April 15, 2001

Mr. Steven Koonin

Undersecretary for Science

US Department of Energy

Washington DC

Subj: Comments on the USDOE Quadrennial Technology Review Framing Document

Dear Mr. Koonin:

I have noted that the USDOE QTR Framing Document has discounted the importance of mobilizing the resources of the natural gas industry to help meet the Presidents' energy policy goals and objectives in the Transport Sector. I am shocked to learn that supporting RD&D and accelerating commercial deployment hydrogen and fuel cell motor vehicle technology is not a priority with USDOE senior managers.

As a professional engineer with 40+ years experience in the environmental, transport and energy sectors I find this position not only unbelievable, but unacceptable.

America MUST Implement a Comprehensive Plan to Reduce Petroleum Vulnerability

I agree strongly with the policy statements made by President Obama, especially his call on March 30, 2011 for a comprehensive national approach to energy policy and the creation of a National Energy Plan. The federal government has a clear responsibility to empower the American People with information and resources needed to overcome existing market-entry barriers to widespread and immediate implementation of more sustainable Clean Energy solutions.

Policy Goals and Objectives Should Not be Used to Pre-select Winners and Losers

The stated policy goals and objectives for the transport sector demonstrate that this Administration has determined that battery electric and various types of hybrid electric vehicles powered by liquid petroleum-based motor fuels have been pre-selected to meet policy goals and objectives.

1. Reduce Energy-Related Greenhouse Gas Emissions by 17% by 2020 and 83% by 2050,
2. Supply 80% of America's Electricity from Clean Energy Sources by 2035,
3. Support deployment of 1 million electric vehicles (EVs) on the road by 2015.

The direct use of natural gas as a motor fuel to power vehicles today and RD&D to accelerate commercial deployment of hydrogen fuel cell electric vehicles tomorrow has not even been mentioned.

As documented in this QTR, USDOE program objectives are focused on "six more or less independent strategies that are both necessary and sufficient to address the Administration's goals and enhance our energy, economic and environmental security." In the Transport Sector the QTR outlines three strategies:

1. Increase Vehicle Efficiency
2. Progressive Electrification of the Vehicle Fleet
3. Alternative Fuels

The QTR then outlines several specific technology pathways for the Transport Sector. Unfortunately the USDOE Clean Energy Programs are focused entirely on continuing consumer dependence on liquid petroleum-based biofuels with electric motor fuels being used to enhance efficiency.

The use of more efficient gaseous motor fuels, i.e. methane and hydrogen, and fuel cell technology is totally ignored.

This is a fatal flaw in the USDOE Clean Energy Program Plan. It completely ignores the domestic natural gas industry, the supplier of the most affordable, most abundant low carbon motor fuel currently available in the United States. The USDOE Clean Energy Plan also ignores the fact that the use of natural gas as a primary fuel for transport offers significant and immediate reductions in greenhouse gas emissions.

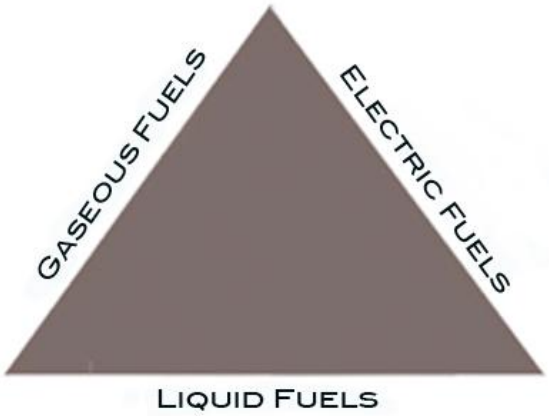
It fails to recognize that development of natural gas vehicle fuel stations will create jobs today and save consumers money immediately. It also fails to recognize that widespread use of natural gas vehicles today will stimulate private-sector investment that will accelerate commercial deployment of hydrogen fuel cell technology that will accelerate electrification of the vehicle fleet.

The widespread use of NGVs TODAY and Hydrogen Fuel Cell Electric Vehicles TOMORROW will significantly reduce American dependence on liquid petroleum-based motor fuels AND empower American consumers to meet ambitious environmental policy goals.

Together Gaseous, Liquid & Electric Motor Fuels Will Reduce Petroleum Dependency

The Framing Document affirms the near-total dependency of the transportation sector on liquid petroleum-based motor fuels. It recognizes three viable alternative motor fuels currently

available for the transport sector – 1) advanced liquid biofuels, 2) electric motor fuels, and 3) natural gas motor fuels.



Unfortunately the QTR discounts the use of gaseous motor fuels; natural gas motor fuels are assumed to be structurally disadvantaged and hydrogen motor fuels are not mentioned.

The Framing Document describes an aggressive RD&D agenda for advanced liquid biofuels, batteries and electric motor fuels. Unfortunately the document completely ignores the third leg of what should be a robust, stable and competitive transport fuel market – the gaseous motor fuels. The gaseous fuel leg of this platform is missing. The QTR fails to even discuss, let alone support, development of high efficiency, clean gaseous motor fuels and technology pathways.

When this oversight is corrected the U.S. will have a comprehensive national energy plan based on a triad of low-carbon motor fuels. This will create a stable and robust distribution and retail fuel infrastructure that will protect consumers and accelerate the widespread introduction and commercial use of all practical and affordable clean energy sources and technologies in all types of transport and stationary energy applications.

Liquid Motor Fuel and Automotive Markets Failed the American Consumer

The United States economy did not crash in 2007-2008 because of electrical blackouts or grid failure, the high price of electricity or the huge carbon footprint created by the inefficient production of electricity from coal and natural gas. The recession was triggered by $147/bbl petroleum and the high price of gasoline and diesel fuels, aka liquid petroleum-based motor fuels. The fact that 10 percent of the liquid petroleum-based motor fuel sold in Florida in 2008 was corn-derived ethanol (E10) did NOT mitigate the economic or environmental damage caused by our total dependence on liquid petroleum-based motor fuels.

In 2008 American consumers had no CHOICE but to purchase an expensive blend of liquid petroleum-based motor fuels. Three years later, April 14, 2011, American consumers still have no CHOICE but to purchase liquid petroleum-based motor fuels.

Consumers are forced to purchase vehicles that use only liquid petroleum-based motor fuels. Biofuel mandates have been ineffective as once again the cost is approaching $4 per gallon. E85 has closely tracked the price of petroleum. As currently structured liquid motor fuel markets track petroleum prices; they do not buffer consumers from oil price volatility. It is highly unlikely that expensive, drop-in biofuels will offer a cost-effective alternative to the problem of oil price volatility.

However, since 2008 the price of natural gas has been low and stable; hovering around $4/mmbtu. This price is equivalent to about $0.50/gge (gasoline gallon equivalent) or $0.56/dge (diesel gallon equivalent). Today the spot market price spread of natural gas motor fuels is between $2.65/gge to $2.85/gge less than the price of gasoline or diesel fuel ranges (NYMEX).

In 2008 energy analysts knew that supplies of natural gas were robust. Automotive sector planners knew that affordable natural gas vehicles could empower consumers to save thousands of dollars on fuel costs every year. Yet automakers failed to respond to motor fuel markets and produce vehicles that would give consumers the power to choose natural gas motor fuels. Save Honda, not one automaker even attempted to mass produce affordable natural gas vehicles.

This huge spread in the price of motor fuel documents a fundamental failure in automotive and motor fuel markets that are based solely on liquid petroleum-based motor fuels. Even when government mandates requiring a 10% corn ethanol blend could not protect the American consumer from this market failure.

Yet the USDOE QTR Framing Document audaciously states that non-liquid alternative motor fuels, such as natural gas, face a “structural disadvantage” compared to liquids.

I disagree; it is the American consumer who faces a structural disadvantage from total dependence on liquid petroleum-based motor fuel markets.

The USDOE Energy Strategy should not be focused solely on protecting or sustaining a mature, if not obsolete, liquid motor fuel supply chain from robust competition, especially competition that empowers consumers to help this Nation achieve national economic, security and environmental policy goals and objectives. Natural gas motor fuels have been cleaner, safer, more efficient and less expensive than liquid petroleum-based motor fuels for more than 30-years. Yet mass markets have failed to exploit this fact.

The current price differential between petroleum and natural gas motor fuels offers hard evidence that total reliance on liquid fuel pathways will not achieve national policy objectives.

Relevant Facts about Clean, Low-Carbon Motor Fuels

It is a fact that electricity, some biofuels, methane and hydrogen are the cleanest low-carbon motor fuels available. These low carbon motor fuels are also easily and efficiently produced from many different types of renewable energy sources. Ignoring the important role that gaseous motor fuels will play in creating a stable, competitive and more sustainable energy system for the United States is like sawing one leg off of a three-legged stool.

It is a fact (IEA 2011) that the United States has much larger reserves of low-cost natural gas than previously recognized. It is also a fact that recoverable natural gas reserves are perhaps much larger than the petroleum resource at current prices. In fact, the most cost-effective, affordable, scalable, cleanest, domestically produced alternative low-carbon motor fuel available in the United States TODAY is either compressed natural gas (CNG) or liquefied natural gas (LNG).

It is also a fact that production of biomethane from biomass is one of the most energy efficient pathways for the use of many renewable energy sources (Dr. Anne Wilkie, University of Florida, 2010). Yet the Framing Document does not mention biomethane.

It is also a fact that the direct use of natural gas in vehicles or in distributed, high-efficiency combined heat and power generation facilities is the most efficient and lowest emission strategy for the use of fossil natural gas. This means that using natural gas to replace coal in large central electric power stations is neither as efficient nor as sustainable as direct uses by the consumer. The energy losses created by inefficient generation and long-distance transmission of electricity cannot be offset solely by the "smart grid."

Sadly using fossil-derived electricity to power battery electric vehicles or petroleum-based hybrid electric vehicles today creates more greenhouse gas emissions per mile than the direct use in a natural gas vehicle. Tomorrow, when hydrogen fuel cell electric vehicles are ready for market, the direct use of affordable gaseous motor fuels will empower consumers to help meet rigorous greenhouse gas reduction goals.

Yet this Framing Document completely ignores any discussion of integrating direct use of biomethane, neat biofuels, natural gas, hydrogen and high-efficiency fuel cell technology into the "smart grid" energy systems necessary to achieve stated energy policy goals and objectives for both the transportation and building sectors.

This oversight or omission of gaseous motor fuels and fuel cell technologies must be corrected immediately. The stakes are too high to hope that technology breakthroughs in advanced biofuel or battery technology will magically solve America's oil problem. Unfortunately, recent market failures described above also provide stark evidence that liquid petroleum-based motor fuel

markets cannot be relied upon to protect American consumers from oil price volatility, let alone disruptions in supply.

When fully implemented all three types of motor fuels – liquid, gaseous and electric -- will create a competitive, stable, secure and sustainable energy system that will serve the needs and budgets of ALL American consumers. Adding gaseous fuels to the USDOE National Energy Strategy will, in fact, empower consumers to use domestic energy resources and use their purchasing power to move this Nation to a more sustainable low-carbon energy future.

COMMENTS BY SECTION

I have provided comments that note the oversights and omissions in the Mission Statement and the Transport Section of the QTR document, as follows:

Section 5.1 -- Comments on the Mission Statement

I also agree strongly with the proposed USDOE Mission Statement set forth Section 5.1 of the DOE-QTR Framing Document. It captures the spirit of the Presidents' challenge to the US Congress and the American People.

I welcome this opportunity to help the USDOE craft policy recommendations and programs that support the President's goals and objectives AND that meet the needs of the American People. This is why I urge you to correct the total omission of affordable natural gas vehicles and hydrogen and fuel cell electric technology from the USDOE strategic plan and the QTR Framing Document.

The USDOE QTR Should Conform to the Mission Statement

I am dismayed that the QTR Framing Document itself does not comport with the concepts set forth in the Mission Statement. The USDOE interpretation completely ignores the role that the natural gas, hydrogen and fuel cell industries should play in the Transport Sector. The failure to include natural gas, hydrogen and fuel cell electric vehicle research, development and demonstration (RD&D), let alone policy recommendations for actual commercial deployment must be corrected. Consumers cannot afford energy policy that fails to mobilize the resources of vital American industries that are capable of quickly solving the most vexing challenge facing American drivers today – the high and extremely volatile cost of liquid petroleum-based motor fuels.

I compared the USDOE Energy Strategy elements described in the Framing Document with the Mission Statement and have noted how omissions of gaseous motor fuels and fuel cell technologies have compromised policy intent, as follows:

- To facilitate – there is no mention of convening the natural gas, automotive or hydrogen or fuel cell industries to empower the American People to choose the cleanest, safest, domestically produced, abundant and most affordable motor fuel best suited for their needs and budgets – natural gas.

- Invention, refinement – there is no mention of a plan to foster the evolution from petroleum hydrocarbons to widespread use of low-carbon natural gas to zero-carbon hydrogen motor fuels. There is no mention of the potential revolutionary impact of electrochemical hydrogen fuel cell technology on the transport or stationary sector or how these technologies will be integrated into existing natural gas distribution systems and the electric "smart" grid.

- Early deployment – there is no mention of supporting early deployment of natural gas vehicles anywhere in the Nation, not to mention in regions where strong State support for alternative motor fuels does not exist. Nor is there mention of a plan to bridge fuel supply infrastructure from advanced petroleum-based biofuels and natural gas to accelerate commercial deployment of electric and hydrogen powered fuel cell electric vehicles.

- Meaningful technologies – there is no mention of the fact that the domestic natural gas industry is robust and can quickly scale to support widespread use of gaseous motor fuels, in natural gas vehicles TODAY and in hydrogen vehicles TOMMOROW.

- Enable options – there is no mention of USDOE intent to refine and adopt performance metrics, such as life-cycle carbon emissions, to guide decision-making by stakeholders in transport sector markets. Just the opposite, the QTR assumes that advanced biofuels and advanced batteries are the ONLY possible solutions to America's oil problem.

- Scaling by the private sector – again there is no mention of support that would facilitate commercialization by tapping into the resources of the natural gas industry and mobilizing the entrepreneurial spirit that has created so many successful energy companies.

- Toward national energy goals – natural gas is an abundant resource in the United States and its' use in the Transport Sector will significantly enhance national security, create economic opportunity and jobs, reduce environmental impacts, and increase U.S. competitiveness. However, natural gas is NOT the end game; U.S. policy must create a roadmap so that widespread use of natural gas motor fuels TODAY will create a bridge to even more sustainable energy solutions based on use of electrochemical technology, renewable energy sources, and zero-carbon renewable hydrogen and electric motor fuels TOMMOROW.

Section 6.1 Comments on Transport

This section reinforces my long-standing observation that USDOE programs have been technology-oriented rather than system oriented. Unfortunately this QTR continues this trend. The focus on pre-selected solutions violates President Obama's call for a comprehensive national energy strategy that taps all practical resources to enhance national security, reduce environmental impacts, and increase U. S. competitiveness and jobs.

President Obama has called for a comprehensive performance-based approach to achieving his Clean Energy goals rather than a technology-specific approach. Government is NOT supposed to pick winners and losers. Yet this QTR has selected winners and losers; this QTR is entirely focused on specific motor fuels and vehicle technologies; there is no mention of developing and implementing performance-based metrics to guide commercial deployment of motor fuels and technologies to meet policy goals and objectives.

For example, rather than use life-cycle efficiency, economic and environmental performance metrics to guide RD&D priorities, both for vehicles and the entire energy system required to support that vehicle, this QTR has pre-selected liquid petroleum-based and electric motor fuels as the winners. Proposed budgets allocate resources appropriately.

The QTR assumes that the primary energy sources and motor fuel distribution infrastructure must be based on liquid petroleum-based biofuels and electricity. Gaseous fueled vehicles are ignored and assumed to NOT be commercially viable solutions that should be readily available for use by the American people. This narrow focus by the USDOE has created a Clean Energy program that completely ignores the one entire sector of the American economy, the domestic natural gas industry.

Section 6.1.1 Comments on Increased Vehicle Efficiency

The QTR calls for reduced vehicle weight with light-weight materials and improved performance of internal combustion engines operating on low-carbon motor fuels. Reduction of vehicle weight by use of gaseous motor fuels in place of dense carbon intensive, liquid petroleum-based motor fuels is not mentioned. Increased vehicle efficiency enabled by the use of low-carbon gaseous motor fuels, i.e. methane and hydrogen, to power both internal combustion engines and fuel cells is not mentioned.

Section 6.1.3.2 also repeats the popular myth that the larger storage space required for compressed natural gas creates a disadvantage compared to liquid motor fuels. The fuel storage volume is a design assumption, not a technology barrier. Why has a vehicle design assumption been used to discourage RD&D to reduce fuel system weight? More importantly why has this

design assumption been used to dictate national energy policy priorities; priorities that have effectively discouraged mass production of affordable natural gas vehicles and widespread use of cleaner, safer, and affordable gaseous motor fuels?

It is a fact that vehicle weight controls vehicle efficiency, not the volume of the fuel storage space. A fully loaded light-weight compressed gas storage system is comparable in weight to a fully loaded liquid fuel storage tank of similar energy storage capacity.

Section 6.1.2 Comments on Progressive Electrification of the Vehicle Fleet

The QTR calls for cost reductions and improved performance of advanced electric batteries and motors for use in mild and strong hybrid electric vehicles (HEVs), plug-in hybrid electric vehicles (PHEVs) and battery electric vehicles (BEVs). Infrastructure focus in solely on deployment of electric vehicle charging infrastructure that might integrate energy storage capabilities of electric vehicles into the "smart grid". The integration of distributed hydrogen production and storage as well as the use of hydrogen to power fuel cell electric vehicles is not mentioned. Production of electricity with fuel cells on hybrid vehicles in place of conventional internal combustion engines powered by liquid petroleum-based motor fuels is not mentioned.

Section 6.1.3 Comments on Alternative Fuels

This entire section is biased by the audacious statement that drop-in liquid fuels have a structural advantage over gaseous fuels. This statement is NOT fact based; it is an opinion based on assumptions made by those who have an obvious bias for liquid motor fuels and who choose to ignore economic and policy benefits offered by gaseous motor fuels. This statement must be recognized for what it is; an assumption. Unfortunately it is an assumption that has created an ill-advised and unacceptable bias against gaseous motor fuels in the USDOE Energy Strategy and this Framing Document.

The "Structural Advantage" of Liquid Motor Fuels is based on Commercial Assumptions Not Policy Factors of Efficiency, Greenhouse Gas Emissions or Affordability

The QTR divides alternative fuels into production oriented renewable and fossil categories, rather than a user-friendly focus on the performance of each type of motor fuels as measured against policy factors. The QTR advocates total focus of federal RD&D, subsidies and loan guarantee programs on liquid petroleum-based motor fuels. Program goals are to reduce the cost and increase supply of advanced liquid petroleum-based biofuels that have a **"structural advantage"** over non-petroleum motor fuels that "suffer from low-energy density relative to petroleum-derived incumbents." Highly efficient production of "low-energy density" biomethane produced from organic waste or energy crops is not mentioned. The production of zero-carbon hydrogen from renewable energy sources also is not mentioned.

Natural gas (fossil methane) motor fuels are specifically called out as highly efficient, but low-energy density motor fuels. The QTR then makes the ASSUMPTION that low energy density burdens gaseous motor fuels with a "structural disadvantage" in the market. The stated reasons for this assumption are the larger size of onboard storage tanks and incompatibility with existing liquid petroleum-based motor fuel infrastructure.

Relevant Assumptions and Facts about "Structural Advantage"

Unfortunately QTR Framing Document statements about structural advantages of liquid petroleum-based motor fuel compared to gaseous motor fuels are based on assumptions that conveniently overlook several relevant facts about motor fuels and markets.

First, the volume of the fuel storage space on a vehicle is a "design" choice. If a vehicle was designed to accommodate a gaseous fuel tank then the volume of a gaseous fuel storage tank would not be a "structural disadvantage." Because of the dominance of liquid petroleum motor fuels, virtually every vehicle sold in the U.S. is designed to carry liquid motor fuels.

Second, vehicle efficiency is a direct function of vehicle weight not the volume, size or configuration of the fuel storage tank. If Type IV or even more lightweight compressed gas cylinders are used, then the weight of a optimally designed gaseous fuel system is comparable with the weight of a fully load liquid hydrocarbon fuel system. There is no significant efficiency penalty for optimizing vehicles to use gaseous fuels.

Third, the natural gas production and distribution system in the U.S. is mature and robust. The only infrastructure deficiency is the fact that retail natural gas motor fuel dispensers are not located next to every gasoline dispenser at every highway intersection. Sufficient numbers of retail natural gas motor fuel dispensers can be quickly installed by thousands of qualified engineers and contractors who are actively seeking employment.

Fourth, over the past 25-years tens of thousands of liquid petroleum-based fuel stations have received billions of dollars in taxpayer subsidies to monitor, detect and clean-up groundwater pollution caused by leaks, spills, accidents and intentional releases of petroleum hydrocarbons. In spite of this massive subsidy, the American consumer is still exposed to air toxics and criteria air pollution created by widespread use of liquid petroleum-based motor fuels. Blended biofuels or drop-in biofuels will NOT mitigate this expensive public health and safety problem.

Fifth, blended biofuels do NOT offer significant economic or air quality benefits to consumers. Engines that burn blended biofuels must be constructed and operated to satisfy emission standards; the cost to the consumer is significant, both in increased cost of the vehicle, increased vehicle maintenance costs, and increased cost of fuel. Cleaner, low carbon gaseous motor fuels, such as methane and hydrogen, eliminate much of the fine particulate, air toxics, reactive

hydrocarbons and NOx pollution associated with the combustion of liquid petroleum-based motor fuels and biofuels.

Sixth, motor fuel markets have failed consumers. The liquid petroleum-based motor fuel industry has proved itself incapable of effectively using market forces to protect the American consumer from oil price volatility. In my opinion this sad record of performance actually places the American consumer at a structural disadvantage. American motor fuel markets have failed the American consumer; motor fuel markets are no longer competitive, let alone sources of clean and sustainable energy for transport.

Based on these facts alone, I must strongly protest the statement that gaseous motor fuels are burdened with a "structural disadvantage" compared to liquid fuels. There is absolutely no policy factor basis for this conclusion. Policy factors should drive national policy, not commercial preferences.

The Size of the Fuel Tank is a Design Choice, Not a Technology Barrier

The larger storage space required for compressed gases is only a disadvantage IF vehicle designers are required by commercial forces, custom or policy to design vehicles that are only capable of using liquid petroleum-based motor fuels. If the vehicle designer is required to design vehicles capable of using liquid or gaseous motor fuels, then a good designer will optimize the vehicle to use either liquid or natural gas motor fuels. This simple change in design philosophy would empower the consumer to choose the type of fuel used by the vehicle as well as the color and the type of stereo system. When made at the design stage, the incremental cost of this simple change in design philosophy would be minimal. But the benefit to the consumer in fuel cost savings and achievement of stated policy goals would be huge.

Gaseous Motor Fuels are More Efficient and Have Lower Life-Cycle Carbon Emissions

Section 6.1.3.2 states that natural gas motor fuels are more efficient than gasoline when used in internal combustion engines. Natural gas vehicles also emit much less air pollution. These are well-established facts; yet federal policy does NOT encourage mass production of natural gas vehicles.

In fact, when the higher efficiency of gaseous fueled prime movers, either internal combustion engines or electrochemical fuel cells, is taken into consideration, the efficiency of a gaseous fueled vehicle can be significantly higher than a comparable vehicle powered by liquid petroleum-based hydrocarbon motor fuels. The production of hydrogen from natural gas or renewable energy sources and the use of that hydrogen gas in high efficiency hydrogen fuel cell electric vehicles is a very promising pathway. Unfortunately this pathway is not mentioned in the

QTR Framing Document. This oversight must be corrected. The U.S. must implement a practical, comprehensive energy plan for the new millennium.

Gaseous Fuel Infrastructure is Robust and Scalable

Methane (natural gas) and hydrogen motor fuels have been completely ignored in this Framing Document. Given the stated policy goal of displacing petroleum with high efficiency, low-carbon, clean alternatives this oversight is unacceptable. American blood and treasure is being spent protecting the uninterrupted flow of liquid petroleum motor fuels.

It is a FACT that natural gas motor fuels are affordable, scalable, efficient, clean, readily available and easily deployable in large numbers. Abundant reserves of natural gas are available in the United States and production of this resource is sufficient to assure low prices for many years (EIA 2011). Natural gas no longer needs to be imported and distribution infrastructure is robust.

The barrier to widespread consumer use of NGVs is NOT retail infrastructure; millions of motorists would love to save DOLLARS PER GALLON.

Thousands of engineers and contractors, like my companies, are standing by to upgrade liquid fuel stations to dispense compressed and liquefied natural gas motor fuels. But consumer demand for natural gas motor fuels is weak because consumers cannot purchase affordable natural gas capable vehicles; the vehicles readily available to consumers use LIQUID PETROLEUM-BASED MOTOR FUELS.

There are absolutely NO technical or economic barriers to mass production of natural gas vehicles; NONE. But fleet and retail natural gas fuel stations will NOT be constructed IF affordable natural gas capable vehicles are NOT mass-produced by automakers. The only barrier to rapid scale-up of retail fuel infrastructure is demand for this motor fuel.

Correct Market Failure -- Natural Gas Motor Fuel Will Solve Our Oil Problem NOW

Drivers will travel miles out of their way to save a few pennies per gallon on gasoline; yet federal policy TODAY is retarding fleet and retail deployment of natural gas motor fuels that could save consumers DOLLARS per gallon. The NYMEX price spread between natural gas and gasoline / diesel fuel is more than $2.20/gge (13 April 2011).

This situation represents a fundamental market failure that is the direct result of government policy and corporate decision making that is totally out of touch with economic realities faced by the average American consumer.

This price spread represents a fundamental failure in markets for liquid petroleum-based motor fuels; yet the USDOE QTR Framing Document states that non-liquid alternative motor fuels, such as natural gas, face "structural disadvantage." The USDOE Energy Strategy should not be focused solely on protecting a mature, if not obsolete, liquid motor fuel supply chain from competition from cleaner, safer, more efficient and less expensive energy sources and gaseous motor fuels.

Also note that distribution of natural gas is NOT controlled by suppliers of liquid petroleum motor fuels. In other words, natural gas motor fuels are in direct competition with liquid petroleum-based motor fuels. Immediate deployment of compressed natural gas will give consumers the opportunity to CHOOSE their motor fuel; a choice they have been denied in years past when high oil prices triggered economic chaos or threatened supply disruptions triggered US military intervention to not only protect shipping lanes but the actual flow of oil from cooperative and grateful oil-producing nations.

The Framing Document recognizes that natural gas is abundant and readily available throughout the U. S. Natural gas is also much cheaper than gasoline and is projected to be much cheaper for many years to come. Yet mass production of affordable natural gas vehicles that would make widespread use of affordable, domestically produced natural gas motor fuels possible is NOT supported by this document, let alone federal energy policy.

An oft-stated Administration policy is ending dependency on foreign oil; natural gas motor fuels will do this while creating jobs, saving consumers money and reducing pollution. Automakers will be empowered to quickly optimize natural gas vehicles to meet or exceed efficiency goals while significantly reducing carbon emissions with low-carbon natural gas motor fuels that also significantly reduce all other forms of air, water and toxic pollution.

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