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Natural Gas: Continued Growth in Maine?

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Chief Executive Officer
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October 9, 2014

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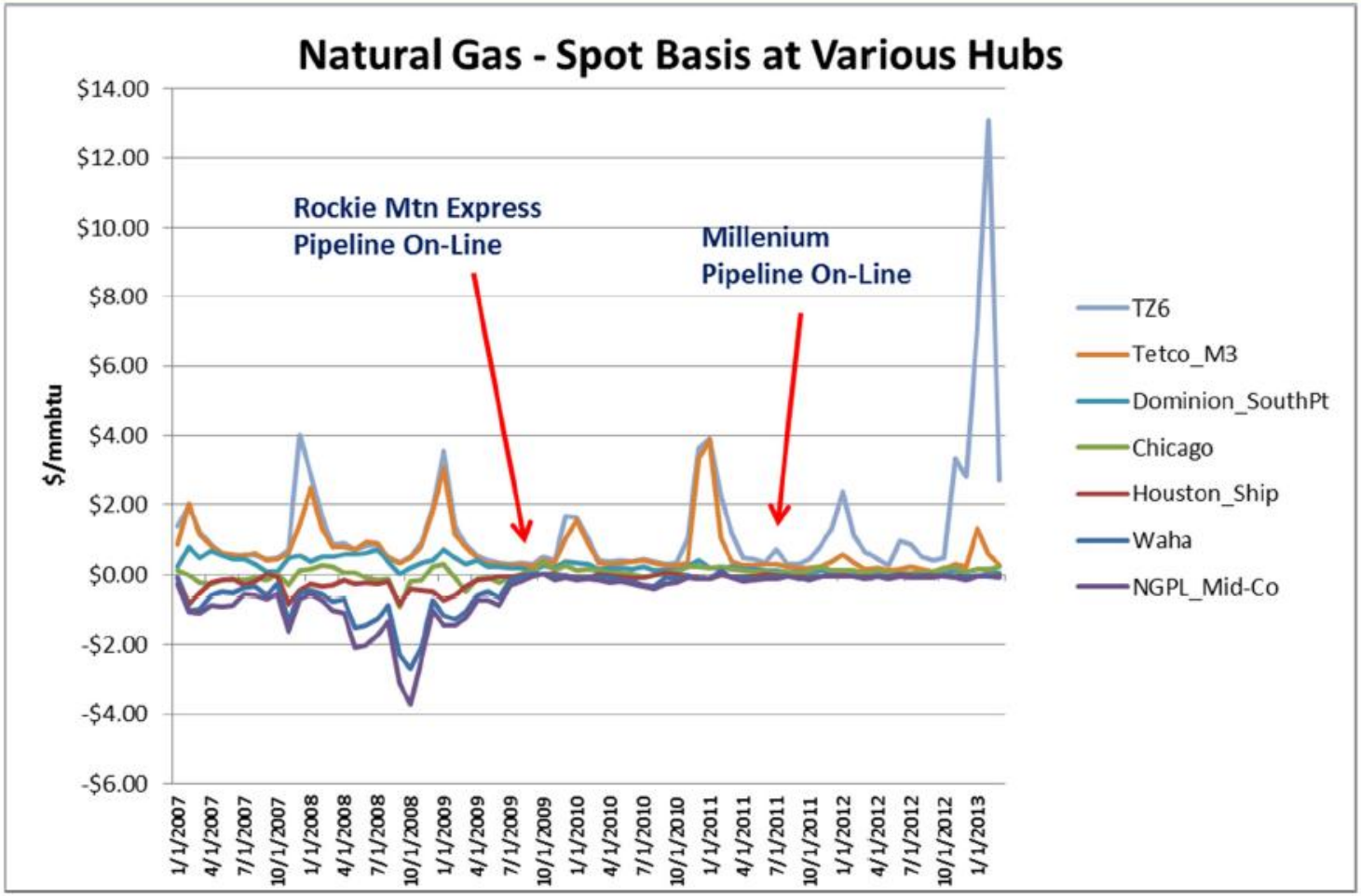
*Phone (207) 772-6190 * Fax (866) 743-4968*

Moving Gas to Markets



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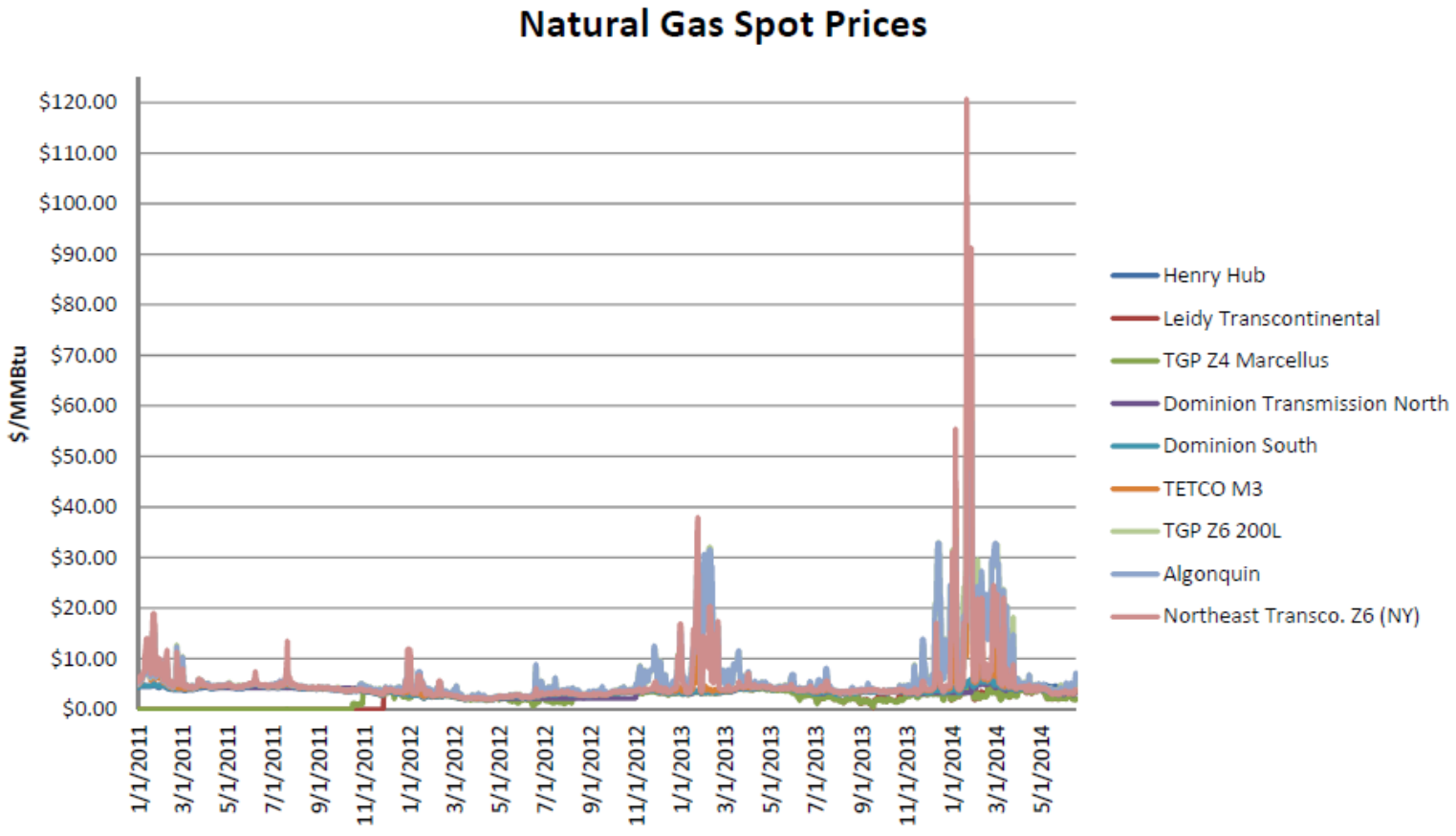

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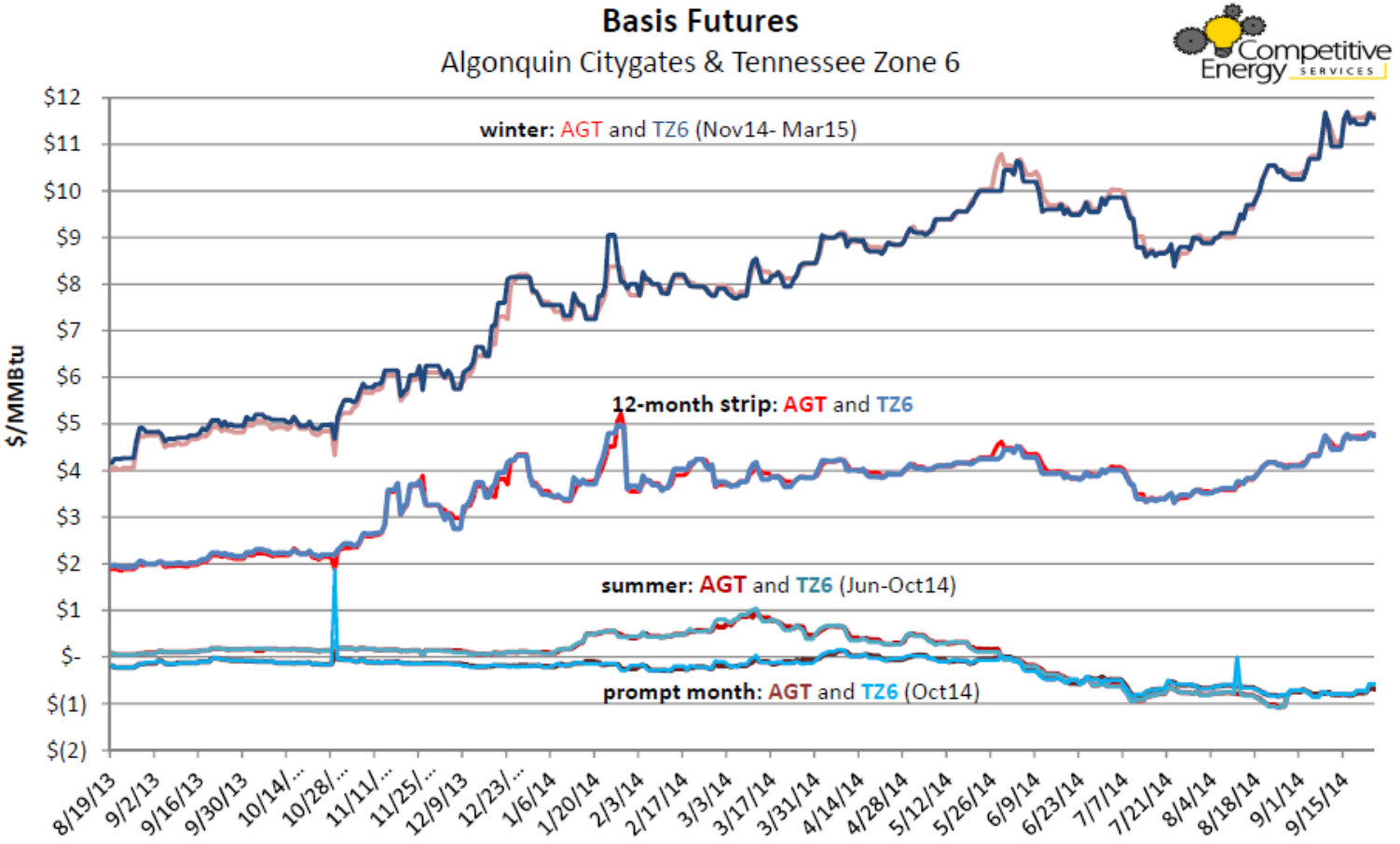
LNG Pricing



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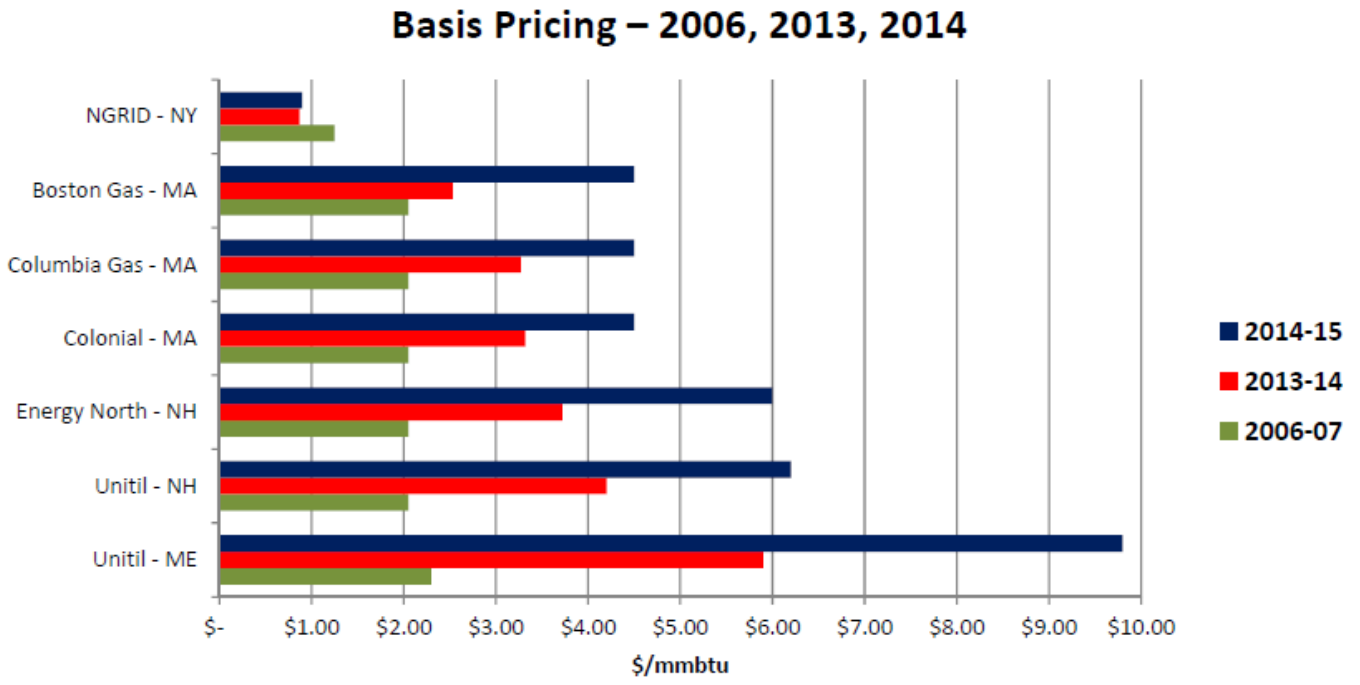
Economic Cost of Pipeline Constraints



Commercial customer with essentially identical facilities behind various LDCs in the Northeast.

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Moving Gas to Markets

Summary - Economic Value of Incremental Natural Gas Pipeline Capacity to New England Electric Consumers				
	Pipeline Capacity	Hours of Generation by Fuel Type		
Pipeline Capacity	bcf/d	LNG	Propane	Oil
Base Case	3,086	1502	233	183
+ 0.2 bcf/d Capacity	3,286	1147	168	138
+ 0.4 bcf/d Capacity	3,486	858	127	95
+ 0.6 bcf/d Capacity	3,686	641	86	68
+ 0.8 bcf/d Capacity	3,886	456	64	50
+ 1.0 bcf/d Capacity	4,086	336	48	39
+ 1.2 bcf/d Capacity	4,286	242	37	33
+ 1.4 bcf/d Capacity	4,486	174	31	27
+ 1.6 bcf/d Capacity	4,686	133	25	15
+ 1.8 bcf/d Capacity	4,886	93	13	11
+ 2.0 bcf/d Capacity	5,086	66	10	6
+ 2.2 bcf/d Capacity	5,286	49	6	6
+ 2.4 bcf/d Capacity	5,486	39	6	4

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Moving Gas to Markets

Pipeline Capacity	Annual Energy Costs ($)	Incremental Savings ($)	Cumulative Savings ($)	Load Weighted Avg. Energy Price ($/MWh)
Base Case	$7,945,735,821			$62.44
+ 0.2 bcf/d Capacity	$7,255,844,755	$689,891,066	$689,891,066	$57.02
+ 0.4 bcf/d Capacity	$6,664,449,979	$591,394,776	$1,281,285,842	$52.37
+ 0.6 bcf/d Capacity	$6,196,962,991	$467,486,988	$1,748,772,830	$48.70
+ 0.8 bcf/d Capacity	$5,779,395,509	$417,567,482	$2,166,340,312	$45.41
+ 1.0 bcf/d Capacity	$5,495,438,821	$283,956,688	$2,450,297,000	$43.18
+ 1.2 bcf/d Capacity	$5,263,210,225	$232,228,596	$2,682,525,596	$41.36
+ 1.4 bcf/d Capacity	$5,087,525,805	$175,684,420	$2,858,210,016	$39.98
+ 1.6 bcf/d Capacity	$4,977,290,940	$110,234,865	$2,968,444,881	$39.11
+ 1.8 bcf/d Capacity	$4,865,818,772	$111,472,168	$3,079,917,049	$38.24
+ 2.0 bcf/d Capacity	$4,787,981,865	$77,836,907	$3,157,753,956	$37.62
+ 2.2 bcf/d Capacity	$4,737,078,172	$50,903,693	$3,208,657,649	$37.22
+ 2.4 bcf/d Capacity	$4,705,966,963	$31,111,208	$3,239,768,858	$36.98

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Conclusions

- Plenty of Natural Gas
- Pipeline Constraints into N.E.
- Reliance on LNG/Oil during Winter Months Leads to Higher Prices and Much Higher Price Volatility
- Three Solutions
  - Major New Pipeline Capacity into New England
  - Abundant Shale Gas in New Brunswick
  - …..

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Moving Gas to Markets

t's News

courier-journal.com

TODAY, IN 1902

President Theodore Roosevelt became the first U.S. chief executive to ride in an automobile, in Hartford, Conn.

A2

MONDAY

AUGUST 22, 2005

Stealing natural gas in China

Two women carried a plastic bag containing natural gas siphoned from a well in Puheng Town, in central China's Henan province. Local peasants have been illegally taking natural gas from oil wells. Each bag can last a household for up to two weeks, but they are dangerous.

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Tina Shute

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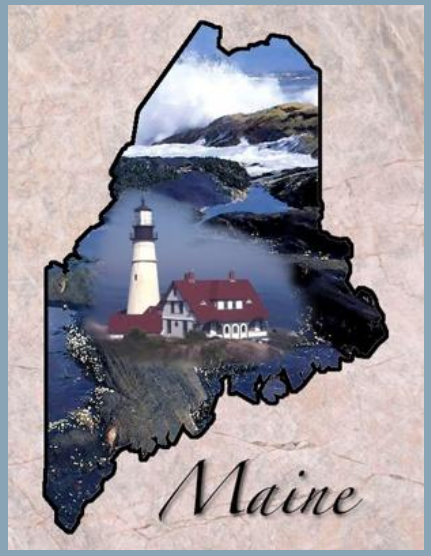


The Natural Gas Fuel Switch
October 9, 2014

Who/Where We Are

- Privately held, multi-disciplinary firm of over 100 consulting engineers and scientists
- Providing a wide range of environmental, geotechnical and energy services
- Founded in 1993

SANBORN HEAD

Client Service Areas

Industrial

Development

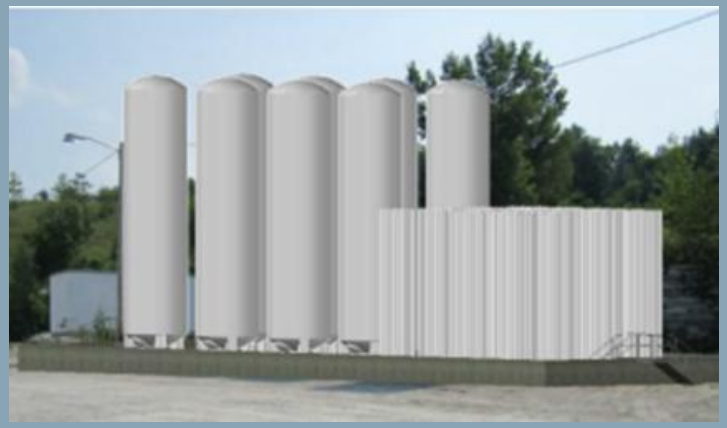
Solid Waste

Energy

SANBORN HEAD

Fuel Switch

- Industrial/Manufacturing entities (e.g., paper mills, aggregate companies) and campus settings (e.g. colleges/universities, hospitals) have large fuel requirements
- Many are considering switching from fuel oil to either CNG or LNG
- This is what we call the “fuel switch”



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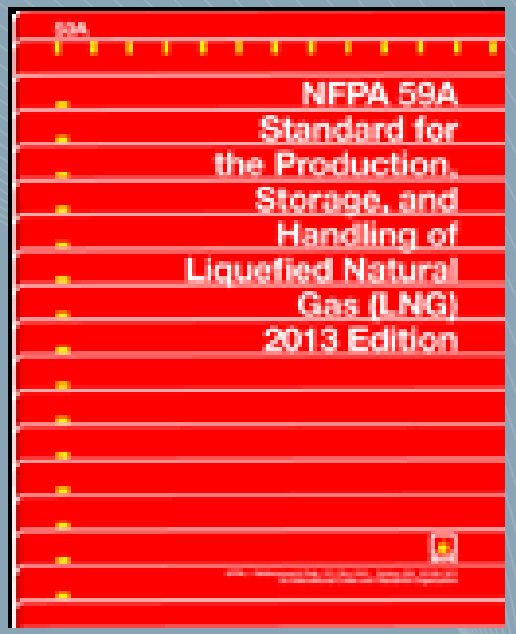
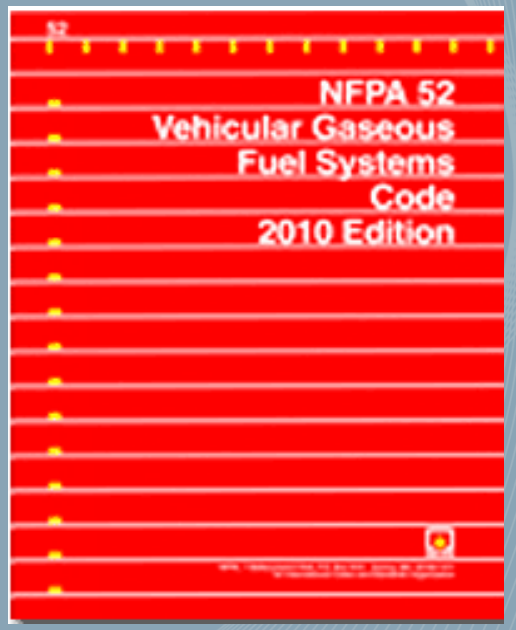
Our Role

Assist large fuel users in:

- Evaluating fuel options
- Siting
- Design
- Commissioning





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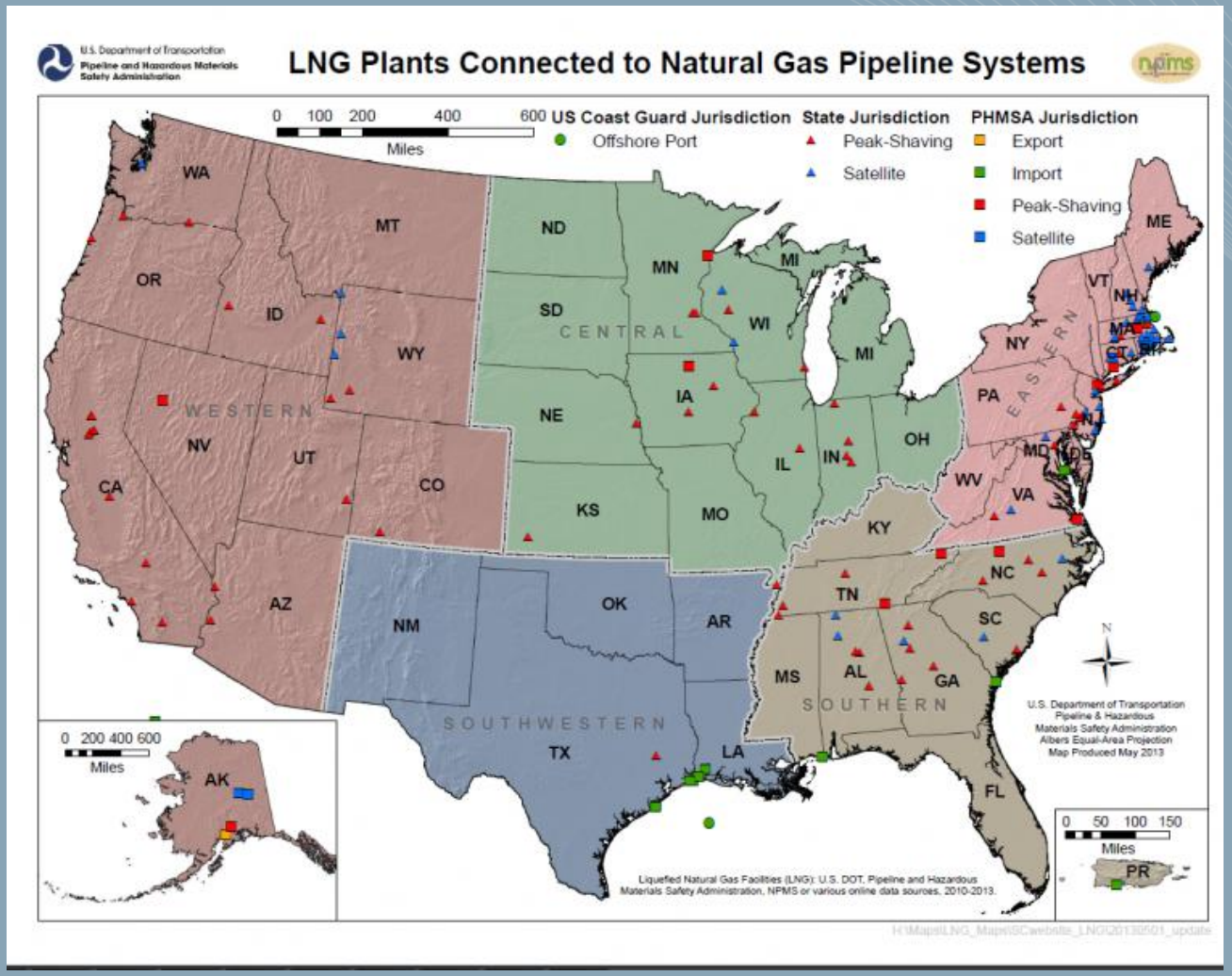
LNG Basics

- Liquid methane @ -260 °F
- ½ the unit weight of water
- Volumetric reduction: 620 to 1
- Not flammable as a liquid
- Used in U.S. since 1941
- Stellar safety record
- Over 100 million truck miles traveled

U.S. LNG Facilities



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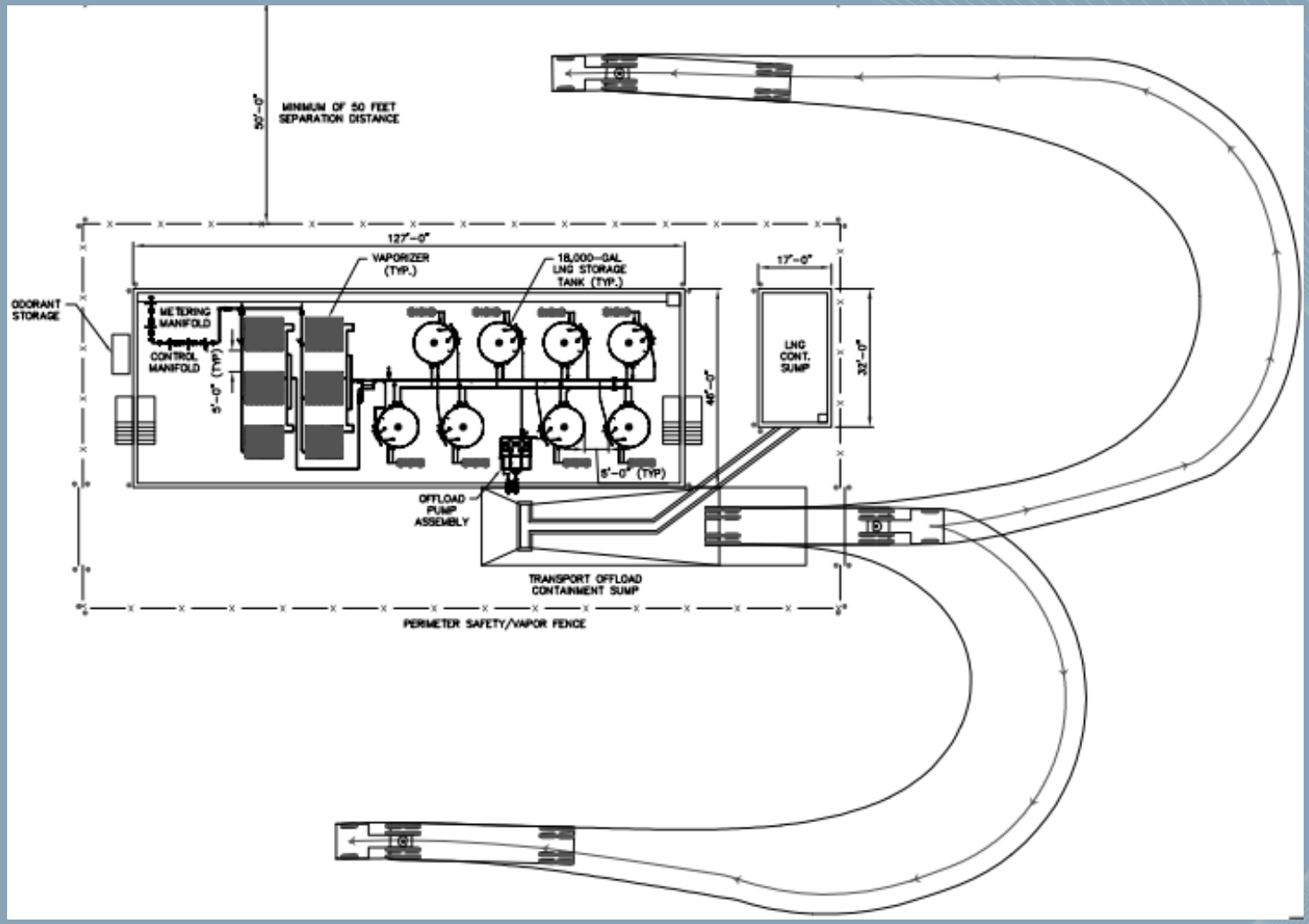
Representative LNG Facilities

Omya LNG Florence, VT

Waterville, ME

Yankee Gas Waterbury,CT

Small Scale LNG Facility Layout



LNG Challenges & Advantages

- Liquid Supply
- Siting/Governmental Obstructions
- CAPEX
- Shortage Of Expertise
- Anti-Frackers

- Energy Density/Days Of On-Site Storage
- Cost-Effective Compared To Oil
- Great Safety Record/Mature Regulations
- Domestic Abundance Of Natural Gas
- Environmentally Friendly

LNG Outlook

- A number of liquefiers in planning stages
- Utilities now focused on satellite LDC's
- Fuel diversity is a strategy
- NIMBY Evolution …….

“The Hurdle”
NIMBY Evolution

- NIMBY - Not In My Back Yard
- NINBY - Not In Neighbor’s Back Yard
- NOTE - Not Over There Either
- CAVE(men) - Citizens Against Virtually Everything
- BANANA - Build Absolutely Nothing, Anywhere, Near Anything (Anyone)
- NOPE -- Not On Planet Earth

PIERCE ATWOOD LLP

Regulatory and Commercial Issues in Obtaining Natural Gas Supply for Industrial and Commercial End-Users

Randall S. Rich
Pierce Atwood LLP
Washington, DC

Gas Supply and Transportation

- Dealing with Interstate Pipelines
  - New or Expanded Pipeline Projects
    - Open Seasons
    - Precedent Agreements
  - Transportation Agreements
    - Governed by Tariff
    - Firm or Interruptible
    - Other Services – Balancing, Park & Loan
    - Rates – Recourse or Negotiated
    - Fuel and Line Loss
    - Creditworthiness

Gas Supply and Transportation

- End-User Pipeline Facilities
  - Interconnection, Construction and Operating Agreements
  - The Plant Line Exception to FERC Jurisdiction
    - Interstate Commerce Begins at the Wellhead and Ends at the Burner Tip
    - Are you jurisdictional?
  - Pipeline Safety Regulation – PHMSA
  - Receiving CNG/LNG by Truck