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March 7, 2014

Via Hand-Delivery
Mr. Jeff Derouen
Executive Director
Public Service Commission
211 Sower Boulevard
P.O. Box 615
Frankfort, KY 40602-0615

Re: *Case No. 2013-00365; Application of Delta Natural Gas Company, Inc. for an Order Declaring That it is Authorized to Construct, Own and Operate a Compressed Natural Gas Station in Berea, Kentucky*

Dear Mr. Derouen:

Enclosed for filing in the above styled action are an original and ten copies of the direct testimony of Dave Mrowzinski on behalf of Interstate Gas Supply, Inc. and Clean Energy Fuel Corp. Please place the document of file.

Thank you for your attention to the foregoing, please call me with any questions or concerns.

Very truly yours,
HURT, CROSBIE & MAY, PLLC

Matthew Malone

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COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

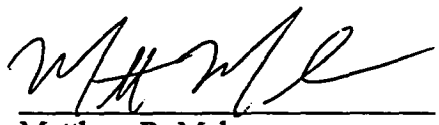
Application of Delta Natural Gas Company, Inc. for An Order Declaring That it is Authorized to Construct, Own and Operate a Compressed Natural Gas Station in Berea, Kentucky	)))	**Case. 2013-00365**

INTERSTATE GAS SUPPLY INC.'S AND CLEAN ENERGY FUEL CORP.'S CERTIFICATE OF SERVICE REGARDING DIRECT TESTIMONY OF DAVE MROWZINSKI

Comes Interstate Gas Supply, Inc. and Clean Energy Fuel Corp., by counsel, and hereby certifies that an original and ten (10) copies of the attached Direct Testimony was served via hand-delivery upon Jeff Derouen, Executive Director, Public Service Commission, 211 Sower Boulevard, Frankfort, Kentucky 40602-0615; furthermore, it was served by mailing a copy by first class U.S. Mail, postage prepaid, on the following, and by electronic mail where available all on this 7th day of March 2014.

Hon. Robert M. Watt, III
Stoll Keenon Ogden
300 W. Vine Street
Suite 2100
Lexington, KY 40507-1801

Hon. Dennis Howard
Assistant Attorney General
Office of the Attorney General Utility & Rate
1024 Capital Center Drive
Suite 200
Frankfort, Kentucky 40601-8204



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Counsel for the Petitioner,
IGS CNG Services and
Clean Energy Fuels Corp.

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BEFORE THE PUBLIC SERVICE COMMISSION

Application of Delta Natural Gas Company, Inc. for An Order Declaring That it is Authorized to Construct, Own and Operate a Compressed Natural Gas Station in Berea, Kentucky	)))	**Case. 2013-00365**

Direct Testimony of Dave Mrowzinski

On behalf of IGS CNG Services and Clean Energy Fuels Corp.

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Counsel for the Petitioner,
IGS CNG Services and Clean Energy Fuels Corp.

Dated March 7, 2014

I. INTRODUCTION AND PURPOSE OF TESTIMONY

Q. Please state your name and by whom you are employed.

A. My name is Dave Mrowzinski. I am employed by IGS CNG Services ("IGS CNG"). My business address is 6100 Emerald Parkway, Dublin, Ohio 43016.

Q. What is the nature of IGS' business?

A. IGS CNG is an owner and operator of compressed natural gas ("CNG") public refueling stations throughout the region. IGS CNG also provides on-site CNG refueling solutions for residential, small commercial and industrial customers. IGS CNG is an affiliated sister company of Interstate Gas Supply, Inc. ("IGS"). IGS has over 25 years of experience serving retail natural gas customers and has extensive institutional knowledge about the operations of natural gas markets in Kentucky and in other states. IGS serves tens of thousands of natural gas customers in Kentucky and provides electric and natural gas service to over 1 million customers in 11 states and in over 40 utility programs throughout the United States.

Q. Please describe your educational background and work history.

A. I earned a degree in Business Administration from The Ohio State University with a specialization in Transportation Logistics. I also hold CSA certification to inspect high pressure compressed natural gas vehicle fuel systems to ensure compliance with NGV2 and FMVSS 304 natural gas vehicle standards. I also hold several other certificates with respect to CNG station design and CNG compressor maintenance.

I have worked at IGS companies for the past six years and am currently the CNG Program Manager for IGS CNG. Throughout my career at IGS I have gained in-depth knowledge and experience in financial hedging, gas transportation, project management,

gas marketing and the Compressed Natural Gas (CNG) industry. Currently, I oversee the business development and strategic build out of the IGS CNG stations and corridor development. I have overseen the construction of several CNG stations for IGS CNG and I understand both the technical and financial aspects of building, owning, and operating CNG stations. I have also had the opportunity to participate in dozens of CNG related panels and technical presentations throughout the region.

Q. What is the purpose of your testimony?

A. In its application filed in this proceeding, Delta Natural Gas' ("Delta") seeks approval from the Commission to recover the cost of constructing and owning a CNG refueling station from distribution rate payers. The purpose of my testimony is to dispute many of the assumptions made by Delta witnesses with respect to the economics of building a CNG station. Specifically, it is my opinion that Delta's witnesses grossly underestimate the costs of providing CNG to customers. As a result of these questionable assumptions, Delta overstates the benefits of building a CNG station for Delta customers and understates the risk. I also testify that it is bad public policy to allow natural gas distribution companies ("NGDCs") to build CNG stations and recover those costs from all distribution rate payers. Vehicle refueling is not a "natural monopoly" service, thus it is inappropriate to grant Delta an authorized rate of return and cost recovery for a CNG station. I also testify that allowing Delta to recover CNG station costs in the rate base will hinder the development of CNG stations in Kentucky over the long run.

Q. What are your recommendations with respect to Delta's Application?

A. Given all of these concerns, I recommend that the Commission reject Delta's application.

II. COST COMPONENTS OF CNG REFUELING

Q. Have you read Witness Wesolosky's testimony that discusses the cost of owning and operating a CNG station?

A. Yes, I have.

Q Can you please state generally your opinion on Mr. Wesolosky variable cost estimates for providing CNG refueling service?

A. Yes. I believe Mr. Wesolosky grossly underestimates the variable cost of providing CNG refueling service. On page 5 of his testimony, Mr. Wesolosky estimates that the cost of gas for CNG is 30 cents per gasoline gallon equivalent ("GGE"), thus a price of $2.00 per GGE at the pump will result in a $1.70 per GGE returned to ratepayers to reduce Delta's revenue requirements for the proposed CNG station. In this estimate, not only does Mr. Wesolosky underestimate the cost of gas to provide CNG refueling service, Mr. Wesolosky also excludes a number of important variable cost components that Delta will have to pay when providing CNG refueling service. Accordingly, a $2.00 per GGE price will return much less to rate payers to pay down Delta's revenue requirement than Mr. Wesolosky estimates.

Q. How does Mr. Wesolosky inaccurately calculate the cost of gas in his testimony?

A. First, Mr. Wesolosky does not use the correct ratio when converting a CCF to a GGE of CNG. In his testimony Mr. Wesolosky claims that at 38 cents per CCF, the gas costs will result in a 30 cents per GGE to customers. Based on these numbers Mr. Wesolosky is assuming that 1 CCF of gas will yield 1.27 GGE. This is incorrect.

Q. Can you explain how Mr. Wesolosky arrived at his conversion ratio?

A. Yes. Mr. Wesolosky cites in his testimony a report issued by the U.S. Department of Energy. The report says that 126.67 cubic feet of CNG has 100% of the energy of one

gallon of gasoline, or put in another way, 1.27 CCF is equivalent to 1 GGE. While Mr. Wesolosky testifies to this, when actually doing the calculation, Mr. Wesolosky would have had to use the conversion ratio of 1 CCF yielding 1.27 GGE in order to arrive at the conclusion that 38 cents per CCF would yield a gas cost of 30 cents per GGE. This is likely why Mr. Wesolosky arrived at a cost of 30 cent per GGE gas costs when a CCF is at 38 cents.

Q. What is the correct conversion ratio?

A. The correct conversion ratio is that 1.27 CCF is equivalent to 1 GGE or put in another way 1 CCF yields approximately .79 GGEs. Using the correct conversion ratio, a .38 cent per CCF costs, would yield a gas cost per GGE of approximately 48.26 cents per GGE.

Q. Why do you use the term approximately when discussing conversion ratios?

A. Because the actual GGE produced from one CCF of natural gas would depend on the MMBTU content of the natural gas. When IGS (or any CNG station owner) sells natural gas to the public, we follow the state guidelines, which are typically adopted by NIST (National Institute of Standards and Technology, a Federal organization). NIST guidelines outline that 1 GGE = 5.66 lbs which is a widely accepted method of measuring natural gas. The 126.67cf = GGE conversion factor does not take into account the specific makeup of the natural gas (BTU count per CF) so depending on the location in the country and time of year, 126.67cf will usually generate an incorrect result when comparing to the actual method of sale, which is 5.66 lbs. Therefore, the range of CCF to GGE may vary by a couple of percentage points. In regard to Mr. Wesolosky's calculation, however, in no circumstances would 1 CCF ever have enough energy content to yield 1.27 GGE.

Q. Is the 0.8 conversion ratio industry standard?

A. Yes. The rule of thumb in the industry is that 1 CCF of gas will yield approximately 0.8 GGE. This is common knowledge for anyone that owns and operates a CNG station, and it also comports with the calculations made above showing that 1 CCF = 0.79 GGE.

Q. Are there other ways Mr. Wesolosky underestimates the gas costs?

A. Yes. I believe Mr. Wesolosky also underestimates the cost of gas per CCF. Mr. Wesolosky utilizes a cost of gas per CCF of 38 cents. However, over the past 3 months the prompt month for the New York Mercantile Exchange (NYMEX) has traded in the range of 45 cents to 55 cents per CCF. While, we have seen 38 cents per CCF of natural gas in the past, historically, the NYMEX has traded much higher. Also, the forward curves on the NYMEX indicate that future prices of natural gas will be significantly higher than 38 cents a CCF. Therefore, I believe a more reasonable estimate for the cost of gas is 50 cents per CCF over the long run, if not higher.

Q. Utilizing the correct conversion ratio and a more reasonable cost per CCF on natural gas, what do you calculate the cost per GGE on CNG?

A. Using the correct conversion ratio and a 50 cent per CCF cost of gas, I estimate that the actual cost of CNG per GGE is 62.5 cents. This is over 100% higher than the 30 cents per GGE Mr. Wesolosky estimates.

Q. Are there other cost components Mr. Wesolosky leaves out of his cost calculation?

A. Yes, there are a number of variable cost components that Mr. Wesolosky leaves out of his calculations of the CNG costs. First, Mr. Wesolosky does not include electric compression costs which I estimate to be about 20 cents per GGE (this depends on the

per KWH charges and monthly fixed KW demand charges in the electric tariff applicable to the station). Mr. Wesolosky does not include state and federal road tax which I estimate to be at 49 cents per GGE in Kentucky. Mr. Wesolosky does not include maintenance for the compressor which is approximately 30 cents per GGE. Mr. Wesolosky does not include natural gas transportation costs which I estimate to be 16 cents per GGE. Mr. Wesolosky does not include credit card transaction merchant fees which I estimate to be 7 cents per GGE.

Q. Is it possible that Mr. Wesolosky is including electric compression costs and maintenance costs in the $20,000 operating costs he projects annually for operating the station?

A. Yes it is possible that Mr. Wesolosky is considering these costs operating costs; however, if he is including electric and maintenance in his operating cost assumptions, then $20,000 would vastly underestimate Delta's operating expenses. As I note above, maintenance and electric costs are approximately 50 cents per GGE. Thus, assuming that Delta achieves a modest 150,000 GGE annual usage from the station, these components would contribute $75,000 annually to Delta's operating costs, in addition to other operating costs Delta incurs. Further, it is much more appropriate to include electric and maintenance in the variable cost components. There is almost a one to one correlation between these expenses and the amount of GGEs consumed at the station, and thus we view these as variable costs. It is also the industry standard to include these cost components as variable costs.

Q. What are the actual total variable costs per GGE that you estimate Delta will incur?

A. Adding up all of the cost components discussed above, I estimate that Delta's actual variable costs per GGE will be approximately $1.84.

Q. Do you have anything else to substantiate these cost estimates?

A. Yes. These cost estimates are based on my experience and the experience IGS CNG has in operating multiple public refueling stations in the marketplace. However, these cost estimates are also common knowledge in the industry. Attached as Exhibit 1 to my testimony is a presentation given by NGV America, an independent organization focused on the proliferation of CNG stations and vehicles throughout the United States. On page 41-50, the presentation discusses CNG variable costs. While some of the cost estimates vary slightly from my own, on slide 50 NGV America projects variable costs per GGE to be approximately $2.17 per GGE for taxable entities and $1.67 per GGE for non-taxable entities. This is consistent with my conclusions above and in fact NGV America projects higher costs per GGE for taxable entities. As this is a station that is going to be made open to the public, Delta would have to pay road tax on its public sales.

Q. What is a more reasonable estimate that Delta can expect to contribute to the revenue requirement?

A. At a total variable cost of $1.84 per GGE, and a sales price of $2.00 per GGE, Delta can expect a $0.16 per GGE contribution to its revenue requirement, not a $1.70 contribution to its revenue requirement as Mr. Wesolosky testifies.

Q. How will the increased cost estimates impact the break-even analysis of Mr. Wesolosky?

A. Mr. Wesolosky uses a $1.70 per GGE contribution to Delta's revenue requirement in his break even analysis to estimate that Delta would need an additional 107,000 per GGE in

sales annually to break even on top of what Delta uses for its fleet vehicles. First, because Delta underestimates the variable cost of providing CNG, Delta dramatically over estimates the saving it will achieve from its own vehicles when converting to CNG. Delta uses its fuel savings to offset its annual revenue requirements. Also, given the much lower contribution to the revenue requirement per GGE, Delta would have to sell significantly more to the public than the 107,000 per GGE just to break even for ratepayers. At $2.00 per GGE, Delta would likely need 500,000 GGE or more to meet revenue requirements.

Q. Are there other costs Delta leaves out of its analysis?

A. Delta does not appear to account for the incremental cost of purchasing natural gas vehicles ("NGV") in its revenue requirement calculations. Typically the NGVs of the size Delta would be utilizing cost approximately $10,000 more than the incremental vehicle costs estimated in the analysis that Delta needs to recover from ratepayers in order to break even. Because Delta intends to purchase 11 natural gas vehicles as part of its project, Delta should add an additional $110,000 to its project costs.

Q. Do you believe the station cost estimates Mr. Wesolosky provides in his testimony are reasonable?

A. Given the very limited detail provided on the CNG station Delta intends to build, it is difficult for me to tell whether Delta's CNG station costs are reasonable. Construction costs for CNG stations can range from $700,000 to $4,000,000 or more. However, from my experiences, costs tend to run over when constructing stations, particularly when it is the first CNG station that is being built by a particular entity. Delta does not propose to limit the rate payer risk for any excess station costs and thus presumably ratepayers will be exposed to the risk of cost overruns.

Q. Do you expect Delta to get the public use it needs to meet its revenue requirements for its CNG station?

A. No. From my experience it takes a long time for public station usage to ramp up. Also, typically before a station is built, a station owner will obtain firm commitments from a number of surrounding fleets to use that station. Delta does not appear to have done this, other than from its own small fleet. In my opinion it will be extremely difficult for Delta to obtain the public sales it needs to meet its projected revenue requirements.

Q. What are your overall conclusions with respect to the risk Delta's CNG station poses to Delta ratepayers?

A. It is my opinion Delta grossly underestimates the fixed and variable project costs for its proposed CNG station and thus does not accurately represent the risk the proposed CNG station will pose to CNG ratepayers. Delta is also likely to experience higher cost because this is its first attempt at building a CNG station. Further, Delta does not appear to have any firm commitment from non-Delta fleets to utilize the CNG station and no full-time sales representative to promote the CNG station. Thus Delta's public sales are likely to be lower than what a typical CNG station would receive. Consequently, it is highly unlikely that Delta will achieve the revenue requirements it needs to cover the cost of building the CNG station. This means that Delta ratepayers will perpetually be paying to subsidize the ownership and operation of Delta's CNG station.

Q. Do you believe the great risk Delta's CNG station ownership will pose to Delta ratepayers is sufficient to reject Delta's application?

A. Yes, I do. CNG station ownership is a risky endeavor to begin with. Further, an inference that can be drawn from its application is that Delta has a limited understanding of the CNG station industry and CNG station costs. I believe this inexperience poses a great

risk to Delta ratepayers. Thus, I would recommend that the Commission reject Delta's CNG station application given the great risk it poses to Delta ratepayers.

III. THE DEVELOPMENT OF CNG MARKET

Q. Will the approval of Delta's CNG application harm the development of CNG infrastructure in Kentucky over the long run?

A. Yes. While I believe the risk to Delta's ratepayers is sufficient grounds to reject Delta's application alone, as I explain below, approval of Delta's CNG station application will hinder the development of CNG infrastructure over the long run, and should be rejected for this reason as well.

Q. What other benefits does Delta believe its CNG station project will bring?

A. In his testimony, Delta's Witness Brown relies heavily on public policy reasons as to why Delta should receive cost recovery from Delta ratepayers for CNG station ownership. Witness Brown cites many benefits CNG usage brings to the economy and the environment. Witness Brown believes Delta's CNG project will help bring these benefits to Kentucky.

Q. Do you agree that there are many benefits to using CNG as a vehicle fuel?

A. Yes, I do agree with Witness Brown that there are great benefits derived from using CNG as a vehicle fuel. CNG is domestically produced and creates less air pollution than gasoline or diesel. Further, the raw commodity cost of CNG is much cheaper than diesel or gasoline. IGS CNG is committed to expanding the CNG refueling infrastructure for these very reasons. That said, I believe that allowing a NGDC to recover CNG station costs through rate base will discourage the development of a robust CNG marketplace over the long run.

Q. Why will NGDC owned CNG stations discourage the development of CNG stations over the long run?

A. If a NGDC is allowed to recover its costs in its rate base, it can essentially build a CNG station with limited to no risk to its shareholders. Further, NGDC's enjoy a lower cost of capital due to the fact that ratepayers will bear all of the risk for CNG station costs. This is an anti-competitive advantage in the marketplace. Private companies will be discouraged from entering into a market and will be reluctant to compete against an entity that can simply recover all of its infrastructure costs through captive distribution ratepayers. Thus, in the short run, you could see more stations built if the NGDC is allowed to recover the costs of a CNG station in its rate base, but in the long run, a robust private market for CNG stations will not develop.

Q. Is there any other anti-competitive effects of allowing an NGDC to recover cost of a CNG station in its rate base?

A. Yes. CNG station owners must work with the NGDC before the CNG station is constructed and disclose confidential and competitively sensitive information to the NGDC, such as potential station site. Further, the NGDC would have incentive to not cooperate with a potential competitive CNG station owner on things such as pipeline extension and interconnection for a CNG station, because the new station would be competing against the NGDC's station. All of this would put privately built stations at an undue competitive disadvantage in the market place.

Q. From your experience does NGDC ownership deter private investment in CNG stations?

A. Yes, IGS CNG will not enter a market where a NGDC is the owner and operator of a CNG station. It makes no economic sense for IGS CNG to invest its dollars in a market

where an NGDC can recover its station costs through all distribution ratepayers while IGS CNG would have to recover its station costs through actual CNG sales. Further, in states that have allowed the NGDCs to recover costs through the rate base, you may see ownership of CNG stations from NGDCs, but you see very limited ownership of CNG stations from other private entities. I should note that a vast majority of states do not allow the NGDC to recover CNG station costs through the NGDC rate base.

Q. NGDC's are allowed to recover costs of pipeline infrastructure in its rate base. How is this different than CNG stations?

A. CNG station ownership is not analogous to owning pipeline infrastructure. Natural gas distribution is considered a "natural monopoly" and thus NGDC's are given an authorized rate of return on their pipeline assets In exchange for being highly regulated by state utilities commissions. Vehicle refueling has never been considered a natural monopoly service and in fact natural monopoly status is very rarely granted for any product or service in the marketplace. Further, Delta is asking for cost recovery and guaranteed rate of return which are the benefits of being a natural monopoly, but is not willing to accept the restrictions of regulated pricing to which natural monopolies must adhere. Delta is asking that its CNG prices not be regulated and that Delta be able to charge whatever it chooses. Finally, monopolies are generally illegal, and only by grant of state or federal governing bodies can monopoly status be granted to a specific industry. The Kentucky legislature has not enacted any statute of which I am aware that would grant guaranteed cost recovery of CNG stations through a NGDC distribution rate base.

Q. Do you object to Delta using unregulated shareholder dollars to compete in the CNG marketplace?

A. No. If Delta wishes to form an unregulated affiliate company where only Delta shareholder dollars were used to construct and operate a CNG station, I would have no objection.

Q. Is there anything else you would like to address in Witness Brown's testimony?

A. Yes. Mr. Brown cites Utah as an example of how NGDCs have successfully built CNG stations. Utah is one of the very few states that have allowed NGDCs to recover station costs in their rate base. However, Utah is very different than Kentucky. First, as Mr. Brown cites in his testimony, there is a state statute in Utah that allows NGDCs to recover the costs of station infrastructure. Kentucky has no such statute. Further, Utah has a number of tax credits that are available for CNG and NGVs. I am not aware of similar tax credits available in Kentucky. Thus Utah cannot be used as a reasonable comparison for the Kentucky Public Service Commission's policy decisions. Rather, the Commission should follow the example of the vast majority of other states and prohibit NGDCs from recovering the cost of CNG station infrastructure in their rate base.

IV. CONCLUSION

Q. Does this conclude your testimony?

A. Yes, it does.

AFFIDAVIT OF DAVID MROWZINSKI

[illegible] states that he is employed by [illegible] as the Service Director of the position of Water Treatment Manager that he has personal knowledge of the matters set forth in the foregoing testimony and exhibits which were prepared by him or under his direction and supervision if changes were made to the facts of said testimony he would testify as therein set forth and the answers contained therein are true and correct to the best of his knowledge.

David Mrowzinski

STATE OF OHIO

COUNTY OF Franklin

Subscribed and sworn to me this [illegible] day of [illegible] 2010 by David Mrowzinski

Notary Public

My Commission Expires N/A

RONALD L. WATERMAN
Attorney At Law
Notary Public, State of Ohio
My Commission Has No Expiration
Section 147.03 R.C.

The Compelling Case For NGVs in Public and Private Fleets

(and the potential for consumer market adoption)

Stephe Yborra
Director of Market Analysis, Education & Communications
Clean Vehicle Education Foundation

Director of Market Development
NGVAmerica

AMERICA

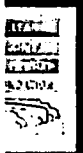
What is the Compelling Case?

- Environmental, energy security and – now, more than ever due to domestic natural gas abundance - ***economic*** market drivers are behind the trend toward greater use of NGVs. While fleet fuel use has been the primary focus, potential consumer market is now spurring additional investment in infrastructure.

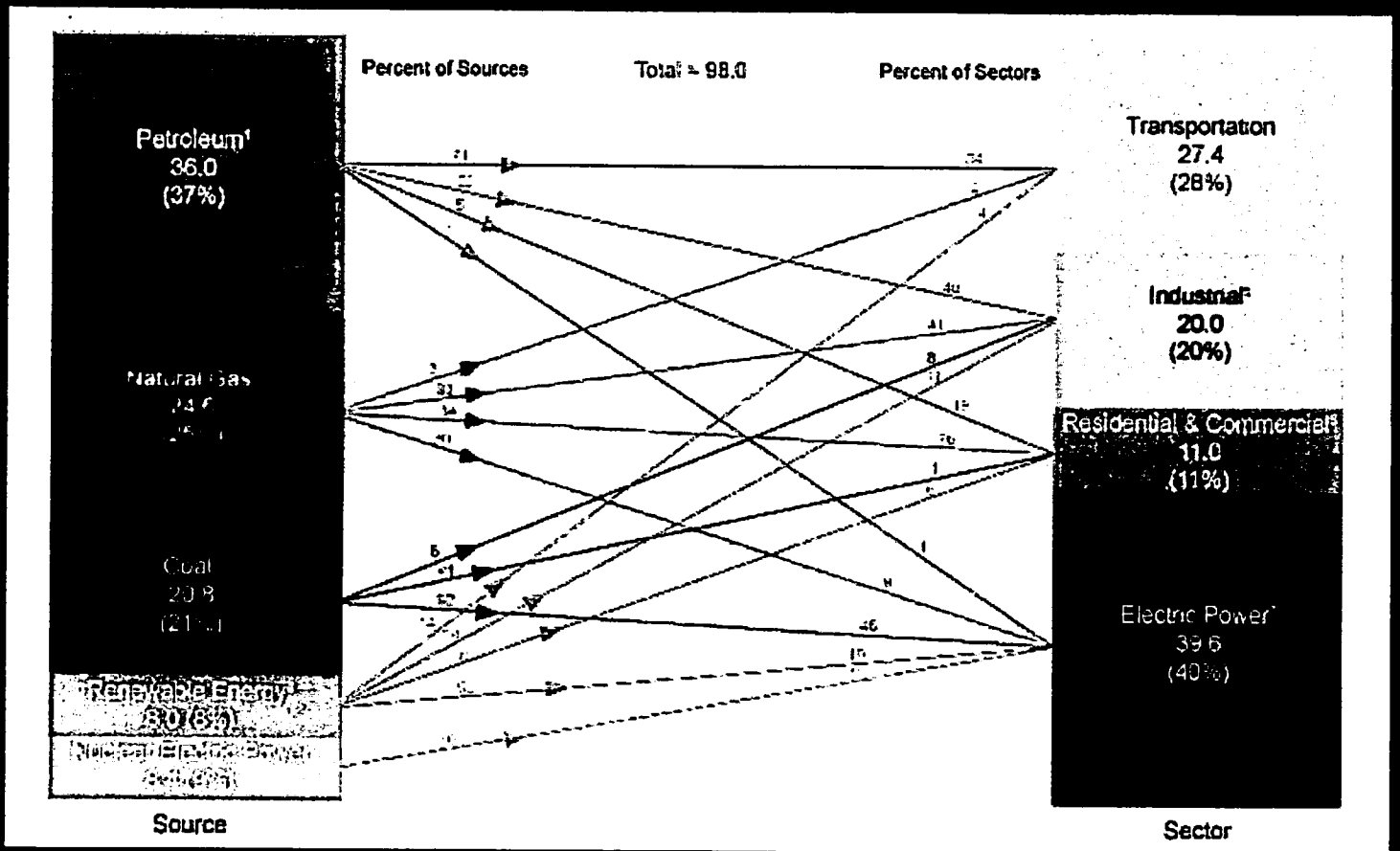
- A growing selection of light-, medium- and heavy-duty NGVs are available from OEMs and SVMs, delivering performance and reliability that are on par with gasoline and diesel counterparts.

- A variety of fueling options are available – LDCs, E&Ps, leasing companies, other customers and independent fuel retailers – both NGV-focused and, now, more traditional fuel retailers - are engaging to develop fueling infrastructure.

- Natural gas is America's fuel: America's resource, America's jobs. Reduced reliance on volatile foreign oil supplies = Energy Security



Snapshot of Energy Supply and End Use



- Transportation (on-road, off-road, rail, marine and aviation) = ~28% of all energy use
- ~71% of all oil is for transportation
- On-road vehicles account for ~60% of all petroleum use

AMERICA

LNG / CNG

Liquefied Natural gas (LNG)

–Cryogenically cooled natural gas @ ~(260)F, stored in liquid form onboard vehicle and vaporized before it enters engine cylinder

–Preferred by many heavy-duty fleets due to its energy density, space requirements

–Option for locations without pipeline gas.

Compressed Natural gas (CNG)

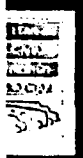
–Typically delivered via the local gas utility's distribution system at low pressure, then compressed and stored on site for fast filling of vehicles …or compressed and distributed directly to vehicles' onboard storage cylinders (time-fill applications)

Snapshot of US NGV Market Today

- Existing NGV inventory: ~140K (revised up from 2013)
  - Pace of attrition of older LDVs is gradually declining; total LDV count again increasing; beginning to see attrition of HDVs placed in service 12-15 yrs ago
  - Steady growth in MDV/HDV inventory due to expanded truck OEM options

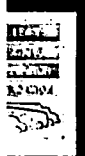
- ~33-35,000 HDVs
  - 11,000 buses
  - 5,300 school bus
  - 7,500+ refuse
  - 5,000 ports/regional haul
  - 4,500-5,000 municipal/F&B/Misc
- ~83,000 LDVs
  (fleet and consumer use vehicles)
  - Cars/SUVs, trucks/vans

- ~22-24,000 MDVs
  - 9,000 gov't
  - 1,700 package delivery
  - 3,000 airport/university/ community shuttle
  - 9,000 utilities, F&B, commercial services, household goods, construction, misc



Independent Forecasts

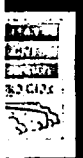
- Frost & Sullivan:
  - By 2017: 8% of ~370,000 Class 6-8 truck market (30,000 trucks)
    - Doesn't account for Class 3-5 market (step vans, small box trucks, c/c utility work trucks, shuttles)
- National Petroleum Council (NPC) study:
  - Under "aggressive" (high oil price case), NPC's scenario shows, by 2050, NGV capturing:
    - 50 percent of LD market
    - Upwards of 35 percent of the class 3-6 truck market
    - Almost 50 percent of the class 7-8 truck market by 2050



Snapshot of US NGV Market Today

- Vehicular natural gas consumption :~10-12% AGR past 6 years
  - 2005: ~200MM GGE
  - 2011: ~325MM GGE
  - 2012: ~350MM GGE
  - 2013: ~400MM GGE
  - Medium- and Heavy-duty vehicle fuel use is growing dramatically
  - Growth rate will accelerate with new niche market successes, new platform availability for MD/HD truck sector…and consumer market?
  - Factors affecting timeframe include pace of worldwide economic recovery, petroleum-natural gas differential, vehicle choices…

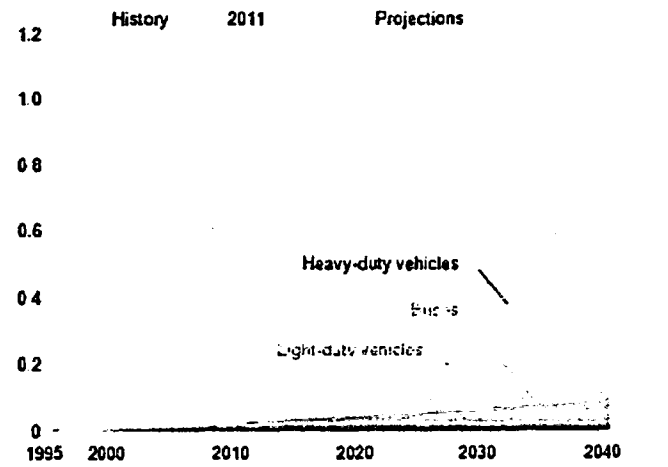
    ….vehicle and station tax credits, grants that accelerate adoption



Energy Use in On-Road Transportation

- Total on-road transportation energy usage: 21.97 Tcf (2010):
  - Light-duty: 16.7
  - Heavy-duty freight: 4.41
  - Commercial light trucks: 25% 0.59
  - Buses: 0.27
- US DOE EIA forecast →
- Independent Forecasts (PIRA Consulting):
  - By 2030:
    5.1 Tcf gas used in vehicles per year
  - Equal to 24% of today's on-road energy use

Figure 74. Natural gas consumption in the transportation sector, 1995-2040 (quadrillion Btu)



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Snapshot of US NGV Market Today

- Station count is ~1325. Just now achieving same number as late1990s. Count has grown steadily in past 30 months and installed capacity is up significantly
  - Attrition of older stations built in 1990s is finished;
  - New investment/upgrades to older stations
  - New stations are based on better economics, either higher throughput with anchor accounts or aggregated loads and better sizing of equipment to loads
- While less than half of all stations are "public access" and most do not meet public expectations, emphasis today is on upgrading that experience
- CNG able to handle local and some regional trucking
- Increased LNG infrastructure for OTR trucking
- Potential for 250-300 new stations in 2014!

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Multiple Stakeholders Are Engaging NGV Fueling Infrastructure

- Local Gas Dist Cos.
- NG Retailers
- NG Exploration &Production Cos.
- Leasing Companies
- Customers
- "Traditional" Fuel Retailers

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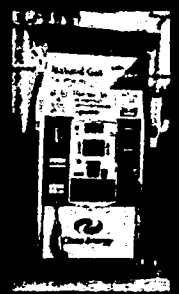
Truck Stops Are Embracing Public-Access Fueling Infrastructure

- Pilot/Flying J is working with Clean Energy to develop LNG (and potentially L/CNG) stations at locations all across the country.

- Love's is co-developing CNG locations in the Midwest. Love's continues to develop backyard and front-of-store retail options.

- TravelCenters of America has partnered with Shell to install LNG capability at 100 locations



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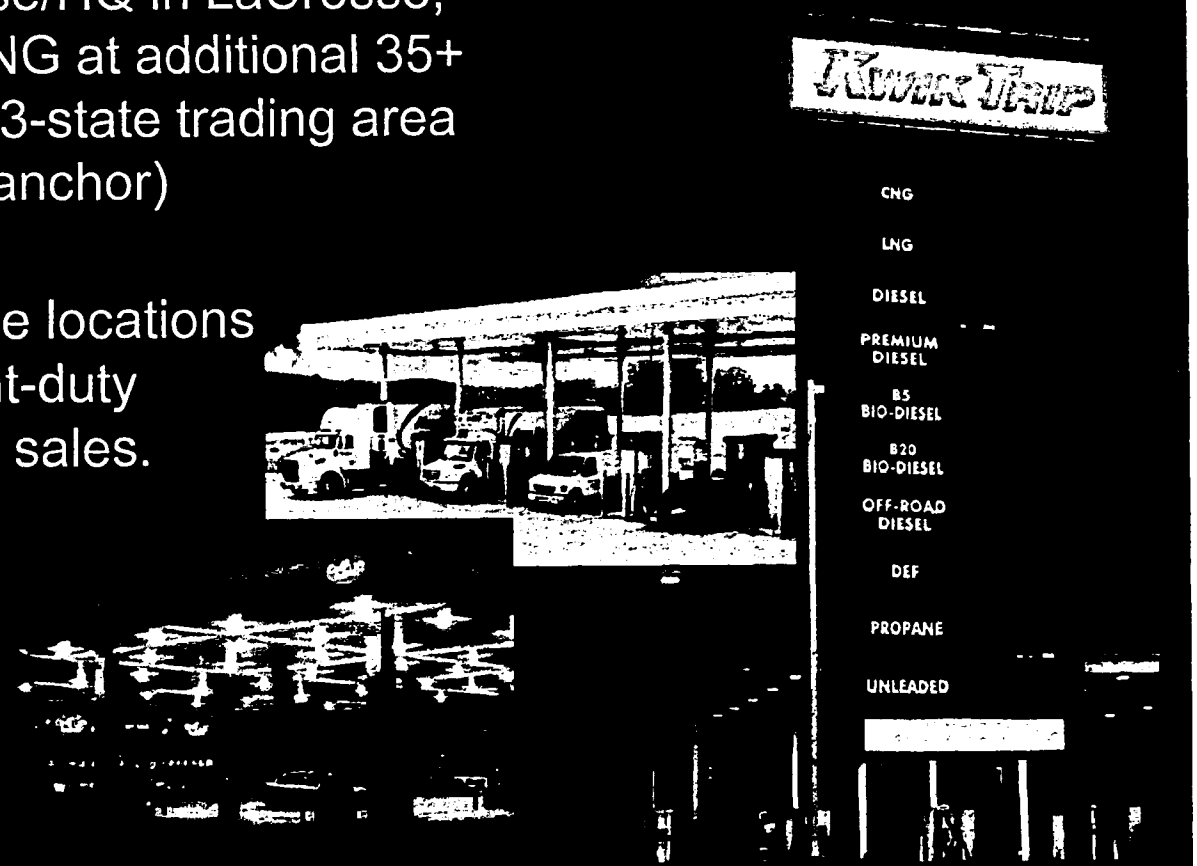
Nat[illegible] for Ame

C-Stores Are Embracing Public-Access Fueling Infrastructure

- Kwik Trip has installed LNG and CNG dispensing capability at its central warehouse/HQ in LaCrosse, WI and adding CNG and/or L/CNG at additional 35+ retail locations throughout their 3-state trading area (KT's fleet is serving as its own anchor)

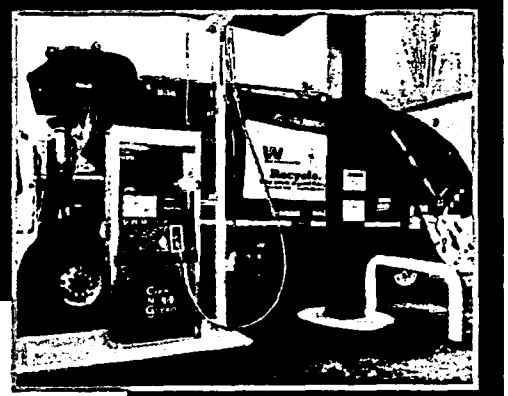
- OnCue Express has built multiple locations in OK and AR.... focus is on light-duty commercial and retail consumer sales.

- Additional C-store chains are in process of evaluating similar options



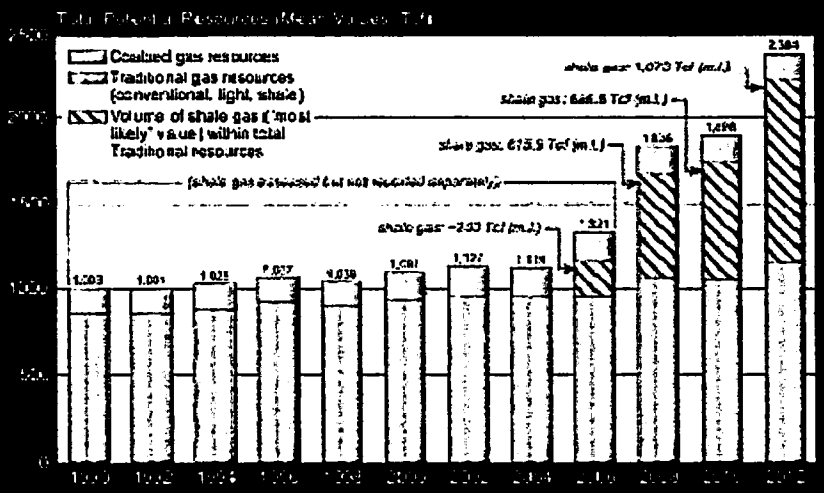
Customers Are Embracing Public-Access Fueling Infrastructure

- Waste Management has been co-developing retail locations with PetroCard under the Clean-N-Green brand. WM fleet serves as anchor load inside the fence (primarily time fill) while promoting to public outside the fence (and extending their "green" messaging)



- Transit agencies, municipalities, F&B companies, small businesses are collaborating with other fleets to aggregate load to meet critical throughput thresholds.

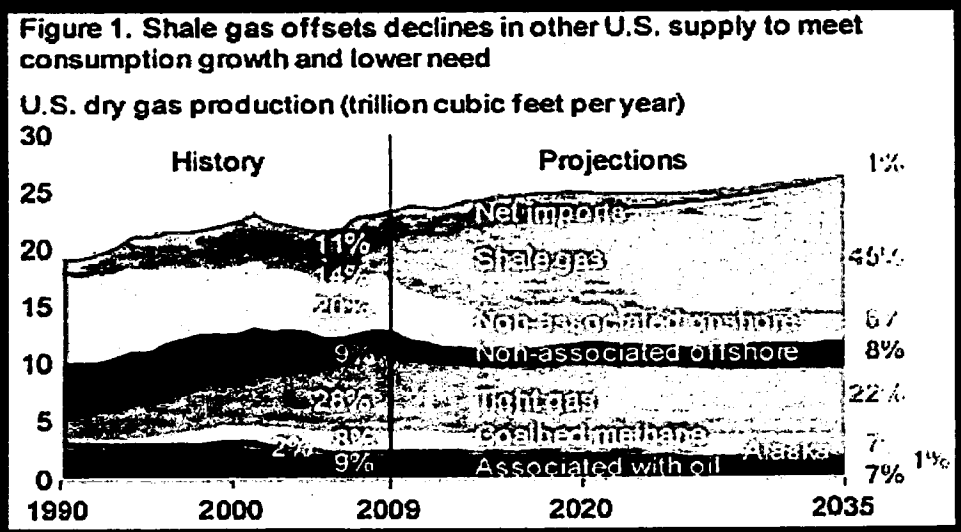
Natural Gas is an Abundant Domestic Fuel



PGC Resource Assessments, 1990-2012

- 98+% of US gas consumption comes from North America (~90% from US)
- Well-developed distribution infrastructure;
- Technology improvements are expanding our economically recoverable base so much so that the estimated supply is now @ 115+ yrs!
- **Natural gas E&P activity is generating tens of thousands of quality jobs which gives direct and indirect economic boost to communities across America**

Shale Basins and the U.S. Pipeline Grid
Source: American Clean Skies Foundation.



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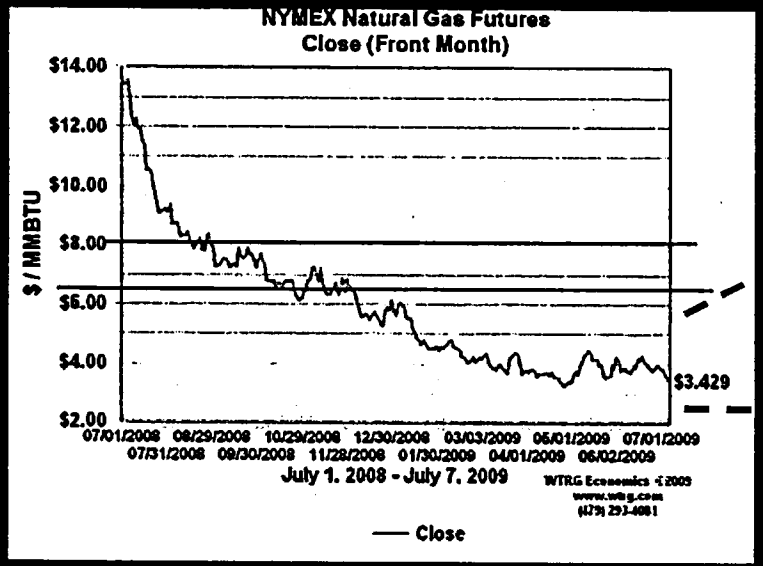
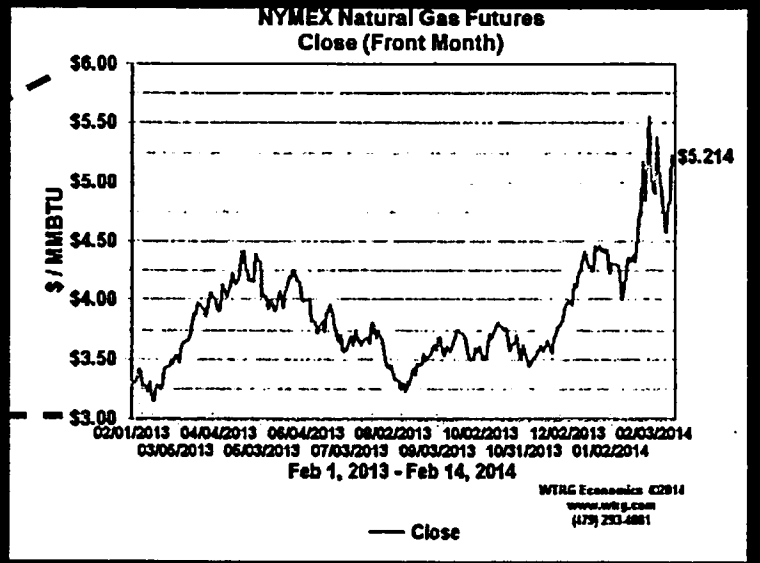
Translating Abundance into Savings





One MMBtu is ~8.0 GGE of (uncompressed) natural gas
One MMBtu is ~7.2 DGE of (uncompressed) natural gas.

If average MMBtu is ~$4.75; commodity % is $.59/GGE ($.66/DGE) . Add LDC delivery, compression, maintenance, equipment amortization: ~$1.45-1.65/GGE ($1.63 -1.85/DGE) + fed and state taxes. LNG pricing derived differently but base stock gas cost is same

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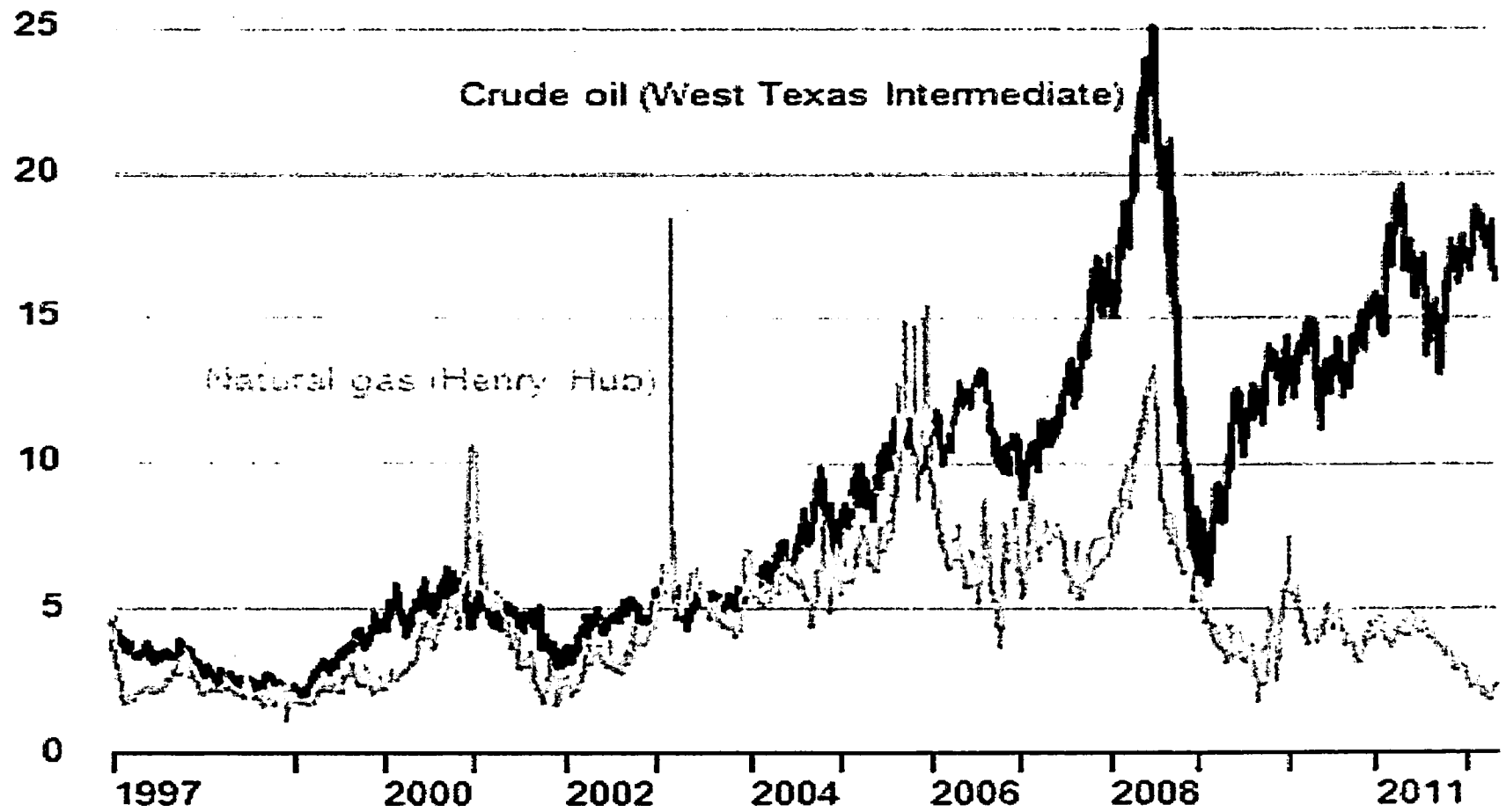
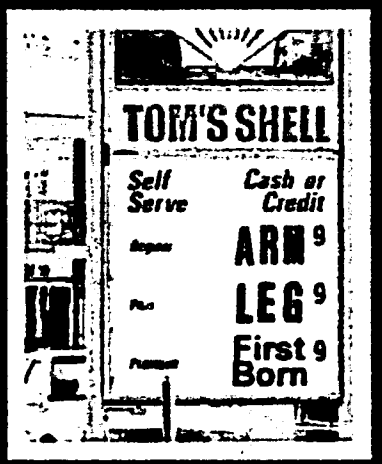
Figure 34. U.S. spot market prices for crude oil and natural gas, 1997-2012

(2010 dollars per million Btu)



Snapshot of US NGV Market Today

- On a Btu basis, natural gas and oil prices are now decoupled.
  - BBL:MCF ratio was 40:1 for much of 2012; upper 30s:1 for 2013
  - Even when gas is at more sustainable $4.50/MCF, ratio tends to hover at ~20:1;
  - This "new norm" is up from long-time 7:1 ratio



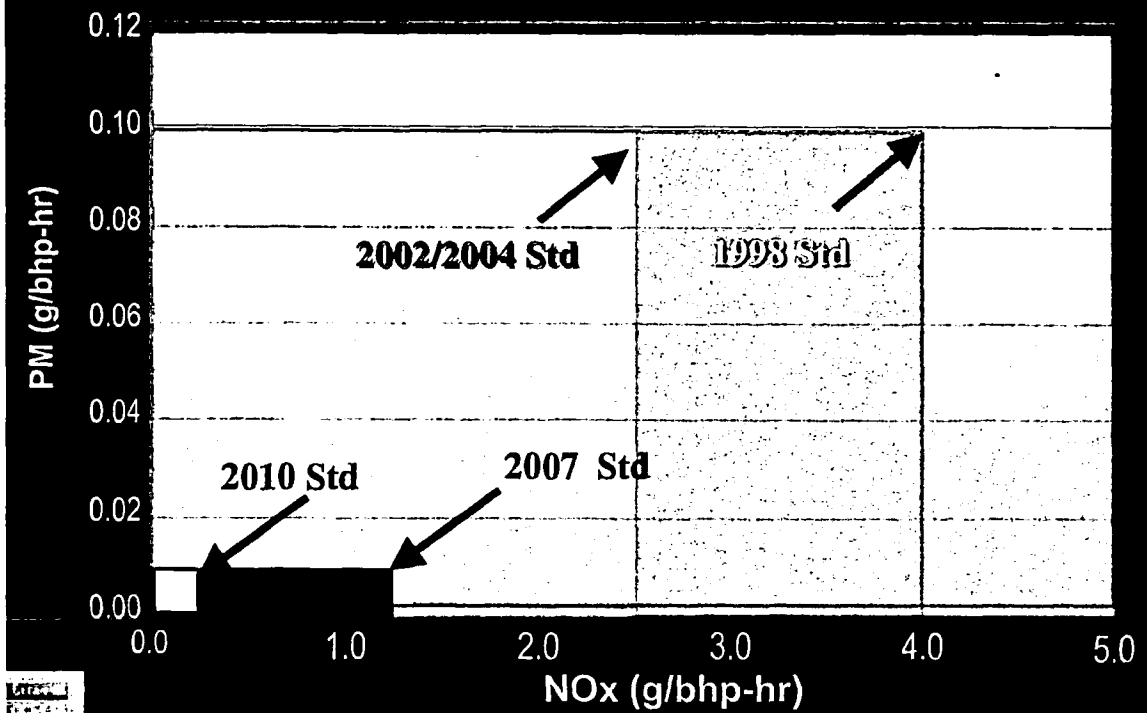
- **Currently, CNG saves $1.25-1.75 versus gasoline and $1.50-2.00+ versus diesel.**

- Favorable fuel cost differential between natural gas and petroleum is expected to improve further as economy recovers because fundamentals of oil supply-demand have not changed

Market Driver of Change

Emissions/Improvement in AQ

- AQ Goals, NAAQS and EPA Vehicle Emissions Requirements
  - CAAA drives local/regional govts to reduce criteria emissions (NOx, PM)
  - EPA and CARB vehicle/engine emissions requirements impact OEMs' product offerings, vehicle performance and fuel economy



- 2004 and 2007 diesel emissions strategies increased purchase price and O&M cost ; added complexity.
- 2010 NOx reduction using SCR technology further increased cost, complexity and O&M costs. "DEF" systems and usage
- 2014 phase-in of GHG and fuel efficiency requirements

The Price of Progress: OUCH!

Complexity, Confusion and Cost

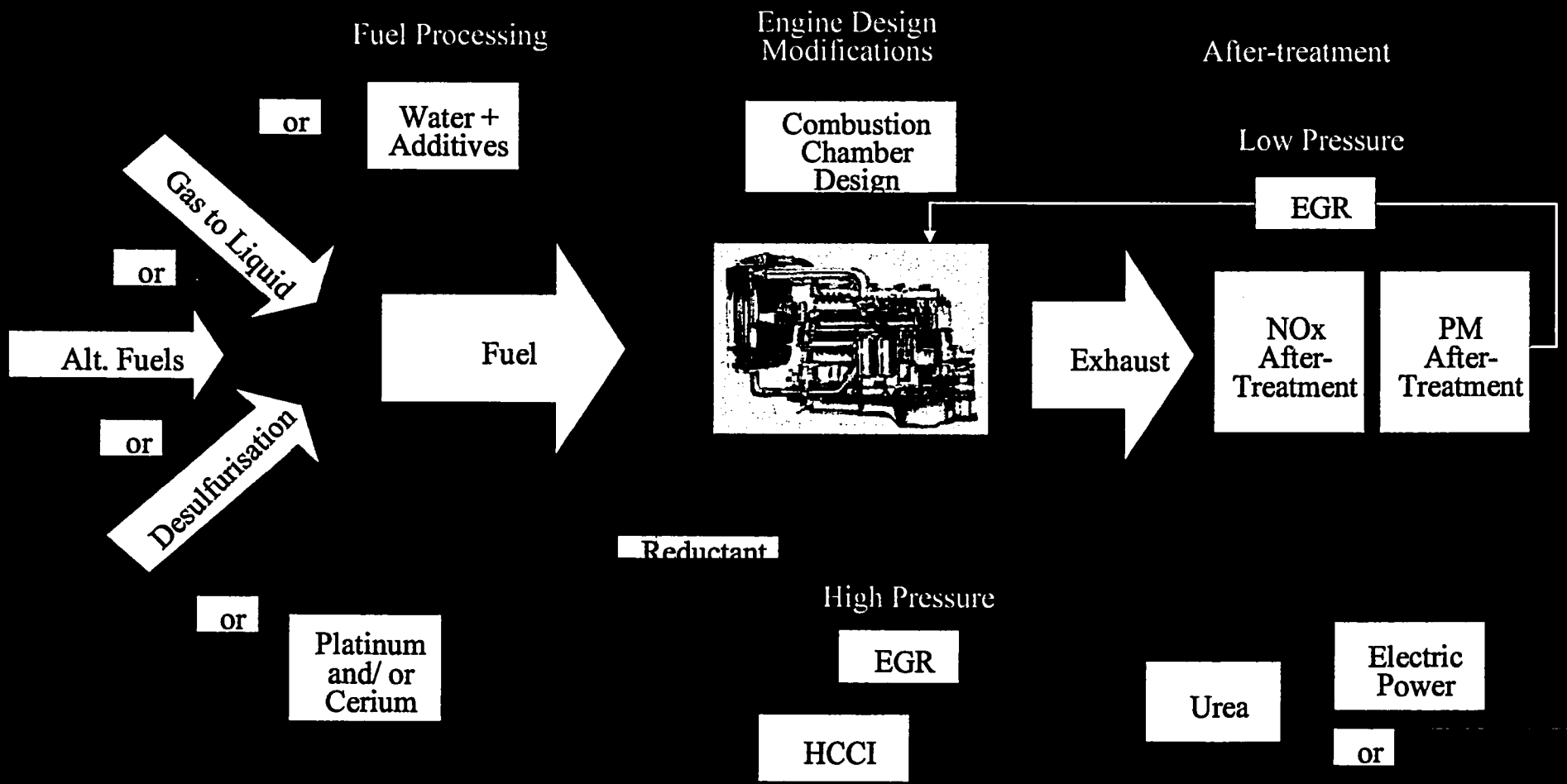


Diagram Courtesy of TIAX LLC

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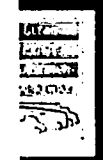
Market Driver for NGVs

Lower Greenhouse Gases (GHG)

- The Environmental, Economic and Political Realities of Global Warming and Greenhouse Gases
  - Issue is gaining traction internationally and here in US
  - New LDV GHG requirements are already phasing in and EPA and NHTSA are phasing in HDV GHG/fuel economy requirements (2014-2018)
- **Natural gas vehicles reduce GHGs significantly**
  - According to CEC study, between 20-29%
    - For HDVs, about 20-23%; for LDVs, 26-29%
    - Depends on comparative vehicles and duty cycles
  - Revised EPA GREET model (2012) based on new data
    - GHG savings are still significant: 15-20+%

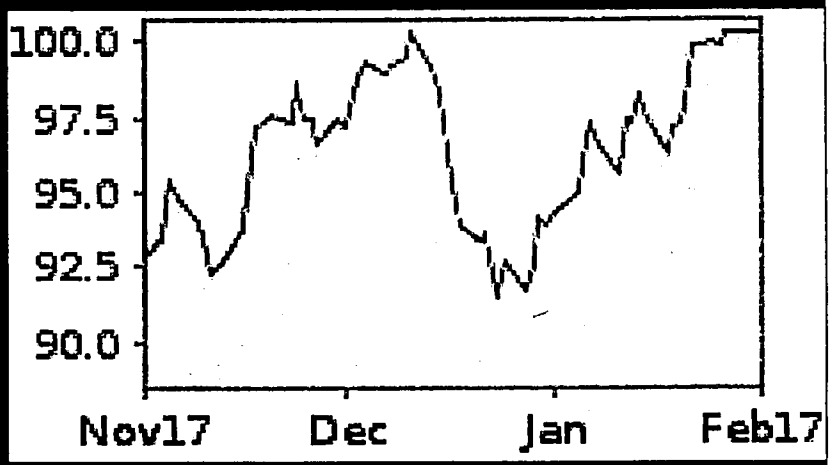


Market Driver For NGVs

Energy Security and Impact at Fuel Pump

- Global oil supply-demand imbalance getting worse, pushing fuel prices up
  - US = <5% of world pop but 25% of oil use
  - Oil price is based on world market so even new oil discoveries here are driven by world demand, which is outpacing supply;
  - Political instability in key producer regions further exacerbates price volatility
  - Existing refinery capacity is at/or near peak – new capacity is lengthy process
  - Barrel of oil topped $145 in late spring 2008! WTI currently ranges between $85-100

West Texas Intermediate 2/17/2014



Are you prepared for the next spike?

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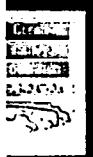
Market Driver For NGVs

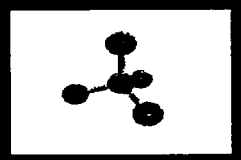
Energy Security and Diversity

- Diversifying America's Transportation Fuel Portfolio
  - Electricity
    - All-electric
    - Hybrids, PHEVs
  - Bio-diesel (B100) and blends
  - Ethanol
    - E85 (limited production/distribution – majority is in Midwest market)
    - Oxidant additive to gasoline (e.g. E10 gasoline – perhaps to be increased)
  - Propane
  - Natural Gas
    - CNG for light and medium duty and LNG for heavy duty vehicles
  - Hydrogen
    - Internal combustion engines (H/CNG blends like Hythane)
    - Fuel cells (eventually)

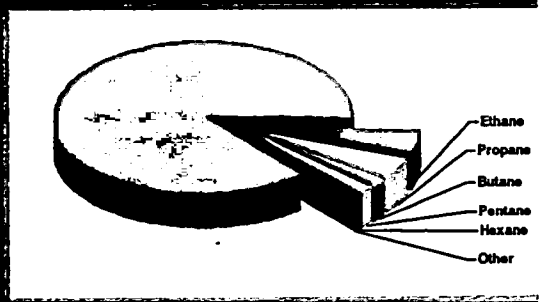


Natural Gas and the Hydrogen Future

- Natural gas and NGVs are the logical energy pathway and technology bridge to the hydrogen transportation energy future
  - Natural gas is 87-95% Methane
  - Methane is CH4 - 80% Hydrogen
  - Reform at station or on-board
  - H/CNG blending in internal combustion engines is likely precursor to wider use of H2
  - Market acceptance of gaseous fuel compression, storage vessels, engine maintenance
  - NGV industry is spearheading Codes & Standards development



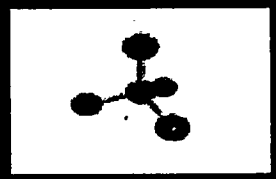
Methane Molecule



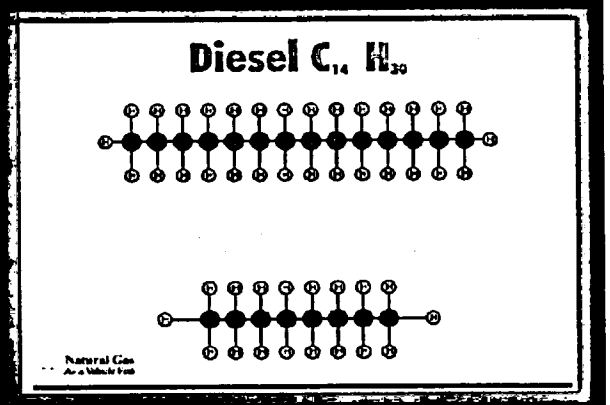
- Still a LONG way to go before H2 vehicles are commercially viable and represent significant impact

Benefits of Natural Gas/NGVs

- Natural gas is an inherently clean fuel
  - Natural gas is low-carbon fuel (CH4)
  - Less NOx, PM and GHGs
- Natural gas is very safe
  - Lighter than air; Limited combustion ratio (5-15%)
  - High ignition temperature: 1000+F
  - Colorless, odorless, non-toxic substance
  - Doesn't leak into groundwater
- NGVs are proven and reliable
  - 16+ million worldwide;
- NGVs are quiet
  - HDVs are 80-90% lower db than comparable diesel
- NGV life-cycle costs are significantly lower
  - Fuel costs are far lower!
  - Maintenance costs are =/< than gas or diesel



Methane Molecule



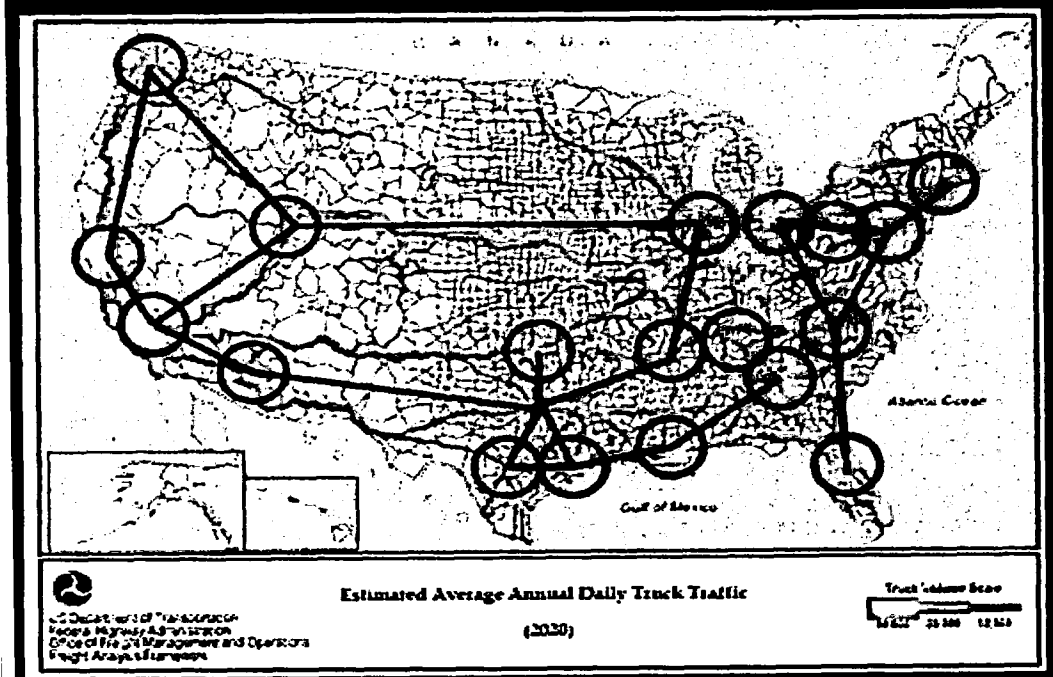
Key Attributes and Best Prospects

- High fuel use vehicles with return-to-base operations or repetitive route or pre-set geographic operating areas

-Regional / long haul freight truck – 18-22K DGE
-Transit buses – 11-13K DGE
-Refuse/Concrete trucks – 7.5-10K DGE
-Municipal sweeper – 5-6K DGE
-Airport shuttle service – 5.5-7.5K GGE
-Local goods/svcs: F&B, Textiles etc – 7K DGE
-Taxi - 4.5-5.5K GGE
-School Bus – 2.5-3K GGE
-E&P pick-up 2-2.5K GGE
-Courier sedan, newspaper van, utility/ telecom van, public works pick-ups – 1.2-1.5K GGE

- Consumers have already shown that they will adopt given sufficient infrastructure

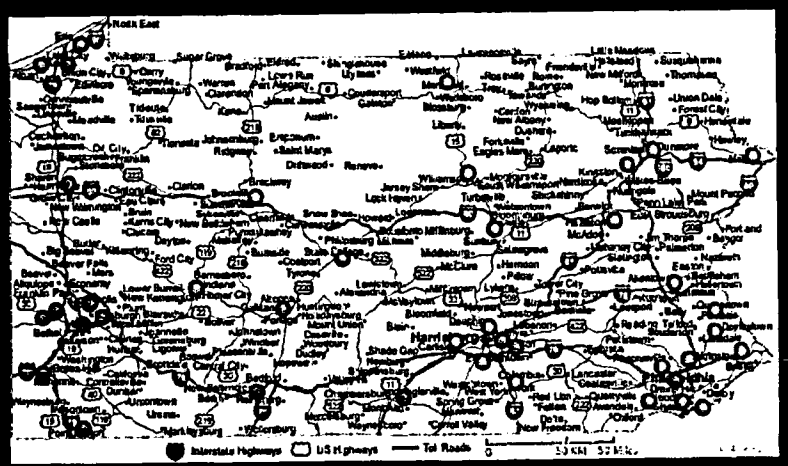
Expanding Infrastructure: "Hub and Spoke" and Corridor Development



Hub and spoke: 
Local fleets with predictable "limited" range needs (CNG or L/CNG).

Corridor: 
Lanes that connect the hubs (CNG or LNG, depending on range)

Hypothetical example based on key population centers, travel patterns:



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Growing Selection of NGVs from OEMs, SVMs

HD Truck OEMs

- Freightliner Truck
- Volvo
- International
- Kenworth
- Peterbilt
- Mack

HD Vocational OEMs

- Mack
- Peterbilt
- Crane Carrier
- Autocar Truck
- ALF Condor
- Elgin
- Johnston
- Schwarze
- Tymco
- Capacity

HD Bus OEMs

- Thomas Built Bus
- Blue Bird Bus
- Optima/NABI
- El Dorado
- New Flyer
- Motor Coach Ind.
- Gillig
- DesignLine

HD Retrofit/Repowers

- American Power Group
- Clean Air Power
- Eco Dual Inc
- Fyda Energy Solutions
- NGV Motori
- Omnitek Engineering

Dual fuel retrofits and SING repowers of Cummins, Daimler, Navistar, Detroit Diesel, Mack, Volvo, Caterpillar

LD OEMs

- American Honda
- General Motors
- Chrysler Ram Trucks

LD/MD Retrofits*

- Altech-Eco
- Landi Renzo/Baytech
- IMPCO Automotive
- Westport/BAF Technologies
- NGV Motori USA
- NatGasCar
- Auto Gas America
- Greenkraft
- PowerFuel Conversions

Retrofits of GM, Ford, Dodge, VW, Mazda, Mitsubishi, Workhorse, Isuzu, JAC, UtiliMaster, Freightliner Custom Chassis

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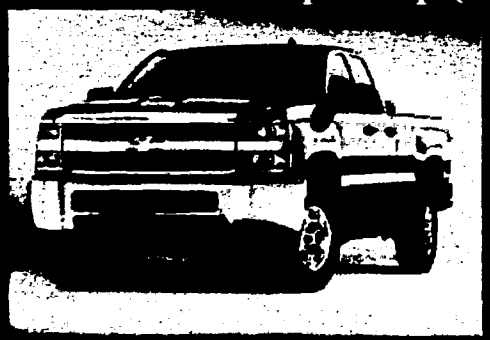
Natural Gas V[illegible]es for Ame

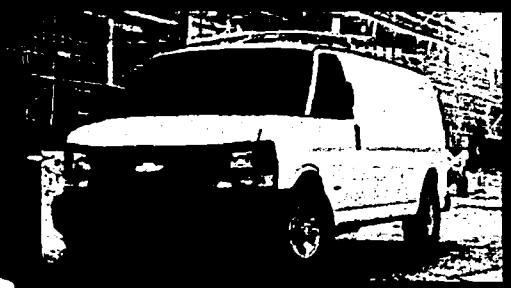
LDVs Available from OEMs

Honda Natural Gas Civic Sedan (dedicated)

GM Silverado/Sierra pick-up (bi-fuel)



GM Express/Savana Cargo & Passenger Vans (dedicated)



Ram 2500 dual-cab pick-up (bi-fuel)

NEW! MY 2015 Bi-fuel GM Impala (late summer 2014)

LDVs Available Through SVMs

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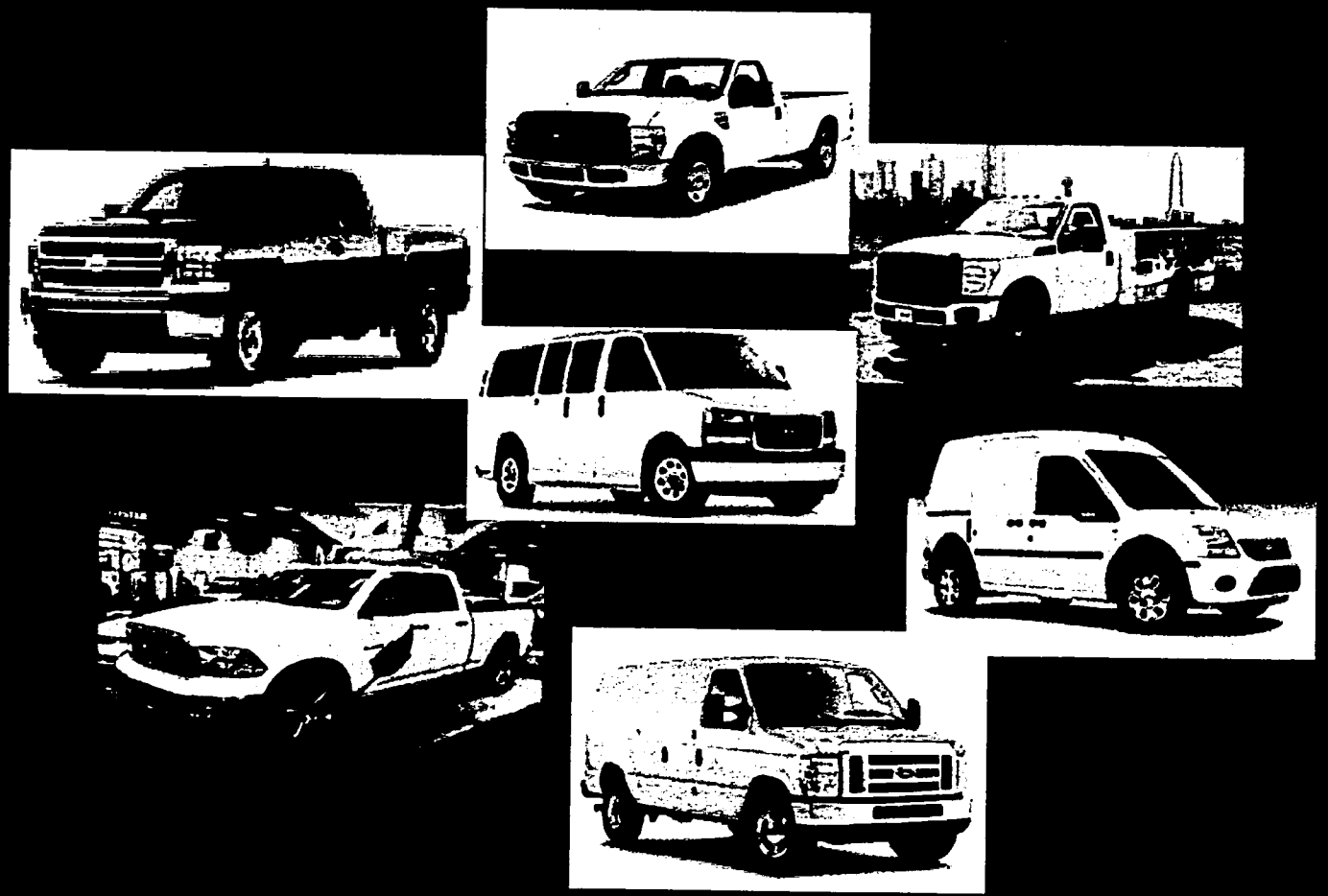
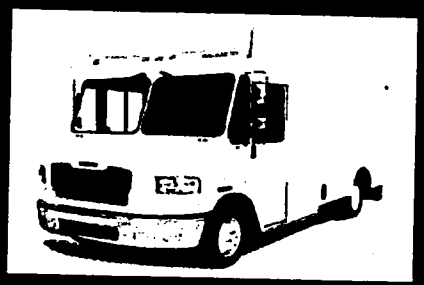
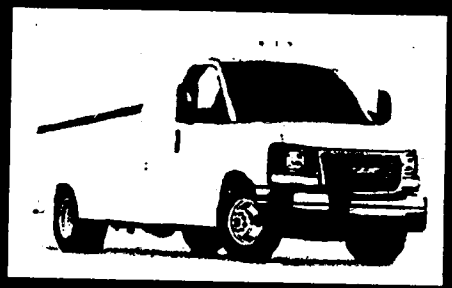
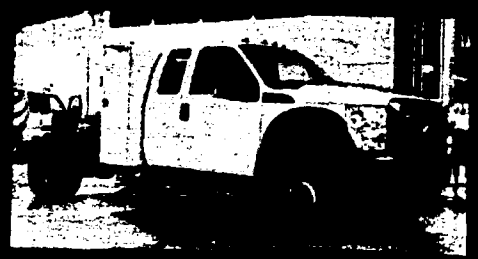
Additional Vehicles Available Through SVMs



MDVs Available Through SVMs







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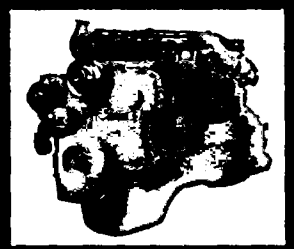
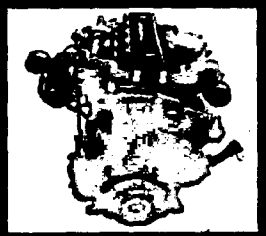
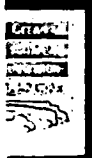
Natural Gas Vehicles for Ame

OEM HD Natural Gas Powertrains

CWI 8.9L ISL-G	CWI 11.9L ISX-G	(2014) Volvo 13L D13	(2015) CWI 6.7L ISB-G	(2016?) CWI 15L ISX-G
		?	?	?
Spark Ignition	Spark Ignition	Dual Fuel (LNG+Diesel)	Spark Ignition	Spark Ignition
CNG or LNG	CNG or LNG	LNG Only	CNG or LNG	CNG or LNG
Peak Rating:	Peak Rating:	Peak Rating:	Peak Rating:	Peak Rating:
320 hp / 1,000 ft-lbs	400 hp / 1,450 ft-lbs	hp /torque TBD	~260 hp / ~660 ft-lbs	hp /torque TBD



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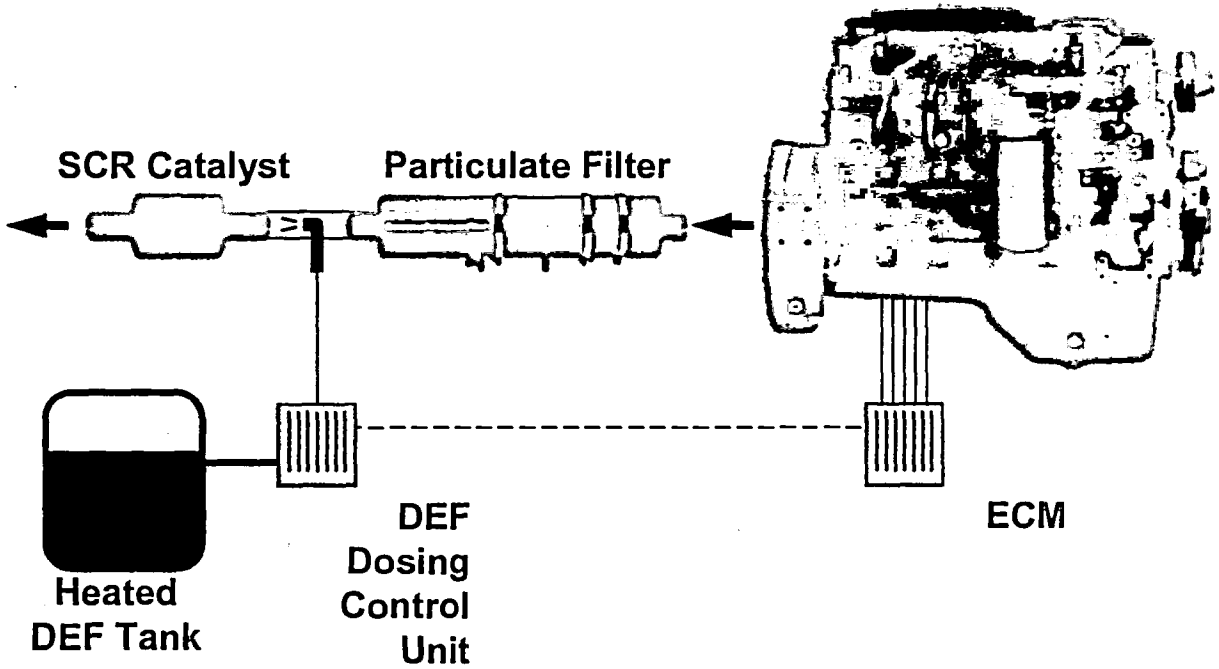
Natural Gas Vehicles for Ame

Aftertreatment Comparison

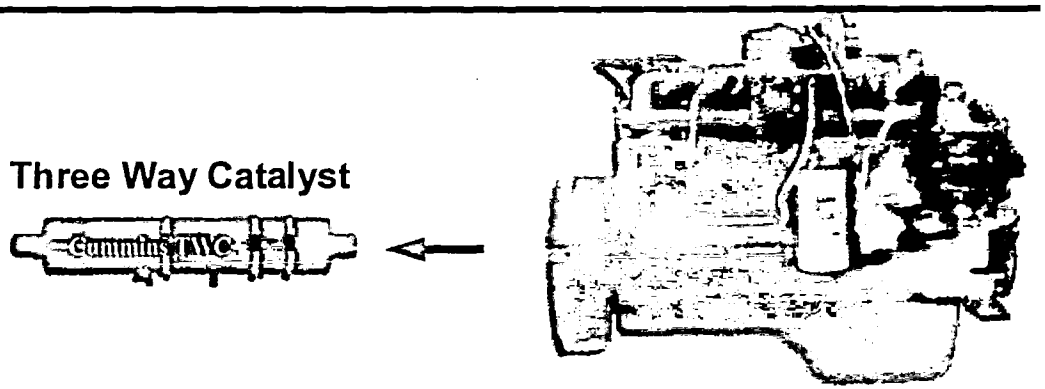
ISL9

(diesel)



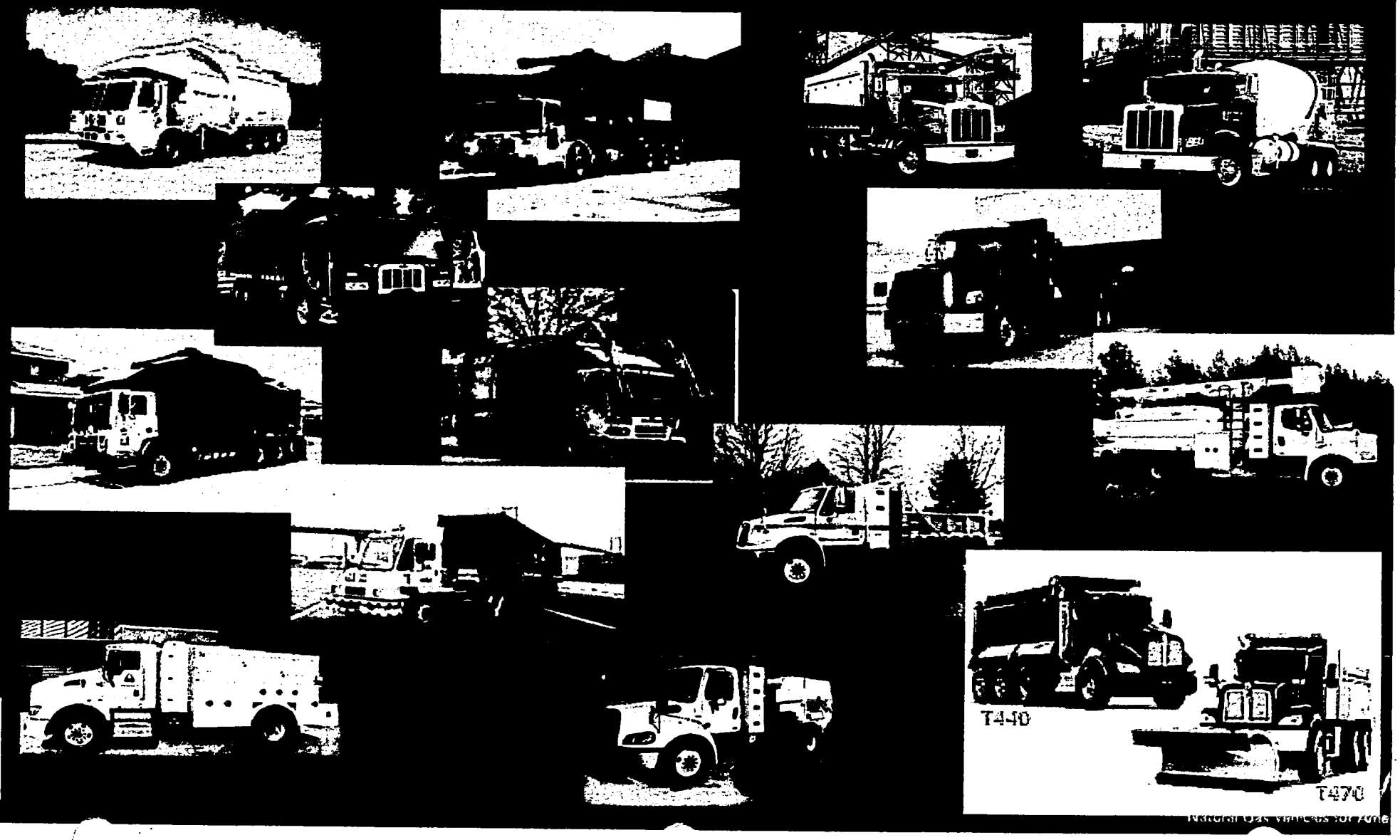
ISL G

(natural gas)



Transit and School Bus Platforms

Vocational/Specialty/Work Truck



Local-Regional Haul/Line Haul

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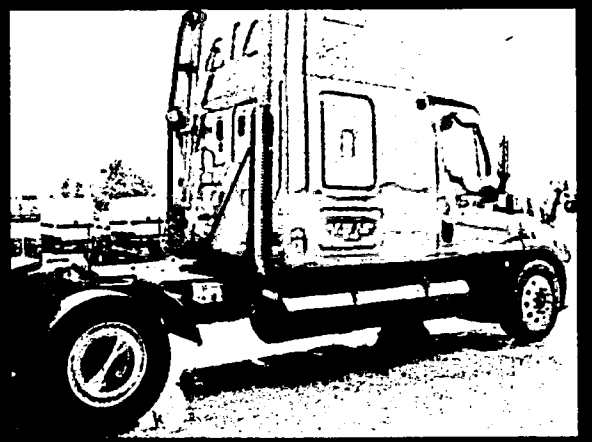
OEM	Model	Segment	ISL G	ISX12 G
Freightliner Truck	Business Class M2 112 (Class 7/8)	MD/HD Truck	X	
	Cascadia	HD Truck		X
Kenworth	W900S	MD/HD Truck	X	X
	T440 / T470	MD/HD Truck	X	
	T660	HD Truck		X
Peterbilt	Model 384	MD/HD Truck	X	X
	Model 365	MD/HD Truck	X	X
Volvo	VNM	MD/HD Truck	X	
	VNL	HD Truck		X
Mack	Pinnacle	HD Truck		X
	Granite	HD Truck		X
International	TranStar	MD/HD Truck	X	
American LaFrance	Condor	Refuse	X	
AutoCar	ACX	Refuse	X	X
Crane Carrier	LCF	Refuse	X	
Peterbilt	320	Refuse	X	X
Mack	TerraPro Low Entry	Refuse	X	
Mack	TerraPro Cab Over	Refuse	X	
NABI	35 LFW/40 LFW/60 BRT	Urban Bus	X	
New Flyer	30 LF/35 LF/40 LF	Urban Bus	X	
Orion	Orion V HF/Orion VII LF	Urban Bus	X	
Foton	City - L40 CNG	Urban Bus	X	
Gillig	LF	Urban Bus	X	
MCI	Commuter Coach 40/45	Motor Coach	X	
DesignLine	Commuter Coach 40/45	Motor Coach	X	
El Dorado National	Axess/E-Z Rider II/Transmark RE/XHF	Shuttle	X	
Blue Bird	All American	School Bus	X	
Thomas Bus	Saf-T Liner	School Bus	X	
Capacity	TJ9000 , TJ5000	Yard Spotter	X	
AutoCar	Xspotter	Yard Spotter	X	

Dual Fuel Technologies: Re-emerging Opportunity

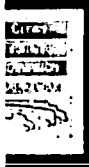
- Dual fuel technology is making a comeback, primarily being marketed to "Intermediate Use (IUL)" and "Out of Useful Life (OUL)" HD engine applications;
  - Varying amounts of diesel is displaced by natural gas during duty cycle
- 3/11 - EPA established a lower cost "approval" process that reduced cost and data burden thus making this dual fuel retrofit system option economically attractive to legacy fleets
- "Approval" process requires technical paper, supporting documentation, field data



- Presently, 500+ engine families have been approved and more are added each month
  - EcoDual, APG, CAP, NGV Motori, Fyda, Landi Renzo, Diesel 2 Gas

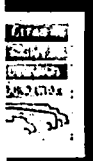
Dollars and Sense

NGV Economics:
Components of CNG Cost,
Calculating Simple Payback
and
Life-Cycle Cost Savings

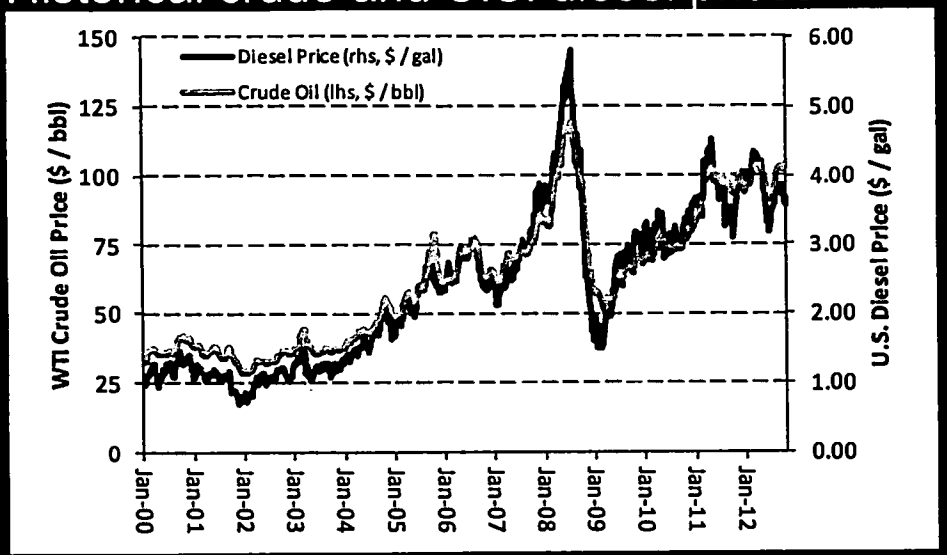


Components of CNG Cost

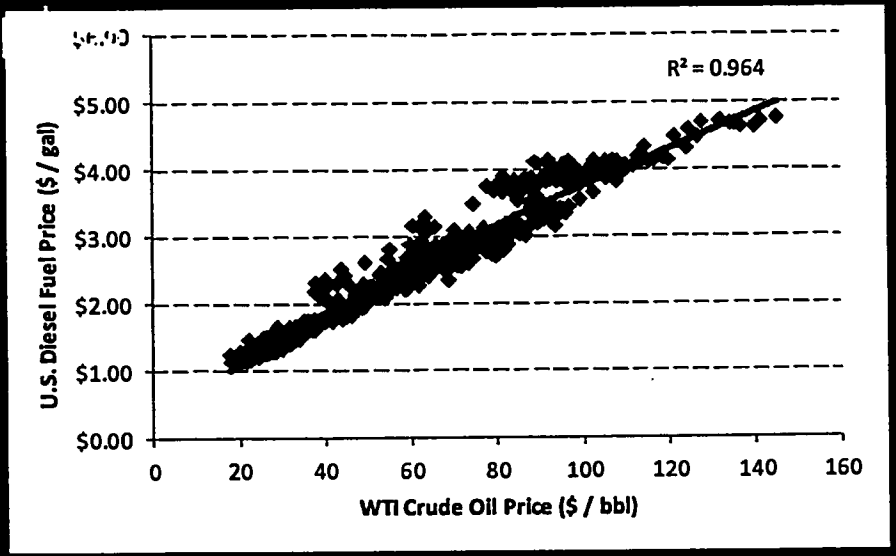
- Gas Bill:
  - Unregulated portion associated with purchasing gas
  - Regulated local gas utility distribution company (LDC) services
- Compression
  - Electric motor KWH and KW …OR engine driven unit's natural gas use
- Station Maintenance
  - Normal PM, scheduled replacement of parts, compressor rebuilds
- Capital /equipment amortization
  - Amortized cost of equipment or cost of capital factored into GGE price
- Federal, state and local excise fuel taxes (if applicable)
  - Tax is paid by the fuel seller; tax status of buyer determines
- Margin



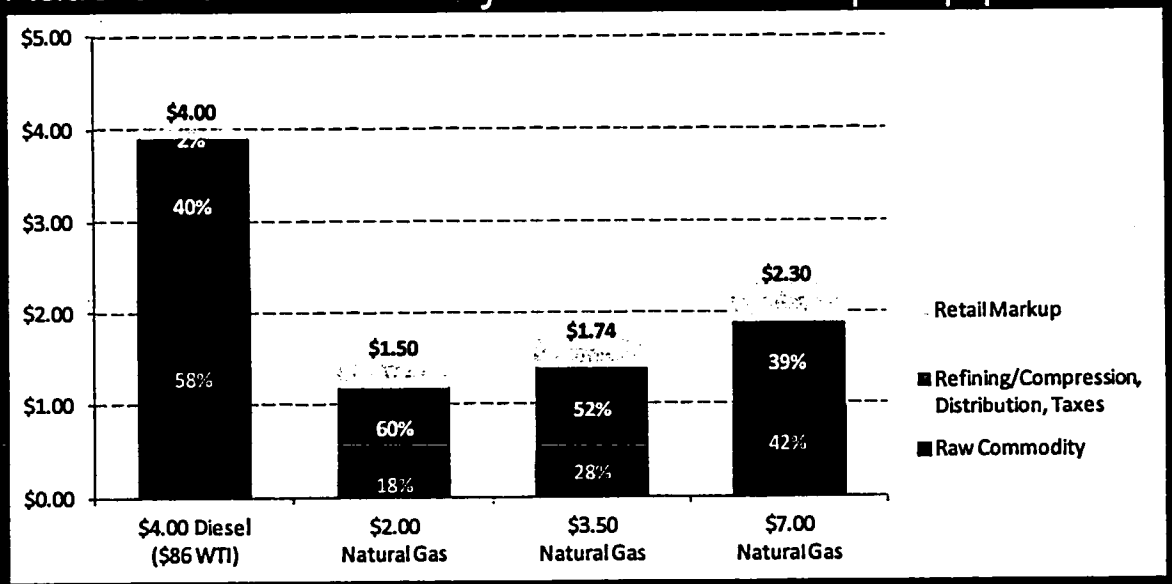
Historical crude and U.S. diesel prices



Relationship between crude and diesel



Ratio of raw commodity contributions to pump prices



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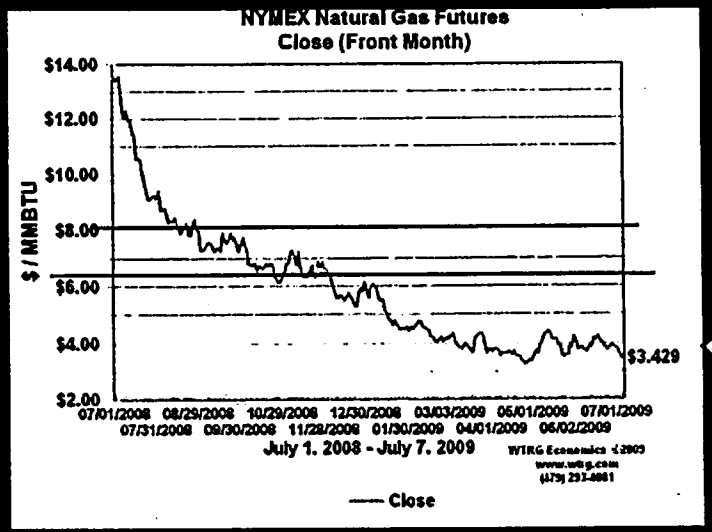
Components of CNG Cost

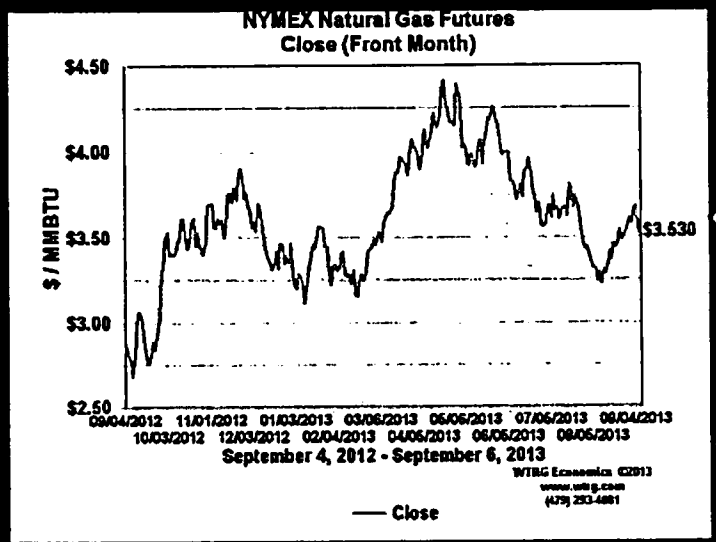
- Gas company bill (unregulated portion)
  - Commodity:

    Gas is drawn from wells, gathered/ pooled, stripped of impurities and "heavy" gases, then transported to "hubs" where it is available on the commodities market. Henry Hub (Louisiana) is used for NYMEX pricing.

    US DOE and industry long term price forecasts (prior to the economic collapse) pegged NYMEX natural gas at $6.50-8.00/MCF. Impact of shale gas is being reflected in more recent forecasts.

    Future market projections for gas are still up in the air now that shale gas has changed the equation





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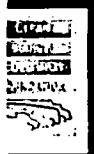
Components of CNG Cost

Gas company bill (unregulated portion):

Gas Commodity:

- One cubic foot = ~1000 BTUs (Note: cf = volume, BTU = energy)
- One Mcf = 1000 cubic feet
- One Mcf = 1000x1000 = ~1,000,000 Btus (MMBtu or decatherm)
- US Gov't says 124,800Btu/GGE and 138,700Btu/DGE…therefore….
- **One MMBtu = roughly 8.0 GGE of (uncompressed) natural gas**
- **One MMBtu = roughly 7.2 DGE of (uncompressed) natural gas.**

- Although up sharply in last 30-45 days due to severe cold throughout much of the nation, 2013 NYMEX MMBtu averaged about $3.70; thus the commodity portion of CNG was $.46/GGE ($.52/DGE)
- Your local gas company buys gas at various prices and uses weighted formula to pass along commodity at cost….commodity cost is PART OF the purchased gas adjustment (PGA).



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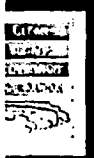
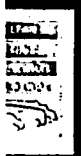
Components of CNG Cost

- Gas company bill (unregulated portion):
  - In addition to commodity costs, Purchased Gas Cost Adjustment (PGC/PGA) includes costs associated with getting gas to LDC's gate.
    - Gas acquisition
    - Pipeline capacity and transmission; "balancing" charges
    - Storage to supplement pipeline flows during heaviest demand periods
  - These costs vary across the country but may range from $.75-$2/MMBtu
    - Storage is often about half that fee
  - Commercial and industrial customers with steady gas loads often elect to buy their own gas through a broker/marketer and "transport" via the LDC, thus eliminating/reducing fees associated with storage.
    - Commercial/industrial customers with process loads (e.g., bakeries, bottlers, dairies, laundries, manufacturing plants)
    - Fleets (regardless of their facility load)



Components of CNG Cost

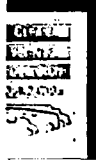
- Gas company bill (regulated portion):
  - Local utility distribution system charges a regulated tariff for delivery of gas from their city gate to your meter. This is a per-unit cost, not tied to the PGA. Rate typically includes:
    - Recovery of distribution system investment/depreciation
    - System operations and maintenance
    - Meter set / customer services
    - Administrative G&A
    - Other mandated fees / assessments
  - These tariffs are often stepped (i.e. larger volumes often earn lower rates)
  - Customers that do not meet minimum load requirements to qualify for 'transportation" rates buy "bundled" gas service from their LDC. Those with sufficient load can opt to buy their own gas and pay LDC to transport.
    - Minimum amount required to qualify for transportation rate varies widely from one utility area to the next… as little as 10,000 DGE/year to as much as 150,000 DGE/year



Components of CNG Cost

Sample case: commercial baking company with 20 step vans

- Gas Bill: $.85/GGE
  - Gas costs: ~$.59/GGE
    (based on estimated wellhead price of $4.00/MMBtu + $.75/MMBtu associated fees for transportation and services up to LDC city gate)
  - LDC's regulated city-gate-to-meter services: $.21/therm (~$0.26/GGE)
    (transportation rate)



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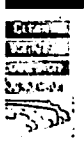
Components of CNG Cost

- Gas Bill: $.85/GGE

- Electric compression costs
  - Gas delivered to the customer has to be compressed.
  - Most stations use electric motors although many larger stations use natural gas engine-drive compressors (depends on local regs).
  - Be sure to factor in both KWH consumption and KW demand
  - Estimated @ 1 fully-loaded KWh/GGE – a bit less for larger stations and more for small stations
  - Varies significantly from one utility area to the next
  - Nat'l range:$.04 -.30/KWH – : **~$.12/GGE**



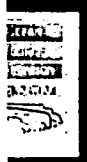
Components of CNG Cost

- Gas Bill: $.85/GGE
- Electric compression costs:$.12/GGE

- CNG stations require regular preventative maintenance/ service and occasional rebuilds of compressors and replacement of other parts.

- Cost per GGE will vary based on total throughput (generally, larger throughput = less cost/GGE due to economies of scale)

- Maintenance/Repair/Service: $.20-.50/GGE.: **$.30/GGE***



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Components of CNG Cost

- Gas Bill: $.85/GGE
- Electric compression costs: $.12/GGE
- Maintenance/Repair/Service: Assume average of $.30/GGE
- **Capital amortization of equipment: $.25-.60/GGE**
  - Station cost divided by total GGE over life of equipment
  - Depreciation (5 yrs,7 yrs,10 yrs?), Cost of capital, Utilization factor

Example 1:

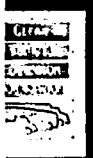
- 20 veh. x 15 GGE/day x 5 days/wk = 1500 GGE/wk =~80,000 GGE/yr
- 80,000 GGE/year x 10 yrs = 800,000 GGE
- If 100 scfm 10-post/20-hose time-fill station cost is $400K, then **$.50/GGE**

Example 2:

- Ex 2: 20 veh. x 20 GGE/day x 6 days/wk = 2400 GGE/wk = ~125,000 GGE/yr
- Same 100 scfm station, then **$.32/GGE**

Example 2 using 7 year depreciation:

- 125,000 GGE/year x 7 yrs = 875,000 GGEs = $.46/GGE



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Components of CNG Cost

- Gas Bill: $.85/GGE
- Electric compression costs: $.12/GGE
- Maintenance/Repair/Service: $.30/GGE
- Capital amortization of equipment: $.40/GGE

SUB-TOTAL:

- **$1.67 (use by or sales to tax exempt entities)**
- **$2.17 (use by or sales to taxable entities)**
  - Federal motor fuels excise tax: $0.183/GGE;
  - Pennsylvania Fuels Taxes: $.312/GGE (same as gasoline)

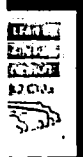
Components of CNG Cost

- **What if NYMEX MMBtu cost rose to $8.00/MMBtu?**

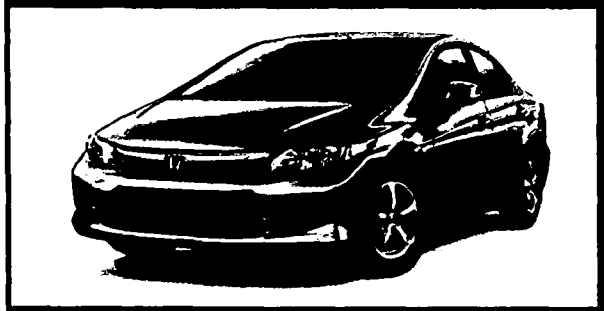
- **Gas Bill: $1.35/GGE**
  - **Gas acquisition cost: $1.09/GGE ($8.00+.75 = $8.75/8)**
  - LDC transportation tariff remains: $.26/GGE
- Electric compression costs: $.12/GGE
- Maintenance/Repair/Service: $.30/GGE
- Capital amortization of equipment: $.40/GGE

- **Tax exempt fuel sales: $2.17/GGE**
- **Taxable fuel sales in PA: $2.67/GGE**

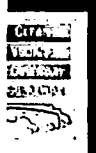
- **At $8.00/MMBtu, oil is very likely to be well over $200+/barrel… easily equates to $5+ for diesel!**



Medical Lab Courier Service



- Honda Civic Natural Gas sedan
- MPG: 31 (combined); 30K miles/year
- Fuel Use: 4GGE/day; 1000GGE/yr
- CNG Premium*: $6500
- Without grant, simple payback = 5yrs
  (based on $1.30/GGE savings)
- Without grant, LCC = $1300 (based on 6 year life)
- Grant: $3000
- Remaining premium: $3500
- Simple Payback: 2.7 yrs
- Life-cycle cost advantage: $4290



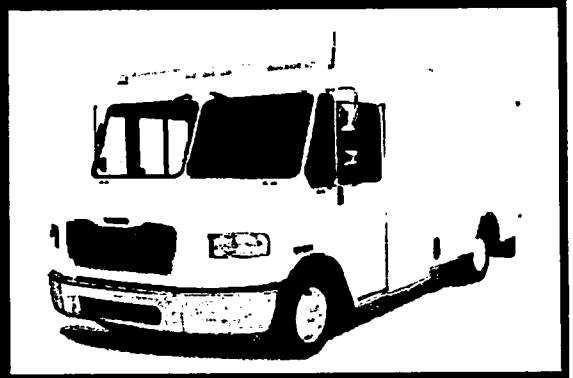
Passenger van for Limo

- Ford E-350 passenger van, Chevy/GMC 3500 passenger van
- MPG: 15/16 (combined), 90K miles/year
- Fuel Use: 17GGE/day; 5500GGE/yr
- CNG Premium: $13,500
- Without grant, simple payback = 1.9 years and LCC savings = $29,315 (6yr life; $ 1.30/GGE savings)

- With Grant: $ 6000
- Remaining premium: $7500
- Simple Payback: 1 year and LCC savings = $35K+

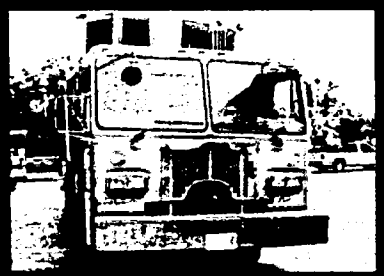
Step Van

- Sample Applications (e.g., textile rental service, comm. bakery)
- MPG: 6.0, 95mpd x6 dys/wk, 30K/yr
- Fuel Use: 16GGE/day; 5000GGE/yr
- CNG Premium: $25,000
- Without grant, simple payback = 3.3 years;
  LCC savings = $50,250
  (based on 10 yr life and 1.50 savings/GGE)
- Grant: $15,000
- Remaining premium: $10,000
- Simple Payback: 1.3 yrs; LCC savings: $65K !!!



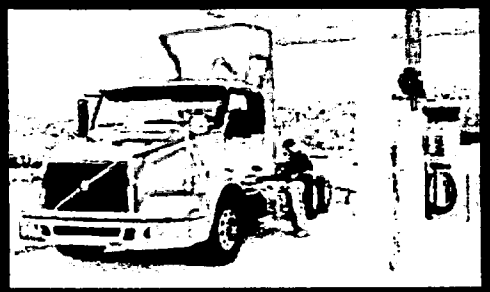
Refuse Truck

(LCF model)



- Crane Carrier LET, Autocar Xpeditor, Peterbilt LCF 320, Condor , Mack TerraPro
- MPG: 2.5 – 3.0 (lots of idle and PTO time)
- Fuel Use: 35-40gge/day; 10,500DGE/yr
- CNG/LNG Premium: $30,000
- If no grant, payback is 1.9 years and Life-Cycle Cost savings = $96+K
  (based on $1.50 savings/DGE and 8 year life)
- Grant $15,000
- Remaining Premium: $15K
- Simple Payback: 0.95 years; LCC savings: $110K

Grocery Truck



- Volvo VNM/VNL, Freightliner M2/Cascadia
- MPG: 5.6 miles/DGE; 100K miles /year
- 17,850 DGE/yr
- CNG Premium (w 84 DGE capacity): $60,000
- If no grant, payback is 2.25 yrs
- Life-cycle cost savings: $127K
  (based on $1.50/DGE savings, 7-year /700K life before resale)

- Grant $25K; Remaining Premium: $35K
- Simple Payback: $26,775 yr savings = 1.3 yrs
  (based on 1.50 savings /DGE)
- Life-cycle cost savings: $152+K

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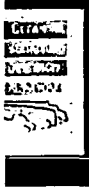
Fill'er Up

Natural Gas Fuel Station Types

Development, Ownership and Operations Options

Sizing/Design Considerations



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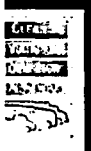
CNG Fuel Station Types

- **Time-fill capability**
  CNG is dispensed slowly directly to vehicles' onboard storage tanks. Lower cost station investment. Best for fleets that return to central lot and sit idle overnight or for extended periods and do not need fast fill capability.
  Home fueling devices are time-fill applications.

- **Fast-fill capability**
  Similar to liquid fueling station, same fill rates and times. A MUST for public access. Also good for larger fleets where fueling turn-around time is short.

- **Combo-fill capability**
  Comprises both time-fill and fast-fill. Often good for fleets that can fuel on time-fill but need occasional "top off" or want/need ability to provide public access



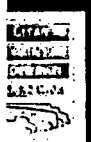
Q: How Do We Solve The "Chicken & Egg" Conundrum?

(A: Make a chicken-egg omelet*)

- Throughput (sales volume) is key to generating economies of scale for the public access station owner, thus allowing pump price differentials that drive reasonable payback and life-cycle savings for customers

- Minimum load thresholds vary based on a variety of factors including: station type, station size, fuel price differential, ability to amortize maintenance costs, equipment depreciation, grants .....ROI expectations

- Achieve minimum load thresholds by:
  - Identifying an anchor fleet that justifies the investment...or
  - Aggregate several semi-anchor fleets' loads if their depots or operating areas are geographically acceptable...or
  - Create retail public access for small fleets and consumers....or
  - All of the above



Station Options

- Station Location Options:
  - Offsite – use existing public access station if available, convenient and of sufficient capacity. Anchor fleets or 'pooled loads' create economies of scale.
  - Onsite - private access only or with public access "outside the fence"

- Different ownership & operations options available depending on throughput, funding:
  - Fleet owned & operated station
  - Outsource station O&O entirely via independent fuel provider and contract gas price
  - Fleet owned/leased station but contracted out operations for a fee (usually on a GGE basis)

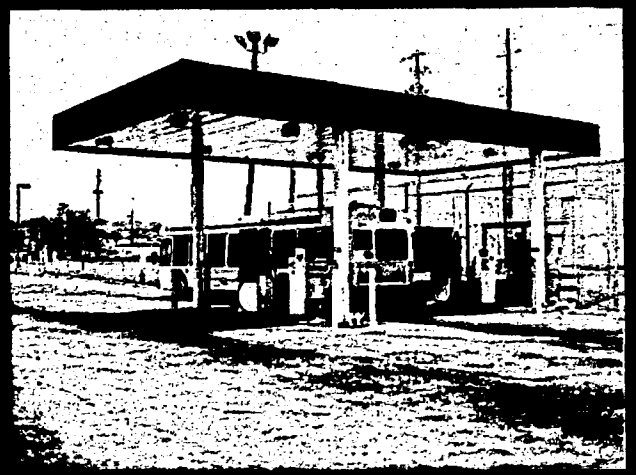
Natural Gas Station Development and Ownership-Operations Options: #1

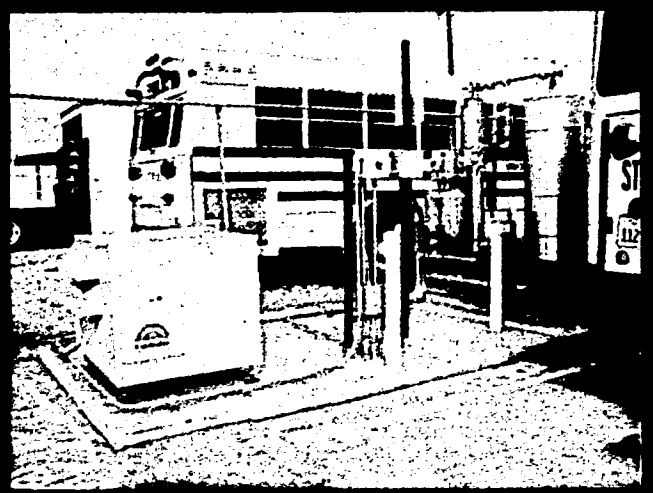
Fleet owns & operates station

- Fleet takes responsibility for building and then operating its own station. Fleet works with vendors or design consultant, manages build-out and takes responsibility for PM (parts, etc).

- Applies to small-to-mid sized fleets that do not have offsite options nearby, b/c their fuel use does not meet the threshold required by most LDCs or independent developers to invest in developing, owning and operating station for them.

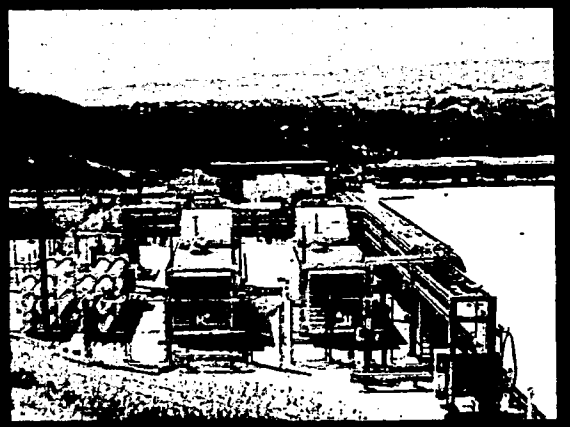
- Some large fleets also opt for this but many do not have experience nor want responsibility for station operations and maintenance

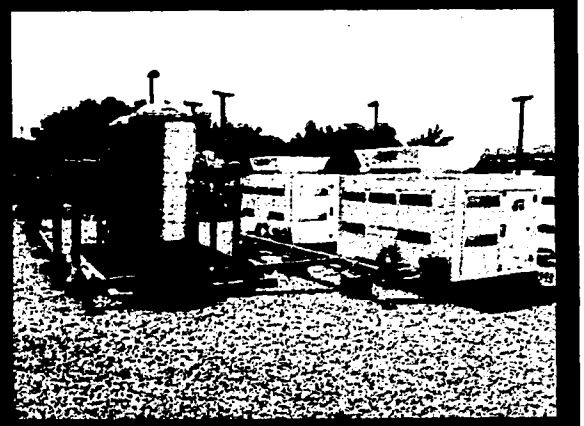




Natural Gas Station Development and Ownership-Operations Options: #2

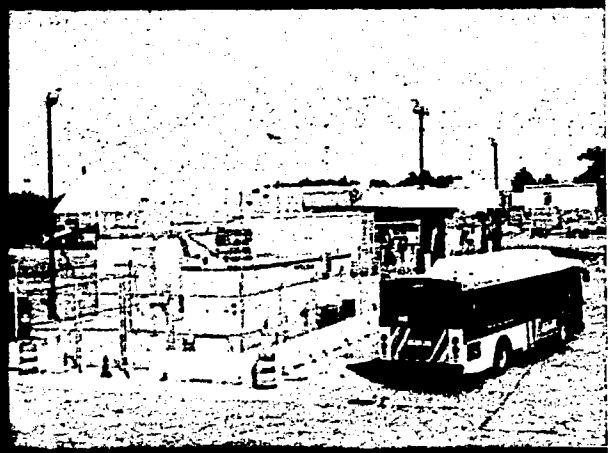
- Outsource station development, ownership, O&M to independent fuel provider
  - Fleet serves as anchor for independent operator's station, contracts long term fuel agreement with set price(s) and expected throughput for duration.
  - One stop shop. All capital investment and O&M risks are borne by independent fuel provider while fleet focuses on core competencies.
  - Fleet usually provides low-cost lease for property – important to making deal work - land is costly!
  - Often allows fuel provider option to create public access as well – sometimes a "royalty" paid back to fleet for retail sales from premises





Natural Gas Station Development and Ownership-Operations Options: #3

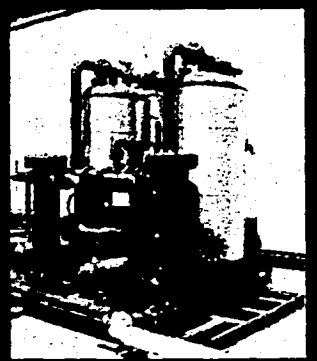
- Fleet owns/leases station but contracts out operations for a fee (e.g., monthly fee or GGE basis)
  - Option used by many large fleets that need/desire ownership of their own station equipment but want to reduce risk, assure best O&M practices, etc
  - Contract is often (but not always) awarded to the firm that builds station; usually a 5-7yr contract.
  - Some fleets that initially Own & Operate their own stations decide that they want to delegate to others – put out RFP for O&M contract
  - Decision weighs pros/cons of "leaving $ on table" versus potential downtime risks, maintaining parts inventories, updated training of techs, etc



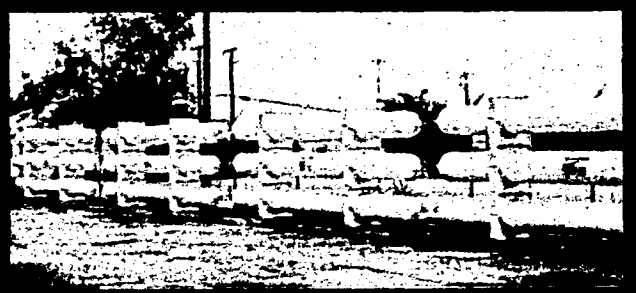
CNG Station Design Considerations

- How Much Fuel in How Much Time?
  - Vehicles/day, fuel/vehicle, fueling patterns
  - Maximum *daily* flow, maximum *hourly* flow, targeted fueling time per hose
  - Back-up fueling availability? Redundancy

- Real estate concerns
  - Proximity to major travel routes
  - Vehicle needs (entry/egress patterns)
  - Equipment footprint
  - Site development issues



- Equipment needs/performance/cost
  - Balance of compression and storage
  - Gas service (volumes/pressures, moisture)
  - Electric service (kVa, etc)
  - Dispensers and fuel management needs



Implementation: How do we transition?

- Communicate benefits to your staff to get their "buy in" and to create feedback mechanisms that keep your program on track. Tell your customers; show environmental stewardship.

- Identify your internal champion, assemble stakeholders and resources; learn from others' successes, don't repeat mistakes… Use the resources of your Clean Cities Coalition

- Maximize use of OPM while it is available. Investigate other creative financing/leasing and station operation options. Learn how to purchase gas to lower fuel costs.

- Connect with your Clean Cities Coalition and fed/state agencies. Prepare fleet inventory replacement schedule and fuel use projections. Contact LDC, vehicle, fuel station development and/or equipment providers. Get started!

5 Tips that Make Some Grant Applications More Successful Than Others

- Speak to the area of interest/evaluation criteria of the funding agency
- Clearly spell out the proposed benefits, the criteria by which you plan to measure those benefits, the action plan and the proposed processes in place to manage resources/take corrective action mid-stream to achieve the goal(s).
- Leverage funding of multiple stakeholders.
- Communicate succinctly and effectively
- Meet the administrative requirements

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