

Terry Piotrowski - RE: NGV Industry Input to AB 1007 Process -- Docket 06-AFP-1

From: "Mike Eaves" <meaves@cngvc.org>
To: "Jerry Wiens" <jwiens@energy.state.ca.us>
Date: 7/25/2006 1:28 PM
Subject: RE: NGV Industry Input to AB 1007 Process -- Docket 06-AFP-1
CC: "Jim Folkman" <Jfolkman@energy.state.ca.us>, "Jeffrey Parsons" <Jparsons@energy.state.ca.us>, "Lorraine White" <Lwhite@energy.state.ca.us>, "McKinley Addy" <Maddy@energy.state.ca.us>, "Mike Trujillo" <Mtrujill@energy.state.ca.us>, "Pcter Ward" <Pward@energy.statc.ca.us>, "Tim Olson" <Tolson@energy.state.ca.us>

Jerry,

I will work on a response to these new questions. I had contemplated doing so in my previous submittal -- but the document was long enough as is and another letter submittal is warranted.

In a previous communication on "barriers" I included a lot of additional information on both the light-duty and heavy-duty market. I have heard of no response/questions on this document so I have attached it again for your consideration, review, and response if you have any questions. I have also included a response from Honda on the "barrier" comments I submitted. I have attached their comments to give you insight on how Honda views the light-duty market. **If possible, I would like the attached documents also included in Docket 06-AFP-1.**

Any feedback/comments on material submitted to date would be appreciated. Once I have had a chance to respond to your additional questions, perhaps we should arrange a meeting to discuss (with myself and others in the industry).

Mike

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DOCKET	
06-AFP-1	
DATE	JUL 25 2006
RECD	OCT 11 2006

From: Jerry Wiens [mailto:jwiens@energy.state.ca.us]
Sent: Tuesday, July 25, 2006 10:26 AM
To: meaves@cngvc.org
Cc: Jim Folkman; Jeffrey Parsons; Lorraine White; McKinley Addy; Mike Trujillo; Peter Ward; Tim Olson
Subject: Re: NGV Industry Input to AB 1007 Process -- Docket 06-AFP-1

Thank you for this impressive contribution to setting the record straight. I hope it gets the desired attention.

It occurs to me that there are additional elements that deserve to be presented in support of NGVs.

Your letter does not mention the annual tax sticker that saves money for heavy-duty NGVs and other high fuel consumers compared to paying the per gallon state excise tax. The letter also does not mention the home refueling opportunity for California commuters. It will be interesting to see other manufacturers join Honda in this market.

Another topic that deserves to be brought out is the competitive effect of growing LNG imports on future natural gas prices. I believe this effect deserves careful treatment in our price forecasts.

Thanks again for your excellent support. I look forward to continuing to work with you and the CNGVC on the NGV element in the AB1007 report.

Jerry Wiens
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California Natural Gas Vehicle Coalition Response to CEC Barriers Document

Natural Gas Obstacles

The use of the term barriers here is unfortunate. It implies that all the barriers have to be overcome before there can be any market penetration. Issues listed below do not define a go—no go situation in the market. The issues define below define the limitations on market penetration but not whether there can be a viable market.

Vehicle:

- **Light Duty Owners/Operators:**

This light duty market should be separated into at least two different categories: 1) consumer vehicles and 2) light-duty fleet vehicles. Each has their own separate issues regarding economics and infrastructure.

- **Vehicle Selection Choice**

Product variety and availability is an issue that policies need to address. One can't just look at the current situation of limited product models. The right policies, strategies, incentives can bring more manufactures to the market. For example, AB 1493 gave CARB the authority to develop greenhouse gas regulations. In 2005, CARB did just that, requiring vehicle manufacturers in the future to comply with reduced CO2 emissions. However, while the legislation allowed for the provision of credits of early adopters, the CARB regulations included no such provision. Had CARB identified an early adopter credit program and calculated in the potential greenhouse emission gains from NGVs and given appropriate credits – OEMs would have been encouraged to offer more NGV products to the market instead of walking away from the market in the U.S. This is an example of why you can't wait until there is product to formulate policies. It is also the reason the CEC and the state can't dismiss NGVs as a viable opportunity for petroleum displacement simply based on products in the market. Europe is a great example of where Global Warming Initiatives, CO2 reductions and desire for petroleum diversity have combined to foster 16 OEM NGVs in the market. And these products are not pickups and vans but consumer oriented vehicles like Mercedes, Volvo, BMW, and VW.

- ~~**Safety, tank pressure**~~

Safety is not an issue to the NGV industry. The U.S. NGV industry has done an excellent job of developing process and performance standards for CNG and LNG storage that are being used around the world. Fuel stations operate up to 5,000 psig for the buffer storage systems to be able to transfer fuel to vehicles. On-board storage fuel systems are designed to operate at up to 3,600 psig. All OEMs

in the U.S. have used 3,600 psig fuel systems without problems. Fuel cell vehicle manufacturers are using 5,000 psig fuel storage systems on their prototype vehicles. Some are experimenting with as high as 10,000 psig fuel systems. High pressure gaseous fuel systems are unknown to the consumer. Proper consumer education – as has been conducted by the NGV industry for years – is the way to totally eliminate this as any type of obstacle. Consumer education on a broader scale is needed to for high pressure gaseous fuel systems/vehicles.

➤ **Incremental Cost of Vehicles Economics**

“Economics” is the real issue. It is hard to envision any advanced technology vehicle that isn’t going to command a price premium over a conventional gasoline counterpart. Even light-duty diesel will command a price premium over gasoline. New technology penetrating the market at much lower volumes than conventional vehicles will try to recover development costs through product pricing. As the CEC looks at all alternative fuels, the issue will not be necessarily vehicle cost but economics.

Even fuels like E85 have their economic issues. While the cost of an E85/FFV may be zero to \$200 – the economic issues then switch to the cost of fuel. If oil companies don’t wish to be the marketers for E85 (as Exxon and Chevron have indicated in the Midwest), then the E85 interests will be forced to develop their own infrastructure and have that cost of capital reflected in their price at the pump. If the volume throughput through a station is low – then the capital recovery cost in a gallon of fuel will increase significantly. On top of infrastructure costs, the economics of production and distribution need to be captured in the E85 fuel costs. One has to consider that the price oil companies pay for ethanol for blend purposes may be much lower than the price that will have to be paid if ethanol is distributed outside the petroleum retail infrastructure.

For some options like hydrogen – the issue is more complex. Even if fuel cell vehicles are produced with no incremental cost (and few believe this is possible), one still has to consider the viability of the market if hydrogen pump prices are \$10+/gallon (kilogram). So I think Economic – not Vehicle Cost is the proper metric.

But considering vehicle cost, for years the incremental cost of light-duty NGVs was in the order of \$4,000 to \$5,000. These were OEM vehicles from Ford, Chrysler, GM, Toyota, and Honda. When OEMs first started producing NGVs in the early 90’s, they believed that with the right economies of scale (production/sales) the differential cost of NGVs could eventually be reduced to \$1,500-\$2,000 (the cost of high pressure fuel storage under mass production quantities). These were the economics of the mid 90’s. In a look forward market – and assuming appropriate automotive economies of scale of production and sales -- \$3,000-\$4,000 may be the appropriate target.

It was once unthinkable that a product with an incremental price of \$4,000 over a conventional gasoline vehicle could sell in the market. The hybrid market is an example of why price of the vehicle isn't necessarily a limiting factor to market penetration. And while hybrids haven't necessarily been proven over the long haul, the fact that they are such hot sellers is an indication that the consumer sees value in the purchase of a more expensive vehicle, even though fuel cost savings may not be justified over time. Just as hybrids are selling into a fuel price conscious market – NGVs can potentially offer the same type of fuel price savings value to the consumer. Hybrids use the carrot of reduced fuel bills to justify the incremental cost of the hybrids. These fuel savings are attributed to the higher efficiency of the hybrid. Depending on the specific vehicle, fuel economy can be increased 20% to 100%. In a \$3.25/gallon gasoline world, this means a hybrid can reduce fuel costs 16.7% to 50%. In dollars, this represents a \$0.54 to \$1.62/gallon fuel price saving. For NGVs, the consumer would potentially be incurring a \$4-5,000 incremental cost of the vehicle but achieving a \$1.00+/gallon fuel price savings. If the home fueling option is pursued, a consumer could be saving \$2/gallon today over \$3.25/gallon gasoline prices.

The average consumer drives between 10,000 and 15,000 miles per year. At 15 mpg, this represents an annual fuel usage of 666-1000 gallons/year for the 15mpg case and 333-500 gallons/year for the 30 mpg case. A consumer with a dedicated NGV like the Honda Civic with home fueling would be able to achieve a 4-5 year payback on their investment. I think the hybrid has a longer payback period to offset an incremental cost of \$4-5,000.

However, fleet vehicles like taxis and delivery vans that consume 5,000 – 7,500 gallons of fuel per year and would be able to achieve less than a one year payback at the going fuel prices.

➤—Vehicle range

The NGV industry does not view vehicle range to be a barrier to overcome. Range, less than gasoline, may define ultimate market penetration limits. Range certainly differs for various types of light-duty vehicles. It can be as low as 150-200 miles for work vehicles like taxis and vans, but as high as 250-300 miles for vehicles like the Honda Civic (new model has 8 gallon tank and 39 mpg highway rating). Natural gas taxis in Los Angeles travel an average of 90,000+ miles per year with a 200 mile range fuel system.

NGV range is an issue because OEMs continue to package fuel storage into the trunk of vehicles instead of designing purpose built NGVs where storage is integrated into the frame where gasoline fuel systems exist. Better integration will provide greater range for all products as well as greater utility (trunk space).

Range is not an issue that has to be solved before NGVs are promoted in the state as an option for fuel diversity. Many studies were conducted years ago as the

state pursued battery electric vehicles. Those studies showed that the majority of daily use was below 60 miles per day. In today's market, a Honda Civic with a home fueling appliance allows the consumer a 200-300 mile range per day. Pickup trucks and delivery vans in fleet service have been very good economic markets for natural gas with vehicles that only have a 150-200 mile range.

The CEC needs to focus not on what exists today but what can be achieved with long term policies that promote and encourage NGVs. Purpose built NGVs with greater range are possible over the next 25 years. Volume sales will encourage OEMs to deliver products consumers demand vs. taking the least cost approach of putting whatever fuel storage they can into an existing trunk space.

➤ **Difficult to refuel**

This should be removed from the list. NGVs are not difficult to fuel. New dispensers combine credit card convenience with video training. This is not the issue it was 15 years ago when station hardware was not customer friendly.

➤ **Lack of trunk space**

Certainly today, fuel storage detracts from trunk space, pickup truck cargo space, and van cargo handling capacity. In some cases this is a nuisance but not a barrier. It may limit the degree of initial market penetration – but is certainly not a reason to wait for it to be “fixed” before advocating NGVs as a petroleum diversification strategy.

If one looks at the small vehicles that have been selling fast in recent weeks, it is fuel cost economics that are driving sales. Smaller trunks/smaller space is not dictating purchase decisions.

➤ **Economics of Scale**

This is the real barrier that the NGV industry needs to address. NGVs aren't sustainable in the long-term without achieving greater sales. Greater OEM sales drive down the incremental cost of vehicles. It will also stimulate other manufacturers to enter the market. Price competition and competition between manufacturers is the ultimate solution to a viable market. The types of sales needed to drive sustainability are only going to be achieved through bold policy initiatives at the state level. The right state policies and the economic size of California can achieve significant petroleum displacement via NGVs. California policies need to address not only promoting petroleum diversity but promoting goals for market penetration that are consistent with achieving economies of scale from manufacturers.

It has been suggested that the CEC look at life cycle costs (LCC) for each fuel/vehicle category. This type of analysis is misleading because as economies

of scale are achieved by manufacturers and reflected in lower differential costs of vehicles, the LCC economics will change.

➤ **Policies**

The NGV industry exists because of bold policy initiatives. The federal 1992 Energy Policy Act launched the light duty market in the U.S. It resulted in dozens of OEM light-duty products in the market – both bi-dual and dedicated. While the NGV market was growing in California through the 90's – it was dying elsewhere. The federal government was found to be the biggest culprit in not following EPACT guidelines. The federal government failed to implement further regulations in 1997 when it was supposed to. States began to follow the federal lead and ignore EPACT. As a result, California was the last state promoting NGVs – but OEMs because of low sales abandoned the market.

In addition, changes in policies can help with the vehicle availability issue. For example, if CARB would relax the OBD and other certification standards for CNG retrofits, it would enhance availability by providing retrofits for more vehicles at a lower cost.

California/CEC/ARB needs to realize that bold policies are needed to achieve the market transformation of petroleum diversification. These policies must be codified in state law and require action by state agencies, business, and the public. While there are initiatives active to pursue petroleum diversity, these are all being done without formal policies that have been approved by the legislature. All initiatives that are driven by executive orders by the governor can be reversed/eliminated with a new administration. California needs to adopt formal legislative initiatives into law for the state to use as guidance for the next 10-20 years.

➤ **Outreach/Public Awareness/Public Education**

This may be the most important issue for the state and the industry to address regarding market penetration of alternative fuels and NGVs in particular. The NGV industry has no advertising or promotion budget. Industry members attend conferences and industry meetings where they have a chance to link directly with fleet customers. In recent years, budgets for sponsoring booths at events have been reduced. Even a company like Honda resorted to a mail campaign to 40,000 or so customers for the release of their 2006 Civic – rather than resort to newspaper ads or other media advertising. The NGV industry spends most of its time responding to direct inquiries from potential customers – and does not have the resources to conduct generic outreach on the benefits of natural gas as a transportation fuel.

The state, the CEC, ARB, governor's office, etc., is in a great position to fill the void of public outreach regarding alternative fuels. The state needs to both

communicate a fuels diversity strategy/agenda and provide a source of information for types of options that are available. This broad outreach and public education role for the state was highlighted in the Hydrogen Highway Blueprint Plan for fuel cell vehicles. The need for the state to champion this outreach runs across all alternative fuels.

➤ **Research/Product Development/Demonstration**

Research/product development has been a key ingredient in getting natural gas products to the market. In the 90's, OEM research sponsored by the Gas Research Institute (now Gas Technology Institute), gas distribution companies, and state organizations like the CEC were instrumental in getting product to the market. All NGV products in the market today are an offshoot of those research programs. OEMs today are not likely to want to invest in NGV research given their current financial positions. But, as in the 90's, OEMs can be convinced to conduct development work if other entities put up the development dollars.

California is in a unique position of market size and economic power to command OEM attention, especially if product development dollars are put on the table. California has the opportunity to go beyond previous research/development programs and work with OEMs to develop "purpose built" NGVs that have range, fuel economy, and emissions needed by California. The California utilities are no longer involved in NGV research/product development as they once were. CPUC decisions in the 90's forced utilities to abandon product development research with OEMs. In the future, the state (CEC or ARB) should be the entity responsible for carrying on an aggressive product development strategy with OEMs.

If NGVs are really desired in a petroleum diversity strategy, thought should be given to establish a public purpose surcharge for transportation funded by natural gas utility ratepayers. These funds should only be spent on NGVs.

- Heavy Duty Owners/Operators:

➤ **Cost-Economics**

Again, it is economics, not cost of the vehicles that are important for heavy-duty vehicles. The current cost for CNG and LNG vehicles are impacted by the same lack of economies of scale as the light-duty market. Differential costs for heavy-duty vehicles can be \$50,000 or more greater than a comparable diesel vehicle. The differential cost doesn't mean that purchase of these vehicles is not an economically viable market. In fact, for high fuel use fleet markets like transit and refuse trucks – fuel savings can provide a 3-5 year payback for vehicles that are retained in the fleet for 7-12 years. One can't look at vehicle cost alone – but must consider the overall LCCs associated with achieving significant fuel cost savings.

The current differential costs for heavy-duty vehicles are misleading. Production/sales of these products are currently low. At higher volumes, the differential cost of heavy-duty vehicles can be reduced by 50%. The CEC needs to look at the near-term penetration of heavy-duty NGVs in niche markets as well as the longer term penetration into other fleets that may not be economically viable now.

➤ **Safety**

Safety is not an issue with CNG vehicles. There are some safety issues regarding fueling with LNG. The NGV industry does not foresee LNG fueling being adopted for the light-duty market.

The NGV industry has an excellent safety record in both heavy-duty and light-duty vehicle markets.

➤ **Range**

Range is not an issue for heavy-duty vehicles. There have been times in the past when manufacturers offered inadequate fuel storage. It takes time and effort by a vehicle manufacturer to accommodate specific fuel requirements on a vehicle. As customers become more specific regarding their requirements, vehicle manufacturers have been more accommodating in their fuel system designs.

If/when CNG storage has been an issue, manufacturers now offer LNG storage as a viable solution. To the extent that even LNG storage doesn't meet the range desired of a customer – well that defines a market penetration limit – not a barrier.

➤ **Weight**

Weight should not be considered a barrier. At one time, only CNG heavy-duty vehicles were available. Some of these vehicles, given the weight of CNG fuel cylinders did have some weight issues that detracted from payload capacity on the vehicles. Customers with this concern have switched to LNG which doesn't create a weight issue onboard the vehicles.

➔ ~~Lack of space for tanks~~

Space for tanks is not an issue in a growing market. To date, many manufacturers have added fuel storage on their existing vehicle platforms. If space limitations defined fuel capacity, then customers got less fuel capacity than potentially they wanted. Purpose build vehicles eliminate this problem. A good example of purpose built vehicles is the new LNG yard tractors for the ports of Los Angeles and Long Beach. Without chassis modifications, the vehicle would have insufficient LNG storage. By extending the chassis, they provided sufficient space for fuel but increased the turning radius of the vehicle. In reengineering the steering, they ended up with a shorter turning radius as well as accommodating sufficient fuel storage.

➔ ~~Power, engine models~~

Power and engine models should be removed from this list. Current products do limit the market potential of heavy-duty NGVs – but these products also can address a large segment of the potential market NGVs plans to capture. Power in the past has been an issue, but vehicle manufactures were trying to accommodate natural gas engines in their existing products vs. engineering the engine to an application using different transmissions and rear differentials. Vehicle manufacturers have got much smarter and are now providing purpose built products for specific applications. Engine manufactures are offering increased horsepower so previous issues with power have been resolved.

The number of engine models is increasing because of increased sales in the U.S. and overseas for existing products. Manufacturers can't/won't commit to new products until they see respectable sales for their existing products. Since current manufacturers operate in a world market, increased sales overseas is helping them make plans for further product additions. Engine products currently available address a very large percentage of vocational applications.

➔ ~~Support from manufacture~~

This should not be considered an issue. There have been manufacturers that have departed the market and have left a void regarding continued support of their products, but this is the exception. There are also products that have been offered as experimental prototypes that customers confuse with factory supported OEM products (which is unfortunate). Manufactures currently in the market are offering excellent support to the market.

➤ **Economies of Scale**

Economies of scale are just as important an issue for heavy-duty vehicles/engines as for light-duty vehicles. Differential costs of vehicles can be reduced up to 50% if sufficient sales are achieved. Viable, sustainable markets will be those where economies of scale can be achieved. For some systems like CNG fuel storage tanks, there are synergies between the light-duty and heavy-duty markets (production of carbon fibers) that will lower the cost across both markets if economies of scale are reached.

➤ **Policies**

Achieving petroleum diversification will require policy intervention by the state. Little can be achieved if the state leaves it up to everyone to make their own decisions modify purchases of vehicles, fuel, etc. The heavy-duty NGV market exists because of state policies that have rewarded cleaner technology to enter the market. New policies and incentives to encourage non-petroleum could produce even greater change in the market.

Changes in policies in midstream can also upset emerging markets. Recently, CARB was faced with a decision to either change the 2007 emission standards for transit buses or essentially mandate that all transit properties convert to the alternative fuel path. Even though the diesel industry has not met their requirements under the Transit Rule, CARB elected to change the standard for them vs. mandating natural gas which would have met the 2007 standard. This was unfortunate for the NGV industry as manufactures have spent millions of dollars to develop 2007 CARB compliant engines. If there had been a petroleum diversity strategy for the state, CARB may have opted to make the California market a natural gas market – meeting both its emission standards and petroleum diversity strategy/goals. Policies can effect market change.

➤ **Outreach/Public Awareness/Public Education**

As previously mentioned under the light-duty vehicle market, outreach and public awareness/education are just as important for the heavy-duty market.

• **Industry Barriers:**

➤ **Lack of infrastructure (CNG, LNG)**

The NGV industry in California has over 350 stations with more than 150 of those having public access. There are currently over 30,000 NGVs in the state. The existing infrastructure is capable of supporting 100,000 to 200,000 with out serious upgrades. The NGV has also developed a viable business model to address market expansion. It is a plan that focuses on high fuel use fleets (which

may be heavy-duty or light duty), uses near-term fuel sales to guarantee the viability and sustainability of infrastructure, adds public access fueling for collateral fleets or a consumer market, and builds stations at no cost to customer if sufficient load is present.

The business model is not dependent upon utilizing petroleum industry infrastructure. It relies on locating stations on customer property, having reasonable leases with the customer, providing fuel price discounts to customers allowing the station to be sited on their property, and reaching agreement with customers to establish public fueling islands to service collateral fleets and the public at large.

The industry is in a position to continue development of NGV infrastructure to service a growing NGV population in response to California's need for petroleum diversity.

➤ **Lack of vehicle demand**

This is a chicken and egg issue. The NGV industry for years has marketed exclusively to a target market of high fuel use fleets. Marketing efforts have kept this focus. There are no resources available to mount a general outreach campaign to the public. Other than Honda, there has been no OEM that has developed a product for the consumer market. OEMs that have produced NGVs have focused on pickup trucks, vans, and automobiles that targeted the fleet market public fleet requirements to meet EPCACT compliance.

Natural gas utilities in the state (PG&E, SoCalGas, and SDG&E) had initial plans to promote NGVs to the public. The CPUC in a 1995 ruling on utility Low Emission Vehicle Programs severely limited the utility programs to sponsor outreach. The CPUC decision was heavily influenced by WSPA's negative position regarding having ratepayer sponsored utility LEV programs.

As mentioned earlier, product demand can be generated if there are well defined petroleum diversification policies for the state and general outreach programs to communicate to the public the need for diversity and which options the public should consider.

➤ **High cost of production**

I am assuming this refers to the high differential cost of vehicles. As mentioned earlier, there are economies of scale that have yet to be achieved by OEMs that will substantially reduce the differential cost of vehicles. These economies of scale could be achieved through sales in California if appropriate policies are put in place as well as a state outreach program to advertise both the need for petroleum diversification and options available to consumers and fleets.

➤ **Lack of support from government (policy failures)**

The NGV industry has survived a number of reversals of government policies over the years. In the early 90's there was a legislative mandate for California utilities to develop Low Emission Vehicle (LEV) programs and pursue until the market was sustainable. Electric vehicles and EV charging were supported by the electric utilities and NGVs were supported by the gas and combined utilities. The CPUC asked the utilities to submit 6 year plans. WSPA and oil companies intervened in the proceedings and convinced the CPUC that utilities shouldn't be in the transportation fueling business or promoting alternative fuels. As a result of WSPA intervention, the utility LEV programs were reduced by 80% funding for successful programs like R&D with OEMs was eliminated as well as outreach and communications programs being eliminated.

Federal EPACT legislation also failed. As noted earlier, the federal government was one of the worse violators of its own policies. EPACT had set goals similar to the recommendations that the CEC is trying to make (10% petroleum reduction by 2000 and 20% reduction by 2010). EPACT is still on the books but numerous ways have been designed to get around the requirements.

Markets can't be sustained if policies developed to encourage their growth – aren't themselves sustained over the long run. The type of market transformation required to displace 30% of petroleum usage in California by 2030 will cost billions of dollars. Infant alternative fuels industries can't afford the state to change policies every few years and leave hundreds of millions of dollars in stranded investments. Weak policies will also deter new entries into the market based on new policy requirements.

➤ **Volatile fuel price**

The NGV industry does not feel that volatile fuel prices are a large issue. The marketplace is familiar with fuel price volatility for gasoline and diesel fuel. Natural gas should be no different.

The NGV industry supports the development of a dedicated NGV market. Twice in the history of NGVs (once in the early 70's and the second in the early 80's) the NGV industry pursued a bi-fuel (gasoline and natural gas) market development strategy. Unfortunately, in both of those instances, when oil prices fell, the use of natural gas in bi-fuel vehicles disappeared. Both times, the NGV industry was left with major stranded investments. With dedicated NGVs, there is no fuel switching capability and the market can achieve stability.

The volatility of natural gas prices is not unlike the volatility of gasoline or oil prices. For natural gas, market prices increase in the winter and fall in the summer. This is just the opposite of gasoline and oil prices. The NGV industry is

fairly confident that future natural gas prices are going to be able to compete very favorably with oil prices.

- **Government :**

I think it is wrong to characterize government as a barrier. Government is an enabler that sets the stage for others to follow (e.g. putting a man on the moon, etc.) To the extent that government identifies a problem but takes no action to provide resolution – then government lets everyone down. Government is defined as federal, state, and even local.

- **Lack of commitment to alternative fuel**

It is wrong to characterize this as an alternative fuel issue. This is an energy issue and specifically a transportation fuel issue for the U.S. It involves petroleum dependence upon specific areas of the world, security issues, balance of payment economic issues, etc. There is a lack of commitment to alternative fuels because “government” hasn’t recognized alternative fuels as a solution to a greater energy issue. It also hasn’t recognized the need for multiple options to address the problem.

There is extremely little action to foster change at the federal level. The government would like to take the road of unaccountability – develop long range R&D programs that won’t require accountability by current administrations for results. In some respects, the state has adopted a similar approach – pushing for a hydrogen highway that is decades away, pushing for a world of renewables (that will take much time to develop), and placing the burden of carbon sequestration on everyone (something that just isn’t practical in the near term).

The state has had recommendations on the books for three years defining the need for petroleum diversity but no action has been taken to develop a California Energy Policy that encourages all non-petroleum fuels. The state needs to not adopt policies for specific alternative fuels but create an environment of R&D, product development, market development incentives to encourage all fuels to ramp up their activities in the marketplace.

The state (and the federal government if they ever get their act together) has to develop a comprehensive educational campaign to alert the public on what the state is promoting and which options the consumer/fleets can consider in their petroleum displacement strategy.

- **No long term programs for alt fuel**

It isn’t that there are no long term programs for alternative fuels – the problem is there has been no government commitment to address transportation energy at all. Years ago, the legislature directed the CPUC to allow California utilities to

develop comprehensive alternative fuel programs (for NGVs and electric vehicles). It asked that utilities be engaged in these programs until the market was sustainable. Less than three years after that legislation, the CPUC at the urging of WSPA made the utilities abandon much of their programs (research/product development, infrastructure building, public outreach, etc.). The urgency for petroleum displacement was just as critical in 1992 with the federal EPACT legislation as it is today. But in all that time, more than 14 years, neither the state nor the federal government has gotten serious about petroleum reduction and a transportation fuel energy policy.

If, as all fuels indicate, it will be a decades process to bring alternatives to the market (cost effective product and infrastructure), then it is incumbent upon the state (if not the federal government) to take the lead and adopt policies that really do encourage and reward market penetration of alternative fuels.

➤ **Budget constraints**

Short term program funding is totally insufficient to address long-term market transformation and significant market penetration of alternative fuels. Infant industries have few financial resources to develop products and infrastructure prior to market entry. Infant industries depend on getting into the market as a small scale and growing their market incrementally – very much like the NGV industry has done over the last 16 years. There is a risk to this incremental market growth strategy – and that is losing the market altogether based on not meeting OEM criteria for vehicle/product sales and or failure of infrastructure to achieve profitability.

If the state wants alternative fuel industries to penetrate the market at an accelerated rate, it has to address the issues of product development to get a wider range of vehicles in the market sooner than would normally be possible with industry funding, and incentives to have infrastructure built at an accelerated rate. Public investment to develop petroleum diversity is absolutely essential.

Pursuing product development and infrastructure development without a viable public outreach program to communicate goals and options for the consumer/fleet will not be productive.

The dilemma for the state is whether incremental market expansion is capable of achieving long term goals of petroleum displacement. If not, the state has to offer incentives for infrastructure expansion and product development so alternative fuel development in the market can be accelerated. To date, only the petroleum industry has the financial resources needed to develop options to petroleum. That industry has a strong financial incentive to only offer those options that offer them financial reward in terms of revenue and profits. They are more likely to pursue gas to liquids than options that will add to their bottom line than options like ethanol and biodiesel that contribute to someone else's bottom line.

If the state wishes to see the natural gas fuel option developed to its maximum for the state, it needs to consider recommendations/legislation to allow the California natural gas public utilities to once again invest in developing the market – through research/product development and public outreach.

California Natural Gas Vehicle Coalition Response to CEC Barriers Document

Natural Gas Obstacles

The use of the term barriers here is unfortunate. It implies that all the barriers have to be overcome before there can be any market penetration. Issues listed below do not define a go—no go situation in the market. The issues define below define the limitations on market penetration but not whether there can be a viable market.

American Honda Comment:

- Agree – this is an unfortunate term to use.
- CEC's Mission Statement is as follows: to assess, advocate and act through public/private partnerships to improve energy systems that promote a strong economy and a healthy environment.
- CEC's Vision Statement is as follows: It is the vision of the California Energy Commission for Californians to have energy choices that are affordable, reliable, diverse, safe and environmentally acceptable.
- CEC's introduction to the Fuels and Transportation Division states: California's size and its "love affair" with the automobile translates into roughly 51 percent of all energy in the state being used by the transportation sector. California's nearly 28 million vehicles consume more than 16 billion gallons of gasoline and nearly 3 billion gallons of diesel. California is the second largest consumer of gasoline in the world, behind the entire United States and just ahead of Japan. The Energy Commission is concerned with the impact transportation fuels has on our state.
- I know that the CEC embraces this mission and has these concerns for our State; therefore the use of the term "opportunities" would be best.
- And, yes, there were and are challenges, but many were already addressed or can be addressed if we all embrace CEC's mission.

Vehicle:

- **Light Duty Owners/Operators:**

This light duty market should be separated into at least two different categories: 1) consumer vehicles and 2) light-duty fleet vehicles. Each has their own separate issues regarding economics and infrastructure.

American Honda Comment:

- Agree

➤ **Vehicle Selection Choice**

Product variety and availability is an issue that policies need to address. One can't just look at the current situation of limited product models. The right

policies, strategies, incentives can bring more manufactures to the market. For example, AB 1493 gave CARB the authority to develop greenhouse gas regulations. In 2005, CARB did just that, requiring vehicle manufacturers in the future to comply with reduced CO2 emissions. However, while the legislation allowed for the provision of credits of early adopters, the CARB regulations included no such provision. Had CARB identified an early adopter credit program and calculated in the potential greenhouse emission gains from NGVs and given appropriate credits – OEMs would have been encouraged to offer more NGV products to the market instead of walking away from the market in the U.S. This is an example of why you can't wait until there is product to formulate policies. It is also the reason the CEC and the state can't dismiss NGVs as a viable opportunity for petroleum displacement simply based on products in the market. Europe is a great example of where Global Warming Initiatives, CO2 reductions and desire for petroleum diversity have combined to foster 16 OEM NGVs in the market. And these products are not pickups and vans but consumer oriented vehicles like Mercedes, Volvo, BMW, and VW.

American Honda Comment:

- **Let's start with celebrating what we do have!**
 - **Honda is now in its ninth model year of its natural gas Civic GX, which is being sold to both fleets and retail customers throughout California. The Civic GX is sold in all 50 states, with the vast majority being deployed here in California**
 - **There is a number of natural gas Small Volume Manufacturers (SVM) that are converting both General Motors and Ford vehicles to compressed natural gas and these SVMs' vehicles are warranted similar to an OEM NGV.**
- **With regards to policies, these are very important. Here are two important:**
 - **Incentives - If incentives were available to buyers, more vehicles would be purchased and more would be manufactured. Market forces can have this effect. Incentives are very important to the retail (and fleet for that matter) market.**
 - **Clean Fleet-Type Rules - Additionally, mandates for fleets to buy vehicles have the impact of increasing CNG vehicle deployment. OEMs will respond to mandates to build; but, without mandates to buy, the vehicles and their energy benefits never experienced.**

➔ ~~Safety, tank pressure~~

Safety is not an issue to the NGV industry. The U.S. NGV industry has done an excellent job of developing process and performance standards for CNG and LNG storage that are being used around the world. Fuel stations operate up to 5,000 psig for the buffer storage systems to be able to transfer fuel to vehicles. On-board storage fuel systems are designed to operate at up to 3,600 psig. All OEMs in the U.S. have used 3,600 psig fuel systems without problems. Fuel cell vehicle manufacturers are using 5,000 psig fuel storage systems on their prototype vehicles. Some are experimenting with as high as 10,000 psig fuel systems. High

pressure gaseous fuel systems are unknown to the consumer. Proper consumer education – as has been conducted by the NGV industry for years – is the way to totally eliminate this as any type of obstacle. Consumer education on a broader scale is needed to for high pressure gaseous fuel systems/vehicles.

American Honda Comment:

- **Agree - Comments regarding tank safety and pressure are accurate.**
- **Safety is always a top concern and the perception of NGVs being unsafe must be addressed.**
 - **Emphasizing the inherent safeness of natural gas juxtaposed with gasoline is very important. (Natural gas is lighter than air and dissipates in case of a release, etc.)**
 - **It is important to note that certain OEM NGVs, like the Honda Civic GX, have 5-star NHTSA safety ratings. It does not get any safer than that!**
 - **Natural gas has a long excellent safety record.**
 - **Well-to-wheel safety is improved for natural gas as well. For example, oil refinery fires have occurred and oil tankers have caused many freeway catastrophes. Natural gas use would eliminate these safety issues**
 - **An education campaign is the best way to deal with these safety concerns and the CEC could help with this.**

➤ **Incremental Cost of Vehicles Economics**

“Economics” is the real issue. It is hard to envision any advanced technology vehicle that isn’t going to command a price premium over a conventional gasoline counterpart. Even light-duty diesel will command a price premium over gasoline. New technology penetrating the market at much lower volumes than conventional vehicles will try to recover development costs through product pricing. As the CEC looks at all alternative fuels, the issue will not be necessarily vehicle cost but economics.

Even fuels like E85 have their economic issues. While the cost of an E85/FFV may be zero to \$200 – the economic issues then switch to the cost of fuel. If oil companies don’t wish to be the marketers for E85 (as Exxon and Chevron have indicated in the Midwest), then the E85 interests will be forced to develop their own infrastructure and have that cost of capital reflected in their price at the pump. If the volume throughput through a station is low – then the capital recovery cost in a gallon of fuel will increase significantly. On top of infrastructure costs, the economics of production and distribution need to be captured in the E85 fuel costs. One has to consider that the price oil companies pay for ethanol for blend purposes may be much lower than the price that will have to be paid if ethanol is distributed outside the petroleum retail infrastructure.

For some options like hydrogen – the issue is more complex. Even if fuel cell vehicles are produced with no incremental cost (and few believe this is possible), one still has to consider the viability of the market if hydrogen pump prices are \$10+/gallon (kilogram). So I think Economic – not Vehicle Cost is the proper metric.

But considering vehicle cost, for years the incremental cost of light-duty NGVs was in the order of \$4,000 to \$5,000. These were OEM vehicles from Ford, Chrysler, GM, Toyota, and Honda. When OEMs first started producing NGVs in the early 90's, they believed that with the right economies of scale (production/sales) the differential cost of NGVs could eventually be reduced to \$1,500-\$2,000 (the cost of high pressure fuel storage under mass production quantities). These were the economics of the mid 90's. In a look forward market – and assuming appropriate automotive economies of scale of production and sales -- \$3,000-\$4,000 may be the appropriate target.

It was once unthinkable that a product with an incremental price of \$4,000 over a conventional gasoline vehicle could sell in the market. The hybrid market is an example of why price of the vehicle isn't necessarily a limiting factor to market penetration. And while hybrids haven't necessarily been proven over the long haul, the fact that they are such hot sellers is an indication that the consumer sees value in the purchase of a more expensive vehicle, even though fuel cost savings may not be justified over time. Just as hybrids are selling into a fuel price conscious market – NGVs can potentially offer the same type of fuel price savings value to the consumer. Hybrids use the carrot of reduced fuel bills to justify the incremental cost of the hybrids. These fuel savings are attributed to the higher efficiency of the hybrid. Depending on the specific vehicle, fuel economy can be increased 20% to 100%. In a \$3.25/gallon gasoline world, this means a hybrid can reduce fuel costs 16.7% to 50%. In dollars, this represents a \$0.54 to \$1.62/gallon fuel price saving. For NGVs, the consumer would potentially be incurring a \$4-5,000 incremental cost of the vehicle but achieving a \$1.00+/gallon fuel price savings. If the home fueling option is pursued, a consumer could be saving \$2/gallon today over \$3.25/gallon gasoline prices.

The average consumer drives between 10,000 and 15,000 miles per year. At 15 mpg, this represents an annual fuel usage of 666-1000 gallons/year for the 15mpg case and 333-500 gallons/year for the 30 mpg case. A consumer with a dedicated NGV like the Honda Civic with home fueling would be able to achieve a 4-5 year payback on their investment. I think the hybrid has a longer payback period to offset an incremental cost of \$4-5,000.

However, fleet vehicles like taxis and delivery vans that consume 5,000 – 7,500 gallons of fuel per year and would be able to achieve less than a one year payback at the going fuel prices.

American Honda Comments:

- **Agree – Incremental cost of vehicle is better presented in terms of fuel cost savings as well as the extended life-cycle that can be experience with NGVs. For example, the Civic GX has a 15-year/150,000 mile warranty on the emissions system and the engine may last much longer due to the fact that there is no carbon build-up.**
 - **Also, incentives, such as the federal tax credit, assist in buying down the incremental cost of the vehicle**
 - **There are also numerous benefits that are less quantifiable (health care costs associated with poor air quality, etc.) that should be factored in as well**
- **More importantly, what will be the cost if we do not deploy or prepare to deploy NGVs and other AFVs today? The State is already aware due to previous crises (such as the electric energy crisis) that waiting can cost billions. Also, what is the environmental costs of damage (global warming, etc.) that will be irreversible if we do not transition to NGVs? (No money in the world will be able to pay our way out of such a situation; and, then, won't a \$4,000 or even a \$10,000 incremental seem like a deal?)**

➔ **Vehicle range**

The NGV industry does not view vehicle range to be a barrier to overcome. Range, less than gasoline, may define ultimate market penetration limits. Range certainly differs for various types of light-duty vehicles. It can be as low as 150-200 miles for work vehicles like taxis and vans, but as high as 250-300 miles for vehicles like the Honda Civic (new model has 8 gallon tank and 39 mpg highway rating). Natural gas taxis in Los Angeles travel an average of 90,000+ miles per year with a 200 mile range fuel system.

NGV range is an issue because OEMs continue to package fuel storage into the trunk of vehicles instead of designing purpose built NGVs where storage is integrated into the frame where gasoline fuel systems exist. Better integration will provide greater range for all products as well as greater utility (trunk space).

Range is not an issue that has to be solved before NGVs are promoted in the state as an option for fuel diversity. Many studies were conducted years ago as the state pursued battery electric vehicles. Those studies showed that the majority of daily use was below 60 miles per day. In today's market, a Honda Civic with a home fueling appliance allows the consumer a 200-300 mile range per day. Pickup trucks and delivery vans in fleet service have been very good economic markets for natural gas with vehicles that only have a 150-200 mile range.

The CEC needs to focus not on what exists today but what can be achieved with long term policies that promote and encourage NGVs. Purpose built NGVs with greater range are possible over the next 25 years. Volume sales will encourage

OEMs to deliver products consumers demand vs. taking the least cost approach of putting whatever fuel storage they can into an existing trunk space.

American Honda Comments:

- **Agree - please note – Civic GX is a purpose-built NGV and the tank configuration is the best for driver usage and ability to build the vehicle on the assembly-line.**
- **Range has been a bit of a challenge but as the CNGVC comments note, home refueling with Phill can greatly improve range. Also, the comments regarding average vehicles miles traveled are important to note as the average commute driving 60 miles per day will not be inconvenienced by the range**
- **One solution to “range is an issue” is providing more natural gas refueling infrastructure. Then, it would be more convenient to fuel more frequently. (The CEC could assist greatly with this, as they have in the past, by providing incentives for public infrastructure and cultivating an environment for public-private partnerships.)**

➤ **Difficult to refuel**

This should be removed from the list. NGVs are not difficult to fuel. New dispensers combine credit card convenience with video training. This is not the issue it was 15 years ago when station hardware was not customer friendly.

American Honda Comment:

- **Agree.**
- **There are also many websites that can be accessed to view refueling training videos.**

➤ **Lack of trunk space**

Certainly today, fuel storage detracts from trunk space, pickup truck cargo space, and van cargo handling capacity. In some cases this is a nuisance but not a barrier. It may limit the degree of initial market penetration – but is certainly not a reason to wait for it to be “fixed” before advocating NGVs as a petroleum diversification strategy.

If one looks at the small vehicles that have been selling fast in recent weeks, it is fuel cost economics that are driving sales. Smaller trunks/smaller space is not dictating purchase decisions.

American Honda Comments:

- **Agree.**
- **Honda Civic GX retail demand has been increasing significantly and truck space has rarely been an issue. Drivers of NGVs recognize that there are some design differences between NGVs and gasoline vehicles. This should**

not be characterized as a barrier or a trade-off; it is just a difference. (An analogy may be made with today's home designs – homes are smaller and may be in areas with higher densities. These homes are today's reality in a market that has much larger demand than supply for both built homes and available land for development. Consumers are accepting this reality. Who says a truck must be 12 cubic feet?)

➤ **Economies of Scale**

This is the real barrier that the NGV industry needs to address. NGVs aren't sustainable in the long-term without achieving greater sales. Greater OEM sales drive down the incremental cost of vehicles. It will also stimulate other manufacturers to enter the market. Price competition and competition between manufacturers is the ultimate solution to a viable market. The types of sales needed to drive sustainability are only going to be achieved through bold policy initiatives at the state level. The right state policies and the economic size of California can achieve significant petroleum displacement via NGVs. California policies need to address not only promoting petroleum diversity but promoting goals for market penetration that are consistent with achieving economies of scale from manufacturers.

It has been suggested that the CEC look at life cycle costs (LCC) for each fuel/vehicle category. This type of analysis is misleading because as economies of scale are achieved by manufacturers and reflected in lower differential costs of vehicles, the LCC economics will change.

American Honda Comments:

- **Economies of scale are important. Larger sales volumes may lead to lower costs for manufacturing (tank prices may decrease, etc.) and, thus, lower incremental costs. Also, more sales may lead to manufacturers considering new and different NGVs that can lead to even greater market share for NGVs.**

➤ **Policies**

The NGV industry exists because of bold policy initiatives. The federal 1992 Energy Policy Act launched the light duty market in the U.S. It resulted in dozens of OEM light-duty products in the market – both bi-fuel and dedicated. While the NGV market was growing in California through the 90's – it was dying elsewhere. The federal government was found to be the biggest culprit in not following EPACT guidelines. The federal government failed to implement further regulations in 1997 when it was supposed to. States began to follow the federal lead and ignore EPACT. As a result, California was the last state promoting NGVs – but OEMs because of low sales abandoned the market.

In addition, changes in policies can help with the vehicle availability issue. For example, if CARB would relax the OBD and other certification standards for CNG retrofits, it would enhance availability by providing retrofits for more vehicles at a lower cost.

California/CEC/ARB needs to realize that bold policies are needed to achieve the market transformation of petroleum diversification. These policies must be codified in state law and require action by state agencies, business, and the public. While there are initiatives active to pursue petroleum diversity, these are all being done without formal policies that have been approved by the legislature. All initiatives that are driven by executive orders by the governor can be reversed/eliminated with a new administration. California needs to adopt formal legislative initiatives into law for the state to use as guidance for the next 10-20 years.

American Honda Comments:

- **Agree – Policies are important and these that are referenced are excellent to note.**
- **In addition to the policies mentioned, policies related to establishing incentives and policies that create mandates to buy will also increase the number of vehicles sold.**
- **New policies that could make it easier to buy (establish incentives), easier to sell (make certification of NGVs simpler and less expensive) and easier to fuel (ease the permitting requirements for establishing NG infrastructure and Phil) NGVs would expand and strengthen the market.**
- **If CEC could coordinate with other State agencies, such as CARB and Caltrans, there may be some innovative policies and projects put into place. For example, could CEC assist CARB in resolving the hot-gas specification issues in Central California?**

➤ Outreach/Public Awareness/Public Education

This may be the most important issue for the state and the industry to address regarding market penetration of alternative fuels and NGVs in particular. The NGV industry has no advertising or promotion budget. Industry members attend conferences and industry meetings where they have a chance to link directly with fleet customers. In recent years, budgets for sponsoring booths at events have been reduced. Even a company like Honda resorted to a mail campaign to 40,000 or so customers for the release of their 2006 Civic – rather than resort to newspaper ads or other media advertising. The NGV industry spends most of its time responding to direct inquiries from potential customers – and does not have the resources to conduct generic outreach on the benefits of natural gas as a transportation fuel.

The state, the CEC, ARB, governor's office, etc., is in a great position to fill the void of public outreach regarding alternative fuels. The state needs to both

communicate a fuels diversity strategy/agenda and provide a source of information for types of options that are available. This broad outreach and public education role for the state was highlighted in the Hydrogen Highway Blueprint Plan for fuel cell vehicles. The need for the state to champion this outreach runs across all alternative fuels.

American Honda Comments:

- **Agree.**
- **There are at least two types of outreach needed – one related to natural gas generally and one related to NG products and infrastructure.**
- **For many people, NG is a mystery and unknowns seem risky. The CEC and other State agencies could provide an excellent service in spreading the word about NG as a transportation fuel. (This would be a great project for the CEC and the PUC or the utilities.)**
- **With regards to NG products, companies like American Honda are spending millions of dollars to market vehicles like the Civic GX. Traditional marketing (newspaper ads, etc.) is not always as effective for NGVs as advertising through websites and through direct mail.**
- **Also, CNGVC should add information regarding CNG as the pathway to hydrogen and the reasons why CNG must be widely adopted if H2 is to flourish (i.e., infrastructure, vehicle range similarities, refueling similarities, etc.)**

➤ **Research/Product Development/Demonstration**

Research/product development has been a key ingredient in getting natural gas products to the market. In the 90's, OEM research sponsored by the Gas Research Institute (now Gas Technology Institute), gas distribution companies, and state organizations like the CEC were instrumental in getting product to the market. All NGV products in the market today are an offshoot of those research programs. OEMs today are not likely to want to invest in NGV research given their current financial positions. But, as in the 90's, OEMs can be convinced to conduct development work if other entities put up the development dollars.

California is in a unique position of market size and economic power to command OEM attention, especially if product development dollars are put on the table. California has the opportunity to go beyond previous research/development programs and work with OEMs to develop "purpose built" NGVs that have range, fuel economy, and emissions needed by California. The California utilities are no longer involved in NGV research/product development as they once were. CPUC decisions in the 90's forced utilities to abandon product development research with OEMs. In the future, the state (CEC or ARB) should be the entity responsible for carrying on an aggressive product development strategy with OEMs.

If NGVs are really desired in a petroleum diversity strategy, thought should be given to establish a public purpose surcharge for transportation funded by natural gas utility ratepayers. These funds should only be spent on NGVs.

American Honda Comments:

- **Agree – except please note that some OEMs like American Honda are conducting research and product development (and should be recognized for these efforts). American Honda uses much of its own funding to develop its AFVs.**
- **A public purpose surcharge funded by natural gas utility ratepayers may not be the best approach. (It will be challenging to achieve advocacy for such a fee.) However, funding for these efforts is important.**

Terry Piotrowski - NGV Industry Input to AB 1007 Process -- Docket 06-AFP-1

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Date: 7/21/2006 6:07 PM
Subject: NGV Industry Input to AB 1007 Process -- Docket 06-AFP-1
CC: "Jerry Wiens (Jerry Wiens)" <jwiens@energy.state.ca.us>, "Peter Ward" <Pward@energy.state.ca.us>, "James M. Folkman" <jfolkman@energy.state.ca.us>, "Michael D. Trujillo" <mtrujill@energy.state.ca.us>, "McKinley Addy" <maddy@energy.state.ca.us>

Please accept these comments from the California Natural Gas Vehicle Coalition regarding the AB 1007 Process. There are several issues relating how NGVs have been analyzed in the past that should be addressed in the AB 1007 Report process.

I would appreciate it if these comments can be officially accepted as part of Docket 06-AFP-1.

If you have any questions, please don't hesitate to call.

Mike

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California Natural Gas Vehicle Coalition

Michael L. Eaves
President

July 19, 2006

Ms. Lorraine White
Project Manager IEPR
California Energy Commission
1516 9th Street, MS 39
Sacramento, CA 95814-5504

Subject: Docket # **06-AFP-1** – AB1007 Alternative Fuels Plan

Dear Ms. White:

I thought we had a very productive meeting on May 30th to discuss the natural gas vehicle industry, the economics of the industry, our business plan focus on heavy-duty vehicles, and the potential NGVs offer to reduce petroleum dependence in the state. Natural gas fuel is currently priced at \$2.09 per gasoline gallon equivalent in southern California. High-volume fleet operators are realizing fuel price discounts down to \$1.30 per gallon. Natural gas can and will play a very valuable role in reducing petroleum demand – something that hasn't been recognized or appreciated in the Commission's 2003 or 2005 IEPR.

At our May 30th meeting, you requested feedback on what didn't work for the natural gas vehicle (NGV) industry in terms of characterizing the opportunities for natural gas in the 2005 IEPR. You also wanted our input in what to do differently in AB 1007 from the approach taken in the 2005 IEPR. The 2005 IEPR implies that natural gas will have limited petroleum displacement potential (for both CNG and LNG) by the year 2025. The potential displacement was listed as about 300 million gallons of petroleum displacement by 2025. The reality is that in 2005 the combined CNG and LNG use in California amounted to about 100 million gallons of petroleum displacement. The market is growing at a 25-30% per year rate. The CEC perspective that natural gas can't be a significant factor in displacing petroleum in California is biased by a number of questionable assumptions and analyses over the last three years. One of the critical issues framing the need for any alternative fuels is the demand forecast projections.

- **Changes in Petroleum Demand Forecast**

A most significant change in the last three years has been the reduction in the demand projections for gasoline and diesel fuel. The petroleum demand forecast has been reduced by 4-5 billion

gallons per year from the initial AB 2076 report. In 2005 hearings, staff indicated the reductions were the result of modifying the growth expectations for the state. In 2005, the overall growth rate for California was reduced to 1.15 percent for population, 1.01 percent for total number of households, and 1.25 percent for real per-household income. The Commission would apply these projections over the next 20 years.

While the change in growth rate projections reflects the downturn in California's economy, projecting this growth rate out 20 years will lead to severe consequences if the California economy rebounds as many think it will. Earlier growth rates used to predict future petroleum demand were 0.4-0.5 percent higher. A change in the growth rate of 0.1 percent equates to about 1 billion gallons per year increase/decrease in projected petroleum consumption in 2030. The Commission should be looking not only at the best-case scenario for petroleum use (worst-case economic scenario) but also the worst-case scenario for petroleum dependence – which would mean using higher growth rate projections and higher projections of petroleum demand.

On top of that, the growth rate that truly matters is not population, households, or income, but expected growth rate for energy consumption. The following table (III) from EIA's International Energy Outlook 2006 shows forecasted growth rates for energy for the world.

Table III. Comparison of Energy Consumption Growth Rates by Region, 2002-2010
(Average Annual Percent Growth)

Region	IEO2006			IEO2005	IEA	PIRA	PEL
	Low Growth	Reference	High Growth				
OECD	1.0	1.2	1.5	1.3	1.4	1.2	1.2
North America	1.1	1.4	1.7	1.7	1.5	1.3	1.4
Europe	0.8	1.0	1.2	0.9	1.1	1.2	1.2
Asia	1.0	1.2	1.4	1.3	1.6	0.4	0.5
Non-OECD	4.0	4.5	5.0	3.9	2.8	2.9	3.8
Europe and Eurasia	1.9	2.4	2.8	2.0	1.8	2.5	1.8
China	7.3	7.8	8.4	6.8	3.4	7.8	6.2
Other Non-OECD Asia	1.5	2.0	4.5	3.9	3.2	3.0	3.7
Middle East	3.0	3.4	3.9	3.4	3.2	4.8	4.5
Africa	3.7	4.2	4.8	3.4	2.7	3.3	3.0
Central and South America	3.0	3.6	4.0	3.0	2.7	2.5	2.4
Total World	2.4	2.7	3.1	2.6	2.2	2.7	2.4

EIA projects an average 1.4 percent growth rate for energy in North America (with a low growth of 1.1 percent and a high growth factor of 1.7 percent). California's energy growth could easily lead the rest of the United States and North America. This means that California energy growth could be greater than 1.4 percent average that EIA forecasts for North America. If this is so, the Commission's demand forecast over the next 25 years could easily be underestimated by 4-5 billion gallons – the same amount removed from the original 2003 AB 2076 forecast.

- **How Growth Projections Bias Solutions**

The AB 2076 report investigated the quantity and mix of alternative fuels needed to complement more efficient vehicles to reduce petroleum demand so that demand would more closely match

California's refinery capacity. The original growth scenario projected a 27-28 billion gallons per year transportation fuel demand (in 2030) and a state refinery capacity of 16-18 billion gallons per year. The Commission concluded that all measures -- vehicle efficiency gains and alternative fuels -- were needed to offset this 9-10 billion gallon per year "shortfall" of refinery capacity.

Solutions to reducing petroleum demand started with the recommendation that CAFÉ be doubled. Once reductions from efficiency gains were subtracted from the demand curve, potential contributions of alternative fuels were subtracted from demand to yield a petroleum demand comparable with state refinery capacity. The Commission went so far as to identify an alternative fuels penetration scenario where overall petroleum demand could be reduced to 15 percent below 2003 consumption levels. Even after the impact of doubling CAFÉ was subtracted from the petroleum demand curve, there was a sufficient gap between demand and refinery capacity that required factoring in all alternative fuels, even a substantial contribution for hydrogen (fuel cell vehicles) to bring the demand curve down to state refinery capacity.

Once the Commission changed the growth projections and petroleum demand for the state, solution options for alternative fuels were greatly scaled back. The following table represents some of the subtle changes to an aggressive strategy identified in the AB 2076 Report and the strategies identified in the 2005 IEPR.

Strategies to Reduce Petroleum Demand

Strategy	Before Demand Forecast Reduced	After Demand Forecast Reduced
CAFÉ	Need to Double CAFÉ	Accept 30% improvement in efficiency from GHG legislation
Alternative Fuels	Need all alternative fuels to achieve appropriate market shares	Need ethanol blends and possibly E85 along with biodiesel blends and GTL blends
Hydrogen	Had this in the mix for future	Not discussed in needs/recommendations
Natural gas	Desired for niche markets	Not identified as making a significant contribution
Hybrids	Not really mentioned separately from CAFÉ improvements	Now highlighted technology for efficiency gains
Electric and Plug-in hybrids	Not mentioned	Now play a role
Petroleum Demand	Reduce to 15% below 2003 consumption	Silent on reductions below any baseline

The changes in demand forecasts are influencing the Commission on strategies and recommendations to achieve petroleum diversity. As petroleum demand is refined downward and becomes more manageable from a strategic perspective, the recommendations for alternatives to petroleum become fewer and fewer (e.g. the case of hydrogen – highlighted in the 2003 reports but not mentioned in 2005). Greater reliance and the majority of focus is placed on petroleum blend fuels (10 percent ethanol in gasoline and 20 percent biofuels/GTLs in diesel). Other options such as CNG, LNG, LPG, and hydrogen are essentially dismissed from consideration. Even the discussion of doubling CAFE has been replaced with acceptance of the 30 percent reductions that can be achieved (if) CARB regulations on greenhouse gases are enforced. **And while the Commission has stated a number of times that its characterization of specific fuels (ethanol and biofuels) is only an example of what can be achieved using a portfolio of all alternative fuels, the reality is that policy makers, legislators and others (including CEC staff) have focused on those specific fuels as the solution and have dismissed other alternatives, such as natural gas, that are available today and capable of achieving significant amounts of petroleum displacement over the next 25 years.**

The 2003 AB 2076 report proposed a suite of options that could achieve approximately 12 billion gallons of petroleum reduction by 2030 (the difference between the extrapolated demand curve in Figure 8 and the 14 billion gallon line in Figure 8). Only about 3-4 billion gallons of that were alternative fuels – 8-9 billion gallons were attributed to doubling CAFE. If this same 12 billion gallon potential were subtracted from the “revised” petroleum demand curve (Figure 2 – Projected Gasoline and Diesel Demand) from the 2005 IEPR – petroleum demand could be cut to 12-14 billion gallons per year – significantly below today’s California refinery capacity. **This should be the state’s goal.**

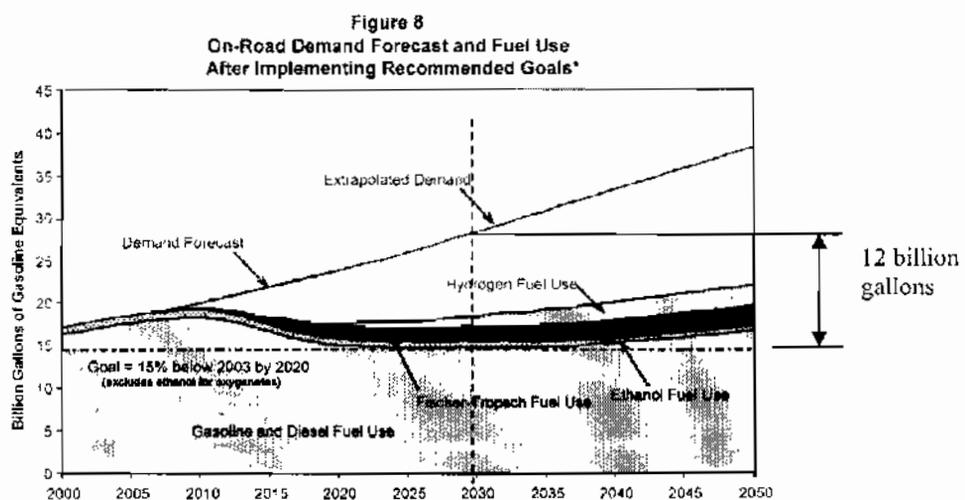
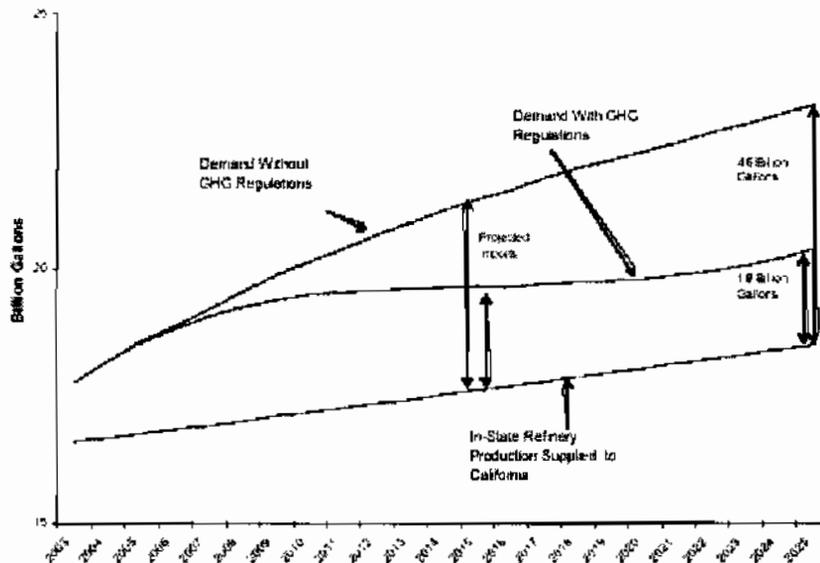


Figure 2: Projected Gasoline and Diesel Demand



AB 2076 originally recommended that the state reduce petroleum demand/consumption to 15% less than 2003 consumption. WSPA and oil companies fought hard to have this recommendation removed from the AB 2076 report, the 2003 IEPR, and the 2005 IEPR. With the reduction in the demand projections for the state, it now appears that the Commission is trying to use alternative fuels to bring petroleum demand down merely to refinery capacity for the state – and is not pursuing all the potential alternative fuel options to reduce petroleum demand by as much as possible. **Again, reducing petroleum use as much as possible should be the goal if the point of the effort is to preserve California's economic health** (rather than to ensure market share for the industry).

- **Has the Commission selected the right target?**

The premise for the AB 2076 report was that petroleum demand in the state was exceeding state refinery capacity, and to avoid economic disruption caused by refinery outages and price spikes, petroleum demand in the state had to be reduced. Recent events have shown us that matching petroleum demand with petroleum refinery capacity is not going to prevent disruptions to the California or U.S. economy. While refinery outages in California certainly impact short-term prices, it is the overall volatility of oil prices on the world market that is causing economic disruptions throughout the world. California has to worry about world pricing disruptions that can last months or years – not about price swings when a refinery goes down unexpectedly for weeks. California's petroleum demand and refinery capacity are better balanced today than they may be

over the next 20-30 years. Today's gasoline and diesel prices, over \$3 per gallon for extended time frames, does not validate a Commission strategy that California's future with respect to petroleum will be secure if we work to match future petroleum demand to California refinery capacity.

World oil demand is set to increase 37% from the existing level of 86 million barrels per day to 118 bpd in 2030, according to the U.S. Energy Information Administration (EIA). And some analysts believe we have already hit peak capacity; many more believe we will soon. It is going to be world competition for this demand as well as a struggle to increase supply that will dictate fuel prices. California's desire to match internal refinery capacity with demand will be noise in the global energy market.

California must elect to support the growth of all alternative fuels for the state. As the Commission has stated numerous times, it needs a suite of solutions for the marketplace. Each alternative fuel has a host of obstacles it must overcome to become a viable, sustainable fuel in the market. State support for alternative fuels is essential to allowing them to grow in the current monopoly (oil) market, but the state is not in a position to select a "winner." Only the market can do that, and given the patterns of growth we're already seeing, it seems certain that different segments of the market will gravitate toward different fuels. State policies must be equitable to allow all fuels to compete and to serve all users.

- **Cost Effectiveness**

The NGV industry has several concerns regarding the economic/cost effectiveness studies for alternative fuels and many issues regarding the specific analyses for natural gas. The cost effectiveness of fuels is based on the projected market prices for an alternative fuel (or real data if available) compared to a baseline projection of gasoline and diesel prices developed by the Commission.

The gasoline and diesel price benchmarks have been unrealistically low – creating an unrealistic cost effectiveness hurdle for the alternative fuels to achieve. For instance, in 2003, the benchmark price of gasoline used in the calculations was \$1.67 per gallon. In looking back at the price history for regular gasoline in the state (CEC website data), since January 1, 2003 that \$1.67 benchmark price has been exceeded 162 out of 172 weeks. The average price of regular gasoline in California was \$1.83 in 2003. Similarly, in 2005 the Commission used \$2.23 per gallon as the gasoline benchmark. That price has been exceeded in 67 of the last 78 weeks (since January 1, 2005). The average price of regular gasoline for 2005 was \$2.47.

The Commission is thus establishing an unreasonable standard: It is unrealistic to think that, given the financial costs of developing new fuels, delivering them to market, and providing both infrastructure and vehicles, alternative fuels can compete with below-market price forecasts for gasoline and diesel. Developing and bringing new fuels to the market is a very expensive

proposition where all “investments” have to ultimately earn a return. Most market entry prices for alternative fuels will have to command a premium to begin paying back investors, or be initially subsidized. Alternative fuel prices could eventually be reduced but only after economies of scale of market penetration have been achieved. Alternative fuel developers are therefore banking on competing with high-priced oil and high-priced fuel at the pump not figuring out how to compete with the lowest priced oil/fuel imaginable.

Major economic disruptions to the economy exist when oil prices go to \$70 per barrel and \$3.00 to \$3.50 per gallon prices at the pump. If these are the types of price spikes that cause the Commission and California concern, then cost-effectiveness of options should be compared to this benchmark – not the \$1.67 or \$2.23 per gallon used in the past. Using the higher benchmark prices will greatly improve the cost-effectiveness of all alternative fuels and provide significant financial benefits to the state.

To date, the Commission (and to a lesser but still serious extent, the EIA) seems to think that current market prices are anomalies that will soon be corrected. No respected industry, economic, or political analyst seems to believe this, and neither do the oil companies.

- **“Business as Usual”**

Since NGVs are an existing market, the Commission has conducted numerous scenarios for NGVs that are identified as “business as usual.” This is unfortunate because the state that is looking for guidance from the Commission on policies needed to *expand* alternative fuel use in the state. The Commission needs to look at the NGV market in the same context as other infant alternative fuel markets and determine how NGVs can also capitalize on progressive policies to expand alternative fuel use in the state.

What is also a concern to the NGV industry is that the business model used by the Commission makes incorrect assumptions on fuel costs, vehicle costs, potential for market entry of new products, etc. to define “business as usual” projections. The industry is working hard to educate the Commission on the current business model used by the industry. The NGV industry believes that with better understanding, the Commission will see that the economics of NGVs are economically viable and that natural gas should be a part of an alternative fuels strategy for the state.

- **Station Economics and Fuel Prices**

For over 11 years, the California NGV industry has focused on a business plan for high fuel use fleets. There are two major reasons for this: first, the economics for CNG compressor capacity are better with larger compression systems, and second, larger capacity systems require higher throughput to make stations economically viable – thus the focus on high fuel use fleets. For any size compressor system, the economics are better if threshold volumes of fuel are dispensed. Low

station throughput leads to underutilized capacity. With underutilized stations/capacity, fixed costs are spread over smaller volumes of fuel, making the fuel economics unattractive. When high station throughputs are achieved relative to installed compression capacity, fixed costs are spread over large volumes of fuel and attractive fuel economics are achieved. Attractive fuel economics can be achieved with high station utilization regardless of whether the station is a private station built by the customer or a station built by a third-party fuel provider.

Third-party fuel providers are capable of and willing to invest their own capital to build stations for customers based on fuel purchase contracts that meet required throughputs. Depending upon how much projected fuel demand exceeds minimum station throughput requirements, customers can be offered significant discounts on fuel purchases.

For economic development of the market, third-party fuel providers offer customers incentives to allow installation of a public access fuel island at the customer's site. A public access island allows the third-party fuel provider to achieve higher volume throughput via selling retail to other fleets or the consumer market. Retail sales complement the station throughput to the resident/host fleet. In this way, third-party fuel providers can sell unused capacity from the system to other customers, which further improves the operational economics of a station.

In southern California the SCAQMD and MSRC infrastructure grants are conditional upon installation of public access fuel islands. These grants are available to third-party fuel providers as well as to private companies wanting to build their own fueling infrastructure.

The Commission has been tracking the retail pump prices for both PG&E and SoCalGas for years. These retail prices are some of the highest prices in California for natural gas. Because the bulk of utility stations are underutilized, all the fixed costs of operation, maintenance, and capital recovery are amortized over low throughputs, yielding retail pump prices much higher than at stations where throughput (relative to capacity) is higher. For example, as a result of the third-party fuel provider protest to the CPUC, SoCalGas in 2005 was required to adjust its compression tariff to reflect fully allocated costs of the utility. In October 2005, SoCalGas increased its compression tariff from \$0.35 per therm to \$0.76 per therm (and the transportation tariff was reduced from \$0.116 per therm to \$0.0923 per therm). PG&E also had to increase its compressed tariff as a result of a similar protest.

The Commission must recognize the majority of sales of CNG in California displace diesel fuel and not gasoline. In 2005 the average west coast diesel price was \$2.57 per gallon. The average CNG price for PG&E and SoCalGas was \$2.11 per DEG (diesel equivalent gallon) based on utility retail prices at utility stations. Based even on these market-high prices, natural gas on a DEG basis was \$0.46 per DEG cheaper than retail diesel in 2005.

Another way to calculate the DEG price is to start with the cost of the natural gas commodity and add the cost of utility transport of the gas, operation and maintenance of the stations, fuel taxes,

and capital recovery for the stations. The average natural gas commodity price in 2005 was \$0.764 per therm, or \$1.03 per DEG. To this one must add the transportation tariff for each utility (\$0.0923 per therm or \$0.1246 per DEG for SoCalGas, and \$0.0613 per therm or \$0.0827 per DEG for PG&E). One must also add about \$0.38 per DEG for operation (electricity for compression) and station maintenance. Taxes amount to about \$0.162 per DEG. Capital recovery is about \$0.38 per DEG. This brings the total price for a DEG to \$2.04 to \$2.08 per gallon – similar to the previous estimate.

The fuel price, however, can be substantially less for high throughput stations. In 2005, the Coalition provided information to the Commission that showed that high fuel use fleets like transit were receiving fuel for as low as \$1.45 per gallon to \$1.85 per gallon. These prices reflect the efficiency of the fueling operation when station throughput is high. High throughput through a station significantly decreases the capital recovery factor per gallon and the operating and maintenance unit costs per gallon. One must realize that the “highest” throughput stations for heavy-duty vehicles like transit buses, dispense as much as 250,000 to 300,000 diesel equivalent gallons per month vs. “high” throughput public access stations at tens of thousands of gallons per month – or “low” throughput stations in the thousands of gallons per month. Moreover, many customers that build their own stations do not factor a capital recovery factor into their fuel price. They view the capital costs of stations as a long-term facility cost that allows them access to natural gas fuel.

Fuel prices for high fuel use fleets have to be correctly factored into the economics of heavy-duty fleet vehicles or high fuel use fleets. These fuel prices can be as much as 43 percent lower than the diesel retail prices (in the above example, \$2.57 diesel vs. \$1.45 CNG). Depending upon the customer and fuel usage, there is another band of fuel pricing that is 10 to 15 percent below retail CNG pricing. These prices are for customers providing base load at public access stations.

The NGV industry is in a unique position in regard to pricing at the pump. Stations may provide discount prices for tenant/host fleets. A public access island can also supply discount prices to transient fleets (through the use of proprietary fleet fuel cards offered by the fuel provider) or full retail prices to other customers through the use of major credit cards.

- High Fuel Use Fleet Economics

The Commission continues to evaluate the economics of NGVs by comparing retail CNG prices to retail gasoline or diesel prices. As mentioned earlier, high fuel use fleets (which are primarily heavy-duty fleets) enjoy significant price savings for fuel over retail CNG prices. A recent evaluation of the NGV market in California shows that 74 percent of the CNG throughput in the state goes to the transit bus market. At current natural gas prices (July 2006), transit fleet fuel is about \$0.86 per gallon uncompressed. Compression brings the fuel cost up to \$1.25 per DEG. Since many of the transit properties have already fully depreciated their fueling infrastructure, the economics of natural gas look very good against market prices of diesel.

School and refuse fleets account for an additional 15 percent of state CNG throughput. These fleets usually generate their fuel or purchase fuel from fuel providers for well under \$2 per gallon. Only about 10-12 percent of the remaining CNG market – this includes taxis, shuttles, and municipal fleets – pay retail pump prices. The Commission should factor these pricing realities into its economic models.

- **Path to Market**

One weakness in the analysis of fuels to date is an incomplete assessment of whether there is a definitive plan on how to bring fuels to the market. The natural gas vehicle industry has a viable business plan that it has been executing for over 11 years. There are over 400 CNG fuel stations in California with more than 160 of those accommodating public access through the use of major credit cards. More than 100 million gallons of petroleum are currently being displaced by CNG and LNG vehicles. Favorable fuel prices provide an economically viable market for vehicles costing as much as \$50,000 more than their conventional fuel counterparts. NGVs have penetrated significant market segments like transit, refuse, school buses, taxis and shuttles. Expansion to other markets is underway. The lack of OEMs in the light duty sector is a problem that can be remedied by aggressive state strategies and policies to expand the penetration of alternative fuels – especially since all major OEMs in the U.S. are currently offering NGVs in Europe to meet greenhouse gas emission reduction and petroleum displacement goals there. Natural gas as a transportation fuel has a superior environmental record that has set low emission performance standards since its inception. Natural gas engines will meet 2010 heavy-duty standards by 2007. Market expansion with LNG will further expand the market potential.

In addition, the NGV industry business plan does not count upon involvement of the oil industry for market expansion. This is a critical element the Commission must consider since oil companies are not receptive to becoming the marketing and distribution agent for fuels that they don't own or control. While the Commission likes the potential of blend fuels, these fuels mean direct revenue reductions for oil companies unless they are vertically integrated and companies own the blend stock industry as well as their own oil interests. It is not a given that oil companies will embrace biofuels and fully embrace marketing and distributing them.

Recommendations for AB 1007

The Commission needs to reevaluate the demand forecasts for California growth and more specifically energy growth in the transportation sector. The most recent fuel demand projections in the 2005 IEPR could be significantly understated. The Commission cannot afford to be conservative in projections of fuel demand. To do so would be to put the state in another state of crisis years down the road. The Commission needs to evaluate near, midterm, and long-term fuel solutions for the transportation sector. It must provide recommendations and guidance across the board for viable fuels – and certainly not ignore fuels like natural gas that are making a major

contribution to petroleum displacement, greenhouse gas reductions, and toxic and criteria pollutant reductions, not to mention economic savings to customers and the state.

The natural gas vehicle industry looks forward to working with the Commission and providing input to the AB 1007 process. Attached is feedback I provided earlier on what the Commission perceives as barriers to the NGV industry. We are always available to discuss any issues the Commission has regarding natural gas as a transportation fuel.

Sincerely,



Michael L. Eaves
President, California Natural Gas Vehicle Coalition

cc: Commissioner Jackalyne Pfannenstiel
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