This weight reduction results in a 2.5% increase in fuel economy relative to the 1991 DX (Harrington 1992).

Aerodynamic improvements

Aerodynamic drag is due to the resistance of air to the movement of the vehicle. The aerodynamic characteristic of a vehicle is generally expressed as the coefficient of drag, or C_D . The lower the C_D , the less energy is required to overcome air resistance. The C_D of the 1992 DX is 0.32, compared with 0.33 for the 1991 DX, while the VX has a drag coefficient of 0.31. This reduction in drag coefficient is estimated to produce a 1.5% increase in fuel economy for the VX relative to the 1991 DX (Harrington 1992).

Low rolling resistance tires

Rolling resistance results from heat generated and lost by tires as they flex. The 1992 VX is equipped with tires that have a reduced surface area in contact with the road and increased stiffness, thus decreasing rolling resistance. Low rolling resistance tires improve fuel economy by an estimated 1% (Harrington 1992).

Reduced idle speed

An engine that idles at higher than average revolutions per minute (rpm) will generally consume more fuel than one that idles at lower rpm. Honda has reduced idle fuel consumption by decreasing the speed at which the VTEC-E engine idles, thus improving fuel economy by 3% (Harrington 1992).

Shift indicator light

Honda estimates that the shift indicator light, which alerts the driver to shift gears at the most efficient shift point, will result in a 5% fuel economy improvement. The 49 state Civic VX is equipped with a shift indicator light, while the California VX is not (Harrington 1992).

file CAFE

Environmental Team
Alden Mayer
Draft #1
Time:

Rhetoric:

Bush: ...40 mile per gallon would break the auto industry and put them out of work--- fuel efficiency standards at 40 to 45 mpg will throw them out of work...and then try to appeal to spotted owl crowd--- it just won't work playing to one side of issue one day and the other side another.

Perot: your going to hear a giant sucking job outside...it will create global jobs. while we

Response: The study relied on by the President and Vice President Quayle was done by the Motor Vehicle Manufacturers' Association. It predicted job losses of 150,000 to 300,000 if the CAFE standard were to be increased to 40 miles per gallon. The study makes a totally unrealistic assumption that all plants now producing cars getting less than 40 mpg would have to shut down -- in other words, no technological improvement is possible in the auto industry over the next 10 to 15 years.

This is reminiscent of the industry's claims back in 1974, when Congress was considering the original CAFE law increasing fuel economy to 27.5 mpg. In testimony before the Senate Commerce Committee, a Ford Motor Company official stated that such a standard would "require a Ford product line consisting of either all sub-Pinto size vehicles or some mix of vehicles ranging from a sub-sub-compact to perhaps a Maverick." Of course, when Congress mandated the 27.5 mpg standard despite the Detroit scare tactics, the industry achieved the standard through use of new technologies and materials -- we're not all driving Pintos today. And in a 1985 letter to the Secretary of Transportation, Chrysler's Chairman Lee Iacocca noted that "General Motors has also conceded that its earlier predictions of massive job loss if the current CAFE standard is retained is unfounded."

A recent study by the American Council for an Energy-Efficient Economy found that far from costing jobs, a 40 mpg standard would create 72,000 net new jobs in the American economy by 2000, and 244,000 net new jobs by 2010. The study found that consumers would save twice as much in reduced fuel consumption than the cost of the new fuel-conserving technologies needed to meet the 40 mpg standard.

Our trade competitors recognize that efficiency and economic strength go hand-in-hand. In an April 8, 1991 cover story in Business Week, Honda's President, Nobuhiko Kawamoto states that his company is making meeting environmental goals a top priority. "If a maker doesn't build more efficient cars," Kawamoto said, "it can't survive." The same article noted that "in Germany, a draft government regulation calls for a 60% mileage increase, to 47 mpg by 2005." In stark contrast to Detroit's view that improved fuel efficiency is a burden, the Germans and Japanese look at it as an opportunity for technical innovation, increased market share, employment and profits in the decades ahead.

file CAFE

Environmental Team

Draft #1

Time: 7:30p

Meyer/Lieberman

More on Fuel Efficiency Standards

CAFE: Using current technology, no change in size or performance, domestic fleet could be at 38.5 mpg by 2000. Achievement of these levels would be cost effective. Expected rise in gasoline prices should result in fuel economy of 42 mpg by 2010, an increase of 2.7% per year, even without increased fuel economy standards. Source: Oak Ridge national Laboratory (operated for DOE) ("Energy Efficiency: How Far can We Go?", January 1990)

The Center for Auto Safety has calculated that by "relaxing CAFE standards to 26.0 MPG for 1986-88, DOT allowed GM and Ford to export production of over 500,000 small cars annually at a loss of 175,000 jobs in the U.S."

* What Bush did for Detroit - Tokyo.

BACKGROUND BRIEF ON CAFE STANDARDS

Introduction

In the aftermath of the Arab oil embargo, Congress created the corporate average fuel economy (CAFE) standards, which requires the makers of light-duty vehicles (cars and light trucks) to meet average fuel economy standards for the new car fleet. The standard was set at 18 miles per gallon (mpg) in 1978 and gradually grew to 27.5 mpg in 1985 for automobiles, and DOT set the standards for light trucks around 20 mpg since 1983.

The average fuel economy of new cars rose from 16 mpg in 1975, peaked at 28.8 in 1988, and stood at 28.1 mpg in 1990. While high gasoline prices contributed to the mileage increase during the late 1970s and early 1980s, the CAFE standards now govern the fuel economy of new cars since real gas prices have fallen below the 1973 level.

Issues

CAFE standards raise a host of issues -- impact on U.S. automobile industry competitiveness, market interactions that contribute or compromise CAFE impact on oil demand, consumer acceptance, automobile safety, and the role of government in product regulation.

History

Many observers believe that CAFE standards helped the U.S. automobile industry compete during the late 1970s, helped reduced oil demand during the 1980s, and continue to stimulate efficiency R&D in the automobile industry. The reduction in U.S. transportation oil demand generally helped break OPEC price discipline and reduced gasoline prices (which, in turn, makes CAFE more difficult to meet and increases vehicle miles traveled).

Because so many forces acted on the automobile market during the 1970s and 1980s, it is impossible to delineate all causes and effects. New emission controls, safety standards, shifts in consumer tastes, etc. caused significant disruption in the U.S. automobile industry. Much of the dislocation was caused by inflated production costs and poor product quality that made the formerly secure oligopoly vulnerable to fierce foreign competition, especially as the dollar appreciated massively during the early 1980s. Moreover, since imported cars tended to be very fuel efficient, the CAFE standards have been implicated in the general decline of U.S. auto industry. The relatively lenient standard on light trucks has encouraged a shift toward small pickup trucks used primarily as personal transport. Finally, the implementation of CAFE standards probably caused a lot of "gaming" by industry over which cars are labeled foreign or domestic production.

Safety

The safety issue is extremely complex and controversial. Overall highway death rates have steadily declined during a period of explosive growth in vehicle miles travelled. This is a result of 55 mph speed limit, federal safety standards, increased drunk driving enforcement, raising legal drinking ages, better highway technology, increased seat belt usage, air bags and anti-lock brakes, maturing of the population, and other factors. Whether or not downsizing was a significant offsetting factor is impossible to determine. What is undeniable, however, is that cars today are more fuel efficient, more responsive, far less polluting, and safer than their ancestors of twenty years ago. Even free-market critics of auto safety regulation concede that safety regulation has been a cost-effective success. The emergence of consumer demand for expensive safety features such as air bags and anti-lock brakes will continue to reduce traffic fatalities. The main safety issue is, therefore, the extent to which increased CAFE will lead to manufacturers reducing weight and size, compared with the effect of improved safety features.

Baseline: What the Future holds

The baseline fleet fuel efficiency (what would occur under market forces) is a matter of significant debate, with implications both for the cost and effectiveness of increasing CAFE standards.

	<u>1990</u>	<u>2000</u>	<u>2010</u>
CAFE Binding	28.1	27.5	27.5
NES Baseline	28.1	33.1	37.1
EIA (AEO-92)	28.1	31.8	36.7

Obviously, the cost and impact of CAFE standards depends heavily on the baseline. If, for example, CAFE standards are set at 32 mpg in 2000 and 37 in 2010, then they would not have any impact if the Administration forecasts hold up. Nor would they entail significant costs or disruption in the automobile market. Optimistic forecasts tend to underestimate future oil imports, and minimize the oil demand impact of CAFE standards set higher than the forecasted levels.

The most realistic baseline might be no progress on fuel efficiency at all. Nothing in the current market indicates optimism regarding fuel economy without an increase in CAFE standards. If CAFE is binding (it determines fuel economy rather than pure market choice) then we are in deep trouble with oil imports. It will not matter what domestic oil supply initiatives can achieve -- we will import more oil in the future under any realistic scenario.

Recent CAFE Analyses

Because of the Gulf war and the National Energy Strategy debate, automobile fuel economy has been studied intensively for the past two years. The main problem with economic analysis and forecasting is the need to "freeze" certain attributes in order to examine potential changes in other parameters. This can bias the results either way compared to market reactions: better technologies and changes in buying patterns could increase mileage beyond what these analyses support, but higher costs for fuel efficiency features could hamper the market prospects of the more efficient models.

OTA

The Congressional Office of Technology Assessment (OTA) has conducted several studies of fuel economy. In Congressional testimony, OTA has indicated that fuel economy in the range of 35-38 mpg for the late 1990s or 2000 are technically feasible and could be obtained with little change in vehicle performance or size. Higher overall fuel economy levels are possible if size and performance changes can be made.

NAS

The much-touted National Academy of Sciences report on CAFE released in the spring of 1992 took a narrow view of the technological options and reported that a CAFE of 34 mpg would be reasonable by 2001 and 37 mpg was feasible by 2006. This analysis is probably conservative, because it relied on model leadtimes of 8 years compared to emerging best practice of 5-6 years leadtime, considered only technologies that have been commercialized in at least one existing vehicle, and it maintained constant size and performance assumptions (although it allowed for some reduction in weight through material substitution.)

EPA

The Environmental Protection Agency publishes an annual "Trends Report" on fuel economy, which contains a stylized analysis of potential fuel economy under the assumption that all vehicles could meet the "Best in Class" mileage. Because the model classes are broad, and the analysis does not factor in important product attributes steady in broad categories. (e.g. automatic transmission, air conditioning, size...) the analysis is only suggestive. Nevertheless, the last EPA Trends report showed that the 1990 CAFE could have reached 34.4 mpg under the "best in class" assumptions. With a weight reduction of 12% but no changes in size mix, EPA showed that a 45% gain in current CAFE was possible with a fleet that included "Thunderbirds, Buick station wagons, and Rolls Royces, with weights in the two-to-three ton range." This report has been challenged and apparently stifled by the Department of Transportation.

Consensus

Modest fuel economy increases are technically feasible without significant shifts in fleet size and with favorable economics. If enacted quickly, CAFE of 33 - 35 mpg by the year 2000 poses minimal risks to industry. At this point, 40 mpg by 2000 (e.g. Bryan Bill) is ambitious, but 40 by 2005 or so would not be difficult. If the Administration forecasts are believed, this would only accelerate predicted improvements by a few years. If their baseline is wrong -- and fuel economy will not improve over then next decade -- then tightened CAFE will be necessary to limit oil imports.

President's Policy

Increases in the corporate average fleet economy (CAFE) standards was not part of the President's National Energy Strategy (NES) unveiled in February 1991. This is surprising, since the NES was designed primarily with the view of limiting oil imports in the wake of Desert Storm.

Aside from the rosy scenario about market-driven mileage increases, the NES relies on the following initiatives:

- An alternative fuel program building on the Clean Air Act. Enhanced biofuels R&D coupled with mandatory fleet requirements and "dual-use" CAFE credits is intended to stimulate alternative fuel markets. However, many believe that methanol imports would dominate the market, which is neither domestic nor renewable.
- Auto efficiency R&D, including fuel cell and battery research. This R&D is focussed on the long run (post 2010) and the technology advance and market penetration estimates are purely speculative.
- Supply initiatives -- ANWR exploration, review of outer continental shelf (OCS) moratoria, tax incentives for oil and gas exploration and extraction. ANWR is dead for now, OCS is very controversial, and tax incentives mean that taxpayers will end up subsidizing domestic oil.

Even if all NES supply provisions passed, the R&D contributed to market penetration of efficient vehicles, etc., oil imports could still grow if CAFE does not increase through the market (NES baseline) or through tighter standards. Thus, the NES cannot be viewed as serious policy to reduce oil imports. Nor can it be viewed as serious policy to limit CO₂ emissions or other pollutants from automobiles. It is a policy designed around supply enhancement, optimism regarding market forces, hopes pinned on R&D, and an alternative fuel policy that is not

entirely clear in its implications. In other words, without CAFE and under realistic assumptions about the future, the Administration's energy policy does not fundamentally address the problem of foreign oil dependence.

Alternative Policies

Economists are unanimous in the conviction that higher gasoline prices are the best policy for increasing fuel economy. This would not only stimulate fuel efficiency in new car purchases but would provide incentives to drive less. However, increased gasoline taxes are very unpopular. Moreover, in order to affect new car purchase decisions, they will have to be very high. It is worth noting that the automobile industry supports higher fuel taxes over raising CAFE standards because it would provide them with an incentive that works with the market, not a dictate that pulls against it.

If we are serious about fuel economy and oil imports, we either hike gasoline taxes by substantial amounts or else we only have CAFE. Other policy tools have longer lead times and are also expensive -- such as alternative fuels or expanded mass transit.

Despite the hand-wringing by auto companies and economists, there is strong public sentiment for increasing CAFE. A recent American Automobile Association poll found that 84% of the public favored increasing CAFE to 40 mpg by 2001. However, the public may perceive CAFE rather narrowly as imposing costs on industry rather than consumers.

Senator Gore's Record

Senator Gore sponsored S.201 (January 25, 1989, 101st Congress) which called for a 20% increase in CAFE by 1993, 45% increase by 1997, and 65% increase by 2000. This would push the CAFE standard above 45 mpg by 2000.

Senator Gore co-sponsored the Bryan Bills (S. 1224 - 101st Congress, S. 279 - 102nd Congress), which would raise CAFE to 34 MPG by 1996 and 40 MPG by 2001.

In Earth in the Balance, Senator Gore wrote:

Though it is technically possible to build high-mileage cars and trucks, we are told that mandating a more rapid transition to more efficient vehicles will cause an unacceptable disruption in the current structure of the automobile industry. Industry officials contend that it is unfair to single out their industry while ignoring others that also contribute to the problem; I agree, but their point only illustrates further the need for a truly global, comprehensive, and strategic approach to the energy problem. I support

new laws to mandate improvements in automobile fleet mileage, but much more is needed. Within the context of the SEI, it ought to be possible to establish a coordinated global program to accomplish the strategic goal of completely eliminating the internal combustion engine over, say, a twenty-five year period. [p. 325-326]

The government must establish higher mileage requirements for all cars and trucks sold in the United States. Although the carbon taxes and corresponding subsidies of the Environmental Security Trust Fund will be far more effective in accelerating the transition to more efficient vehicles, mandated improvements in the average fuel economy can be an important supplementary measure. With two of the largest automobile manufacturing plants in the world located in my own state, I have faced an awkward political problem in supporting tougher mileage requirements, and I do recognize some of the very real practical difficulties with the proposed legislation. Nevertheless, the amount of CO₂ emissions in the United States is so great that I think that even imperfect measures to force remedial action are better than none at all. [p. 350]

Positions on CAFE

The earlier support for 45 mpg by 2000 is not tenable without severe dislocation in the U.S. auto manufacturing market. This is due to the passage of time and the recognition that the market is heading in the other direction. More recent support for 40 mpg (Bryan bill) may be popular with environmentalists and the consuming public.

I would craft the position in the following manner:

- Indicate strong support for aggressive CAFE increases, subject to technical analysis.
- Precise numbers are not needed -- but point out that the Administration intransigence on the issue has closed out an important window of opportunity to address the issue now. Also, they are oblivious to the fact that fuel economy is unlikely to improve under current market conditions. This may demand a strong response given the environmental threat and our growing dependence on foreign oil. Americans died for access to oil, when instead we could have been investing in fuel economy to avoid the middle east conflict.
- Would continue the thrust of the recent highway bill to use government revenues to enhance public transportation opportunities. Some Administration positions are worth examining -- like a bounty for scrapping the oldest, least safe, most polluting, gas guzzling cars. But the funds have to come from somewhere..perhaps an energy or carbon dioxide tax.
- George Bush can lead militarily, but shies away from domestic solutions that could decrease our dependence on foreign oil. Energy issues have not disappeared -- they have simply taken on new forms. For the Bush Administration not to support increasing automobile fuel economy is another tragedy waiting to happen.
- Concern for the U.S. automobile industry must be addressed in trade and macroeconomic policy. CAFE standards will challenge industry -- but that can be turned to competitive advantage. Export markets will expand in the 1990s and beyond, and U.S. automobiles improved by CAFE standards could win in international competition. The Japanese sure think that fuel economy will gain market share in the global economy.
- Environmental problems demand visionary thinking. We spend billions improving our sophisticated military capabilities -- and it has paid off. Similar investments in commercial technologies will help us compete and protect the environment.

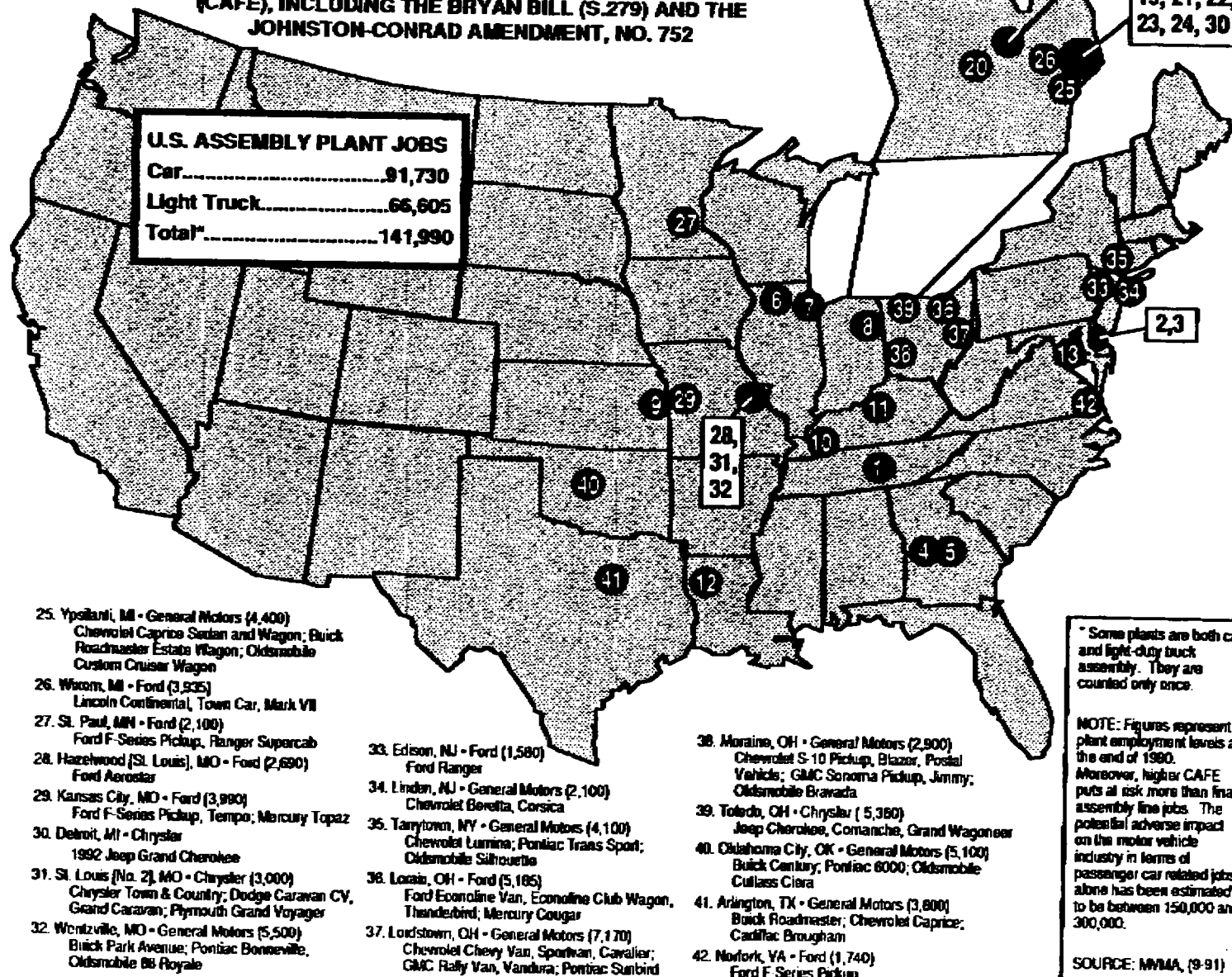
Model Year 1991 Car And Light Truck Assembly Plants

City, State • Company (Number of Employees)
Models Produced

1. Spring Hill, TN • General Motors (4,500)
Saturn
2. Newark, DE • Chrysler (3,500)
Chrysler LeBaron; Dodge Spirit;
Plymouth Acclaim
3. Wilmington, DE • General Motors (3,520)
Chevrolet Corsica, Beretta
4. Atlanta, GA • Ford (2,785)
Ford Taurus; Mercury Sable
5. Doraville, GA • General Motors (2,500)
Oldsmobile Cutlass Supreme
6. Belvidere, IL • Chrysler (3,700)
Chrysler New Yorker Sedan, New Yorker
Landau, Imperial, Fifth Avenue; Dodge
Dynasty
7. Chicago, IL • Ford (2,810)
Ford Taurus; Mercury Sable
8. Fort Wayne, IN • General Motors (2,700)
Chevrolet C/K Pickup; GMC C/K Sierra
Pickup
9. Kansas City, KS • General Motors (2,200)
Pontiac Grand Prix
10. Bowling Green, KY • General Motors (1,120)
Chevrolet Corvette
11. Louisville, KY • Ford (3,825)
Ford Ranger, Explorer, Mazda Navajo
12. Shreveport, LA • General Motors (2,400)
Chevrolet S-10 Pickup, S-10 Blazer;
GMC Sonoma Pickup, S-15 Jimmy
13. Baltimore, MD • General Motors (3,500)
Chevrolet Astro; GMC Safari
14. Dearborn, MI • Ford (2,390)
Ford Mustang
15. Detroit, MI • General Motors (400)
Commercial Chassis; Recreational Chassis;
Specialty Vehicle Chassis
16. Detroit Hamtramck, MI • General Motors (3,505)
Buick Riviera; Oldsmobile Toronado;
Cadillac Eldorado, Seville, Allante
17. Flint, MI • General Motors (4,000)
Chevrolet Blazer, Suburban; GMC
Jimmy, Suburban
18. Flint, MI • General Motors (5,000)
Buick LeSabre; Oldsmobile 88 Royale
19. Lake Orion, MI • General Motors (5,800)
Cadillac DeVille; Oldsmobile 88 Regency
20. Lansing, MI • General Motors (7,420)
Buick Skylark; Oldsmobile Cutlass Calais;
Pontiac Grand Am
21. Pontiac [East], MI • General Motors (3,000)
Chevrolet C/K Pickup; GMC Sierra C/K Pickup
22. Pontiac [West], MI • General Motors (2,100)
Chevrolet S-10 Pickup, S-10 Blazer;
GMC Sonoma Pickup, S-15 Jimmy
23. Warren, MI • Chrysler (3,000)
Dodge Full size and Mid-size Pickup
24. Wayne, MI • Ford (1,865)
Ford F-Series Pickup, Bronco

JBS AT RISK

**DOMESTIC CAR AND LIGHT TRUCK ASSEMBLY PLANTS ENDANGERED
BY PROPOSALS TO SHARPLY RAISE FUEL ECONOMY STANDARDS
(CAFE), INCLUDING THE BRYAN BILL (S.279) AND THE
JOHNSTON-CONRAD AMENDMENT, NO. 752**



CAFE MYTHS & FACTS

EMPLOYMENT IMPACT

MYTH

Large increases in Corporate Average Fuel Economy (CAFE) standards for cars and light trucks would not affect employment in the motor vehicle and related industries.

FACT

Large CAFE increases would force automakers to downsize vehicles and scale back or eliminate production of selected models of full- and mid-size cars, vans, sport utility vehicles and pick-up trucks. As a result, the model mix of vehicles available to consumers would shift radically. In 1990, small cars constituted 29 percent of the new car fleet, mid-size cars made up 52 percent and large cars 19 percent. If proposed CAFE standards requiring a 40 percent improvement by 2001 were enacted into law, known technologies would provide only a minor share of that required increase. The market shift required would be radical because it is estimated that the small car share of the new car fleet would have to triple to 82 percent, the mid-size segment would have to be trimmed to 13 percent and larger models would be limited to only 5 percent of the new car fleet. Market shifts of such magnitudes will have a substantial adverse employment impact for the following reasons:

- Restricted availability of domestically produced family-size cars and light trucks will cause many consumers to keep their older, less fuel-efficient cars longer, resulting in lost sales. Such sales declines cause shutdowns at assembly and supplier plants, the closing of car and light truck dealerships and employee layoffs throughout the entire industry.
- Limitations on the production of larger cars, light trucks, and vans would result in elimination of jobs — and even plant closings — at many of the facilities that now produce those vehicles. Assembly plants currently producing family- and mid-size cars, light trucks and vans — threatened by unreasonable increases in CAFE — have a combined labor force of 142,000 employees in 18 states. In addition, countless jobs would also be at risk at numerous supplier firms dependent on those assembly plants for business. The jobs displaced by CAFE would not be offset by increased production of small cars because overall sales would be lower and smaller/lighter cars require less labor to build than larger models.
- U.S. jobs are concentrated in the production of domestic manufacturer-produced family-size cars and trucks, while foreign firms have dominant positions in the small car and truck segments. Dramatic shifts in the mix of cars would hit domestic full-line manufacturers particularly hard. Many of their most competitive products are mid- and full-size cars and trucks, which have fuel economy ratings that fall significantly below standards included in congressional proposals.

THE POINT

One in every seven jobs in the United States is tied to the motor vehicle industry or related industries. Efforts to conserve fuel must be balanced against their impact on American workers. Proposed increases in CAFE will result in thousands of layoffs, leading to further declines in the U.S. tax base and increased demand for unemployment benefits.

MYTH

Proposed increases in Corporate Average Fuel Economy (CAFE) standards will not affect the choice of cars and light trucks available to consumers.

FACT

To meet today's CAFE standards, manufacturers are already using those technologies capable of achieving the greatest gains in fuel economy. Unrealistic CAFE increases that have been proposed would force automakers to scale back production or eliminate selected models of full- and mid-size cars, vans, sport utility vehicles and pick-up trucks — vehicles that are critical to the needs of larger families, tradesmen, farmers and those who car pool. Secretary of Energy James Watkins has concluded that a proposed 40 mile per gallon (mpg) CAFE requirement could not be achieved without "significant changes to the size mix and performance" of today's vehicles. And Secretary of Transportation Samuel Skinner has determined such an increase in CAFE "would radically curtail the choice of new vehicles available to American consumers."

Under the current 27.5 mpg CAFE standard, small cars constitute 32 percent of the new car fleet, mid-size cars make-up 50 percent and family-size cars 18 percent. If a proposed 40 mpg CAFE requirement is enacted into law, one manufacturer estimates that about two-thirds of the new car fleet would have to be small cars. Family-size cars would be restricted to only about a five percent share of the fleet, and mid-size cars would be trimmed to about 29 percent.

Cars in the 40 mpg fuel economy range are available today, but they have weight, size and interior space far smaller than the average car. The average 40 mpg car is 16 percent smaller and weighs about 1,250 pounds less than the average car purchased. It is no surprise that these vehicles meet the needs of less than three percent of car buyers.

THE POINT

Unrealistic CAFE standards would require fundamental changes to the mix of vehicles offered by manufacturers, resulting in cars and trucks that do not meet the needs of many consumers. Higher CAFE standards would inevitably move the market toward smaller, lighter cars. The objective of higher fuel economy should be weighed against the legitimate needs of consumers to choose the vehicle that fits their needs. Cars today that achieve over 40 mpg clearly do not meet the needs of the vast majority of American car owners.

Consumers now have the option of choosing from among 600 models of cars, light trucks and vans designed to meet their transportation needs. But the restrictions necessary in order for manufacturers to meet proposed higher CAFE will limit the ability of families, farmers and tradesmen to purchase the car of their choice. Restricted supplies of family-size cars and utility vehicles will drive up prices of those models and motivate consumers to keep their older, larger and less fuel efficient cars longer.

CAFE MYTHS & FACTS

VEHICLE
DOWNSIZING

MYTH

Dramatic increases in Corporate Average Fuel Economy (CAFE) can be achieved without building cars and light trucks smaller and lighter.

FACT

New car fleet fuel economy has been doubled since 1974 to over 28 miles per gallon mainly by reducing the weight of the average car by 1,100 lbs. As a result, today's new cars weigh, on average, 25 percent less than comparable cars did 17 years ago.

The Secretaries of the U.S. Departments of Transportation and Energy, have stated that a 40 percent increase in the CAFE standard cannot be reached without "substantial reduction in vehicle size and weight."

At the March 20, 1991 hearing of the Senate Energy Committee, experts from the Office of Technology Assessment and Energy and Environmental Analysis, who have analyzed the industry's capability to dramatically increase fuel economy, testified that a 40 percent increase in CAFE standards cannot be achieved by technology alone and will require downsizing.

THE POINT

Size and weight clearly are the factors which most directly affect vehicle fuel economy. Further weight reduction to achieve a substantial CAFE increase will require further downsizing.

Reducing weight by the use of more aluminum, plastic or aerospace materials — such as titanium and magnesium, which are far more expensive than steel — would add hundreds of dollars to the price of the average vehicle.

While today's average car is 1,100 pounds lighter than its mid-1970's counterpart, manufacturers were able to maintain sufficient interior occupant space, by converting to front wheel drive, despite the fact that the exteriors of the cars were made smaller. If automakers have to further reduce the weight of the average car by 800 to 1,000 pounds to dramatically increase CAFE, interior space will have to be decreased significantly.

Vehicles must be made to fit the needs of the average size family. If the majority of cars don't, most consumers won't buy them. Small, light-weight cars are now available that get 40-50 mpg, but they represent only three percent of sales.

CAFE MYTHS & FACTS

OIL
IMPORTS

MYTH

Legislation to require a sharp increase in Corporate Average Fuel Economy (CAFE) standards for new cars and light trucks will reduce U.S. reliance on imported oil.

FACT

1974 — Average new car fuel economy was 14.2 miles per gallon, and the United States imported 35% of its oil.

1990 — Fuel economy levels have doubled for passenger cars to 28.2 mpg, but the United States now imports 42% of its oil.

THE POINT

New U.S. cars today are twice as fuel efficient as 1974 models. History shows, however, that increases in CAFE alone will not reduce U.S. oil imports, because our nation's dependence on foreign oil is linked to OPEC pricing policies, not to CAFE.

In 1986, OPEC countries increased production and cut the price of crude oil in half. As a result, U.S. oil imports rose and domestic oil production fell. OPEC can continue to adjust its production and pricing policies to maximize its share of U.S. oil consumption, despite increases in the fuel efficiency of U.S. cars and trucks.

CAFE MYTHS & FACTS

AVAILABLE
TECHNOLOGY

MYTH

Major increases in Corporate Average Fuel Economy (CAFE) — up to 45 miles per gallon for cars and 35 mpg for light trucks — are achievable with available technology.

FACT

Although the greatest gains in improving automobile fuel economy from 14 to over 28 miles per gallon have come from reducing the weight of the average car by 1,100 pounds, available technologies have also been put into widespread use. For example:

- All cars have been more aerodynamically designed
- Fuel injection is in 98 percent of today's new cars
- Over 80 percent have front wheel drive
- Nearly two-thirds have automatic overdrive transmissions with lock-up converter clutches
- The engine size of the average car has been reduced by nearly 40 percent

For light trucks, the opportunities for downsizing or applying some of the known fuel economy technologies are more limited than for cars because their cargo carrying capacities and towing capabilities require more powerful engines and heavier structures.

THE POINT

Many known technologies are already widely used and their fuel economy gains have already been made. While most will spread across all car model lines, the fleet average fuel economy improvements gained will be limited because you can only convert once to such technologies as front wheel drive or fuel injection.

New technologies being discussed — light weight aerospace materials and two-cycle engines, for example — will significantly increase the price of the average vehicle and yield only small fuel economy improvements.

Health Care

Earlier this year, the Joint Economic Committee Republican staff estimated the employment effects of a "play or pay" health care plan, modeled on the Democrat Senate leadership bill, which incorporated a 7 percent payroll tax. The direct costs to employers was calculated at \$42.09 billion, a figure which compares favorably with estimates of similar plans made by others.¹¹ Governor Clinton has embraced "play or pay" as his model for health care reform. In our earlier analysis, we projected 712,742 jobs would be lost in the first year of implementing a 7 percent payroll tax "play or pay" health insurance scheme.¹²

Environmental Regulations

Clinton's platform includes ambitious environmental goals that translate into increased regulatory and tax costs to American industries. The Democrat ticket has endorsed the goals of limiting carbon dioxide emissions to 1990 levels by the year 2000 and increasing the Corporate Average Fuel Economy (CAFE) standard from the present 27.5 miles per gallon (MPG) to 45 MPG, in addition to other steps that would create additional burdens on industry, especially high wage manufacturing. In this analysis we estimate only the Corporate Average Fuel Economy (CAFE) and CO₂ costs.

A commitment to major carbon dioxide emissions regulation would create large economic losses and job loss. The base case, assuming no new emission controls, predicts an annual growth in CO₂ emissions of between 1.4 and 2.7 percent. Freezing those levels will be very costly in lost economic output and jobs. Even done in the most economically efficient way, by imposing a carbon tax, the Democrat promise would reduce real GDP by between 0.5 and 2.0 percentage points by 2000, or between \$34.9 billion and \$139.5 billion in constant 1990 dollars. The Urban Institute found that a carbon tax of \$15 per ton, rising by 5 percent annually for 20 consecutive years, would be necessary in order to stabilize CO₂ emissions at 1990 levels. Such a tax would lead to a loss of 616,300 jobs in the first three years following imposition. About 31.7 percent of the three-year burden of this tax would be borne in the first year, and if job losses are distributed in the same pattern as costs, the first-year employment effects would be 195,500 lost jobs in 1993.

A Senate bill endorsed by Senator Gore would raise the CAFE standard to 40 MPG by 1996. Such a jump in CAFE standards would, by the time it was fully effective, lose approximately 166,000 jobs in auto manufacturing and at least 150,000 jobs in general

¹¹ For example, the Urban Institute estimated employer costs of a slightly different play or pay plan, with a 7 percent payroll tax, at \$29.7 billion, however, premium costs were underestimated by approximately \$8 billion, in Zedlewski, Acs, Wheaton and Winterbottom, "Pay or Play Employer Mandates: Effects on Insurance Coverage and Costs." (Washington: Urban Institute, January 1992). A higher tax rate would increase employer costs.

¹² JEC\GOP Health Care Briefing Paper No. 5, "Run From Coverage: Job Destruction From a Play or Pay Health Care Mandate," prepared for Representative Richard K. Armey (R-TX), April 9, 1992.

manufacturing for a total job loss of 316,000, and a 45 MPG CAFE standard would lead to a loss of at least 232,400 jobs in automobile manufacturing and another 210,000 jobs in general manufacturing, for a total job loss of 442,400. If there is a 3-4-5-5 MPG improvement over the four years with a similar gradually rising cost burden to industry, the first-year share of the employment losses is 75,840 jobs. Total jobs lost in 1993 from the carbon dioxide and automobile mileage goals of the national Democrat ticket is 271,340, with far greater job losses in later years.

Indexing Minimum Wage

The platform passed at the Democratic Convention in New York advocates "an indexed minimum wage"¹³ although there were no details of how this would be achieved. In preparation of this report, a member of the Clinton staff indicated that the Governor "was committed to the notion of indexing the minimum wage, however, he has not as yet focused on any details of that process."¹⁴

Given this lack of detail, we conservatively assumed a simple indexation of the present wage to the Consumer Price Index (CPI). There is no dispute that an increase in the minimum wage loses jobs. GAO has summarized the evidence regarding the minimum wage, finding "virtually total agreement that employment is lower than it would have been if no minimum wage existed... As the minimum wage reduces employment, some workers lose jobs or are unable to find jobs, and thus lose income."¹⁵ To adjust for price changes from 1990 to 1991, the Federal minimum wage would have had to increase by 4.2 percent. Such an increase in the minimum wage will directly raise absolute and relative costs to hire and retain low-wage workers. Employers will find that many of these workers are not economically advantageous to employ. We estimate that the first-year employment adjustment will be a loss of 42,000 jobs in the economy.

An alternative indexing approach has been contained in legislation offered previously by the Democrat leadership.¹⁶ This scheme would set the minimum wage equal to 50 percent of the average private, nonsupervisory, nonagricultural hourly wage. Using the Bureau of Labor Statistics (BLS)-indexed minimum wage, the current Federal minimum hourly wage rate would equal \$5.17 or a 92 cent increase. First-year disemployment effects from the BLS-indexed minimum are estimated to exceed 360,000 jobs. For the sake of this analysis, we employed the CPI-indexed minimum wage with its lower disemployment effects.

¹³ "Party Statement of Policies Mirrors Clinton's Goals," Congressional Quarterly, July 18, 1992, pg. 2111.

¹⁴ Personal conversation with Mr. Paul Weinstein, Clinton-Gore for President Committee, July 22, 1992.

¹⁵ U.S. General Accounting Office, Minimum Wage Policy Questions Persist, Report to the U.S. Senate Committee on Labor and Human Resources, 1983.

¹⁶ See for example, The Minimum Wage Restoration Act of 1987, S. 837 offered by Senators Kennedy and Mitchell.

APPENDIX

Increased Environmental Regulation

Carbon Taxes

A commitment to major carbon dioxide emissions regulation would create large economic losses and job loss. The baseline case, assuming no new emission controls, predicts an annual growth in CO₂ emissions of between 1.4 and 2.7 percent. Freezing those levels will be very costly.

Most experts agree that the most efficient means available to achieve a stabilization of CO₂ emission levels is a carbon tax. Jorgenson and Wilcoxon²⁴ estimate that carbon taxes needed to stabilize CO₂ emissions at 1990 levels would reduce real gross national product (GNP) by 0.5 percent by 2000, or \$34.9 billion (in constant 1990 dollars). Others have projected a tax of this size would reduce GNP in 2000 by 2.0 percent, or \$139.5 billion (in constant 1990 dollars).²⁵

A disproportionate share of job loss will fall on those industries where carbon use is the greatest, and in those industries most dependent on carbon-based fuels. A carbon tax implies large cost increases for most major forms of energy (including coal, natural gas, gasoline, and electricity from public utilities which operate generating stations requiring non-nuclear, fossil fuels) and will consequently result in higher cost increases and greater job losses on industrial sectors most dependent on energy as an input.

Hardest hit by a carbon tax will be metal mining, oil and gas production, petroleum and coal products manufacturing, and primary metals manufacturing. All of these industries either produce, sell, or in their operations utilize large quantities of fossil fuels. Employees in the transport services sectors serving these industries will also be severely affected. The imposition of a carbon tax will also produce indirect job losses in industries that furnish goods and services to the above-mentioned industries.

About 68 percent of the jobs lost due to a carbon tax will occur, however, in other than these most severely affected industries. General manufacturing establishments will confront higher prices for needed energy; restaurants will face higher energy costs and decreased demand for their meals; the construction industry will pay more for materials and see a drop in home sales. Energy producing industries will be the most severely affected,

²⁴ Dale W. Jorgenson and Peter J. Wilcoxon, "Reducing U.S. Carbon Dioxide Emissions: An Assessment of Different Instruments," Harvard Institute of Economic Research, Discussion Paper 1590, April 1992.

²⁵ Congressional Budget Office, Carbon Charges as a Response to Global Warming: the Effects of Taxing Fossil Fuels (Washington, D.C.: August 1990).

but the biggest impact in terms of jobs lost will be in other sectors.

This lost economic output will generate very large job losses. The Urban Institute²⁶ calculates that a carbon tax of \$15 per ton, rising by 5 percent annually for 20 consecutive years, would be necessary in order to stabilize CO₂ emissions at 1990 levels. Such a tax would lead to a loss of 616,300 jobs in the first three years following imposition.²⁷ About 31.7 percent of the three-year cost of this tax would be borne in the first year. If job losses are distributed in the same pattern, the first-year employment effects would be 195,500 lost jobs in 1993.

CAFE Standards

A Senate bill endorsed by Senator Gore, S. 279, would raise the CAFE standard to 40 MPG by 1996. Such a CAFE standard would kill approximately 166,000 jobs in auto manufacturing, and at least 150,000 jobs in general manufacturing, for a total job loss of 316,000.²⁸ If the cost in jobs lost for every additional MPG increase in the CAFE standard is constant, a 45 MPG CAFE standard would lead to a loss of at least 232,400 jobs in automobile manufacturing and another 210,000 jobs in general manufacturing, for a total job loss of 442,400. If there is a 3-4-5-5 MPG improvement over the four years with a similar cost burden to industry, the first-year share of the employment losses is 75,840 jobs.

More stringent CAFE standards would tend to increase the cost of manufacturing new cars, and adversely impact on consumer demand for new autos. Choice among technically available car designs would be restricted, reducing aggregate demand for new cars. These two effects taken together will reduce the demand for labor in the auto industry, and result in net job loss. The many industries which support auto manufacturing (for example, parts manufacturers) will similarly experience a decline in demand for their products, and reduced employment. Finally, automobiles mandated to achieve higher miles-per-gallon will be more expensive, adversely affecting the many industries which rely on car fleets in their business. Robert Crandall of the Brookings Institution calculates that the increased cost of each additional mile-per-gallon for a given model year's cars is \$1 billion. Firms confronting these higher costs will reduce employment still further.

The Motor Vehicle Manufacturing Association calculated the anticipated job loss due to a 40 mpg CAFE standard for the national economy. This estimate is divided into two parts -- job loss in the passenger car manufacturing sector and job loss in the general

²⁶ Urban Institute, Preliminary Analysis of Distributional Effects of Energy Taxes (Washington, D.C.: February 1992).

²⁷ See Wilbur A. Steger and Frederick H. Rueter, Jobs-at-Risk: Short-term and Transitional Employment Impacts of Global Climate Policy Options (Pittsburgh, PA: Consad Research Corporation, May 1992).

²⁸ Job loss estimates calculated by the Motor Vehicles Manufacturers' Association.

manufacturing sector. The cost of a more stringent CAFE standard will be partly passed on to consumers of automobiles. Based on Crandall and Graham (1989),²⁹ increasing the CAFE standard to 45 MPG will result in added costs to car consumers of \$17.5 billion.

More stringent CAFE standard also generate large human costs. The chief means to increase vehicle MPG is reduce vehicle weight. Unfortunately, lighter vehicles are less safe than heavier cars. Crandall estimates that a 40 MPG CAFE standard would result in between 4,800 and 8,600 additional highway fatalities over the life of a model year.

Minimum Wage

The minimum wage was \$4.25 per hour in 1990 and the percent change in the Consumer Price Index (CPI) between 1990 and 1991 (the latest available period) was 4.2; therefore, a CPI-indexed minimum wage would be \$4.43 per hour, up 18 cents. We estimate that a 4.2 percent increase in the minimum wage will adversely affect employment by directly raising the absolute and relative cost of hiring and retaining low-wage workers. Given the higher Federal minimum and the limited productivity of low-wage workers, employers will find that many of these workers are not economically advantageous to employ. We estimate that the first-year employment loss will be 42,000 jobs.³⁰

An alternative approach to indexing the Federal minimum wage rate has been contained in legislation offered previously by the Democrat leadership.³¹ This methodology would set the minimum wage rate equal to 50 percent of the average private, nonsupervisory, nonagricultural hourly wage, as determined by the Bureau of Labor Statistics. Using BLS-indexed minimum wage, the current Federal minimum hourly wage rate would equal \$5.17 or a 92 cent increase. First-year disemployment effects from the BLS-indexed minimum are estimated to exceed 360,000 jobs.

Family and Medical Leave Act

Legislation such as the Family and Medical Leave Act of 1991, which Mr. Clinton says he "will immediately sign into law,"³² differentially benefits baby boomers such as Messrs Clinton and Gore. This benefit, however, comes at the expense of poor working families, low-skilled workers and working women who are least able to afford it:

²⁹ Robert W. Crandall and John D. Graham, "The Effect of Fuel Economy Standards on Automobile Safety," Journal of Law and Economics, XXXII (April 1989); pp. 97-118.

³⁰ R. McKenzie and C. Simon, The Proposed Minimum Wage Increase: Associated Job Loss by State, Region and Industry, The National Chamber Foundation, Washington, D.C., 1988.

³¹ See for example, The Minimum Wage Restoration Act of 1987, S. 837 offered by Senators Kennedy and Mitchell.

³² Putting People First, pg. 9.

The Republicans Paint Clinton Program as Anti-Growth

By Dan Balz

Washington Post Staff Writer

In a coordinated effort to shift the terms of the presidential debate, the Republicans opened an assault on the economic program of Democratic nominee Bill Clinton, hoping to paint the Arkansas governor as an opponent of economic growth whose policies could mean the loss of more than 2 million jobs over four years.

But Clinton's campaign advisers swiftly counterattacked, charging the Republicans with distorting their estimates of the Democratic plan to cover up their lack of a plan of their own "to get the economy moving."

Sensing that Clinton's plan, which lacks specifics in some key areas, is vulnerable to attack, the Republicans produced a blizzard of reports, rhetoric and statistics to undermine the Democrats' claim that they, not the Republicans, would be the party of economic growth.

The Republicans said Clinton's claims of deficit reduction, growth and new jobs were "spurious" and that his plan would have a destructive effect on the economy. "We simply believe that this plan doesn't hold water in any facet of the projections," said Clayton Yeutter, Bush's top White House domestic adviser.

Campaigning in New York and Pennsylvania yesterday, Clinton taunted the president to explain what he stands for. "What are you going to do for America if you win?" Clinton said.

The Republicans have criticized Clinton's economic plan for several weeks. But yesterday's orchestrated attack represented a dramatic increase in intensity that reflected GOP anxiety over the large lead Clinton has opened up against Bush in the polls.

The reports, one by the Republican staff of the Joint Economic Committee prepared for Rep. Richard K. Armey (R-Tex.) and the other issued by the Bush-Quayle Committee, were far more detailed than anything the Republicans have produced to date. Their critiques covered a wide variety of issues, but the main points fall under several broad categories.

The Republicans say Clinton's call for 150 billion in new taxes over four years on wealthy individuals and corporations represents the largest tax increase in history. But the Clinton camp says the Republicans do not take into account that his economic plan includes individual tax cuts of about 60 billion over the same period, offsetting some of the tax increases.

In any event, Clinton aides say, the largest tax increase in U.S. history was signed into law by then-President Ronald Reagan in 1982. That law produced tax increases of 214 billion over five years. But the 1982

tax increase followed a massive tax cut bill signed by Reagan the previous year which reduced taxes by more than \$700 billion over the same span.

Clinton aides counter that the massive deficits that hamstringing the economy today are the result of that 1981 tax cut.

The two campaigns disagree significantly on the number of jobs Clinton's proposed \$200 billion in spending on public works and infrastructure would produce.

The Clinton camp, citing estimates by the firm of DRI/McGraw-Hill Inc., said each \$1 billion in such spending will produce 50,000 jobs. The Republicans said Clinton's plan would produce only about 12,000 jobs for each \$1 billion in public investment. But Lowell Gallaway, a visiting scholar at the Joint Economic Committee, acknowledged that the committee had underestimated the amount of yearly investment spending Clinton has proposed.

The Republicans argue that Clinton's deficit-reduction plan is a phony, based on vague promises and weak assumptions, a charge made by some outside economists in the past. Clinton's camp defended its budget cuts, in part by charging Bush with letting the national debt balloon by 41 percent.

The Joint Economic Committee document said the first-year impact of Clinton's proposals would mean the loss of 1.8 million jobs. The Bush campaign said over four years, Clinton's policies would result in 2.6 million fewer jobs. The Clinton camp said those estimates are flawed, that they ignore some of the job-creation measures Clinton has proposed and in some cases are based on faulty assumptions. If the most commonly repeated word in the Republican documents was "tax," the most commonly used word in the Clinton response was "lie."

The biggest single impact on jobs, the Republicans say, comes from Clinton's health-care proposals. Clinton advocates cost-control measures and a phased expansion of coverage so that eventually all Americans would have health-care protection. He has argued that the money saved from cost-containment will be enough to finance universal coverage.

But Clinton's proposal lacks specifics, so the Republicans picked one of the Democratic legislative proposals in Congress, called "pay or play," which would require business to provide health insurance for workers or pay a tax to fund government coverage, and estimated the impact of that on the economy. They said the proposal would require a 7 percent payroll tax on businesses and would mean the loss of more than 700,000 jobs.

"The Republican document reaches its illogical conclusions because it hypothesizes that full coverage will be imposed immediately and without cost control," the Clinton campaign analysis said. It said its plan would have no measurable impact on unemployment.

But Ed Gillespie, an aide to Armey, challenged the Clinton campaign to provide more details of its health-care plan. "If [Clinton] can come up with the least harmful way of doing it, he ought to answer it. We take specifics where he gives them. Where he talks policies or principles, we take the leading proposal floating around the Democratic Congress."

The Republicans say new environmental regulations advocated by Clinton would cost 271,000 jobs the first year and about 300,000 over four years. The Clinton camp said the Republican analysis is based on a false assumption and a misreading of Clinton's program. The Republicans agreed they had misread Clinton's proposal for higher fuel economy standards, but said using a new carbon tax as the basis for calculating jobs lost was an attempt to figure out how Clinton would fulfill his environmental objectives. Clinton has not proposed a carbon tax.

The two camps also disputed the impact of Clinton's proposal that all companies devote 1.5 percent of their payroll costs to worker training programs. The Republicans said it represented a "regressive payroll tax" that would cost 265,000 jobs the first year. "The Republicans don't understand that worker training and investment have tremendously high returns because they create high-wage jobs," Clinton campaign officials argued.

Clinton advisers also complained that the Republicans account only for jobs lost from new tax increases, but give the Democratic nominee no credit for cutting taxes on business. The Republicans said they had accounted for both.

The Republican "Analysis" of CAFE standard employment impact.

The JEC/GOP present what they purport to be an "analysis" of the potential employment impact of CAFE standards. But when you look beyond the absurd aura of specificity and accuracy, this section of their "study" is really a complete fabrication, that does not resemble in any fashion an economic analysis.

1) The Republicans have already conceded that they messed up the CAFE proposal [Washington Post]. This concession was smart, because they would not want to invite further scrutiny.

2) The source of the CAFE "job losses" is the Motor Vehicles Manufacturers Association (MVMA). While the GOP staff on the JEC purports to be unbiased and objective, they take data from a trade association, which should invite some skepticism from objective analysts. Trade associations data is often accurate and indispensable in economic analysis, but should always be verified.

3) The real problem with the CAFE analysis is not the structure and timing of the proposal, on which the Republican staff erred, nor the use of trade association data, which in this case is probably accurate. The problem is that they took a number that has some relevance to conduct economic analysis and then proclaimed it to be economic analysis.

In arguing against CAFE standards, the MVMA

- determines which automobile assembly plant currently manufacture cars and light trucks that would not meet the proposed standard -- in this case 40 MPG;
- determines the number of workers currently employed in those plants;
- Adds up the national total (142,000) and labels them "jobs at risk."
- THATS ALL FOLKS!

The MVMA figure is merely a data point. MVMA is careful to call this figure "jobs at risk" and offers the following arguments:

"Limitations on the production of larger cars, light trucks, and vans would result in elimination of jobs -- and even plant closings -- at many of the facilities that now produce these vehicles. Assembly plants currently producing family- and mid-size cars, light trucks and vans -- threatened by unreasonable increases in CAFE -- have a combined labor force of 142,000 employees in 18 states. In addition countless jobs would be at risk at numerous supplier firms dependent

on those assembly plants for business. The jobs displaced by CAFE would not be offset by increased production of small cars because overall sales would be lower and smaller/lighter cars require less labor to build than larger models."

From this data -- the JEC/GOP concludes that "such a CAFE standard would kill approximately 166,000 jobs in auto manufacturing, and at least 150,000 jobs in general manufacturing, for a total job loss of 316,000 [MVMA is cited here]."

Even the MVMA tries to discuss an intelligent economic analysis -- albeit to generate skepticism -- which would have to take into account the potential for these plants to manufacture cars with higher mileage, a mix in the shift of automobiles and the manufacturing base, etc. The JEC/GOP analysis just blithely calls this number "jobs killed."

This is unbelievably dishonest. By this "logic," no cars are currently produced with MPG under the current standard of 27.5 MPG. But CAFE stands for "Corporate Average Fuel Economy, and many people are now at work producing cars that do not attain the standard (in fact, they work at the plants cited by MVMA). But according to the GOP logic, these people don't currently exist. Thus, they are saying that Bill Clinton can even "kill" jobs that are already dead according to their analysis! That is some trick, and exposes the grotesque distortions of the entire GOP analysis.

IMPACT

Center for Auto Safety

Vol. 17, No. 6 July-August 1992

DOT KILLS "BEST-IN-CLASS" EPA FUEL EFFICIENCY STUDY

The National Highway Traffic Safety Administration (NHTSA) is keeping a secret. The 1992 passenger car fleet would attain 35 MPG if every car was as efficient as the best in its weight class. This efficiency improvement is more than half way to the year 2001 legislative proposals of 40 MPG — and includes no new technology or shift to smaller cars since it is based on the actual 1992 fleet. A 35 MPG fleet would put the U.S. on a path to saving 800,000 barrels of oil per day and cutting emissions of carbon dioxide by 125 million tons per year.

The "Best-in-Class" analysis, used for years by Environmental Protection Agency (EPA) scientists to evaluate the fuel efficiency potential of current fleets, drew heavy fire from NHTSA last year. In a letter criticizing "Light Duty Automotive Technology and Fuel Economy Trends" (the EPA report containing the analysis), NHTSA wrote "We are disturbed over the 'best-in-class analysis' which makes it appear that CAFE can be greatly improved without changing the size mix of vehicles." In the same letter, DOT insisted the report be submitted for "administrative review" in future years. The 1992 version of the Trends report was never published.

EPA's Trends report is the most complete source of data on the car and light truck fleet and is relied upon by Congress, federal policy-makers, researchers and the public to evaluate fuel economy potential for setting Corporate Average Fuel Economy (CAFE) standards. Most recently, the National Academy of Sciences depended on the Trends report as a source of data in preparing its April 1992 study "Automotive

Fuel Economy, How Far Should We Go?" (IMPACT, Vol. 17, No. 5).

The Center for Auto Safety (CAS) obtained the raw data on the 1992 fleet from EPA and conducted an analysis similar to the EPA's "Best-in-Class" analysis. EPA scientists who developed the analysis determined that, because EPA weight classes are so narrow, exceptional efficiency within a given class must be explained by technology not weight or size reduction. "Best-in-Class" vehicles, termed "technology role models," represented a valuable tool in ascertaining what CAFE levels were possible given the weight mix and technology of a particular model year's fleet.

CAS released its own 1992 "Best-in-Class" report at a press conference July 2, 1992. Prepared by CAS to replace the missing EPA analysis, the report identified a broad range of technology role models embodying the same size mix of vehicles with the same room, features and performance consumers expect. The 1992 "Best-in-Class" fleet includes cars ranging in size from the 1875-lb. Geo Metro XFi to the 4250-lb. Chevrolet Caprice Wagon and averages 35 MPG. Yet, because the "Best-in-Class" fleet is based on the actual 1992 fleet weight class mix, the 66 MPG XFi accounts for less than 0.05 MPG because its weight class account for only 0.1% of the new car market (chart, pg. four).

In a joint letter to EPA Administrator William Reilly released with its report, CAS and the Sierra Club said "[A]ny global warming policy, as recognized at the June 1992 Earth Summit, must confront motor

continued on pg. four

FOLLOWUP: Ford Paint Defect Secret Warranty

Since its June 23, 1992 press release and petition to the Federal Trade Commission (IMPACT, Vol. 17, No. 5), the Center for Auto Safety (CAS) has received more than 1500 consumer letters about defective paint on a variety of Ford makes and models. CAS met with attorneys from the FTC's Bureau of Consumer Protection in late July to press the case for FTC enforcement action.

Ford's Parts & Service Division general manager, Tom Wagner, admitted to the Associated Press on July 31 that the company knew of this defect since 1988, and knew other models affected by defective paint included Rangers, Econolines, Mustangs, EXPs, Tempos, Bronco and Bronco IIs. Ford refuses to recall the defective vehicles and owners continue to be subject to the abuses of a "secret warranty" — i.e. some are getting new paint jobs at no cost while others are told that Ford will pay for 50% of the cost or only a partial paint job with the rest of the vehicle likely to peel later. A month after CAS' petition, Ford announced "Owner Dialogue" letters to 1987-91 F-series pickup owners. The notices are inadequate because they fail to (1) specify the paint is defective, (2) offer to repaint vehicles at no cost and (3) cover all 1985-92 Ford owners.

Publicity nationwide about CAS' petition has helped some consumers get satisfaction. Dorothy Pepper's (Thermal CA) 1986 F150 pickup with metallic blue paint had extensive peeling with mileage less than 34,000. The dealership and its district representative turned down her March 1992 request for a free repaint job and charged her \$400.

continued on pg. two

"BEST IN CLASS"

continued from pg. one

vehicle emissions. More carbon dioxide comes out of the tailpipes of America's cars than comes from all sources in all of Latin America."

The purpose of a "Best-in-Class" analysis is to highlight the technologies that make the role models stand out. The technologies are usually ones that have been around for quite some time, but have not yet achieved a high market penetration. These include multi-point fuel injection, multi-valve engines, automatic transmissions with lockup torque converter clutches and use of lighter alternative materials that allow

weight reduction without reducing the size or structural integrity of key structures.

Honda's VX is an excellent example of a vehicle that attains its superior fuel economy due to technology, not weight or size reduction. Its features include a multivalve engine with variable valve timing, multi-point fuel injection and an aluminum engine block with aluminum cylinder heads. Currently, the VX is one of two models available with the revolutionary lean burn technology. It is designed to deliver superior efficiency 61 MPG.

CAS' 1992 analysis clearly indicates even more dramatic efficiency gains are possible. For instance, if

the lean burn technology of the VX (limited to the 1.3% of the market) were used in vehicles occupying bigger market segments (like the Chevrolet Corsica whose weight class covers 32% of the entire market), efficiency gains in the 1992 fleet would be much greater. Wider use of strong, lightweight materials substituted to reduce vehicle weight by 10.6%, would push the 1992 "Best-in-Class" fleet to over 40 MPG. +

1992 "BEST-IN-CLASS" FLEET

WEIGHT CLASS	MARKET SHARE %	MODEL	CAFE (MPG)	TRANS.	INTERIOR VOLUME	A/C
1750	0.1	Geo Metro Xfi	65.9	manual 5	89	No
2000	1.6	Geo Metro	57.3	manual 5	92	Yes
2250	1.3	Honda Civic VX	60.9	manual 5	90	No
2500	9.1	Honda Civic	44.9	manual 5	90	Yes
2750	15.1	VW Golf diesel	44.7	manual 5	105	Yes
3000	31.9	Chevrolet Corsica	34.0	manual 5	106	Yes
3500	29.8	Mercedes 300D diesel	33.0	auto 4	108	Yes
4000	10.0	Ford Thunderbird	26.3	lockup 4	116	Yes
4500	1.1	Chev. Caprice Wagon	22.8	lockup 4	170	Yes
Fleet Average			35.0			

The "Best-in-Class"

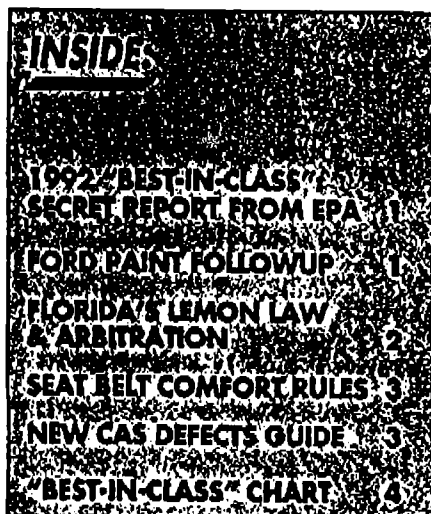
Report is available for \$15 from CAS Publications

(note PUBLICATIONS on check and on envelope),
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IMPACT

Center for Auto Safety
2001 S Street NW
Washington DC 20009-1160

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5.16.91
CAPE

*Comments on
Nissan draft.*

Steve Plotkin

- not able to
guarantee they will follow
these criteria.

→ just hope admin will

34 mfg cannot be done by
1996 & 40 conceivable by 2001

31 more pending
if want 34

but extremely difficult.
if can get diesels back in
or 2-strokes & look like a
charm & a lot use ~~the~~ have
alt. fuel then maybe.



Specific S.P.'s
#1 (6) - 3rd person
Separate size or wt. class
w/ "parently anal" &
The

per 515(a)(4)
 That asset in their
 comply w/ CAPE 8th but.

? = will not do a smart job & can you trust them. non objective (eventually)

Curry etc - not objective (eventually
tech. people probably OK).



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Analysis assumes have every
Co. putting tech on to the
same extent. UPI does
this a little but not as well.

What happens if some companies
are not pushed as hard.

Plotkin assumes size/class
will do a good job here but
doesn't have the ability to
do

We want an interim volume -
based on

with a fleet area
approx equal technological



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Challenge

*define interior volume as
passenger volume.*

Have Culp @ Ford.

Japanese

Barry McNutt

SEC. ... Not later than 18 months after enactment of this Act, the Secretary shall, by rule, prescribe new average fuel economy standards for passenger automobiles and light duty vehicles manufactured in model year 1996 and thereafter. Such standards shall be designed to achieve, in the specified model years, the following overall levels of fuel economy for all passenger automobiles and light duty trucks by all manufacturers:

<u>Model years</u>	<u>Fuel Economy Target (miles per gallon)</u>	
	<u>Passanger vehicles</u>	<u>Lt. Duty Trucks</u>
1996 through 2000	34	25.5
2001 and thereafter	40	29.8

check #1

??? ALSO REQUIRE AN OVERALL LIGHT DUTY VEHICLE STANDARD EQUAL TO THE HARMONIC AVERAGE OF THE ABOVE?? THIS MAKES SENSE IF THE FORM OF THE STANDARD IS UNIFORM PERCENTAGE INCREASE (REMOVES INCENTIVE TO SHIFT TO PRODUCTION OF TRUCKS FROM VEHICLES); DOES IT MAKE SENSE (IS IT WORKABLE) IF THE SECRETARY CHOOSES INSTEAD TO USE A SIZE-CLASS STANDARD???

** With need for target method chosen precludes LDV then don't have to use*

??? IF AN OVERALL LDV TARGET IS ALSO USED, DOES IT MAKE SENSE TO DIRECT SECRETARY TO SET UP A CREDIT TRADING SCHEME IN WHICH EACH MFRG COULD USE CREDITS EARNED BY E.G. OUTDOING THE VEHICLE TARGET TO MEET THE TRUCK TARGET??? IS IT NECESSARY TO HAVE SUCH A SCHEME???

** if do harmonic avg don't need to hold & build in.*

FORM OF STANDARDS

Sec. ... In conjunction with the rulemaking specified in section ... the Secretary shall determine the most appropriate form for the average fuel economy standards for passenger automobiles and light duty vehicles, under section ... The Secretary shall consider whether such standards should be expressed as a single numerical standard applicable to all manufacturers, as a uniform percentage increase in average fuel economy over each manufacturers's average fuel economy level in a base year, as separate standards for different categories of automobiles based on vehicle size ~~or market segments~~, or in some other appropriate form. [DOES THIS LANGUAGE COVER YOUR SIZE NORMALIZED IDEA??? QUESTION WITH REGARD TO YOUR SIZE NORMALIZED APPROACH -- YOU SUGGEST THAT, IF A MFRG INCREASES AVG INTERIOR VOL BY X%, THAN TARGET WILL BE INCREASED BY X% TO REMOVE UPSIZING INCENTIVE. BUT, IF TARGET IS PRODUCT OF INTERIOR VOL AND ENERGY INTENSITY, THAN TARGET WILL NATURALLY INCREASE BY X% IF INT VOL INCREASES BY THAT MUCH. THEREFORE, DON'T YOU NEED TO INCREASE TARGET BY X2 (X-SQUARED)

Should the Sec. Choose an approach that takes into account vehicle size or payload weight or similar service related parameter then make each mfg's full economy target

*not finally
just
enables
get
mfr*

shall be increased proportionate to the lumps
increase in the parameter in question
shall the upper. " " 370 above the
base year.

Sec. shall track the parameter yr-by-yr.
Subsequent to passage determined by adjustment
is necessary.



American Council for an Energy-Efficient Economy

1001 CONNECTICUT AVE., N.W. SUITE ⁸⁰¹~~425~~ WASHINGTON, DC 20036 (202) 429-8873

FACSIMILE TRANSMISSION

From Fax number (202) 429-2248

To: Katie McGinty
Sen. Gore's office 224-0580

Date: 8/8/91

Pages: 3
(including this page)

From: John De Cicco

Re: combined std's levels

MPG		CARS	LT. TRUCKS	BOTH
1988	base	28.6	21.2	25.9
1996	+20%	34.3	25.4	31.1
2001	+40%	40.0	29.7	36.3

Based on preserving truck share at 30% of light vehicle market. Truck fuel economy peaked in 1987 at 21.6 MPG, slightly higher than the 1988 level.

Attached are comments of Tom Feaheny, former Ford V.P. for Product Engineering, excerpt from his recent presentation to the National Academy - I will send his full text on via mail - it's very interesting and generally supportive.

resolved the problem. With all due respect to our military and intelligence, the possibility of a successful future takeover cannot be ignored. It could happen anytime due to political and religious turmoil, and could well be supported with nuclear weapons. Are the odds 50%? 25%? Even if the risk is only 10%, the impact on the domestic auto industry will be catastrophic if current trends continue.

In the last few days, the industry has presented a "business-as-usual" scenario and has ignored requests for information as to what can reasonably be done. The term "technological feasibility" has been expanded and distorted to declare that all changes that do not "payout", at discounted cash flows and current gasoline prices, are not "feasible". We have also been told that any changes not already included in an undefined and proprietary "product plan" are "unfeasible" and that any change in product attributes is "unfeasible" as it would interfere with "free market choice".

I must disagree.

Let me briefly summarize my conclusions as to what is technically feasible and reasonable:

1. The 20% and 40% fuel economy improvement targets proposed for U. S. cars are

technically feasible and reasonable. I am convinced of this based upon my own personal experience and knowledge as well as very authoritative recently published studies of R. G. Duleep and others.

- X { 2. The proposed 20% and 40% fuel economy improvement targets for U. S. light trucks are also technically feasible and reasonable. Indeed trucks have technical opportunities not available to cars. It is important that car and truck standards be kept in "balance" to deter truck/car substitution with resulting adverse safety and energy penalties.

I must note that the suggested replacement of CAFE standards by size-class or size-weight standards would probably result in counter-productive game playing and diminished energy conservation.

} doesn't
take
size class.

I would also add that various catastrophic projections of adverse safety tradeoffs are simply not credible. These projections assume massive downsizing and weight reduction, which is not required to achieve a 40% fuel economy improvement. Also, passenger car fatality rates

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Calendar No. 75

102D CONGRESS
1ST SESSION

S. 279

[Report No. 102-48]

To amend the Motor Vehicle Information and Cost Savings Act to require new standards for corporate average fuel economy, and for other purposes.

IN THE SENATE OF THE UNITED STATES

JANUARY 29 (legislative day, JANUARY 3), 1991

Mr. BRYAN (for himself, Mr. GORTON, Mr. HOLLINGS, Mr. MITCHELL, Mr. ADAMS, Mr. BENTSEN, Mr. BUMPERS, Mr. CHAFEE, Mr. COHEN, Mr. CONRAD, Mr. D'AMATO, Mr. DASCHLE, Mr. DECONCINI, Mr. DODD, Mr. FOWLER, Mr. GORE, Mr. GRAHAM, Mr. HEINZ, Mr. KERREY, Mr. KERRY, Mr. LAUTENBERG, Mr. LEAHY, Mr. LIEBERMAN, Mr. MCCAIN, Mr. METZENBAUM, Ms. MIKULSKI, Mr. MOYNIHAN, Mr. PELL, Mr. REID, Mr. ROBB, Mr. RUDMAN, Mr. SANFORD, Mr. SIMON, Mr. WELLSTONE, and Mr. WIRTH) introduced the following bill; which was read twice and referred to the Committee on Commerce, Science, and Transportation

APRIL 25, 1991

Reported by Mr. HOLLINGS, with amendments

[Omit the part struck through and insert the part printed in italic]

A BILL

To amend the Motor Vehicle Information and Cost Savings Act to require new standards for corporate average fuel economy, and for other purposes.

primarily for use in the transportation of not more than 10 individuals.

(3) The term "automobile capable of off-highway operation" means any automobile which the Secretary determines by rule—

(A) has a significant feature (other than 4-wheel drive) which is designed to equip such automobile for off-highway operation, and

(B) either—

(i) is a 4-wheel drive automobile, or

(ii) is rated at more than 6,000 pounds gross vehicle weight.

(4) The term "average fuel economy" means average fuel economy, as determined under section 2003 of this title.

(5) The term "fuel" means gasoline and diesel oil. The Secretary may, by rule, include any other liquid fuel or any gaseous fuel within the meaning of the term "fuel" if he determines that such inclusion is consistent with the need of the Nation to conserve energy.

(6) The term "fuel economy" means the average number of miles traveled by an automobile per gallon of gasoline (or equivalent amount of other fuel) consumed, as determined by the EPA Administrator in accordance with procedures established under section 2003(d) of this title.

(7) The term "average fuel economy standard" means a performance standard which specifies a minimum level of average fuel economy which is applicable to a manufacturer in a model year.

(8) The term "manufacturer" means any person engaged in the business of manufacturing automobiles. The Secretary shall prescribe rules for determining, in cases where more than one person is the manufacturer of an automobile, which person is to be treated as the manufacturer of such automobile for purposes of this subchapter. Such term also includes any predecessor or successor of such a manufacturer to the extent provided under rules which the Secretary shall prescribe.

(9) The term "manufacture" (except for purposes of section 2002(c) of this title) means to produce or assemble in the customs territory of the United States, or to import.

(10) The term "import" means to import into the customs territory of the United States.

(11) The term "model type" means a particular class of automobile as determined, by rule, by the EPA Administrator, after consultation and coordination with the Secretary.

(12) The term "model year", with reference to any specific calendar year, means a manufacturer's annual production period (as determined by the EPA Administrator) which includes January 1 of such calendar year. If a manufacturer has no annual production period, the term "model year" means the calendar year.

(13) The term "Secretary" means the Secretary of Transportation.

(14) The term "EPA Administrator" means the Administrator of the Environmental Protection Agency.

(Pub. L. 92-513, title V, § 501, as added Pub. L. 94-163, title III, § 301, Dec. 22, 1975, 89 Stat. 901, and amended Pub. L. 96-425, § 4(c)(1), 8(b), Oct. 10, 1980, 94 Stat. 1824, 1828; Pub. L. 100-494, § 6(b), Oct. 14, 1988, 102 Stat. 2452.)

CODIFICATION

"This subchapter", referred to in text preceding par. (1) and in pars. (1)(B)(ii) and (8), was in the original "this part", meaning former part A, "Automotive Fuel Economy", of this subchapter, which designation, the only part designation appearing in the subchapter, was struck out by section 8(a)(3) of Pub. L. 96-425.

AMENDMENTS

1988—Par. (1). Pub. L. 100-494 inserted ", or by alcohol or natural gas," after first reference to "fuel".

1980—Par. (8). Pub. L. 96-425, § 4(c)(1), provided that for purposes of this subchapter the term "manufacturer" would also include any predecessor or successor of a manufacturer to the extent provided under rules prescribed by the Secretary.

Par. (9). Pub. L. 96-425, § 8(b), substituted "manufacture" for "manufacturer".

EFFECTIVE DATE OF 1980 AMENDMENT

Section 9 of Pub. L. 96-425 provided that: "Except as otherwise provided in this Act [see Effective Date of 1980 Amendment note set out under section 2002 of this title], the amendments made by this Act [amending sections 1901, 2001, 2002(b), (c), (d), (g)-(k), 2003, 2005, 2008(b)(1)(A) and 2012 of this title and enacting provisions set out as notes under sections 1901, 2001, and 2002 of this title] shall take effect on the date of enactment of this Act [Oct. 10, 1980]."

CONGRESSIONAL DECLARATION OF PURPOSE OF 1980 AMENDMENT

Section 2 of Pub. L. 96-425 provided that: "It is the purpose of this Act [amending sections 1901, 2001, 2002, 2003, 2005, 2007, 2008 and 2012 of this title and enacting provisions set out as notes under sections 1901, 2001, and 2002 of this title]—

"(1) to amend certain Federal automobile fuel economy requirements to improve fuel efficiency, and thereby facilitate conservation of petroleum and reduce petroleum imports, and

"(2) to encourage full employment in the domestic automobile manufacturing sector."

SECTION REFERRED TO IN OTHER SECTIONS

This section is referred to in sections 2002, 2004, 2006, 2012, 2021 of this title; title 26 section 4064; title 42 section 6291.

§ 2002. Average fuel economy standards

(a) Standards for passenger vehicles manufactured after 1977; review of standards; report to Congress; standards for passenger automobiles manufactured from 1981 through 1984; amendment of standards

(1) Except as otherwise provided in paragraph (4) or in subsection (c) or (d) of this section, the average fuel economy for passenger automobiles manufactured by any manufacturer in any model year after model year 1977 shall not be less than the number of miles per gallon established for such model year under the following table:

Model year:	Average fuel economy standard (in miles per gallon)
1978.....	18.0.
1979.....	19.0.
1980.....	20.0.
1981.....	Determined by Secretary under paragraph (3) of this subsec- tion.
1982.....	Determined by Secretary under paragraph (3) of this subsec- tion.
1983.....	Determined by Secretary under paragraph (3) of this subsec- tion.
1984.....	Determined by Secretary under paragraph (3) of this subsec- tion.
1985 and thereafter ...	27.5.

(2) Not later than January 15 of each year, beginning in 1977, the Secretary shall transmit to each House of Congress, and publish in the Federal Register, a review of average fuel economy standards under this subchapter. The review required to be transmitted not later than January 15, 1979, shall include a comprehensive analysis of the program required by this subchapter. Such analysis shall include an assessment of the ability of manufacturers to meet the average fuel economy standard for model year 1985 as specified in paragraph (1) of this subsection, and any legislative recommendations the Secretary or the EPA Administrator may have for improving the program required by this subchapter.

(3) Not later than July 1, 1977, the Secretary shall prescribe, by rule, average fuel economy standards for passenger automobiles manufactured in each of the model years 1981 through 1984. Any such standard shall apply to each manufacturer (except as provided in subsection (c) of this section), and shall be set for each such model year at a level which the Secretary determines (A) is the maximum feasible average fuel economy level, and (B) will result in steady progress toward meeting the average fuel economy standard established by or pursuant to this subsection for model year 1985.

(4) The Secretary may, by rule, amend the average fuel economy standard specified in paragraph (1) for model year 1985, or for any subsequent model year, to a level which he determines is the maximum feasible average fuel economy level for such model year, except that any amendment which has the effect of increasing an average fuel economy standard to a level in excess of 27.5 miles per gallon, or of decreasing any such standard to a level below 26.0 miles per gallon, shall be submitted to the Congress in accordance with section 551 of the Energy Policy and Conservation Act [42 U.S.C. 6421], and shall not take effect if either House of the Congress disapproves such amendment in accordance with the procedures specified in such section.

(5) For purposes of considering any modification which is submitted to the Congress under paragraph (4), the 5 calendar days specified in section 551(f)(4)(A) of the Energy Policy and Conservation Act [42 U.S.C. 6421(f)(4)(A)] shall be lengthened to 20 calendar days, and the 15 calendar days specified in section 551(c) and (d)

of such Act [42 U.S.C. 6421(c) and (d)] shall be lengthened to 60 calendar days.

(b) Standards for other than passenger automobiles

The Secretary shall, by rule, prescribe average fuel economy standards for automobiles which are not passenger automobiles and which are manufactured by any manufacturer in each model year which begins more than 30 months after December 22, 1975. Such rules may provide for separate standards for different classes of such automobiles (as determined by the Secretary), and such standards shall be set at a level which the Secretary determines is the maximum feasible average fuel economy level which such manufacturers are able to achieve in each model year to which this subsection applies. Any standard applicable to a model year under this subsection shall be prescribed at least 18 months prior to the beginning of such model year.

(c) Exemptions for manufacturers of limited number of cars

(1) On application of a manufacturer who manufactured (whether or not in the United States) fewer than 10,000 passenger automobiles in the second model year preceding the model year for which the application is made, the Secretary may, by rule, exempt such manufacturer from subsection (a) of this section. An application for such an exemption shall be submitted to the Secretary, and shall contain such information as the Secretary may require by rule. Such exemption may only be granted if the Secretary determines that the average fuel economy standard otherwise applicable under subsection (a) of this section is more stringent than the maximum feasible average fuel economy level which such manufacturer can attain. The Secretary may not issue exemptions with respect to a model year unless he establishes, by rule, alternative average fuel economy standards for passenger automobiles manufactured by manufacturers which receive exemptions under this subsection. Such standards may be established for an individual manufacturer, for all automobiles to which this subsection applies, or for such classes of such automobiles as the Secretary may define by rule. Each such standard shall be set at a level which the Secretary determines is the maximum feasible average fuel economy level for the manufacturers to which the standard applies. An exemption under this subsection shall apply to a model year only if the manufacturer manufactures (whether or not in the United States) fewer than 10,000 passenger automobiles in such model year.

(2) Any manufacturer may elect in any application submitted under paragraph (1) to have the applications for, and administrative determinations regarding, exemptions and alternative average fuel economy standards be consolidated for two or more of the model years after model year 1980 and before model year 1986. The Secretary may grant an exemption and set an alternative standard or standards for all model years covered by such application.

(d) Application

(1) Any maximum salary for most of the employees of this section for the year 1978, 1979, 1980, 1981, 1982, 1983, 1984, 1985, 1986, 1987, 1988, 1989, 1990, 1991, 1992, 1993, 1994, 1995, 1996, 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 265

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(d) Application for modification of standards

(1) Any manufacturer may apply to the Secretary for modification of an average fuel economy standard applicable under subsection (a) of this section to such manufacturer for model year 1978, 1979, or 1980. Such application shall contain such information as the Secretary may require by rule, and shall be submitted to the Secretary within 24 months before the beginning of the model year for which such modification is requested.

(2)(A) If a manufacturer demonstrates and the Secretary finds that—

(i) a Federal standards fuel economy reduction is likely to exist for such manufacturer for the model year to which the application relates, and

(ii) such manufacturer applied a reasonably selected technology,

the Secretary shall, by rule, reduce the average fuel economy standard applicable under subsection (a) of this section to such manufacturer by the amount of such manufacturer's Federal standards fuel economy reduction, rounded off to the nearest one-tenth mile per gallon (in accordance with rules of the Secretary). To the maximum extent practicable, prior to making a finding under this paragraph with respect to an application, the Secretary shall request, and the EPA Administrator shall supply, test results collected pursuant to section 2003(d) of this title for all automobiles covered by such application.

(B)(i) If the Secretary does not find that a Federal standards fuel economy reduction is likely to exist for a manufacturer who filed an application under paragraph (1), he shall deny the application of such manufacturer.

(ii) If the Secretary—

(I) finds that a Federal standards fuel economy reduction is likely to exist for a manufacturer who filed an application under paragraph (1), and

(II) does not find that such manufacturer applied a reasonably selected technology,

the average fuel economy standard applicable under subsection (a) of this section to such manufacturer shall, by rule, be reduced by an amount equal to the Federal standards fuel economy reduction which the Secretary finds would have resulted from the application of a reasonably selected technology.

(3) For purposes of this subsection:

(A) The term "reasonably selected technology" means a technology which the Secretary determines it was reasonable for a manufacturer to select, considering (i) the Nation's need to improve the fuel economy of its automobiles, and (ii) the energy savings, economic costs, and lead-time requirements associated with alternative technologies practicably available to such manufacturer.

(B) The term "Federal standards fuel economy reduction" means the sum of the applicable fuel economy reductions determined under subparagraph (C).

(C) The term "applicable fuel economy reduction" means a number of miles per gallon equal to—

(i) the reduction in a manufacturer's average fuel economy in a model year which re-

sults from the application of a category of Federal standards applicable to such model year, and which would not have occurred had Federal standards of such category applicable to model year 1975 remained the only standards of such category in effect, minus

(ii) 0.5 mile per gallon.

(D) Each of the following is a category of Federal standards;¹

(i) Emissions standards under section 202 of the Clean Air Act [42 U.S.C. 7521] and emissions standards applicable by reason of section 209(b) of such Act [42 U.S.C. 7543(b)].

(ii) Motor vehicle safety standards under the National Traffic and Motor Vehicle Safety Act of 1966 [15 U.S.C. 1381 et seq.].

(iii) Noise emission standards under section 6 of the Noise Control Act of 1972 [42 U.S.C. 4905].

(iv) Property loss reduction standards under subchapter I of this chapter.

(E) In making the determination under this subsection, the Secretary (in accordance with such methods as he shall prescribe by rule) shall assume a production mix for such manufacturer which would have achieved the average fuel economy standard for such model year had standards described in subparagraph (D) applicable to model year 1975 remained the only standards in effect.

(4) The Secretary may, for the purposes of conducting a proceeding under this subsection, consolidate one or more applications filed under this subsection.

(e) Determination of maximum feasible average fuel economy

For purposes of this section, in determining maximum feasible average fuel economy, the Secretary shall consider—

(1) technological feasibility;

(2) economic practicability;

(3) the effect of other Federal motor vehicle standards on fuel economy; and

(4) the need of the Nation to conserve energy.

For purposes of this subsection, the Secretary shall not consider the fuel economy of alcohol powered automobiles or natural gas powered automobiles, and the Secretary shall consider dual energy automobiles and natural gas dual energy automobiles to be operated exclusively on gasoline or diesel fuel.

(f) Amendment of average fuel economy standards

(1) The Secretary may, by rule, from time to time, amend any average fuel economy standard prescribed under subsection (a)(3), (b), or (c) of this section, so long as such standard, as amended, meets the requirements of subsection (a)(3), (b), or (c) of this section, as the case may be.

(2) Any amendment prescribed under this section which has the effect of making any aver-

¹ So in original. The semicolon probably should be a colon.

age fuel economy standard more stringent shall be—

- (A) promulgated, and
- (B) if required by paragraph (4) of subsection (a) of this section, submitted to the Congress,

at least 18 months prior to the beginning of the model year to which such amendment will apply.

(g) **Exemption of emergency vehicles from fuel economy standards**

(1) At the election of any manufacturer, the fuel economy of any emergency vehicle shall not be taken into account in applying any fuel economy standard prescribed by or under subsection (a), (b), or (c) of this section. Any manufacturer electing to have the provisions of this subsection shall provide written notice of that election to the Secretary and to the Environmental Protection Agency Administrator.

(2) For purposes of paragraph (1), the term "emergency vehicle" means any automobile manufactured primarily for use—

- (A) as an ambulance or combination ambulance-hearse,
- (B) by the United States or by a State or local government for police or other law enforcement purposes, or
- (C) for other emergency uses prescribed by the Secretary of Transportation by regulation.

(h) **Application of other laws**

Proceedings under subsection (a)(4) or (d) of this section shall be conducted in accordance with section 553 of title 5 except that interested persons shall be entitled to make oral as well as written presentations. A transcript shall be taken of any oral presentations.

(i) **Consultation with Secretary of Energy; impact of proposed standards upon conservation goals; comments**

The Secretary shall consult with the Secretary of Energy in carrying out his responsibilities under this section. The Secretary shall, before issuing any notice proposing under subsection (a), (b), (d), or (f) of this section, to establish, reduce, or amend an average fuel economy standard, provide the Secretary of Energy with a period of not less than ten days from the receipt of the notice during which the Secretary of Energy may, upon concluding that the proposed standard would adversely affect the conservation goals set by the Secretary of Energy, provide written comments to the Secretary concerning the impacts of the proposed standard upon those goals. To the extent that the Secretary does not revise the proposed standard to take into account any comments by the Secretary of Energy regarding the level of the proposed standard, the Secretary shall include the unaccommodated comments in the notice.

(j) **Notification of Secretary of Energy; comments**

The Secretary shall, before taking action on any final standard under this section or any modification of or exemption from such standard, notify the Secretary of Energy and provide such Secretary with a reasonable period of time to comment thereon.

(k) **Adjustments or relief regarding standards for other than passenger automobiles**

(1) On the petition of any manufacturer for any model year beginning after model year 1981 and before model year 1986, the Secretary may conduct an examination of the impacts on that manufacturer or a class of manufacturers of any standard under subsection (b) of this section applicable to 4-wheel drive automobiles. If after consideration of the results of that examination the Secretary finds in accordance with paragraph (2) that the manufacturer has demonstrated that such manufacturer or class of manufacturers would not otherwise be able to comply with such standard for that model year as it applies to 4-wheel drive automobiles without causing severe economic impacts, such as plant closures or reduction in employment in the United States related to motor vehicle manufacturing, the Secretary shall, by order, make an adjustment or otherwise provide relief regarding—

(A) the manner by which the average fuel economy of that manufacturer or class of manufacturers is calculated for purposes of that standard as it applies to 4-wheel drive automobiles, or

(B) other aspects regarding the application of that standard to the manufacturer or class of manufacturers with respect to such automobiles to the extent consistent with the provisions of this subchapter.

(2) Any finding by the Secretary under paragraph (1) shall be made (A) after notice and a reasonable opportunity for written or oral comment, and (B) after consideration of the benefits available under the amendments made by the Automobile Fuel Efficiency Act of 1980.

(3) The authority of the Secretary under this subsection to make any adjustment or provide other relief shall not be effective for any model year after model year 1985.

(4) The Secretary shall notify the Congress of any adjustment or other relief provided under this subsection in the first annual report submitted to the Congress under section 2012 of this title after the order is issued providing for that adjustment or relief.

(5)(A) Any final decision of the Secretary under this subsection shall be made, and notice thereof published in the Federal Register, not later than 120 days after the date of the petition involved. The Secretary may extend such period to a specified date if the Secretary publishes notice thereof in the Federal Register, together with the reasons for such extension. Any such decision by the Secretary shall become final 30 days after the publication of the notice of final decision unless a petition for judicial review is filed under subparagraph (B).

(B) Any person adversely affected by such a decision may, not later than 30 days after publication of notice of such decision, file a petition for review of such decision with the United States Court of Appeals for the District of Columbia or for the circuit in which such person resides, or in which the principal place of business of such person is located. The United States court of appeals involved shall have ju-

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jurisdiction to review such decision in accordance with section 706(2)(A) through (D) of title 5, and to affirm, remand, or set aside the decision of the Secretary. Except as otherwise provided in this subparagraph, section 2004(c) and (d) of this title shall apply to such review to the same extent and manner as it applies with respect to review of any rule prescribed under this section or section 2001, 2003, or 2006 of this title.

(6) The availability of any adjustment or other relief under this subsection shall not be taken into account in prescribing standards under subsection (b) of this section.

(I) Credits for exceeding average fuel economy standards

(1)(A) For purposes of this subchapter, credits under this subsection shall be considered to be available to any manufacturer upon the completion of the model year in which such credits are earned under subparagraph (B) unless under subparagraph (C) the credits are made available for use at a time prior to the model year in which earned.

(B) Whenever the average fuel economy of the passenger automobiles manufactured by a manufacturer in a particular model year exceeds an applicable average fuel economy standard established under subsection (a) or (c) of this section (determined by the Secretary without regard to any adjustment under subsection (d) of this section or any credit under this subsection), such manufacturer shall be entitled to a credit, calculated under subparagraph (C),² which—

(i) shall be available to be taken into account with respect to the average fuel economy of that manufacturer for any of the three consecutive model years immediately prior to the model year in which such manufacturer exceeds such applicable average fuel economy standard, and

(ii) to the extent that such credit is not so taken into account pursuant to clause (i), shall be available to be taken into account with respect to the average fuel economy of that manufacturer for any of the three consecutive model years immediately following the model year in which such manufacturer exceeds such applicable average fuel economy standard.

(C)(i) At any time prior to the end of any model year, a manufacturer which has reason to believe that its average fuel economy for passenger automobiles will be below such applicable standard for that model year may submit a plan demonstrating that such manufacturer will earn sufficient credits under subparagraph (B) within the next 3 model years which when taken into account would allow the manufacturer to meet that standard for the model year involved.

(ii) Such credits shall be available for the model year involved subject to—

(I) the Secretary approving such plan; and

(II) the manufacturer earning such credits in accordance with such plan.

(iii) The Secretary shall approve any such plan unless the Secretary finds that it is unlike-

ly that the plan will result in the manufacturer earning sufficient credits to allow the manufacturer to meet the standard for the model year involved.

(iv) The Secretary shall provide notice to any manufacturer in any case in which the average fuel economy of that manufacturer is below the applicable standard under subsection (a) or (c) of this section, after taking into account credits available under subparagraph (B)(i), and afford the manufacturer a reasonable period (of not less than 60 days) in which to submit a plan under this subparagraph.

(D) The amount of credit to which a manufacturer is entitled under this paragraph shall be equal to—

(i) the number of tenths of a mile per gallon by which the average fuel economy of the passenger automobiles manufactured by such manufacturer in the model year in which the credit is earned pursuant to this paragraph exceeds the applicable average fuel economy standard established under subsection (a) or (c) of this section, multiplied by

(ii) the total number of passenger automobiles manufactured by such manufacturer during such model year.

(E) The Secretary shall take credits into account for any model year on the basis of the number of tenths of a mile per gallon by which the manufacturer involved was below the applicable average fuel economy standard for that model year and the volume of passenger automobiles manufactured that model year by the manufacturer. Credits once taken into account for any model year shall not thereafter be available for any other model year. Prior to taking any credit into account, the Secretary shall provide the manufacturer involved with written notice and reasonable opportunity to comment thereon.

(2) Credits for manufacturers of automobiles which are not passenger automobiles shall be earned and be available to be taken into account for model years in which the average fuel economy of such class of automobiles is below the applicable average fuel economy standard established under subsection (b) of this section to the same extent and in the same manner as provided for under paragraph (1). Not later than 60 days after October 10, 1980, the Secretary shall prescribe regulations to carry out the provisions of this paragraph.

(3) Whenever a civil penalty has been assessed and collected under section 2008 of this title from a manufacturer who is entitled to a credit under this subsection, the Secretary of the Treasury shall refund to such manufacturer the amount of the civil penalty so collected to the extent that penalty is attributable to credits available under this subsection.

(4) The Secretary may prescribe rules for purposes of carrying out the provisions of this subsection.

(Pub. L. 92-513, title V, § 502, as added Pub. L. 94-163, title III, § 301, Dec. 22, 1975, 89 Stat. 902, and amended Pub. L. 95-91, title III, § 305, Aug. 4, 1977, 91 Stat. 580; Pub. L. 96-425, §§ 3(a)(1), 5, 6(b), 7, 8(c), (d), Oct. 10, 1980, 94

² So in original. Probably should be "subparagraph (D)".

Stat. 1821, 1825, 1826, 1828; Pub. L. 100-494, § 6(c), Oct. 14, 1988, 102 Stat. 2452.)

REFERENCES IN TEXT

The National Traffic and Motor Vehicle Safety Act of 1966, referred to in subsec. (d)(3)(D)(ii), is Pub. L. 89-563, Sept. 9, 1966, 80 Stat. 718, as amended, which is classified to chapter 38 (§ 1381 et seq.) of this title. For complete classification of this Act to the Code, see Short Title note set out under section 1381 of this title and Tables.

The Automobile Fuel Efficiency Act of 1980, referred to in subsec. (k)(2), is Pub. L. 96-425, Oct. 10, 1980, 94 Stat. 1821, which amended sections 1901, 2001 to 2003, 2005, 2007, 2008, and 2012 of this title, and enacted provisions set out as notes under sections 1901, 2001, and 2002 of this title. For complete classification of this Act to the Code, see Short Title note set out under section 1901 of this title and Tables.

CODIFICATION

"This subchapter", referred to in subsecs. (a)(2) and (D)(1)(A), was in the original "this part", meaning former part A, "Automotive Fuel Economy", of this subchapter, which designation, the only part designation appearing in the subchapter, was struck out by section 8(a)(3) of Pub. L. 96-425.

AMENDMENTS

1988—Subsec. (e). Pub. L. 100-494 inserted at end "For purposes of this subsection, the Secretary shall not consider the fuel economy of alcohol powered automobiles or natural gas powered automobiles, and the Secretary shall consider dual energy automobiles and natural gas dual energy automobiles to be operated exclusively on gasoline or diesel fuel."

1980—Subsec. (b). Pub. L. 96-425, § 8(c), substituted "and such standards shall be set" for "and shall be set".

Subsec. (c). Pub. L. 96-425, § 3(a)(1), designated existing provisions as par. (1) and added par. (2).

Subsec. (d)(3)(E). Pub. L. 96-425, § 8(d), substituted "under this subsection" for "under this subparagraph".

Subsecs. (g) to (j). Pub. L. 96-425, § 7, added subsec. (g) and redesignated former subsecs. (g) to (i) as (h) to (j), respectively.

Subsec. (k). Pub. L. 96-425, § 5, added subsec. (k).

Subsec. (l). Pub. L. 96-425, § 6(b), added subsec. (l).

1977—Subsecs. (h), (i). Pub. L. 95-91 added subsecs. (h) and (i).

EFFECTIVE DATE OF 1980 AMENDMENT

Section 6(d) of Pub. L. 96-425 provided that: "Under such regulations as the Secretary of Transportation shall prescribe, the amendments made by this section [enacting subsec. (l) of this section and amending sections 2007 and 2008 of this title] shall apply to the 3 model years preceding the model year during which this Act is enacted."

Amendment by sections 3(a)(1), 5, 7, 8(c), (d) of Pub. L. 96-425 effective Oct. 10, 1980, see section 9 of Pub. L. 96-425, set out as a note under section 2001 of this title.

AMENDMENT OF CERTAIN APPLICATIONS FILED FOR MODEL YEAR 1981

Section 3(a)(2) of Pub. L. 96-425 provided that any application filed for model year 1981 under 15 U.S.C. 2002(c) before Oct. 10, 1980, could be amended by the applicant to make the election allowed under the amendment made by paragraph (1) [amending 15 U.S.C. 2002(c)] and have such application apply for the model years covered by the election, and that additional information could not be required in connection with such application for the years covered by such election except information which the Secretary of Transportation specifically requested.

REVIEW BY SECRETARY OF EXEMPTION REQUIREMENTS AND PROCEDURES; NOTIFICATION OF CONGRESS

Section 3(a)(3) of Pub. L. 96-425 required Secretary of Transportation to review the requirements and procedures established pursuant to 15 U.S.C. 2002(c)(1) as soon as practicable after Oct. 10, 1980, modify such requirements and procedures to maximum extent practicable in order to further reduce administrative burdens on such applicants and the Secretary, expedite determinations regarding such applications, and notify Congress of the review and actions taken or to be taken in the first annual report to Congress which is made under 15 U.S.C. 2012 after completion of such review.

SECTION REFERRED TO IN OTHER SECTIONS

This section is referred to in sections 2001, 2003, 2004, 2005, 2007, 2008, 2010, 2013 of this title; title 26 section 6427.

§ 2003. Calculation of average fuel economy

(a) Method of calculation

(1) Average fuel economy for purposes of section 2002(a) and (c) of this title shall be calculated by the EPA Administrator by dividing—

(A) the total number of passenger automobiles manufactured in a given model year by a manufacturer, by

(B) a sum of terms, each term of which is a fraction created by dividing—

(i) the number of passenger automobiles of a given model type manufactured by such manufacturer in such model year, by

(ii) the fuel economy measured for such model type.

(2) Average fuel economy for purposes of section 2002(b) of this title shall be calculated in accordance with rules of the EPA Administrator.

(3) In the event that a manufacturer manufactures electric vehicles, as defined in section 2012(b)(2) of this title, the average fuel economy will be calculated under subsections (a)(1) and (2) of this section to include equivalent petroleum based fuel economy values for various classes of electric vehicles in the following manner:

(A) The Secretary of Energy will determine equivalent petroleum based fuel economy values for various classes of electric vehicles. Determination of these fuel economy values will take into account the following parameters:

(i) the approximate electrical energy efficiency of the vehicles considering the vehicle type, mission, and weight;

(ii) the national average electricity generation and transmission efficiencies;

(iii) the need of the Nation to conserve all forms of energy, and the relative scarcity and value to the Nation of all fuel used to generate electricity;

(iv) the specific driving patterns of electric vehicles as compared with those of petroleum fueled vehicles.

(B) The Secretary of Energy will propose equivalent petroleum based fuel economy values within four months of enactment of the Act. Final promulgation of the values is

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? = include such time as per ~~other~~

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6/14/91
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Answers

Dr. J. H. Jones

Week - Fiction, reports & documents

Mar 4 1924

cc: [unclear]

Carl Kitzman

~~Handwritten notes:~~

Annals of the

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NI 1st sample

5.24.91

6-7 Mtg w/ Linda Lauer, Moses Boyd, Aug

Recycling

- * Scope of program - amount of \$.
- * NIST → addressing tech. technologies & materials that interfere w/ recyclability
 - ESR interested too.
 - * avoiding adversary.

* No one rate for everybody
→ Can't get to

m to lose Glenn - (v. close to VAA)

~~** Sasser **~~

TO REMOVE THE INCENTIVE???] In evaluating the various alternative forms for such standards, the Secretary shall adopt that form which best promotes the following goals:

- (1) maximizing overall energy conservation;
- (2) encouraging all manufacturers to adopt fuel efficient technologies;
- (3) preserving competition in the auto industry; and
- (4) minimizing the opportunities for manufacturers to adopt strategies that do not result in actual improvements in average fuel economy.

(b) Within 60 days after completing the rulemaking in subsection (a), the Secretary shall report to Congress on the basis for the selection of the chosen form of the standards.

(c) Not later than 24 months after enactment of this Act, the Secretary and the EPA Administrator shall make appropriate amendments to regulations issued under the authority of this Subchapter (including regulations regarding the calculation of credits and of average fuel economy), to assure that such regulations conform to the results of the rulemaking specified in subsection (a). [??? DOES THIS MAKE SENSE GIVEN THAT THE STANDARDS DON'T KICK IN UNTIL 1996; HOW WILL SECRETARY KNOW UNTIL THEN WHETHER THE SCHEME IS ACHIEVING INTENDED OBJECTIVE?? BETTER TO ASK FOR THIS EVALUATION IN 1997???

??? ADDITIONAL SUGGESTIONS AS TO HOW TO PLUG LOOPHOLES AND ENSURE THAT STANDARDS ARE MET???

??? SHOULD WE ADD SOME LANGUAGE HERE THAT ALLOWS THE SECRETARY OT WORK WITH TREASURY TO SET UP A FEEBATE SCHEME IF IT IS DETERMINED THAT SUCH A SCHEME COULD HELP ENSURE THAT THE TARGETS ARE MET???

Strike all that appears from page 12, line 16, through page 13 , line 8, and insert in lieu thereof the following:

not reduce any such standard by an amount greater than that specified in the following table:

Affected Model years	Maximum standards reduction (miles per gallon)	
	<u>Passenger automobiles</u>	<u>Light trucks</u>
1996 through 2000	1.5	1.0
2001 and thereafter	3.0	2.0

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??? WOULD IT BE PREFERABLE HERE, RATHER THAN ADJUSTING THE REQUIRED MPG, TO ALLOW A 2-YEAR ROLL-BACK OF THE DEADLINES SO THAT THE FIRST 34 MPG WOULD BE ACHIEVED BY 1998 AT THE LATEST AND 40 MPG WOULD BE ACHIEVED BY 2003 AT THE LATEST?

??? ANY REASON TO CHANGE THE IMPORT/DOMESTIC RULES???

??? ANY REASON TO CHANGE THE CREDIT SYSTEM???

*unions still
(like) domestic
autos don't.
enrags feel this is
another loophole.*

United States Senate

WASHINGTON, DC 20510-4202

to: greg
from: katie
re: cafe

There are two major problems with bryan's bill. First, the mileage targets are very ambitious and most likely unrealistic, and second, use of a uniform percentage increase to achieve the desired mpg has some perverse effects.

1. MILEAGE:

Bryan requires each automobile manufacturer in 1996 to achieve a 20% increase in fuel economy from its 1988 average. By 2001, an additional 20% increase is required. The corporate average (CAFE) in 1996 would then be 34 mpg (today's level is 27.5 mpg) and in 2001, CAFE would be 40 mpg.

OTA's analysis of these numbers is the most recent, thorough, and credible available. Plotkin tells me -- unequivocally -- that 34 mpg by 1996 is impossible. He thinks that 31 mpg by that date may be possible. However, he says that a target should not be set for 1996 at all -- because of the lead time required by manufacturers, 1998 is a much more realistic date. By 1998, Plotkin says that Bryan's 34 mpg is "conceivable".

As to the 2001 target of 40 mpg Plotkin does not say that it is impossible, but he says that it can only be achieved if the latest technology (for example, two-stroke engines) is perfected AND widely penetrates the market AND alternatively fueled vehicles are widely used. Even at that, Plotkin only says that 40 mpg "may be" achieved.

If we raise this issue, Linda may fall back on the discretion that is given to the Secretary to roll the targets back. If she does so respond, we can use that to our advantage in discounting any objection she might otherwise raise to our vesting the Secretary with discretion to choose the best way to achieve the mpg target we would set in the bill.

Plotkin's analysis shows that the following targets are achievable:

2. UNIFORM PERCENTAGE INCREASE:

UPI requirements present issues of fairness, workability and effectiveness:

- o Fairness: The UPI approach penalizes manufacturers who have voluntarily exceeded the CAFE standards because they have already put into use much of the advanced fuel economy technology on which the increase in CAFE standards is based.

United States Senate

WASHINGTON, DC 20510-4202

o **Workability and Effectiveness:** The UPI approach lacks a mechanism for dealing with new entrants into the US automotive market and the practice of "rebadging" (selling one manufacturer's product under another's name).

As to the new entrant problem, we could possibly solve it by setting some CAFE floor that the new entrant would have to meet. We likely would determine that floor by requiring the Secretary to compare the new model with similar models already in the US market. We would thereby keep the notion of size-class standards alive. However, we would NOT thereby help Nissan -- Nissan already is in both the US car and truck markets.

The rebadging problem, however, defies solution. UPI encourages this practice because standards are set on a manufacturer - by - manufacturer basis. A manufacturer that has a higher target to achieve therefore has a strong incentive to have a manufacturer with a lower CAFE requirement sells his big gas guzzlers. Note that the ultimate effect of this game is that Bryan will not achieve the 40 mpg he says he will. In fact, manufacturers may not have to improve their fuel economy at all:

For example, assume that there are two manufacturers in the market. The first has a 40mpg target, the second a 20 mpg target. The first guy produces 2 models -- one that achieves 50 mpg and one that achieves 30 mpg. The second guy produces one 15 mpg model and one 25 mpg model. If the first guy asks the second to produce his 30 mpg model, he has a much easier time of making his target, and in fact, can produce some gas guzzlers whose poor mpg performance will be offset by his 50 mpg winner. The second guy is psyched to do this 'cause now he has a 30 mpg model in his line, which means he can produce alot more 15 mpg models and still meet his 20 mpg target.

If standards were instead developed on a model by model (rather than a manufacturer by manufacturer) basis, this problem would NOT arise.

3. OUR AMENDMENT:

As currently drafted, the bill retains Bryan's numbers. We need to decide whether we want to be the ones to carry more responsible numbers. However, if we are trying to do something real here and build a coalition behind our amendment, we need to keep in mind that, for the most part, Senators who have a problem with the Bryan bill oppose it primarily because the numbers are too ambitious -- they are not particularly concerned that the UPI screws the Japanese or is not very workable (in fact, they are probably pleased that it is not workable!). It is only a few Senators (Hatfield, Packwood, Ford?) who have imports in their states that are concerned.

As to our mechanism for getting to the 34 and 40 mpg targets, we direct DOT, through a rulemaking, to devise a mechanism that best promotes the following goals:

- (1) maximizing overall energy conservation;

United States Senate

WASHINGTON, DC 20510-4202

(2) encouraging all manufacturers to adopt fuel efficient technologies;

(3) preserving competition in the auto industry;

(4) minimizing the opportunities for manufacturers to adopt strategies that do not result in actual improvements in average fuel economy.

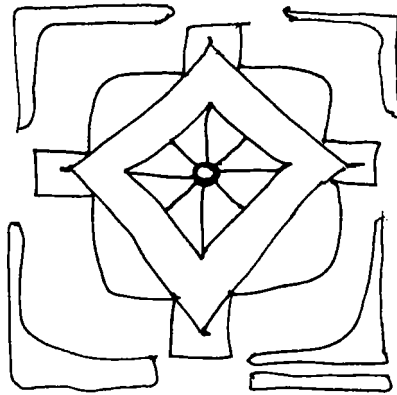
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'96 can be pushed back 2 yrs

* Criticality : When there is communication throughout the entire system.

(After transition stage in which it builds up.)



P.2/2 2/2

National Energy Strategy

August recess, a source says.

The legislation will be "largely based" on bills introduced by energy and power subcommittee chairman Philip Sharp (D-IN), a source says. Sharp has introduced separate packages dealing with energy efficiency, the Strategic Petroleum Reserve and natural gas regulation. In addition to these, Sharp is studying possible vehicles to deal with coal, including bills by Energy & Commerce ranking minority member Norman Lent (R-NY), and Rick Boucher (D-VA).

The subcommittee official says Sharp also has drafted a proposal on coal that is circulating among members of the energy and power panel. The draft includes coal bed methane extraction provisions the source calls "good for developing the resource and good for global warming."

The final subcommittee package may contain a separate global warming title but Sharp is waiting to see how the issue is addressed in other titles, the source says. The chairman believes efficiency, alternative fuels, coal and other provisions will go a long way toward addressing global warming, the source says.

Senate Energy Bills**COMPROMISE TO ADD LEAD TIME, BOOST FUEL ECONOMY NUMBERS, OFFICIALS SAY**

Key congressional officials predict an emerging Senate compromise on corporate average fuel economy provisions between the Bryan and Johnston-Wallop energy bills will revise the Johnston bill's CAPE amendment to add more lead time for carmakers while mandating specific fuel efficiency numbers. Sen. Albert Gore (D-TN) reportedly is spearheading the compromise. The Johnston bill now would require Transportation Dept. officials to set fuel economy standards based on their assessment of technology; the Bryan bill would require a 40% boost in fuel economy by 2001.

"The standards are much more achievable and palatable by moving the dates back at least two or three years than by changing the numbers, now locked in the public consciousness," says an official with the congressional Office of Technology Assessment. A Senate official agrees with OTA's assessment to expect very little improvement in fuel economy by 1996 - the Bryan bill's current starting point. The official says "lead time is the heart of the debate, and more lead time makes common sense." Automakers' one message throughout the debate, the official says, "has been: lead time, lead time, lead time." Senate officials who support the compromise claim automakers need a 10-15 year lead time due to the length of time required for fleet turnover.

Meanwhile, environmentalists June 25 kicked off a national grassroots petition and postcard drive to defeat "the Bush/Sununu/Johnston national energy tragedy." Sen. Paul Wellstone (D-MN) has championed the campaign but warns that industry lobbyists will prevail without strong public support of the environmentalist position. Sen. Bennett Johnston (D-LA) -- the bill's cosponsor -- is trying to push Senate Majority leader George Mitchell (D-ME) to bring his bill to the floor before the campaign gets rolling, according to a congressional source.

Johnston would prefer the Senate debate his bill after its July 4 recess. But current debate on President Bush's comprehensive anti-crime bill may last for weeks blocking access to the Senate floor, according to a congressional source. The White House would prefer to wait for a study on fuel economy from the National Academy of Sciences slated for the fall, according to the source.

Global Warming**Congressional Action****CO2 OFFSET PLAN TARGETING UTILITIES MAY MOVE IN HOUSE ENERGY PACKAGE**

A bill to require major emission sources, primarily power generators, to obtain offsets for carbon dioxide emissions would expand the national energy debate in Congress to include the first substantive discussions on legislation to cut greenhouse gas emissions. The measure, a reintroduction of similar provisions offered last Congress, was proposed by Rep. Jim Cooper (D-TN) and Rep. Mike Synar (D-OK) and was the subject of a lengthy June 19 hearing on global warming by the Energy & Commerce Committee panel on energy and power. The bill, H.R. 2663, would mandate that large new stationary sources find offsetting credits for the increased CO2 emissions they would cause.

Supporters of the Cooper-Synar bill would like to see the bill folded into the energy package being

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POLICY CONSULTING SERVICES, INC.

JOHN V. MOLLER, PRESIDENT

TO: Katie McGinty
FROM: John Moller
DATE: July 31, 1991

Katie, is there something you meant to tell me but forgot?