

Streamlining Fueling for the Growing Natural Gas Vehicle Market

Transportation Infrastructure Revenue Subcommittee

Sherrie Merrow

Co-Chair, New Mexico NGV Coalition

Colin Messer

Clean Energy Program Manager, NM EMNRD

Blake Littauer

Manager, Transit Business Development, Clean Energy Fuels

November 12 | 2013



New Mexico
NGV Coalition

Natural Gas Value Proposition



abundant fuel

Canada and the U.S. have approximately a 100 year supply of natural gas.



reduced emissions

Natural gas reduces Green House Gas emissions by 20-30% when compared to diesel and gasoline.



lower cost

Natural gas is 20-30% more affordable than diesel or gasoline.



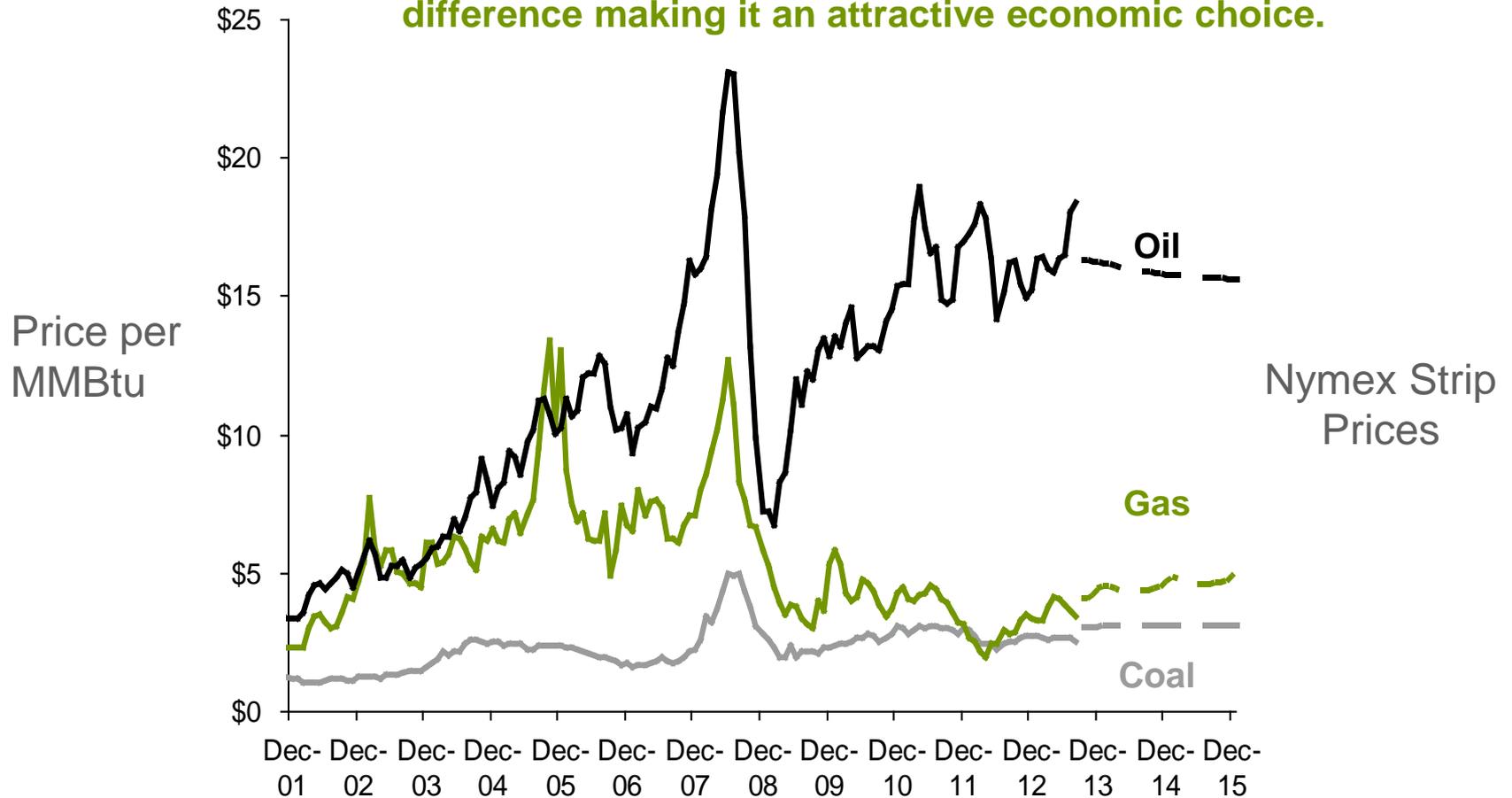
energy security

In 2010, the U.S. imported 49% of the petroleum it consumed. Natural gas is produced domestically.

Historic Energy Commodity Price Spreads

Situation Enables Expanded Markets for Natural Gas

Abundance of Natural Gas expected to sustain price difference making it an attractive economic choice.



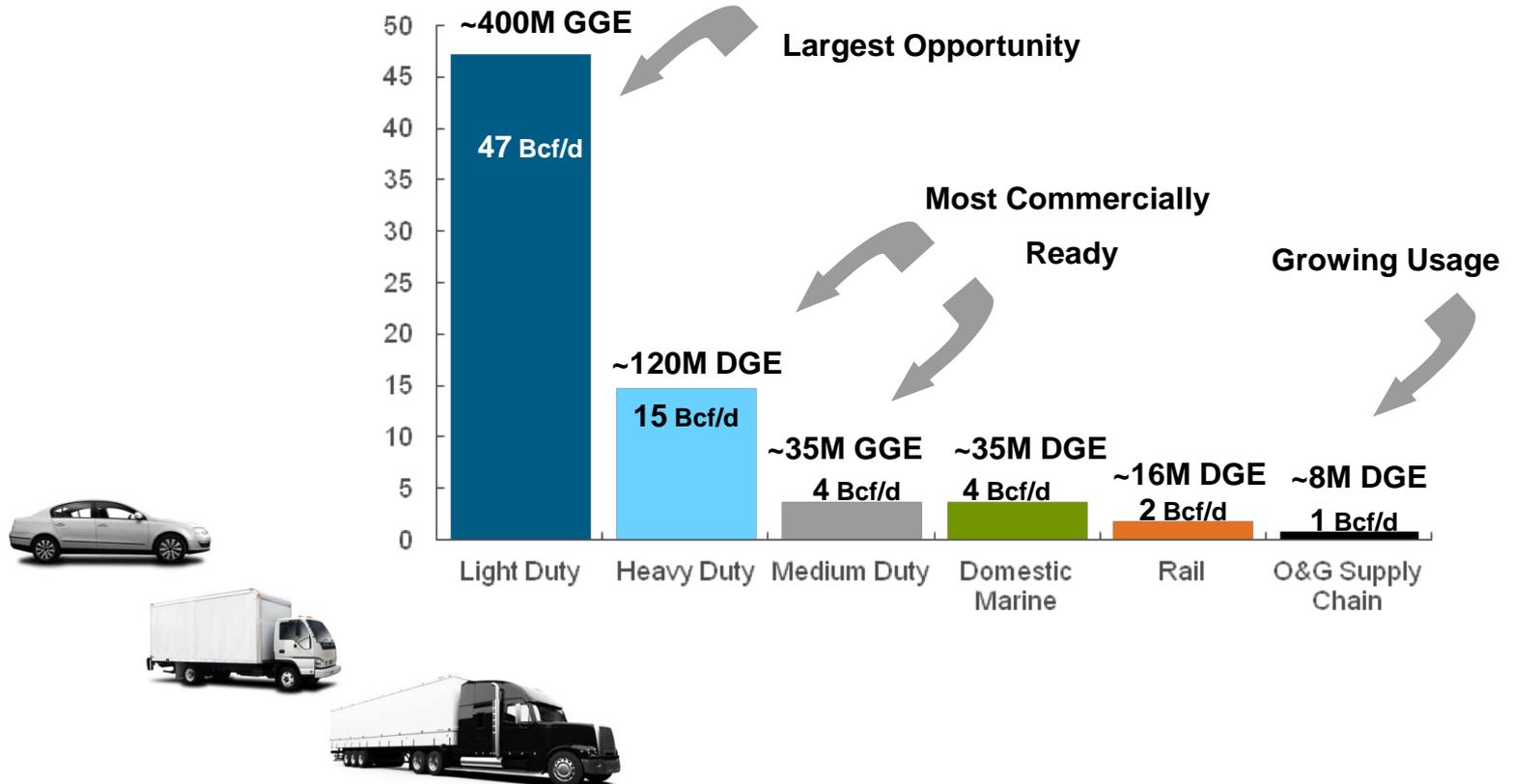
Source: NYMEX oil, coal, and gas spot prices. Forward prices as of September 2013.

The Transportation Sector

USA and Canada (Bcf/d)

CURRENT FUEL CONSUMPTION BY MARKET SEGMENT

Displaceable Market Volume: 73 Bcfe/d or 614M GGE/DGE per day



Fortune 500 Adoption of CNG & LNG

- 4 of the Fortune 10 are using natural gas fuels for transportation
- >10% of the Fortune 100
 - Wal-Mart (LNG trucks)
 - Berkshire Hathaway (Locomotive project)
 - General Electric (CNG trucks)
 - AT&T (CNG vans)
 - Verizon (CNG vans)
 - Procter & Gamble (CNG trucks)
 - PepsiCo (CNG trucks)
 - Comcast (CNG vans)
 - UPS (LNG trucks)
 - Lowe's (LNG trucks)
 - FedEx (LNG trucks)
 - Sysco (LNG trucks)

1  Wal-Mart Stores

2  Exxon Mobil

3  Chevron

4  Phillips 66

5  Berkshire Hathaway

6  Apple

7  General Motors

8  General Electric

9  Valero Energy

10  Ford Motor

Natural Gas – Working for New Mexico

- Leading NG producing state (10% of U.S. production)
 - San Juan Basin – Nation’s largest proved NG reserves
 - Permian Basin – 3 of the Nation’s 100 largest oil fields
- More than 46,000 total jobs (5% of total employment)
- \$3.5 billion in economic output
- \$4.3 billion in direct value added to the state



New Mexico NGV Coalition

Natural Gas for Transportation

The purpose of the Coalition is to advance natural gas infrastructure and vehicle growth in New Mexico through planning for best infrastructure placement, connecting stakeholders together to create the infrastructure, and engaging appropriate fleets and vehicles.

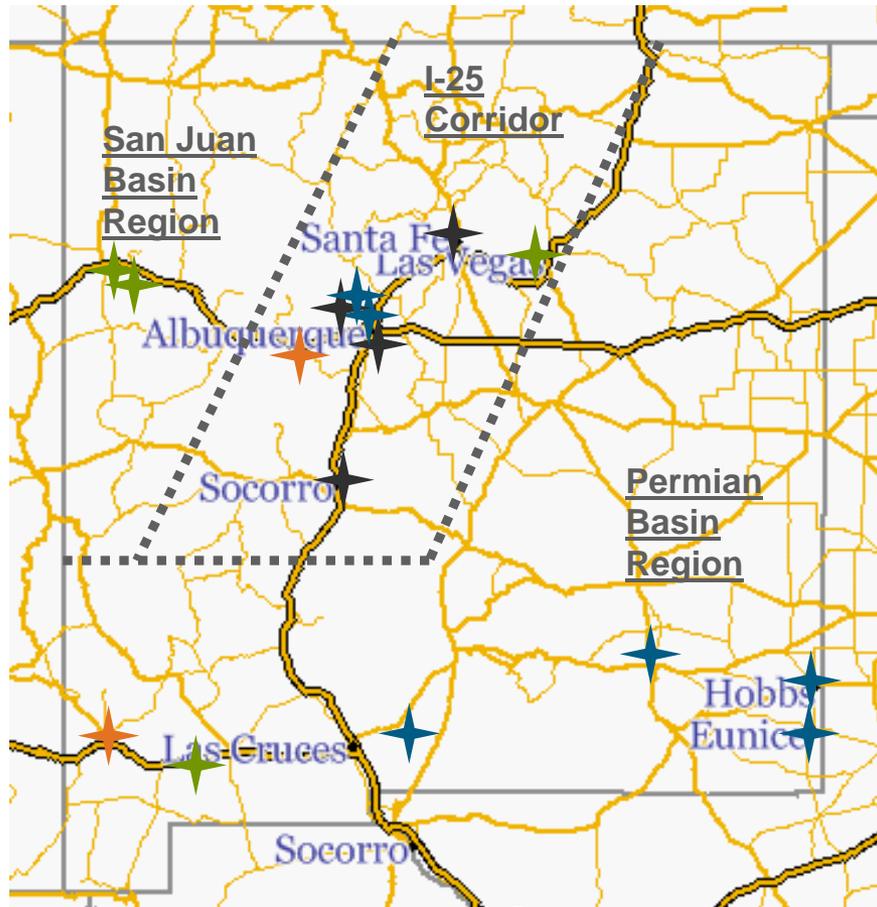


Energy, Minerals and Natural Resources Department



Natural Gas Fueling Stations

Regional Leadership in New Mexico



10 Existing CNG Stations

- ★ 4 Public - Albuquerque (2), Santa Fe, Socorro
- ★ 6 Private - Albuquerque (2), Artesia, Eunice, Hobbs, White Sands

3 Planned CNG Stations

- ★ Deming (2-1 private), Gallup, Farmington? Las Vegas? Las Cruces?

2 Planned LNG Stations

- ★ Albuquerque, Lordsburg

Regional Leadership

I-25 Corridor – EMNRD, LOE Clean Cities Coalition

Permian Basin Region – Apache

San Juan Basin Region – Ray Hagerman, EMNRD, LOE Clean Cities Coalition

Who's Converting in New Mexico?

- State of New Mexico
- University of New Mexico
- Municipalities
 - City of Albuquerque
 - City of Santa Fe
 - City of Socorro
- ABQ Ride
- Albuquerque International Sunport
- Santa Fe Trails Transit
- City of Santa Fe Environmental Services
- Sandia National Laboratory
- White Sands Main Post
- Waste Management
- Natural Gas Producers
 - Vehicles
 - Rigs, equipment



NGV MOU

States are Leading the Way for NGVs

Led by CO, OK, PA and WY, states are joining together to use NGVs in state fleets

- Aggregate vehicle purchase numbers for auto manufacturers to submit a joint RFP that all states can use - completed
NGVs being delivered now
- Commit to converting state fleets (county, municipal, and other government) – in progress
- 16 signatories to date (CO, OK, WY, PA, UT, ME, NM, WV, KY, TX, OH, MS, LA, AR, VA & TN) and 7 states in support (CT, HI, MN, MT, NV, SC and VT)



Memorandum of Understanding

This Memorandum of Understanding (MOU) describes a coordinated effort between the undersigned States (States) to attract automobile manufacturers in the U.S. to develop a functional and affordable original equipment manufacturer (OEM) fleet natural gas vehicle (NGV) that will also meet public demand. The States recognize the benefits and unique attributes of clean burning natural gas and understand the significant opportunity compressed natural gas (CNG) presents to save State and taxpayer dollars by encouraging an energy future that utilizes domestic energy resources to fuel our nation's transportation needs. Through the joint solicitation of a Multi-State Request for Proposal (Joint-RFP) that aggregates annual State fleet vehicle procurements, the States will endeavor to provide a demand base sufficient to support the design, manufacture, and sale of functional and affordable OEM NGVs by automotive manufacturers in the United States.

In anticipation of soliciting a Joint-RFP, the States will endeavor to coordinate with local agencies, municipalities, and companies to determine the number of NGVs each State can commit to purchase and the required specifications necessary to meet fleet needs. The Joint-RFP shall require that the ultimate cost of an OEM NGV should be comparably priced to an equivalent gasoline powered model and that warranty and reliability concerns are not compromised. Simultaneously, the States understand the need for continued development and expansion of CNG fueling infrastructure and should endeavor to encourage private investment, predicated on demonstrating an anticipated increase in State NGVs, to meet growing demand.

Pursuant to the terms of the Joint-RFP, to be executed at a later date, the States intend, where practical, to transition new fleet vehicle acquisitions, in committed volumes, to a resulting OEM NGV. Such future acquisitions should, when economically feasible, rely on traditional distribution channels that incorporate local businesses in procurement processes. In continued recognition of the benefits of CNG, the States should also endeavor to pursue fleet vehicle conversions to CNG, where economically compelling, based on a life-cycle cost analysis. The States will also reach out to fellow Governors to determine broader interest and participation in the principles and process outlined in this MOU.

This MOU embodies the principle understandings of the States but shall not create any legal relationship, rights, duties, or obligations binding or enforceable at law or in equity. Notwithstanding the foregoing, each State shall in good faith endeavor to reach a mutually agreeable and economically beneficial Joint-RFP, as contemplated herein. This MOU does not create additional state power, enhance existing state power, or interfere with federal authority or law. This MOU shall continue to demonstrate the States' understanding until execution of the Joint-RFP, or until otherwise discontinued by either State.

Set forth by:

State of Oklahoma

Mary Fallin, Governor
November 9, 2011

State of Colorado

John Hickenlooper, Governor
November 9, 2011

Natural Gas Solutions

Compressed Natural Gas (CNG)

- Source: Pipeline
- Compressed to 3,600 psi
- Focused on light and medium duty vehicles, but has heavy duty capability
- Ideal for return-to base fleets or fleets that require fast-filling
- Time-fill and fast-fill capability / stored in pressurized tanks

Liquefied Natural Gas (LNG)

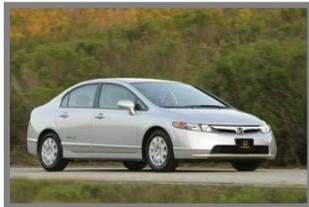
- Source: Liquefaction Plant
- Converted to liquid form for ease of storage and transport (Cooled to -260° F and 40 psi)
- Ideal for medium to heavy duty fleets
- Fast-fill / stored in tanks (similar to diesel size)



Vehicle Categories – Choices Already Exist

CNG Options

Light Duty



Medium Duty



Heavy Duty



LNG Options

Heavy Duty On Road



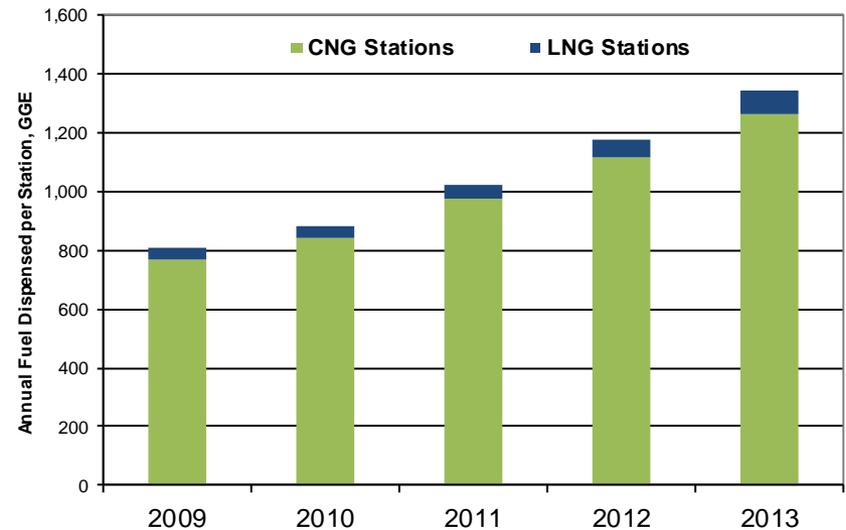
Heavy Duty Off Road



U.S. Market Natural Gas Infrastructure

- Since 2009:
 - 64% increase in CNG stations
 - 125% increase in LNG stations
- Planned Stations:
 - 113 CNG stations
 - 69 LNG stations
- Regional Corridors:
 - Rocky Mountains
 - CA Interstate Clean Transportation
 - I-75 Corridor
 - Texas Triangle
 - Ark-La-Tex

1,263 CNG stations and 81 LNG stations



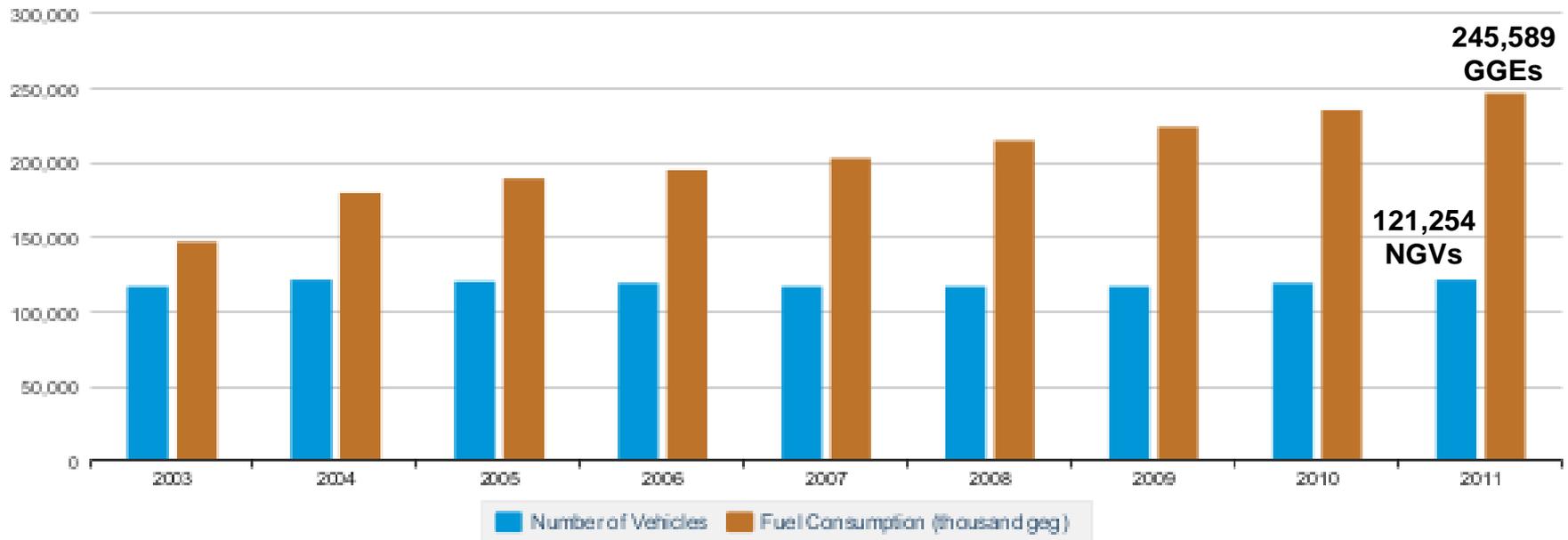
Top States for NGV Stations

- California: 300
- New York: 111
- Utah: 95
- Oklahoma: 93
- Texas: 73
- Pennsylvania: 50

U.S. CNG/LNG Vehicles and Fuel Consumption

40% growth in fuel usage due to steady growth in stations

Yearly Estimates



Collecting Excise Tax on CNG/LNG - Current

- New Mexico Currently Uses a Decal System
 - Assumes “manned” stations so that the decal may be viewed
 - Current decal charges may not be accurate to gallons dispensed and do not cover vehicles above 54,000 lbs.
 - Differs from the excise tax process for gasoline and diesel
- LNG Issue
 - CNG has a gasoline gallon equivalent (GGE) definition of 5.66 lbs. or 126.67 cubic feet of CNG – excise tax is calculated accurately
 - LNG, being a liquid, has simply been taxed by the gallon (often at the same tax rate as diesel) but the energy content of a diesel gallon and a LNG gallon are different
 - 1 diesel gallon equivalent (DGE) = 1.7 LNG gallons
 - Excise tax should be calculated using a defined DGE of LNG



Collecting Excise Tax on CNG/LNG - Proposed

- Create the same “Pay at the Pump” Experience as Gasoline and Diesel
- Define CNG/LNG Energy Equivalence to Gasoline/Diesel
 - GGE = 5.66 lbs. or 126.67 cubic feet of CNG
 - DGE = 6.06 lbs. LNG
- Dispense CNG and LNG using these definitions
- Charge Excise Tax using these definitions



Natural Gas...

From New Mexico, For New Mexico!



New Mexico
NGV Coalition