



Natural Gas Vehicle Task Force Report



In January 2013, Governor Tomblin announces the location of CNG stations in Charleston, Jane Lew and Bridgeport.



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EARL RAY TOMBLIN
GOVERNOR

February 15, 2013

The Honorable Earl Ray Tomblin
Governor
1900 Kanawha Boulevard East
Charleston, WV 25304

Dear Governor Tomblin:

On behalf of the members of your Natural Gas Vehicle Task Force, I am pleased to present you with this final report. Contained within are recommendations laying the groundwork for West Virginia's transition to natural gas as a vehicular fuel. This effort has the potential to support our natural gas industry, improve our air quality, and save state government millions of dollars.

The Task Force's proposals stem from the work of three committees: Infrastructure Development, Legislative and Communication, and Finance. Their proposals outline a plan for transitioning our fleet, supporting infrastructure development, and communicating the message that these alternative fuels are clean, safe and economical.

West Virginia, a leader in the exploration and production of natural gas for over a century, has the opportunity to become a national leader in the utilization of a cleaner and more efficient fuel source. We have appreciated the opportunity to serve you in this capacity.

Sincerely,

A handwritten signature in black ink, reading "Hallie Schenker Mason".

Hallie Schenker Mason
Director of Public Policy

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Photos courtesy of West Virginia Department of Commerce and US Department of Energy/National Renewable Energy Laboratory

Executive Summary

West Virginia has been a leader in the exploration and production of our abundant natural gas resources for more than a century. With a growing movement toward compressed natural gas and propane as a fuel source, Governor Earl Ray Tomblin sought to make West Virginia a national leader by evaluating the transition of the state's vehicular fleet to natural gas. West Virginia hopes to send a clear message that transitioning to natural gas has the potential to improve air quality and save consumers and state government millions of dollars.

Governor Tomblin began this effort by signing an executive order in June of 2012 creating the Governor's Natural Gas Vehicle Task Force. The task force was charged with finding the most sensible and cost-effective approaches to the proliferation of natural gas as a vehicular fuel in West Virginia. The task force quickly recognized three main areas of work and divided into the following committees: Infrastructure Development, Legislative and Communication, and Finance.

An initial obstacle to introducing natural gas as a vehicular fuel will be the supporting of natural gas-fueling infrastructure. The Infrastructure Development Committee completed an in-depth study on how to best overcome this obstacle. The committee's findings demonstrated a straightforward premise that the greatest chance of success for these stations is to locate them in heavily populated areas, which contain the largest concentration of federal, state, and municipal fleet vehicles.

Because there is currently a lack of adequate demand for these stations, the committee recommends the state transition a segment of fleet vehicles to support new fueling stations in these areas. Through a return on investment analysis, the Finance Committee found transitioning some of the state's medium- and heavy-duty vehicles will not only result in initial demand for these stations, it will also result in immense cost savings to the state. Knowing these state vehicles will not be enough for initial development of the natural gas fueling infrastructure, the Legislative and Communication Committee felt it was important to revisit the state's alternative fuel motor vehicle and infrastructure tax credit.

Once infrastructure is in place, communicating a positive message about the transition to natural gas is vital to long-term sustainability. The Legislative and Communication Committee found it was imperative that both private and public sectors are provided with basic information about the practical and economic benefits of conversion to natural gas and its derivatives as vehicular fuel. After identifying the key issues, they developed a communication plan to ensure this transition effort is not crippled by a lack of information.

The enclosed final report outlines recommendations from all three committees and outlines a plan for the state to build support for natural gas-fueled vehicles in West Virginia.

1.0 INTRODUCTION

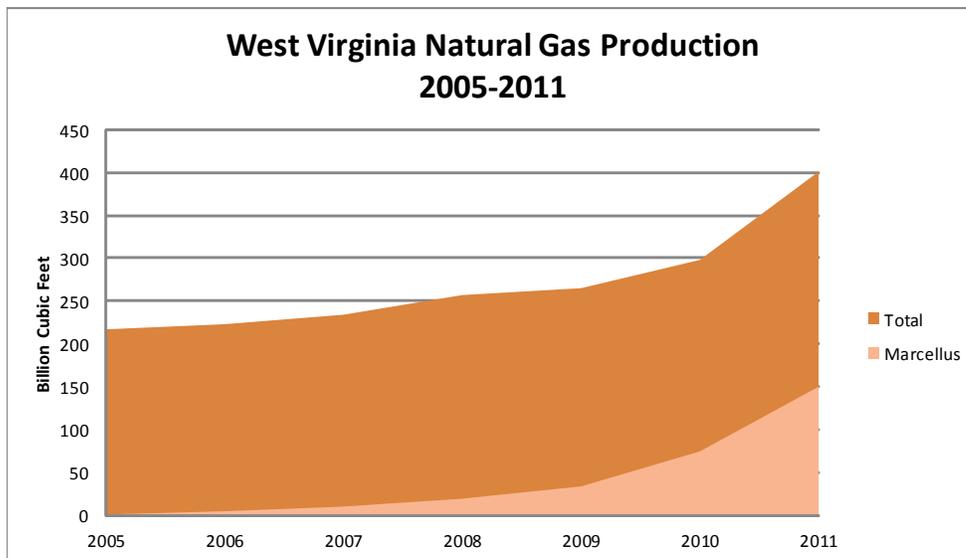
The exploration and production of natural gas has been a long-standing staple of the West Virginia economy. The gas industry has been a part of the economic mix of our state for more than 100 years, providing jobs for families and generating revenue for state and county governments.

New discoveries in the Marcellus Shale formation and endless opportunities to develop the cleanest burning fossil fuel have stimulated economic growth in our state in a myriad of ways. Scientific and technological advances in the processes by which natural gas is recovered, as well as investment and jobs created to tap the untold potential of the Marcellus Shale, have propelled West Virginia's economy for the past four years.

Advancements in drilling and production technologies, coupled with substantial investments by natural gas producers, have increased the domestic supply of natural gas to the point that conversion of diesel-fueled fleets to natural gas fuel gives rise to a policy issue requiring careful analysis.

At the direction of Governor Earl Ray Tomblin, West Virginia has embarked on a trailblazing effort to improve the air quality in America and save consumers and state government millions of dollars.

The transition of part of West Virginia's fleet of trucks, buses, and automobiles to compressed natural gas (CNG) and propane as vehicular fuels will help make these goals a reality. Natural gas burns remarkably cleaner and emits less CO₂ emissions into the atmosphere. One of the most attractive qualities of natural gas as a vehicular fuel is its affordable availability at approximately half the per mile cost of usage than oil-based gasoline or diesel fuel. Clean burning, abundant, and less costly, natural gas can save taxpayers billions of dollars at the federal government level and millions of dollars at the state government level.



While the United States imports more than 47% of the oil it uses, 98% of the natural gas used domestically is produced in North America. By expanding fleet fuel alternatives, West Virginia will play a role in decreasing our nation's dependence on foreign oil. Natural Gas Vehicles for America (NGV-America) reports vehicular natural gas displaced more than 350 million gasoline gallon equivalents in 2010.

According to NGV-America, natural gas vehicles (NGVs) have been a part of global vehicle fleets for decades, with an estimated 15 million on the road worldwide. The United States ranks 17th globally with 120,000 gas-fueled vehicles, considerably behind Argentina, Brazil, Italy, India, and others. Between 1999 and 2009, US domestic consumption of natural gas in the transportation sector tripled, but NGV infrastructure remains a challenge. There are only 1,000 natural gas fueling stations in the United States, compared with 4,000 diesel truck stops.

1.1 Solving the Chicken or Egg Problem

The biggest obstacle to introducing a new fuel is the current lack of infrastructure for refueling. Infrastructure developers want to see demand by numerous vehicles needing the fuel, but the would-be purchasers of the vehicles require the infrastructure in place first.

In a recent Forbes Magazine article titled *Tough Trucking For Natural Gas Vehicles: Can They Make It In The Long Haul?*, author Larry Bell analyzes the current market environment for natural gas and the obstacles of developing natural gas as a significant competitive fuel alternative to gasoline for use in motorized vehicles¹. There is general agreement the largest impediment is the "chicken v. egg" conundrum. Market demand for vehicles is dependent upon a satisfactory refueling infrastructure and vice versa. There are signs on the horizon that this development impediment will fade over time with incremental commercial development of both refueling infrastructure and vehicles. Accordingly, incentives, if any, provided by taxpayers to address the development impediment ought to be of limited duration.

The US Department of Energy hosts an alternative fuels data center online providing the number and locations of natural gas fueling stations in the United States (see Attachment A on page 2). The map illustrates that all states surrounding West Virginia have natural gas fueling stations. In order to assist with continuity of travel for business, state, and private fleets, it is imperative West Virginia attract a robust natural gas fueling station infrastructure.

¹ The article by Larry Bell may be found at <http://www.forbes.com/sites/larrybell/2012/11/27/tough-trucking-for-natural-gas-vehicles-can-they-make-it-in-the-long-haul/>

Purposeful supply and demand must be nurtured to successfully encourage and utilize CNG and other natural gas derivative vehicles in West Virginia. This report explores infrastructure needs, assesses costs and benefits of transitioning to NGVs, analyzes tax implications, and offers a communications strategy with practical recommendations for growth.

1.2 Report Goal

This report seeks to provide Governor Tomblin a summary of findings and recommendations for practical short- and long-term actions to facilitate growth in demand for natural gas to supply West Virginia's transportation needs.



1.3 Governor's Action

Governor Tomblin issued Executive Order No. 10-12 (see attachment B on pages 21-25) on June 19, 2012, creating the Governor's Natural Gas Vehicle Task Force and appointed its members. The task force includes Cabinet-level positions in the WV Department of Commerce and the WV Department of Transportation; persons in leadership positions representing the Office of the Governor, WV Office of Fleet Management, and the WV Department of Education; and experts who have specialized knowledge of the natural gas industry, alternative fuels, coal, petroleum marketing, transportation, and safety. The complete list of the task force membership is as follows:

Attachment C

Seat 1	Mr. Philip A. Reale	Reale Law Office	Charleston, WV
Seat 2	Mr. Chuck Davidson	Noble Energy	Houston, TX
Seat 3	Mr. W. Henry Harmon	Triana Energy	Hurricane, WV
Seat 4	Mr. Rick Blankenship	Antero Resources	Denver, CO
Seat 5	Mr. John Young	Northeast Natural Energy	Charleston, WV
Seat 6	Mr. Scott Rotruck	Chesapeake Energy	Morgantown, WV
Seat 7	Mr. Robert C. Orndorff Jr.	Dominion Resources	Clarksburg, WV
Seat 8	Mr. Jim Scheel	Williams Company	Tulsa, OK
Seat 9	Mr. Steve Winberg	CONSOL	South Park, PA
Seat 10	Mr. Michael R. Graney	One Stop	Charleston, WV
Seat 11	Mr. Greg Darby	Little General Stores	Beckley, WV
Seat 12	Mr. Frank M. Semple	MarkWest Energy Partners	Denver, CO
Seat 13	Mr. Paul Gaughan	GoMart	Gassaway, WV
Seat 14	Mr. David Ross	EQT	Pittsburgh, PA
Seat 15	Mr. Francis "Frank" McCullough	Spring Creek Energy	Charleston, WV
Seat 16	Secretary Charles O. Lorensen	Department of Revenue	Charleston, WV
Seat 17	Mr. James C. Hunt	Clarksburg City Council	Clarksburg, WV
Seat 18	Mr. Ryan White	White Law Offices	Charleston, WV
Seat 19	Ms. Judy Archibald	Waste Management	Langhorne, PA
Seat 20	Mr. Larry Meador	Mountaineer Gas	Hinton, WV
Seat 21	Nigel N. Clark Ph.D.	West Virginia University	Morgantown, WV
Seat 22	Secretary Paul Mattox	Department of Transportation	Charleston, WV
Seat 23	Secretary Keith Burdette	Department of Commerce	Charleston, WV
Seat 24	Mr. Ben Shew	Department of Education	Charleston, WV
Seat 25	Mr. Kenny Yokum	WV Fleet Management	Charleston, WV
Seat 26	Mr. Charlie Rittenhouse	Utility Workers Union	Weston, WV
Seat 27	Mrs. Hallie Mason	Governor's Office	Charleston, WV
Seat 28	Mr. Peter Markham	Governor's Office	Charleston, WV

The Executive Order outlined the task force's duties to:

- Perform an analysis of the cost savings realized by governmental entities that convert to NGVs
- Perform a cost-benefit analysis between converting the current fleet of vehicles to natural gas fueling systems and purchasing original equipment manufacturer NGVs
- Research and analyze the potential for the state to operate pilot public-access natural gas fueling stations
- Communicate with executive agencies in sister states in the process of transitioning their fleets and encouraging infrastructure development for NGVs
- Explore interest in partnerships with and among natural gas producers, infrastructure developers, vehicle manufacturers, and other industry leaders to expand natural gas fueling infrastructure and investing in natural gas fuel solutions
- Examine options for modernizing the motor fuel excise tax to address NGVs
- Develop a communications strategy to educate the citizens of West Virginia about the economic, environmental, and safety benefits of operating NGVs

1.4 Task Force Organization

At the task force's initial meeting in July 2012, members created three committees to complete the aforementioned duties. The Infrastructure Development, Legislative and Communication, and Finance Committees researched their assigned topics throughout the months of August, September, October, and November 2012, and convened at the state Capitol in public meetings on several occasions to exchange information, recommendations, and ideas for further study.

2.0 INFRASTRUCTURE

To facilitate natural gas-fueled transportation, infrastructure must be developed to accommodate access to West Virginia's abundant source of natural gas to fuel state fleet vehicles and, optimistically, private and municipal vehicles as well. The required infrastructure must include, among other things, a statewide network of natural gas fueling stations and compressors, a supporting natural gas delivery system consisting of pipelines or other means of delivery, vehicle repair and conversion facilities, and a trained workforce.



2.1 Demand Drives Infrastructure Development

The Infrastructure Development Committee studying this issue began its analysis by assessing where in West Virginia infrastructure should be developed to support prospective and current users of NGVs. In considering this issue, the committee was mindful of its primary directive to recommend infrastructure development options geared toward fueling a segment of the state's vehicle fleet. Cognizant there will be significant public interest in the utilization of NGVs once their cost and environmental benefits become better publicized, the committee's infrastructure research also focused on accommodating private vehicles (and federal and municipal vehicles) in addition to the state fleet.

Numerous infrastructure experts served on the committee and provided insightful presentations and recommendations. Task

Force member Frank McCullough, for example, shared the lessons he learned while working with Governor Caperton and Governor Wise to pioneer the use of NGVs in West Virginia. Mr. McCullough explained the market dictates the answer to the "where question," i.e., fueling stations should be located where the greatest demand for NGVs exists.

The committee believes demand will be greatest—at least initially—in the areas of West Virginia that are the most heavily populated and contain the largest concentrations of federal, state, and municipal fleet vehicles. Demand should likewise be present in areas with significant interstate

traffic in addition to the aforementioned characteristics. Although natural gas fueling stations can be constructed wherever an adequate supply of natural gas exists, such stations will be economically viable only where they can consistently service enough NGVs to offset development and operating costs.

The committee has determined that Berkeley, Cabell, Fayette, Greenbrier, Harrison, Jefferson, Kanawha, Logan, Marion, Mercer, Monongalia, Ohio, Putnam, Raleigh, Wayne, and Wood counties have the most attractive population and fleet concentration characteristics to support infrastructure development. The committee reached this conclusion by comparing census population data with fleet concentration data provided by the state fleet manager, private companies, and federal, county and municipal governments. The map on page 6 (Attachment D) illustrates the comparison between population data and fleet concentration data. To help facilitate a successful transition to NGVs, the committee recommends infrastructure be developed in the aforementioned counties first, particularly in the counties hosting interstate traffic courtesy of Interstates 64, 68, 77, and 79.

2.2 Supply Issues Also Impact Infrastructure Development

A demand for natural gas requires an adequate supply of gas. Although there are numerous interstate and intrastate pipelines in West Virginia that can potentially supply the required natural gas depending on specific pipeline size and pressure issues, the precise locations of the pipelines can significantly impact where NGV infrastructure can be developed. Committee member Bob Orndorff of Dominion Resources prepared a detailed map showing where West Virginia’s pipelines are located generally. The pipeline map is on page 7 (Attachment E). Less detailed maps showing the major pipelines follow on pages 8 and 9 (Attachments F and G). These maps were prepared at the Committee’s request by the West Virginia Office of Geographic Information Systems (GIS).

The pipelines shown on these maps are operated by various companies, including Columbia Gas, Cabot, Dominion, EQT, Tennessee Gas, and Texas Eastern. More likely than not, the locations of the pipelines will not overlap with the locations of the prospective fueling stations; therefore, lateral lines will have to be laid from the pipelines to service prospective fueling stations.

The committee believes utilities will be interested in constructing laterals and related infrastructure necessary to allow adequate supply for station locations in light of the ratemaking incentives provided by West Virginia law. Specifically, W. Va. Code § 24-2D-2(b) requires the Public Service Commission (PSC) to “authorize ratemaking allowances for public utilities to encourage the use of alternative fuel in new demonstration technologies, including alternative fuel vehicles.” In 1992, for example, the PSC authorized Hope Gas, Inc. to add an increment of \$0.005 to its base rate for three years to help offset the capital expenditure and operating and maintenance costs associated with developing NGV infrastructure in West Virginia. A copy of the PSC’s order of October 30, 1992 is attached as Attachment H on pages 26-29.



2.3 Private Retailers Can Develop Infrastructure Under The Right Circumstances

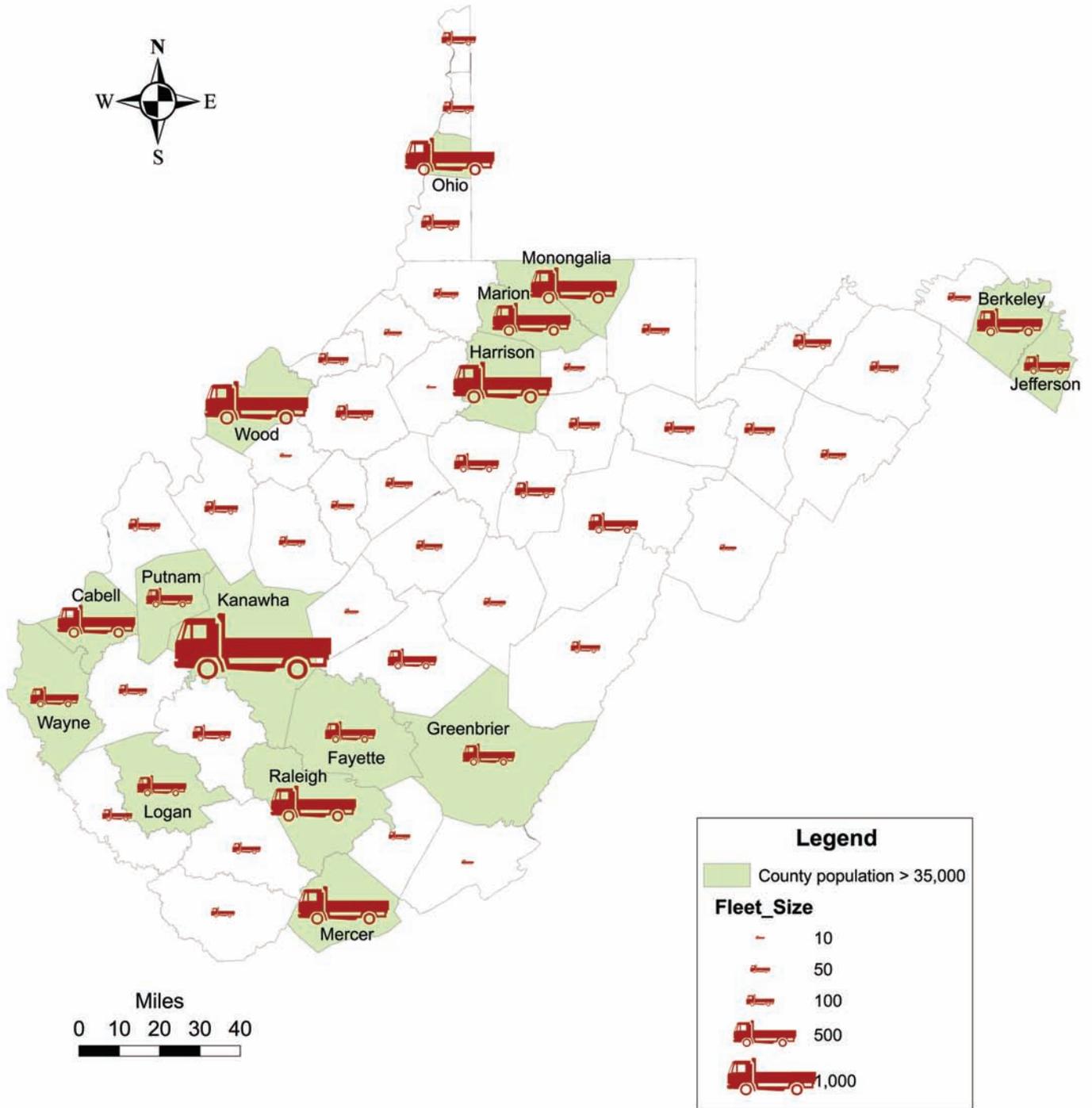
The committee also explored the feasibility of private retail stores developing NGV infrastructure. Retail experts Michael Graney of One Stop and Greg Darby of Little General led these discussions. Mr. Graney’s presentation to the committee illustrated the feasibility of private retailers offering natural gas fueling facilities where certain key criteria are present.

- Retailers require enough space on their property to accommodate natural gas fueling equipment and additional—often larger—NGVs (e.g., heavy duty trucks).
- Retailers need to be located in high population zones where there is an increased demand for natural gas, preferably from “willing partners” (e.g., concentrations of the state vehicle fleet) who require a specific amount of natural gas on a monthly basis.
- Retailers require access to high pressure natural gas.
- Retailers’ facilities have to be on level sites highly visible to the public, and situated where there are constant flows of traffic, with adequate means of ingress and egress.

If these key criteria are present, the committee believes private retailers will likely be interested in working with willing partners to develop the infrastructure needed to fuel NGVs.

Attachment D

Population and Fleet Concentration



10/10/2012

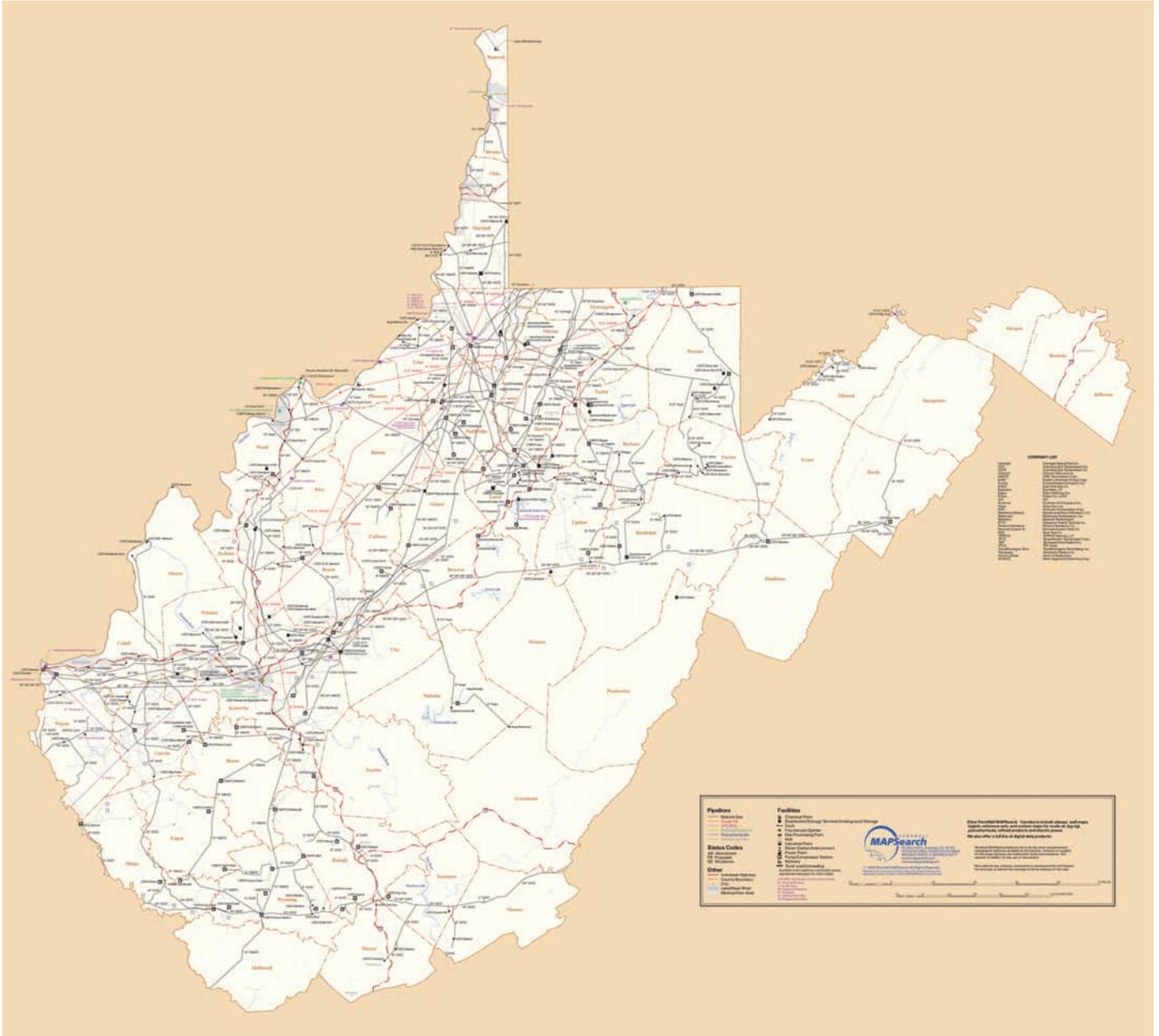
NAD_1983_UTM_Zone_17N
Projection: Transverse_Mercator

This map represents interpretations of best available data. Location of pipelines is approximate. As in all cartographic work, professional interpretations may vary, and can change with advancements in both technology and data quality. This map is produced for use by Governor Tomblin's NGV Task Force; proper use of the information herein is the sole responsibility of the user.

GCS_North_American_1983
Datum: D_North_American_1983

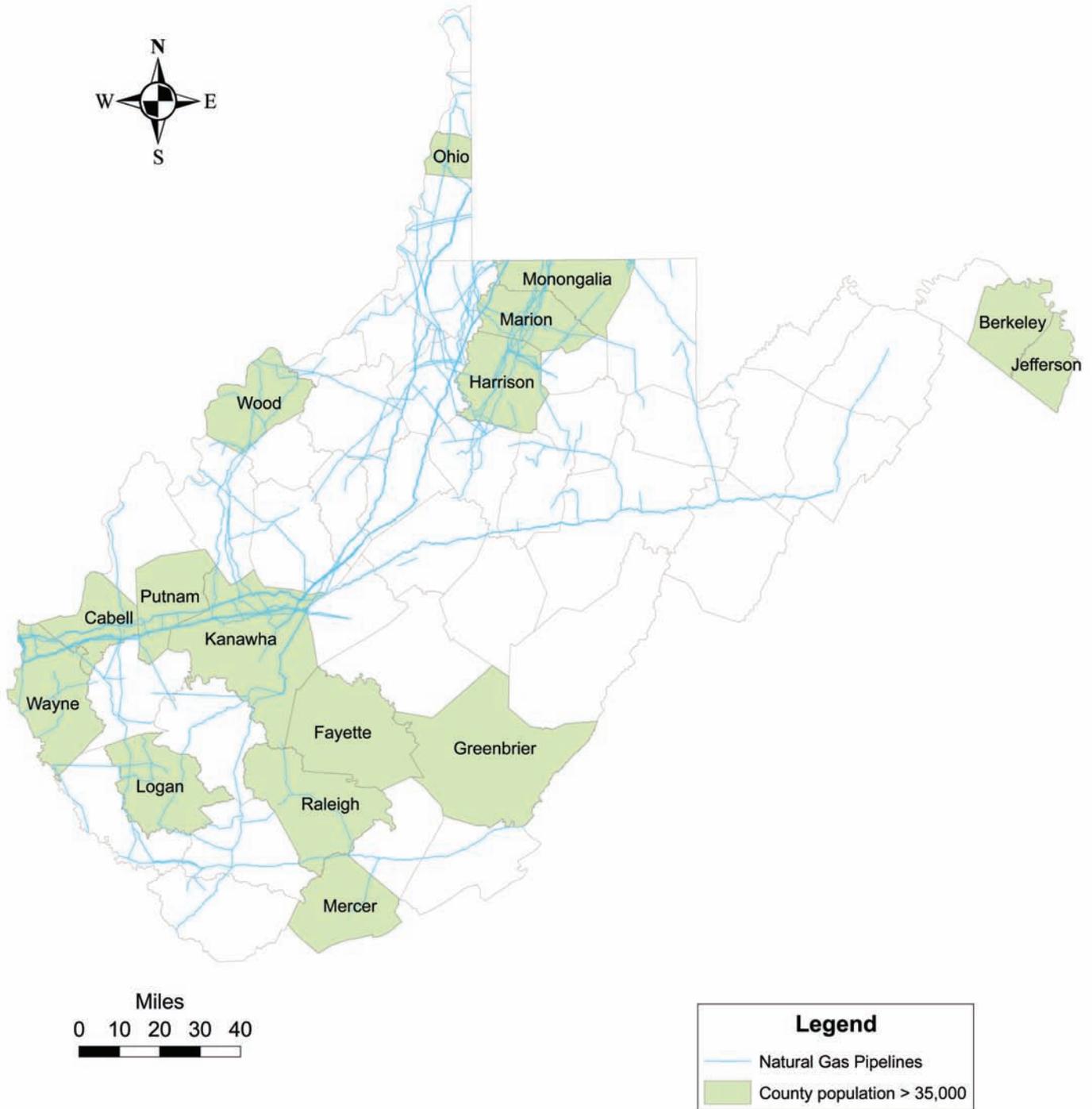
Attachment E

Detailed Gas Pipeline Information



Attachment F

Population, Fleet Concentration and NG Pipelines



10/10/2012

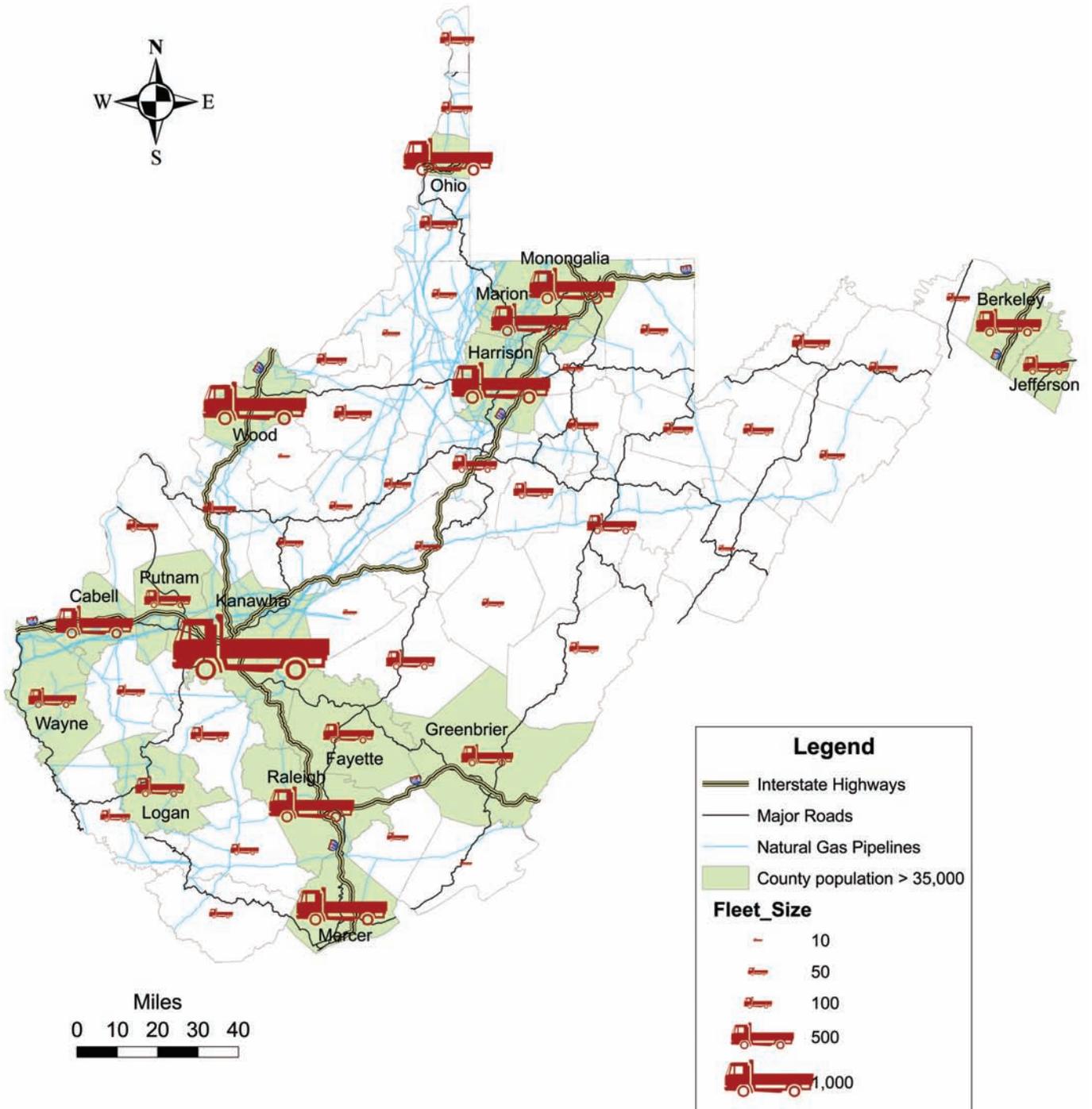
NAD_1983_UTM_Zone_17N
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GCS_North_American_1983
Datum: D_North_American_1983

Attachment G

Population and Major NG Pipelines



10/10/2012

NAD_1983_UTM_Zone_17N
Projection: Transverse_Mercator

This map represents interpretations of best available data. Location of pipelines is approximate. As in all cartographic work, professional interpretations may vary, and can change with advancements in both technology and data quality. This map is produced for use by Governor Tomblin's NGV Task Force; proper use of the information herein is the sole responsibility of the user.

GCS_North_American_1983
Datum: D_North_American_1983

2.4 Current Economic and Technological Conditions for Infrastructure Development

Although laudable, efforts in the 1990s to develop widespread and sustainable NGV infrastructure in West Virginia proved to be unsuccessful. The committee's research, however, indicates many of the obstacles thwarting infrastructure development in the past have either ceased to exist or are no longer as daunting. Consider the following:

Fuel prices. Gasoline and natural gas were priced similarly on an energy equivalent basis throughout the 1990s and early 2000s. Not surprisingly, natural gas was not an economically attractive alternative to gasoline produced from crude oil at that time. However, natural gas is now significantly cheaper, largely because of increased supply.

For example, in late March 2012, crude oil was more than eight times as expensive as natural gas on an energy equivalent basis. Although this large price gap has contracted, crude oil in 2013 is expected to remain around five times more expensive than natural gas. The committee believes the state, as well as the private sector, will now have greater interest in fueling cars and trucks with compressed natural gas, which at 2012 prices of approximately \$2.20 per gasoline gallon equivalent is significantly cheaper than gasoline at approximately \$3.68 a gallon.²

Natural gas economics. There was an adequate supply of natural gas in 1990s, but its price tended to fluctuate unpredictably—due in part to the lack of a competitive futures market. Today, by contrast, natural gas futures are traded competitively on the New York Mercantile Exchange, which has ensured greater pricing stability and lower gas prices.

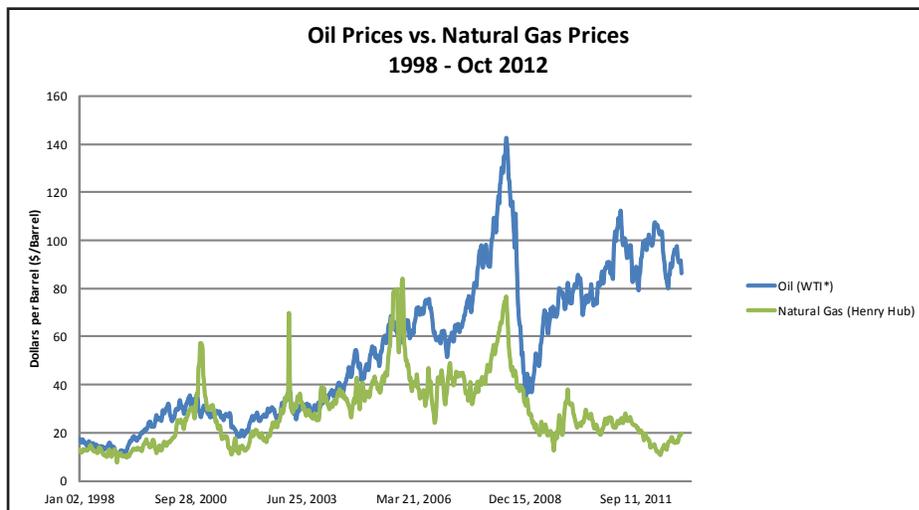
Furthermore, the discovery and development of new shale reserves through horizontal drilling and improved fracking technology has produced an over-abundant supply of domestic natural gas. Given these market conditions, the price of natural gas is expected to remain low for the foreseeable future. Gasoline produced from crude oil, by contrast, is expected to remain expensive.

Incentives. West Virginia law now provides tax credits for the purchase of NGVs and for converting traditional vehicles to NGVs³. Tax credits also are available for the purchase of qualified alternative fuel vehicle refueling infrastructure for homes and businesses.

Private-sector participation. In the 1990s, the West Virginia NGV movement was pioneered by a handful of private-sector individuals and entities. Today there is significant private-sector participation. For example, Chesapeake Energy and Antero Resources are operating part of their fleets on natural gas. Kanawha Converts hopes to fuel county and municipal vehicles, including KRT (Kanawha Valley Regional Transportation Authority) buses. Automakers such as Chrysler, Ford, Volvo, Toyota, Honda, and GM are introducing NGVs into the market and providing consumers with affordable vehicle options.

Significantly, in January 2013 Governor Tomblin announced the construction of three CNG service gas stations in West Virginia by IGS Energy CNG Services. With locations in Charleston, Jane Lew, and Bridgeport, this investment will establish four stations along the I-79 corridor. Private and public fleets will be able to drive between Charleston and western Pennsylvania with multiple fueling options.

Environmental and political concerns. According to the National Alternative Fuels Training Consortium's Clean Cities Learning Program, the United States owns only 2-3% of the world's oil reserves, but uses 25%. Petroleum is the most consumed energy source in the United States, which spends \$5.7 billion per week (\$297 billion per year) on petroleum imports. The transportation sector consumes the lion's share of this petroleum. Conversely, nearly 87% of the natural gas used in the United States is produced domestically. Natural gas is cleaner to burn than gasoline produced from petroleum, and its use as a vehicular fuel results in less particulate matter and lower carbon monoxide and nitrogen oxide emissions. Natural gas is exceptionally safe; it does not pool if spilled and it quickly mixes with the air if released. Importantly, the use of domestic natural gas will help reduce Americans' dependence on foreign oil. Developing better infrastructure for NGVs in West Virginia will create further demand for this abundant, homegrown natural resource. The increased demand will lead to more production, which means more jobs for West Virginians.



Source: Energy Information Administration (EIA)

*West Texas Intermediate

Natural gas prices appear as a dollar per barrel equivalent. Henry Hub weekly spot prices were converted from dollars per million BTU to dollars per barrel using the ratio of 5.8 million BTUs per barrel of oil.

² The Committee obtained the 2012 average price of retail motor gasoline and compressed natural gasoline equivalent price information from the Department of Energy.

³ See *W. Va. Code § 11-6D-1, et seq.*

Gasoline Vehicle Emissions vs. CNG Vehicle Emissions				
(Well-to-Wheel)				
	Gasoline Vehicle	CNG Vehicle	Units	Reduction
Fuel Blend	E10	100% NG		
Emissions				
Volatile Organic Compounds (VOC)	265.0	141.3	mg/mile	46.7%
Carbon-Monoxide (CO)	3.8	3.4	g/mile	10.4%
Nitrogen-Oxides (NOx)	389.3	266.5	mg/mile	31.5%
Sulfur-Oxides (SOx)	147.6	65.0	mg/mile	56.0%
Particulate Matter 2.5 (PM2.5)	29.2	10.5	mg/mile	64.1%
Particulate Matter 10 (PM10)	51.4	12.8	mg/mile	75.0%
Carbon-Dioxide (CO2)	457.5	343.2	g/mile	25.0%

Source: Argonne National Laboratory, GREET Model.

Better fueling station technology. NGV fueling station technology has also improved drastically. The latest stations are computerized, contain state-of-the-art compressors and driers, and can fill an NGV tank in a matter of minutes. Nozzle control systems can deliver compressed natural gas at different pounds per square inch (psi). Gas dispenser systems accept credit card payments. Home units are available and are capable of fueling an NGV overnight.

The committee believes the foregoing economic and technological conditions form a stronger backdrop for the public and private sectors to develop widespread and sustainable NGV infrastructure in West Virginia.

3.0 CNG VEHICLES

West Virginia's fleet has the potential to provide vehicle volume supporting the development of natural gas fueling stations in West Virginia. Transitioning a segment of state fleet vehicles to natural gas fuel also has the potential to significantly reduce the state's vehicle fueling costs. Members of the task force contemplated the obstacles and considerations regarding the state's ability to purchase CNG vehicles, the location of potential CNG fleet vehicles, the cost of purchasing and converting the vehicles, as well as the utilization of propane as a fuel.



NGV request for proposal. The unified goal of the states' memorandum of understanding was to leverage greater purchasing power to pursue the transition of their fleets to CNG-powered vehicles. This effort demonstrated to automakers a collective purchasing interest encouraging them to develop varying-sized, functional, affordable NGVs that could also meet public demand.

Manufacturers and dealers responded and provided the MOU partner states a significant amount of feedback on the prospect of original equipment manufacturer (OEM) vehicles. The proposals received reflected a diverse range of vehicle availability. Through their responses, manufacturers demonstrated they are prepared to meet an increasing market demand for CNG vehicles.

Better vehicle technology. In the 1990s, NGVs were not widely produced and marketed. The vehicles that existed had limited technological capabilities and carburetor engines. The fuel storage systems in those vehicles resembled scuba tanks and had life spans of only one to three years. Today, most major vehicle manufacturers are offering NGV options. These vehicles feature computerized fuel injection engines that maximize the properties of compressed natural gas. Drivers report new NGVs perform in a manner analogous to traditional gasoline-powered vehicles. Fuel storage systems now last 20 years on average and will probably not require replacement during the useful life of NGVs.



3.1 Vehicle Availability to Support Infrastructure Investment

CNG purchasing authorization

To transition a segment of vehicles in West Virginia's state fleet to natural gas, the opportunity to purchase the vehicles required enhancement. In January 2012, Governor Tomblin signed a memorandum of understanding (MOU) with 22 other states to participate in a multi-state

In July 2012, the task force voted unanimously to recommend the Governor include CNG vehicles on the state fleet request for proposal (RFP). Governor Tomblin took action on the recommendation and announced in August that 10 dedicated CNG models would be available for agencies to purchase. Significantly, this action also paved the way for the WV Department of Highways to purchase CNG heavy-duty trucks.

Location of Vehicle Volume

As previously noted, it was vital to the task force's analysis to determine which West Virginia counties have the most desirable population and fleet concentration characteristics to support infrastructure development. These locations pinpoint the greatest potential for public and private demand. A review of the state's fleet data provided solid statistics from which to derive recommendations.



In 2012, the West Virginia Department of Administration's Office of Fleet Management reported a total of 7,811 state vehicles. Twelve state government agencies operate more than 80% of the state's fleet. Accordingly, the task force requested the "home county" designation of each agency vehicle. Those agencies and vehicle totals are as follows:

1. WV Division of Highways – 2,960
2. State Police – 902
3. WV Division of Natural Resources/State Parks – 563
4. West Virginia University – 481
5. WV Department of Environmental Protection – 341
6. WV Department of Health and Human Resources – 270
7. WV Division of Corrections – 182
8. WV Parkways Authority – 179
9. WV Office of Miners' Health, Safety, and Training – 133
10. WV Division of Forestry – 122
11. WV Division of Juvenile Services – 125
12. Public Service Commission of WV – 105

County and city government fleet data is also relevant to vehicle volume consideration. Local governments have the opportunity to purchase vehicles available on the state contract, which now includes NGVs. These vehicles total more than 2,000 in the most densely populated cities and counties. The US Department of Energy's Clean Cities program reports that over 10,000 vehicles in private and federal fleets are operating in West Virginia. Private fleet employers in West Virginia include Chesapeake, Mountaineer Gas, Antero, EQT, local newspapers, and Waste Management.

Maps depicting the location of fleet volumes were prepared and display county-by-county fleet breakdown, counties with populations over 35,000 residents, interstate natural gas pipelines, and major roads in West Virginia.

The data demonstrate a majority of fleet vehicles are located in the most populated counties, which fall along the major highways. The 10 areas providing the highest potential for NGV demand related to vehicle volume include: Berkeley, Cabell, Harrison, Kanawha, Marion, Mercer, Monongalia, Ohio, Raleigh, and Wood.

Because of the limited availability of natural gas fueling stations at the writing of this report, the finance committee recommends the WV Department of Administration add bi-fueled vehicles to the State RFP in 2013. Bi-fueled vehicles are available both as conversion and OEM. The utilization of these vehicles would allow for a gradual transition to CNG in an environment with a currently limited natural gas fueling infrastructure.

3.2 Cost Analyses for Conversion vs. OEM Vehicles

To transition a portion of the state's fleet to NGVs, options exist to either convert existing fleet vehicles through utilization of a conversion kit or purchase OEM vehicles.

Conversion Analysis

To perform such an analysis, the finance committee collected relevant data necessary to carry out the charge – including total state vehicles by type, replacement cycle, expenditures for gasoline, etc.

The WV Office of Fleet Management provided a conservative estimate in its Return on Investment analysis of converting vehicles to natural gas. The analysis considered three types of vehicles: sedans, medium-duty, and heavy-duty trucks. Conservative estimates were considered for the price of CNG compared to gasoline, MPGGE (miles per gallon gas equivalent) and the current price of conversion. Based on those numbers, the committee calculated the monthly incremental conversion cost, as well as monthly gallons and monthly miles to recoup conversion costs, as found in Attachment I on pages 30-31. An explanation of the analysis is included in Attachment J on page 32.

The conversion cost of a sedan does not produce a reasonable return on investment. However, if the state converted full-size pick-up trucks to natural gas, a cost savings would be realized within the first four years of the vehicles' operation. The analysis shows conversion of full-sized pick-up trucks to CNG will save approximately \$5,000 per vehicle. The state will also realize a savings of at least \$2,569 per vehicle when converting a heavy-duty dump truck to CNG over its life cycle.

It should be highlighted that the State of Oklahoma recently purchased 196 Dodge Ram 2500 NGVs after conducting a life cycle cost comparison of the model and its gasoline-powered cousin. Although the natural gas-powered Rams have price tags at approximately \$30,000 and are roughly \$6,000 more expensive than the \$24,000 gasoline-powered Rams, the fuel savings Oklahoma can realize over the course of their useful lives justifies the purchases.

Ram 2500 Lifecycle Cost Comparison		
	Gasoline	Compressed Natural Gas
Vehicle Cost	\$24,352	\$29,993
Fuel Economy	14	14
Fuel Cost/GGE	\$3.25	\$1.35
Useful Life	175,000	175,000
Lifecycle Cost	\$64,727	\$46,868

As the preceding chart demonstrates, Oklahoma's purchase of 196 Ram 2500 NGVs will result in \$3.5 million of life cycle cost savings.

OEM Purchase Analysis

The conversion of gasoline-powered engines to those that run on natural gas can be performed by installing a conversion kit. The cost of converting vehicles in this manner ranges from \$8,000 - \$35,000, depending on the type of vehicle (from passenger to heavy-duty dump truck).

OEM vehicles are new vehicles that are either upfitted with a natural gas engine by a certified garage prior to final delivery or use natural gas as their primary source of fuel directly off the assembly line. As demand grows, manufacturers have indicated more vehicles will roll off the assembly line with dedicated natural gas fueling systems already installed. This will eliminate delivery lag time related to upfitting kit installations. It will also guarantee the full manufacturer warranty will remain in effect; whereas currently the utilization of a conversion kit partially voids manufacturers' warranties and the kits themselves are typically covered for one year by upfitters.

As part of the multi-state RFP, West Virginia received bids for various OEM vehicles with dedicated CNG engines. When comparing the cost of converted vehicles to the OEM bids, the cost-differential for sedans is between \$7,000 and \$8,000.

The cost differential between gasoline and CNG vehicles is the same cost of converting a pick-up, between \$9,000 and \$10,000. However, the incidental cost differences between conversion and OEM purchases should be considered when estimating the total price of the vehicle. Additional maintenance and service costs may result from conversion kit vehicles because kit warranties do not provide the same length of coverage as OEM vehicle warranties.

3.3 Additional Cost Benefits of Natural Gas Fueled Vehicles

Decreased State Costs for Fuel

By transitioning to NGVs, additional state savings would be realized through decreased expenditures in fuel purchases. In FY 2012, the state spent \$19 million on gasoline. The state accounting system does not currently delineate between airplane fuel, diesel, or unleaded gasoline costs. West Virginia is transitioning to a new Enterprise Resource Planning system (OASIS), so future expenditures by gasoline-type purchases may be tracked once the system is fully operational. Hypothetically, based on \$19 million expenses in gasoline per year, if 20% of the fleet was converted in five years and CNG remains at half the cost of current oil-based gas prices, the state could save \$1.9 million a year.

Propane Utilization

In certain areas of West Virginia, the natural gas fields are home to gas rich in liquid content – commodities such as propane, butane and ethane may be extracted and utilized in a variety of capacities. Exploration of new uses for these commodities further enhances the economics of drilling and opens up a new world of opportunity.

In conjunction with task force efforts, the WV Department of Education is exploring investment in a propane-powered school bus fleet. According to CleanFuel USA, propane generally costs 40 percent less than traditional gasoline and refueling sites are cost-effective and easy to install. Fueling infrastructure costs approximately \$30,000 per location. School systems in 27 states have transitioned to propane-powered school buses utilizing liquid propane, also known as autogas. Autogas is a natural byproduct of natural gas drilling and 90 percent of the utilized autogas in the United States is domestically produced.

In October 2012, the West Virginia Board of Education approved a policy waiver allowing the use of propane as an alternative fuel for school buses. As a result, a specification for propane-fueled vehicles was included in the request for bids for the statewide purchase of school buses after July 1, 2013.

According to the WV Department of Education, about 3,000 buses currently run every school day in West Virginia and travel more than 46 million miles a year. The adoption of propane could save an average of \$3,100 per bus annually. Therefore the state can expect a projected savings of more than \$9 million per year on bus fuel expenditures.

Propane school buses cost approximately \$10,000 more than diesel-fueled buses; however, based on projected costs, the return on investment is 3.2 years. West Virginia's school buses are replaced on a twelve-year cycle and more than 250 new buses are purchased annually at a cost of \$20 million. On average, the state school bus fleet consumes six million gallons of diesel annually at a cost of nearly \$24 million. Presently the Office of School Transportation for the WV Department of Education is researching the feasibility of retrofitting existing buses. After a life cycle cost analysis is completed, the department will ascertain the potential of retrofitting the existing bus fleet.



4.0 SISTER STATE NGV TRANSITION EXPERIENCES

The multi-state MOU vehicle initiative provided West Virginia officials with contacts in states currently exploring and transitioning their fleets to CNG. The task force found other state experiences helpful in framing the progress of CNG efforts nationwide.

The State of Oklahoma coordinated the MOU's efforts and is a national leader in CNG vehicle utilization. The Oklahoma Legislature's stated intent is to "increase the amount of CNG fueling infrastructure in the state, with the overall goal of having one public fueling station located every 100 miles along the interstate highway system by 2015, and one public fueling station every 50 miles by 2025. The Department of Central Services Fleet Management Division may take steps to reach this goal by collaborating with private entities to build CNG fueling infrastructure."⁴

Currently, 88 CNG fueling stations exist in Oklahoma— of which 60 are open to the public. It was reported the primary driver of this infrastructure was local natural gas utilities. The State of Oklahoma made a contractual commitment to purchase a designated volume of CNG for its fleet, which in turn, spurred interest in natural gas fueling infrastructure investment.

⁴ See *Oklahoma Statutes* §74-78f



By December 2012, public agencies in Oklahoma utilized more than 240 CNG-fueled vehicles. State officials report a plan to replace more than 90% of its fleet with CNG purchases over the next three years. The state reports a recent purchase of 160 new CNG vehicles cost \$5 million. Each vehicle is estimated to save \$20,000 in fuel and maintenance costs over the life of the vehicle. It is important to note a significant number of private CNG fleet vehicles in Oklahoma support its fueling infrastructure. Chesapeake Energy maintains a fleet of more than 1,178 vehicles registered in Oklahoma.

Patrick Henderson, Governor Corbett’s Energy Advisor, reported Pennsylvania is currently focused on transitioning 25% of Pennsylvania’s existing mass transit system to alternative fuels by the year 2020. The Governor’s Marcellus Shale Advisory Commission recommended in its July 2011 final report: “Pennsylvania should develop ‘Green Corridors’ for natural gas-fueled vehicles, including Compressed Natural Gas (CNG) and Liquefied Natural Gas (LNG)

fueling stations, located at least every 50 miles and within two miles of designated highways.”

Private entities such as EQT, Giant Eagle, and Waste Management have utilized grant funding to construct public access CNG fueling stations in the Pittsburgh, Pennsylvania area. Waste Management provided a tour for Task Force members of its natural gas fueling facility in Washington, PA. The quick-fill facility is open for public use, while Waste Management’s fleet utilizes separate slow-fill dispensers.

In Virginia, the State Legislature passed House Bill 2282 in 2010 requiring a plan to utilize alternative fuels for state vehicles. As a result, Governor McDonnell signed an Executive Order setting out Virginia’s alternative fuel plan for creating partnerships between alternative fuel source providers, infrastructure developers, and vehicle manufacturers.

West Virginia participates in the Southern States Energy Board (SSEB), which recently passed a resolution supporting the use of NGVs (Attachment K on Page 33.) The unified effort of sister states to promote the utilization of natural gas as a vehicular fuel bodes well, ensuring continuity of travel - nationwide - for private and public fleets.

5.0 NGV COMMUNICATION STRATEGY

Education of the public must parallel the introduction of a new fueling source. A communications strategy informing public employees and the citizens of West Virginia about the economic, environmental, and safety benefits of utilizing NGVs will help promote and ease the transition to natural gas from diesel-fueled vehicles.

Public employees. Developing a strategy to educate state employees is vital to the adoption and realization of NGV cost savings. The committee’s research indicates past efforts of the state to adopt NGVs were frustrated as state employees were hesitant to fill vehicles with natural gas due to safety and other concerns. Buy-in from state employees will not only further cost savings, it will also lend additional voices of support to the opportunities and benefits of using NGVs.

The West Virginia Division of Energy, in conjunction with West Virginia University’s National Alternative Fuels Training Consortium, should develop programs of education and orientation for employees of state agencies purchasing NGVs, instructing on not only the economic, environmental and safety benefits of NGVs, but the operational protocols for the use and maintenance of such vehicles.

NGV conference. As part of the task force’s mission of communication, the West Virginia Oil and Natural Gas Association (WVONGA) scheduled the 2013 Appalachian Basin Natural Gas Vehicle Expo and Conference for May 13 – 15, 2013 at the Charleston Civic Center in Charleston, WV. The conference will provide informative speakers on NGVs and the future of the natural gas industry. WVONGA’s conference will also feature state-of-the-art displays of transportation equipment and the many examples of the different types of NGVs.

Governor Tomblin has invited fellow governors from the Appalachian Basin to the expo, as well as signatories of the natural gas vehicle MOU. Other guests will include nationwide representatives from state public-sector fleet operations, county and municipal transit authorities, and private-sector fleet operations, including taxi cab operators. Members of the West Virginia State Senate and the House of Delegates, all state media outlets, and selected civic, trade and labor organizations will also attend.



Private Sector. While public-sector demand will drive natural gas as a vehicular fuel in the early stages, for natural gas to truly become a sustainable alternative to gasoline, the private sector must also adopt natural gas as a vehicular fuel. There is increasing awareness of the benefits of using natural gas, or derivatives thereof, as fuels to replace the conventional use of gasoline or diesel fuel. However, the committee gauged public opinion and learned there are still many misconceptions and misunderstandings regarding the safety of NGVs.

In this vein, it is important to broadly communicate and educate the public about the economic, environmental, and safety benefits of NGVs. While public employees will learn of these benefits through the West Virginia Division of Energy, communication and education of the private sector should be led by the natural gas industry. A successful ad campaign on the benefits of shale gas has heretofore been driven by industry leaders such as the Independent Oil and Gas Association (IOGA), WVONGA, the American Natural Gas Association, and many others. These entities should again develop a consistent and robust campaign to educate the public about NGVs.

NGV website. In coordination with industry leaders, the West Virginia Division of Energy should create and maintain a website devoted to the use of natural gas as a vehicular fuel in West Virginia. Contents of the website should include the general location of state fleet vehicles operating on natural gas, the location of natural gas and propane fueling stations in West Virginia, news articles on the use and proliferation of NGVs, a calendar of upcoming events, and general information relating to NGVs.

Speakers Bureau. It is further recommended that a speakers bureau be established by Governor Tomblin's designee, comprised of public and private sector individuals who will make themselves available as presenters at public meetings upon the request of sponsoring agencies. Moreover, such presenters should be co-opted on a definitive plan to meet with editors of newspapers, hosts of radio and television talk shows, and the media generally. The speakers bureau will provide information and testimonials to the public on the attributes of NGVs.

Earned media. As a means of highlighting state use of NGVs, where and when appropriate, the committee recommends that communications specialists in various agencies of state government work with state media outlets to capture, through print or broadcast, relevant news items covering the public sector use of natural gas or its derivatives as a vehicular fuel. Although the work of agency communications officials may be dedicated to state operations, in those instances in which there is joint public and private participation in an event or activity worthy of public attention, it is recommended that Governor Tomblin direct agency communications officials to collaborate with private-sector counterparts to maximize opportunities.

6.0 NGV LEGISLATIVE PROPOSALS

As more natural gas derivative fuels become viable alternatives to gasoline, it is critical to appreciate that WV Department of Transportation relies almost entirely on the Road Fund to build and maintain safe highways and roads. Revenue for the Road Fund is dependent on the tax imposed on gasoline and diesel fuel dispensed in our state. It is therefore imperative to take this fact into consideration when contemplating a transition of fuel for vehicles in West Virginia from conventional gasoline and diesel to natural gas or some derivative thereof. A modernization of policies related to revenue from using natural gas as a vehicular fuel should be contemplated.

The State of West Virginia seeks to foster responsible growth in the emerging markets for alternative fuel vehicles and refueling infrastructure. To accomplish that goal, the Legislative and Communications Committee, working with the WV Department of Revenue, tailored a set of legislative proposals striving to stimulate the purchase of private-sector NGVs, promote the development of NGV refueling infrastructure, and modernize the motor fuel excise tax laws to accommodate alternative fuel use.

Purchasing NGVs. The committee has determined that targeted tax incentives may help jump-start private-sector investment particularly in geographic areas of lower population density. West Virginia currently offers significant tax incentives for purchasing certain types of alternative fuel motor vehicles. The NGV Task Force recommends the following tax incentive policies regarding alternative fuel vehicles:

- Offer a 35% tax credit on the purchase price of a new car or truck capable of running on compressed natural gas, liquefied natural gas, or propane up to a maximum of \$7,500 per vehicle
- Offer a 50% tax credit on the conversion cost of a car or truck from use of traditional fuel to use of compressed natural gas, liquefied natural gas, or propane up to a maximum of \$7,500 per vehicle
- Offer a 35% tax credit on the purchase price of a new vehicle weighing more than 26,000 pounds capable of running on compressed natural gas, liquefied natural gas, or propane up to a maximum of \$25,000 per vehicle
- Offer a 50% tax credit on the conversion cost of a vehicle weighing more than 26,000 pounds from use of traditional fuel to use of compressed natural gas, liquefied natural gas, or propane up to a maximum of \$25,000 per vehicle.

These incentives would not be refundable or transferable.

The above tax incentive program should extend only to the private sector and not extend to federal, state, and local government units. However, the committee encourages all governmental units to apply for any available inter-governmental grants which may be available for purchases of alternative fuel NGVs.

Refueling infrastructure. A critical mass of NGVs without an adequate infrastructure of fueling stations yields few benefits. Commercial natural gas refueling stations are gradually increasing in number throughout the United States. According to the US Department of Energy, there are 536 commercial CNG fueling stations and 30 commercial LNG stations spread throughout the country⁵. However, these stations tend to be located within densely populated urban areas. Commercial CNG fueling stations located near West Virginia include locations in Zanesville, Ohio; Washington, Pennsylvania; and Gaithersburg, Maryland. Private-sector investment to bring about available fueling stations is critical to the evolution of NGV use in West Virginia.

Congress recently renewed certain federal tax credits for alternative fuel vehicle refueling properties for investment placed in service in 2012 and 2013. Businesses may qualify for a tax credit equal to 20% of the cost of qualified alternative fuel vehicle refueling property up to a maximum of \$40,000 per facility. The qualified cost is reduced by any IRS section 179 expense deductions taken for the property. Qualified alternative fuel vehicle refueling property is defined as any property (other than a building or its structural components) used for storing or dispensing an alternative fuel into the fuel tank of a motor vehicle propelled by the fuel, but only if the storage or dispensing is at the point where the fuel is delivered into that tank. CNG and LNG qualify as alternative fuels for purposes of the federal tax credit.

Federal law also provides for a 50 cent per gallon tax credit for liquefied natural gas and a 50 cent per gasoline gallon equivalent tax credit for CNG for use as a motor vehicle fuel. The tax credit goes to the seller in the case of retail transactions. However, when such fuels are dispensed using private fueling stations, the credit may go to the user of the fuel. The tax credit must first be applied against the federal fuel excise tax due on such fuel use. The federal excise tax is 18.3 cents per gallon per gasoline gallon equivalent of CNG and 24.3 cents per gallon of LNG. Both retail businesses and tax exempt entities that own their own fueling stations may then claim the remainder of the tax credit as a refundable credit. This federal subsidy tax credit program is currently scheduled to expire at the end of 2013.

In addition to any available federal tax incentives, targeted West Virginia tax incentives may help jump-start private-sector investment, particularly in geographic areas of lower population density. West Virginia currently offers significant tax incentives tied to development of commercial and residential alternative fuel infrastructure. The Legislative and Communications committee recommends the following tax incentive policies regarding alternative fuel infrastructure:

- Offer a commercial alternative fuel vehicle refueling infrastructure tax credit equal to 20% of the cost of CNG or LNG automotive fuel dispensing facilities up to a maximum of \$400,000 per facility
- Any change to this credit would not be effective until January 2014

The committee recommends that excise taxes on alternative fuels used in motor vehicles on the highways of this state should be imposed on the basis of energy content or gasoline gallon equivalents. Research by members of the task force and WV Department of Revenue staff have found that other states with established tax policies on alternative motor fuels tend to use gasoline gallon equivalents as their tax base measure. The Btu content of a gallon of gasoline or other fuels will vary somewhat by changes in seasonal temperature. On average, it takes 126.67 cubic feet of CNG to yield one gallon of gasoline with an energy content of 114,100 Btu. One gallon of CNG is equivalent to 31.847134 cubic feet of CNG. In the case of LNG, it takes 1.5362 gallons of LNG to equal the energy content of one gallon of gasoline.

Presently, West Virginia imposes two separate taxes on motor fuel, a 20.5 cent per gallon excise tax and an additional 5.0 percent wholesale sales tax based upon a calculated average wholesale price of gasoline and special fuels. The committee recommends that West Virginia should similarly impose both of these taxes on alternative fuels such as CNG, LNG and propane. However, in lieu of the current measurement of wholesale price (which is most heavily weighted upon sales of gasoline and diesel fuels), a separate wholesale price measurement for CNG, propane and LNG should be the basis of the imposition of the 5.0 percent wholesale sales tax.

The current gasoline equivalent tax rates for CNG would be \$0.052 per gallon of CNG for the fixed excise tax rate component and \$0.008 for the variable wholesale fuel tax component under the assumption that the wholesale price is \$4 per thousand cubic feet. The combined tax rate would be \$0.06 (i.e., 6 cents) per gallon of CNG.⁶ A wholesale price measurement procedure would need to be adopted for the actual measurement of wholesale price of natural gas used in powering motorized vehicles.

⁵ See http://www.afdc.energy.gov/fuels/natural_gas_locations.html

⁶ Tax equivalent for 20.5 cent excise tax: Tax of (\$0.205/gallon of gasoline) x (gallon of gasoline/126.67 cubic feet of CNG) = \$0.001618/ cubic foot of CNG or 16.2 cents per 100 cubic feet of CNG or Tax of (0.205/gallon of gasoline) x (gallon of gasoline/ (0.0314 liquid gallons/cubic foot of CNG) x 126.67 cubic feet) = \$0.052 cents per gallon of CNG. Tax equivalent for 5% wholesale sales tax (Assuming average wholesale price of \$5/1,000 cubic feet): (\$5/1,000 cubic feet x 126.67 cubic feet) x 5% tax rate = 3.2 cents or (\$5/1,000 cubic feet x 126.67 cubic feet) x 5% tax rate x (gallon of gasoline/ (0.0314 liquid gallons/cubic foot of CNG) x 126.67 cubic feet) = \$0.008/gallon of CNG.

Similarly, the current gasoline equivalent tax rates for LNG would be \$0.133 per gallon of LNG for the fixed excise tax rate component and \$0.09 for the variable wholesale fuel tax component under the assumption that the wholesale price is \$1.80 per gallon of LNG. The combined tax rate would be \$0.223 (i.e., 22.3 cents) per gallon of LNG.⁷

It is further recommended that Governor Tomblin direct the appropriate persons in the WV Department of Revenue and the WV Department of Transportation to collaborate in efforts to determine the extent that legislation is required to achieve the necessary balance in tax policies recommended above and to draft any such legislation which may be necessary to effectuate these recommendations.

The foregoing task force recommendations for targeted responsible tax incentives should adequately jump-start the development of the use of natural gas as a viable alternative transportation fuel in West Virginia, while leaving the private-sector market forces in control of the economic outcome. In addition, the task force highway fuel excise tax recommendations foster neutral tax policy and maintain a critical highway funding stream for the State.

7.0 RECOMMENDATIONS

Members of the Governor's Natural Gas Vehicle Task Force are appreciative of the opportunity to assist Governor Tomblin in assessing the feasibility of fleet transition to NGVs and facilitating development of a supporting natural gas infrastructure.

The following is a list of recommendations for the Governor's consideration:

I. *Priority consideration for NGV infrastructure development should be in the counties that have the largest vehicle fleet concentrations and host interstate traffic courtesy of Interstates 64, 68, 77, and 79.*

Berkeley, Cabell, Fayette, Greenbrier, Harrison, Jefferson, Kanawha, Logan, Marion, Mercer, Monongalia, Ohio, Putnam, Raleigh, Wayne, and Wood Counties have the most attractive population and fleet concentration characteristics to support infrastructure development.

II. *Utilities should explore the ratemaking incentives provided by West Virginia law to help offset the costs of constructing laterals and related infrastructure.*

III. *Private retailers can afford to develop infrastructure under the right conditions.*

Retailers can develop NGV infrastructure where the following criteria are present: space, high population, willing partners (such as state departments) requiring fuel, access to natural gas, and level sites with constant flows of traffic.

IV. *The State of West Virginia should move toward NGV transition without delay.*

Current economics, fuel prices, incentives, private-sector participation, technology, and environmental and political factors make 2013 the ideal time to plan for fleet vehicles' utilization of natural gas/propane.

V. *Natural Gas Vehicle Transition Team should be appointed by the Governor to review this report, monitor NGV technology and economic issues related to natural gas, and make additional recommendations to the Governor to further the work of the task force.*

An NGV Transition Team should review this report and advise the Governor how its recommendations should be implemented in both the public and private sectors.

The Team could be comprised of representatives from the Divisions of Highways, Energy, Tax, Fleet Management, Purchasing, the Governor's Office, the Board of Education, and the National Alternative Fuels Training Consortium at West Virginia University.

VI. *Departmental secretaries should be directed to embrace the purchase, conversion, and utilization of CNG vehicles – where it makes sense.*

The Governor should request cabinet secretaries direct state agencies to assess opportunities to transition segments of their fleets to NGVs, identify which vehicles to convert, and develop eight-year implementation plans.

The task force recommends a minimum goal of transitioning twenty-five percent (25%) of the state fleet to NGVs in four years. Twenty-five percent (25%) of 7,811 fleet vehicles results in 1,952 NGVs.

The conservative return on investment for converting full-sized trucks from diesel fuel to natural gas is \$5,000 per vehicle over the five year life of the vehicle. Therefore, agencies with local access to natural gas fueling stations should give priority to converting full-sized trucks to CNG.

Agency NGV transition plans should be submitted to the Fleet Management Office for review by the Natural Gas Vehicle Transition Team. Agencies located in counties where CNG stations are announced should begin their analysis immediately for submission no later than April 30, 2013.

⁷ Tax equivalent for 20.5 cent excise tax: Tax of (\$0.205/gallon of gasoline) x (gallon of gasoline/1.5362 gallons of LNG) = \$0.133 tax/gallon LNG. Tax equivalent for 5% wholesale sales tax (Assuming average wholesale price of \$1.80/gallon of LNG): (\$1.80/gallon x 5% tax rate = 9.0 cents per gallon of LNG).

VII. *The Transition Team should explore and evaluate characteristics of an RFP for willing private partners/infrastructure providers with whom the state could contract to fuel the vehicles to be purchased.*

VIII. *The State should add bi-fuel vehicles to the fleet RFP.*

To assist in transitioning vehicles through the period of unbalanced growth in vehicle stock and fuel station infrastructure, bi-fueled vehicles would expand the volume of vehicles to support natural gas fueling stations.

IX. *The Department of Education's school bus alternative fuel definition should focus on propane and compressed natural gas.*

Funding to support propane infrastructure for county bus garages would be strengthened and available through limiting the definition of alternative fuel in the codified language of the school aid formula.

X. *The Community and Technical College System can help expand the workforce by preparing NGV trained technicians.*

Certification training and requirements are vital to properly support conversion, vehicle maintenance, and infrastructure support. NGV trained technicians will ensure vital safety standards are met.

The Community and Technical College System of WV should explore expansion of an NGV training network in conjunction with the National Alternative Fuels Training Consortium (NAFTC) at West Virginia University.

XI. *The WV Department of Education should actively seek propane partners to explore installation of propane-autogas refueling stations.*

XII. *The Division of Energy and the natural gas industry should support the expansion of NGV usage through education and communication.*

The WV Division of Energy, in conjunction with West Virginia University's National Alternative Fuels Training Consortium, can develop programs of education and orientation for employees of state agencies purchasing NGVs, instructing on not only the economic, environmental and safety benefits of NGVs but the operational protocols for the use and maintenance of such vehicles.

A website, private ad campaign, and Speakers Bureau should be developed to present a consistent and robust campaign to educate the public. It is recommended that Governor Tomblin direct agency communications officials to collaborate with private-sector counterparts to maximize opportunities.

XIII. *The WV Department of Education should aggressively educate county level transportation employees on the environmental and financial benefits of propane school buses.*

XIV. *Non-transferable tax incentives on compressed natural gas, liquefied natural gas, or propane fueled vehicles should be continued for private sector purchases until utilization is established.*

- Offer a 35% tax credit on the purchase price of a new car or truck capable of running on compressed natural gas, liquefied natural gas, or propane up to a maximum of \$7,500 per vehicle
- Offer a 50% tax credit on the conversion cost of a car or truck from use of traditional fuel to use of compressed natural gas, liquefied natural gas, or propane up to a maximum of \$7,500 per vehicle
- Offer a 35% tax credit on the purchase price of a new vehicle weighing more than 26,000 pounds capable of running on compressed natural gas, liquefied natural gas, or propane up to a maximum of \$25,000 per vehicle
- Offer a 50% tax credit on the conversion cost of a vehicle weighing more than 26,000 pounds from use of traditional fuel to use of compressed natural gas, liquefied natural gas, or propane up to a maximum of \$25,000 per vehicle
- These incentives would not be refundable or transferable.

XV. *Offer a commercial alternative fuel vehicle refueling infrastructure tax credit equal to 20% of the cost of CNG or LNG automotive fuel dispensing facilities up to a maximum of \$400,000 per facility*

XVI. *Excise taxes on natural gas used in motor vehicles on the highways of this State should be imposed on the basis of energy content or gasoline gallon equivalents (GGE).*

Because the State Road Fund is dependent on the tax imposed on gasoline and diesel fuel dispensed in our state, the preservation of revenue to support our transportation infrastructure is imperative.

XVII. Consistent application of excise and wholesale taxes should be applied to all fuel-supporting vehicles utilizing the transportation infrastructure in West Virginia.

To do so, a per-gallon excise tax and a wholesale tax on alternative fuels such as CNG and LNG would be applied. A combined tax rate would be \$0.06 (i.e., 6 cents) per gallon of CNG. The combined tax rate would be \$0.223 (i.e., 22.3 cents) per gallon of LNG.

Currently, West Virginia imposes two separate taxes on motor fuel, a 20.5 cent per-gallon excise tax and an additional 5.0 percent wholesale sales tax based upon a calculated average wholesale price of gasoline and special fuels. However, in lieu of the current measurement of wholesale price (which is most heavily weighted upon sales of gasoline and diesel fuels), a separate wholesale price measurement for CNG, propane and LNG should be the basis of the imposition of a 5.0 percent wholesale sales tax.

8.0 ACKNOWLEDGEMENTS

The task force would like to extend its appreciation to the following individuals for their contributions to this final report:

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Bob Ovitz

Anne Phipps

Tony Semintal

Terry Sterling, Wheeling Chamber of Commerce

Attachment B

STATE OF WEST VIRGINIA
EXECUTIVE DEPARTMENT
AT CHARLESTON
EXECUTIVE ORDER NO. 10-12
By the Governor

WHEREAS, West Virginia recognizes the exceptional benefits and opportunities natural gas vehicles present to encourage an energy future utilizing domestic natural resources to fuel our State's and our nation's transportation needs; and

WHEREAS, West Virginia is fortunate to be blessed with substantial natural gas deposits, and is one of the leading producers of natural gas in the nation; and

WHEREAS, the United States is one of the world's foremost natural gas producers; however, our nation has not invested the resources necessary to develop a robust transportation infrastructure designed for vehicles fueled by natural gas; and

WHEREAS, natural gas fuels 12.7 million vehicles worldwide, but only approximately 124,000 of those vehicles are located in the United States; and

WHEREAS, the State of West Virginia operates more than 6,500 vehicles fueled primarily by gasoline or diesel fuels blended from foreign oil, contributing to our nation's dependence on foreign oil; and

WHEREAS, utilization of natural gas vehicles by the State of West Virginia would support expansion of an alternative fuel market having the potential to provide a significant savings to the State; and

WHEREAS, school systems throughout the State could realize substantial savings by utilizing natural gas-fueled school buses; and

WHEREAS, in order for West Virginia to maximize the opportunities presented by the operation of natural gas-fueled vehicles, our State must collaborate with private industry to encourage construction of natural gas fueling stations and related infrastructure; and

WHEREAS, constructing natural gas fueling stations will not only allow the State and its political subdivisions to save hundreds of thousands of dollars per year in fuel costs, it will also help connect West Virginia to surrounding states' natural gas fueling infrastructure, thereby allowing travelers continuity in their excursions; and

WHEREAS, advancements in drilling and production technologies, coupled with substantial investments by natural gas producers, have increased the domestic supply of reliable, inexpensive natural gas to the point that conversion of diesel-fueled fleets to natural gas-fueled fleets gives rise to a policy issue that cannot be ignored and must be carefully analyzed by the State; and

WHEREAS, our great State is poised and ready to assess the feasibility of transitioning toward fueling vehicles with natural gas and developing a supporting infrastructure.

NOW, THEREFORE, I, EARL RAY TOMBLIN, by virtue of the authority vested in me as Governor of the State of West Virginia, do hereby **ORDER** that:

1. The Natural Gas Vehicle Task Force (“Task Force”) is hereby constituted, the members of which shall serve at the will and pleasure of the Governor.

2. The members of the Task Force shall consist of the following persons who shall serve at the will and pleasure of the Governor:

- (a) General Counsel, Office of the Governor;
- (b) Director of Public Policy, Office of the Governor;
- (c) Secretary, West Virginia Department of Commerce;
- (d) Secretary, West Virginia Department of Transportation;
- (e) Executive Director, West Virginia Office of Fleet Management;
- (f) Executive Director of Transportation, West Virginia Department of Education;
- (g) Fourteen (14) citizen members appointed by the Governor; and
- (h) Such additional members as the Governor, at his discretion, may from time to time appoint.

3. The citizen members of the Task Force shall be persons who have education, experience or specialized knowledge regarding the natural gas industry, alternative fuels, coal, and petroleum marketing, transportation, and safety.

4. Members of the Task Force may not designate individuals to serve in their place without the express consent of the Governor.

5. The Task Force shall have the following duties:
 - (a) Perform an analysis of the cost savings that could be realized by governmental entities that convert gasoline or diesel-fueled vehicles to natural gas-fueled vehicles;
 - (b) Perform a cost-benefit analysis between converting West Virginia's current fleet of State vehicles to a natural gas fueling system and purchasing original equipment manufacturer (OEM) vehicles fueled by natural gas;
 - (c) Research and analyze the potential for the State to operate pilot public access natural gas fueling stations;
 - (d) Communicate with executive agencies in sister states that are in the process of transitioning their fleets and encouraging infrastructure development for natural gas-fueled vehicles;
 - (e) Explore interest in partnerships with and among natural gas producers, infrastructure developers, vehicle manufacturers, and other industry leaders to expand natural gas fueling infrastructure and investing in natural gas fuel solutions;
 - (f) Examine options for modernizing the motor fuel excise tax to address natural gas vehicles; and
 - (g) Develop a communications strategy to educate the citizens of West Virginia about the economic, environmental, and safety benefits of operating vehicles fueled by natural gas.

6. The Task Force shall have all such other general powers and perform such other acts as deemed reasonably necessary and proper to carry out the aforementioned duties.

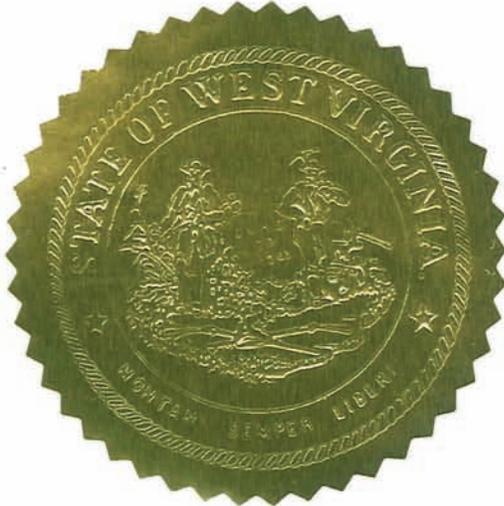
7. The Task Force shall hold regular meetings and shall conduct and regulate such meetings and other activities in accordance with the procedures it adopts at its first meeting, which meeting shall be scheduled and presided over by the chairperson designated by the Governor from among the members of the Task Force.

8. The Task Force may establish such subcommittees as it deems necessary and convenient to carry out the provisions of this Executive Order.

9. All members of the Task Force shall serve without salary, although the citizen members of the Task Force may seek reimbursement from the Office of the Governor for necessary and reasonable expenses incurred related to the official business of the Task Force in carrying out the provisions of this Executive Order.

10. The Task Force, and its subcommittees, shall report the status of their efforts under the mandates of this Executive Order to the Office of the Governor as they complete their delegated tasks, but in no event may they submit reports less frequently than semi-annually.

IN WITNESS WHEREOF, I have hereunto set my hand and caused the Great Seal of the State of West Virginia to be affixed.



DONE at the Capitol, in the City of Charleston, State of West Virginia, this the nineteenth day of June, in the year of our Lord, Two Thousand Twelve, and in the One Hundred Forty-Ninth year of the State.

Earl Ray Tomblin
GOVERNOR

By the Governor

Statelia E. Elmore
SECRETARY OF STATE

ORIGINAL

ENTERED

O.B. 92-T Page

PUBLIC SERVICE COMMISSION
OF WEST VIRGINIA
CHARLESTON

At a session of the PUBLIC SERVICE COMMISSION OF WEST VIRGINIA in the City of Charleston on the 30th day of October , 1992.

CASE NO. 92-0770-G-PT

HOPE GAS, INC.

Petition and tariff filing
for approval of natural gas
vehicle rate treatment.

COMMISSION ORDER APPROVING RATE INCREMENT

On August 3, 1992, Hope Gas, Inc. made a petition and tariff filing requesting Commission approval of a natural gas vehicle increment of \$0.006 per Mcf for 1991-92 qualifying expenditures to become effective November 1, 1992. Hope's filing was made pursuant to a Commission Order approving a Stipulation in Case No. 91-071-G-PC entered into among four (4) West Virginia natural gas utilities, the Commission Staff, the Consumer Advocate Division and the Independent Oil & Gas Association of West Virginia. Pursuant to the terms of the Stipulation, the four gas utilities will be permitted to add increments to their base rates each year for a period of three years beginning November 1, 1992, to cover the revenue requirements associated with developing a natural gas vehicle infrastructure in West Virginia. According to the petition, during the period July 1, 1991 through June 30, 1992, Hope made capital expenditures totalling \$524,727.60. In addition, Hope incurred operating and maintenance expenses directly related to the qualifying capital expenditures totaling \$29,111.

On August 7, 1992, the Consumer Advocate Division of the Public Service Commission of West Virginia (CAD) filed a petition to intervene in this proceeding. In addition, the CAD requested that this proceeding be consolidated with Case No. 92-0769-G-30C, which is Hope's 1992 Purchased Gas Application proceeding. The CAD believes that it would be administratively more efficient and effective to consolidate these two proceedings since revenues associated with Hope's 1992 Natural Gas Vehicle filing are related to Hope's 1992 Purchased Gas Application filing.

On August 19, 1992, Hope filed a response to the CAD's petition to intervene and motion to consolidate the two proceedings. Hope's response indicates that although the Company's original NGV filing requested that revenues generated by the program be credited to purchased gas costs, for purposes of settlement, it was agreed to account for the non-gas revenues in base rates and to allocate costs on a "modified throughput" basis, rather than sales. The only bearing Hope's annual PGA filing has on the current NGV filing is that "modified throughput" is found in the PGA filing. However, that figure is also available independent of the PGA. Hope states that consolidating these

two proceedings would unnecessarily complicate matters both procedurally and substantively. Procedurally, Hope's 1992 PGA filing has been referred to the ALJ Division with a decision deadline of October 11, 1992, while Hope's NGV is in the hands of the Commission for disposition. Substantively, these two filings are unrelated.

On September 21, 1992, Commission Staff submitted a Final Staff Memorandum in this proceeding. According to the memorandum, Hope's requested rate increment of \$0.006 per Mcf was derived using the formula attached to the Order in Case No. 91-071-G-PC and labeled as Exhibit 2. The return on capital used in this case is 12.10% based on the last return on equity approved by the Commission for the Company in Case No. 91-025-G-42T. The increment requested in this filing uses a ten percent (10%) depreciation rate for NGV stations and NGV conversion kits. However, Commission Staff believes that a more realistic rate for depreciation of the NGV stations is 3.5%, which is the rate Hope uses for depreciation of compressor station equipment in Account 368. Using the rate of 3.5% for depreciation of NGV stations changes the annual depreciation from \$52,472.76 to \$25,120.54. Staff's depreciation rate of 3.5% changes Hope's requested NGV rate increment of \$0.006 per Mcf to \$0.005 per Mcf. The change in depreciation rate also caused a change in taxes. Staff calculated deferred taxes and recalculated state and federal income taxes using the new numbers. Attached to Staff's memorandum are three (3) exhibits which support Staff's calculations. In closing, Staff recommended that a NGV rate increment of \$0.005 per Mcf be approved for Hope to become effective November 1, 1992.

On September 27, 1992, the Independent Oil and Gas Association of West Virginia filed a petition to intervene in this proceeding.

On October 14, 1992, Hope submitted a letter indicating that it had received Commission Staff's final memorandum and after reviewing Staff's recommendation it was apparent that there is only one area where the Company and Staff differ: the proper depreciation period for NGV fueling stations and related equipment. The letter goes on to state that Hope's rate personnel have committed to provide additional information to Staff by the end of the week on this issue and then resolve it. In closing, Hope states that a hearing is not necessary.

On October 29, 1992, Hope submitted a letter indicating that it has provided Commission Staff with additional information on a depreciation question, but Staff needs additional time to review it. In order to resolve this case and to implement the 1992 NGV-rate increment, Hope is agreeable to implementing the Staff-recommended rate of \$0.005 per Mcf effective November 1, 1992, provided that by the time of next year's NGV filing, Staff would complete its review of the depreciation issue and submit a final recommendation. If any issue remains, it would become part of Hope's 1993 NGV filing. The difference, if any, in the final 1992 revenue requirement caused by the outcome of the depreciation issue would be added to the revenue requirement in 1993.

On October 30, 1992, Staff submitted a further joint staff memorandum stating that it had no objection to Hope's settlement proposal in the Company's October 29, 1992 letter.

DISCUSSION

Having reviewed the CAD's motion to consolidate the proceedings and Hope's response, the Commission concurs with Hope that the NGV filing and the PGA filing are unrelated and consolidating the two proceedings would unnecessarily complicate matters. Therefore, the CAD's motion to consolidate the proceedings is denied.

As far as the rate increment, the Commission concludes that Staff's recommended increment of \$0.005 per Mcf is reasonable and should be approved to become effective November 1, 1992.

FINDINGS OF FACT

1. On August 3, 1992, Hope Gas, Inc. filed its 1992 Natural Gas Vehicle application.

2. The Company requested Commission approval of an increment of \$0.006 per Mcf to become effective on November 1, 1992.

3. On August 7, 1992, the Consumer Advocate Division filed a petition to intervene and motion to consolidate this proceeding with Hope's 1992 Purchased Gas Application proceeding.

4. On August 19, 1992, Hope filed a response in opposition to the CAD's motion to consolidate the proceedings.

5. On September 21, 1992, Commission Staff submitted a Final Staff Memorandum recommending approval of an increment \$0.005 per Mcf for the Company to become effective November 1, 1992.

6. On September 27, 1992, the Independent Oil and Gas Association filed a petition to intervene in this proceeding.

7. On October 29, 1992, Hope submitted a letter indicating that, in order to resolve this case and implement the 1992 NGV-rate increment, Hope is agreeable to implementing the Staff-recommended rate of \$0.005 per Mcf effective November 1, 1992, provided that by the time of next year's NGV filing, Staff would complete its review of the depreciation issue and submit a final recommendation.

8. On October 30, 1992, Staff submitted a further joint staff memorandum stating that it had no objection to Hope's settlement proposal in the Company's October 29, 1992 letter.

CONCLUSIONS OF LAW

1. The petitions to intervene filed by the Consumer Advocate Division and the Independent Oil and Gas Association of West Virginia should be granted.

2. The CAD's motion to consolidate Hope's 1992 NGV filing and its 1992 PGA filing should be denied because such proceedings are unrelated and consolidation would unnecessarily complicate matters.

3. Commission Staff's recommended NGV rate increment of \$0.005 per Mcf is reasonable and should be approved to become effective November 1, 1992.

ORDER

IT IS, THEREFORE, ORDERED that the natural gas vehicle rate increment of \$0.005 per Mcf recommended by Commission Staff for Hope Gas, Inc. in this proceeding be, and it hereby is, approved to become effective November 1, 1992.

IT IS FURTHER ORDERED that the petitions to intervene filed by the Consumer Advocate Division of the Public Service Commission of West Virginia and the Independent Oil and Gas Association of West Virginia be, and they hereby are, granted.

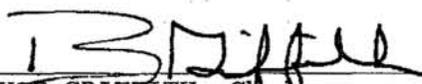
IT IS FURTHER ORDERED that the Consumer Advocate Division's motion to consolidate this proceeding with Hope Gas, Inc.'s 1992 Purchased Gas Application proceeding be, and it hereby is, denied.

IT IS FURTHER ORDERED that the Executive Secretary of the Commission shall serve a copy of this Order upon all parties to this proceeding by United States First Class Mail and upon Commission Staff by hand delivery.

OTIS D. CASTO, Commissioner



RICHARD D. FRUM, Commissioner



BOYCE GRIFFITH, Chairman

Attachment I

SEDAN ROI

Incremental Cost	MIS (4 Years)	Cost of Fuel	Cost of CNG	Net Difference	MPG	Incremental Conversion Cost Monthly \$8K	Gallons Monthly to Recoup \$8K Conversion	Miles Monthly to Recoup \$8K Conversion
\$8,000.00	48	\$3.29	\$1.80	\$1.49	20	\$167	112	2237
\$8,000.00	48	\$3.30	\$1.80	\$1.50	20	\$167	111	2222
\$8,000.00	48	\$3.31	\$1.80	\$1.51	20	\$167	110	2208
\$8,000.00	48	\$3.32	\$1.80	\$1.52	20	\$167	110	2193
\$8,000.00	48	\$3.33	\$1.80	\$1.53	20	\$167	109	2179
\$8,000.00	48	\$3.34	\$1.80	\$1.54	20	\$167	108	2165
\$8,000.00	48	\$3.35	\$1.80	\$1.55	20	\$167	108	2151
\$8,000.00	48	\$3.36	\$1.80	\$1.56	20	\$167	107	2137
\$8,000.00	48	\$3.37	\$1.80	\$1.57	20	\$167	106	2123
\$8,000.00	48	\$3.38	\$1.80	\$1.58	20	\$167	105	2110
\$8,000.00	48	\$3.39	\$1.80	\$1.59	20	\$167	105	2096
\$8,000.00	48	\$3.40	\$1.80	\$1.60	20	\$167	104	2083
\$8,000.00	48	\$3.41	\$1.80	\$1.61	20	\$167	104	2070
\$8,000.00	48	\$3.42	\$1.80	\$1.62	20	\$167	103	2058
\$8,000.00	48	\$3.43	\$1.80	\$1.63	20	\$167	102	2045
\$8,000.00	48	\$3.44	\$1.80	\$1.64	20	\$167	102	2033
\$8,000.00	48	\$3.45	\$1.80	\$1.65	20	\$167	101	2020
\$8,000.00	48	\$3.46	\$1.80	\$1.66	20	\$167	100	2008
\$8,000.00	48	\$3.47	\$1.80	\$1.67	20	\$167	100	1996
\$8,000.00	48	\$3.48	\$1.80	\$1.68	20	\$167	99	1984
\$8,000.00	48	\$3.49	\$1.80	\$1.69	20	\$167	99	1972
\$8,000.00	48	\$3.50	\$1.80	\$1.70	20	\$167	98	1961
\$8,000.00	48	\$3.51	\$1.80	\$1.71	20	\$167	97	1949
\$8,000.00	48	\$3.52	\$1.80	\$1.72	20	\$167	97	1938
\$8,000.00	48	\$3.53	\$1.80	\$1.73	20	\$167	96	1927
\$8,000.00	48	\$3.54	\$1.80	\$1.74	20	\$167	96	1916
\$8,000.00	48	\$3.55	\$1.80	\$1.75	20	\$167	95	1905
\$8,000.00	48	\$3.56	\$1.80	\$1.76	20	\$167	95	1894
\$8,000.00	48	\$3.57	\$1.80	\$1.77	20	\$167	94	1883
\$8,000.00	48	\$3.58	\$1.80	\$1.78	20	\$167	94	1873
\$8,000.00	48	\$3.59	\$1.80	\$1.79	20	\$167	93	1862
\$8,000.00	48	\$3.60	\$1.80	\$1.80	20	\$167	93	1852
\$8,000.00	48	\$3.61	\$1.80	\$1.81	20	\$167	92	1842
\$8,000.00	48	\$3.62	\$1.80	\$1.82	20	\$167	92	1832
\$8,000.00	48	\$3.63	\$1.80	\$1.83	20	\$167	91	1821
\$8,000.00	48	\$3.64	\$1.80	\$1.84	20	\$167	91	1812
\$8,000.00	48	\$3.65	\$1.80	\$1.85	20	\$167	90	1802
\$8,000.00	48	\$3.66	\$1.80	\$1.86	20	\$167	90	1792
\$8,000.00	48	\$3.67	\$1.80	\$1.87	20	\$167	89	1783
\$8,000.00	48	\$3.68	\$1.80	\$1.88	20	\$167	89	1773
\$8,000.00	48	\$3.69	\$1.80	\$1.89	20	\$167	88	1764

TRUCK ROI

Incremental Cost	MIS (5 Years)	Cost of Fuel	Cost of CNG	Net Difference	MPG	Incremental Conversion Cost Monthly \$9K	Gallons Monthly to Recoup \$9K Conversion	Miles Monthly to Recoup \$9K Conversion
\$9,000.00	60	\$3.29	\$1.80	\$1.49	15	\$150	101	1510
\$9,000.00	60	\$3.30	\$1.80	\$1.50	15	\$150	100	1500
\$9,000.00	60	\$3.31	\$1.80	\$1.51	15	\$150	99	1490
\$9,000.00	60	\$3.32	\$1.80	\$1.52	15	\$150	99	1480
\$9,000.00	60	\$3.33	\$1.80	\$1.53	15	\$150	98	1471
\$9,000.00	60	\$3.34	\$1.80	\$1.54	15	\$150	97	1461
\$9,000.00	60	\$3.35	\$1.80	\$1.55	15	\$150	97	1452
\$9,000.00	60	\$3.36	\$1.80	\$1.56	15	\$150	96	1442
\$9,000.00	60	\$3.37	\$1.80	\$1.57	15	\$150	96	1433
\$9,000.00	60	\$3.38	\$1.80	\$1.58	15	\$150	95	1424
\$9,000.00	60	\$3.39	\$1.80	\$1.59	15	\$150	94	1415
\$9,000.00	60	\$3.40	\$1.80	\$1.60	15	\$150	94	1406
\$9,000.00	60	\$3.41	\$1.80	\$1.61	15	\$150	93	1398
\$9,000.00	60	\$3.42	\$1.80	\$1.62	15	\$150	93	1389
\$9,000.00	60	\$3.43	\$1.80	\$1.63	15	\$150	92	1380
\$9,000.00	60	\$3.44	\$1.80	\$1.64	15	\$150	91	1372
\$9,000.00	60	\$3.45	\$1.80	\$1.65	15	\$150	91	1364
\$9,000.00	60	\$3.46	\$1.80	\$1.66	15	\$150	90	1355
\$9,000.00	60	\$3.47	\$1.80	\$1.67	15	\$150	90	1347
\$9,000.00	60	\$3.48	\$1.80	\$1.68	15	\$150	89	1339
\$9,000.00	60	\$3.49	\$1.80	\$1.69	15	\$150	89	1331
\$9,000.00	60	\$3.50	\$1.80	\$1.70	15	\$150	88	1324
\$9,000.00	60	\$3.51	\$1.80	\$1.71	15	\$150	88	1316
\$9,000.00	60	\$3.52	\$1.80	\$1.72	15	\$150	87	1308
\$9,000.00	60	\$3.53	\$1.80	\$1.73	15	\$150	87	1301
\$9,000.00	60	\$3.54	\$1.80	\$1.74	15	\$150	86	1293
\$9,000.00	60	\$3.55	\$1.80	\$1.75	15	\$150	86	1286
\$9,000.00	60	\$3.56	\$1.80	\$1.76	15	\$150	85	1278
\$9,000.00	60	\$3.57	\$1.80	\$1.77	15	\$150	85	1271
\$9,000.00	60	\$3.58	\$1.80	\$1.78	15	\$150	84	1264
\$9,000.00	60	\$3.59	\$1.80	\$1.79	15	\$150	84	1257
\$9,000.00	60	\$3.60	\$1.80	\$1.80	15	\$150	83	1250
\$9,000.00	60	\$3.61	\$1.80	\$1.81	15	\$150	83	1243
\$9,000.00	60	\$3.62	\$1.80	\$1.82	15	\$150	82	1236
\$9,000.00	60	\$3.63	\$1.80	\$1.83	15	\$150	82	1230
\$9,000.00	60	\$3.64	\$1.80	\$1.84	15	\$150	82	1223
\$9,000.00	60	\$3.65	\$1.80	\$1.85	15	\$150	81	1216
\$9,000.00	60	\$3.66	\$1.80	\$1.86	15	\$150	81	1210
\$9,000.00	60	\$3.67	\$1.80	\$1.87	15	\$150	80	1203
\$9,000.00	60	\$3.68	\$1.80	\$1.88	15	\$150	80	1197
\$9,000.00	60	\$3.69	\$1.80	\$1.89	15	\$150	79	1190

HEAVY-DUTY ROI

Incremental Cost	MIS (7 Years)	Cost of Fuel Diesel	Cost of CNG	Net Difference	MPG	Incremental Conversion Cost Monthly \$35K	Gallons Monthly to Recoup \$35K Conversion	Miles Monthly to Recoup \$35K Conversion
\$35,000.00	84	\$3.96	\$1.80	\$2.16	8	\$417	193	1543
\$35,000.00	84	\$3.97	\$1.80	\$2.17	8	\$417	192	1536
\$35,000.00	84	\$3.98	\$1.80	\$2.18	8	\$417	191	1529
\$35,000.00	84	\$3.99	\$1.80	\$2.19	8	\$417	190	1522

Attachment J

Vehicle Specific Conversion Analysis

Sedan – 4-Year Break-even Point

Cost of Conversion – \$8,000

Cost of Gasoline – \$3.69

Cost of CNG – \$1.80

MPG – 20

Monthly Incremental Conversion Cost – \$167

Gallons Monthly to Recoup Cost – 88

Miles Monthly to Recoup Cost – 1,764

The 21,168 yearly miles it would take to reach the four-year break-even point for a sedan is significantly more than the 14,376 average yearly miles currently traveled by a mid-size sedan within West Virginia's state fleet. However, as gas prices climb to projected higher levels and natural gas maintains a lower price, the cost recovery becomes easier to achieve in four years.

Full-Size Truck – 5-Year Break-even Period

Cost of Conversion – \$9,000

Cost of Gasoline – \$3.69

Cost of CNG – \$1.80

MPG – 15

Monthly Incremental Conversion Cost – \$150

Gallons Monthly to Recoup Cost – 79

Miles Monthly to Recoup Cost – 1,190

If the state were to convert full-size pick-up trucks to natural gas, a cost savings would be realized within the first four years of the vehicles' operation. These savings are realized quickly, because the less fuel efficient a vehicle is and the more it is used, the more quickly the cost difference between gasoline and natural gas adds up to reach the break-even point.

A full-size pick-up truck requires 14,280 yearly miles to reach the five-year break-even point. That is well below the 22,213 average yearly miles currently traveled by full-size pick-up trucks within West Virginia's state fleet. In the five-year life of this vehicle, the state will save approximately \$5,000 if it is converted to run on natural gas.

Heavy-Duty Truck – 7-Year Break-even Period

Cost of Conversion – \$35,000

Cost of Diesel – \$3.99

Cost of CNG – \$1.80

MPG – 8

Monthly Incremental Conversion Cost – \$417

Gallons Monthly to Recoup Cost – 190

Miles Monthly to Recoup Cost – 1,522

The seven-year break-even point on a heavy-duty truck requires it to travel a minimum of 18,264 miles a year. Currently, the dump trucks operating in the Department of Highways fleet average approximately 19,000 miles per year. Thus, within the seven-year life cycle of these dump trucks, the state's average savings per vehicle of \$2,569.

Attachment K

Adopted by the Southern States Energy Board on September 24, 2012

3.2012–CNG and LNG Conversion Resolution

WHEREAS, we believe that increased use of CNG and LNG will benefit our nation by:
Contributing to energy independence through increased use of a plentiful American resource;
Creating jobs and revitalizing our economy because CNG and LNG are cheaper to use and allow for investment in the American economy instead of adding to the trade deficit; and
Protecting our environment through use of cleaner energy sources;

WHEREAS, we believe that the federal government and the respective state governments can serve as catalysts for private sector actions that will result in the broader use of compressed natural gas (CNG) and liquid natural gas (LNG) in fueling America's transportation industry.

WHEREAS, states are endeavoring to encourage an energy future that utilizes domestic resources to fuel our nation's transportation needs through initiatives such as the November 2011 multi-state Memorandum of Understanding designed to attract automobile manufacturers in the U.S. to develop a functional and affordable original equipment manufacturer fleet natural gas vehicle that will also meet public demand;

WHEREAS, we believe that state and federal government actions that will accomplish these goals are in the best interest of the states constituting the Southern States Energy Board and the United States as a whole:

Encourage the conversion of long haul tractor trailers, locally operated delivery vehicles, freight and passenger rail operations, and practicable freight and passenger water transport to CNG/LNG.

Encourage the conversion of City, County, State and Federal vehicles to CNG/LNG.

Encourage the installation of storage and refueling equipment to provide readily available fueling facilities on all interstate corridors and for all aspects of the logistics industry.

Encourage the development of additional CNG/LNG infrastructure.

Encourage research and development of CNG/LNG technology.

NOW, THEREFORE, BE IT RESOLVED, the Southern States Energy Board endorses advocacy actions that will accomplish the aforesaid goals; and

BE IT FURTHER RESOLVED, we endorse the actions of the various states entering into the November 2011 multi-state Memorandum of Understanding designed to attract automobile manufacturers in the U.S. to develop a functional and affordable original equipment manufacturer fleet natural gas vehicle that will also meet public demand and

BE IT FURTHER RESOLVED, we endorse passage of state and federal legislation that would serve to encourage freight companies (trucking and rail) and public transportation entities facilitating conversion of their fleets to use of CNG and LNG as fuel and conversion of fueling facilities to include CNG and LNG aspects.

*The American Chemistry Council, an active and valued participant in the Associate Member Program of the Southern States Energy Board, does not support federal or state subsidies for Compressed Natural Gas and Liquefied Natural Gas Vehicles due to concerns about market distortions and a level playing field for all energy sources and technologies. ACC is supportive of the state MOU provisions of the resolution but does not support the last provision.

