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Autos Cry for Alcohol; France Will Do Its Part

NYT 12/30/87 By JAMES BROOKE

Special to The New York Times

RIO DE JANEIRO, Dec. 29 — As they set out for summer vacations these days, Brazilian drivers are likely to scan the sea lanes before they scan the highway lanes.

Help comes only on the high seas for owners of Brazil's 4.5 million alcohol-powered cars. Hailed as a model alternative energy project a decade ago, Brazil's alcohol program stumbled in recent weeks as sugar-cane distillers switched from producing alcohol fuel to a more profitable product, sugar.

With hooded pumps proliferating, alcohol lines stretching and tempers rising with the heat of the Southern Hemisphere's summer, energy officials seek help from afar — tankers filled with methanol from Chile, with corn ethanol from the United States and with a liquid described as "French grape alcohol."

"You can't really call it wine," an official at the state oil company, Petrobrás, said, wincing at the suggestion. "Wine has a much lower alcohol content."

A Matter of Class

The trouble over fuel has taken on a special resonance in class-conscious Brazil, because owners of alcohol-powered cars represent the most affluent segment of society. About 90 percent of all new cars sold in the last four years were alcohol-powered.

In the chic ocean-front neighborhoods of Ipanema, Copacabana and Leblon, the new muse of the beach set this week was Marta, an ungainly Petrobrás tanker that docked here to

deliver Rio's alcohol fuel in time for the New Year weekend.

In addition to denouncing distillers who take advantage of high international sugar prices, the talk of Rio's fuel lines centers on various alcohol "cocktails" that the Government plans to pump into fuel tanks.

French grape alcohol and American corn alcohol are met with grumbling acceptance. But the Chilean methanol provoked street protests.

"Something out of a horror movie," said Carlos Minc, a Green Party city councilman who last month led a picket line outside Petrobrás headquarters here.

Lower Mixture Tried in U.S.

According to the Greens, the only significant use of methanol is at the Indianapolis 500 car race and in American urban tests, where the fuel formula is 3 percent methanol and 97 percent gasoline.

Brazil's mixture would be 33 percent methanol, 60 percent ethanol and 7 percent gasoline.

"Brazil would become a great laboratory in which its inhabitants would be guinea pigs," Tereza Lobo wrote in the Rio daily Jornal do Brasil.

The Greens warned that odorless methanol fumes would poison attendants working in parking garages and drivers stalled in rush-hour traffic in Rio's mountain tunnels.

The debate also brought out the casual attitudes that many Brazilian fuel-station attendants have toward sugar-cane alcohol fuel.

Many work in plastic sandals,

splashing fuel on their feet. Others use the fuel to wash their hands or as a home cleaning solvent. Sometimes, underpaid attendants gulp a few shots of fuel as a cheap intoxicant.

"Fuel-station attendants will have to wear protective gear like astronauts," the Rio daily *Globo* warned under a picture of an attendant wearing goggles, mask and rubber apron, boots and gloves.

On the road, a Brazilian driver who runs out of fuel will often insert a rubber hose in the tank of another car, start a siphon by sucking on the hose and then spit out fuel.

"Four milliliters of methanol causes blindness; more than eight milliliters can be fatal," the Greens said.

In recent weeks, methanol was banned as a fuel in São Paulo and Porto Alegre, two cities with mayors from the left-wing Workers' Party.

This month, as the tanker *Cabo Negro* laden with 50 million liters of Chilean methanol neared Brazil's shores, the anti-methanol chorus grew louder.

Greens Protest Around Tanker

Borrowing a tactic from the international environmental group Greenpeace, the Greens festooned a rented schooner with protest banners and sailed circles around the tanker as it approached a Petrobrás terminal in São Paulo state.

To allay fears, the state oil company promised to add red coloring to the colorless liquid. But on Dec. 5, three days after the tanker unloaded, a federal judge banned the use of methanol as car fuel in Brazil until further scientific study is completed.

In São Paulo, environmentalists blocked an effort to ease the shortage with the 22 percent alcohol content of gasoline sold in the city. Scientists said the widespread use of sugar-cane alcohol had cut air pollution in Brazil's largest city.

With environmental threats largely averted and American and European alcohol shipments not expected until late January, Brazil has settled down to a full-blown energy crisis.

Taxi fleets have started to glide to a halt, as many as two-thirds of Rio's service stations have closed their alcohol pumps, and last Tuesday a 400-car alcohol line blocked traffic on the Rio-São Paulo highway.

Converter's Phones Are Busy

"I get 200 telephone calls a day, compared with 20 calls six months ago," said Affonso Carapenticow, manager of Retifica Recamavo, an auto repair shop that specializes in converting alcohol engines into gasoline engines.

"Listen, I drove from São Paulo the day after Christmas," he said, referring to a 300-mile drive. "In the last half of the trip, all the alcohol pumps

were closed."

Used car dealers have started charging a 20 percent premium for gasoline cars.

"When they hear my car's alcohol, they hang up the phone," said a young man here who has placed a classified ad in a local newspaper.

Brazil's automobile manufacturers have changed their lines to produce 80 percent gasoline cars and 20 percent alcohol cars — a virtual reversal of last year's proportion. Manufacturers are also preparing conversion kits to sell to owners.

Prices Being Raised

In Rio, with a 40 percent shortfall expected in alcohol supplies in January, taxi drivers are lobbying for permission to convert their cars to bottled cooking gas.

To ease shortages, the Government is considering raising alcohol prices,

a measure supported by the World Bank, which calculates that alcohol subsidies cost the Government \$2.5 billion a year.

Indeed, low producer prices are at the heart of the shortage. In recent years, alcohol consumption grew 10 percent a year, while land under sugar-cane cultivation shrank 4 percent a year.

While drivers wait in line this summer, alternatively blaming Government planners and environmentalists, Mr. Carapenticow says he will have no complaints.

His alcohol-motor conversion business has been so busy that a Brazilian auto parts supplier this week awarded him a free summer vacation in the Bahamas.

"The telex said, 'Just bring shorts and sunglasses,'" he said during a brief moment on Thursday when his five desk telephones stopped ringing.

DRAFT

INCENTIVES INDEX

*John W. ...
Alternative
Fuels*

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8500 <

125 cities < 60? (more than 22)

1995 - 96

Trading beyond 26,000 lbs

Fuel people paying for infrastructure
under Seffords

May 3, 1991

FUEL COST DIFFERENTIAL

I. Proposal

A. Federal Motor Fuels Exemption

Establish a national energy policy to encourage the use of alternative fuels from diverse sources. Such a policy would continue the current non-taxed status of compressed natural gas (CNG) and would also require a rollback of alternative fuel taxes.

1. Congress must affirmatively commit itself to refraining from imposing federal excise taxes on the sale or use of clean alternative fuels used for transportation purposes.
2. Prohibition would continue until alternative fuels constitute 30% of transportation fuel use.¹ Thereafter, alternative fuels would bear their fair share of road use taxes.

B. State Motor Fuels Exemption

1. (Pre-emption Option) Pre-emption of state authority to impose taxes on sale or use of clean alternative fuels, including electricity used for motor vehicles.
2. (Clean Air Act Option) Provide that if a state imposes a tax on clean alternative fuels used for transportation, it must revise its State Implementation Plan filed under the Clean Air Act and receive EPA approval of such provision. EPA would only approve a SIP provision if a sufficient amount of emission reductions from other mobile and stationary sources could be achieved to offset projected increases in emissions resulting from higher priced clean alternative fuels.

II. Rationale

Any favorable cost differential between alternative fuels and conventional fuels becomes marginal at best when future road use taxes are included. The uncertainty regarding the future tax treatment of clean

¹ Sunsetting the proposal based on percentage of fuel used makes more sense than a fixed date. If such a date were needed, it should be either 2010 or 2015.

alternative fuels by federal and state governments prevents fleets from pursuing long-term commitments based on current attractive prices.² For example, the marketplace differential for CNG right now is 30-40 cents/gallon relative to gasoline. If CNG were taxed, this competitive price advantage would be eliminated.

Policymakers can exploit the status quo -- the uncertain but economic attractiveness of CNG and other alternative fuels. They can provide greater long-term certainty for vehicle owners considering the use of alternative fuels for transportation by ensuring that these fuels will not be taxed in the future.

III. Economics

Existing federal law taxes gasoline used for highway transportation at 14 cents per gallon. State gas taxes comprise an additional cost to fuel users, averaging 17 cents per gallon nationwide and ranging as high as 22 cents per gallon. Therefore, a prohibition of federal and state taxation of clean alternative fuels sold and used for transportation purposes could result in a competitive advantage for alternative fuels over their gasoline or diesel counterparts in the range of 30 cents per gallon, depending on the state gasoline tax. For example, for trucks traveling between 13,000 and 16,000 miles per year with a fuel economy range of 5-7 miles per gallon, this proposal would constitute a functional subsidy of \$ 650-700 per year.

IV. Parties Affected

- A. All consumers of alternative fuels, not just fleets, could benefit from the tax exemption for alternative motor fuels. In effect, the prohibition of future taxation of such fuels, until they are sufficiently utilized, would guarantee a subsidy towards reliance on non-gasoline products.

² Fuels are taxed very differently under existing federal law. For example, CNG, LNG, and electricity for transportation use are not taxed. But, federal taxes are imposed on fuels such as gasoline (14 cents/gallon); diesel for highway use (20 cents/gallon); special motor fuels for highway use such as benzene, liquefied petroleum gas (14 cents/gallon); methanol or ethanol derived from natural gas (7 cents/gallon); methanol or ethanol derived from substances other than petroleum or natural gas (8.6 cents/gallon); gasohol (either 6.1 or 6.7 cents/gallon depending on use of ethanol). 26 U.S.C.A. § 4041, 4081, 4091 (West ed. 1990).

Note, however, that the budget consequences will be small as the alternative fuels are generally not taxed now as heavily as conventional fuels and the quantity consumed is minuscule.

- B. Some road users would object to any variation from the "users pay" requirement. The proposal would counter their objections because it would sunset when alternative fuel vehicles are significant users of highways. It is merely a transitional incentive to achieve a higher policy goal.
- C. If the Clean Air Act option is used, it would affect all sources regulated by its nonattainment provisions. If an emissions source is located in a nonattainment area, and a SIP revision is required because the state taxes clean alternative fuel, other sources, stationary and/or mobile, must offset the pollutant emission reductions lost through elimination of the tax advantage enjoyed by alternative fuels over gasoline and diesel. Thus, state taxation of these fuels would trigger more stringent emissions limits on entities emitting pollutants similar to those released by cars and trucks. This would create allies for alternative fuel users from among these other sources.

V. Expected Result

- A. Federal and State exemptions: provide a major incentive to vehicle owners to use alternative fuels throughout the nation. Private fleets, which are subject to such taxes, would find the competitive advantage of alternative fuels much to their liking. Public fleets, which do not necessarily pay federal gasoline taxes, would benefit from the increased vehicle availability and infrastructure that would arise as a result of private fleet purchasing decisions.
- B. Clean Air Act option: this proposal would cover 96 ozone nonattainment areas nationwide, representing approximately 60 percent of total U.S. population, but would have its strongest impact on the 22 worst polluted cities covered by the Clean Air Act. The difficulties inherent in obtaining initial EPA approval of a SIP would create an extremely large incentive for states containing nonattainment areas to avoid triggering additional emission reduction requirements by refraining from taxing the use of clean alternative fuels. This would result in a competitive price advantage for alternative fuels

and encourage their increased use. It would help overcome any marketplace bias towards clean diesel and reformulated gasoline, which would continue to be fully taxed.

"BUBBLE": ALTERNATIVE COMPLIANCE WITH CLEAN AIR ACT

I. Proposal

A. Vehicle Miles Traveled

The Clean Air Act requires that in severe ozone nonattainment areas, employers must implement programs to reduce work-related vehicle trips and miles traveled by employees. Some areas, such as Southern California, have already begun to require employers to subsidize employees' use of carpools or public mass transit.

The "bubble" proposal would provide that an employer that purchases and utilizes alternative fuel vehicles to an extent beyond that required by law would be exempted from the mandated expenses associated with trip reduction requirements. For each alternative fuel vehicle, the employer would be relieved of a ride-reduction subsidy for an employee.

B. Vapor Recovery

To decrease mobile source emissions, the Clean Air Act imposes costly requirements for fuel vapor recovery on vehicles and refueling facilities.

If an alternative fuel refueling facility is established, the "bubble" proposal would provide that a gasoline refueling facility owned by the same owner would not be subjected to the Clean Air Act Stage II vapor recovery regulations and special refueling equipment requirements contained therein. For each alternative refueling "pump" added, a service station or fleet central refueling station would be excused from Stage II at their location.

In addition, this "bubble" proposal could be extended to provide that vehicle manufacturers would be exempted from having to install an onboard vapor recovery system on a gasoline powered light duty vehicle (provided that such vehicle is not sold in one of the worst polluted cities), for each alternative fuel vehicle they build.

II. Rationale

Under this "bubble" proposal, emission reductions potentially achieved under the Clean Air Act trip reduction, employee travel, and vapor recovery restrictions are displaced by reductions resulting from the switch by fleets and individuals to clean alternative fuels. What emissions reductions, if any, lost early would be made up later from the more rapid shift to alternative fuel.

III. Economics

At present, employers must pay as much as \$15/month per employee to subsidize carpooling and mass transit use under some trip reduction plans. For a vehicle traveling 250 miles a week (and 5 to 7 mpg) the "bubble" would constitute a \$.30 - \$.41 a gallon subsidy.

The Stage II vapor recovery aspect of this proposal would constitute a major incentive for public service stations. It has been estimated that Stage II compliance can be at least \$220,000 a station, which is approximately the cost for a small fast-fill CNG pump.

IV. Parties Affected

For the trip reduction aspect, the primary beneficiaries would be large employers.

With respect to refueling facility vapor recovery, service station operators would have a marketplace alternative to Stage II. Likewise for manufacturers, but to a lesser extent. Indirectly, alternative fuel purchasers and other consumers would benefit from the increased availability of alternative fuels and the lower expenses for refueling facilities.

V. Expected Result

Employers will voluntarily purchase clean alternative fuel vehicles in urban areas rather than subsidizing employee travel to and from work. Refueling facility operators will switch to alternative fuels rather than incur the costs of installing Stage II vapor recovery equipment.

EMISSION TRADING

I. Proposal

Establish emission credit trading system between mobile and stationary sources in order to encourage increased voluntary use of clean alternative fuels.

Under such a trading scheme, vehicle operators that use clean alternative fuels would receive marketable credits for emitting lower levels of pollutants regulated by the Clean Air Act. These credits could then be sold or traded to stationary source operators for use in complying with their Clean Air Act emission permits.

II. Rationale

Vehicle operators would have an incentive to use clean alternative fuels if, by doing so, they could obtain marketable emission credits to defray the cost of having purchased alternative fuel vehicles.

III. Economics

It is generally cheaper to achieve a one-ton reduction in emissions from mobile sources than stationary sources.

IV. Parties Affected

Fleets could generate numerous credits under this proposal and sell or trade them to stationary sources affected by the acid rain and air toxics regulations of the 1990 Clean Air Act Amendments. Indirectly, this would affect alternative fuel suppliers by increasing demand for clean fuels.

V. Expected Result

This proposal would increase the depth and liquidity of the existing emission allowance trading program for utilities. Such "environmental arbitrage" would make clean alternative fuels more attractive to fleet operators and would facilitate Clean Air Act compliance for both utilities and industrial sources of pollutants similar to those emitted by motor vehicles.

**DEREGULATION INCENTIVES (REMOVAL OF
UNNECESSARY TRUCK WEIGHT LIMITS)**

I. Proposal

Increase the voluntary use of alternative fuels by fleets by adopting regulatory reforms at the federal and state levels to increase the use of triple truck-trailer combinations. When a company voluntarily acquired a sufficient level of heavy duty alternative fuel vehicles (trucks above an 8,500 lbs. gvwr cap on a vehicle acquisition mandate), such fleet would be awarded "Most Favored Energy Consumer" status, entitling it to several forms of regulatory relief. Chief among these would be the authority to rely on triple trailers to transport goods in interstate and intrastate commerce. To attain such status as an energy progressive company, which would be akin to "Most Favored Nation" status in U.S. international trade law, a company must exhibit substantial voluntary acquisitions in the 22 worst polluted cities covered by the Clean Air Act.

II. Rationale

Must of the impetus behind government efforts to increase use of alternative fuels is the goal of reduced petroleum consumption. Triple trailers can similarly help achieve this goal due to their significant productivity and fuel efficiency. By focusing on fleets in the 22 Clean Air Act cities, the proposal recognizes the need to improve air quality there and the expected development there of the necessary alternative fuels infrastructure.

III. Economics

Triple trailers offer as much as 30% greater fuel efficiency and an even greater level of capacity, than double trailer configurations. Thus companies relying on triples would enjoy economic benefits that would defray the costs of obtaining alternative fuel vehicles.

IV. Parties affected

Companies with heavy duty trucks would be the prime direct beneficiaries of this proposal, for if they acquire sufficient alternative fuel trucks, to receive "Most Favored Energy Consumer" status they will be able to enjoy the advantages of relying more extensively on triple trailers. This proposal would also increase demand for alternative fuel heavy duty vehicles and supplies of such fuels.

Consumers would benefit from increased use of triple trailers because the capacity and fuel efficiency gains would likely translate into lower trucking and delivery costs.

V. Expected Result

Interstate long haul fleets of trucks will likely move towards acquiring alternative fuel vehicles in order to secure the benefits of federal and state regulatory reform facilitating the use of triple trailers.

GRANT PROGRAM FOR EQUIPMENT AND VEHICLES

I. Proposal

The Federal Government should provide financial grants assistance to private entities and state and local governments that purchase alternative fuel vehicles or necessary refueling equipment. The Federal Government share of vehicle purchases would be limited to the amount by which the cost of an alternative fuel vehicle exceeds that of a comparable conventionally fueled vehicle. (This proposal is similar to Section 203 of H.R. 560, introduced by Rep. Leon Panetta.)

II. Rationale

Cost remains a significant barrier to the increased use of alternative fuel vehicles. In an effort to encourage reliance on a diverse group of alternative fuels, and thus reduce U.S. dependence on imported petroleum, Congress should facilitate the purchase of such vehicles and refueling equipment. This grant program would "jumpstart" alternative fuel vehicle manufacturing by assuring auto and truck makers that there will be a market for their products.

III. Economics

Alternative fuel vehicles generally cost a few thousand dollars more than their gasoline or diesel-powered counterparts. Further, the cost of establishing a refueling facility, such as for CNG, can run as high as \$750,000.

This proposal would rely on the financial resources of the Federal Government to permit private companies such as fleet operators, as well as state and local governments, to overcome these prohibitive expenses.

IV. Parties Affected

This proposal would directly affect private companies and state and local governments that are considering alternative fuel vehicles but can not afford to purchase them or establish refueling facilities. It would also directly affect vehicle manufacturers by facilitating the purchase of their vehicles.

Increased vehicle availability would indirectly benefit individuals considering a purchase of an alternative fuel vehicle and would generate a greater market for alternative fuel suppliers and distributors.

V. Expected Result

Parties eligible for federal grants can be expected to apply for such assistance, thus increasing the demand for and use of alternative fuel vehicles on a voluntary basis. More vehicles will be produced, thus reducing the cost borne by individuals unable to receive grants and by the Federal Government, which must purchase these vehicles for its own fleet.

LUST FUND: AUTHORIZED EXPENDITURES FOR LOAN GUARANTEES

I. Proposal

Promote the increased voluntary use of alternative fuels by relying on the Leaking Underground Storage Tank Fund (LUST Fund) to initiate a federal loan guarantee program -- the "Alternative Fuel Refueling Facility Assistance Program" -- that would enable entities to overcome the significant costs involved in establishing alternative fuel refueling facilities. Borrowers such as private commercial fleet operators would thus have access to much needed capital at rates favorable enough to induce voluntary shifts to alternative fuels.

II. Rationale

A major obstacle to the increased reliance on alternative fuels by fleet operators is the cost of building necessary refueling facilities. A CNG refueling facility for 100 vehicles, for example, can cost as much as \$750,000 to establish. This proposal would rely on the financial backing of the Federal Government to ensure access to low interest loans for entities wishing to build such facilities.

III. Economics

An "Alternative Fuel Refueling Facility Assistance Program" would not be a grant program, but a loan guarantee program using sums currently untouched in the LUST Fund. According to the EPA Office of Underground Storage Tanks, the Fund currently contains approximately \$500 million, and annual spending on storage tank purposes is generally met by annual LUST tax revenues. (Money is raised for the Fund through a 1/10 of a cent tax on automobile fuel and is channeled to state and local governments through EPA's regional offices.)

IV. Parties Affected

Companies considering a switch to alternative fuels could rely on this program to build necessary refueling facilities. Alternative fuel suppliers would directly benefit from increased demand for their products. Additional refueling facilities would indirectly benefit vehicle manufacturers because the absence of an alternative fuel infrastructure has impeded the development of a strong market for such vehicles.

V. Expected Results

With the infrastructure development assistance available under this proposal, an increased voluntary reliance on alternative fuels by companies, particularly commercial fleet operators, will result.

HIGHWAY TRUST FUND: ASSISTANCE FOR MUNICIPAL FLEETS

I. Proposal

Utilize the Federal Highway Trust Fund to provide financial assistance to municipal governments that purchase alternative fuel vehicles. Additionally, use the Fund to subsidize alternative fuel vehicle demonstration projects by private commercial fleet operators.

II. Rationale

Governments can and should lead by example. By facilitating the purchase of alternative fuel vehicles at the local governmental level, the Federal Government will encourage the general public to rely more extensively on alternative fuel vehicles. By assisting some private commercial fleets with demonstration projects, this proposal also enhances the likelihood

that other fleets will voluntarily switch to using alternative fuels.

III. Economics

The Federal Highway Trust Fund is a logical source of financial resources for promoting the nationwide use of alternative fuels. As of January 30, 1991, the Treasury Dept. reported that the Fund had a balance of over \$9 billion. During the last fiscal year, expenditures from the Fund fell short of revenues, indicating that there is some money available for alternative fuel vehicle promotion. This proposal would utilize the Fund to defray the incremental cost differences between alternative fuel and conventional fuel vehicles that provide obstacles to greater use of alternative fuels by municipalities. Funding demonstration projects will increase the ability of private fleets to experiment with this new technology.

IV. Parties Affected

Directly, this proposal would affect municipal governments and selected private commercial fleet operators, as well as vehicle manufacturers, who would experience an increased demand for alternative fuel vehicles. The increased availability of such vehicles would indirectly benefit individuals considering a switch to alternative fuels.

V. Expected Results

As more municipal governments purchased alternative fuel vehicles for their fleets, an alternative fuel infrastructure could be expected to develop throughout the nation. Given a more readily available source of alternative fuels, and the likely success of the demonstration projects, private commercial fleets would voluntarily increase their reliance on such fuels. Vehicle demand would rise, making vehicle availability less of an obstacle to consumers and other parties considering reliance on alternative fuels.

CURTAILMENT PRIORITY

I. Proposal

In an effort to promote the increased reliance on alternative fuels, the Federal Government should provide that when such fuels are destined for transportation use, they are not subject to curtailment in any

situation, even in the case of a non-interruptable contract.

II. Rationale

There already exists a national curtailment policy that prohibits fuel supply shortages for schools, hospitals, and other essential needs. Since a greater use of alternative fuels is in the public interest, efforts should be made to facilitate their use for transportation purposes. Without curtailment protection, for example, operations of major commercial fleets that rely on alternative fuels could be jeopardized. Further, if dedicated engine alternative fuel vehicles are to be relied on by governments, private industry, and consumers, the potential for curtailment must be eliminated.

III. Economics

Parties benefiting from curtailment priority could be expected to pay more in the marketplace for non-interruption of supplies. A failure to protect alternative fuel users from supply shortages could, by contrast, have a negative effect on the economy and essential services provided by government and private industry.

IV. Parties Affected

Public and private fleets would be the biggest beneficiaries of curtailment priority because of the ensured access to alternative fuels. For fuel suppliers, extending curtailment protection to transportation users would mean that they must curtail nonpriority users to a greater extent.

V. Expected Results

With curtailment priority, vehicle manufacturers would find an increased demand for dedicated engine alternative fuel vehicles. Such priority would also serve as a major incentive to private commercial fleets, such as delivery services, which are dependent on effective and efficient dispatching and vehicle utilization. As a result, the level of service consumers receive from government and private fleets would be unaffected by a switch to alternative fuels.

COMPETITIVE FUEL SUPPLIER REQUIREMENT

I. Proposal

For fleets that are not centrally fueled, any mandated purchases or use of alternative fuel vehicles will not apply if three or more retail dispensers of such alternative fuel are not located in the fleet's area of operations. For fleets that are centrally fueled, such mandates would not apply unless three or more alternative fuel suppliers are actively engaged in wholesale transactions in the area that includes the fleet's central facility. A supplier would not be considered to be "actively engaged" if it is unwilling to install alternative fuel refueling equipment for a fleet at its own expense.

II. Rationale

For fleets to rely successfully on alternative fuels, there must be an assurance of adequate supply and competitive pricing. In the absence of true competition, fleets will be held captive by a fuel supplier and charged monopoly prices. By exempting fleets from mandated purchases and use of alternative fuel vehicles unless there are competitive fuel supplies, the Federal Government would provide fleets with necessary economic and logistical safeguards.

III. Economics

Fleets and other users of alternative fuels run the risk of encountering monopoly pricing from fuel suppliers. Competitive pricing and assured supply are essential for the move to alternative fuels and away from imported petroleum products. This proposal would serve to stimulate competitive pricing because any mandate-based market would be eliminated in the absence of 3 or more suppliers. For centrally fueled fleets, the cost obstacle of installing refueling equipment can be better borne by the fuel supplier, which has the technological capability and the guarantee of a return on its investment.

IV. Parties Affected

All fleets, including those centrally fueled, would benefit from the competitive supplier requirement. Consumers and other users of alternative fuels would also directly benefit from the development of a diverse fuel marketplace in an area. In such an environment, we can expect that more parties would favorably consider a

move to alternative fuels as long as the price remained advantageous over conventional fuels.

Under this proposal, alternative fuel suppliers would have to create an infrastructure and to compete in an area because if fewer than three were in operation, no mandates would apply and the market would ostensibly evaporate. Therefore, they could be expected to oppose the competitive supplier requirement. Similarly, in the absence of competition, any vehicle purchase or use requirements would cease to be effective, and manufacturers would have less demand for their vehicles.

V. Expected Result

If national policy supports competition among alternative fuel suppliers, we should see the development of a diverse alternative fuels infrastructure and a greater voluntary shift to such fuels by fleets.

TAX CREDIT FOR REFUELING EQUIPMENT AND VEHICLES

I. Proposal

Provide federal and state tax incentives, such as tax credits, for individuals and businesses that purchase alternative fuel refueling equipment and vehicles.

II. Rationale

The Federal Government can help individuals and businesses overcome the primary obstacle to reliance on alternative fuels: the cost of vehicles, and, where applicable, refueling equipment. In enacting such a subsidy, the Government would not just be assisting purchasers financially. Tax credits of this nature would signal the advent of a new national energy policy focused on clean alternative fuels.

III. Economics

The cost of an alternative fuel vehicle exceeds that of conventionally fueled vehicles by as much as \$2500. Tax credits can create a more level playing field for such vehicles by offsetting the incremental cost of a dedicated or flexi-fueled alternative fuel engine.

Refueling equipment can be a significant expense for any alternative fuel user. Although fuel suppliers should bear installation expenses in return for a fair return

on their investment, fleets are often expected to install such equipment themselves. The tax credit would make alternative fuels a much more attractive option for such fleets and thus encourage increased voluntary reliance of these fuels.

IV. Parties Affected

All parties eligible for refueling equipment and vehicle tax credits would directly benefit from this proposal. This would include fuel suppliers, public and private fleets, and individual vehicle purchasers. By making refueling equipment and vehicle purchases more affordable for individuals and businesses, it would stimulate the market for alternative fuel vehicles, thus increasing demand and indirectly benefit manufacturers.

V. Expected Result

With a powerful incentive such as a federal tax credit for these purchases, businesses and individuals are likely to be more receptive to the prospect of shifting to alternative fuel vehicles. Fuel suppliers and fleets will also have an added incentive to install refueling equipment.

SALES TAX DEDUCTION FOR PRIVATE, NONCOMMERCIAL VEHICLES

I. Proposal

Provide for a Federal income tax deduction for state and local sales tax imposed on the purchase of a noncommercial alternative fuel vehicle by an individual. Such a vehicle may be new, resold, or an equivalent.

II. Rationale

This proposal would develop the interest in alternative fuels among non-fleet vehicle users. In doing so, it would significantly help fleets by increasing vehicle demand and thus contribute to the establishment of necessary infrastructure.

III. Economics

A Federal sales tax deduction would provide a financial incentive to individuals to purchase alternative fuel vehicles by bringing their cost more in line with that of a conventional fuel vehicle.

IV. Parties Affected

Private individuals and vehicle manufacturers would be direct beneficiaries of this proposal. Fleets, both public and private, would indirectly benefit from increased vehicle and fuel demand from individuals because vehicles and fuel would become more readily available and less expensive.

V. Expected Result

A sales tax deduction, which is no longer available for other vehicles, would be very attractive to individuals and would serve as a major inducement for the purchase of alternative fuel vehicles.

CONSORTIUM FUNDING FOR ALTERNATIVE FUELS

I. Proposal

Facilitate the creation of consortia devoted to alternative fuels technology development and demonstrations. Participants might include companies involved in vehicle and engine manufacturing, fuel suppliers, fleet operators, research institutions (i.e., GRI), trade associations (i.e., AGA), and government entities (DOE). A similar consortium, SEMATECH, has excelled in semiconductor manufacturing research and is co-funded by the semiconductor industry and an agency within the Defense Department. A limited antitrust exemption for the participants would also be necessary for the consortium to work successfully.

II. Rationale

By pooling resources and operational abilities, the consortium members could better develop and demonstrate alternative fuel technologies. Each party would have an incentive to contribute fully to the mission of the consortium because all would stand to benefit from progress in this field.

III. Economics

Such consortia should be modeled after SEMATECH, which is jointly funded by public and private resources. Duplicated research can be avoided by sharing information among consortium members, leading to some cost savings over current individualized technology development.

IV. Parties Affected

Participating companies and public entities would directly benefit from the consortium experience and the sharing of research information among themselves. Non-participants will receive indirect benefits from the project only after the participants have determined that such research results should be disseminated. Consumers should benefit from advances in alternative fuels technology because the work of the consortium should lead to cheaper, more efficient vehicles and fuels.

V. Expected Results

Consortia would assist in the research, development and demonstration of alternative fuel technologies and should spur industry growth. As a result, increased reliance on alternative fuels would likely ensue.

Amendment To Title XI, Subtitle B
Staff Recommendation version of 5/8/91
Alternative Fuels

Rebal -
Alternative Fuels

This Amendment combines Federal/State/commercial fleet provisions and a variant of Jeffords. What follows is a discussion of only those sections that present a problem.

Sec. 11112. Federal Fleets

Mandates purchase of alternative fuels vehicles for Federal fleets on a schedule that is more aggressive than applied to State and commercial fleets: 10% of fleet purchases in 1995 (starting year) rising to 90% in 2000 and thereafter.

DOE position: We agree in principle, cost would be the only issue. Do not oppose except for minor language change related to the operation of these vehicles solely on alternative fuels.

Sec. 11113. State and Private Fleets

Mandates purchases of alt. fuel vehicles starting at 30% of new purchases in 1998 and rising to 70% in 2000 and thereafter. Does not specify fleet size affected by mandate.

If, as suggested verbally by Senate Committee staff, the fleet size coverage is to be increased to fleets of 100 or more, the fuel savings impact is discussed in the attached.

DOE Position: Support with the proviso that fleet size must be specified, per NES: fleets of 10 or more vehicles in non-attainment areas, and of 20 or more vehicles in all other urban areas with population of at least 250,000. Oppose requirement that these fleets be operated solely on alternative fuels. Propose that they be operated on alternative fuels except when the fuel is unavailable.

Part 3 -- Alternative and Replacement Fuels

This amendment is a considerable improvement over Jeffords but additional changes would be required in order to obtain Administration support. Domestic content provisions are still objectionable because they represent an unnecessary economic cost to the Nation. Language changes are proposed in most sections, as indicated on the text, but particularly:

Sec. 11127. Voluntary Supply Commitments

Requires the Secretary of Energy to obtain commitments from suppliers to produce and sell alternative fuels.

DOE: Oppose. Appears benign but leads directly to enforcement provisions in other sections if voluntary commitments are insufficient to meet potential demand.

Sec. 11128. Secretarial Authority

The Secretary may require suppliers to make adequate alternative fuel supplies available to public.

DOE Position: oppose as drafted. Authority could be abused and places DOE in position of controlling market decisions. The mere existence of the authority would have a chilling affect on suppliers, forcing uneconomic decisions on the possibility that the authority would be exercised. Substitute language would request the Secretary to propose to Congress policy options that would make it possible to assure availability of alt. fuels.

Not included in the amendment is any reference to the NES CAFE incentives for alternative fuel vehicle manufacturers. It should be added, unless covered by other amendments.

This amendment represents a good basis for compromise if the Committee is willing to refine language in the son-of-Jeffords section. At minimum the changes necessary would include:

- elimination of domestic content provisions unless the aim of the amendment is limited to exploration of policy options available to the Nation to potentially displace significant volumes of oil by using alternatives, and an assessment of the cost/benefit differential between domestic and foreign supplies.
- elimination of any requirement for the Federal Government to establish control over the transportation fuel market, in part or in whole.
- elimination of any provision that would force uneconomic consumer choice.

VAS: 5/8/91: 1:30 p.m.

INSERT A

Attachment

- the vehicle population covered by increasing the minimum fleet size from 10/20 to 100 or more could substantially reduce the number of vehicles covered. Insufficient data exists to predict with any certainty the effect of increasing minimum fleet sizes on the number of vehicles that would remain included in an alternative fuel program.
- we know that almost 7 million cars and light duty trucks are in business fleets of 10 or more and about 4 million heavy duty trucks are in business fleets. We also know that the 100 largest fleet operators have about 500 thousand light duty vehicles. However, we do not know the average fleet sizes of these large fleet operators in particular urban areas. Most of these large fleets have vehicles located in several locations. It is possible that a restriction of 100 or more vehicles could eliminate many of the vehicles included in these fleets depending on the distribution of these vehicles across the nation.
- an increase of the minimum fleet size to 100 or more vehicles could substantially reduce the number of vehicles we estimate would be alternative fuel capable under the NES program at any future date.
- For example, in 2010, we project that about 3 million light duty vehicles (out of an estimated 8.5 million vehicles in business fleets of 10 or more vehicles) and over 1 million heavy duty vehicles (out of an estimated 6 million heavy duty vehicles in fleets of 6 or more) would be alternative fuel capable if the NES proposal were enacted.
- increasing the minimum fleet requirement from 10/20 vehicles to 100 vehicles could reduce the estimated number of covered vehicles by less than half to more than three quarters, depending on the guesses one would make about the distribution of fleets by average fleet size (nationally) and the distribution of those vehicles in specific urban areas).

An additional problem generated by moving to a large fleet threshold is evasion. It would be extremely difficult, if not impossible, to preclude fleet operators from dividing their fleets into subfleets that fall just short of the minimum threshold. This would not be feasible for lower fleet thresholds.

5-7-91

AMENDMENT TO TITLE XI, SUBTITLE B
ALTERNATIVE FUELS

1 Title XI, Subtitle B of S.341 is amended--

- 2 (1) by redesignating sections 11101 and 11102 as "Part 1 --
3 Mass Transit and Training Programs"; and
4 (2) by adding at the end the following two new parts:

5 PART 2 -- ALTERNATIVE FUEL FLEETS

6 SEC. 11111. DEFINITIONS.

7 For the purposes of this part:

8 (1) "alternative fuel" means methanol, ethanol, and
9 other alcohols; mixtures containing 85 percent or more by
10 volume of methanol, ethanol, or other alcohol with gasoline
11 or other fuels; natural gas; liquid petroleum gas; hydrogen;
12 and electricity;

13 (2) "alternative fuel vehicle" means a motor vehicle
14 that--

15 (A) operates solely on alternative fuel; or

16 (B) is a flexi-fueled vehicle;

17 (3) "federal agency" means any executive department,
18 military department, government corporation, independent
19 establishment, executive agency, the United States Postal
20 Service, the Congress, and the courts of the United States;

(4) "fleet" means a number of motor vehicles that are centrally fueled or capable of being centrally fueled and are owned, operated, leased, or otherwise controlled by a federal agency or person. This term does not include--

(A) motor vehicles held for daily lease or rental to the general public;

(B) motor vehicles held for sale by motor vehicle dealers, including demonstration vehicles;

(C) motor vehicles used for motor vehicle manufacturer product evaluations or tests;

(D) law enforcement vehicles;

(E) emergency vehicles;

(F) military vehicles that the Secretary of Defense has certified to the Secretary must be exempt for national security reasons; or

(G) non-road vehicles, including farm and construction vehicles;

(5) "flexi-fueled vehicle" means a motor vehicle that can operate on alternative or non-alternative fuel;

(6) "motor vehicle" means--

(A) any four-wheel passenger automobile designed for use on public streets, roads, and highways;

(B) any truck with a gross vehicle weight up to 26,000 pounds;

(C) and any bus designed to transport more than ten persons; and

(7) "person" means--

(A) any individual, corporation, partnership, or association;

(B) any State, municipality, or political subdivision of a State--
that owns, operates, leases, or otherwise controls a fleet that contains at least 100 motor vehicles.

SEC. 11112. FEDERAL FLEETS.

(a)(1) When any federal agency purchases, leases, or otherwise acquires vehicles for a federal fleet, in the years specified in this section, the following percentage of the vehicles purchased, leased, or otherwise acquired shall be alternative fuel vehicles in the respective years --

(A) in 1995, 10 percent;

(B) in 1996, 15 percent;

(C) in 1997, 25 percent;

(D) in 1998, 50 percent;

(E) in 1999, 75 percent; and

(F) in 2000 and each year thereafter, 90 percent.

(2) If the number of vehicles purchased, leased, or otherwise acquired by a federal agency in any year when multiplied by the percentage specified in paragraph (1) contains a fraction, the number of vehicles required to be alternative fuel vehicles shall be increased to the next whole number.

(b) The vehicles purchased pursuant to this section shall

1 be operated solely on alternative fuels except when operating in
2 an area where the appropriate alternative fuel is unavailable.

3 (c) The Secretary shall work with the Administrator of
4 General Services and the head of each federal agency to plan
5 effective coordination and cooperation by federal agencies in the
6 purchase, use, and refueling of alternative fuel vehicles
7 acquired under this section or other provisions of law.

8 (d) The Administrator of General Services shall, to the
9 maximum extent practicable, arrange for the fueling of
10 alternative fuel vehicles acquired under this section at
11 commercial fueling facilities that are open to the public and
12 offer alternative fuels for sale to the public.

13 (e) Notwithstanding the provisions of section 211 of the
14 Federal Property and Administrative Services Act of 1949, the
15 Administrator of General Services shall not include the
16 incremental costs of alternative fuel vehicles in the amount to
17 be reimbursed by federal agencies if the Administrator determines
18 that appropriations provided pursuant to this subsection are
19 sufficient to provide for the incremental cost of such vehicles
20 over the cost of comparable conventional vehicles.

21 (f) Funds appropriated pursuant to the authorization under
22 this section shall be applicable only--

23 (1) to the portion of the cost of acquisition,
24 maintenance, and operation of vehicles acquired under this
25 paragraph which exceeds the cost of acquisition,
26 maintenance, and operation of comparable conventional

1 vehicles;

2 (2) to the portion of the costs of fuel storage and
3 dispensing equipment attributable to such vehicles which
4 exceeds the costs for such purposes required for
5 conventional vehicles; and

6 (3) to the portion of the costs of acquisition of
7 alternative fuel vehicles which represents a reduction in
8 revenue from the disposal of such vehicles as compared to
9 revenue resulting from the disposal of comparable
10 conventional vehicles.

11 (g) The incremental cost of vehicles acquired under this
12 section over the cost of comparable conventional vehicles shall
13 not be applied to any calculation with respect to a limitation
14 under law on the maximum cost of individual vehicles which may be
15 acquired by the United States.

16 (h) There are authorized to be appropriated such sums as
17 may be required to carry out the provisions of this section.
18 Such sums as are appropriated for the Administrator of General
19 Services pursuant to the authorization under this section shall
20 be added to the General Supply Fund established in section 109 of
21 the Federal Property and Administrative Services Act of 1949.

22 SEC. 11113. STATE AND PRIVATE FLEETS.

23 (a)(1) When any person purchases, leases, or otherwise
24 acquires vehicles for a fleet in the years specified in this
25 section, the following percentage of the vehicles purchased,

1 leased, or otherwise acquired shall be alternative fuel vehicles,
 2 ~~AND THESE VEHICLES ARE AVAILABLE FOR PURCHASE~~
 3 in the respective years--

4 (A) in 1998, 30 percent;

5 (B) in 1999, 50 percent; and

6 (C) in 2000 and each year thereafter, 70 percent.

7 (2) If the number of vehicles purchased, leased, or
 8 otherwise acquired by a person in any year when multiplied by the
 9 percentage specified in paragraph (1) contains a fraction, the
 10 number of vehicles required to be alternative fuel vehicles shall
 11 be increased to the next whole number.

12 (b) The vehicles purchased pursuant to this section shall
 13 be operated ~~solely~~ on alternative fuels except when operating in
 14 ~~an area where the appropriate alternative fuel is unavailable.~~

15 SEC. 11114. EXEMPTIONS.

16 (a) The Secretary may exempt any federal agency or person
 17 from the requirements of section 11112 or 11113, respectively, in
 18 whole or in part, if the Secretary determines that:

19 (1) alternative fuel vehicles meeting the requirements
 20 of such federal agency or person are not available for
 21 purchase, lease, or acquisition by other means; or

22 (2)(A) commercial alternative fuel refueling
 23 facilities are not available to the federal agency or person
 24 in the area in which the vehicles are operated; and

25 (B) providing an alternative fuel refueling facility
 for such agency or person's alternative fuel vehicles would

DOES NOT
 SPECIFY
 MINIMUM
 FLEET SIZE
 AFFECTED.
 DOES SUPPORTS
 APPLICATION
 TO FLEET SIZE
 OF 10 OR MORE
 VEHICLES IN
 NON-ATTAINMENT
 AREAS AND 70 OR
 MORE VEHICLES IN
 OTHER URBAN
 CENTERS WITH
 AT LEAST 250,000
 POPULATION

1 be impracticable.

2 (b) An exemption granted by the Secretary under subsection
3 (a) shall be for an initial period of no more than 12 months and
4 shall be renewable for additional periods of no more than 12
5 months.

6
7 SEC. 11115. CREDITS.

8 (a) The Secretary shall allocate a credit to a person if
9 that person purchases an alternative fuel vehicle in excess of
10 the number that person is required to purchase under section
11 11113 or purchases an alternative fuel vehicle before the date
12 that person is required to purchase an alternative fuel vehicle
13 under such section.

14 (b) In allocating credits under subsection (a), the
15 Secretary shall allocate one credit for each alternative fuel
16 vehicle the person purchases that exceeds the number of
17 alternative fuel vehicles that person is required to purchase
18 under section 11113 or that is purchased before the date that
19 person is required to purchase an alternative fuel vehicle under
20 such section. In the event that a vehicle is purchased before
21 the date otherwise required, the Secretary shall allocate one
22 credit per vehicle for each year the vehicle is purchased before
23 the required date. The credit shall be allocated for the same type
24 vehicle as the excess vehicle or earlier purchased vehicle.

25 (c) At the request of a person allocated a credit under this
26 section, the Secretary shall treat the credit as the purchase of

one alternative fuel vehicle of the type for which the credit is allocated in the year designated by that person when determining whether that person has complied with this part in the year designated. A credit may be counted toward compliance for only one year.

(d) A person allocated a credit under this section or to whom a credit is transferred under this section, may transfer freely the credit to another person who is required to comply with this part. At the request of the person to whom a credit is transferred, the Secretary shall treat the transferred credit as the purchase of one alternative fuel vehicle of the type for which the credit is allocated in the year designated by the person to whom the credit is transferred when determining whether that person has complied with this part in the year designated. A transferred credit may be counted toward compliance for only one year.

SEC. 11116. REPORTS.

The Secretary may require a person to file with the Secretary the reports the Secretary determines necessary to implement this part.

SEC. 11117. ENFORCEMENT.

(a) A person who violates a requirement or prohibition of section 11113 is subject to a civil penalty of not more than \$2,500 per violation. Each month in which a violation occurs

1 constitutes a separate violation, unless the violator establishes
2 that the vehicle necessary to comply with this part could not be
3 purchased, leased, or otherwise acquired in that month. The
4 first month of a violation of the yearly acquisition requirements
5 of section 11113 is the month in which a person purchases,
6 leases, or otherwise acquires vehicles that result in
7 noncompliance with the yearly alternative fuel vehicle purchase
8 requirement under that section. Each month in which compliance
9 has not been achieved after the first month is a separate
10 violation.

11 (b) The Secretary may request the Attorney General to
12 commence a civil action for a permanent or temporary injunction
13 or to assess and recover any civil penalty under subsection (a)
14 of this section. An action under this subsection may be brought
15 in the district court of the United States for the district in
16 which the violation is alleged to have occurred or in which the
17 defendant resides or has his principal place of business. The
18 court in which the action has been brought may restrain a
19 violation, require compliance, assess a civil penalty, collect
20 any noncompliance assessment and nonpayment penalty owed the
21 United States, and award any other appropriate relief. In such
22 an action, subpoenas for witnesses who are required to attend a
23 district court in any district may run into any other district.

24 (c) In the determining the amount of a penalty to be
25 assessed under this section, the Secretary or the court, as
26 appropriate, shall take into consideration, in addition to other

1 factors justice may require, the size of the business, the
2 economic impact of the penalty on the business, the violator's
3 full compliance history and good faith efforts to comply, the
4 duration of the violation as established by any credible
5 evidence, payment by the violator of penalties previously
6 assessed for the same violation, the economic benefit of
7 noncompliance, and the seriousness of the violation.

8 SEC. 11118. IMPLEMENTATION.

9 (a) Within 180 days after enactment of this part, the
10 Secretary shall issue regulations to implement this part. Such
11 regulations shall include measures to ensure that covered persons
12 comply with the requirements of section 11113 and the criteria by
13 which the Secretary will determine whether to exempt covered
14 persons from such requirements under section 11114.

15 (b) The Secretary may delegate the administration and
16 enforcement of this part within any State to the Governor of such
17 State if--

18 (1) the Governor certifies that the State has a
19 program to administer and enforce the part; and

20 (2) the Secretary finds that the State program is in
21 accordance with the requirements of the part.

22 (c) There is authorized to be appropriated not more than
23 \$20,000,000 for purposes of providing financial assistance to
24 States to which the Secretary delegates administration and
25 enforcement of this part.

11

PART 3 -- ALTERNATIVE AND REPLACEMENT FUELS

SEC. 11121. SHORT TITLE.

This part may be cited as the "Replacement and Alternative Fuels Act of 1991".

SEC. 11122. FINDINGS.

The Congress finds and declares that--

(1) United States national security demands ^{WOULD BE ENHANCED BY} ~~that we~~ reduce our dependency on imported oil; ^{IMPORTS FROM UNSTABLE SOURCES}

(2) domestic resources are ^{POTENTIALLY} available to ~~eliminate or~~ substantially reduce our dependency on imported oil;

(3) the transportation sector, currently 95 percent dependent on oil, accounts for more than 60 percent of our national oil consumption;

(4) a comprehensive energy program, including the stimulation of the production and use of automobiles capable of using alternative fuels, is needed to reduce pollution as well as reduce our dependency on imported oil;

(5) such program should be designed to create a positive impact on the economy, our national trade balance, and our national budget; AND

(6) such program should allow market forces, within appropriate environmental parameters, to affect the selection of replacement or alternative fuels; and

~~(7) such program should provide long-term stability to~~

industries producing replacement and alternative fuels.

SEC. 11123. PURPOSE.

The purposes of this part are to--

- (1) enhance energy security;
- (2) reduce air pollution;
- (3) improve our balance of trade;
- (4) reduce the budget deficit;
- (5) improve the marketability of alternative and flexible fuel vehicles; and
- (6) improve the condition of the national economy through the enhancement of the replacement fuel industry and the creation of an alternative fuel industry.

SEC. 11124. DEFINITIONS.

For purposes of this part--

- (1) the term "Administrator" means the Administrator of the Environmental Protection Agency;
- (2) the term "alcohol" means methanol, ethanol, or other alcohol that are suitable for use by themselves or in combination with other fuels as a motor fuel;
- (3) the term "conventional petroleum" means imported or domestic petroleum derived from oil wells, including stripper wells;
- (4) the term "domestic" means derived from resources within the 50 States, the territories of the United States,

1 or Canada;

2 (5) the term "motor fuel" means any substance suitable
3 as a fuel for a motor vehicle, as the term "motor vehicle"
4 is defined in section 216(2) of the Clean Air Act (42 U.S.C.
5 7550(2));

6 (6) the term "alternative fuel" means a motor fuel not
7 designed to be mixed with gasoline, including propane, LIQUID PETROLEUM GAS
8 natural gas, "neat" alcohol, hydrogen, and electricity;

9 (7) the term "replacement fuel" means a motor fuel
10 capable of mixing with gasoline, including alcohol and
11 ethers or products derived from alcohol; AND LIQUIDS NOT DERIVED FROM
12 (8) the term "commerce" means any trade, traffic, CONVENTIONAL
13 transportation, exchange, or other commerce-- PETROLEUM & DERIV.

14 (A) between any State and any place outside of
15 such State; or

16 (B) which affects any trade, traffic,
17 transportation, exchange, or other commerce described
18 in subparagraph (A); and

19 (9) the term "provider" means--

20 (A) any person engaged in the refining of crude
21 oil to produce motor fuel;

22 (B) any importer of motor fuel;

23 (C) any person engaged in the transportation and
24 sale of natural gas or liquid petroleum gas for use as
25 a motor fuel;

26 (D) any person engaged in the production of

14

1 alcohol or hydrogen for sale and use as a motor fuel;
2 and

3 (E) any utility engaged in the generation and sale
4 to the public of electricity.

5 SEC. 11125. REPLACEMENT AND ALTERNATIVE FUEL PROGRAM.

6 (a) ESTABLISHMENT OF PROGRAM.-- The Secretary shall
7 ^{PROMOTE} establish a program to promote the development and use of
8 domestically produced replacement and alternative fuels. Such
9 program shall promote the replacement of conventional petroleum
10 motor fuels with replacement and alternative fuels to the maximum
11 extent practicable. Such program shall, to the extent
12 practicable, ^{ENCOURAGE} ensure the availability of those replacement and
13 alternative fuels that will have the greatest impact in improving
14 air quality in urban areas, along transportation corridors, and
15 nationwide.

16 (b) DEVELOPMENT PLAN AND PRODUCTION GOALS.-- Under the
17 ^{PROMOTE} program established under subsection (a), the Secretary, in
18 consultation with the Administrator, the Secretary of
19 Transportation, the Secretary of Agriculture, the Secretary of
20 Commerce, and the heads of appropriate agencies, shall review
21 appropriate information and--

22 (1) estimate the production capacity in the United
23 States for replacement fuel and alternative fuel needed to

15

1 implement the provisions of this section;

2 (2) determine the technical and economic feasibility of
3 producing in the United States sufficient replacement fuels
4 and alternative fuels, by the calendar year 2010 to replace ~~up to~~
5 30 percent or more, on an energy equivalent basis, of the
6 projected consumption of motor fuel in the United States for
7 that year;

8 ~~(3) determine the most suitable raw materials, other~~
9 ~~than conventional petroleum, for the production in the~~
10 ~~United States of replacement and alternative fuels;~~

11 ~~(3)~~ ^{ASSESS} ~~determine~~ ^(COST-EFFECTIVE) the most suitable means and methods of
12 ~~developing and encouraging the production, distribution, and~~
13 ~~use of replacement and alternative fuels; and~~

14 ⁴ (5) identify ways to encourage the development of
15 reliable replacement fuel and alternative fuel industries in
16 the United States, and the technical, economic, and
17 institutional barriers to such development.

18 SEC. 11126. ALTERNATIVE FUEL DEMAND ESTIMATES.

19 (a) Not later than October 1, 1994, and not later than
20 October 1 of each year thereafter, the Secretary, in consultation
21 with the Administrator and appropriate state and federal
22 officials, shall estimate--

23 (1) the number of each type of alternative fuel
24 vehicles likely to be in use in the United States during the
25 following calendar year;

(2) the probable geographic distribution of such vehicles; and

(3) the amount of each type of alternative fuel that is needed to fuel such number of vehicles.

(b) Not later than October 1, 1994, and not later than October 1 of each year thereafter, the Secretary shall require *POTENTIAL* providers of replacement and alternative fuels to certify to the Secretary the amount of each type of replacement and alternative fuel that such provider plans to produce.

~~SEC. 11127. VOLUNTARY SUPPLY COMMITMENTS.~~

~~The Secretary shall undertake to obtain commitments from providers of replacement and alternative fuels to produce and offer for sale to the public sufficient amounts of replacement and alternative fuels to meet the needs of vehicles requiring such fuels.~~

SEC. 11128. SECRETARIAL AUTHORITY.

(a) In the event that the Secretary determines under section 11126 that the amount of replacement and alternative fuels produced in the United States is insufficient to meet *POTENTIAL* public demand in any part of the United States *and* the Secretary ~~is unable to obtain voluntary commitments under section 11127 to supply such demand,~~ *SHALL PROPOSE TO CONGRESS PUBLIC POLICY* the Secretary ~~may require providers of motor fuels to make adequate supplies of replacement and alternative~~ *OPTIONS THAT WOULD MAKE IT POSSIBLE TO ASSURE THE* ~~fuels available to the public.~~ *AVAILABILITY OF ADEQUATE SUPPLIES OF REPLACEMENT AND ALTERNATIVE FUELS TO THE PUBLIC.*

17

1 ~~(b) Prior to imposing any requirement under subsection (a),~~
2 ~~the Secretary shall consult with providers of motor fuels to~~
3 ~~consider alternative means of securing adequate supplies of such~~
4 ~~fuels and shall give such providers an opportunity to comment on~~
5 ~~any specific proposed requirements to make such fuels available.~~

6 ~~(c) In exercising the authority under subsection (a), the~~
7 ~~Secretary shall impose the requirement of providing the required~~
8 ~~amount of replacement or alternative fuel proportionately on all~~
9 ~~appropriate providers of motor fuels in a fair and equitable~~
10 ~~manner.~~

→
11 SEC. 111³⁰29. AUTHORIZATION OF APPROPRIATIONS.

12 There is authorized to be appropriated to the Secretary to
13 carry out this part not to exceed \$10,000,000 for each of the
14 fiscal years 1992 through 1996.

— SEC. 11129. ~~INCENTIVES FOR PRODUCTION OF ALTERNATIVE~~
ALTERNATIVE FUEL VEHICLE PRODUCTION
(CAFE CREDITS)

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Legislature on oil displacement and
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DATE: May 3, 1991

TO: C. Boyden Gray ATTENTION: MARY. PLEASE GIVE THIS TO BOYDEN
FOR OUR 11 A.M. PHONE CALL.

FAX #: 456-6279

FROM: Louise Dunlap

Part I

Number of pages, including this cover sheet: 32

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Our telephone number: 202/546-3720

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NOTES:

Boyden: You should be aware of this Acurex Report to the California Legislature on oil displacement and alternative fuels policy proposals.

While Acurex is a contractor with California Energy Commission, this report was commissioned directly by a Joint Committee of the Legislature, independent of CEC.

Louise

Fuel Diversity and Cleaner Air: Alternative Fuel Initiatives for California's Transportation Sector

April 8, 1991

for

**California Legislature
Joint Committee on Energy Regulation and the Environment
Senator Herschel Rosenthal, Chair**

David L. Modisette, Project Director

by

**Carl B. Moyer and Michael D. Jackson
Acurex Corporation
Mountain View, California**

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SUMMARY OF RECOMMENDATIONS

Recommendation 1

California should establish a goal of reducing by 2005 the per capita petroleum demand for transportation, through a combination of conservation and substitution programs, by 30 to 50 percent of the per capita baseline demand in 1990.

Recommendation 2

At least half the targeted reduction in petroleum demand should be achieved through conservation measures.

Recommendation 3

The California Air Resources Board, the California Energy Commission, the California Transportation Commission, the Department of Business, Transportation and Housing, the Office of Planning and Research, the South Coast Air Quality Management District, and the Sacramento Metropolitan Air Quality Management District should develop a joint report and recommendations for implementing specific measures to restrain the rate of growth in vehicle miles traveled to not more than one half the growth rate of the general population in the state.

Recommendation 4

Adopt the DRIVE+ program of **SB 431 (Hart)**, taking the opportunity to modify the factors entering the calculation of the extra tax or rebate to reflect the value of reducing petroleum use and encouraging alternative fuels.

Recommendation 5

California should grant investment tax credits for investments made in equipment to prepare, store, and dispense natural gas, methanol, ethanol, and electric energy for use in vehicles, as well as investments made in equipment needed to store these fuels on vehicles and deliver the fuels to vehicle engines or power plants over and above the costs of comparable gasoline or diesel systems. The tax credit will apply to the costs of retrofits and conversions to use natural gas, methanol, ethanol, and electric energy, and to incremental costs of new engines and vehicles, provided the vehicles receive ARB emissions certification.

Recommendation 6

California should authorize local air quality management districts to impose a \$25 annual surcharge on the annual vehicle registration fee to meet the objectives of a program to identify and repair gross-emitting vehicles or to encourage the retirement of such vehicles in favor of the purchase of new vehicles meeting low emissions standards and capable of using nonpetroleum fuels. The incentive

award for new vehicle purchase should be a graduated scale with a maximum incentive of \$2,000 for the purchase of a zero emissions vehicle as defined by the Air Resources Board. To qualify for any incentive award, the new vehicle must be capable of using nonpetroleum fuels and the retired vehicle must be certified as deregistered and destroyed as part of a recycling program that recovers any air conditioning refrigerant.

Recommendation 7

California should implement a major bond fund to provide for grants and low-interest loans for the construction of clean-fuel production, storage, distribution, and dispensing facilities and facilities for the production of low-emitting vehicles.

Recommendation 8

California should implement a 10-year sales tax surcharge of 5 percent on gasoline and diesel fuel. Revenues from this added tax should be used, if needed, for a cushion fund for the fee/rebate tax program of Recommendation 4; to retire bonds used to provide loans and grants to investors in alternative fuel production, storage, distribution, and dispensing equipment and to provide loans and grants for the construction of facilities to produce low-emissions vehicles capable of using cleaner nonpetroleum fuels; for grants to purchasers of alternative fuel vehicles; for grants to support the alternative fuels programs of local air quality management districts, including random roadside enforcement programs and associated vehicle repair or retirement programs; and for funding research, development, and demonstration programs for low emission vehicles capable of using alternative fuels.

Recommendation 9

Beginning in 1995, require transit buses at the time of engine overhaul or engine replacement to convert to alternative fuels, including methanol, ethanol, natural gas, or electric power.

Recommendation 10

Beginning in 1995, require all state fleets and owners of private fleets of 10 or more vehicles registered in or operating in nonattainment areas, to purchase new and replacement vehicles that are capable of using alternative fuels. The requirement should cover only a small number in the first year, but should grow to cover most new and replacement vehicles by the year 2005.

Recommendation 11

Beginning in 1995, require that a fraction of each vehicle manufacturer's sales in California be capable of using alternative fuels not derived from petroleum.

Recommendation 12

Require that in ozone and carbon monoxide nonattainment areas at least one new or replacement liquid fuel storage tank at each retail refueling location or fleet refueling facility offering and dispensing liquid fuel must be compatible with methanol and ethanol.

Recommendation 13

Require that owners of retail public refueling facilities and private fleet refueling facilities provide access, space and facilities to other parties wishing to offer alternative fuels for sale, unless the station already makes an alternative fuel available.

Recommendation 14

Provide that ownership of a facility to sell natural gas or electric energy for use as motor vehicle fuel, and the sale of natural gas and electric energy for motor vehicle use, does not make the owner or seller subject to public utility regulation by the PUC.

Recommendation 15

Expand the coverage of the California Underground Storage Tank Cleanup Fund specifically to cover spills and leaks of methanol and ethanol. Extend the storage fees to cover methanol and ethanol used as motor fuel.

Recommendation 16

Require the petroleum industry to sell nonpetroleum fuels to vehicles capable of using these fuels, in volumes commensurate with the normally expected fuel demand of these vehicles.

Recommendation 17

Clarify that the Air Resources Board has specific authority to regulate fuel-cycle carbon dioxide emissions from vehicle use, and establish a sales-weighted reduction goal of a 20 percent per vehicle-mile reduction from a 1990 baseline, to be achieved by 2005.

FUEL DIVERSITY AND CLEANER AIR: ALTERNATIVE FUEL INITIATIVES FOR CALIFORNIA'S TRANSPORTATION SECTOR

INTRODUCTION

This Summary of Draft Recommendations for Legislative Action is part of an investigation and assessment of California's dependence on imported petroleum for transportation energy. The study is being conducted by the Joint Committee on Energy Regulation and the Environment.

The objectives of this study have been to assess the relative attractiveness of measures to

- decrease fuel use in the transportation sector,
- increase the number of competing suppliers of transportation fuels, and
- diversify transportation energy beyond our current near-total dependence on petroleum-derived fuels.

All three of these policy goals would reduce the need for petroleum imports.

Decreasing our dependence on imported petroleum would provide multiple benefits for California. Reducing imports would reduce our vulnerability to disruptions in supply and sudden dislocations in price, both of which in the past have had high costs to the California economy. Diversifying suppliers would introduce more competition and help prevent the oligopolistic behavior of a few dominant suppliers of petroleum. Finally, some of the alternatives to petroleum-derived fuels would have significant environmental benefits because these fuels provide reduced levels of emissions from vehicles, and reduced potential for forming photochemical smog.

California has succeeded in establishing an effective energy conservation and diversification program for buildings, appliances, industrial energy use, and electric power generation. Extensions and improvements to this program are currently underway. However, California has made no progress, beyond the stage of demonstrating certain technologies, toward reducing our use of petroleum-derived fuels for transportation. Of course, this task will be complicated, because the manufacture of automobiles and trucks and buses, and the production of gasoline and diesel fuel, are large international industries affected by world events and by many national policy objectives and programs. It is difficult—though not impossible—for California to construct independent programs that affect vehicles and vehicle fuels in a significant way.

Despite the difficulties, California has already made a significant start by taking the lead in demonstrating some alternative fuel technologies for transportation. California also played a key role in the passage a central piece of federal legislation that will encourage the national availability of vehicles that can use alternatives to petroleum, such as ethanol, methanol, and natural gas. Finally, in 1990 the California Air Resources Board implemented a new and complex set of vehicle emissions standards. These new standards recognize the cleaner-burning potential of some fuels and the different photochemical reactivity of the emissions from vehicles using different fuels. This set of standards may lead to the certification of vehicles on clean alternative fuels.

These are important beginnings. However, much remains to be done before California has a program that will lead to energy diversification and conservation in the transportation sector. The Joint Committee is considering a package of initiatives that will extend California's leadership in establishing viable alternatives to petroleum fuels and in reducing the level of energy use in the transportation sector. This program is designed to meet the needs and objectives of California, but is also designed to work in harmony with national programs.

I. NATIONAL POLICY AND REGULATORY STRUCTURE ENCOURAGING CONSERVATION AND DIVERSIFICATION IN THE TRANSPORTATION SECTOR

The 1973 oil embargo produced one strong piece of legislation contributing to improved fuel economy in automobiles and light trucks. The Energy Policy and Conservation Act of 1975 (89 Stat. 902) amended the Motor Vehicle and Information and Cost Savings Act (86 Stat. 947) to require measurement and reporting of vehicle fuel economy under urban and highway driving conditions, and further imposed sales-weighted fuel economy standards applicable to each manufacturer. These Corporate Average Fuel Economy (CAFE) Standards took effect in 1978 at 18 miles per gallon (as a weighted average of urban and highway fuel economy figures) and rose to 27.5 miles per gallon in 1985. The Department of Transportation was empowered to set interim standards within certain guidelines in the years 1981-1984.

There has been some debate about whether the CAFE standards accomplished an improvement in fuel economy beyond anything that might have been caused by market forces associated with the much higher costs of gasoline in the mid- and late 1970s and early 1980s. However there is little doubt that the CAFE standards were effective in preventing a decline of fleet fuel economy in the mid-1980s period of low-cost gasoline. Nevertheless, periodically attempts are made to do away with the CAFE standards altogether. However, other attempts have been made to put the standards much higher, notably the Bryan Bill of 1990 (S. 1224). Growing concerns about global warming and reaction to the 1990 Persian Gulf crisis (and actual war in January of 1991) will no doubt cause the introduction in 1991 of new bills to increase the CAFE standards. Proponents of increased standards point to the likely low petroleum prices in the 1990s, especially once the current Gulf conflict is ended, as an obstacle to long-term programs to reduce petroleum use, improve energy security, and assist air quality programs by introducing cleaner alternative fuels. Since we do not burden oil with its full social costs, efficiency

standards such as CAFE standards are the best way, in the judgment of these proponents, to a long term program to reduce demand and encourage alternatives.

Despite the petroleum crises of 1973-74 and 1978-79, the U.S. in the 1980s generally passed up the opportunity to encourage the use of alternative fuels. Instead, the U.S. relied on unregulated market forces to obtain low-cost and abundant supplies of transportation fuel. This approach was successful, but the result was (despite the effect of CAFE standards) that oil imports gradually grew to nearly 50 percent of oil use by 1990 and amounted to about 7 million barrels per day or about 16 quadrillion Btus (quads), about half of which became gasoline. Possible substitutes for petroleum gained no entry to the market. The fledgling fleets using natural gas and propane that began to appear in the late 1970s quickly shrank. The risk of disruptions in imported oil supply was addressed by a Strategic Petroleum Reserve (SPR), built to about 500 million barrels by 1990.

The invasion of Kuwait by Iraq in August of 1990 renewed fears about the risks of a high dependence on imported oil. Interestingly, even though the supply shortfall brought about by the invasion and the subsequent embargo of exports from Kuwait and Iraq was quickly made up by increased supplies from other suppliers, the market still responded with an initial price jump about as extreme as the price reactions in the 1970s. Thus the SPR did not have the price stabilizing effect it was created for. Furthermore, the U.S. has been compelled to organize an expensive military operation to protect other supplies of oil in the Middle East apparently threatened by Iraq. These events have renewed interest in energy diversification strategies that would try to expand the use of alcohols and other substitutes such as natural gas and electric energy in the transportation sector.

However, only a few measures are currently in place to encourage alternatives. Ethanol blends did receive an exemption from the federal excise tax on motor fuel. This valuable subsidy encouraged some use of ethanol-gasoline blends. This exemption was extended as part of the budget package of October, 1990. The Alternative Motor Fuels Act of 1988, Public Law 100-494, extended credits, effective in 1993, to automobile manufacturers in the calculation of CAFE for vehicles that use methanol, ethanol, or natural gas (electric vehicles already had been granted such a credit treatment in the original legislation establishing CAFE requirements). Under the provisions of the act, ethanol, methanol, and natural gas are not counted as fuel consumed in the calculation of fuel economy. Thus vehicles that use methanol or ethanol or natural gas in effect have very high fuel economy ratings. This calculation reflects the value of these vehicles in reducing imports of oil. (The coalition of forces that gained passage of the credit provisions also included states such as California with a strong interest in the air quality benefits of the alternative fuels, but the calculation of the credit does not include any consideration of these benefits.)

Other than these two specific attempts to recognize the energy diversification and energy security benefits of alcohol fuels, the U.S. has not developed an approach to encouraging the use of alternative fuels. A new energy strategy developed throughout 1990 by the U.S. Department of Energy and thereafter refined and finalized by the President does not include any specific additional measures either to reduce demand for transportation energy or to encourage the use of substitutes for petroleum-based transportation fuels, except for a small program applying to some fleets. Absent some

strong initiatives from the Congress or from major states, it appears that in the U.S. further progress toward reducing energy use for transportation will cease, and the future use of alternatives to petroleum fuels will depend on the air quality benefits offered by these fuels, or on independent state actions to diversify transportation energy.

In using air quality considerations to promote the use of cleaner alternative fuels, California will have to lead the way as it is the only state permitted under the Federal Clean Air Act to establish its own emissions standards and regulations for vehicles. (Other states can, however, adopt California emissions standards. This gives the California lead powerful leverage in national policy questions concerning air quality and fuels.) However, California can also develop an independent approach to encouraging the use of alternative fuels based on creative new approaches to energy legislation.

II. CALIFORNIA'S APPROACH TO ENERGY EFFICIENCY AND DIVERSIFICATION IN THE TRANSPORTATION SECTOR

California has had no specific policy to improve the energy efficiency of transportation or to introduce alternatives to petroleum. The California Energy Commission does publish the Biennial Report, surveying the use of energy in California, identifying issues and problems, and making recommendations. The CEC has recommended a diversification of fuels in the transportation sector (without, however, stating a specific quantified objective). However, this is an Energy Commission recommendation, not an official policy of the State of California.

The California Health and Safety Code contains definitions of low-emissions vehicles that take reference to the low smog-forming potential of methanol vehicles. When state agencies buy new or replacement fleet vehicles, current law requires 25 percent to be vehicles that operate on methanol, or that are certified at half the current certification standard for hydrocarbons (or, in the case of trucks, alternatively at one half the current certification standard for particulates or oxides of nitrogen). This provision is expected to encourage the introduction of some vehicles capable of using methanol.

We believe that these existing provisions are far from sufficient to protect the public interest. Strong new action is needed.

Clearly, whatever steps California might take to increase vehicle fuel efficiency and to diversify fuel sources are constrained by the national program. We are also limited in the effect that even a major state can have on the large vehicle manufacturing industry and the even larger petroleum industry. Nevertheless California can take some steps to reduce energy use and diversify the energy supply for transportation. We can also encourage the use of cleaner alternative fuels which would both displace oil and help improve air quality. These measures would not only benefit California directly, but would help to move the national consensus toward more definitive action, with even greater future benefits.

III. POLICIES, PROGRAMS, AND NEEDS OF LOCAL AIR QUALITY MANAGEMENT DISTRICTS

The South Coast Air Quality Management District restructured by the Presley Bill (SB 151, passed in 1987) and the Sacramento Metropolitan Air Quality Management District formed by AB 4355 (Connelly, 1988) have broad regulatory powers over fleets of vehicles. Districts can also regulate "indirect sources" of vehicle-related pollution (that is, sources that generate vehicle trips, such as sports complexes, shopping centers, and even major new housing developments and roads). Districts have air quality problems that will be very difficult to solve without programs to reduce trips and vehicle miles traveled. Even taking into account aggressive new measures to reduce vehicle trips and miles, the Sacramento and South Coast districts have concluded that cleaner burning fuels are a necessary element of the air quality attainment plans required to be submitted in 1991 pursuant to the California Clean Air Act (AB 2595, Sher). The South Coast has already concluded, in fact, that air quality goals cannot be met unless transportation in the South Coast Air Basin becomes largely powered by electricity and other very clean alternatives. In effect, therefore, the South Coast Air Quality Management District has its own petroleum substitution policy, formally adopted. Sacramento is still forming its 1991 plan, but the draft version available for public review includes a substantial program to introduce cleaner alternative fuels.

The future state energy program must take reference to the needs of air quality management districts, and provide legislation that helps districts, which have little authority over fuels specifications directly, to meet their goals. Air quality programs which emphasize cleaner nonpetroleum fuels can have the associated benefit of increasing our energy diversification and energy security.

IV. WHAT SHOULD BE THE OBJECTIVES OF CALIFORNIA POLICY FOR TRANSPORTATION ENERGY?

A. Energy Security Considerations

At present, California imports almost no petroleum or petroleum products from foreign countries. Roughly half of California demand is met by California production; most of the rest comes from Alaska. However, as Alaskan production declines in the future (it has already peaked and has begun to enter a slow decline that will persist for many years) and as vehicle miles traveled each year continue to grow, imports will again enter the California petroleum balance. A reduction in California demand, and the displacement of demand with alternatives to petroleum, would help keep future costs down and free California and the U.S. from the dislocations associated with interruptions of supply or arbitrary pricing actions during times of high demand and limited supply. Perhaps most importantly from the point of view of geopolitics, decreased demand and some choice of alternatives to oil would allow the U.S. to deny our markets, and the profits associated with our markets, to dangerous and unstable suppliers of oil. This might free us from some of the pressures to take military action against renegade governments, such as that of Iraq in 1990-91, who put themselves in a position to earn large profits from the sale of oil.

Considering these objectives, how much reduction in demand for oil, and how much substitution, would provide worthwhile benefits? About half of U.S. oil demand is met by imports. Most of this demand is for transportation, which is nearly 100 percent dependent on petroleum derived fuels. Our total transportation fuel demand is projected to grow slowly over the next 15 years. Although estimates differ, a total growth of 15 to 25 percent appears to be a reasonable expectation to most. Domestic oil production cannot increase very much at the moderate oil prices that we as a nation aim for (we do not aim for extremely low prices—say below \$15 per barrel—partly to protect our own more expensive production and partly to help support allies in the Middle East, and we hope to avoid high prices—say above \$35 per barrel—to avoid adverse impacts on our economy), although new national incentives proposed in the President's energy plan in February, 1991, will provide some encouragement for increased domestic production. If we were to eliminate all imports, we would have to find a combination of demand-reducing measures and substitution strategies that eliminated more than half of today's petroleum use rate. This would be difficult to achieve without major investment and considerable dislocation in the existing petroleum industry. However, not all would agree that such an aggressive goal is necessary. We may not need to be free from all pressures, only some of them. Only Saudi Arabia provides more than 5 percent of the world demand outside of the Soviet Union and communist China. Even a combination of all producers in the Arabian peninsula would amalgamate the supply of only 30 percent of current world noncommunist consumption under one entity.

Possible, reasonable goals range somewhere from eliminating much of the undesirable pressures for intervention by the U.S., to a complete elimination of imports. The former objective might require eliminating about 5 million barrels per day of our current demand, or about 30 percent of our total demand. For reference, this represents the pre-Gulf war production of Iraq and Kuwait combined. The second objective would require eliminating about 7 or 8 million barrels per day of our demand today, or about 50 percent of our total demand.

Thus, a reasonable goal, if it could be implemented immediately, would appear to lie in the range of 30 to 50 percent displacement of today's demand by some combination of conservation (reduced demand below the expectation) and substitution. To translate this concept into a future goal, we have to consider expected growth in demand. The easiest way to accomplish this is to express the goal in terms of per capita demand in a reference year, for which we will select 1990. If we select a target year of 2005, our per capita demand reductions would have to be somewhat higher than the 30 to 50 percent reductions in use discussed above, in order to take into account the effects of some 15 to 25 percent projected growth in demand. On the other hand, the Energy Strategy proposed by the President does provide for about 3 million barrels per day of increased domestic production. This is within the 15 to 25 percent growth expectation. Thus it is appropriate, taking into account some projected increases in domestic production, to establish a goal of reduced per capita demand in the range of 30 to 50 percent in order to accomplish our overall objectives.

A goal in this range has one other potential objective. A portion of the increase in domestic production targeted in the President's Energy Strategy comes from some 270,000 barrels per day of new production from the continental shelf. Some of this incremental production, perhaps 100,000 barrels per day, would come from the

California coast. There are many environmental threats associated with this expansion of California coastal drilling and production. The goals developed here for reducing petroleum demand in California would more than offset the incremental oil production sought from the California coast by the President's strategy. Therefore the reduction goals proposed here should allow California some valuable options in negotiating the pace and nature of development of the oil reserves in California coastal waters.

We believe that the reduction goal should be made explicit as an objective which governs many future more detailed policy statements as well as specific measures to reduce demand and encourage substitutes. The state should not, of course, frame the goal as a specific commitment, since many factors outside the control of the state could defeat the achievement. Nevertheless, a target goal would help organize California programs.

Recommendation 1

California should establish a goal of reducing by 2005 the per capita petroleum demand for transportation, through a combination of conservation and substitution programs, by 30 to 50 percent of the per capita baseline demand in 1990.

The 50 percent goal has been included in the recently introduced SB 1214 (Killea).

In achieving any reduction goal defined by energy diversification considerations alone, we are relatively indifferent to the share of the contribution of conservation and substitution programs, partly because we cannot foresee at this time the evolution of technologies and the relative public acceptance and cost-effectiveness of approaches in each area. However, air quality programs benefit more from eliminating fuel use than from substituting cleaner fuels. In addition, the threat of global climate change due to the continued burning of fossil fuels introduces another consideration.

B. Air Quality and Global Climate Change Considerations

Although cleaner alternative fuels can help mitigate air quality problems, it would be still better to eliminate transportation energy use to the maximum degree feasible. Using no fuel is better than using even a clean fuel. From this point of view, we would like to see as much as possible of the reduction goal met by conservation (or trip reduction, or reductions in vehicle miles traveled). On the other hand, it is obviously unrealistic to aim for a 50 percent reduction in fuel use. It might be realistic, however, to aim for no growth in fuel use. Such a goal would be consistent with several recent evaluations of the possibility for improved vehicle fuel economy over the next 15 years, which have pointed to possibilities for cost-effective CAFE increases in the range of 20 to 25 percent. This would negate the effects of projected growth in fuel demand with "business as usual". And although a reduction in this range could perhaps be attained from improved fuel economy, reductions in vehicle miles traveled could also contribute to achieving this goal.

Another consideration in setting a conservation goal originates in concerns about global climate change due to emissions of carbon dioxide. Concentrations of carbon dioxide in

the atmosphere are increasing, and the increase is clearly connected mainly with the combustion of fossil fuels. Theoretical considerations suggest, but do not prove, that this increase in atmospheric carbon dioxide will in a few decades be enough to cause a noticeable effect in changing world climate. Although the effects are difficult to predict with certainty, some of the predicted effects are severe. The California Energy Commission, in a report mandated by Public Resources Code 25604.1, has concluded that the effects on California's agriculture, forestry, and tourism—through increasing temperatures and decreasing rainfall—might create extreme problems.

There is an emerging worldwide consensus that although a strong reaction to the threat of global climate change is not yet warranted by the data and the predictions, it would nevertheless be prudent to follow a "no regrets" policy aimed to encourage conservation so as to freeze carbon dioxide emissions worldwide at current levels. Conservation to this level probably would be relatively painless and perhaps even cost-effective, and would not harm industrial productivity or the economy.

Since the transportation sector is a major consumer of energy, roughly equal to the industrial and residential sectors, it seems reasonable to expect that new conservation efforts should be implemented in the transportation sector to meet the objective of guarding against global climate change. At the current projected rate of growth in energy demand for transportation in California, we would expect a growth of 15 to 25 percent by the year 2005. If we expect the transportation sector to hold the use of fuel constant at 1990 levels, then we need to see roughly 15 to 25 percent reductions in per capita carbon emissions. Although some of the alternative fuels do have less carbon dioxide emissions per unit of energy used than gasoline, the reductions are rather small (even for ethanol and methanol produced from biomass, since the amounts of fossil energy needed for fertilizers, pesticides, irrigation energy, cultivation, harvesting, and processing can be considerable), a reduction in carbon dioxide emissions should focus primarily on reducing energy use.

Therefore, to help meet air quality objectives and to limit the growth of carbon dioxide emissions, the goal should be to reduce per capita amounts of energy used for transportation by 15 to 25 percent. This goal amounts to about half of the overall goal for substitution and conservation combined established in Recommendation 1.

Recommendation 2

At least half the targeted reduction in petroleum demand should be achieved through conservation measures.

This goal adds air quality and global climate change considerations to the energy security and diversification considerations of Recommendation 1.

It is still unclear, however, what portion of the conservation goal should be attained by improved fuel economy of passenger vehicles and trucks, and what portion should be attained by reducing vehicle miles traveled. Health and Safety Code Sections 40919 and 40920 require districts with severe and extreme attainment problems (as defined in the Code) to implement transportation control measures to substantially reduce the rate of increase in passenger vehicle trips and the number of miles per trip. The Air

Resources Board is to provide guidance on the kinds of measures that can be considered to reduce trips and miles traveled.

A more significant effort is probably required, drawing upon the joint experience of the Air Resources Board, the California Energy Commission, the Department of Business Transportation and Housing, the Office of Planning and Research, and local air quality management districts.

Recommendation 3

The California Air Resources Board, the California Energy Commission, the California Transportation Commission, the Department of Business, Transportation and Housing, the Office of Planning and Research, the South Coast Air Quality Management District, and the Sacramento Metropolitan Air Quality Management District should develop a joint report and recommendations for implementing specific measures to restrain the rate of growth in vehicle miles traveled to not more than one half the growth rate of the general population in the state.

This report should draw on proven experience in California and elsewhere and should address conditions specific to the major severe and extreme nonattainment areas in California. Effectiveness and cost-effectiveness of possible measures should be reported, and needed funds should be defined. The report should be submitted to the legislature by the end of 1992.

V. WHAT APPROACHES SHOULD BE FOLLOWED — FINANCIAL INCENTIVES, MANDATES, OR STANDARDS?

Programs to achieve social objectives can take many forms, including financial incentives. The government can encourage certain specific technologies into the marketplace with financial incentives. These may include government funded research, development, and demonstrations, government subsidies, rebates, and tax credits for desired investments, extra taxes for the "wrong" technologies, and many other forms. Financial incentives have been used for many energy programs in the industrial and residential sectors. Solar and wind energy tax credits stimulated the deployment of these renewable energy technologies. Rebates for the installation of home insulation have helped reduce residential energy consumption. Financial incentives represent a deep government intrusion into the marketplace. The government not only selects certain specific technologies to be favored by the incentives, but the government by selecting the size of the financial incentive (or penalty, for disfavored technologies) in effect selects prices in the marketplace. Financial incentive/disincentive approaches are well suited for problems in which technologies are uncertain and rapidly evolving. Here, the incentives can help stimulate technological development. Also, financial incentives are usually relatively easy to enforce and administer.

Government can also mandate certain technologies. The requirement for unleaded gasoline was one such mandate. This approach also constitutes a substantial

government intrusion, although pricing decisions in this case are still left to the marketplace.

Finally, government can set performance standards. This approach is very typical in environmental regulation. In the field of energy regulation, appliance energy standards and the CAFE standard for automobiles are important examples of regulatory standard setting. This approach generally allows the marketplace to sort out technological options and prices, and represents the least direct government intrusion. For this approach to be successful, the various technologies needed to meet the standards must be reasonably available and assured of success.

Of course, mixed approaches are possible and nothing prevents more than one approach from being tried simultaneously. To achieve energy conservation and diversification, all approaches can be used. In the case of petroleum, however, financial incentive approaches are the most difficult to implement because the price of oil does not begin to reflect its true social costs. Oil is in effect subsidized to a very high degree. Very favorable tax treatments are applied to the depletion of oil reservoirs, as well as to costs for exploration. (This is to encourage the exploration and production of domestic reserves.) The large environmental costs of air pollution are not charged directly to oil. Nor are the costs of maintaining the 500 million barrel strategic oil reserve. Nor do we include in the price of oil the immense costs of protecting our access to foreign oil. If all these costs were applied directly to the price of oil, oil prices would be from \$10 to \$20 per barrel higher than the market price under today's groundrules. As a result, any financial incentives offered to other fuels might have to be substantial to overcome the large subsidy already given to oil, especially if the alternatives are to be given the chance of growing beyond a few specialized niches. Of course, oil taxes could be raised to cover the social costs of using oil, but this approach is drastically regressive, given the current forms of society and technology which have grown up in the context of subsidized cheap petroleum. As a result, many of the promising alternative fuels have requested subsidy help in some form, at least for some introductory period.

In the long run, however, we believe it is better strategy to rely as much as possible on neutral performance standards. Such standards allow for a more fair competition between fuels based on the aspects regulated. A regulation which required, for example, that a certain fraction of each automobile manufacturer's sales in California be capable of using a nonpetroleum fuel would avoid the government having to select particular technologies to receive specific amounts of subsidy. Instead, the marketplace could sort out the best nonpetroleum fuels, considering cost, technical features, and commercial acceptance of the fuel and the vehicles capable of using the fuel.

For these reasons our recommendations will incorporate some financial incentives as a way to encourage the development and deployment of vehicles that are fuel efficient and that can use alternatives to petroleum. At the earliest possible time, however, we plan a transition to performance standards that are technology-neutral and fuel-neutral. Other recommendations address this approach.

VI. STATUS OF TECHNOLOGIES

A. Improved Fuel Economy

The current CAFE standard is 27.5 miles per gallon. Actual cars sold range from 9 miles per gallon to well over 40 miles per gallon. Cars with good fuel economy tend to have lighter weight and less powerful engines. However, aerodynamics and many other design features influence fuel economy. The obstacles to increasing average fuel economy to values over 27.5 miles per gallon are largely social and political rather than technical. In effect, there is no national consensus to increase the average fuel economy of vehicles. Studies by the Department of Energy conclude that the fleet fuel economy could rather easily be increased to about 33 miles per gallon without substantially increasing costs or decreasing vehicle size and power. A fleet average for new car sales of 40 miles per gallon would be possible, but not without some important changes in average vehicle weight and performance. These changes are viewed by the automobile manufacturers as a significant market risk, and the manufacturers have been opposing proposals for such an increase in the CAFE standards.

Some of the alternative fuels offer the prospects of significantly improved fuel economy. Methanol is perhaps the leading candidate in this regard, as its combustion properties allow for greater power per pound of engine than those of gasoline allow. This extra power can be turned to advantage in lighter weight engines and vehicles. Natural gas may be able to provide similar advantages. Thus to some extent the introduction of alternative fuels can also serve the purpose of improving fuel economy at the same time.

B. Alternative Fuels

General Approach: Alternative Fuels or Synthetic Gasoline?

Energy substitution can be achieved either by using nonpetroleum feedstocks to manufacture gasoline, or by using vehicles that use fuels other than gasoline. The first approach allows the population of vehicles to remain unchanged, and preserves the utility of the gasoline storage and distribution system. However, the costs of converting other forms of energy into the complex aggregation of molecules that constitute gasoline are very high. This approach really only makes economic sense in the case of converting natural gas or coal to synthetic gasoline, but even these technologies are very expensive.

Direct use of alternatives such as methanol, ethanol, natural gas, and electric power are less costly. However, society must adapt to a splintered and differentiated fuels market for transportation, with some loss of flexibility in the end uses.

Status of Technologies

At the present time there are very few alternative fuel technologies for automobiles, buses, and trucks that can offer reasonable performance while at the same time meeting California emissions standards.

Methanol

Methanol (methyl alcohol, once produced from wood but today produced from natural gas; also producible at higher cost from coal and biomass) has the most advanced vehicle technologies of any of the alternatives, and major manufacturers are expected to offer thousands of methanol automobiles meeting California emissions standards in 1992 and 1993. In fact, methanol vehicles have emissions with very low photochemical reactivity, and this advantage may encourage manufacturers to select methanol technologies to meet the low future emissions standards that will apply in California.

These vehicles also have a key technological feature in being able to use either methanol or gasoline or any mixture of the two. These "fuel-flexible" vehicles are not slaves to a methanol distribution network, which at present includes only 22 stations in California and could not climb to thousands of stations until the late 1990s (there are about 17,000 gasoline stations in California). Thus with these fuel-flexible vehicles we can get started on methanol use, if desired, without waiting for a complete deployment of refueling stations. These automobiles are quite comparable to gasoline-only cars. In fact, performance and fuel economy are slightly better on methanol than on gasoline. However, the range of these vehicles on methanol is only about 60 percent of the range of gasoline, due to the lower energy content of methanol on a per gallon basis. Methanol can also be used in heavy-duty diesel-type engines, and Detroit Diesel will offer a methanol version of one of their engines in 1991. This engine is often used in urban buses and is also used in some trucks. Demonstrations of other heavy-duty truck engines using methanol are currently underway.

Methanol that is cost-competitive with gasoline and diesel fuel (given our pricing treatment of oil, as noted above) requires very low cost natural gas as a feedstock. Domestic gas has access to gas markets through pipelines. The gas prices in these markets are more attractive than the prices that could be charged for gas converted to liquid methanol. Therefore, methanol will be produced from low-cost remote (foreign) natural gas resources. Supplies suitable in amount and price are located in Canada, Latin American, New Zealand, Australia, and Indonesia, as well as in Persian Gulf countries, Iran, and the Soviet Union. Globally, gas supplies are much more widely distributed than oil resources. Therefore, even imported methanol offers an attractive alternative to imported petroleum. The use of methanol would generate more suppliers and more competition than our current concentration on oil. However, from the point of view of energy security, imported methanol is not as attractive as a fuel produced from domestic resources.

Ethanol

Ethanol ("grain alcohol", but produced from many agricultural products) is more expensive than methanol but offers many of the same advantages. It can also be used in the fuel-flexible methanol/gasoline vehicles offered by the major manufacturers today, with only minor electronic changes. Ethanol would generally be made from domestic resources, giving it an advantage over methanol produced from low-cost foreign gas, provided that the fossil energy resources used for the fertilizer, pesticides, irrigation pumping, cultivation, harvesting, and processing necessary to produce the ethanol do

not cancel out this advantage. This can be the case if ethanol is produced from feedstocks grown on marginal land, or if the ethanol is produced in an inefficient manner.

The most interesting prospects for ethanol involve the production of ethanol from waste biomass such as straw and waste wood and possibly from municipal waste. Produced from these sources, ethanol would make an important contribution in reducing the amount of fossil carbon converted to carbon dioxide emissions, thought to be important in future global climate change. It is possible that methanol also can be produced from the same wastes, and more detailed studies and demonstrations are needed to determine whether ethanol or methanol provides the most cost-effective approach to converting solid waste to liquid fuel.

Natural Gas

Natural gas has been used in vehicles for many years, although almost all of these past applications represent retrofits done to avoid shortages of gasoline or diesel. None of the natural gas vehicles operated in California has been certified to modern emissions standards, although work is currently very active in crossing this barrier. Natural gas vehicles have considerably less range than their gasoline and diesel counterparts, but per-mile costs may be less due to the relatively low cost of natural gas compared to the cost of gasoline. Natural gas vehicles may be offered in "dual-fuel" or "bi-fuel" versions which have a gasoline fuel system in addition to the natural gas system, or in dedicated versions that can use only natural gas. Due to the short range of vehicles using natural gas, and the high costs of natural gas compressors (or liquefaction units), dedicated natural gas vehicles may be restricted to centrally fueled fleet applications and short routes. However, there are many such applications in California. Liquified natural gas may offer some advantages over compressed natural gas, but the general range and infrastructure problem will be similar. The natural gas used in either type of natural gas vehicle would be from supplies in the U.S., Canada, or Mexico. Such natural gas offers major advantages in energy security.

Propane

Propane or liquified petroleum gas (LPG) is used in many vehicles in California today, although these have not been certified to modern emissions standards. Propane probably will be able to meet such standards. However, propane, much of which is produced during oil refining, is not generally regarded as an alternative to petroleum. Its displacement from current markets into vehicles would generally need to be made up by supplying heating oil to the abandoned propane markets. Substantial new supplies of propane in California would probably require an increase in refining activity, which is not consistent with displacing petroleum. However, it is possible that some amount of propane could become available from increased natural gas production. Also, large amounts of propane could be imported from major natural gas producers such as Canada. Propane supply issues are still being studied, but in general propane does not appear deserving of support in any strategy aimed to create alternatives to petroleum.

Electric Energy

In California, electric power for vehicles does offer an alternative to petroleum since we use very little oil for power generation (an outcome of a successful program to displace petroleum in this sector). Currently, the heavy weight, high costs, and limited storage capability of electric batteries keeps battery cars restricted to very few applications. With current battery technologies, it does not appear that electric vehicles can capture more than 1 to 3 percent of vehicle trips and miles.

However, intense efforts are underway (some with state and local district support) to develop batteries with more energy storage, greater charging efficiencies, and less weight. The most practical design of electric vehicles may take the "hybrid" form, in which an electric battery vehicle has a supplementary low polluting small internal combustion engine. Hybrid designs can use the engine to meet the baseline energy requirements of the vehicle and recharge the batteries as necessary. The battery pack can supply peak power requirements. Hybrid electric vehicles appear able to satisfy ARB goals for the year 2003 to have about 10 percent of new vehicle sales be extremely low emitting vehicles.

Electric power is also used for street cars and light rail systems. This offers petroleum displacement. However, with our current practices of urban design, public transit of this type cannot cost-effectively capture more than a few per cent of all person-miles traveled. Furthermore, this capture is often at the expense of bus ridership, and there is no gain in energy efficiency obtained by shifting to this mode of transport (in fact, there is usually a loss of energy efficiency).

Diesel Fuels

Diesel fuel, which is more energy-efficient to produce than the highly refined gasolines, offers some prospects for reducing petroleum use. However, a further proliferation of diesel technologies in passenger automobiles and light-duty trucks is not consistent with air quality programs for particulates and toxic air emissions, and will not be possible. Programs to increase ridership in diesel buses (and in buses using clean alternative fuels) would be helpful in meeting energy reduction goals in the transportation sector. Programs for this purpose are being addressed in other forums, however.

Reformulated Gasolines

As a means to achieve energy diversification, reformulated gasolines are not an alternative fuel except to the minor extent these gasolines may include some compounds such as methanol, ethanol, and ethers that do not derive from petroleum feedstocks. These blending components are expected to be included in future gasolines in small concentrations. They help gasoline achieve some of the air quality benefits attributed to methanol and other alternative fuels.

Reformulated gasolines do offer air quality benefits over conventional gasolines, and there is little doubt that new California emissions standards will be met to some extent by cars and light trucks running on cleaner reformulated gasolines. More importantly, reformulated gasolines offer a promising possibility for reducing the emissions of the

millions of cars already on the road today that are not designed to the lower emissions standards of the future. Better gasolines will reduce emissions from these cars, and reduce the ozone-forming tendency of the emissions.

VII. PROPOSED LEGISLATIVE PROGRAM FOR FINANCIAL INCENTIVES

A. Fee/Rebate Incentive for New Vehicles

Financial incentives can be used to stimulate the introduction of vehicles capable of using alternative fuels and the development of an infrastructure to supply these fuels. One form of financial incentive can be used to stimulate the sales of fuel-efficient vehicles. States are preempted from setting fuel economy standards by the language establishing national CAFE standards. In 1990 the California legislature attempted to encourage the purchase of energy efficient vehicles through **SB 1905 (Hart)**, the "DRIVE+ program", which defined sales tax increases or rebates for new vehicles based in part on the energy efficiency of the vehicle. The extra taxes and the rebates were to be so structured that the program would be revenue neutral, except for a small amount needed to administer the program. **SB 1905 (Hart)** passed both houses of the California legislature by a wide margin, but was vetoed by Governor Deukmejian partly on the grounds of a perceived conflict with the national preemption of fuel economy standards. The Governor also argued that revenue neutrality could not be guaranteed in any given year, and that some form of tax would be needed to develop a contingency fund.

We strongly disagree with these arguments in the veto message. Clearly a scheme of financial incentives does not conflict with the federal obligation to define and enforce fleet fuel economy standards. Furthermore, revenue neutrality, within a reasonable margin, should be relatively easy to manage.

The DRIVE+ program bill has been reintroduced this session as **SB 431 (Hart)**. In the meantime, however, the new ARB low-emissions vehicle rule has addressed some of the same objectives of the DRIVE+ concept with an averaged standard that does provide, for the first time, a significant incentive for manufacturers to sell vehicles certified at emissions levels below the current average standard. The DRIVE+ program will still make a useful contribution toward lower emissions levels, and will be potentially helpful in stimulating the early introduction of vehicles with very low emissions levels.

Nevertheless, the DRIVE+ program could be improved by adding an additional incentive for manufacturers to sell vehicles capable of using nonpetroleum fuels. It is this type of vehicle that needs some specific new incentive if California's goals for energy diversification in the transportation sector are to be met.

Recommendation 4

Adopt the DRIVE+ program of SB 431 (Hart), taking the opportunity to modify the factors entering the calculation of the extra tax or rebate to reflect the value of reducing petroleum use and encouraging alternative fuels.

The original **SB 1905 (Hart)** and the new **SB 431 (Hart)** both provide for an extra tax or rebate according to the emissions of carbon dioxide and the certification emissions of air pollutants from each engine family sold in California. This basic approach should be retained, but an additional factor should be added to reflect the value of alternative fuels. Vehicles capable of using fuels not derived from petroleum should receive an extra increment of rebate credit. Vehicles dedicated to nonpetroleum fuels should receive a still larger increment of rebate credit. Conversely, vehicles that use only gasoline or diesel fuel should incur an extra increment of sales tax.

B. Investment Tax Credits for Alternative Fuel Storage/Dispensing Equipment and Incremental Vehicle Costs

The newly adopted California Air Resources Board emissions standards for automobiles and light- and medium-duty trucks are not explicitly aimed to improve fuel economy or to develop the use of alternative fuels. The standards are "fuel-neutral". However, the standards are drawn with reference to the low photochemical reactivity of the emissions of vehicles using some clean alternative fuels, and the expected result of the ARB standards, combined with the driving force of the federal CAFE incentives extended to methanol, ethanol, and natural gas (as well as electric energy), is expected to cause the introduction of some number of new vehicles capable of using alternative fuels in California in the 1992+ time period. Approximately 5,000 of such vehicles are expected by 1994, and several tens of thousands by 1996. The ARB rule establishing the standards provides that if new vehicles are sold that are certified on nonpetroleum fuels, then the petroleum industry must offer the alternative fuels for sale in a number of locations proportional to the number of vehicles needing the fuel. However, there is no requirement in the rule for the fuels actually to be sold.

The fee/rebate concept of **SB 431 (Hart)**, if properly tailored to incorporate some incentive for vehicles capable of using alternative fuels and some disincentive for vehicles that use only gasoline or diesel fuel, will provide still more vehicles that can use alternative fuels than will be developed by the existing combination of the ARB emissions rules and the federal CAFE incentives. However, to make a major move toward energy diversification, additional measures will be needed.

In particular, natural gas may need some assistance in the early years because this fuel requires substantial investments in compressor or liquefaction stations that are far more expensive, per vehicle served, than a simple gasoline storage tank and dispensing pump. In addition, the gas storage tanks on vehicles and the conversions of engines to use the natural gas also represent substantial incremental costs over the costs of gasoline or diesel vehicles. In mass production, these extra costs will eventually be reduced and the low price of natural gas itself will help offset the extra initial costs. During an introduction period, however, some financial incentive will be helpful and perhaps critical to the success of this fuel.

On the federal level, the Andrews bill introduced in 1990 (H.R. 2269) would provide for investment tax credits for new investments in fuel preparation, storage, and dispensing equipment, or for incremental costs of on-vehicle items required by the fuel. Fuels eligible for this treatment include natural gas, whether compressed or liquified, methanol,

ethanol, and electric energy. We believe that a state analog to the federal-level Andrews bill will be a helpful addition to the California alternative fuels program.

Recommendation 5

California should grant investment tax credits for investments made in equipment to prepare, store, and dispense natural gas, methanol, ethanol, and electric energy for use in vehicles, as well as investments made in equipment needed to store these fuels on vehicles and deliver the fuels to vehicle engines or power plants over and above the costs of comparable gasoline or diesel systems. The tax credit will apply to the costs of retrofits and conversions to use natural gas, methanol, ethanol, and electric energy, and to incremental costs of new engines and vehicles, provided the vehicles receive ARB emissions certification.

The Andrews bill included provisions to provide equal financial benefits to nontaxed entities such as local governments. We recommend that the same approach be followed here. The investment tax credit should sunset after no more than 10 years, unless extended by the legislature, as it is intended as a promotional measure in early years of a transition. It should be replaced by approaches using fuel-neutral performance standards.

C. Registration Fee Surcharge to Fund Programs to Repair or Retire and Replace Gross-Emitting Vehicles

California can provide other incentives for the deployment of vehicles capable of using nonpetroleum fuels. Local air quality management districts are striving to develop effective plans for meeting the ambitious emissions control goals of the California Clean Air Act (AB 2595, Sher, 1988). An important obstacle to rapid progress is the small number of older, or poorly maintained, or defective vehicles that have grossly high emissions. Some recent data indicates that more than 50 percent of the emissions may come from less than 10 percent of all vehicles. The Inspection and Maintenance Program, despite recent enhancements, is not yet proving fully effective in identifying such gross-emitting vehicles and causing them to be repaired. Perhaps an equally important goal should be to encourage the retirement of such vehicles in favor of newer vehicles that are capable of using cleaner nonpetroleum fuels. A retirement incentive program for these vehicles would meet two important goals: air quality and energy diversification.

Conceptually such a retirement incentive program would work by building a trust fund that would be used to encourage the repair of faulty vehicles in case the repair limits exceeded the limits in the "Smog Check" program (which are limited to \$300), as often is the case for gross-emitting vehicles. In addition, funds could be used to offer a rebate to a purchaser of a new vehicle that met low-emissions standards and that could use a nonpetroleum fuel.

The trust fund should be funded by a surcharge on the annual vehicle registration fee. However, the fee would not apply until the fourth year of registration and thereafter.

Before that time, vehicle emissions control systems are covered by warranty, and warranty repairs can be triggered by the new enhanced Smog Check program. Starting in the fourth year, a registration fee surcharge of \$25 per vehicle would support a useful program to identify and repair gross-emitters and to retire cars not worth repairing in favor of new vehicles capable of using cleaner nonpetroleum fuels.

This program should be structured as a blanket authorization for local districts to implement, subject to local board vote to approve the imposition of the fee to support a defined program meeting state standards.

Recommendation 6

California should authorize local air quality management districts to impose a \$25 annual surcharge on the annual vehicle registration fee to meet the objectives of a program to identify and repair gross-emitting vehicles or to encourage the retirement of such vehicles in favor of the purchase of new vehicles meeting low emissions standards and capable of using nonpetroleum fuels. The incentive award for new vehicle purchase should be a graduated scale with a maximum incentive of \$2,000 for the purchase of a zero emissions vehicle as defined by the Air Resources Board. To qualify for any incentive award, the new vehicle must be capable of using nonpetroleum fuels and the retired vehicle must be certified as deregistered and destroyed as part of a recycling program that recovers any air conditioning refrigerant.

D. Bond Programs for Production of Fuels and Vehicles

Larger sums of money are needed to stimulate the production of nonpetroleum fuels and the manufacture of vehicles. For this purpose, bonds are the appropriate response.

Recommendation 7

California should implement a major bond fund to provide for grants and low-interest loans for the construction of clean-fuel production, storage, distribution, and dispensing facilities and facilities for the production of low-emitting vehicles.

SB 1216 (Rosenthal) provides for such a program. This bill provides for retirement of the bonds through a one-fourth cent increase in the sales tax on gasoline.

E. Increased Gasoline Taxes

A final financial incentive program is to increase significantly the California taxes on gasoline. Added taxes have the benefit of suppressing some gasoline demand, and the additional benefit of generating revenues for other programs to encourage alternative fuels. California and the federal government have recently increased excise taxes on gasoline (initially 5¢ per gallon in California, growing to 9¢; 5¢ per gallon at the federal level). The California increase was aimed at highway infrastructure improvements. We

propose a new sales tax surcharge of 5 percent for specific purposes related to energy diversification.

Recommendation 8

California should implement a 10-year sales tax surcharge of 5 percent on gasoline and diesel fuel. Revenues from this added tax should be used to retire bonds used to provide loans and grants to investors in alternative fuel production, storage, distribution, and dispensing equipment and to provide loans and grants for the construction of facilities to produce low-emissions vehicles capable of using cleaner nonpetroleum fuels; for grants to purchasers of alternative fuel vehicles; for grants to support the alternative fuels programs of local air quality management districts, including random roadside enforcement programs and associated vehicle repair or retirement programs; and for funding research, development, and demonstration programs for low emission vehicles capable of using alternative fuels, and, if needed, for a cushion fund for the fee/rebate tax program of Recommendation 4.

Loans and grants will encourage the production and distribution of alternative fuels and the purchase of alternative fuel vehicles. Grants will be extremely important to help local air quality management districts accelerate the distribution of vehicles using cleaner alternative fuels. The programs being planned by the districts will include random roadside inspection programs to identify gross-emitting vehicles in poor repair. Programs of this type planned in Sacramento, for example, will aim to encourage the retirement of such gross-emitting vehicles in favor of vehicles using cleaner alternative fuels. State assistance in promoting the changeover to such vehicles will be a major help in establishing and administering these programs.

F. Income Tax Surcharge on Oil Industry

Another alternative is contained in **SB 1217 (Rosenthal)** which would impose a five-year, 10 percent surcharge (extra income tax) on oil industry net income attributed to the production, refining, distribution, and sale of oil in California. Half of the money raised by this bill would be made available to the ARB to purchase and remove from public use, in non-attainment areas of California, high-polluting and fuel-inefficient used cars.

VIII. RECOMMENDED STATE MANDATES AND STANDARDS

A. Requirements for Vehicles and Engines

After a period of financial incentives to help develop early uses of alternative fuels in transportation applications, and to help local districts begin the deployment of alternative fuel technologies, financial incentives should be scaled down in favor of more neutral statements of state objectives in the form of general requirements. We make three recommendations to require the sales of vehicles and engines capable of using alternative fuels, to take effect in 1995, when these technologies should be fully capable of satisfying consumers and meeting emissions standards.

Recommendation 9

Beginning in 1995, require transit buses at the time of engine overhaul or engine replacement to convert to alternative fuels, including methanol, ethanol, natural gas, or electric power.

This provision will assure the quick deployment of alternative fuels in the transit bus sector, where smoking diesel buses continue to be a major source of urban pollution and public complaints. Because the lifetime of bus engines is very long, a conversion program in this sector makes sense in order to achieve a quicker introduction than can be obtained from normal turnover. Clean fuel retrofit or conversion technologies will soon be available that meet ARB certification requirements. (The new federal Clean Air Amendments contain a related but much weaker retrofit conversion requirement to meet a technology standard to be defined by the Environmental Protection Agency. The goals are limited to emissions reduction.)

Recommendation 10

Beginning in 1995, require all state fleets and owners of private fleets of 10 or more vehicles registered in or operating in nonattainment areas, to purchase new and replacement vehicles that are capable of using alternative fuels. The requirement should cover only a small number in the first year, but should grow to cover most new and replacement vehicles by the year 2005.

Local districts will be implementing requirements to have local government and private fleets purchase low-emissions vehicles. The state level provision of Recommendation 10 requires that some of these vehicles be capable of operating on nonpetroleum fuels. The two programs are expected to complement one another, since many of the low-emissions vehicles will be alternative-fuel vehicles. State fleets should also be included in programs of this type. SB 1212 (Killea) and SB 1213 (Killea) effectively meet this recommendation.

Recommendation 11

Beginning in 1995, require that a fraction of each vehicle manufacturer's sales in California be capable of using alternative fuels not derived from petroleum.

This provision is similar to the fleet provision but applies to all vehicles sold in California. The fraction would need to start at a small amount, perhaps 1 percent in 1995, and grow over a period of years to approximately 30 percent of all sales, in order to meet petroleum displacement objectives. Like the other recommendations of this group, this provision does not guarantee that alternative fuels will in fact be used, but it does develop the capability of using such nonpetroleum fuels in the population of vehicles.

SB 1214 (Killea) proposes to meet the objective expressed in Recommendation 11 by requiring the ARB to consider fuel diversity in developing regulations for low-emissions

vehicles and clean fuels. This approach may be workable. However, we believe that the more direct approach of Recommendation 11 will be more effective.

B. Availability of Alternative Fuels

Recommendations 9, 10, and 11 have addressed the need to deploy vehicles capable of using alternative fuels. They supplement the financial incentive measures of Section VII. To ensure that alternative fuels are in fact available and are used, additional firm mandates will be needed. The next four recommendations address issues of fuel availability and actual use.

The first of these recommendations will help develop a methanol infrastructure at very low cost:

Recommendation 12

Require that in ozone and carbon monoxide nonattainment areas at least one new or replacement liquid fuel storage tank at each retail refueling location or fleet refueling facility offering and dispensing liquid fuel must be compatible with methanol and ethanol.

The South Coast has already implemented a requirement of this type, and Sacramento plans to do so in the near future. The requirement should apply uniformly to all areas in the state not in attainment for ozone and carbon monoxide, because methanol and ethanol (and gasolines containing methanol and ethanol and other oxygenates) are effective in reducing emissions of carbon monoxide, particulate, and of the precursors to ozone (photochemical smog). The legislature earlier passed a measure of this type (SB 921, Rosenthal, 1987), but it was vetoed by Governor Deukmejian on the grounds that a statewide requirement did not appear needed until the need for alternative fuels was defined. The need has now been defined, not only from the air quality point of view, but more importantly, from the point of view of energy diversification and energy security.

The rate of replacement of old leaking underground gasoline and diesel tanks continues to be high, and the rate of construction of newer larger retail gasoline stations is also high as the gasoline distribution business rationalizes itself toward fewer, larger stations. When tanks are replaced, or new tanks are installed, the incremental costs to make the tank compatible with methanol and ethanol are very small. Both steel and fiberglass tanks can meet the requirements, so neither type is disadvantaged by the rule. If future alternative fuel programs have to depend on replacing new underground tanks not compatible with methanol with substitute tanks that are compatible, the costs can be far more than \$40,000 per tank. It is far more reasonable to take advantage of the current high rate of tank replacement and new tank installations to build in methanol/ethanol compatibility in our infrastructure at very low cost.

The second recommendation seeks to generate active competition in deploying alternative fuels by providing broad access to the current system of gasoline/diesel refueling stations:

Recommendation 13

Require that owners of retail public refueling facilities and private fleet refueling facilities provide access, space and facilities to other parties wishing to offer alternative fuels for sale, unless the station already makes an alternative fuel available.

It is widely suspected that current ARB rules and standards may not be effective in developing a broad offering of alternatives to gasoline and diesel fuel. Although the rules require that the industry make alternative fuels available if vehicle manufacturers sell vehicles that are certified on alternative fuels, the number of stations required by the ARB rule is quite small, especially in early years of the program. There is some evidence that some other parties, including the natural gas and electric utilities, as well as methanol producers, might wish to make alternative fuels available at a greater number of stations, but because they are not now in the vehicle-fuel business they lack suitable locations. It would be greatly to California's advantage to encourage these parties to make investments in refueling facilities. This is best accomplished by allowing these parties access to space at existing retail gasoline/diesel stations. Of course, the station owner would have to be appropriately reimbursed for the value of the space and facilities.

For this recommendation to be fully effective, it will be necessary to exclude these parties from possible regulation as public utilities if they propose to sell natural gas or electric energy to the general public. Sellers of fuel for vehicle use, where there is an intensely competitive environment, should not be subject to the constraints of utility regulation.

Recommendation 14

Provide that ownership of a facility to sell natural gas or electric energy for use as motor vehicle fuel, and the sale of natural gas and electric energy for motor vehicle use, does not make the owner or seller subject to public utility regulation by the PUC.

This recommendation has been effectively addressed by SB 547 (Rosenthal).

Another bill, AB 1607 (Costa) would allow the PUC to authorize natural gas utilities to (1) construct and maintain natural gas refueling stations to be owned and operated by the utility, or to be transferred to non-utility operators; (2) support the construction and maintenance of compressed natural gas vehicle conversion and maintenance facilities; and (3) provide incentives for the conversion of vehicles to natural gas, and the purchase of factory equipped gas vehicles. AB 1607 would also allow the PUC to recover reasonable costs of the above through rates, either by expensing or capitalizing, or both. The issue of rate recovery for these costs may be controversial, since it could involve charging all utility customers for a product used only by a few. Before the PUC can approve such rate recovery, they must make a finding that, it is in the long term interests of the ratepayers, and there are no cross-subsidies. The PUC is currently evaluating these issues.

The fourth of these infrastructure recommendations addresses an omission in the innovative California program to provide for clean-up of spilled or leaked vehicle fuels so that nonpetroleum alternative fuels are also covered in the program:

Recommendation 15

Expand the coverage of the California Underground Storage Tank Cleanup Fund specifically to cover spills and leaks of methanol and ethanol. Extend the storage fees to cover methanol and ethanol used as motor fuel.

The California Underground Storage Tank Cleanup program establishes a trust fund to provide cleanup costs for major leaks of gasoline and diesel fuel. The liability for such cleanup is a major problem for independent dealers, who lack the financial resources to meet their potential cleanup obligations under federal law. Major oil companies can self-insure and can provide protection to their lessee/dealers, but independent station owners have inadequate resources. California has addressed this problem in an imaginative and effective manner with a trust fund that is funded from a fee paid on each gallon of gasoline and diesel fuel sold from storage tanks in California. Owners are liable for the first \$50,000 of cleanup costs. The trust fund covers remaining costs, under some conditions of adequate maintenance, monitoring, and reporting. The lack of similar coverage for methanol and ethanol is a barrier to the deployment of these alternative motor fuels. The problem is easily solved by extending the program to include these fuels.

C. Use of Alternative Fuels

With these measures in place it is a short step to complete the work begun by the Air Resources Board when it developed its low-emissions vehicle rules in 1990. As originally proposed in the ARB Staff Report, the rule provided that if vehicle manufacturers sold vehicles that required specific clean fuels to meet the emissions standards, then gasoline suppliers would have to distribute the required fuels in the volumes required by the vehicles. This "sales mandate" was the vital final link in the program. Without it, there would be no assurance the petroleum industry would see fit to distribute and sell these fuels, and the vehicles would either have no fuel at all unless supplied by industries without any current access to the customers (since these industries do not now sell motor fuel), or in the case of dual-fuel or fuel-flexible vehicles would be forced to use gasoline rather than the fuel they were certified on to meet emissions standards. Without the needed fuels, the vehicles either would be useless, in the case of dedicated-fuel vehicles, or would not meet emissions standards.

For these reasons, the ARB rule included a "distribution mandate", sometimes termed a "sales mandate". Under this provision, the oil industry would have been required to sell the alternative fuels required by the vehicles needing the alternatives. Strategies of locating stations and pricing the fuels were left to the industry, but the obligation to ensure that a reasonable volume of these fuels, commensurate of course with the number of vehicles capable of using these fuels, was on the oil industry. The oil industry objected strongly to this provision, arguing that they could not be sure of being able to sell these fuels to a public uninformed about the fuels or reluctant to use alternatives. Of

course the same burden of a "sales mandate" does apply to the vehicle manufacturers through the mechanism of the low-emissions vehicle emissions standards, but this industry was not successful in defeating the rule with arguments parallel to the arguments used by the oil industry. The oil industry was successful, however, and at the last minute the "fuel sales mandate" was deleted. It was replaced by an "availability mandate" with certain conditions as to numbers of stations (generally proportional to the number of vehicles needing the fuel, but very small in the 1994-1997 time span) and other conditions concerning general comparability with gasoline facilities (lighting, signs, access, etc.). The ARB would monitor the success of the availability mandate, and determine whether the sales mandate approach needed to be applied.

Unlike the Air Resources Board, we conclude that it is a given that a fuel sales mandate is required for alternatives to gasoline to enter the marketplace successfully, and thus to achieve air quality and energy diversification goals. We do not believe that it is necessary to wait to obtain experience with a requirement that only requires availability, and that has no real obligation to place the alternative fuels in vehicles that can use them.

Recommendation 16

Require the petroleum industry to sell nonpetroleum fuels to vehicles capable of using these fuels, in volumes commensurate with the normally expected fuel demand of these vehicles.

We would expect to follow the plan of the originally proposed ARB rule, in which the amount of fuel required to be sold began in 1994 at 50 percent of the implied total demand of the vehicles capable of using alternative fuels, and rose by stages to near 100 percent coverage after a few years, when enough time has passed to allow for fuels production and distribution infrastructure to develop. In early years of the program, it would not be reasonable to expect that vehicles capable of using the alternative fuels would always find a retail station able to provide the fuel. Bi-fuel and fuel-flexible technologies address this early-transition difficulty. Nevertheless, for the program to be effective the industry best able to market fuels must be under a specific and express obligation, similar to their new obligation in the mid-1970s to provide unleaded gasoline to cars, requiring it to put the alternative fuels into commercial use. Mere "availability" is not sufficient.

There is still some residual possibility that the combination of the petroleum and vehicle industries may be able to meet ARB emissions standards with gasoline technologies. Although the gasolines required would probably have to be extremely clean reformulated gasolines, it may be possible to meet even low emissions standards with these gasolines. In these circumstances, even the goals of the South Coast to replace conventional vehicles with extremely clean vehicles that probably use electric energy to a great extent are vulnerable to falling by the wayside. Once cleaner gasolines are produced, the next reduction in emissions provided by electric and other superclean technologies may not appear to be very cost-effective, on air quality considerations alone. Therefore, there are limits to which air quality objectives can help to accomplish energy diversification objectives. It is for this reason that we have included Recommendation 11, under which after a certain year a certain fraction of vehicle sales

in California must be capable of using nonpetroleum fuels regardless of the ability of gasoline and diesel fuel to meet future emissions standards. But having such vehicles on the road accomplishes nothing without an associated fuel distribution mandate, provided by Recommendation 16.

Recommendation 16 is effectively addressed by **SB 1211 (Rosenthal)**.

D. Emissions Standard for Fuel-Cycle Carbon Dioxide

Even with these mandates it is still necessary to pay attention to the balance between energy diversification and energy conservation. The program of **SB 431 (Hart)** will improve the energy efficiency of vehicles to a certain degree. Further tightening will depend on federal action to increase CAFE Standards. However, the President has declared the administration to be strongly opposed to any tightening. If the federal government does not increase CAFE standards, then California will have to take additional steps to freeze carbon dioxide emissions at 1990 levels and combat the threat of global climate change.

Recommendation 17

Clarify that the Air Resources Board has specific authority to regulate fuel-cycle carbon dioxide emissions from vehicle use, and establish a sales-weighted reduction goal of a 20 percent per vehicle-mile reduction from a 1990 baseline, to be achieved by 2005.

This appears superficially to conflict with the federal preemption of fuel economy regulation, but this is a program to reduce the threat of global climate change. It is only indirectly related to fuel economy. In addition, this standard is based on the life-cycle carbon dioxide emissions, covering all carbon dioxide emissions associated with fuel production, conversion or refining, transportation, and distribution, as well as end-use in a vehicle. Thus it is not directly a vehicle fuel-economy measure. For these reasons, it does not conflict with the federal program for vehicle fuel economy standards. It is essential to meeting California environmental objectives.

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Alternative Fuels Fleet Provisions

Provision	Clean Air Act Amendments of 1990	National Energy Strategy The NES: HR 1301, S.570	Senate (Johnston Amendment)	Senate (Wirth Amendment)	House (Lent H.R. 1543)	Compromise
Oil Purpose	Reduce pollution	Oil reduction Energy security	Oil reduction Energy security	Oil reduction Energy security	Oil reduction Energy security	Oil reduction Energy security
Covered Area	22 cities	125 cities	Nationwide	125 cities	125 cities and 1 carbon monoxide nonattainment city	125 cities
Covered Fleet CAA cities (22) Other (103)	CAA cities (10) Other N/A	CAA cities (10) Other (20)	Nationwide (100)	CAA cities (20) Other (20)	CAA cities (10) Other (20) NOTE: trucks above 8,500 lbs gvw are excluded	CAA cities (20) Other (20)
Truck size	Light duty vehicles up to 8500 lbs. gvw; Heavy duty trucks, 8501 to 26,000 lbs. gvw; Nothing over 26,000 gvw	All straight trucks (tractor semi-trailers trucks over 26,000 lbs. gvw excluded)	All trucks up to 26,000 lbs. gwr	All trucks up to 26,000 lbs. gvw	Same as NES	Trucks to 8500 lbs.
Private Fleet Mandate percent of annual acquisition)	Light duty vehicles 30% by 1998 50% by 1999 70% by 2000 Heavy duty vehicles 8,500 to 26,000 lbs. gvw 50% by 1998	1995 10% 1996 15% 1997 25% 1998 50% 1999 75% 2000 90% After 2000 90%	1998 30% 1999 50% 2000 70% After 2000 70%	1998 30% 1999 50% 2000 70% After 2000 70%	Same as NES	Light duty vehicles 1998 30% 1999 50% 2000 70% (or delayed to later date)
Incentives TCM Relief Credits Other Incentives	Yes Yes (credits weighted by emission reduction) Value uncertain None	None addressed Yes (all vehicles 1 : 1 credit) Value uncertain None	Same as NES	Same as NES	Same as NES	Fuel cost differential; Tax incentives for vehicle purchases and infrastructure; emission trading; curtailment protection; truck weight limit exemptions
Oil Import Reduction Note: total current U.S. consumption is 17 million barrels/day (MMBD))	700,000 barrels/day displacement	Clean Air Act Fleet Program and NES Fleet program will combine, according to the Energy Dept., to displace: 1.5 MMBD by 2005 2.2 MMBD by 2010 (Note: Only .35 MMBD directly achieved by Fleet, balance from indirect encouragement of general public.)	75% less than NES	No projection made publicly	No projection made publicly	

ALTERNATIVE FUEL VEHICLES

Include Fleets Smaller Than 100 or 50 Vehicles

Problem

The fleet mandate contained in the Johnston Amendment would only apply to fleets operating more than 100 vehicles that are all within one location and are centrally fueled or capable of being centrally fueled. This proposal unfairly targets only a handful of fleets, especially nationwide delivery services, and omits sufficient incentives for stimulation of a nationwide alternative fuels infrastructure.

Solution

A broadbased energy problem requires a broadbased solution. A fleet program needs to include smaller fleets, such as those of 10 or 20 or more vehicles, or else a critical mass will not develop for creating an alternative fuel refueling infrastructure. Without such facilities, the public at large will not use alternative fuels and the purpose of the program will be defeated. If a new size threshold is deemed necessary, then a nationwide minimum of 50 vehicles would protect small businesses.

Rationale

- ◆ A 100 vehicle limit is anticompetitive. UPS relies on consolidated deliveries, locates its facilities centrally, and is the only company to serve every address in each state. By only targeting the largest fleets, the Johnston Amendment exempts our competitors, who provide only part of the same service and thus have fewer vehicles. The proposal penalizes UPS for operating in the most efficient and reliable manner possible, but allows our competitors to continue using cheaper, gasoline powered vehicles.
- ◆ Some claim that coverage of small fleets would not be fuel neutral and would tilt the program for those companies away from CNG. This is not true because according to the American Gas Association, UPS's own experience to date has been successful, and none of the UPS CNG programs underway have involved more than 15 vehicles at any location.
- ◆ Some have suggested that a 100 vehicle limit will safeguard small fleet operators from burdensome purchase mandates. Rather than exempting them, the key to protecting small fleets without jeopardizing the alternative fuels fleet program is to provide incentives for the creation of sufficient public alternative fuel refueling facilities. If the program focused exclusively on light-duty vehicles and contained enough incentives, everyone's interests would be protected, and the general public would begin to switch to alternative fuels as well. If necessary, a 50 vehicle nationwide minimum would protect small business.
- ◆ DOE claims that the 100 vehicle limit would affect so few fleets nationwide that it will displace 75 percent less petroleum than the original National Energy Strategy fleet program. There are strong reasons to believe that even DOE's estimates are too optimistic.
- ◆ A fleet mandate covering only fleets of 100 or 50 vehicles is not compatible with established policy decisions reflected in the Clean Air Act, which covers all fleets of 10 or more vehicles in the 22 worst polluted U.S. cities. A mandate based on different fleet sizes will create confusion among market place forces currently working toward early Clean Air Act compliance and delay corporate fleet purchase decisions.
- ◆ The 100 vehicle figure is entirely arbitrary, ineffective and unfair. All previous deliberations over the Clean Air Act and National Energy Strategy consideration focused on fleets of 10 to 20 vehicles. Smaller fleets of light duty vehicles are the most appropriate focus of an alternative fuels program because they are more likely to create public refueling infrastructure.

United Parcel Service
May 13, 1991

ALTERNATIVE FUEL VEHICLES

Limit the Fleet Mandate to Cars and Light-Duty Trucks

Problem

The Johnston Amendment does not focus on cars and light-duty vehicles which account for the predominant share of the vehicles in the nation, and that should be the prime target for an alternative fuels program. Instead, it contains a fleet vehicle purchase mandate extending beyond light-duty passenger vehicles and trucks to include heavy-duty trucks, which can be counterproductive to a fleet program. Further, the proposed legislation contains hardly any incentives to develop a market demand for such alternative fuel vehicles.

Solution

Greater U.S. reliance on alternative fuels can be better achieved by targeting a mandate to vehicles used by the general public: light-duty cars and trucks below 8500 lbs. gwvr. The right mix of incentives will create higher vehicle demand, an alternative fuels infrastructure, and voluntary compliance by fleet operators owning heavy-duty trucks.

Rationale

Truck Weights

- ◆ The purpose of the alternative fuels program is to encourage creation of a refueling infrastructure that services the general public. Therefore, one must ensure that these facilities are located in the right place. We learned from the diesel fuel experience that passenger cars don't tend to refuel at truck stops. Thus, the legislation should concentrate infrastructure resources on places compatible with most cars and avoid diluting these resources by focusing on heavy-duty trucks. Private refueling facilities will not benefit the public.
- ◆ The Senate version of the Clean Air Act fleet program was limited to vehicles under 8500 lbs. The 26,000 lbs. limit in the final law was only agreed to because authorized alternative fuels explicitly included reformulated gasoline and clean diesel, both of which are disallowed under the Johnston Amendment.
- ◆ Industrial research and development is directed toward Clean Air Act compliance and emphasizes light-duty vehicles. Although a handful of heavy-duty trucks have experimented with CNG, this experience does not assure fleets that high torque engines in alternative fuel vehicles can withstand their performance needs.
- ◆ Trucks do a wide range of work, tend to be custom-built and more expensive to adapt to alternative fuels, and are replaced so infrequently (replacement rate is over 10 years) that inclusion in the mandatory program will impose immense burdens and yield negligible results.

Incentives

- ◆ A mandated program can not succeed where a market does not exist. Without the "carrot" of incentives, the "stick" represented by the Johnston Amendment will result in gamesmanship, and evasion of the purchase requirements. Fleets will reconfigure and avoid the costly mandate by decentralizing, moving facilities, and paying employees to use private vehicles.
- ◆ With appropriate incentives, market forces will work. Research and development will be spurred, and the necessary alternative fuels infrastructure will come into existence. Fleet operators will not only adhere to the light-duty vehicle mandate, but will also voluntarily shift to using alternative fuel heavy-duty trucks when it becomes cost-effective and practicable.

*United Parcel Service
May 13, 1991*