Natural Gas Infrastructure Replacement and Expansion Efforts

Ohio Gas Association Meeting
April 15, 2014
Washington, D.C.
The American Gas Association (AGA), founded in 1918, represents more than 200 local natural gas utilities that deliver natural gas to 177 million Americans nationwide. In addition, AGA’s broader membership includes natural gas pipelines, Canadian local distribution companies, natural gas gatherers, marketers and storage companies and more than 350 associate members who provide critical products and services to the natural gas industry.
The U.S. estimated future supply of natural gas (reserves plus resources) stood at 2,689 trillion cubic feet (Tcf) at year end 2012 — enough natural gas to meet America’s diverse energy needs for decades.
Fueling the Future with Natural Gas: Bringing it Home

• “For many decades natural gas regulation was based on assumptions of resource scarcity. An opportunity now exists to redefine regulatory policies, financial outreach and technology innovation from a position of strong supply and expectations of long-term price stability.”

• “The new outlook for natural gas cost and availability is contributing jobs and revenues to the economy at the national, state and local levels. It has also created new possibilities for making progress toward national goals of energy efficiency, cost efficiency, environmental protection and energy security.”
Pipeline Safety
Natural Gas Distribution System

- **Safe, reliable natural gas delivery is a top priority and core value**
- **AGA Board of Directors has designated pipeline safety as AGA's number one priority**
- **Repair, Replacement, Reconditioning**
Pipeline Safety Regulations

- DOT Pipeline Safety & Hazardous Materials Administration (PHMSA)
  
  Regulates gas utilities under 49 C.F.R. Part 192

- Significant number of new requirements on the way

  More than 80 mandates from Congress and recommendations from NTSB, GAO, and the OIG

PHMSA’s Other Initiatives:

- Transmission Integrity Management Program (TRIMP)
- Distribution Integrity Management Program (DIMP)
- Control Room Management
- Damage Prevention
- Land Use Planning
- Public Awareness
- Emergency Preparedness
## PHMSA Rulemaking Procedures

<table>
<thead>
<tr>
<th>Rulemaking &amp; Next Action</th>
<th>Estimated Date to OMB</th>
<th>DOT Estimated Publication Date</th>
<th>OIRA Estimated Publication Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excess Flow Valves; NPRM</td>
<td>March 17, 2014</td>
<td>June 27, 2014</td>
<td>May 2014</td>
</tr>
<tr>
<td>Issues Related to Use of Plastic Pipe in the Gas Pipeline Industry; NPRM</td>
<td>No Date Announced</td>
<td>April 2014</td>
<td>April 2014</td>
</tr>
<tr>
<td>Valve Installation and Minimum Rupture Detection Standards; NPRM</td>
<td>September 18, 2014</td>
<td>December 29, 2014</td>
<td>TBD</td>
</tr>
<tr>
<td>Miscellaneous Amendments to Pipeline Safety Regulations; Final Rule</td>
<td>March 27, 2014</td>
<td>July 9, 2014</td>
<td>August 2014</td>
</tr>
<tr>
<td>Periodic Updates of Regulatory References to Technical Standards and Miscellaneous Amendments; Final Rule</td>
<td>March 7, 2014</td>
<td>June 18, 2014</td>
<td>TBD</td>
</tr>
</tbody>
</table>

*Source: DOT’s March 2014 Significant Rulemaking Report*
DOT Pipeline Safety Action Plan

- Raises the bar on pipeline safety
- Accelerates rehabilitation, repair and replacement programs for high risk pipelines
- Focuses on cast iron, bare steel, older plastic

In Section 7 of the Pipeline Safety, Regulatory Certainty, and Job Creation Act of 2011, Congress directed the Secretary of Transportation to develop a report on the national cast iron inventory

- Reports to the Nation on Pipeline Safety
- AGA Supports the Action Plan and “Smart Modernization” of infrastructure that is no longer fit for service
The overall trend is positive

Nine states moved to adopt programs in 2013, alone

States address this issue differently

The basis for these decisions is always just and reasonable rates for consumers
RESOLVED, That the Board of Directors of the National Association of Regulatory Utility Commissioners... 

encourages regulators and industry to consider sensible programs aimed at replacing the most vulnerable pipelines as quickly as possible along with the adoption of rate recovery mechanisms that reflect the financial realities of the particular utility in question; and be it further;

RESOLVED, That State commissions should explore, examine, and consider adopting alternative rate recovery mechanisms as necessary to accelerate the modernization, replacement and expansion of the nation’s natural gas pipeline systems.
Smart Modernization

• Infrastructure replacement programs, if designed and coupled properly, provide the opportunity to put new technology in the ground which could allow for greater pipeline capacity and pressure in a given area.

• With greater capacity, utilities are better positioned to expand to serve more customers.
Pipeline Expansion
Drivers for Expansion

- Economic development
- Reductions in consumer energy prices
- Environmental quality (GHG reduction, efficiency)
- Energy security

The low price of natural gas has attracted investment by utilities.

Where natural gas is available, a builder will put it in 84 percent of the time.

Natural gas will have 80 - 90 percent of the market where lines reach, but there is a significant amount of construction and/or area beyond reach of utility lines.
Impediments to Expansion

• **Economic viability**
  - Main line costs vary depending on topological and environmental factors
  - The average cost is approximately $1 million per mile
  - A utility must determine whether increased throughput from expansion will be sufficient to cover the costs of expanding a line
  - Under traditional rate constructs, it is often not economical

• **Other issues**
  - Permit streamlining
  - Land access
  - Workforce coordination
States with Infrastructure Expansion Programs

18 states presently have or are considering an innovative infrastructure expansion program or policy.

Recent Examples:
- Washington
- Georgia
- Mississippi
- Connecticut
- Nebraska
- Pennsylvania
Economic Impact: Pacific Northwest Example

- Washington HB 2177
- Utilizing the Regional Economic Models, Inc. (REMI) tool to provide analysis, if passed, the resulting economic impact of the legislation would be:
  - A long term boost in net employment creating approximately 400 permanent jobs for the region through 2040
  - Over $1.6 billion in cumulative GDP gains over the following 30 years with a sustained $75 million positive annual gains thereafter
  - $123 million in cumulative revenue gains for state and local governments over the following 30 years with a sustained $5 million positive annual gains thereafter
Role of State & Local Governments

- Authorize PUCs to allow system expansion costs to be recovered through general tariffs
- Provide subsidies for expansion of gas networks to unserved areas that meet established density criteria (via economic development grants or state-backed bonds)
- Promote fuel conversion through information dissemination
- Adopt policies that move beyond a site-based approach to energy efficiency and move toward the use of the full fuel cycle
- Consider including natural gas expansion in comprehensive state energy planning
Working Together With Utilities

- Secure commitments from large anchor customers
- Mitigate initial customer charges
- Amortize consumer conversion costs
- Educate potential customers
- Gather bundled customer commitments
If not now, when?

- Low price of natural gas has attracted investment by utilities

- In the past decade, natural gas utilities have added 300,000 miles of distribution mains to serve 17 million customers, a 30% increase overall

- Yet there are still unserved areas interested in switching to or obtaining natural gas service

The goal should be to craft policy that allows for **smart modernization and growth** and to provide access to the myriad of benefits that natural gas offers.
Natural Gas Distribution

*Shrinking Emissions by the Numbers*

- **1000s** – miles of cast iron & bare steel pipe replaced with PE plastic pipe
- **300,000** – added miles of distribution mains
- **17 million** – number of new customers served (**30% increase**)  
- **16%** - emissions shrinkage since 1990
- **0.3%** - EPA estimated emissions of produced natural gas from distribution systems in 2011
Conclusion

• Safe, reliable gas delivery is core to our business.

• *Smart modernization* initiatives (pipeline replacement and expansion) are increasing safety and driving down natural gas emissions.
Kyle Rogers
Vice President, Government Relations
American Gas Association
400 N. Capitol St. NW
Washington, DC 2001

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www.linkedin.com/company/50905?trk=tyah
Fueling the Future with Natural Gas: 

*Bringing It Home*

Kathryn Clay, Ph.D.
Vice President, Policy Strategy
American Gas Association
Fueling the Future with Natural Gas: Bringing it Home
2014 Study

- The domestic market for natural gas can be greatly expanded beyond its current usage to provide new growth prospects for many sectors of the economy.

- Regulations put in place in a time of natural gas constraint need to be reevaluated to help to clear the way to achieve greater U.S. energy efficiency and support expansion efforts of natural gas utilities.

www.FuelingTheFuture.org
• “The new outlook for natural gas cost and availability is contributing **jobs and revenues to the economy** at the national, state and local levels. It has also created new possibilities for making progress toward national goals of energy efficiency, cost efficiency, environmental protection and energy security.”

- Fueling the Future with Natural Gas: Bringing It Home, IHS CERA, 2014
Natural gas prices will likely remain much lower than prices for competing fuels through 2035.

The new outlook for natural gas can help the country make progress toward national goals of energy efficiency, affordability, environmental protection and energy security.

Regulatory change, policy support, financial and technological innovation is needed for communities to fully realize the benefits of natural gas.

Policymakers should use a full fuel-cycle analysis to assess and compare various fuels and technologies.
Natural Gas: Fueling a Manufacturing Renaissance

Over the last three years, metro area manufacturing employment has expanded by an average annual rate of 1.7%. Energy intensive industry, in particular, has been a key component in manufacturing’s expansion. Recently tapped unconventional shale plays ...have boosted growth in both the manufacturing sector and the national economy.


“The most active industry pursuing growth in the United States is chemicals, which is expected to invest $135 billion in new facilities and to increase its natural gas use by 3 bcf per day by 2035.”

- IHS CERA, Fueling the Future

• “Our country’s natural gas supply should help us maintain cost competitiveness in manufacturing, reduce greenhouse gas emissions through the mid-term, increase our energy independence, and create good paying jobs and leaseholder opportunities in many parts of the country.”

• John P. Surma, Chairman and CEO, U.S. Steel
Strengthening the Economics of System Expansion

• Revisiting assumptions in economic tests for new expansion: load projections, timing, risk, time horizon
• Recognizing the connection between natural gas access and economic development – e.g. Nebraska, Mississippi, Connecticut

• Securing commitments from large anchor customers.
• Mitigating initial customer charges.
• Amortizing customer conversion costs.
• Educating potential customers.
• Gathering bundled customer commitments.
New technologies will help us capture the benefits of abundant natural gas.
Combined Heat and Power Technologies

The use of natural gas, the preferred fuel choice for CHP applications, allows for new electricity generation to meet current and future demand at costs up to 50% less than traditional forms of delivered new baseload electricity.

Separate Production of Electricity and Heat
TOTAL EFFICIENCY: 51%

Combined Heat and Power Systems (CHP)
TOTAL EFFICIENCY: 75%
There has been a 60% growth in our national CNG refueling infrastructure since 2009.
The new abundance of natural gas has changed our energy landscape – natural gas prices are independent of oil prices.
Price at the Pump:
The price structure of CNG buffers commodity volatility

Source: U.S. Energy Information Administration

Source: General Electric, Rethinking your Transportation Equation
Natural gas vs conventional gasoline

On average, CNG costs 47% less than gasoline

Source: CNG prices captured in October 2013 by CNGPrices.com
Gas prices reflect city average on October 20 from GasBuddy.com

Seattle
CNG - $1.60
Gas - $3.79

Salt Lake City
CNG - $1.26
Gas - $3.37

San Francisco
CNG - $2.44
Gas - $3.89

Los Angeles
CNG - $2.74
Gas - $3.81

San Diego
CNG - $2.89
Gas - $3.80

Omaha
CNG - $1.93
Gas - $3.68

Denver
CNG - $2.50
Gas - $3.45

Detroit
CNG - $1.94
Gas - $3.78

Nashville
CNG - $1.63
Gas - $3.59

Atlanta
CNG - $2.34
Gas - $3.72

Ft. Lauderdale
CNG - $2.19
Gas - $3.77

New York
CNG - $2.70
Gas - $4.03

Wash., DC
CNG - $2.40
Gas - $3.94

Denver
CNG - $2.50
Gas - $3.45

Source: CNG prices captured in October 2013 by CNGPrices.com

Gas prices reflect city average on October 20 from GasBuddy.com
Natural Gas Vehicles: Active Issues

• Equal treatment in tax policy: LNG/Diesel excise tax parity, energy basis for fuel tax credits

• Establishing a national standard “diesel gallon equivalent”

• Fuel quality survey – natural gas as a motor vehicle fuel

• EDF “Pump to Wheels” study – expected completion in May
A Context for the Utica Shale, Natural Gas Resource Abundance and Domestic Market Stability

Ohio Gas Association
Outcrop – Utica Shale

Unconventional Natural Gas Production in North America
2014 Key Market Observations for Ohio- IHS CERA

• North American demand is poised for growth.
• Utica Shale production now exceeds 700 MMcf per day.
• Utica infrastructure development is playing catch up.

If other states are any measure:
• Shale activity is and will be creating jobs in Ohio.
• Shale activity within Ohio will generate government revenues.
Utica Shale Production

• Total oil production grew from 4.9 million barrels in 2012 to 9.7 million barrels in 2013

• Natural gas production of 83 Bcf in 2012 increased to 203 Bcf in 2013

• 580 wells drilled in Ohio in 2013
2013-2014 Winter Heating Season

- January 2014 – Highest natural gas consumption month on record at 3.2 Tcf with highest consumption day (139 bcf) on January 7th – a strong consumption day had been more recently about 110 Bcf

- January 2014 – Highest daily average natural gas to power generation on record for a winter heating season month (21.4 Bcf/d) and highest peak day demand for power gen during winter heating season on January 7th (31 Bcf)

- January 2014 – largest net withdrawal of working gas for a month at more than 950 Bcf, surpassing previous record of 847 Bcf set in January 2003
## Peak Day Natural Gas Supply and Disposition – January 7, 2014

<table>
<thead>
<tr>
<th>Domestic Natural Gas Supply (Bcf/d)</th>
<th>Peak Day Avg. 2008/2010/2012</th>
<th>1/7/14</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dry Gas Production</td>
<td>52.1</td>
<td>61.9*</td>
<td>+19</td>
</tr>
<tr>
<td>Canada Imports (Net)</td>
<td>9.1</td>
<td>7.7</td>
<td>-15</td>
</tr>
<tr>
<td>LNG Imports</td>
<td>2.4</td>
<td>1.0</td>
<td>-58</td>
</tr>
<tr>
<td>Underground Storage (Net)</td>
<td>41.9</td>
<td>68.1</td>
<td>+63</td>
</tr>
</tbody>
</table>

### Consumption by End-Use Sector (Bcf/d)

<table>
<thead>
<tr>
<th>End-Use Sector</th>
<th>2008/2010/2012</th>
<th>1/7/14</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential/Commercial</td>
<td>55.9</td>
<td>78.4**</td>
<td>+40</td>
</tr>
<tr>
<td>Industrial</td>
<td>19.9</td>
<td>24.0</td>
<td>+21</td>
</tr>
<tr>
<td>Electric Power</td>
<td>25.2</td>
<td>31.2</td>
<td>+24</td>
</tr>
<tr>
<td>Mexico Exports</td>
<td>1.0</td>
<td>1.8</td>
<td>+80</td>
</tr>
<tr>
<td>Pipeline/Transportation</td>
<td>2.6</td>
<td>3.6</td>
<td>+39</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>104.6</strong></td>
<td><strong>139.0</strong></td>
<td>+33</td>
</tr>
</tbody>
</table>

*Well freeze-offs in Eastern US and Mid-Continent reduced daily production about 4 Bcf/d. Production essentially recovered in one week.*

**Record consumption volume.**

Source: Bentek Energy, LLC.
Incremental gas demand by year (Bcfd)

Source: Bloomberg New Energy Finance
Gas demand growth by sector (Bcfd)

Source: Bloomberg New Energy Finance
North American gas demand (Bcfd)

Source: Bloomberg New Energy Finance
Domestic Dry Natural Gas Production

U.S. Dry Natural Gas Production

Source: U.S. Energy Information Administration
Base case – North American production outlook by area

Dry gas production (Bcfd)

Source: Bloomberg New Energy Finance
Note: Rig count should not be viewed as comprehensive as we do not model every play.
Marcellus Shale production by area (Bcf/d)
Natural Gas Production

Figure 42. Natural gas production in China, Canada, and the United States, 2010 and 2040

trillion cubic feet
### Marketed natural gas in the top 10 producing states (2011-12)

<table>
<thead>
<tr>
<th>Ranking</th>
<th>2011</th>
<th>2012</th>
<th>State</th>
<th>2011-12 % change</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>1</td>
<td>Texas</td>
<td>+5%</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>2</td>
<td>Louisiana</td>
<td>-2%</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
<td>7</td>
<td>Pennsylvania</td>
<td>+72%</td>
</tr>
<tr>
<td>4</td>
<td>4</td>
<td>4</td>
<td>Oklahoma</td>
<td>+7%</td>
</tr>
<tr>
<td>5</td>
<td>5</td>
<td>5</td>
<td>Wyoming</td>
<td>-6%</td>
</tr>
<tr>
<td>6</td>
<td>6</td>
<td>6</td>
<td>Colorado</td>
<td>+4%</td>
</tr>
<tr>
<td>7</td>
<td>7</td>
<td>5</td>
<td>Fed. offshore</td>
<td>-17%</td>
</tr>
<tr>
<td>8</td>
<td>8</td>
<td>8</td>
<td>New Mexico</td>
<td>-2%</td>
</tr>
<tr>
<td>9</td>
<td>9</td>
<td>9</td>
<td>Arkansas</td>
<td>+7%</td>
</tr>
<tr>
<td>10</td>
<td>11</td>
<td>10</td>
<td>W. Virginia</td>
<td>+37%</td>
</tr>
</tbody>
</table>
U.S. Natural Gas Consumption and Reserves
(trillion cubic feet)

Total Working Gas in Underground Storage

Lower 48 States Natural Gas Working Underground Storage

Billion Cubic Feet

Source: U.S. Energy Information Administration
Net Injections Working Gas in Underground Storage
(Energy Information Administration)

Bcf/d

Short-Term Expectations
Domestic Natural Gas Price

Henry Hub Natural Gas Price

(dollars per million Btu)

Source: Short-Term Energy Outlook, February 2014.
Natural gas annual consumption, domestic supply, and net exports in AEO2014

trillion cubic feet

actual projected

Consumption

Domestic supply

Net exports

# DOE Non-FTA LNG Export Approvals

<table>
<thead>
<tr>
<th>Facility</th>
<th>Capacity (Bcf/d)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sabine Pass</td>
<td>2.20</td>
</tr>
<tr>
<td>Freeport LNG</td>
<td>1.80</td>
</tr>
<tr>
<td>Lake Charles</td>
<td>2.00</td>
</tr>
<tr>
<td>Dominion Cove Point</td>
<td>0.77</td>
</tr>
<tr>
<td>Cameron LNG</td>
<td>1.70</td>
</tr>
<tr>
<td>Jordan Cove</td>
<td>0.80</td>
</tr>
<tr>
<td><strong>Non-FTA Approved</strong></td>
<td>** 9.27**</td>
</tr>
<tr>
<td><strong>Total Non-FTA Applications</strong></td>
<td><strong>35.58</strong></td>
</tr>
</tbody>
</table>

*FERC approval up to 2.75 Bcf/d  
** FTA approval up to 2.80 Bcf/d  
*** FTA approval up to 1.0 Bcf/d  
**** FTA approval up to 1.2 Bcf/d
Natural Gas Energy Policy Future

- Pricing Carbon in the U.S. Economy
- Social License to Consume Fossil Fuels
- Meaning of “Winning” the Energy Competition
- Success of Energy Efficiency Investments
- What Regulatory Structure Allows for building that Last Mile of Infrastructure to Serve
- Will There be a “Plan”
- Geopolitics