Economic Opportunities for LNG Development in Louisiana

Prepared for the Louisiana Department of Economic Development and Greater New Orleans, Inc.

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Purpose of the Research

Why Should Louisiana Be Interested in LNG ?

1. LNG regasification facilities represent a major capital investment for the state

2. LNG allows Louisiana to leverage, and even extend our existing energy infrastructure

3. Louisiana has energy intensive users of natural gas and LNG expands a vital energy resource needed to preserve these industries

4. The development of LNG is an important national energy concern in which Louisiana can make a significant contribution

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LNG As A Major Capital Investment

- Potentially a $2.2 billion impact associated with the construction of LNG regasification facilities in Louisiana and the Gulf of Mexico; Potentially 13,877 jobs associated with the construction of these facilities

- Potentially a $220.7 million impact associated with the annual operation of LNG facilities in Louisiana and the Gulf of Mexico; Potentially 1,607 jobs associated with the operation of these facilities

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LNG Leverages and Potentially Expands Louisiana's Existing Energy Infrastructure

- If all GOM regional facilities are developed it could be as much as a 237 percent increase in gas export volumes through the existing pipeline system, which currently averages about 50-65 percent utilization (annually)
- Potentially $350 million impact associated with announced pipeline additions and new natural gas storage facilities; Potentially 3,487 jobs associated with the construction of these facilities

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LNG Benefits Louisiana's Energy Intensive Industries

- Extensive LNG development (15 or greater new projects) is forecasted to lower future natural gas prices and have considerable impacts on energy intensive industries
  - As much as $929 million benefit (positive impact) associated with the lower cost gas associated with high LNG development
  - As many as 11,612 jobs could be regained from recent losses
- Low LNG development (6 to 12 new projects), and higher resulting prices, could hurt Louisiana industries
  - As much as $1,672 million cost (negative impact) associated with the higher cost gas associated with low LNG development
  - As many as 20,902 jobs could be lost
- **Failure to act on LNG development** (less than 6 new plants), in addition to other negative resource development factors could lead to the worst case, "do nothing" scenario which would have devastating impacts on Louisiana's economy
  - As much as **$2,803 million cost** (negative impact) associated with the higher cost gas associated with low LNG development
  - As many as **61,926 jobs could be lost**

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LNG is a Major National Energy Policy Issue

- Natural gas flows, and is traded, in an open competitive continental market. Louisiana cannot directly impact competitive market gas prices.
- With LNG, gas markets should become increasingly global
- Recent NPC studies show that gas prices could reach an annual average of as high as $8.50 per Mcf by 2025 (“Worst Case Scenario”/Upper Reactive Path).
- NIMBY issues are of serious concern for LNG development in many parts of US
- For Louisiana households, this could mean an increase from the baseline of nearly 17 percent (worst case by 2005, or 33.7 by 2025) in their average monthly gas bills, and 3.9 percent (worst case by 2005, or 8.4 by 2025) increase in their monthly average electric bills (ceteris paribus).

Overview of the Unique Relationship Between Natural Gas and the State's Economy

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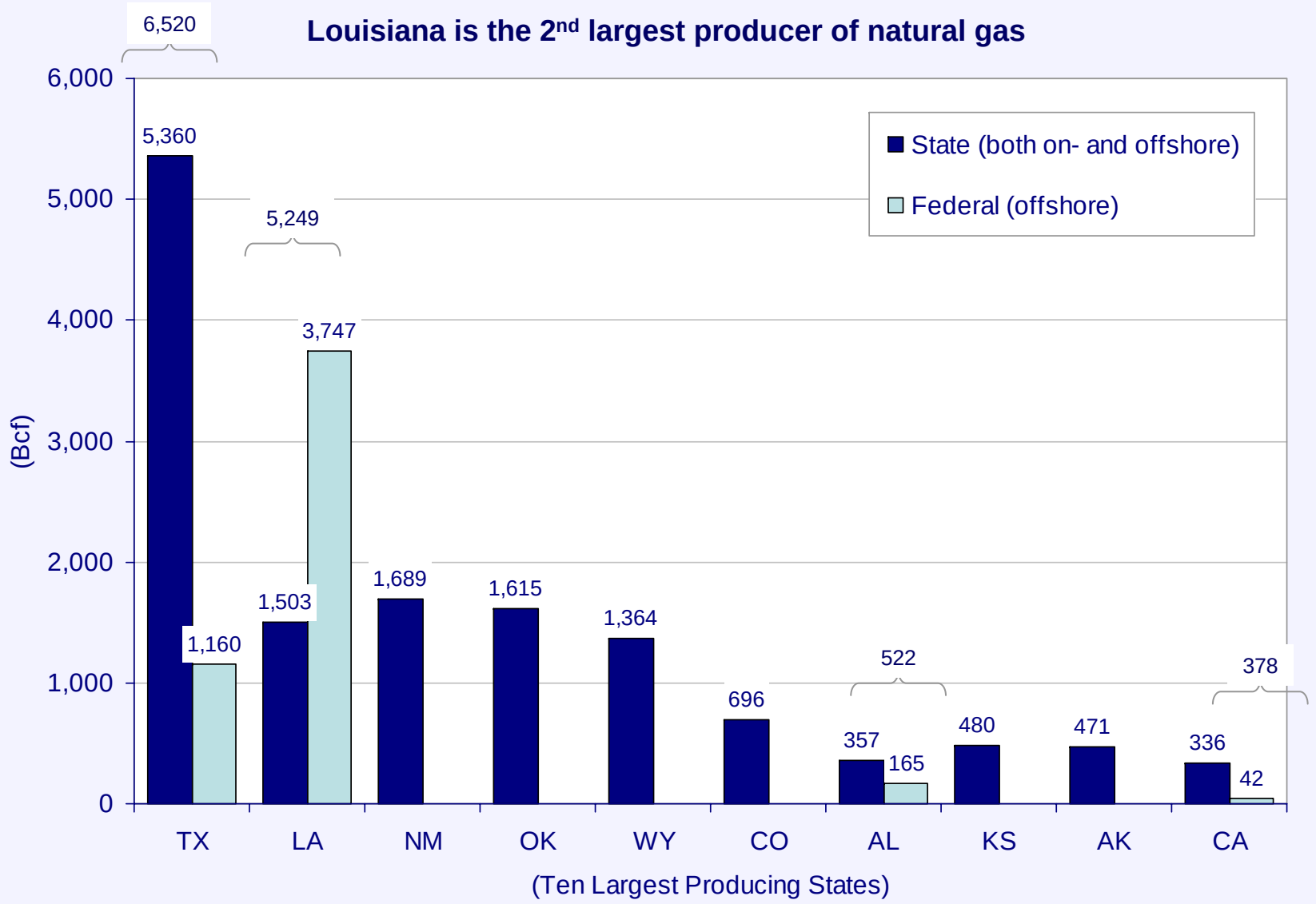
Marketed Production of Natural Gas by State (2001)

Louisiana is the 2nd largest producer of natural gas



Source: Energy Information Administration, Department of Energy.

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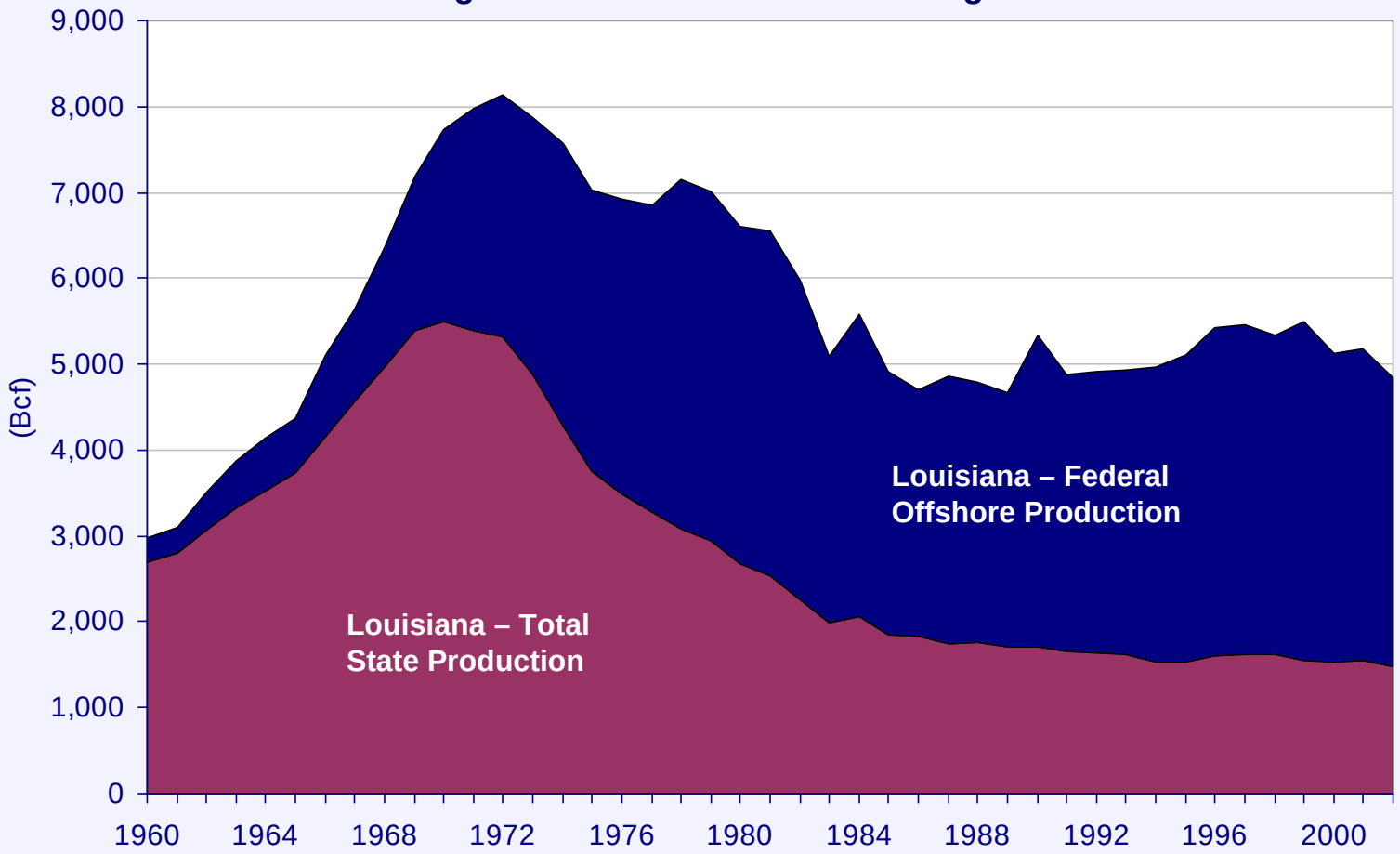
Historic Production of Natural Gas in Louisiana (1960-2002)

An increasing share of Louisiana gas production is coming from the Federal Offshore Region



Source: Louisiana Department of Natural Resources.

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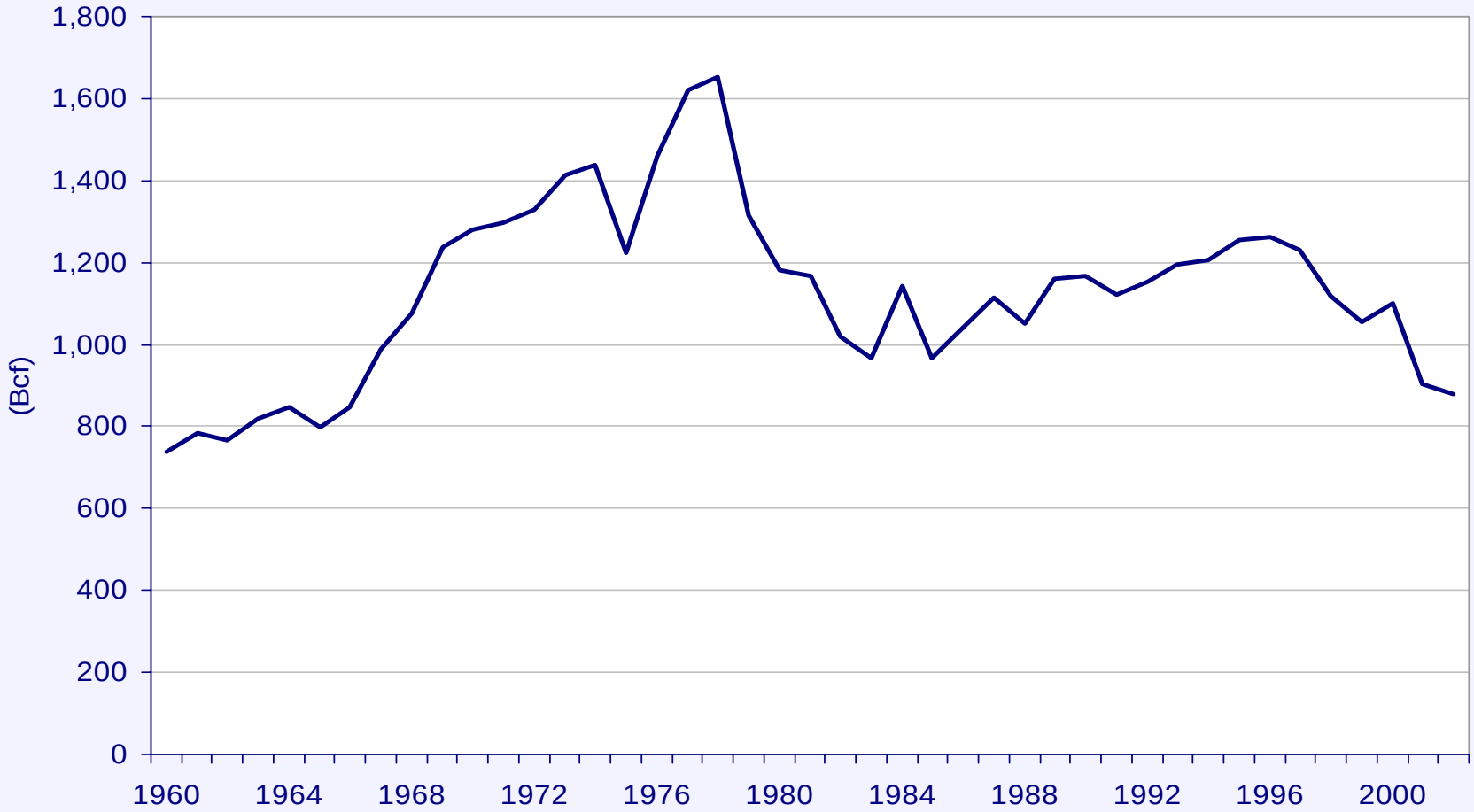
Historic Industrial Consumption of Natural Gas in Louisiana (1960-2002)

Industrial natural gas consumption, while significant, has been decreasing



Source: Energy Information Administration, Department of Energy.

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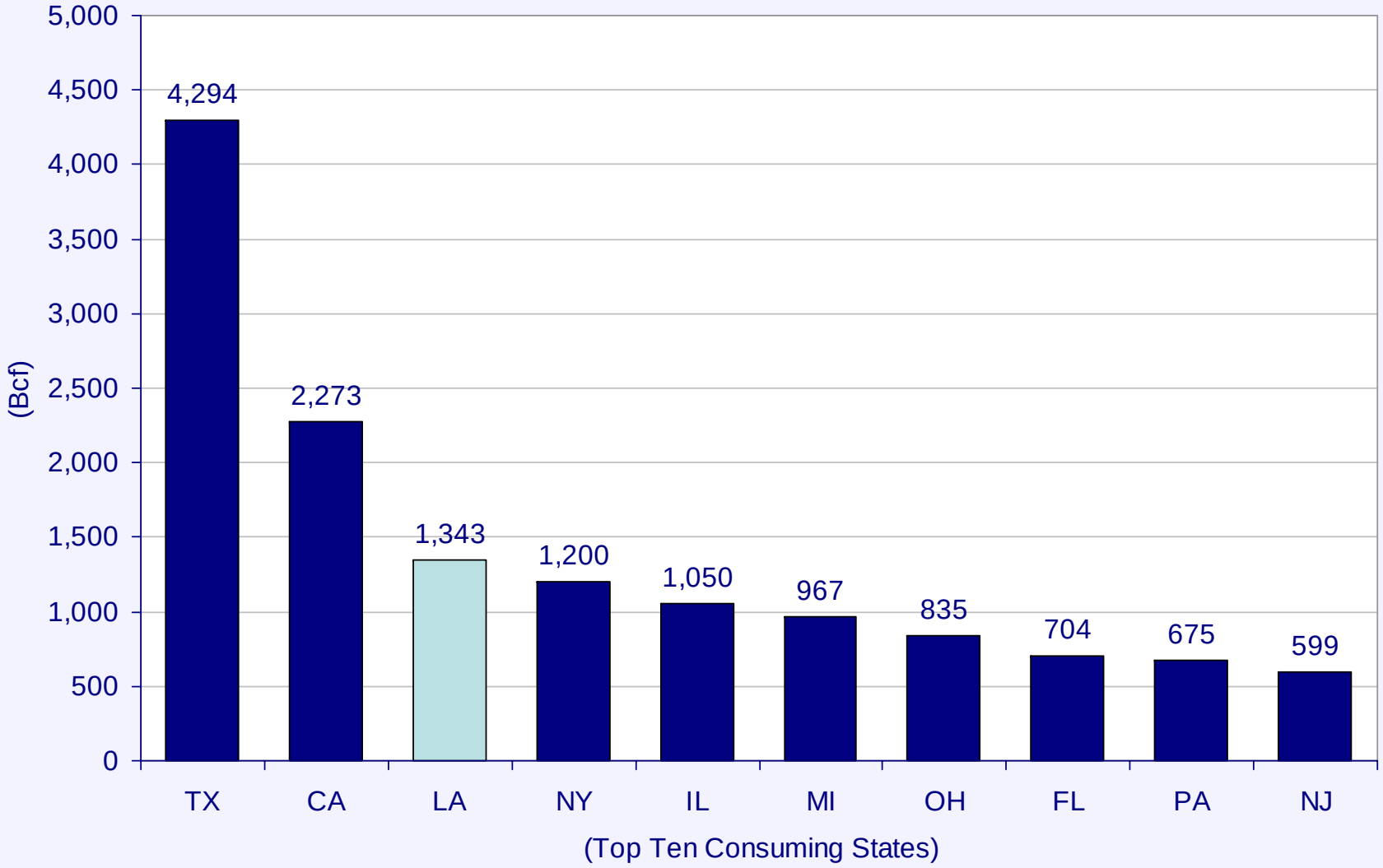
Natural Gas Consumption in the US (2002)

Louisiana is the 3rd largest consumer of natural gas in the US



Source: Energy Information Administration, Department of Energy.

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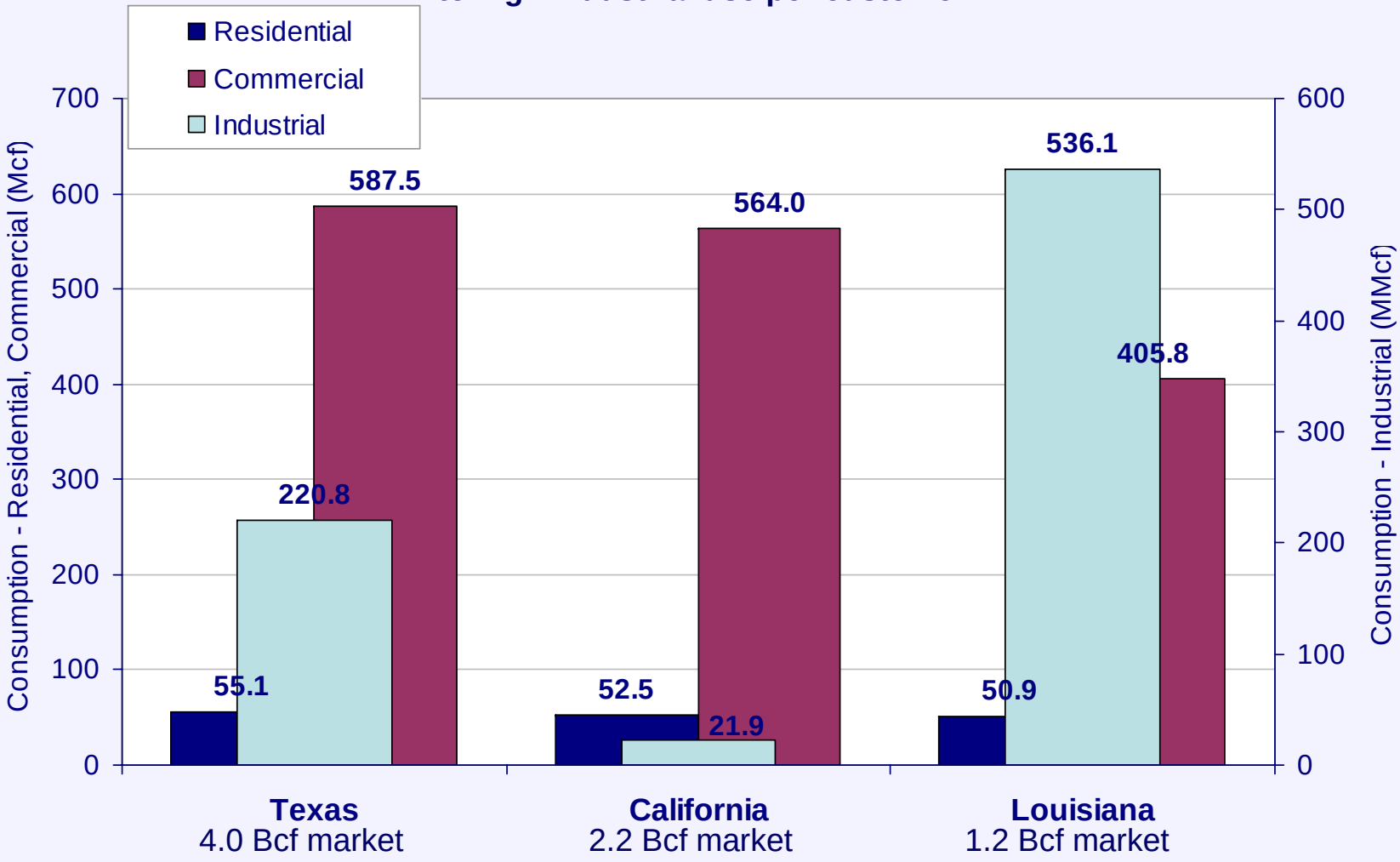
Per Customer Natural Gas Consumption by Sector (2002)

Louisiana's high national gas consumption ranking is due in large part to high industrial use per customer



Source: Energy Information Administration, Department of Energy.

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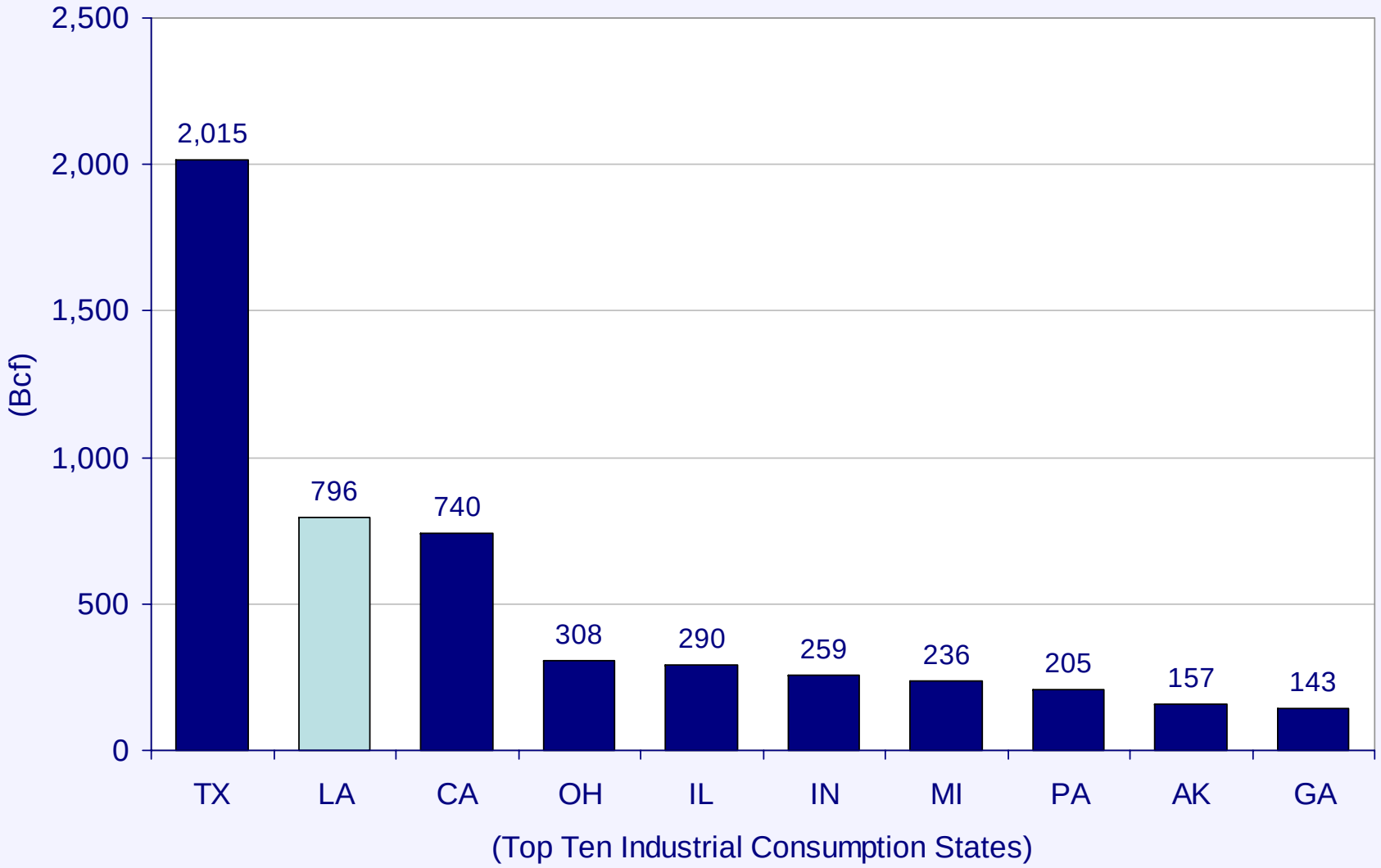
Industrial Natural Gas Consumption (2002)

Louisiana industrial consumption ranks 2nd in the US



Source: Energy Information Administration, Department of Energy.

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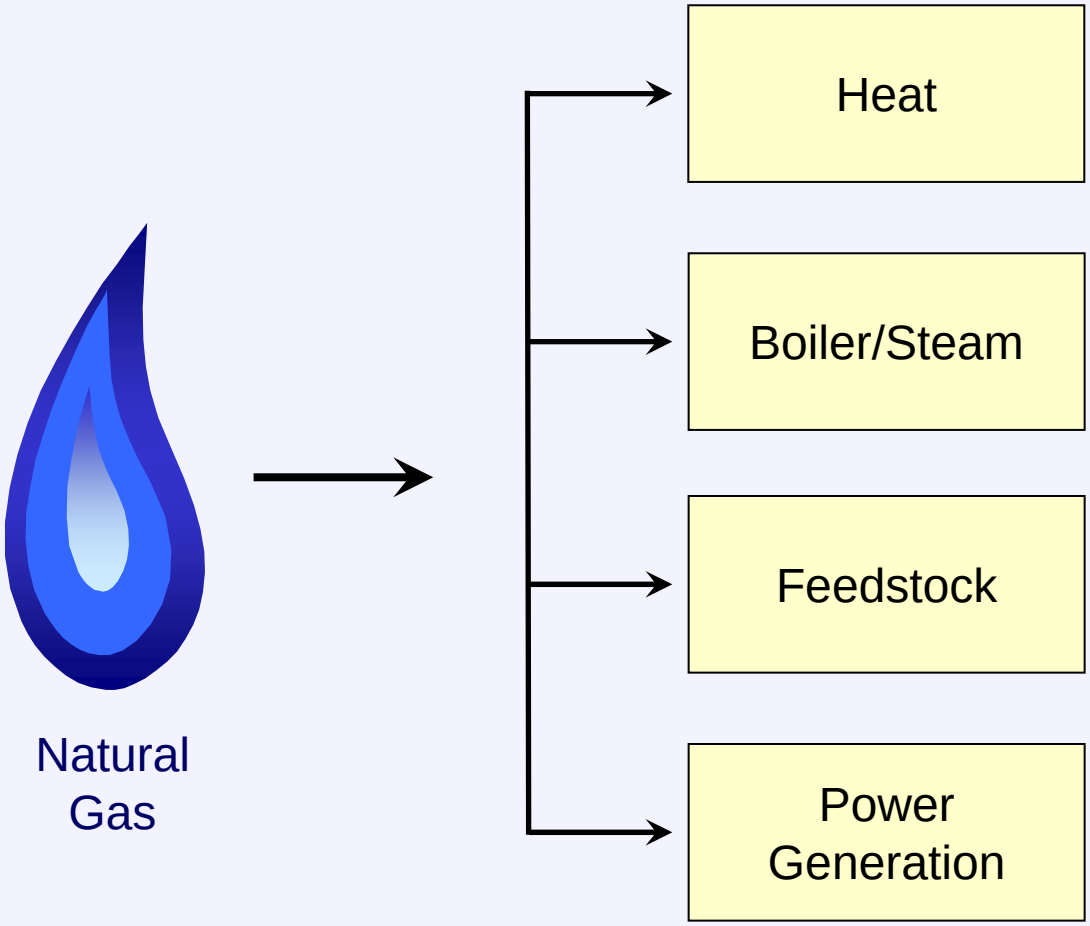
Industrial Natural Gas Usage

Natural Gas is used in a number of different industrial processes



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Natural Gas Used by Selected Industrial Sectors in Louisiana (2001)

SIC		Total Energy (MMBtu)	Percent of Total Energy (%)			Percent of Natural Gas Used For (%)		
			Natural Gas	Electric	Other	Boiler	Furnace	Feedstock
20	Food and Kindred Products	6,940,447	74.1%	15.6%	10.4%	85.7%	14.3%	0.0%
22	Textile Mill Products	1,326,798	80.0%	20.0%	0.0%	91.8%	8.2%	0.0%
23	Apparel & Textile Products	39,009	41.6%	58.4%	0.0%	91.5%	8.5%	0.0%
24	Lumber and Wood Products	5,614,058	55.4%	15.7%	28.9%	54.1%	45.9%	0.0%
26	Paper and Allied Products	150,961,404	17.4%	13.7%	68.9%	69.3%	30.7%	0.0%
27	Printing & Publishing	174,294	24.3%	75.7%	0.0%	42.9%	57.1%	0.0%
28	**Chemicals and Allied Products**	**644,570,575**	**84.4%**	**11.4%**	**4.1%**	**45.9%**	**38.6%**	**15.5%**
29	Petroleum and Coal Products	132,029,844	50.4%	17.2%	32.4%	47.3%	52.1%	0.6%
30	Rubber & Misc. Plastic Prods.	1,555,045	16.9%	82.8%	0.3%	87.7%	12.3%	0.0%
31	Leather & Leather Products	3,982	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%
32	Stone, Clay & Glass Products	3,328,384	88.7%	11.3%	0.0%	2.1%	97.9%	0.0%
33	Primary Metal Industries	5,832,000	56.4%	38.0%	5.6%	14.3%	78.5%	7.2%
34	Fabricated Metal Products	1,124,181	74.6%	25.4%	0.0%	70.9%	29.1%	0.0%
35	Machinery & Computer Equip.	523,498	37.8%	45.3%	16.9%	31.9%	68.1%	0.0%
36	Electric & Electronic Equip.	4,086,641	11.1%	85.9%	2.9%	37.2%	62.8%	0.0%
37	Transportation Equipment	2,281,243	63.8%	34.2%	1.9%	83.2%	16.8%	0.0%
38	Instruments & Related Products	7,327	68.1%	31.9%	0.0%	0.0%	100.0%	0.0%
39	Misc. Manufacturing Industries	3,611	60.6%	39.4%	0.0%	0.0%	100.0%	0.0%

Source: IHS Energy Group Inc., Major Industrial Plant Database, 2002

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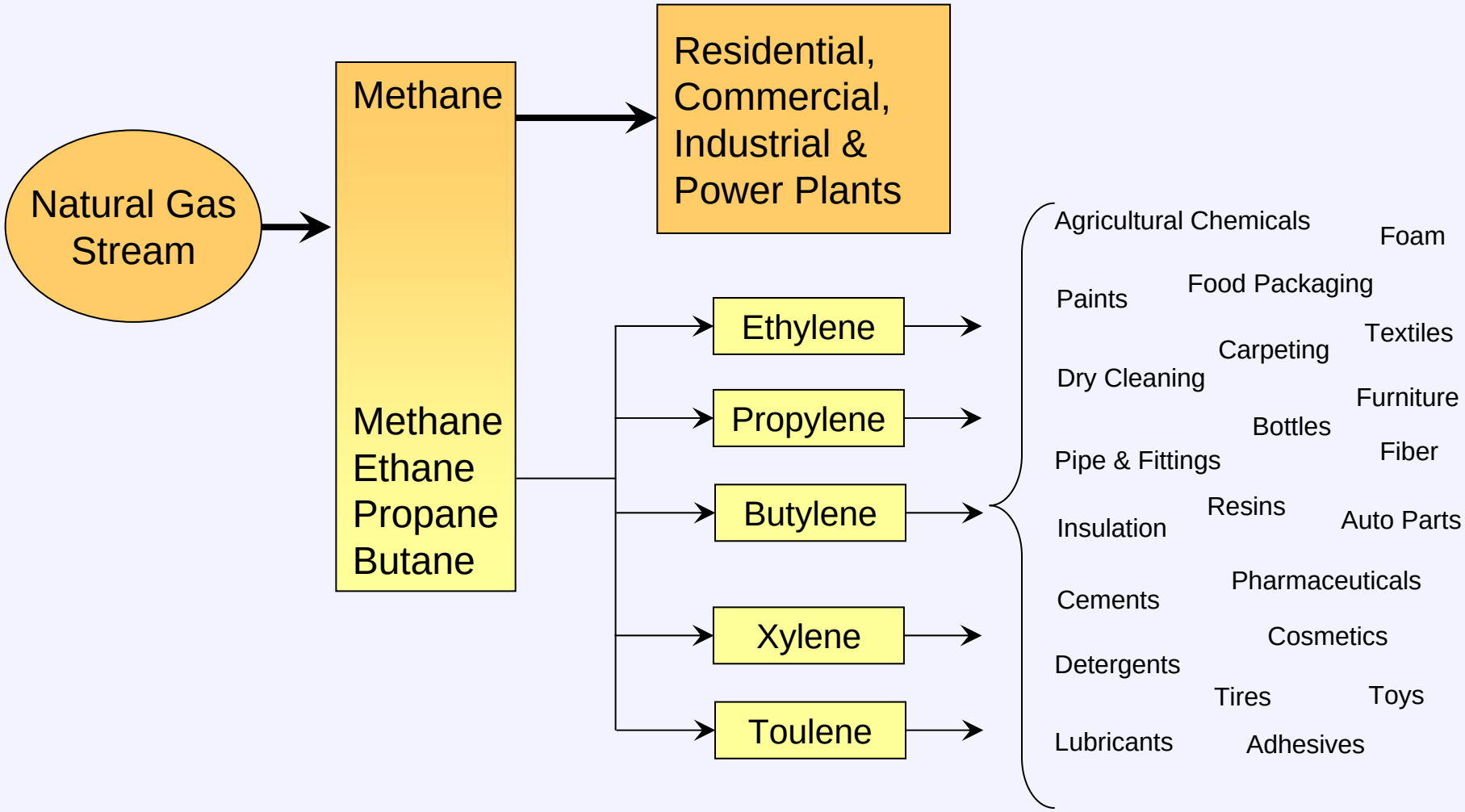
Components of Natural Gas



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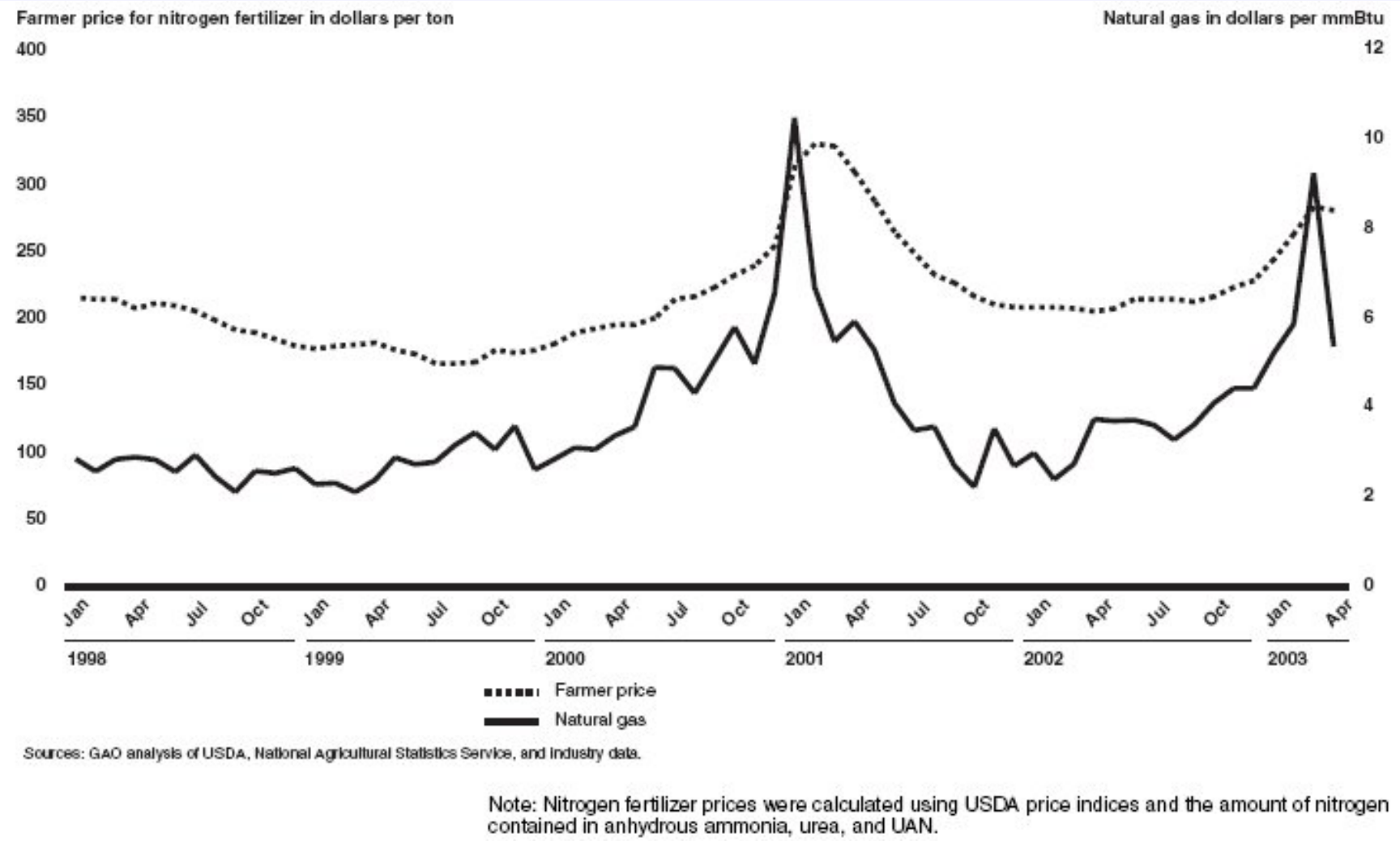
Farmer Prices for Nitrogen Fertilizer Relative to Natural Gas Prices (Jan 1998 - March 2003)



Sources: GAO analysis of USDA, National Agricultural Statistics Service, and industry data.

Note: Nitrogen fertilizer prices were calculated using USDA price indices and the amount of nitrogen contained in anhydrous ammonia, urea, and UAN.

Source: "Domestic Nitrogen Fertilizer Production Depends on Natural Gas Availability and Prices," U.S. General Accounting Office, September 2003.

Implications of Change in Natural Gas Prices on Local Industry

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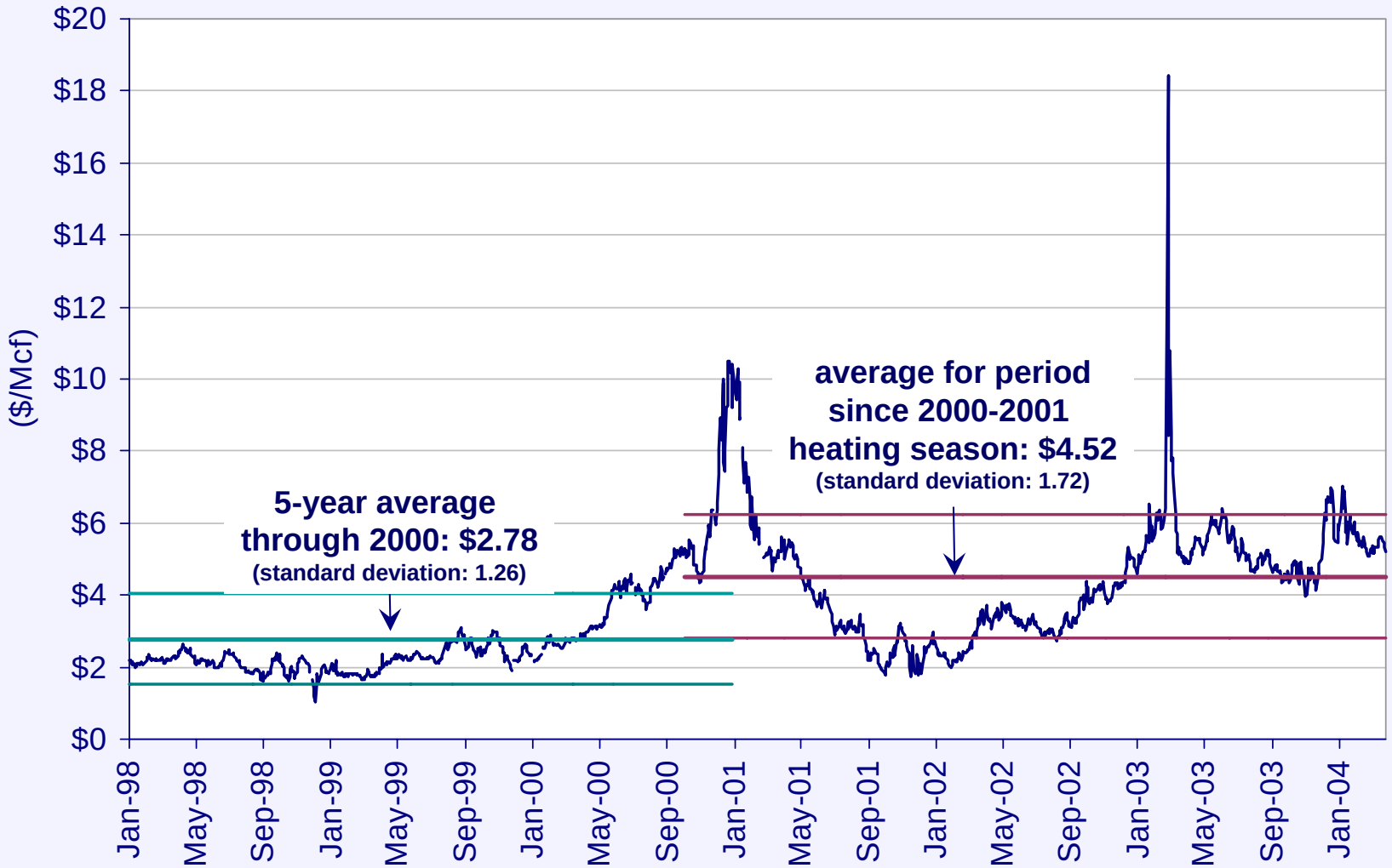
Daily Henry Hub Prices (1998 - Present)



Source: Gas Daily

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Comparison of Consumer Product Price to Natural Gas

If prices of everyday consumer products spiked like they did for natural gas, we would be paying these prices:

Source: American Chemistry Council.

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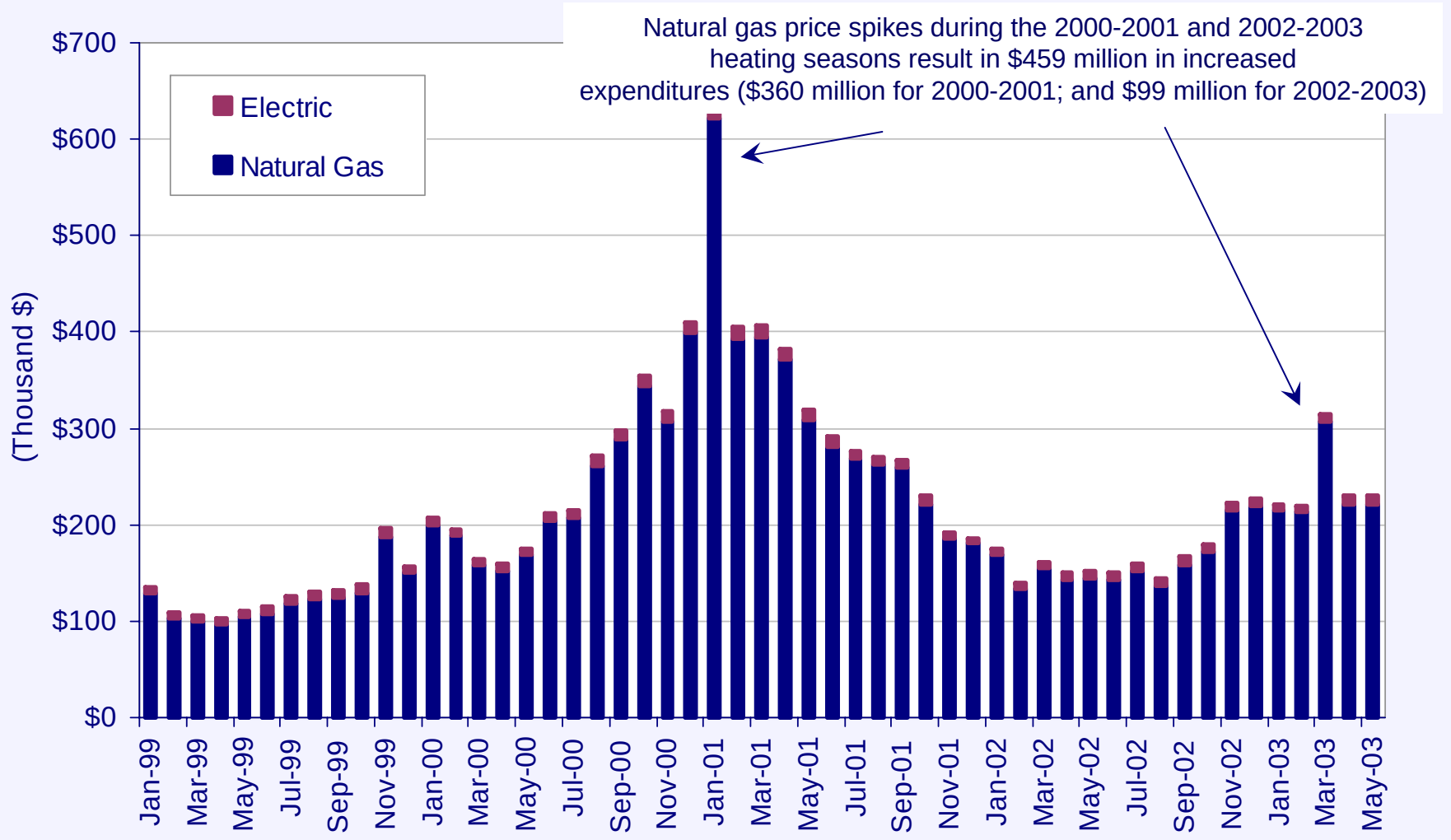
Average Monthly Expenditures by Industrial Customers in Louisiana for Natural Gas and Electric (1999 - 2003)



Note: Number of Customers used to calculate expenditures is annual average; 2003 natural gas expenditures based on estimated number of customers.
Source: Energy Information Administration, Department of Energy.

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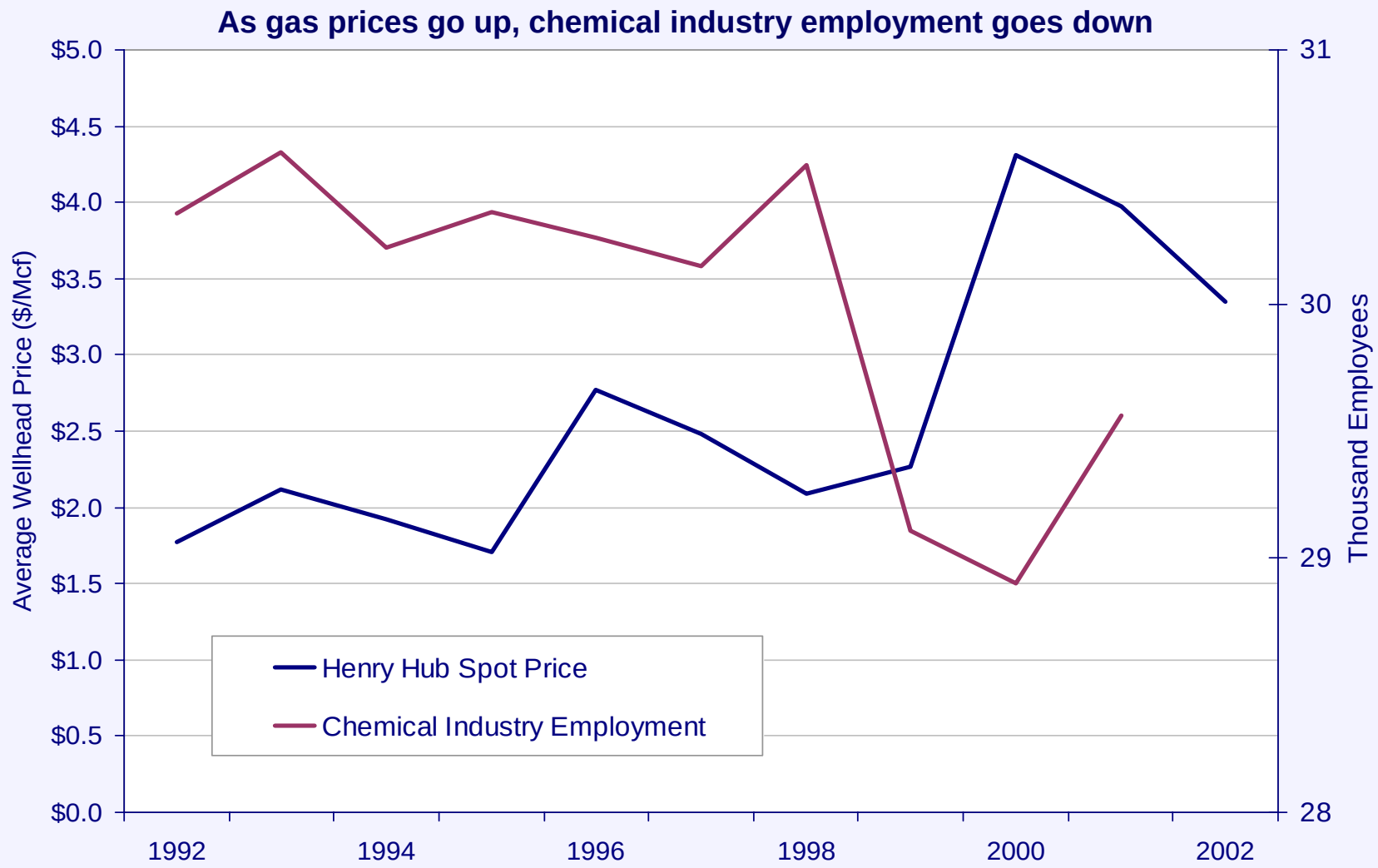
Henry Hub Spot Price and Louisiana Chemical Industry Employment (1992 - 2002)



Source: Bureau of Economic Analysis, US Department of Commerce; and Gas Daily

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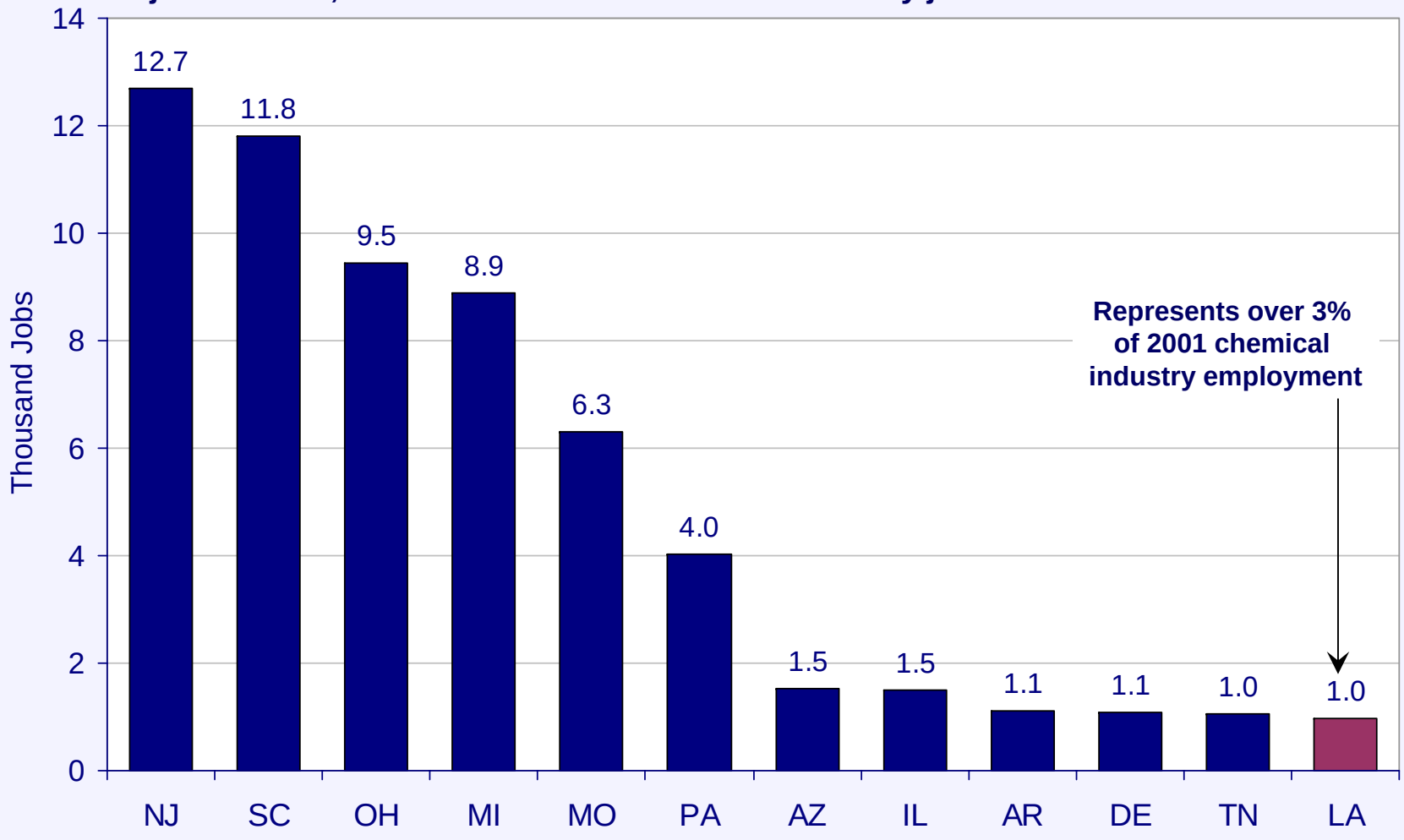
Loss of Chemical Industry Jobs (1998 – 2001)

Louisiana lost 1,644 chemical industry jobs between 1998 and 2000. It regained 662 jobs in 2001, for a net loss of 982 chemical industry jobs between 1998 and 2001.



Source: Bureau of Economic Analysis, US Department of Commerce

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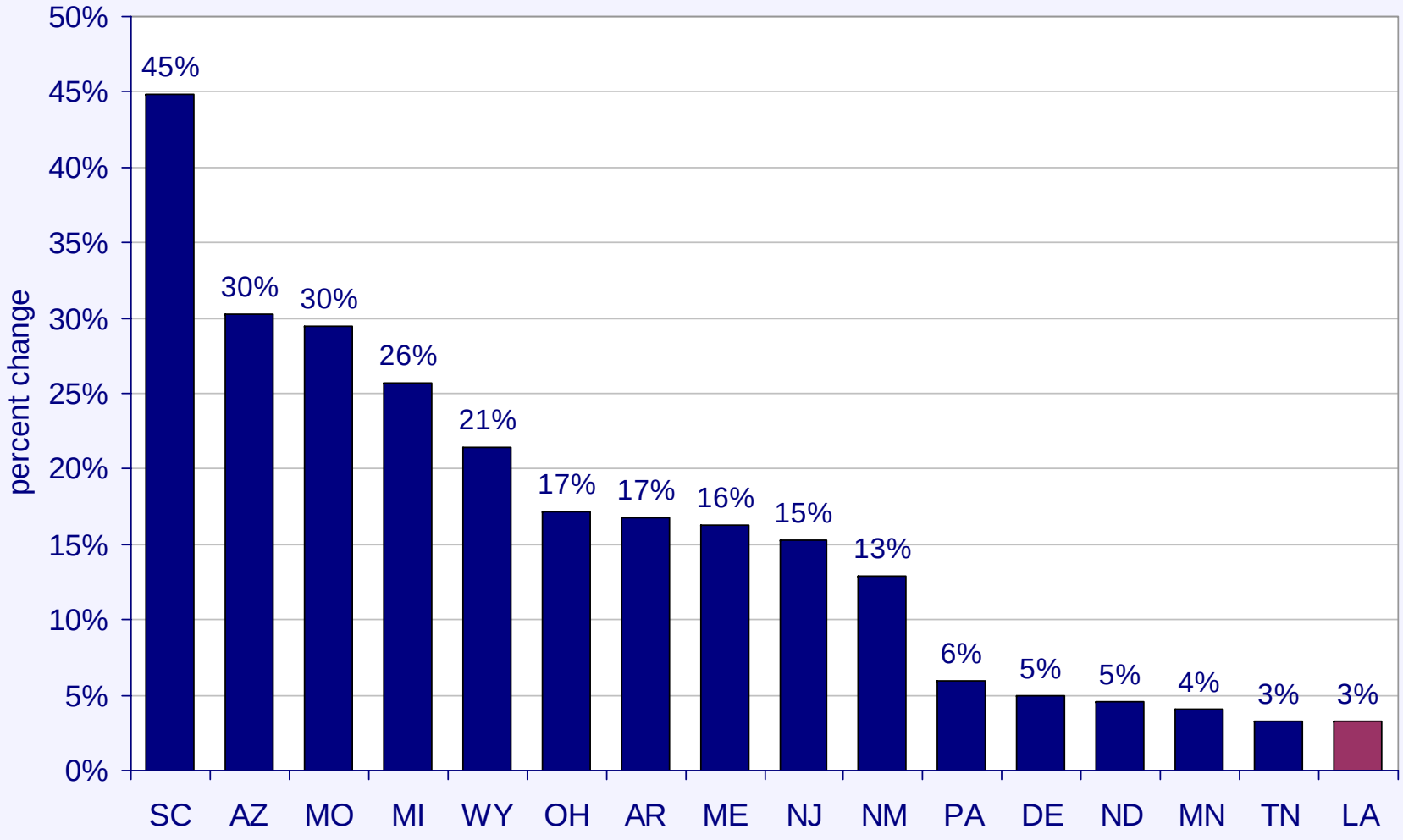
Loss of Chemical Industry Jobs (1998 – 2001)

Louisiana has lost over 3 percent of its chemical industry jobs since 1998



Source: Bureau of Economic Analysis, US Department of Commerce

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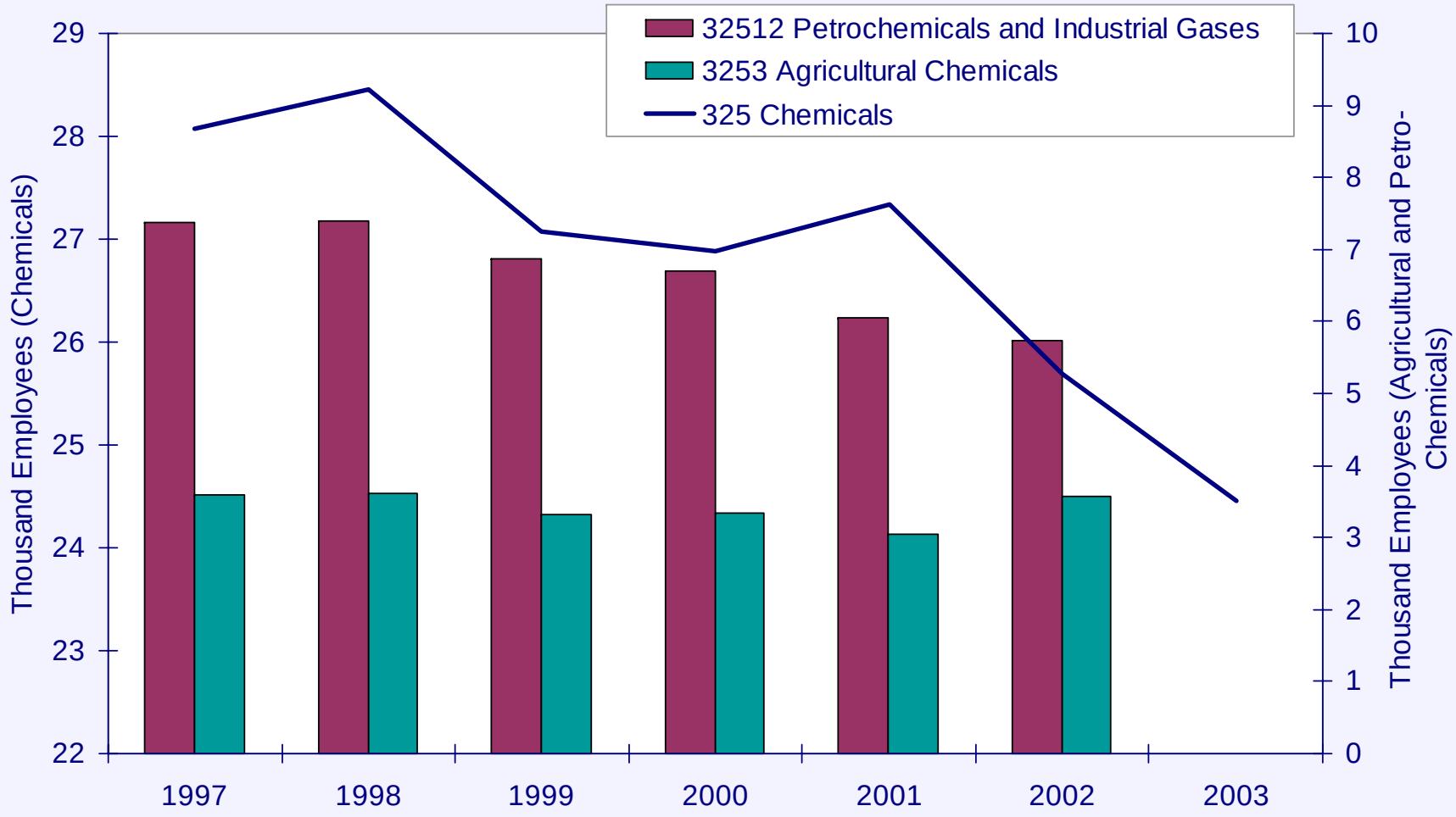
Employment in Chemical, Fertilizer and Petrochemical Industry in Louisiana (1997 - 2003)

The Louisiana chemical industry has lost almost 4,000 jobs since 1998



Source: Bureau of Labor Statistics, Department of Labor

Implications of Change in Natural Gas Prices on US Industry

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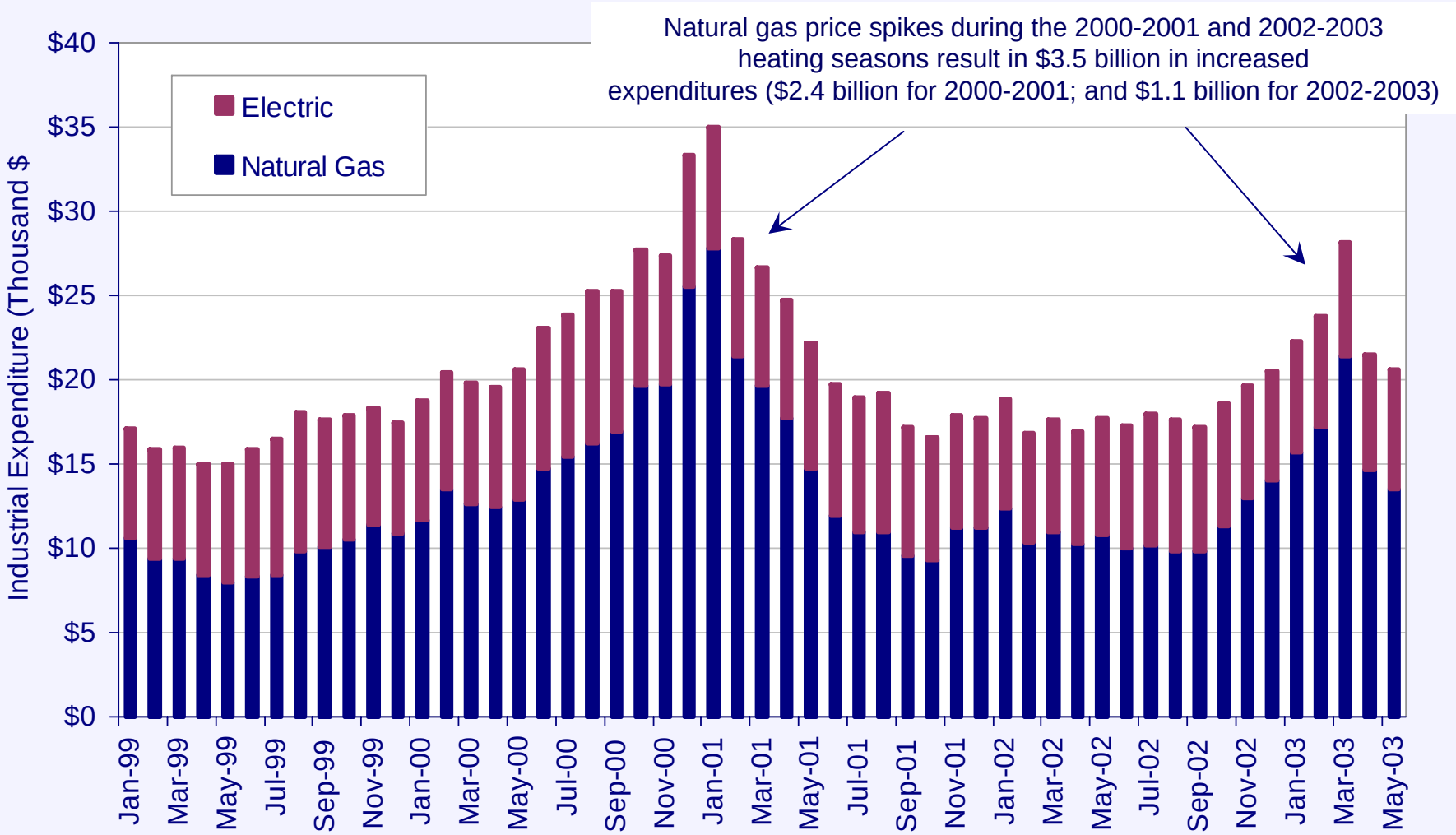
Average Monthly Expenditures by Industrial Customers in US for Natural Gas and Electric (1999 - 2003)



Note: Number of Customers used to calculate expenditures is annual average; 2003 natural gas expenditures based on estimated number of customers.
Source: Energy Information Administration, Department of Energy.

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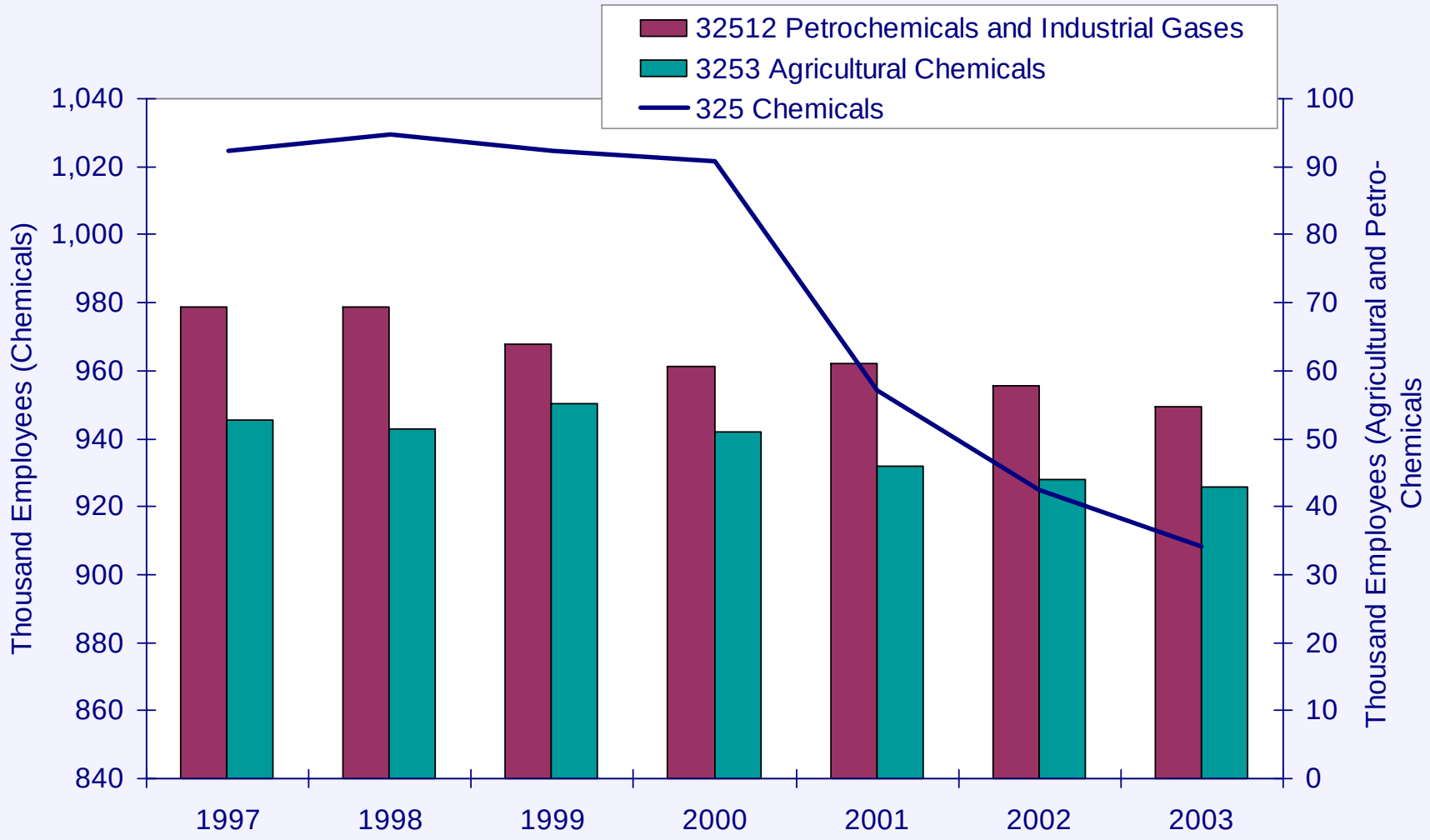
Employment in Chemical, Fertilizer and Petrochemical Industry in the U.S. (1997 - 2003)

The nation as a whole has seen significant losses in chemical industry jobs since 2000



Source: Bureau of Labor Statistics, Department of Labor

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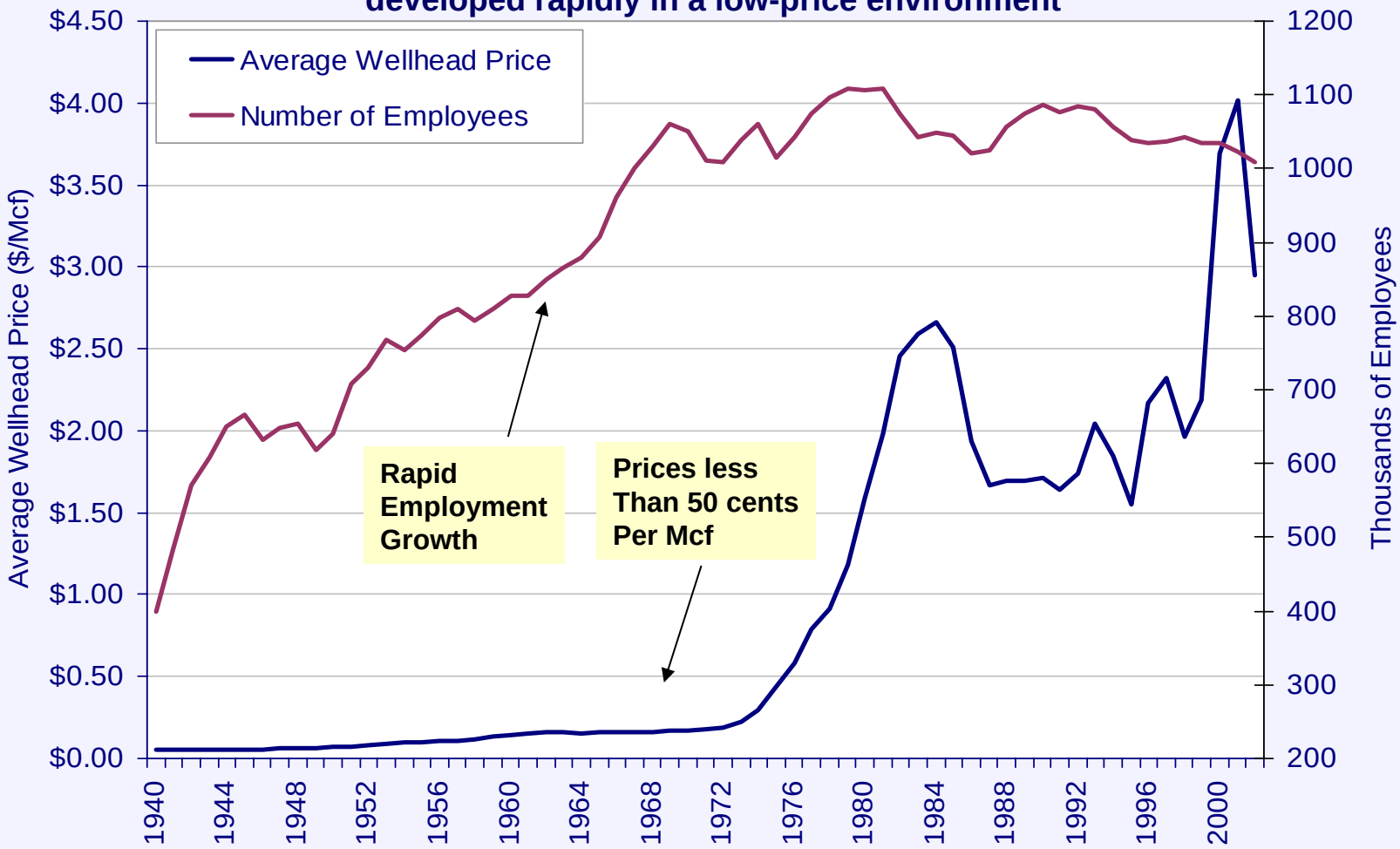
Historic Annual U.S. Average Wellhead Price and Chemical Industry Employment (1940 - 2002)

National trends show chemical industry employment developed rapidly in a low-price environment



Source: Energy Information Administration, Department of Energy; and Bureau of Labor Statistics, Department of Labor.

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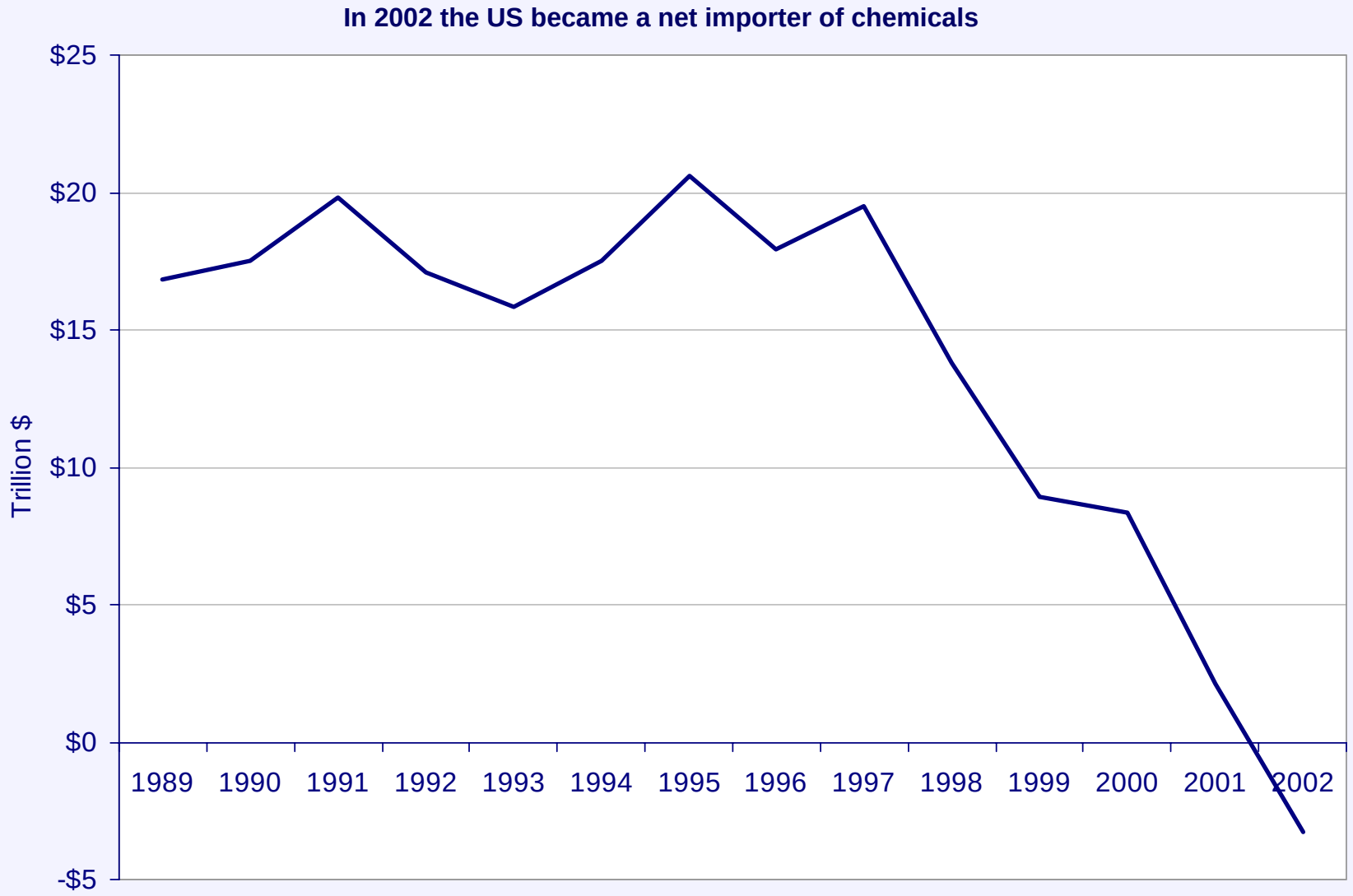
Value of Net Exports of NAICS 325 – Chemicals (1989 - 2002)



Source: Office of Trade and Economic Analysis, Trade Development, International Trade Administration, U.S. Department of Commerce

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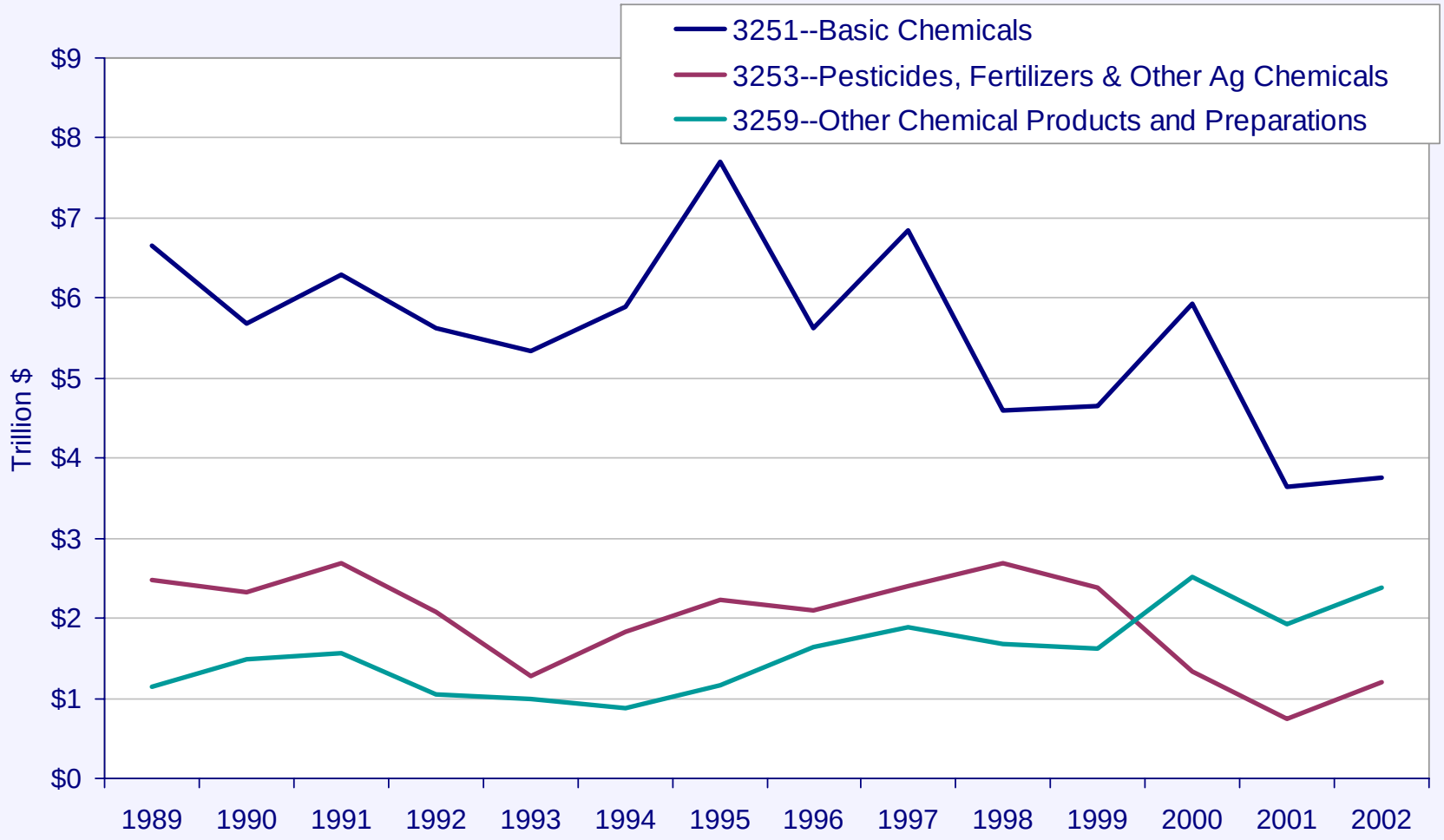
Value of Net Exports -- Chemicals (1989 - 2002)



Source: Office of Trade and Economic Analysis, Trade Development, International Trade Administration, U.S. Department of Commerce

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World Natural Gas Prices for Industry ($US/MMBtu)

Natural gas can be considerably cheaper in other parts of the world

Source: Energy Information Administration

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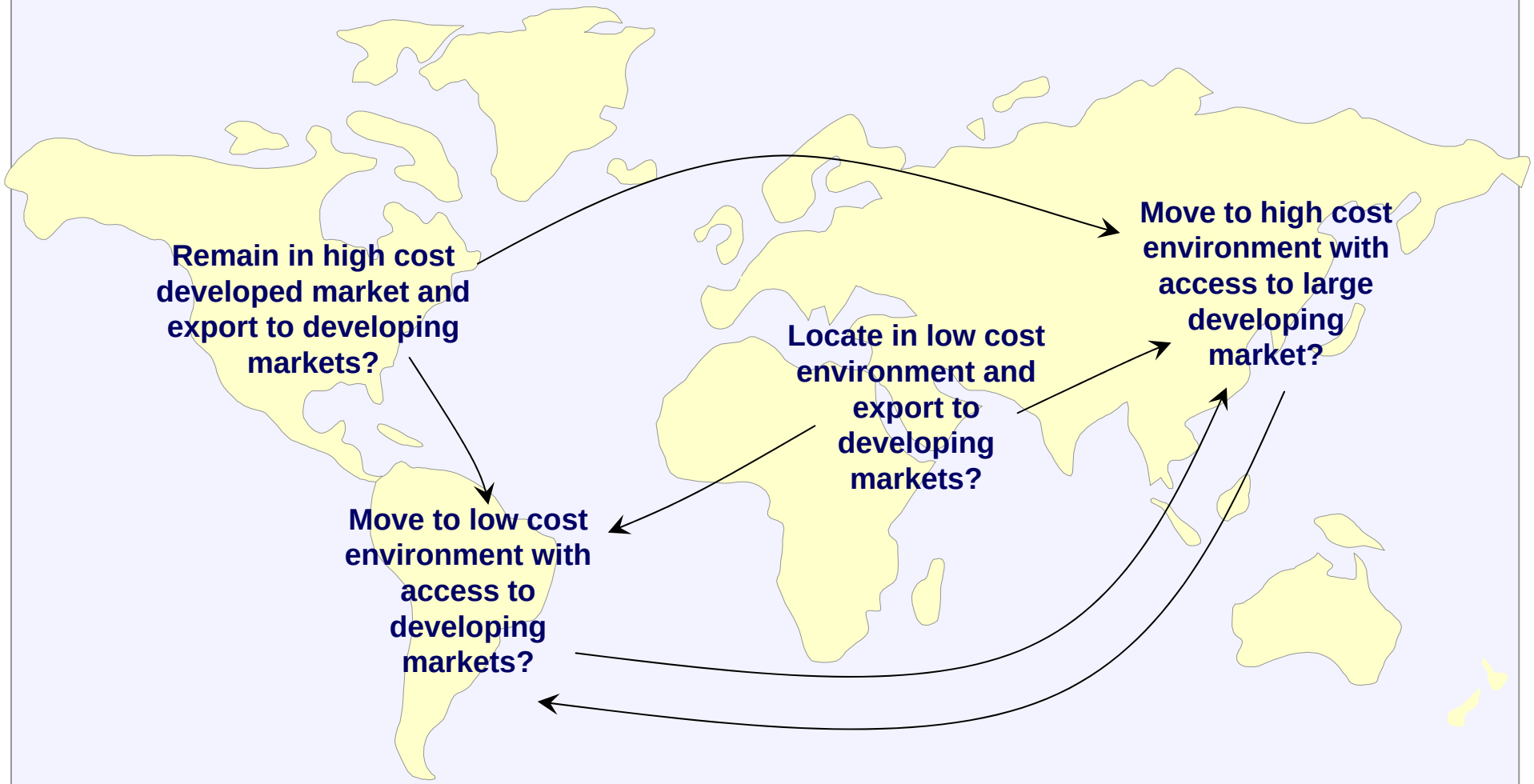
Global Location Considerations

Do US chemical companies remain in a high cost environment (US) or move to other locations around the world?



Background on LNG

Properties of LNG

- Liquefied natural gas (LNG) is natural gas that has been turned into a liquid by cooling it to a temperature of -256°F
- It consists of primarily methane (typically, at least 90 percent)
- LNG is odorless, colorless, non-corrosive and non-toxic
- Liquefying natural gas reduces its volume by a factor of 610.
- The weight of LNG is 45 percent of that of water

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LNG Schematic
Production to End-User

Exploration and Production
World natural gas reserves are abundant, estimated at about 5,500 tcf, or 60 times the volume of natural gas used in 2003. Much of this gas is considered “stranded” because it is located in regions distant from consuming markets.

Liquefaction: Gas from the production field comes to the liquefaction plant. Contaminants are removed and the gas is cooled to a temperature of -256°F. By liquefying the gas, its volume is reduced by a factor of 600.

Storage: LNG is stored in double-walled, insulated tanks at atmospheric pressure. These tanks are designed to prevent any leaks. There is also a dike around the wall that is capable of containing the entire volume of the tank in the unlikely event of a spill.

Shipping: The typical LNG carrier can transport125,000 to 138,000 cubic meters of LNG, which will provide about 2.6 to 2.8 bcf of natural gas. The typical carrier measures 900 feet in length, 140 feet in width and 36 feet in water draft, and costs about $160 million.

Regasification and Delivery: LNG is pumped from the ship to insulated storage tanks at a specially designed terminal. It is then fed into a regasification plant to return the LNG to a gaseous state. The LNG is warmed by passing it through heated pipes and various terminal components. The vaporized gas is then regulated for pressure and enters the pipeline system to be transported to end users.

Source: Energy Information Administration; Federal Energy Regulatory Commission; IELE, University of Houston; and Statoil.com.

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LNG Schematic
Production to End-User

One LNG Tanker Carries Enough Fuel

to Fuel Entergy Louisiana's Little Gypsy Plant (1,251 MW) for 1 month or Waterford 1&2 (891 MW) for 2 Months

OR

to Fuel over 5 percent of Louisiana's Residential Customers for 1 Year (over 51,000 customers)

OR

to Fuel 5 Industrial Plants for 1 Year

Note: Assumes average monthly power usage of 1,275 MMcf; and average annual industrial usage of 536 MMcf

Source: Energy Information Administration; Federal Energy Regulatory Commission; IELE, University of Houston; and Statoil.com.

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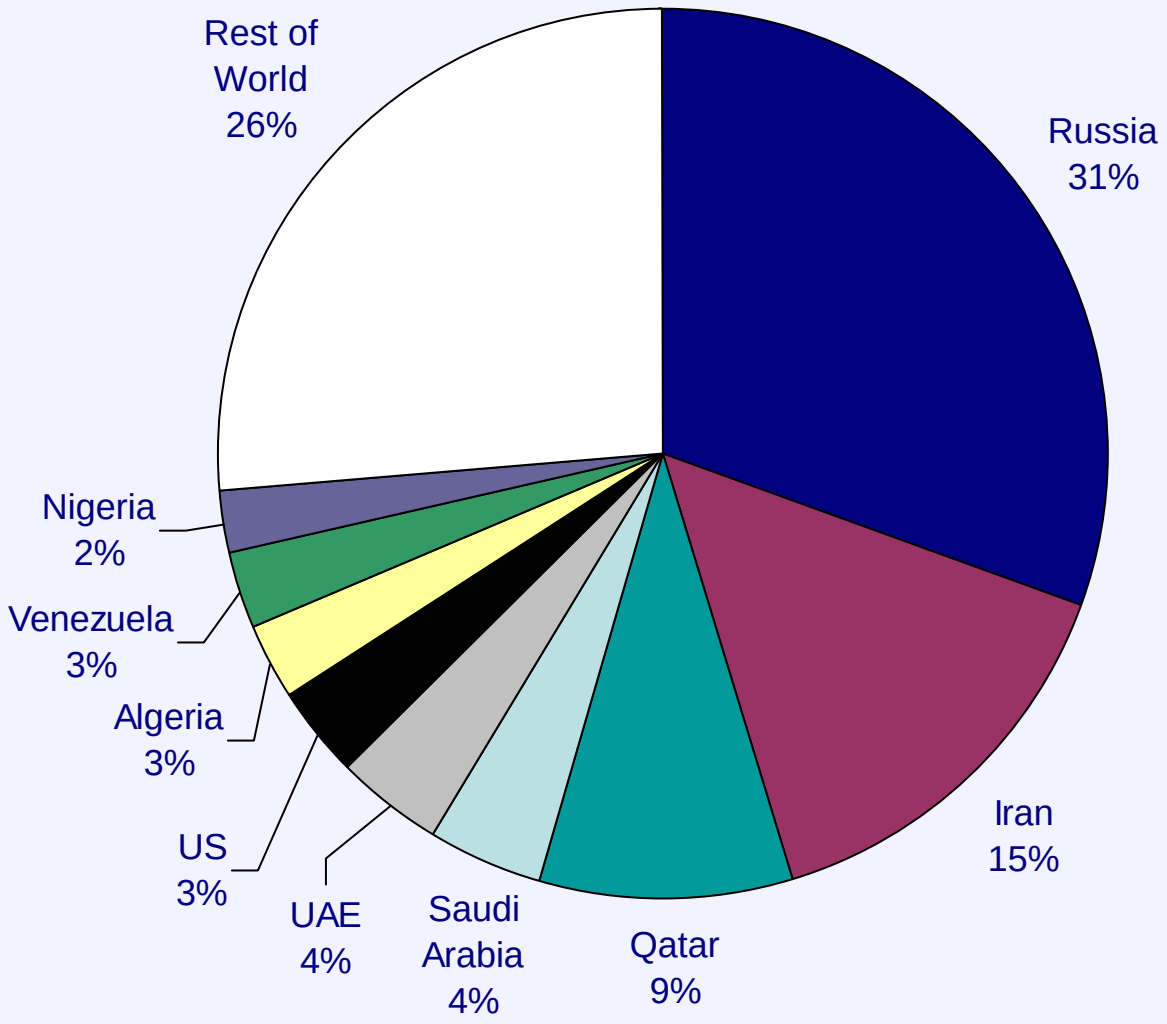
Natural Gas Reserves by Country (2003)

Total World Reserves of 5,501 Tcf



Source: Energy Information Administration, Department of Energy

Benefits of LNG

Higher energy density

- As a liquid, a greater volume of LNG can be stored in a smaller space. By reducing natural gas to 1/600th of its volume makes it practical to transport and store

Delivery and availability

- LNG is frequently transported in trailer trucks that hold up to 11,500 gallons, in small tank trucks and trailers, railcars, barges and 30 million-gallon LNG ships.
- LNG facilities can be built in regions far removed from natural gas producing fields, reducing reliance on pipelines as the only means for obtaining supplies

Potential for lower-cost fueling facilities; lighter fuel tanks and approximation of diesel-engine efficiencies

- The source of LNG is often natural gas that is liquefied and trucked in from centralized locations to take advantage of existing facilities, pipeline operations and very low-cost gas supply. LNG can be produced in about half of the almost 90 LNG storage locations in the US and Canada operated by local gas utilities. In addition, several cryogenic natural gas extraction plants in the gas-producing states now produce LNG as a sidestream. Large liquefaction plants are being built specifically to produce LNG for fuel, and there are now about 70 liquefaction facilities in the US.

Operations and storage:

- LNG operations are a proven safe means to increase the long-term availability of natural gas in the U.S.
- LNG facilities typically provide for large amounts of natural gas storage, which can contribute to price stability and reliability in periods of high demand.

Source: Interstate Natural Gas Association of America.

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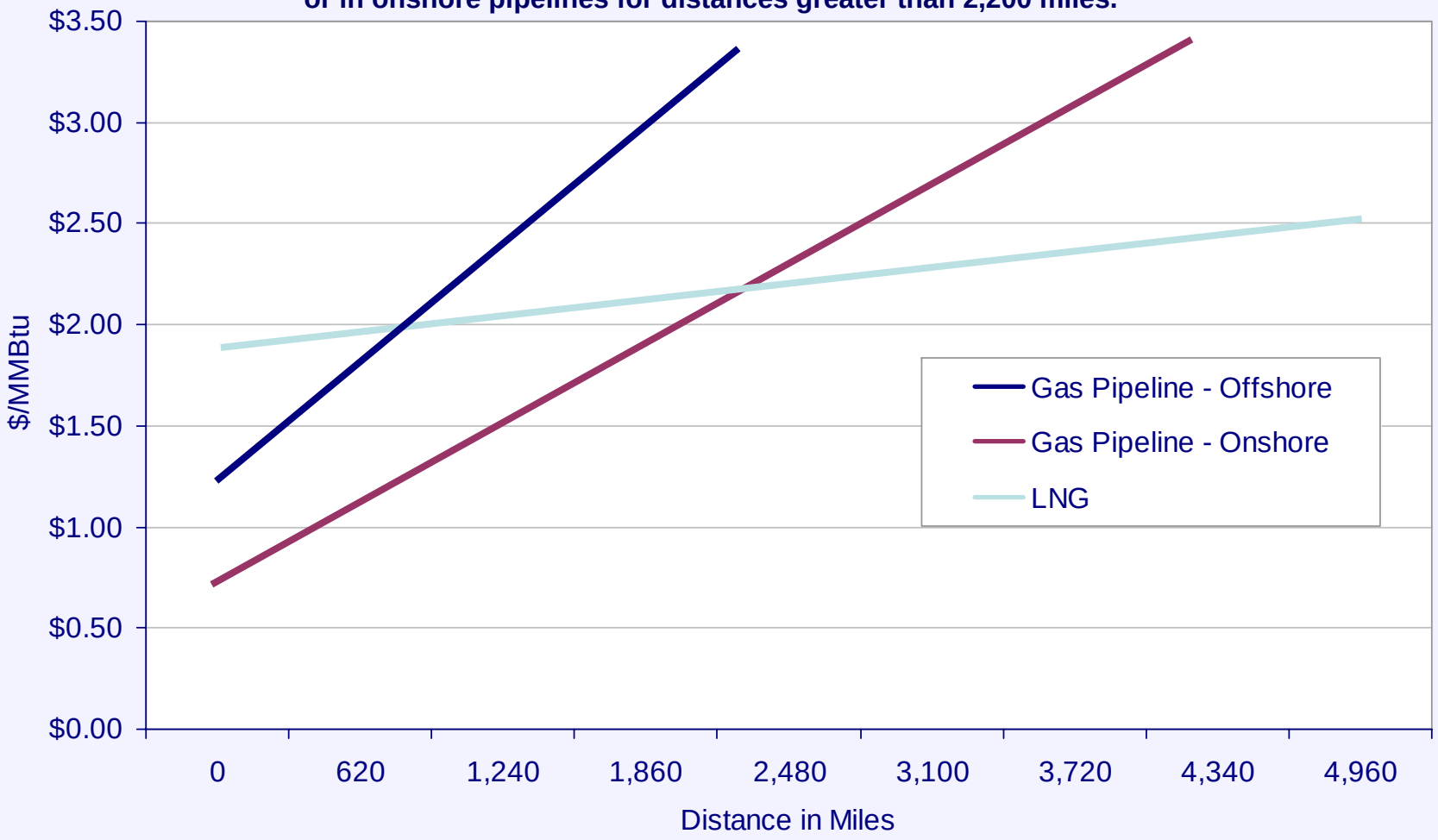
Transportation Cost

As the distance over which natural gas must be transported increases, usage of LNG has economic advantages over usage of pipelines. Liquefying natural gas and shipping it becomes cheaper than transporting natural gas in offshore pipelines for distances of more than 700 miles or in onshore pipelines for distances greater than 2,200 miles.



Source: Institute for Energy, Law and Enterprise, University of Houston Law Center

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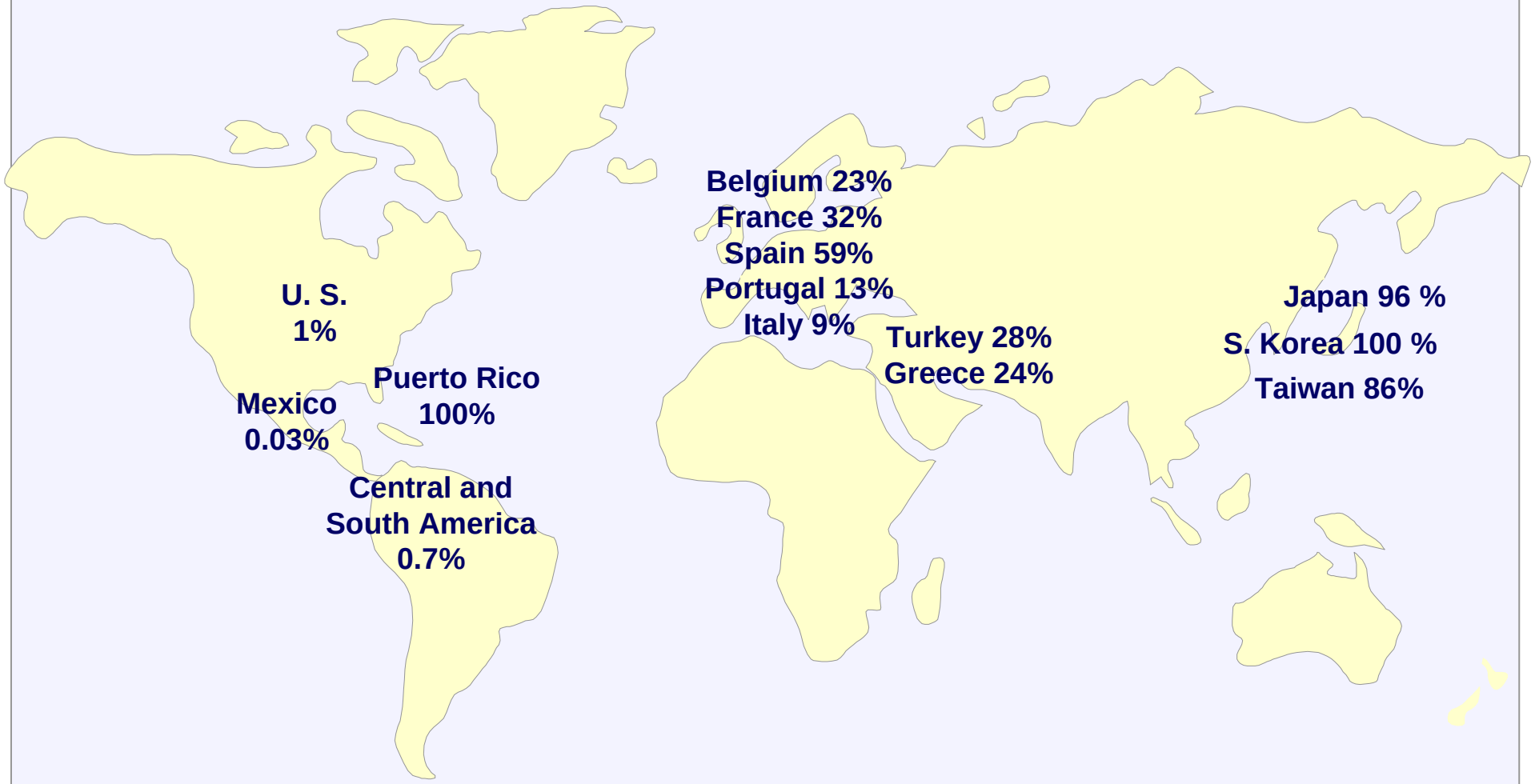
World Importers of LNG: LNG Imports as Percent of Total Natural Gas Consumption (2002)



Source: Energy Information Administration, Department of Energy

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Economic Sharing in the LNG Chain

Gas Producer
$0.5 to $1.0 billion
$0.50 - $1.00 / MMBtu
23% of total cost

Liquefaction
$0.8 to $1.0 billion
$0.80 - $1.00 / MMBtu
28% of total cost

Shipping*
$0.6 to $1.2 billion
$0.65 - $1.60 / MMBtu
35% of total cost

Receiving Terminal
$300-$400 million
$0.40 - $0.50 / MMBtu
14% of total cost

Cost out of Plant
$2.50 – $3.50 / MMBtu

Note: *depends upon the distance shipped

Source: Cheniere LNG Industry Profile, http://www.cheniere.com/LNGIndustryProfile.htm.

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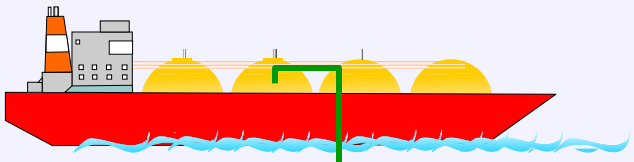
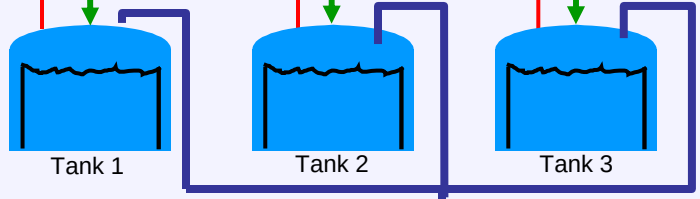
Receiving Terminal – LNG Gas Flow

- LNG – Ship to Tanks
- Natural Gas
- LNG – Tanks to Vaporizers





Boiloff Compressors

As LNG boils off, the gas is withdrawn from the tanks and compressed.

As gas is required, pumps inside the tanks transfer LNG to the plant vaporizers.

Gas Pipeline

The plant vaporizers warm the LNG until it vaporizes.

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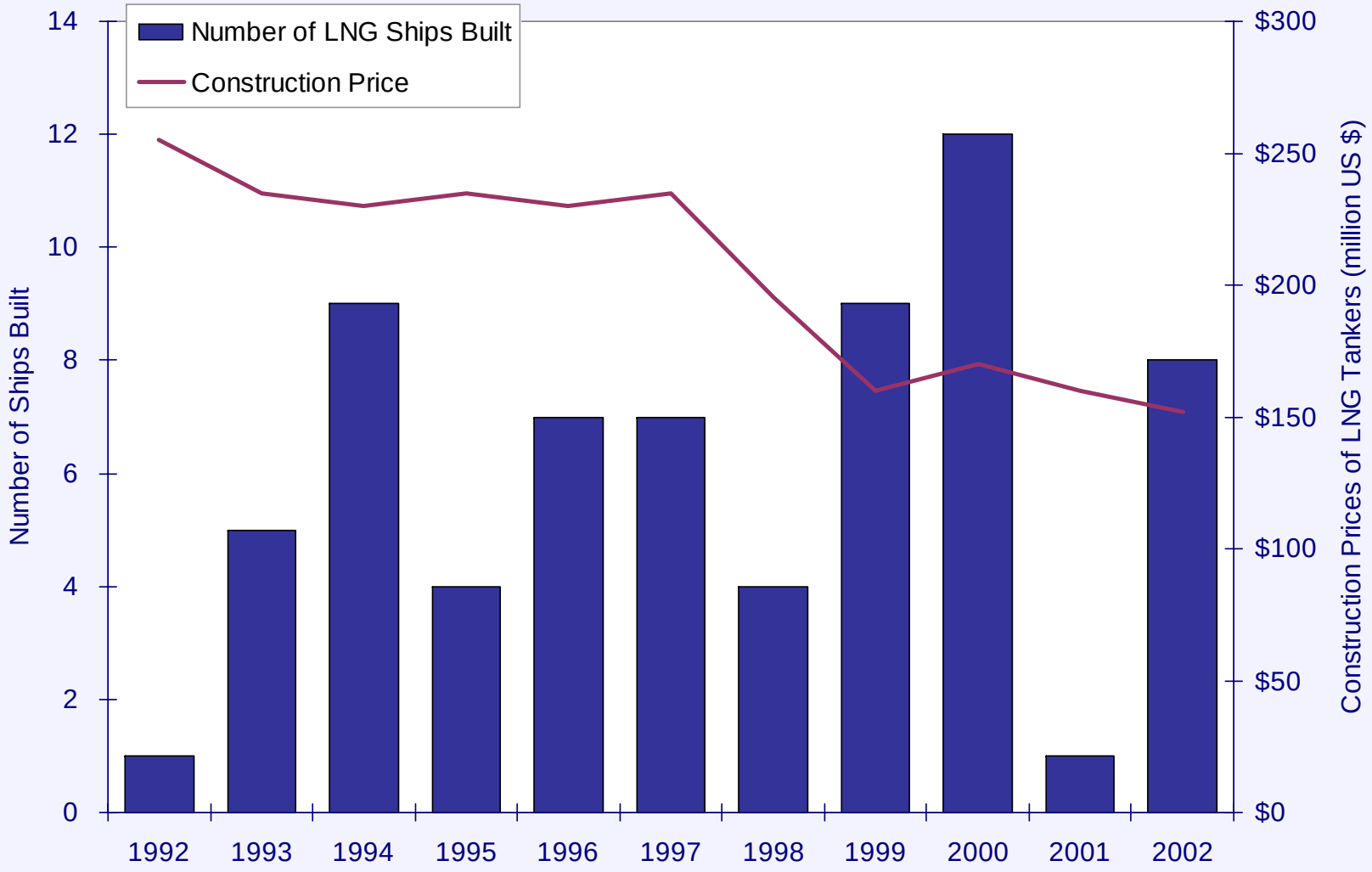
Number of LNG Ships Built and Construction Prices (1992-2002)

The construction price of LNG ships has been steadily falling since 1992



Source: Institute for Energy, Law and Enterprise, University of Houston Law Center; and Energy Information Administration, Department of Energy

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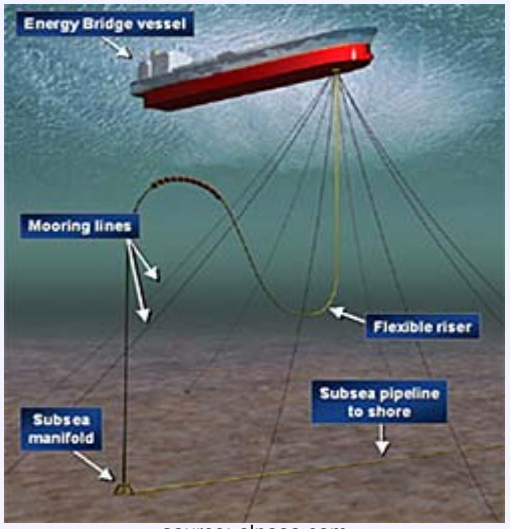
Types of Offshore LNG Receiving Terminals



source: elpaso.com

Buoy or Bridge such as ElPaso's Energy Bridge:
A buoy is attached to a steel pipe called a riser. The buoy rises to the surface when a tanker approaches. LNG is converted to gas aboard the tanker and then pumped through the buoy into subsea pipeline systems that deliver gas to the main pipeline grid.

source: shell-usgp.com

Gravity Based Structure such as Shell's Gulf Landing and ChevronTexaco's Port Pelican:
A gravity-based structure (GBS) consists of two large concrete caissons, which are floated to the site and lowered to rest on the seafloor. LNG carriers will offload cargoes into storage tanks on the GBS. The LNG will then be warmed to return it to its gaseous State and transported by subsea pipeline to processing facilities for delivery to end-users.

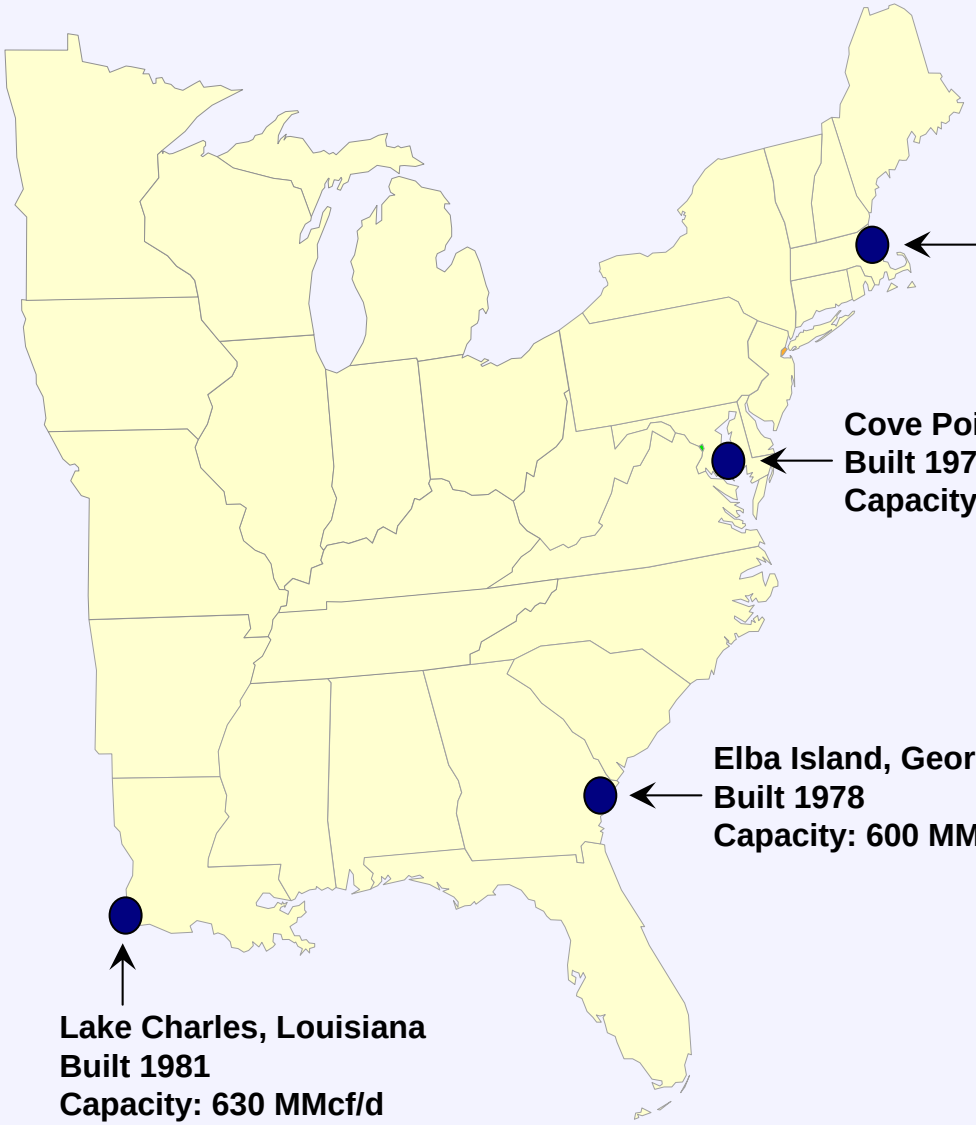
Source: lngsolutions.bhpbilliton.com

Floating Storage and Regasification Unit (FSRU) such as BHP Billiton's Cabrillo Port:
A permanently moored floating vessel houses storage tanks into which LNG is pumped from delivering carriers. Vaporizers on the vessel allow the regasify the natural gas and it is transported via subsea pipeline to the main pipeline grid.

Current and Proposed LNG Facilities

Center for
Energy Studies

Existing US LNG Import Facilities



Source: Energy Information Administration, Department of Energy.

US LNG Import Facilities
Planned Capacity Expansions

Facility	Sendout Capacity (Baseload) Existing	Proposed Expansion	Total with Expansion
	---------- (Bcf) ----------		
Everett, Massachusetts	0.435	0.480	0.915
Cove Point, Maryland	0.630	0.570	1.200
Elba Island, Georgia	0.750	0.250	1.000
Lake Charles Louisiana	0.630		
Phase I		0.570	1.200
Phase II		0.600	1.800
Total	**2.256**	**2.470**	**4.915**

Note: Totals may not sum due to rounding.
Source: Energy Information Administration, Department of Energy.

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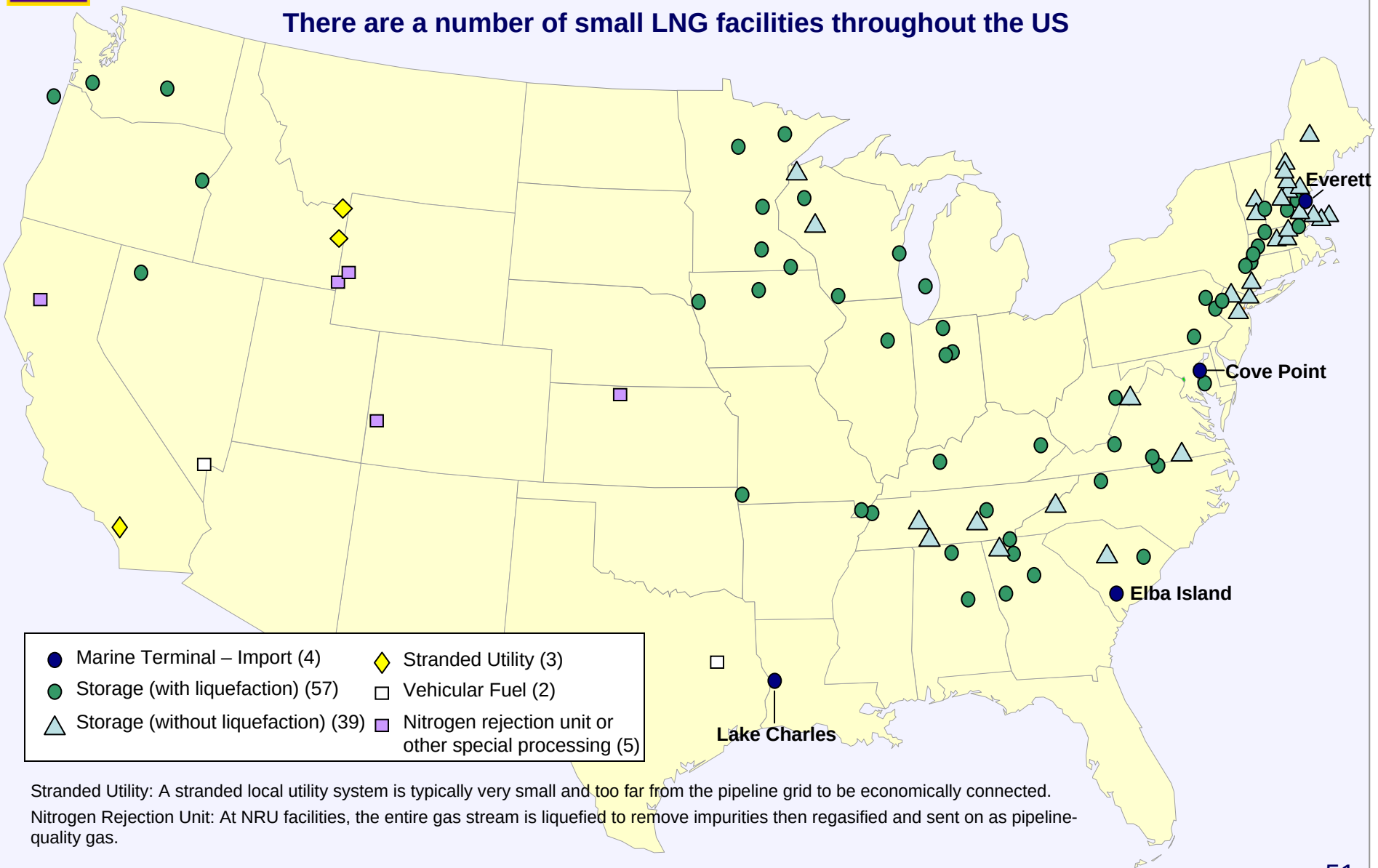
US LNG Facilities

There are a number of small LNG facilities throughout the US



Stranded Utility: A stranded local utility system is typically very small and too far from the pipeline grid to be economically connected.

Nitrogen Rejection Unit: At NRU facilities, the entire gas stream is liquefied to remove impurities then regasified and sent on as pipeline-quality gas.

Source: Energy Information Administration, Department of Energy.

Existing and Proposed LNG Terminals (including Canada and Mexico

Existing Terminals with Approved Expansions

A. Everett, MA : 1.035 Bcfd (Tractebel)
B. Cove Point, MD : 1.0 Bcfd (Dominion)
C. Elba Island, GA : 1.2 Bcfd (El Paso)
D. Lake Charles, LA : 1.2 Bcfd (Southern Union)

Approved Terminals

1. Hackberry, LA : 1.5 Bcfd, (Sempra Energy)
2. Port Pelican: 1.6 Bcfd, (Chevron Texaco)
3. Bahamas : 0.84 Bcfd, (AES Ocean Express)*
4. Gulf of Mexico: 0.5 Bcfd, (El Paso Global)

Proposed Terminals – FERC

5. Bahamas : 0.83 Bcfd, (Calypso Tractebel)
6. Freeport, TX : 1.5 Bcfd, (Cheniere / Freeport LNG Dev.)
7. Fall River, MA : 0.8 Bcfd, (Weaver's Cove Energy)
8. Long Beach, CA : 0.7 Bcfd, (SES/Mitsubishi)
9. Corpus Christi, TX : 2.6 Bcfd, (Cheniere LNG Partners)
10. Sabine, LA : 2.6 Bcfd (Cheniere LNG)
11. Corpus Christi, TX : 1.0 Bcfd (Vista Del Sol/ExxonMobil)
12. Sabine, TX : 1.0 Bcfd (Golden Pass/ExxonMobil)
13. Logan Township, NJ : 1.2 Bcfd (Crown Landing LNG – BP)

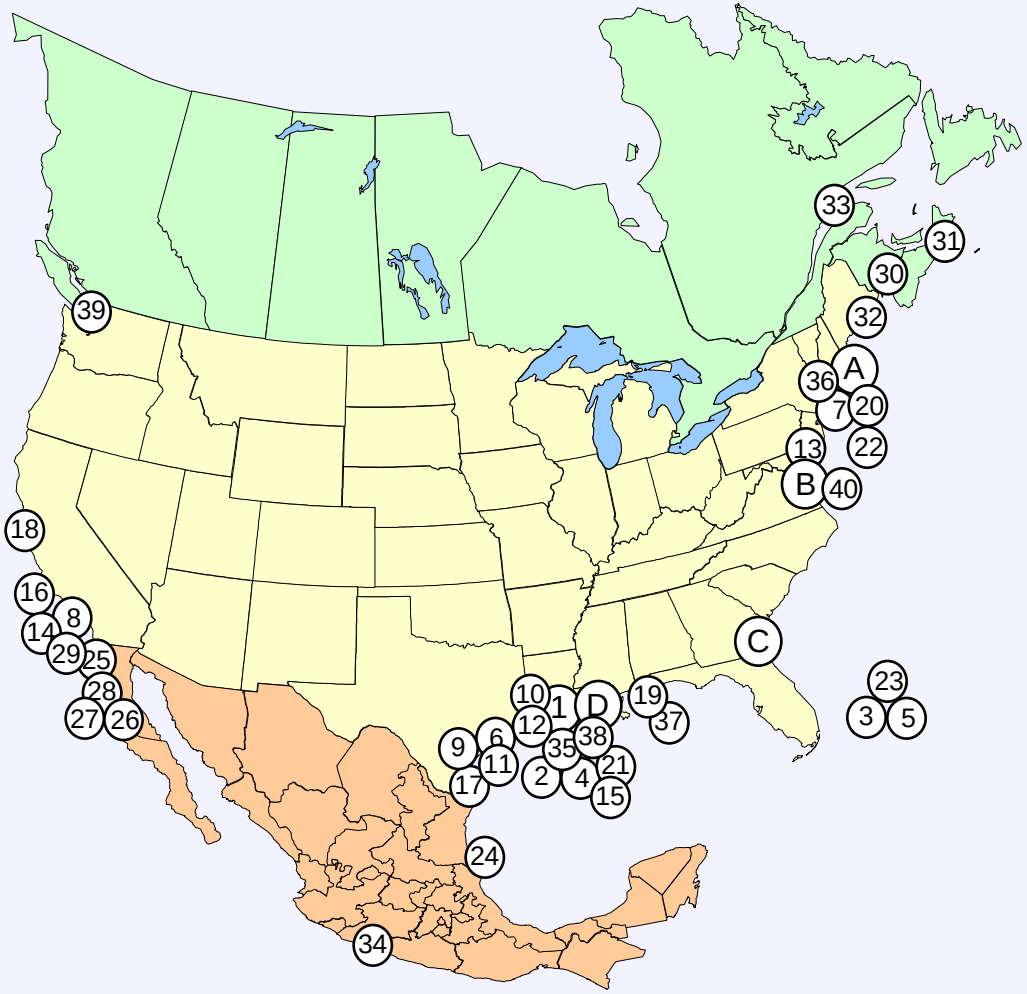
Proposed Terminals – Coast Guard

14. California Offshore: 1.5 Bcfd, (Cabrillo Port – BHP Billiton)
15. Louisiana Offshore : 1.0 Bcfd (Gulf Landing – Shell)
16. So. California Offshore : 0.5 Bcfd, (Crystal Energy)

Planned Terminals and Expansions

17. Brownsville, TX : n/a, (Cheniere LNG Partners)
18. Humboldt Bay, CA : 0.5 Bcfd, (Calpine)
19. Mobile Bay, AL: 1.0 Bcfd, (ExxonMobil)
20. Somerset, MA : 0.65 Bcfd (Somerset LNG)
21. Louisiana Offshore : 1.0 Bcfd (McMoRan Exp.)
22. Belmar, NJ Offshore : n/a (El Paso Global)
23. Bahamas : 0.5 Bcfd, (Seafarer - El Paso/FPL)
24. Altamira, Tamulipas : 1.12 Bcfd, (Shell)
25. Baja California, MX : 1.0 Bcfd, (Sempra & Shell)
26. Baja California : 0.6 Bcfd (Conoco-Phillips)
27. Baja California - Offshore : 1.4 Bcfd, (Chevron Texaco)
28. Baja California : 0.85 Bcfd, (Marathon)
29. California - Offshore : 0.5 Bcfd, (Chevron Texaco)
30. St. John, NB : 0.75 Bcfd, (Irving Oil & Chevron Canada)
31. Point Tupper, NS 0.75 Bcf/d (Access Northeast Energy)
32. Harpswell, ME : 0.5 Bcf/d (Fairwinds LNG – CP & TCPL)
33. St. Lawrence, QC : n/a (TCPL and/or Gaz Met)
34. Lázaro Cárdenas, MX : 0.5 Bcfd (Tractebel)
35. Gulf of Mexico : 1.0 Bcfd (ExxonMobil)
36. Providence, RI : 0.5 Bcfd (Keyspan & BG LNG)
37. Mobile Bay, AL: 1.0 Bcfd (Cheniere LNG Partners)
38. Lake Charles, LA: 0.6 Bcfd (Southern Union)
39. Cherry Point, WA: 0.5 Bcfd (Cherry Point Energy LLC)
40. Cove Point, MD : 0.8 Bcfd (Dominion)

** US pipeline approved; LNG terminal pending in Bahamasr*

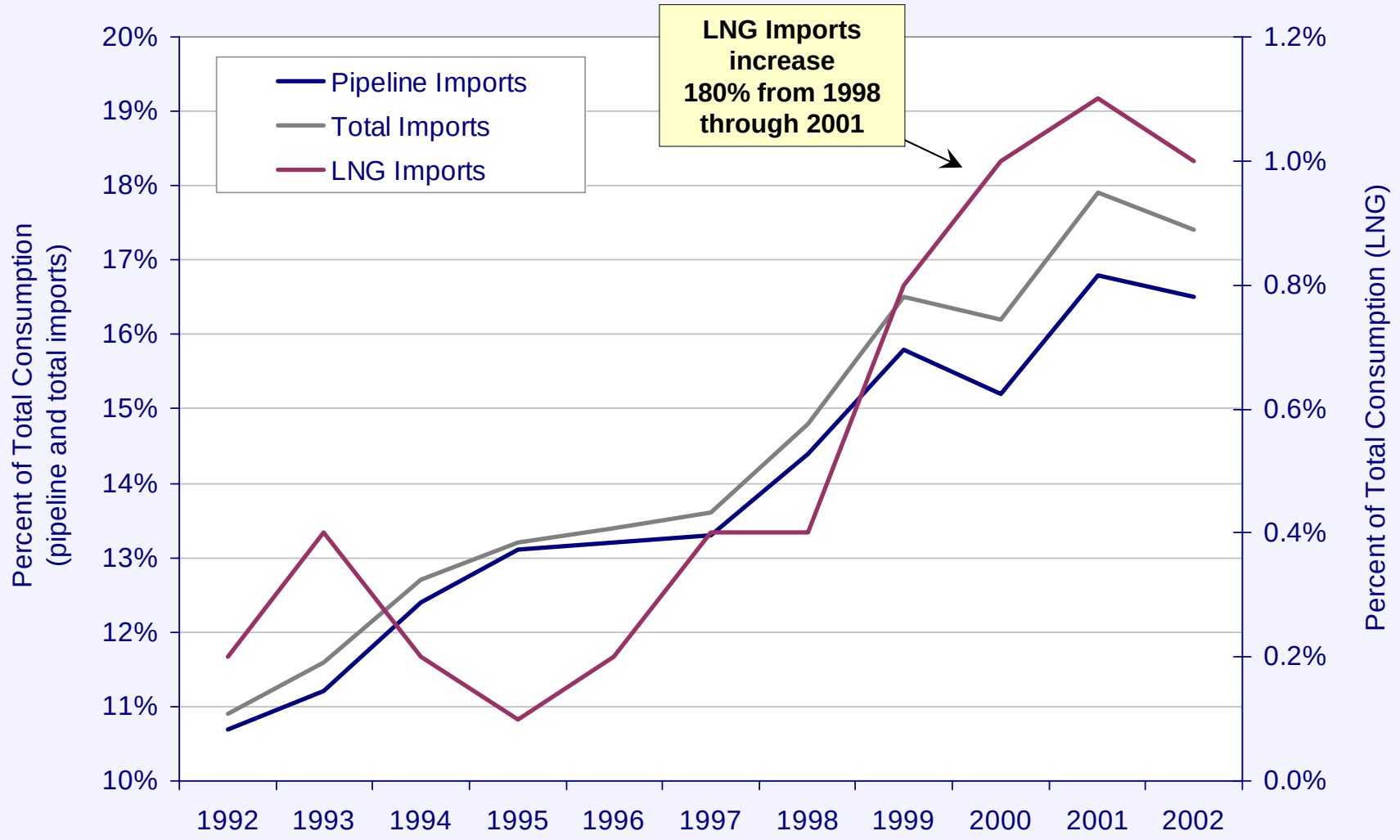


Source: Federal Energy Regulatory Commission

Importance of LNG on Future US Supply Disposition

Center for
Energy Studies

US Imports as a Percent of Total Consumption (1992 - 2002)

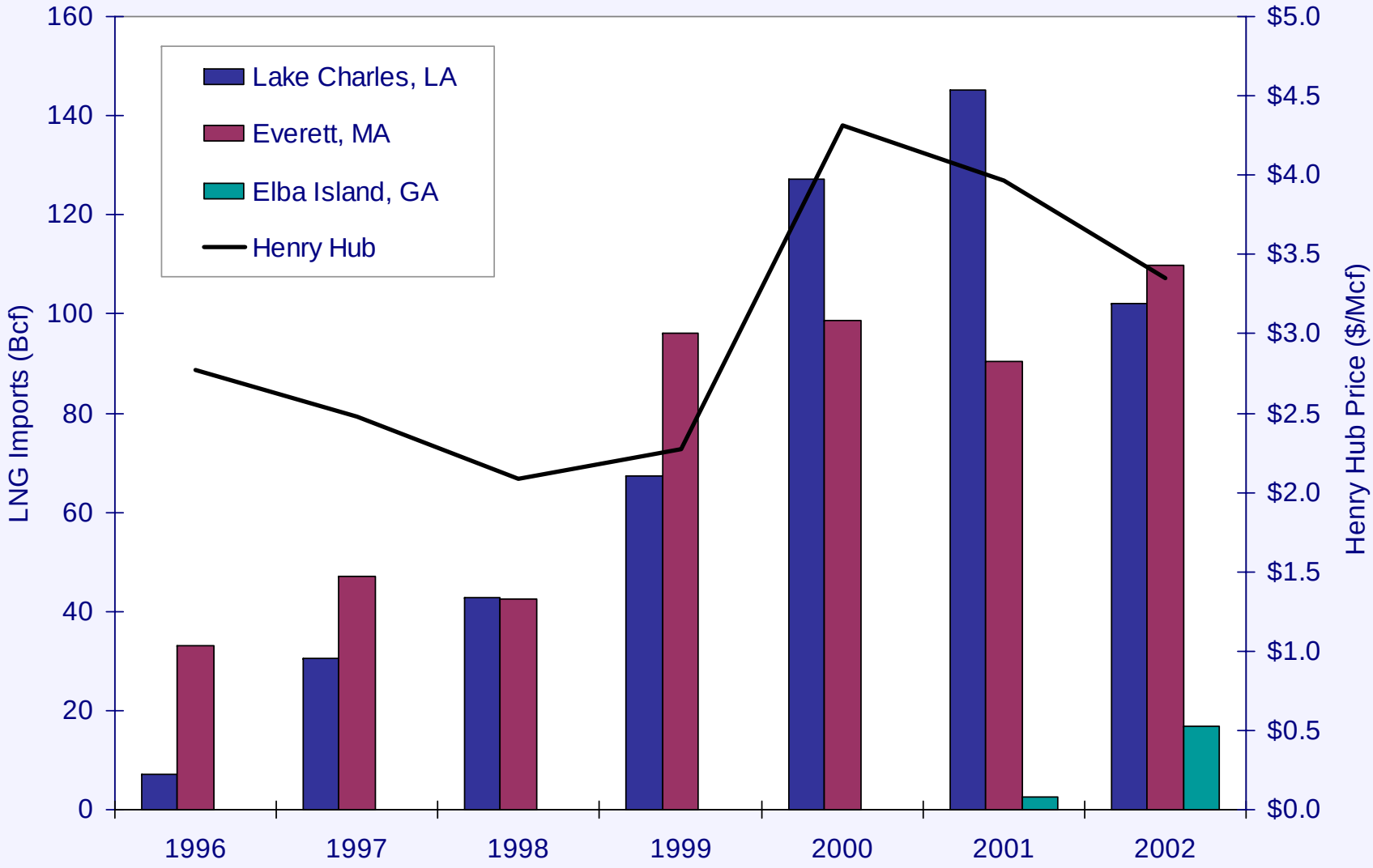


Source: Energy Information Administration, Department of Energy.

Center for
Energy Studies

U.S. LNG Imports by Terminal 1996 - 2002

LNG imports tend to increase as natural gas prices increase



Source: Energy Information Administration, Department of Energy; and Intercontinental Exchange.

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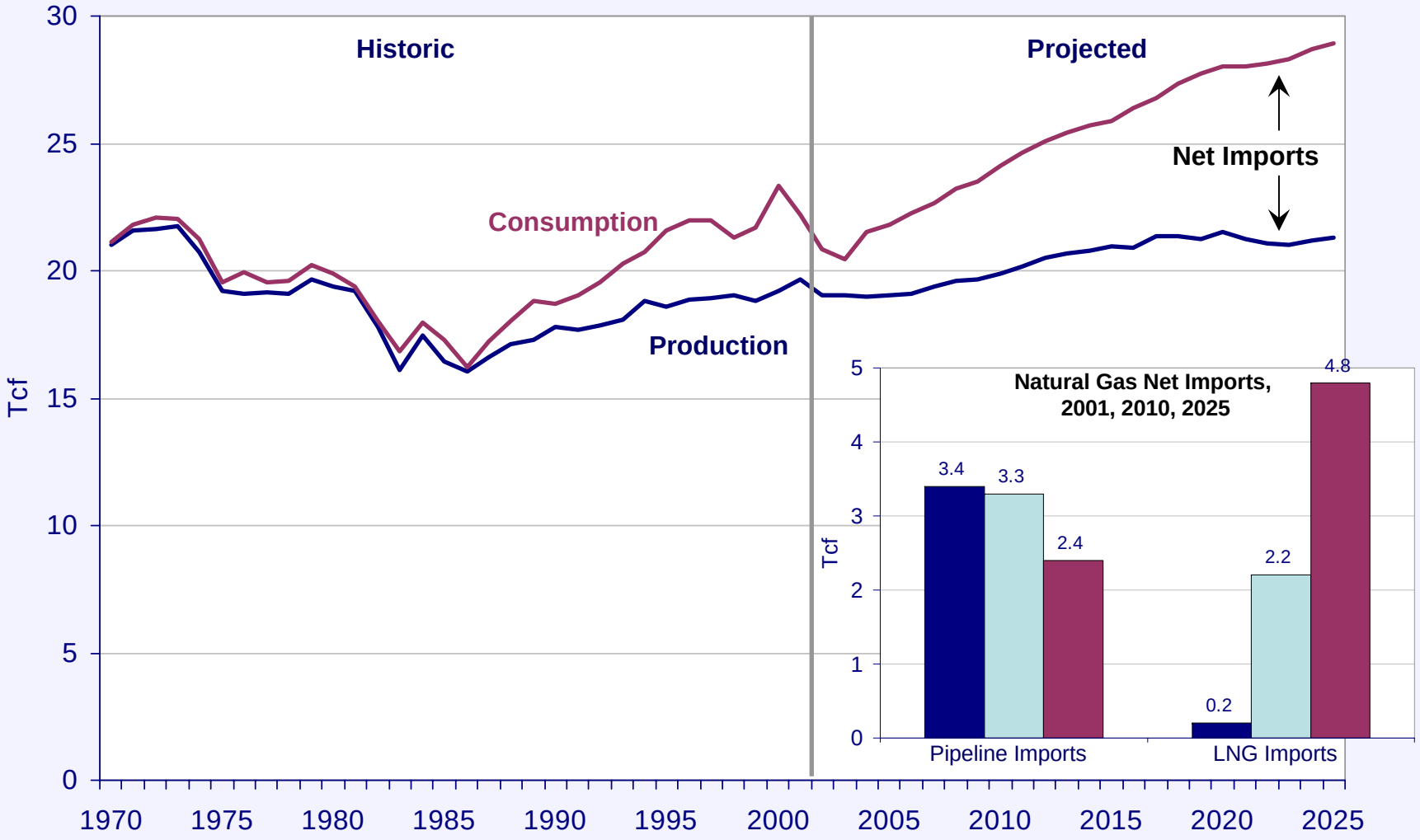
Energy Studies

Natural Gas Production, Consumption and Imports 1970 - 2025



Source: Energy Information Administration, Department of Energy

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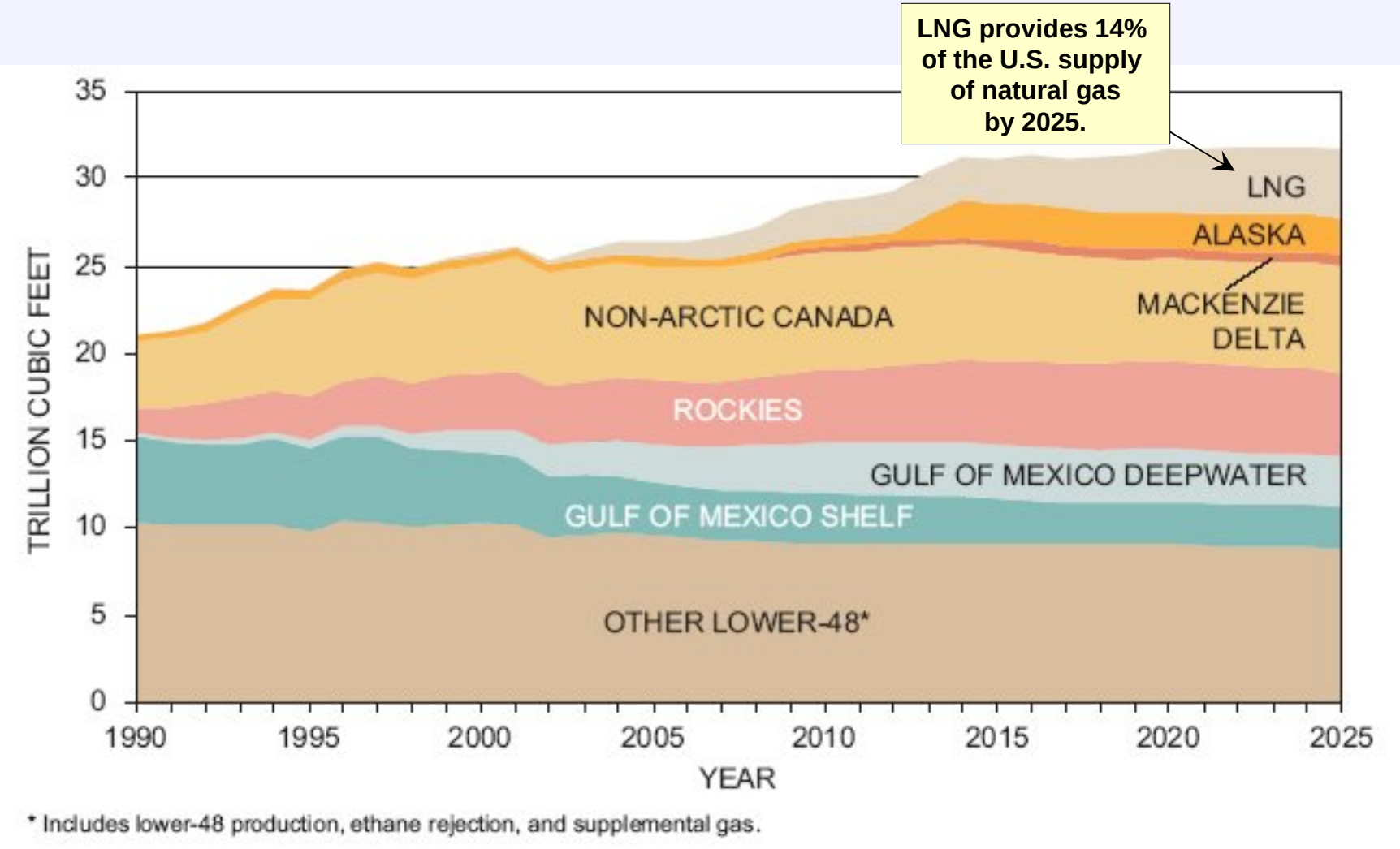
U.S. and Canadian Natural Gas Supply



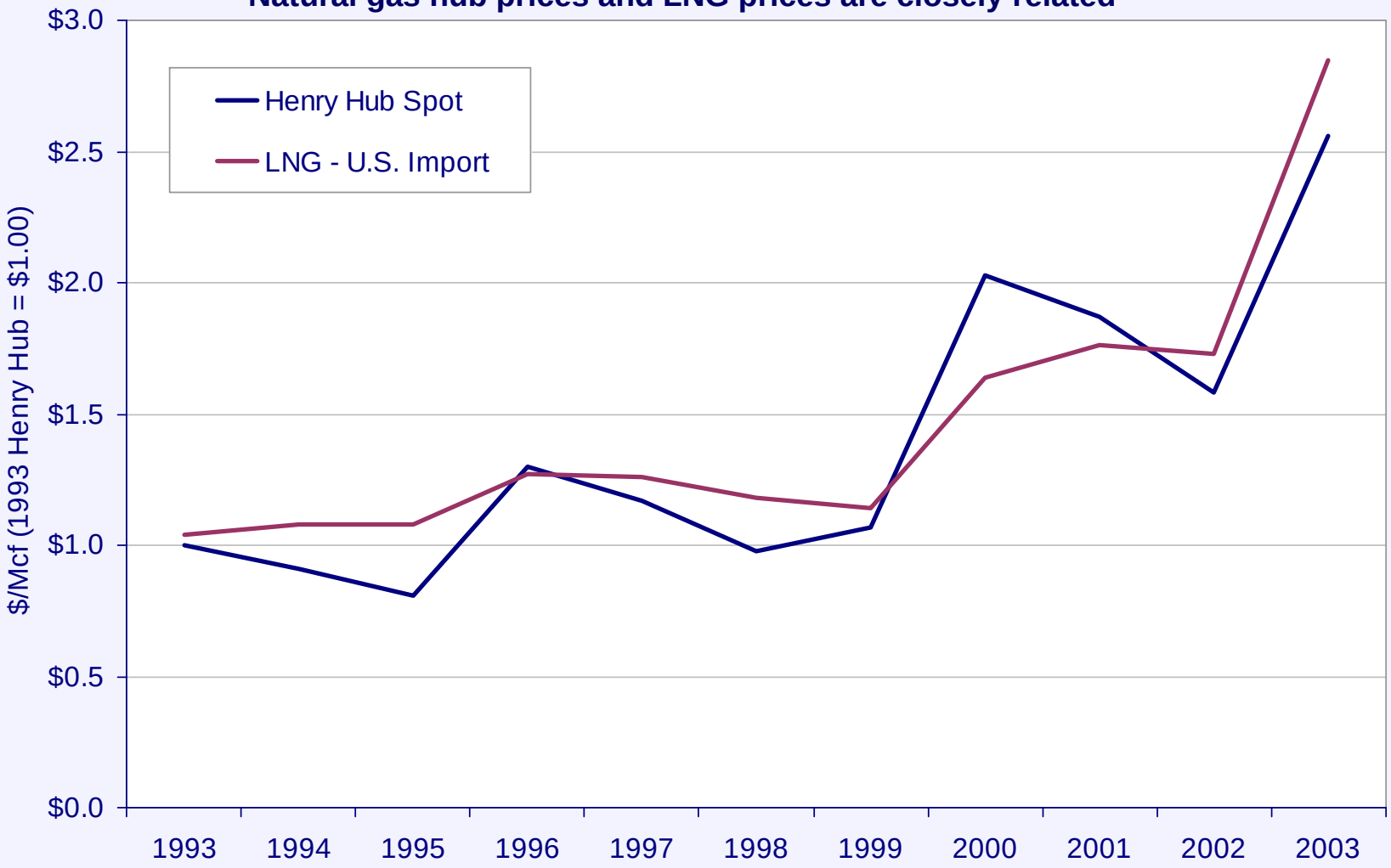
Source: National Petroleum Council

LNG as Future Energy Resource: Comparison to Existing Traditional and Alternative Fuels

Center for
Energy Studies

LNG Import Prices and Henry Hub Spot Prices in the United States 1993 - 2003

Natural gas hub prices and LNG prices are closely related

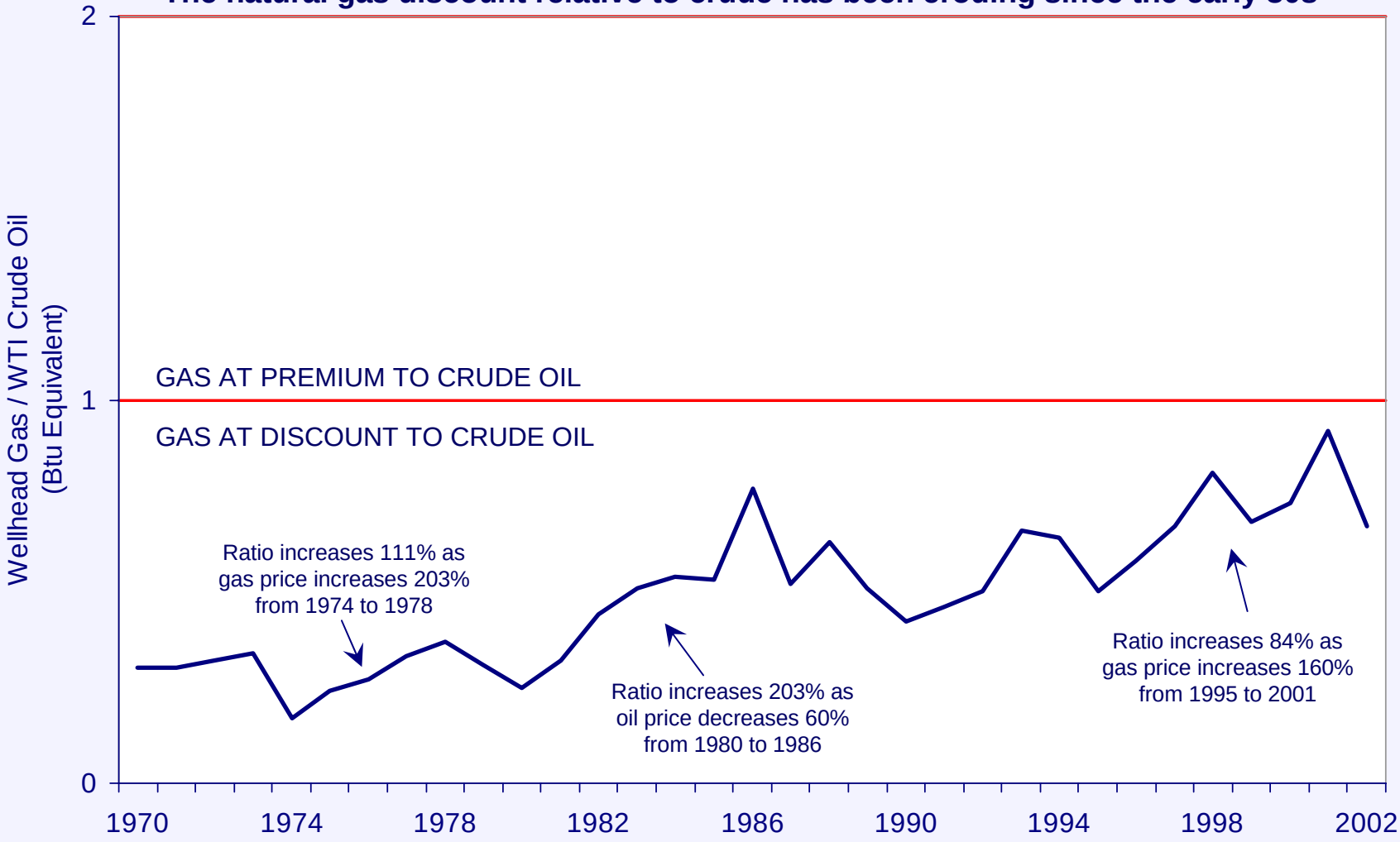


Source: Energy Information Administration, Department of Energy; Gas Daily; and LNGCenter.com

Center for
Energy Studies

Annual Price Ratio of Natural Gas Price to Crude Oil (1970 – 2002)

The natural gas discount relative to crude has been eroding since the early 80s



Source: Energy Information Administration, Department of Energy

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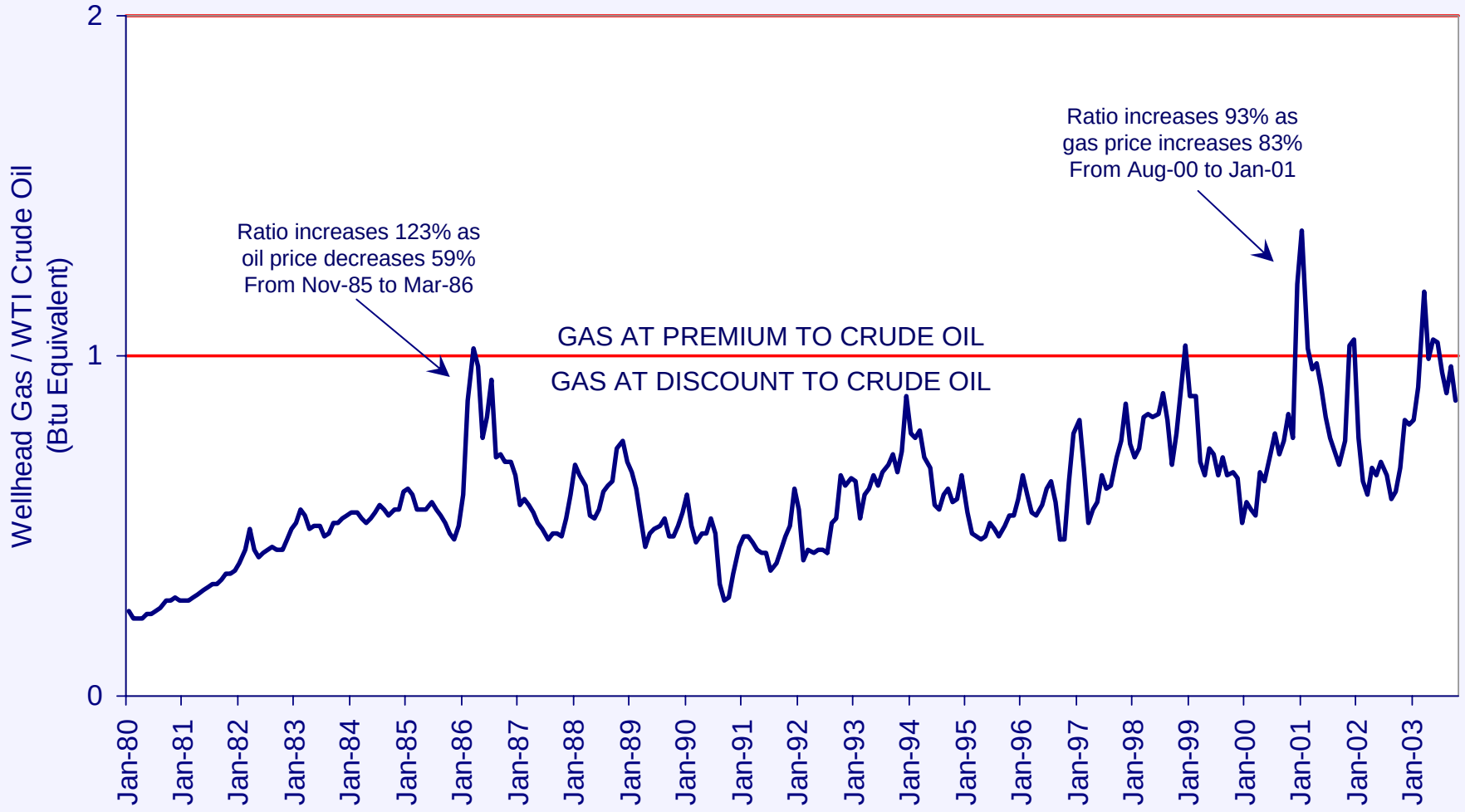
Energy Studies

Monthly Price Ratio of Natural Gas Price to Crude Oil (1970 – 2002)

The erosion shows up in more detail with monthly data



Source: Energy Information Administration, Department of Energy

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Energy Studies

Comparison of Various Energy Infrastructure Investment Costs

Infrastructure Type		Actual or Typical Installed Costs (Million $)	Installed Capacity in Standard Units	Estimated Capacity in Btus (MMBtu)		Estimated or Actual Cost per Btu ($/MMBtu)
Natural Gas Transportation & Storage						
Natural Gas Pipelines						
Gulfstream Gas Pipeline	$	1,700.0	1130 MMcf/d	1,161,640	$	1,463
Kern River Gas Transmission (expansion)	$	1,200.0	906 MMcf/d	931,368	$	1,288
Millennium Pipeline	$	700.0	700 MMcf/d	719,600	$	973
Questart Southern Trails	$	100.0	87 MMcf/d	89,436	$	1,118
Guardian Pipeline	$	238.0	750 MMcf/d	771,000	$	309
Gas Processing Facility						
Williams; Markham, TX	$	40.0	300 MMcf/d	308,400	$	130
Amoco; Pascagoula, MS	$	70.0	1000 MMcf/d	1,028,000	$	68
Shell/Marathon; Centerville, LA (Neptune)	$	300.0	300 MMcf/d	308,400	$	973
Gas Storage Facility						
Duke; Egan (4 Bcf expansion)	$	9.0	4 Bcf	4,112,000	$	2
Napoleonville Phase 2	$	33.8	10.5 Bcf	10,794,000	$	3
South Downsville	$	80.0	41 Bcf	42,148,000	$	2
Northwest Alabama; East Detroit	$	20.3	2 Bcf	2,056,000	$	10
Bay Gas Storage (AL); McIntosh	$	35.0	6 Bcf	6,168,000	$	6
Power Generation						
Gas Combined Cycle	$	246.0	400 MW	10,162,301	$	24
Gas Combustion Turbine	$	66.1	160 MW	1,673,791	$	39
Conventional Coal - Scrubbed	$	700.8	600 MW	15,243,451	$	46
Nuclear	$	1,928.0	1000 MW	27,497,990	$	70
Renewables & Alternative Energy						
Wind Generation	$	50.8	50 MW	582,838	$	87
Solar Generation	$	291.6	100 MW	448,337	$	650
Fuel Cell	$	21.6	10 MW	71,734	$	301

Center for Energy Studies

Comparison of Various Energy Infrastructure Investment Costs

Infrastructure Type	Actual or Typical Installed Costs (Million $)	Installed Capacity in Standard Units	Estimated Capacity in Btus (MMBtu)	Estimated or Actual Cost per Btu ($/MMBtu)
Exploration & Production				
Mars Platform	$ 1,000.0		147,500	$ 6,780
		21000 Bbl/d	121,800	
		25 MMcf/d	25,700	
Bullwinkle Platform[1]	$ 500.0		445,000	$ 1,124
		59000 Bbl/d	342,200	
		100 MMcf/d	102,800	
Brutus Platform[2]	$ 760.0		888,400	$ 855
		100000 Bbl/d	580,000	
		300 MMcf/d	308,400	
Petrochemical				
Refinery (World Class Scale)				
NCRA; Hydrocracker	$ 135.0	35000 Bbl/d	203000	$ 665
NCRA; Hydrogen	$ 32.6	30 MMcf/d	30840	$ 1,057
NCRA; Hydrogen	$ 8.7	35 MMcf/d	35980	$ 242
Navajo; Hydrotreater	$ 48.0	20000 Bbl/d	116000	$ 414
Valero; Delayed Coker	$ 275.0	45000 Bbl/d	261000	$ 1,054
Alon; Desulfurization	$ 14.6	8000 Bbl/d	46400	$ 315
LNG Facilities				
Greenfield -- Onshore	$ 472.0	1 Bcf	1,028,000	$ 459
Cameron LNG	$ 700.0	1.5 Bcf	1,542,000	$ 454
Golden Pass LNG	$ 600.0	1 Bcf	1,028,000	$ 584
Greenfield -- Offshore				
Port Pelican	$ 800.0	1.6 Bcf	1,644,800	$ 486
Gulf Landing	$ 700.0	1.2 Bcf	1,233,600	$ 567

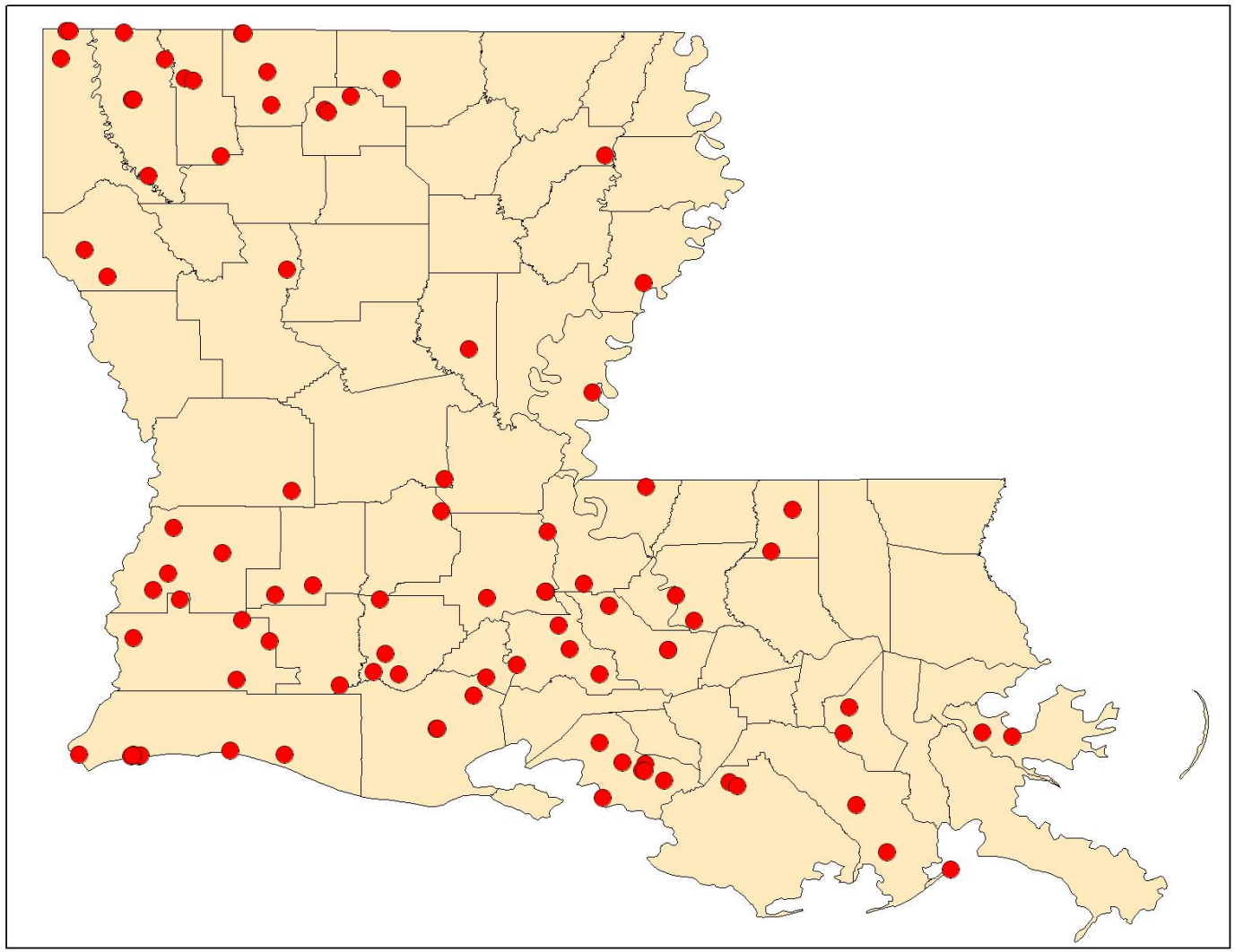
[1] (ultimate recovery is 115 MMB oil and 195 Bcf gas)
[2] (ultimate recovery is +200 mmboe)

Source: Energy Information Administration; Oil and Gas Journal; Various tradepress; and Press Releases

Considerable Existing Infrastructure that Supports LNG

Center for
Energy Studies

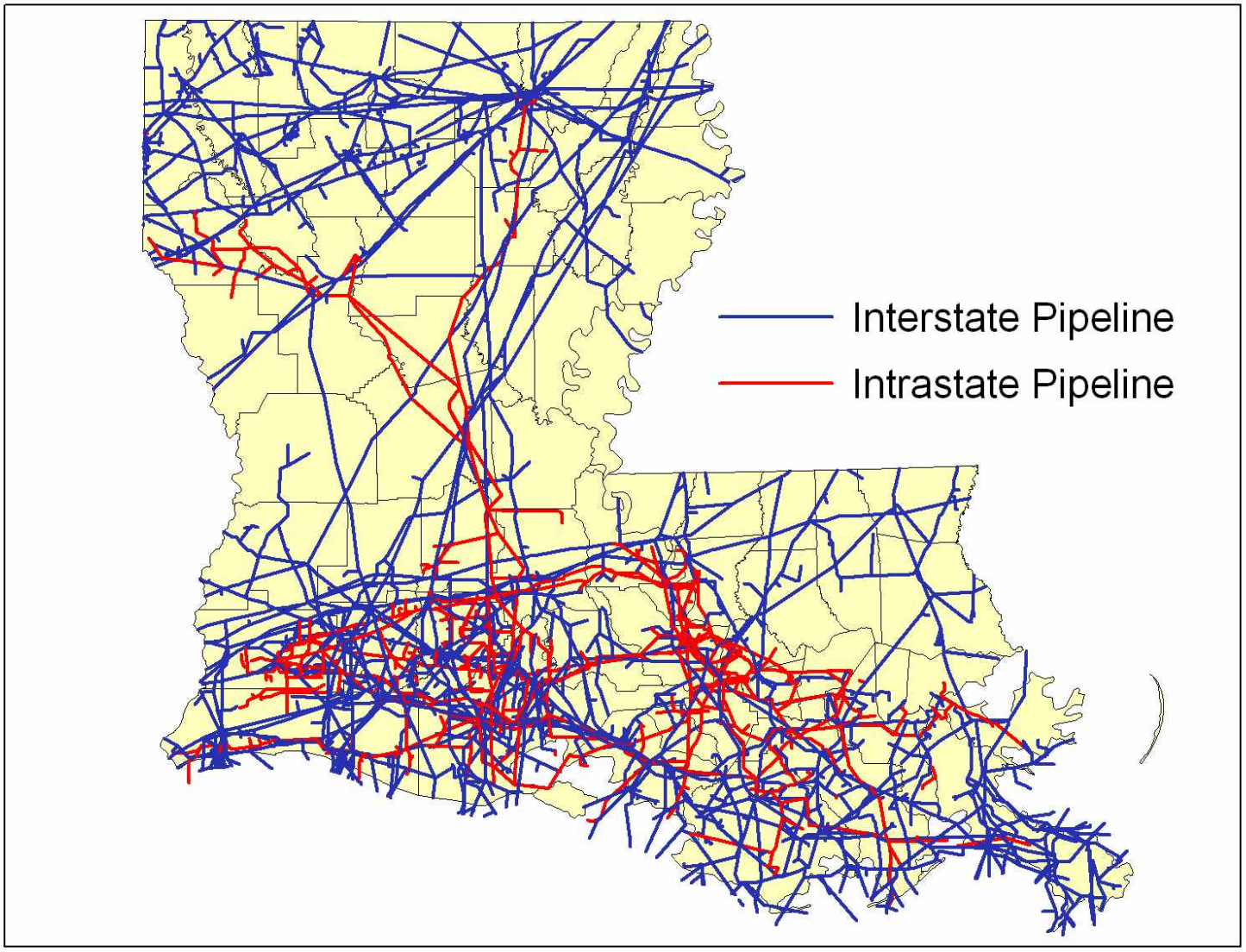
Louisiana Natural Gas Processing Plants



Note: Point locations are approximate
Source: IHS Energy Group Inc., Major Industrial Plant Database, 2002

Center for
Energy Studies

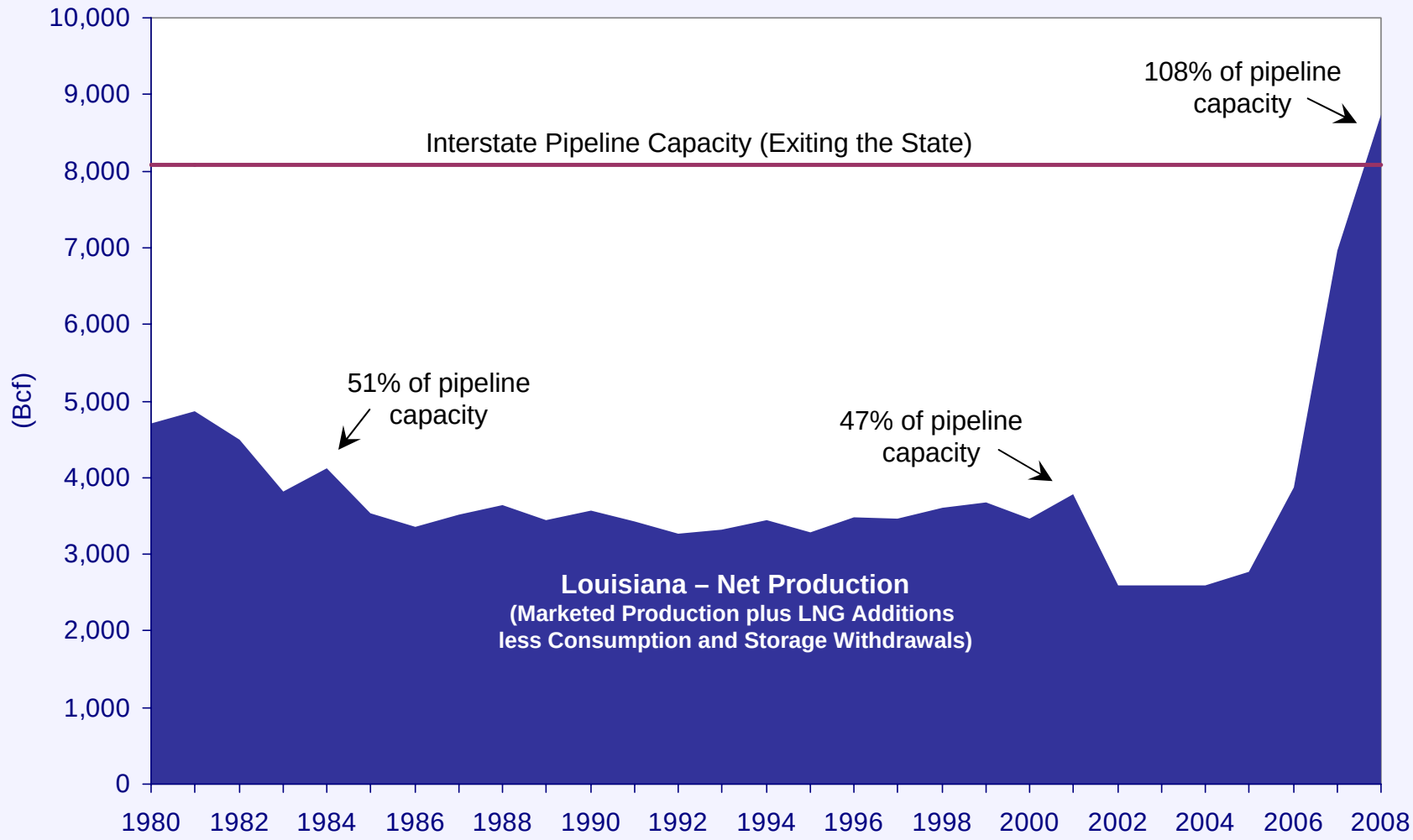
Louisiana Natural Gas Transmission Pipelines



Source: Energy Information Administration, Department of Energy.

Center for
Energy Studies

Louisiana Net Natural Gas Production (including Planned LNG Additions) and Pipeline Capacity



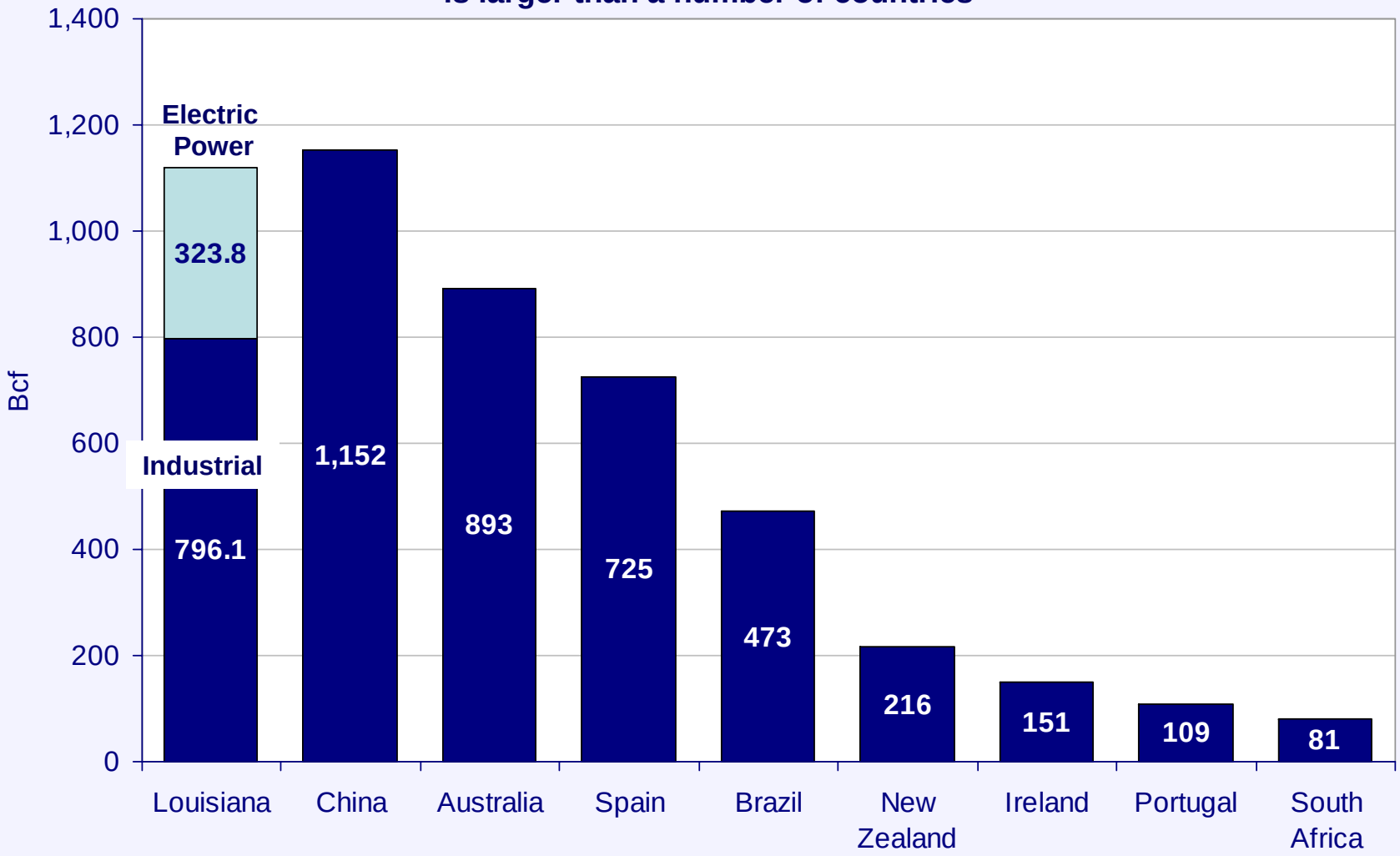
Note: Assumed constant net production from 2002.
Source: Louisiana Department of Natural Resources; and Energy Information Administration, Department of Energy.

Large Market for Natural Gas Users

Center for
Energy Studies

Natural Gas Consumption
Louisiana and World Comparison
(2002)

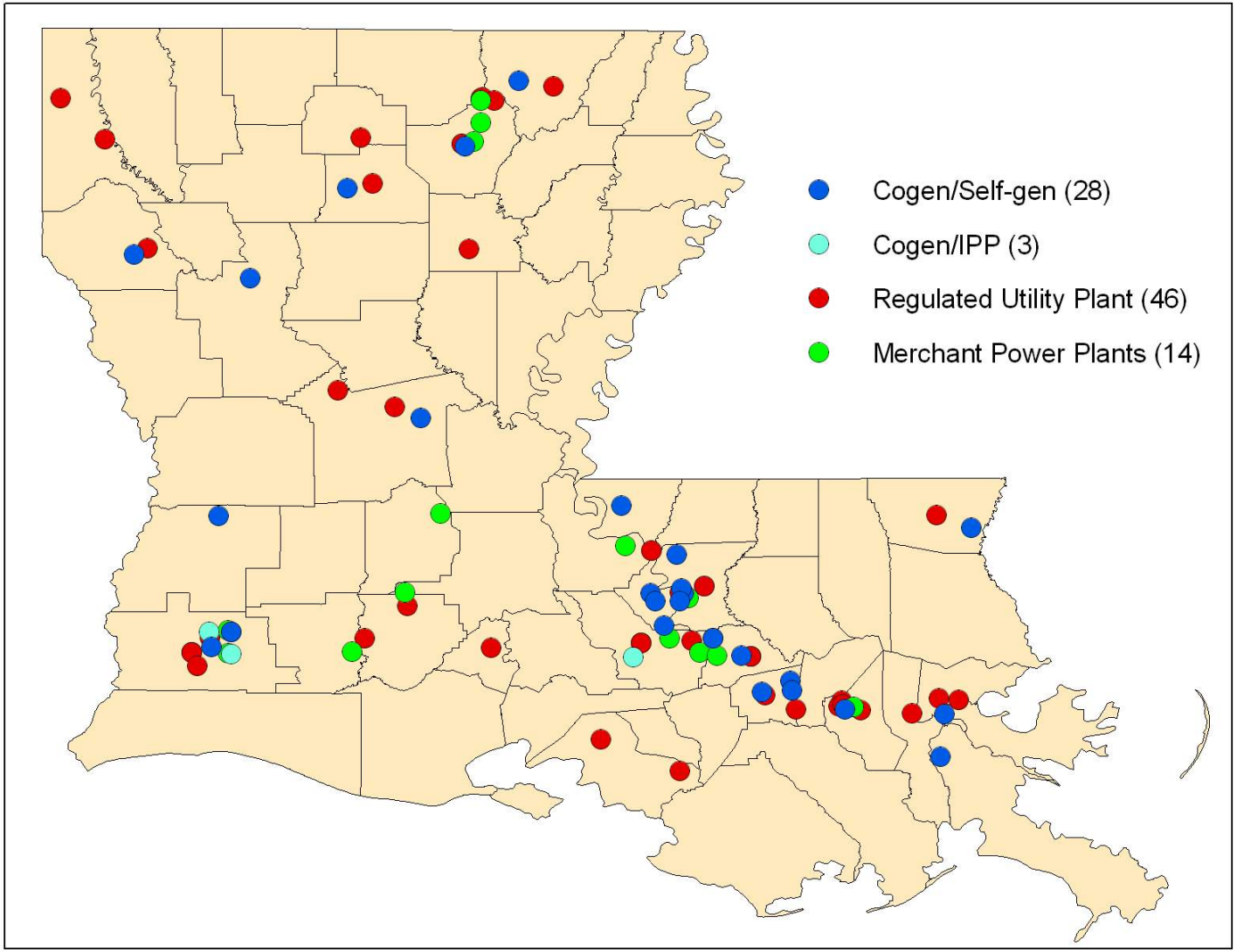
Louisiana industrial and power generation gas consumption is larger than a number of countries



Source: Energy Information Administration, Department of Energy.

Center for
Energy Studies

Louisiana Natural Gas Fired Power Plants



Note: Point locations are approximate
Source: IHS Energy Group Inc., Major Industrial Plant Database, 2002

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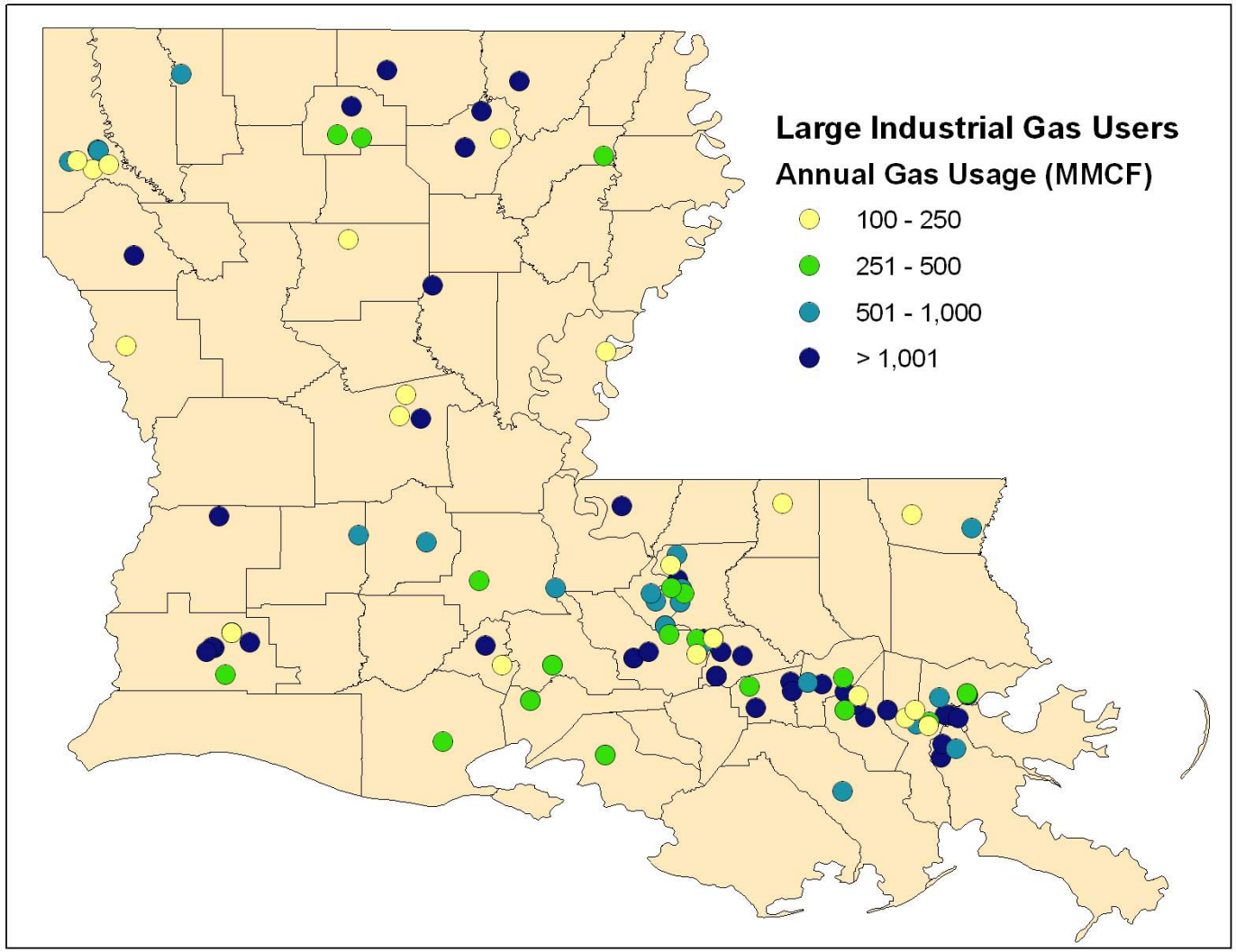
Energy Studies

Louisiana Industrial Natural Gas Users



Note: Point locations are approximate
Source: IHS Energy Group Inc., Major Industrial Plant Database, 2002

Center for Energy Studies

Louisiana Natural Gas Usage by Selected Standard Industrial Codes (SIC)

The chemical industry is the largest user of natural gas in the Louisiana economy

	Total Natural Gas Usage (MMBtu)	Percent of Total Usage (%)
28 Chemicals and Allied Products	544,324	83.0%
2873 Nitrogenous Fertilizers	193,018	29.4%
2869 Industrial Organic Chemicals	182,940	27.9%
2819 Industrial Inorganic Chemicals	60,109	9.2%
2812 Alkalies & Chlorine	58,406	8.9%
Other	49,851	7.6%
29 Petroleum and Coal Products	66,599	10.2%
2911 Petroleum Refining	54,934	8.4%
2999 Petroleum & Coal Products	11,540	1.8%
2992 Lubricating Oil & Greases	125	0.0%
26 Paper and Allied Products	26,317	4.0%
2621 Paper Mills	12,497	1.9%
2631 Paperboard Mills	13,649	2.1%
2653 Corrugated & Solid Fiber Boxes	104	0.0%
2671 Laminated Packaging Paper & Fi	47	0.0%
2674 Uncoated Paper & Multiwall Bags	19	0.0%
2679 Converted Paper Products, Nec	-	0.0%
20 Food and Kindred Products	5,140	0.8%
24 Lumber and Wood Products	3,113	0.5%
33 Primary Metal Industries	3,287	0.5%
32 Stone, Clay & Glass Products	2,951	0.4%
37 Transportation Equipment	1,456	0.2%
22 Textile Mill Products	1,062	0.2%
Other (includes 9 other industries)	1,820	0.3%
Total	**656,069**	

Source: IHS Energy Group Inc., Major Industrial Plant Database, 2002

Center for Energy Studies

Louisiana Gross State Product and Employee Compensation by Selected Standard Industrial Codes (SIC)

Natural gas sensitive industries represent a significant portion of the Louisiana industrial base as well as the total economy

SIC	Description		Gross State Product (Million $) (a)	Percent of Total (%) (b) (a)/sum(a)	Percent of Total State GSP (%) (c) (a)/Total GSP
20	Food and Kindred Products	$	1,699	8.7%	1.1%
26	Paper and Allied Products	$	1,543	7.9%	1.0%
28	Chemicals and Allied Products	$	5,907	30.1%	4.0%
29	Petroleum and Coal Products	$	4,439	22.7%	3.0%
33	Primary Metal Industries	$	172	0.9%	0.1%
	Other Manufacturing	$	5,837	29.8%	3.9%
	Total Manufacturing	**$**	**19,597**	**100.0%**	**13.2%**

SIC	Description		Employee Compensation (Million $) (a)	Percent of Total (%) (b) (a)/sum(a)	Percent of Total State Employee Compensation (%) (c) (a)/Total Comp
20	Food and Kindred Products	$	675	7.7%	1.0%
26	Paper and Allied Products	$	666	7.6%	1.0%
28	Chemicals and Allied Products	$	2,219	25.2%	3.2%
29	Petroleum and Coal Products	$	797	9.0%	1.1%
33	Primary Metal Industries	$	115	1.3%	0.2%
	Other Manufacturing	$	4,338	49.2%	6.2%
	Total Manufacturing	**$**	**8,810**	**100.0%**	**12.6%**

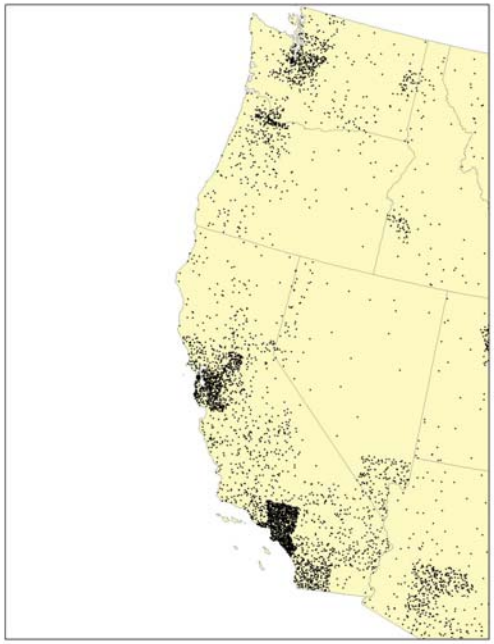
Source: Bureau of Economic Analysis, Department of Commerce.

Gulf/Water-Based Point of Entry

Center for
Energy Studies

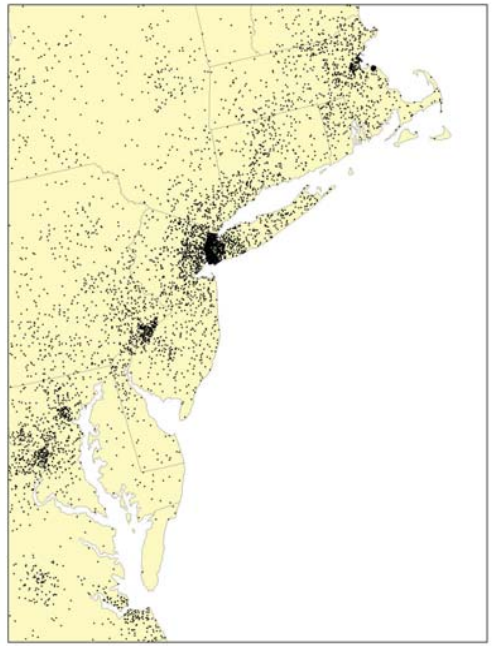
Population Density in Coastal Regions

The Gulf Coast has a lower population density than other areas being considered for LNG facility siting



West Coast

Gulf Coast



East Coast

Note: 1 dot represents 10,000 people.

Regulatory and Permitting Issues at the Federal, State and Local Levels

Federal Agencies with LNG Review or Permitting Authority

Onshore
Federal Energy Regulatory Commission
Department of Transportation, Office of Pipeline Safety

Offshore
Coast Guard
Department of Transportation, Maritime Administration

Others
Department of Energy
Fish and Wildlife Service and NOAA Fisheries
Minerals Management Service
Army Corps of Engineers

Hazards Associated with LNG

Freezing Liquid

- Direct contact with LNG will freeze the point of contact
- A spill on or within the hull can cause brittle fracture

Spills

- Flammable vapor clouds can result from spills where the LNG does not ignite (vapor dispersion exclusion zones are calculated and plotted to keep the public safe).
- Spills are most likely to occur during connection and disconnection process during unloading.
- LNG spills on water: LNG floats on top of water. As heat is transferred from the water to the LNG, it converts from liquid to gaseous form. The large amounts of energy associated with this transition may cause a physical explosion (no ignition).

Fires

- Pool fires can occur when a combustible gas-air mixture burns above a 'pool' of leaked LNG; these fires are very hot. All the LNG has to be consumed before the fire can be extinguished
- A controversial Quest study involving risks associated with LNG fires estimates that fire sizes and danger zones are much smaller than the conventional ½ mile diameter reach expected from a 6 million gallon spill (1/5 of tanker capacity)

Explosions

- Common misperception: LNG is not a pressurized substance. LNG is actually an extremely cold liquid formed through refrigeration and is not stored under pressure
- LNG vapors mixed with air are not explosive in an unconfined environment
- LNG has the highest autoignition temperature when compared to other fuels (e.g. LPG, gasoline, diesel)

Economic Impact of LNG Development

Center for
Energy Studies

Analysis of the Economic Impact of Offshore LNG Facilities on the Louisiana Economy

Total Economic Impact

Louisiana Share of Direct Investment

Offshore / Main Facility Construction

	Direct	Indirect	Induced	Total
Total Gulf of Mexico Investment	$ 2,334,011,774			
Output	$ 909,903,328	$ 175,219,303	$ 152,861,776	**$ 1,237,984,408**
Employment	2,598	1,555	1,592	**5,745**
Total Value Added	$ 209,000,832	$ 97,666,556	$ 85,321,541	**$ 391,988,929**
Employee Compensation	$ 91,319,680	$ 56,017,662	$ 43,739,955	**$ 191,077,297**

Center for
Energy Studies

Analysis of the Economic Impact of Offshore LNG Facilities on the Louisiana Economy

Total Economic Impact

Offshore / Support Facility Construction

Louisiana Share of Project Investment

	Direct	Indirect	Induced	Total
Total Louisiana Project Investment	$ 285,988,226			
Output	$ 90,578,745	$ 36,309,563	$ 42,220,178	**$ 169,108,486**
Employment	819	290	440	**1,548**
Total Value Added	$ 28,989,832	$ 20,609,348	$ 23,565,674	**$ 73,164,855**
Employee Compensation	$ 26,750,352	$ 10,887,139	$ 12,080,905	**$ 49,718,397**

Center for
Energy Studies

Analysis of the Economic Impact of Offshore LNG Facilities on the Louisiana Economy

Total Economic Impact

Offshore / Operation

Louisiana Share of Operations Expenditures	Direct	Indirect	Induced	Total
Total GOM Annual Operations Expenditures	$ 110,000,000	-	-	
Output	$ 93,774,252	$ 24,076,841	$ 23,586,268	**$ 141,437,362**
Employment	541	206	246	**993**
Total Value Added	$ 32,052,116	$ 13,170,511	$ 13,164,944	**$ 58,387,571**
Employee Compensation	$ 27,534,357	$ 7,233,516	$ 6,748,988	**$ 41,516,861**

Center for
Energy Studies

Analysis of the Economic Impact of Onshore LNG Facilities on the Louisiana Economy

Total Economic Impact

Onshore / Main Facility Construction				
Louisiana Share of Direct Investment	Direct	Indirect	Induced	Total
Total Gulf of Mexico Investment	$ 1,267,487,646			
Output	$ 432,225,856	$ 72,685,989	$ 118,865,015	**$ 623,776,860**
Employment	2,756	656	1,238	**4,650**
Total Value Added	$ 133,339,104	$ 41,407,906	$ 66,345,861	**$ 241,092,872**
Employee Compensation	$ 82,297,475	$ 22,338,072	$ 34,012,099	**$ 138,647,646**

Center for
Energy Studies

Analysis of the Economic Impact of Onshore LNG Facilities on the Louisiana Economy

Louisiana Share of Project Investment

Total Economic Impact

Onshore / Support Facility Construction

	Direct	Indirect	Induced	Total
Total Louisiana Project Investment	$ 323,888,733			
Output	$ 102,576,336	$ 44,496,130	$ 53,541,748	**$ 200,614,214**
Employment	1,024	351	558	**1,933**
Total Value Added	$ 38,409,980	$ 25,295,964	$ 29,884,937	**$ 93,590,881**
Employee Compensation	$ 34,827,468	$ 13,313,976	$ 15,320,466	**$ 63,461,910**

Center for
Energy Studies

Analysis of the Economic Impact of Onshore LNG Facilities on the Louisiana Economy

Louisiana Share of Operations Expenditures

Total Economic Impact

Onshore / Operation

	Direct	Indirect	Induced	Total
Total GOM Annual Operations Expenditures	$ 60,000,000	-	-	
Output	$ 54,666,880	$ 10,204,294	$ 14,429,010	**$ 79,300,184**
Employment	383	80	150	**614**
Total Value Added	$ 24,084,914	$ 5,298,106	$ 8,053,717	**$ 37,436,737**
Employee Compensation	$ 15,601,414	$ 2,881,123	$ 4,128,725	**$ 22,611,262**

Center for
Energy Studies

Analysis of the Economic Impact of All Proposed LNG Facilities on the Louisiana Economy

Louisiana Share of All Project Investment

Total Economic Impact

Total Facility Construction

	Direct	Indirect	Induced	Total
Total Project Investment	$ 4,211,376,379			
Output	$ 1,535,284,265	$ 328,710,985	$ 367,488,717	**$ 2,231,483,967**
Employment	7,196	2,852	3,828	**13,877**
Total Value Added	$ 409,739,748	$ 184,979,774	$ 205,118,014	**$ 799,837,536**
Employee Compensation	$ 235,194,975	$ 102,556,850	$ 105,153,425	**$ 442,905,249**

Center for
Energy Studies

Analysis of the Economic Impact of All Proposed LNG Facilities on the Louisiana Economy

Louisiana Share of Operations Expenditures

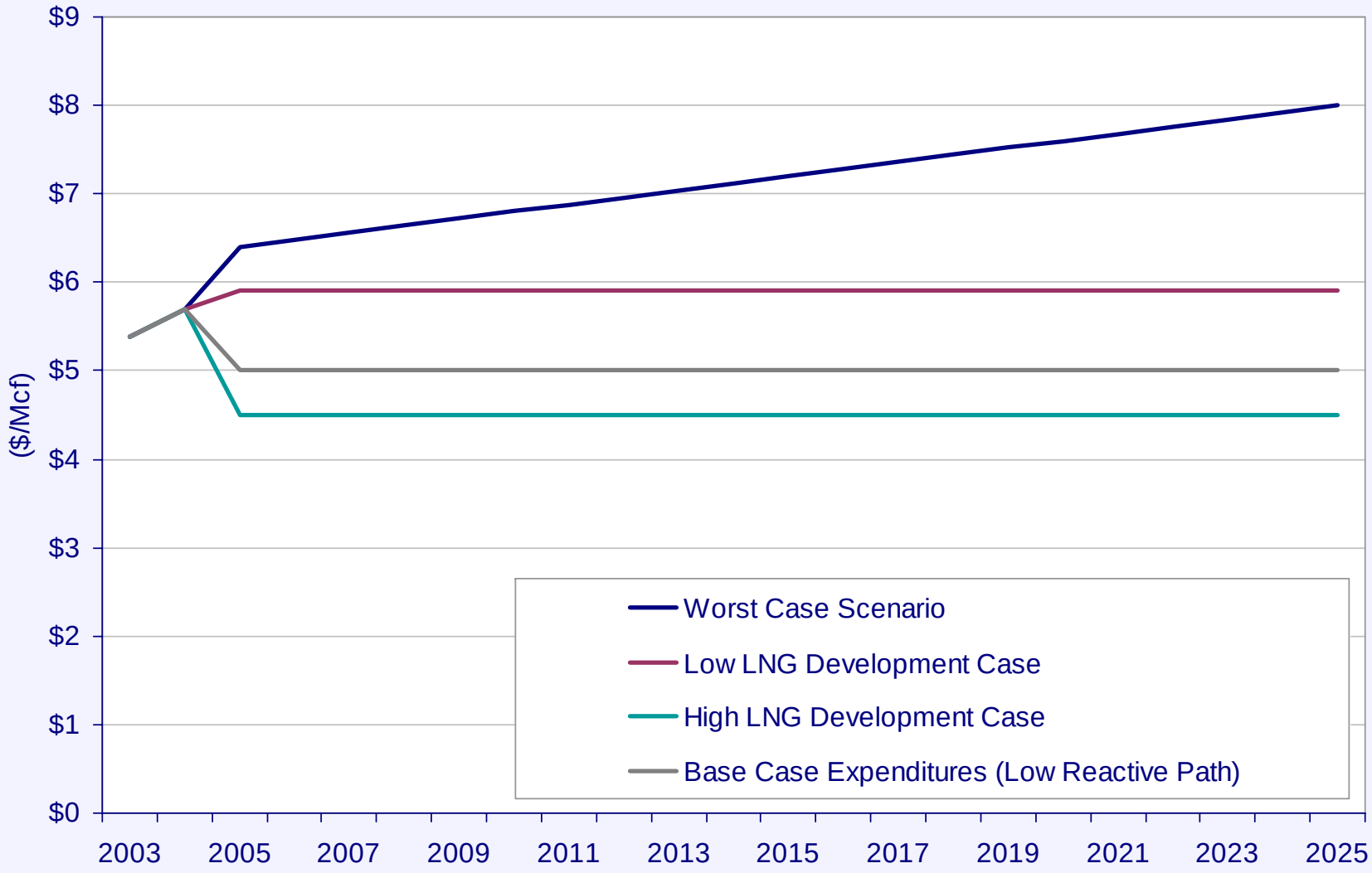
Total Economic Impact

	Total Operation			
	Direct	Indirect	Induced	Total
Total GOM Annual Operations Expenditures	$ 170,000,000			
Output	$ 148,441,132	$ 34,281,135	$ 38,015,279	**$ 220,737,546**
Employment	925	286	396	**1,607**
Total Value Added	$ 56,137,030	$ 18,468,617	$ 21,218,661	**$ 95,824,308**
Employee Compensation	$ 43,135,771	$ 10,114,639	$ 10,877,713	**$ 64,128,123**

Economic Impacts of LNG Development on Louisiana's Industrial Base

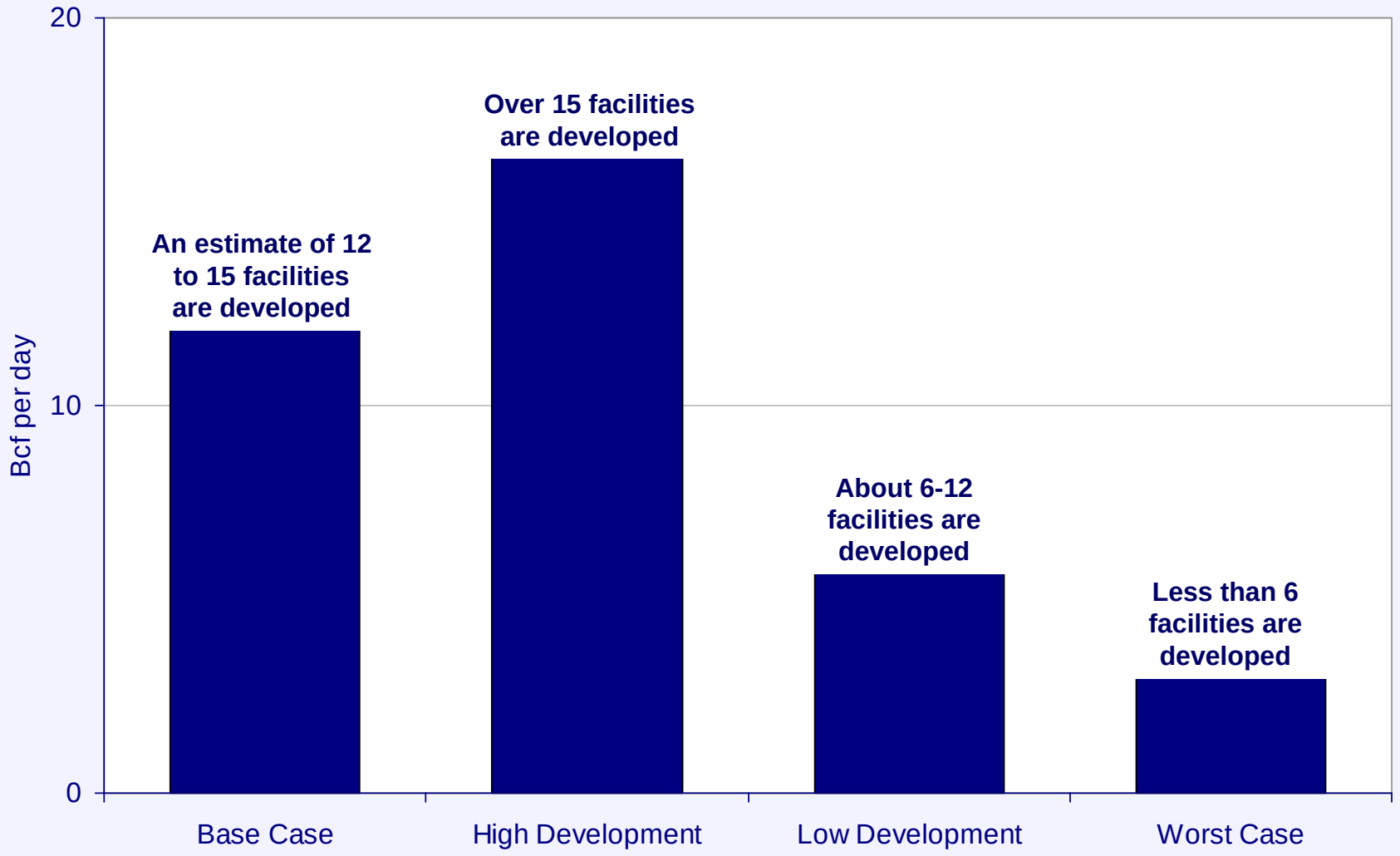
Center for
Energy Studies

Potential Price Scenarios



Center for
Energy Studies

What is High versus Low Development ?



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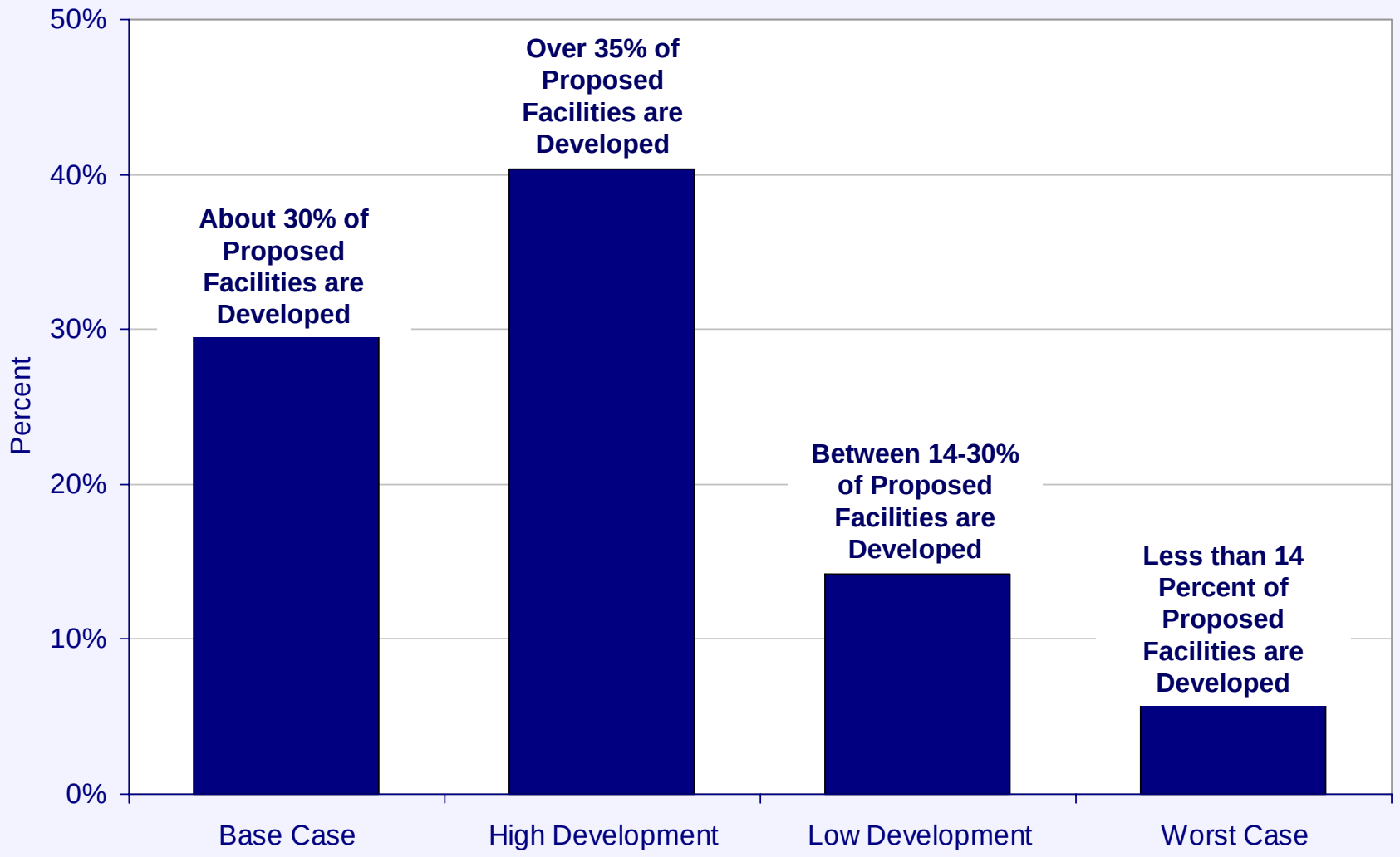
High versus Low Development as a Percent of Planned Development



Center for
Energy Studies

Potential Increases in Industrial Natural Gas Expenditures

SIC Code and Description	Change in Industrial Expenditures					
	Base Case Less High Case		Base Case Less Low Case		Base Case Less Worst Case	
	2002	2005	2002	2005	2002	2005
20 Food and Kindred Products	$ -	$ (2.72)	$ -	$ 4.89	$ -	$ 7.61
22 Textile Mill Products	$ -	$ (0.56)	$ -	$ 1.01	$ -	$ 1.57
23 Apparel & Textile Products	$ -	$ (0.01)	$ -	$ 0.02	$ -	$ 0.02
24 Lumber and Wood Products	$ -	$ (1.65)	$ -	$ 2.96	$ -	$ 4.61
26 Paper and Allied Products	$ -	$ (13.91)	$ -	$ 25.04	$ -	$ 38.95
27 Printing & Publishing	$ -	$ (0.02)	$ -	$ 0.04	$ -	$ 0.06
28 Chemicals and Allied Products	$ -	$ (287.72)	$ -	$ 517.90	$ -	$ 805.63
29 Petroleum and Coal Products	$ -	$ (35.20)	$ -	$ 63.37	$ -	$ 98.57
30 Rubber & Misc. Plastic Prods.	$ -	$ (0.14)	$ -	$ 0.25	$ -	$ 0.39
32 Stone, Clay & Glass Products	$ -	$ (1.56)	$ -	$ 2.81	$ -	$ 4.37
33 Primary Metal Industries	$ -	$ (1.74)	$ -	$ 3.13	$ -	$ 4.86
34 Fabricated Metal Products	$ -	$ (0.44)	$ -	$ 0.80	$ -	$ 1.24
35 Machinery & Computer Equip.	$ -	$ (0.10)	$ -	$ 0.19	$ -	$ 0.29
36 Electric & Electronic Equip.	$ -	$ (0.24)	$ -	$ 0.43	$ -	$ 0.67
37 Transportation Equipment	$ -	$ (0.77)	$ -	$ 1.39	$ -	$ 2.15
38 Instruments & Related Products	$ -	$ (0.00)	$ -	$ 0.00	$ -	$ 0.01
39 Misc. Manufacturing Industries	$ -	$ (0.00)	$ -	$ 0.00	$ -	$ 0.00
Other	$ -	$ (51.28)	$ -	$ 92.31	$ -	$ 143.59
Total	**$ -**	**$ (398.07)**	**$ -**	**$ 716.53**	**$ -**	**$ 1,114.61**

Center for Energy Studies

Economic Impact to Louisiana Industries Associated with High LNG Development

SIC	Sector	Output Impacts (NPV $ Millions) Direct	Indirect & Induced	Total	Employment Impacts (Jobs) Direct	Indirect & Induced	Total	Employee Compensation (NPV $ Millions) Direct	Indirect & Induced	Total
20	Food and Kindred Products	$ 49.51	$ 83.29	$ 132.79	989	675	1,664	$ 22.72	$ 15.50	$ 38.23
22	Textile Mill Products	$ 14.91	$ 23.53	$ 38.44	210	121	331	$ 3.48	$ 2.02	$ 5.50
23	Apparel & Textile Products	$ 6.01	$ 9.51	$ 15.52	445	259	703	$ 5.12	$ 2.97	$ 8.09
24	Lumber and Wood Products	$ 17.73	$ 34.57	$ 52.30	565	537	1,101	$ 11.26	$ 10.70	$ 21.96
26	Paper and Allied Products	$ 0.84	$ 1.31	$ 2.15	10	6	16	$ 0.37	$ 0.21	$ 0.58
27	Printing & Publishing	$ 12.59	$ 20.37	$ 32.96	570	352	922	$ 11.55	$ 7.14	$ 18.68
28	Chemicals and Allied Products	$ 86.90	$ 150.19	$ 237.09	627	456	1,083	$ 30.30	$ 22.06	$ 52.36
29	Petroleum and Coal Products	$ 43.20	$ 87.88	$ 131.09	206	213	418	$ 9.87	$ 10.21	$ 20.09
30	Rubber & Misc. Plastic Prods.	$ 9.13	$ 14.73	$ 23.86	268	164	432	$ 6.39	$ 3.92	$ 10.31
32	Stone, Clay & Glass Products	$ 8.24	$ 13.85	$ 22.10	286	194	480	$ 6.72	$ 4.57	$ 11.29
33	Primary Metal Industries	$ 0.24	$ 0.37	$ 0.61	6	3	10	$ 0.16	$ 0.09	$ 0.24
34	Fabricated Metal Products	$ 25.11	$ 39.39	$ 64.50	782	445	1,227	$ 18.97	$ 10.79	$ 29.77
35	Machinery & Computer Equip.	$ 19.96	$ 31.56	$ 51.52	583	339	923	$ 16.81	$ 9.77	$ 26.58
36	Electric & Electronic Equip.	$ 10.12	$ 15.93	$ 26.05	230	132	362	$ 7.03	$ 4.04	$ 11.07
37	Transportation Equipment	$ 33.74	$ 50.24	$ 83.98	1,016	497	1,512	$ 46.16	$ 22.57	$ 68.74
38	Instruments & Related Products	$ 2.15	$ 3.43	$ 5.59	77	46	124	$ 2.31	$ 1.38	$ 3.68
39	Misc. Manufacturing Industries	$ 3.31	$ 5.42	$ 8.73	186	118	304	$ 2.77	$ 1.76	$ 4.53
Total for Major Louisiana Industries		**$ 343.70**	**$ 585.59**	**$ 929.28**	**7,055**	**4,557**	**11,612**	**$ 201.99**	**$ 129.70**	**$ 331.69**

Center for Energy Studies

Economic Impact to Louisiana Industries Associated with Low LNG Development

SIC	Sector	Output Impacts (NPV $ Millions) Direct	Output Impacts (NPV $ Millions) Indirect & Induced	Output Impacts (NPV $ Millions) Total	Employment Impacts (Jobs) Direct	Employment Impacts (Jobs) Indirect & Induced	Employment Impacts (Jobs) Total	Employee Compensation (NPV $ Millions) Direct	Employee Compensation (NPV $ Millions) Indirect & Induced	Employee Compensation (NPV $ Millions) Total
20	Food and Kindred Products	$ (89.12)	$ (149.91)	$ (239.03)	(1,780)	(1,215)	(2,995)	$ (40.90)	$ (27.91)	$ (68.81)
22	Textile Mill Products	$ (26.84)	$ (42.36)	$ (69.20)	(377)	(218)	(595)	$ (6.27)	$ (3.63)	$ (9.90)
23	Apparel & Textile Products	$ (10.83)	$ (17.11)	$ (27.94)	(801)	(465)	(1,266)	$ (9.21)	$ (5.35)	$ (14.56)
24	Lumber and Wood Products	$ (31.91)	$ (62.23)	$ (94.15)	(1,017)	(966)	(1,982)	$ (20.27)	$ (19.26)	$ (39.53)
26	Paper and Allied Products	$ (1.50)	$ (2.37)	$ (3.87)	(19)	(11)	(29)	$ (0.66)	$ (0.38)	$ (1.04)
27	Printing & Publishing	$ (22.66)	$ (36.66)	$ (59.32)	(1,025)	(634)	(1,659)	$ (20.79)	$ (12.85)	$ (33.63)
28	Chemicals and Allied Products	$ (156.43)	$ (270.35)	$ (426.77)	(1,128)	(821)	(1,949)	$ (54.53)	$ (39.71)	$ (94.25)
29	Petroleum and Coal Products	$ (77.76)	$ (158.19)	$ (235.95)	(370)	(383)	(753)	$ (17.77)	$ (18.38)	$ (36.16)
30	Rubber & Misc. Plastic Prods.	$ (16.44)	$ (26.51)	$ (42.95)	(482)	(296)	(778)	$ (11.51)	$ (7.05)	$ (18.56)
32	Stone, Clay & Glass Products	$ (14.84)	$ (24.93)	$ (39.77)	(514)	(350)	(864)	$ (12.09)	$ (8.23)	$ (20.32)
33	Primary Metal Industries	$ (0.43)	$ (0.66)	$ (1.09)	(11)	(6)	(17)	$ (0.28)	$ (0.15)	$ (0.44)
34	Fabricated Metal Products	$ (45.19)	$ (70.90)	$ (116.10)	(1,408)	(801)	(2,209)	$ (34.15)	$ (19.43)	$ (53.58)
35	Machinery & Computer Equip.	$ (35.93)	$ (56.81)	$ (92.74)	(1,050)	(610)	(1,661)	$ (30.26)	$ (17.59)	$ (47.85)
36	Electric & Electronic Equip.	$ (18.21)	$ (28.68)	$ (46.89)	(414)	(238)	(651)	$ (12.65)	$ (7.27)	$ (19.92)
37	Transportation Equipment	$ (60.73)	$ (90.43)	$ (151.16)	(1,828)	(894)	(2,722)	$ (83.09)	$ (40.63)	$ (123.72)
38	Instruments & Related Products	$ (3.87)	$ (6.18)	$ (10.05)	(139)	(83)	(222)	$ (4.15)	$ (2.48)	$ (6.63)
39	Misc. Manufacturing Industries	$ (5.96)	$ (9.76)	$ (15.72)	(334)	(213)	(547)	$ (4.98)	$ (3.18)	$ (8.16)
	Total for Major Louisiana Industries	**$ (618.65)**	**$ (1,054.06)**	**$ (1,672.71)**	**(12,699)**	**(8,203)**	**(20,902)**	**$ (363.58)**	**$ (233.47)**	**$ (597.05)**

Center for
Energy Studies

Economic Impact to Louisiana Industries Associated with Worst Case Scenario

SIC	Sector	Output Impacts (NPV $ Millions) Direct	Output Impacts (NPV $ Millions) Indirect & Induced	Output Impacts (NPV $ Millions) Total	Employment Impacts (Jobs) Direct	Employment Impacts (Jobs) Indirect & Induced	Employment Impacts (Jobs) Total	Employee Compensation (NPV $ Millions) Direct	Employee Compensation (NPV $ Millions) Indirect & Induced	Employee Compensation (NPV $ Millions) Total
20	Food and Kindred Products	$ (233.95)	$ (159.61)	$ (393.56)	(5,242)	(3,576)	(8,819)	$ (107.38)	$ (73.26)	$ (180.64)
22	Textile Mill Products	$ (69.80)	$ (40.37)	$ (110.17)	(1,089)	(630)	(1,718)	$ (16.31)	$ (9.43)	$ (25.74)
23	Apparel & Textile Products	$ (28.15)	$ (16.36)	$ (44.51)	(2,311)	(1,343)	(3,654)	$ (23.95)	$ (13.91)	$ (37.86)
24	Lumber and Wood Products	$ (84.93)	$ (80.67)	$ (165.60)	(3,081)	(2,927)	(6,008)	$ (53.95)	$ (51.24)	$ (105.19)
26	Paper and Allied Products	$ (4.18)	$ (2.39)	$ (6.58)	(62)	(36)	(98)	$ (1.83)	$ (1.05)	$ (2.88)
27	Printing & Publishing	$ (58.93)	$ (36.42)	$ (95.35)	(2,959)	(1,829)	(4,788)	$ (54.06)	$ (33.41)	$ (87.47)
28	Chemicals and Allied Products	$ (424.26)	$ (308.97)	$ (733.23)	(3,559)	(2,592)	(6,152)	$ (147.90)	$ (107.71)	$ (255.61)
29	Petroleum and Coal Products	$ (211.48)	$ (218.74)	$ (430.22)	(1,175)	(1,215)	(2,390)	$ (48.34)	$ (50.00)	$ (98.34)
30	Rubber & Misc. Plastic Prods.	$ (42.80)	$ (26.23)	$ (69.03)	(1,395)	(855)	(2,250)	$ (29.96)	$ (18.36)	$ (48.33)
32	Stone, Clay & Glass Products	$ (39.08)	$ (26.59)	$ (65.67)	(1,525)	(1,037)	(2,562)	$ (31.85)	$ (21.66)	$ (53.51)
33	Primary Metal Industries	$ (1.19)	$ (0.64)	$ (1.84)	(37)	(20)	(57)	$ (0.79)	$ (0.43)	$ (1.22)
34	Fabricated Metal Products	$ (117.54)	$ (66.87)	$ (184.40)	(4,064)	(2,312)	(6,376)	$ (88.82)	$ (50.53)	$ (139.35)
35	Machinery & Computer Equip.	$ (95.39)	$ (55.44)	$ (150.83)	(3,167)	(1,841)	(5,008)	$ (80.35)	$ (46.70)	$ (127.05)
36	Electric & Electronic Equip.	$ (48.03)	$ (27.60)	$ (75.63)	(1,229)	(706)	(1,936)	$ (33.36)	$ (19.17)	$ (52.53)
37	Transportation Equipment	$ (158.26)	$ (77.39)	$ (235.64)	(5,298)	(2,591)	(7,889)	$ (216.52)	$ (105.88)	$ (322.40)
38	Instruments & Related Products	$ (10.07)	$ (6.01)	$ (16.08)	(402)	(240)	(642)	$ (10.80)	$ (6.45)	$ (17.25)
39	Misc. Manufacturing Industries	$ (15.50)	$ (9.88)	$ (25.38)	(965)	(615)	(1,579)	$ (12.96)	$ (8.26)	$ (21.22)
Total for Major Louisiana Industries		**$ (1,643.55)**	**$ (1,160.18)**	**$ (2,803.73)**	**(37,561)**	**(24,365)**	**(61,926)**	**$ (959.13)**	**$ (617.46)**	**$ (1,576.59)**

Implications for Louisiana Power Generation

Center for
Energy Studies

Potential Increases in Electric Power Expenditures

SIC Code and Description	Change in Electric Power Expenditures (Million $)					
	Base Case Less High Case		Base Case Less Low Case		Base Case Less Worst Case	
	2002	2005	2002	2005	2002	2005
20 Food and Kindred Products	$ -	$ (1.36)	$ -	$ 2.46	$ -	$ 3.82
22 Textile Mill Products	$ -	$ (0.33)	$ -	$ 0.60	$ -	$ 0.94
23 Apparel & Textile Products	$ -	$ (0.03)	$ -	$ 0.05	$ -	$ 0.08
24 Lumber and Wood Products	$ -	$ (1.11)	$ -	$ 2.00	$ -	$ 3.11
26 Paper and Allied Products	$ -	$ (26.14)	$ -	$ 47.05	$ -	$ 73.19
27 Printing & Publishing	$ -	$ (0.17)	$ -	$ 0.30	$ -	$ 0.47
28 Chemicals and Allied Products	$ -	$ (93.17)	$ -	$ 167.70	$ -	$ 260.86
29 Petroleum and Coal Products	$ -	$ (28.60)	$ -	$ 51.48	$ -	$ 80.08
30 Rubber & Misc. Plastic Prods.	$ -	$ (1.63)	$ -	$ 2.93	$ -	$ 4.55
31 Leather & Leather Products	$ -	$ (0.01)	$ -	$ 0.01	$ -	$ 0.01
32 Stone, Clay & Glass Products	$ -	$ (0.48)	$ -	$ 0.86	$ -	$ 1.33
33 Primary Metal Industries	$ -	$ (2.80)	$ -	$ 5.04	$ -	$ 7.84
34 Fabricated Metal Products	$ -	$ (0.36)	$ -	$ 0.65	$ -	$ 1.01
35 Machinery & Computer Equip.	$ -	$ (0.30)	$ -	$ 0.54	$ -	$ 0.84
36 Electric & Electronic Equip.	$ -	$ (4.43)	$ -	$ 7.98	$ -	$ 12.41
37 Transportation Equipment	$ -	$ (0.99)	$ -	$ 1.78	$ -	$ 2.76
38 Instruments & Related Products	$ -	$ (0.00)	$ -	$ 0.01	$ -	$ 0.01
39 Misc. Manufacturing Industries	$ -	$ (0.00)	$ -	$ 0.00	$ -	$ 0.01
Total	**$ -**	**$ (161.90)**	**$ -**	**$ 291.42**	**$ -**	**$ 453.33**

Center for
Energy Studies

Potential Change in Electric Power Fuel Adjustment Clause Rates

	Weighted Average Fuel Cost ($/MWh)	Percent Change Relative to Base Case (%)
Base Case	$ 28.38	
High Case	$ 26.19	-7.7%
Low Case	$ 32.33	13.9%
Worst Case	$ 41.55	46.4%

Assumes constant 2002 generation levels and fuel mix.

Implications for Louisiana Households

Center for
Energy Studies

Impacts on Residential Gas Expenditures

	Residential Expenditures ($)	Annual Per Customer Expenditures ($)	Monthly Typical Bill ($)	Percent Change from 2002 (%)
Base Case				
2002	470,464,584	$ 493.79	**$ 41.15**	
2005	482,761,515	$ 506.70	**$ 42.23**	**2.6%**
High Case				
2002	470,464,584	$ 493.79	**$ 41.15**	
2005	458,386,015	$ 481.12	**$ 40.09**	**-2.6%**
Low Case				
2002	470,464,584	$ 493.79	**$ 41.15**	
2005	526,637,415	$ 552.75	**$ 46.06**	**11.9%**
Worst Case				
2002	470,464,584	$ 493.79	**$ 41.15**	
2005	551,012,915	$ 578.34	**$ 48.19**	**17.1%**
2025	629,014,515	$ 660.21	**$ 55.02**	**33.7%**

Assumes constant 2002 usage levels.

Center for Energy Studies

Impacts on Residential Electric Expenditures

	Residential Expenditures ($)	Annual Per Customer Expenditures ($)	Monthly Typical Bill ($)	Percent Change from 2002 (%)
Base Case				
2002	1,999,147,000	$ 1,081.45	**$ 90.12**	
2003	2,227,781,840	$ 1,205.13	**$ 100.43**	**11.4%**
2004	2,266,075,360	$ 1,225.84	**$ 102.15**	**1.7%**
2005	2,180,759,650	$ 1,179.69	**$ 98.31**	**-3.8%**
High Case				
2002	1,999,147,000	$ 1,081.45	**$ 90.12**	
2003	2,227,781,840	$ 1,205.13	**$ 100.43**	**11.4%**
2004	2,266,075,360	$ 1,225.84	**$ 102.15**	**1.7%**
2005	2,119,095,820	$ 1,146.33	**$ 95.53**	**-6.5%**
Low Case				
2002	1,999,147,000	$ 1,081.45	**$ 90.12**	
2003	2,227,781,840	$ 1,205.13	**$ 100.43**	**11.4%**
2004	2,266,075,360	$ 1,225.84	**$ 102.15**	**1.7%**
2005	2,291,979,800	$ 1,239.85	**$ 103.32**	**1.1%**
Worst Case				
2002	1,999,147,000	$ 1,081.45	**$ 90.12**	
2003	2,227,781,840	$ 1,205.13	**$ 100.43**	**11.4%**
2004	2,266,075,360	$ 1,225.84	**$ 102.15**	**1.7%**
2005	2,353,925,200	$ 1,273.36	**$ 106.11**	**3.9%**
2025	2,551,587,340	$ 1,380.29	**$ 115.02**	**8.4%**

Assumes constant 2002 usage levels.

LNG Development Risks

Project Development Risks
Regional Considerations

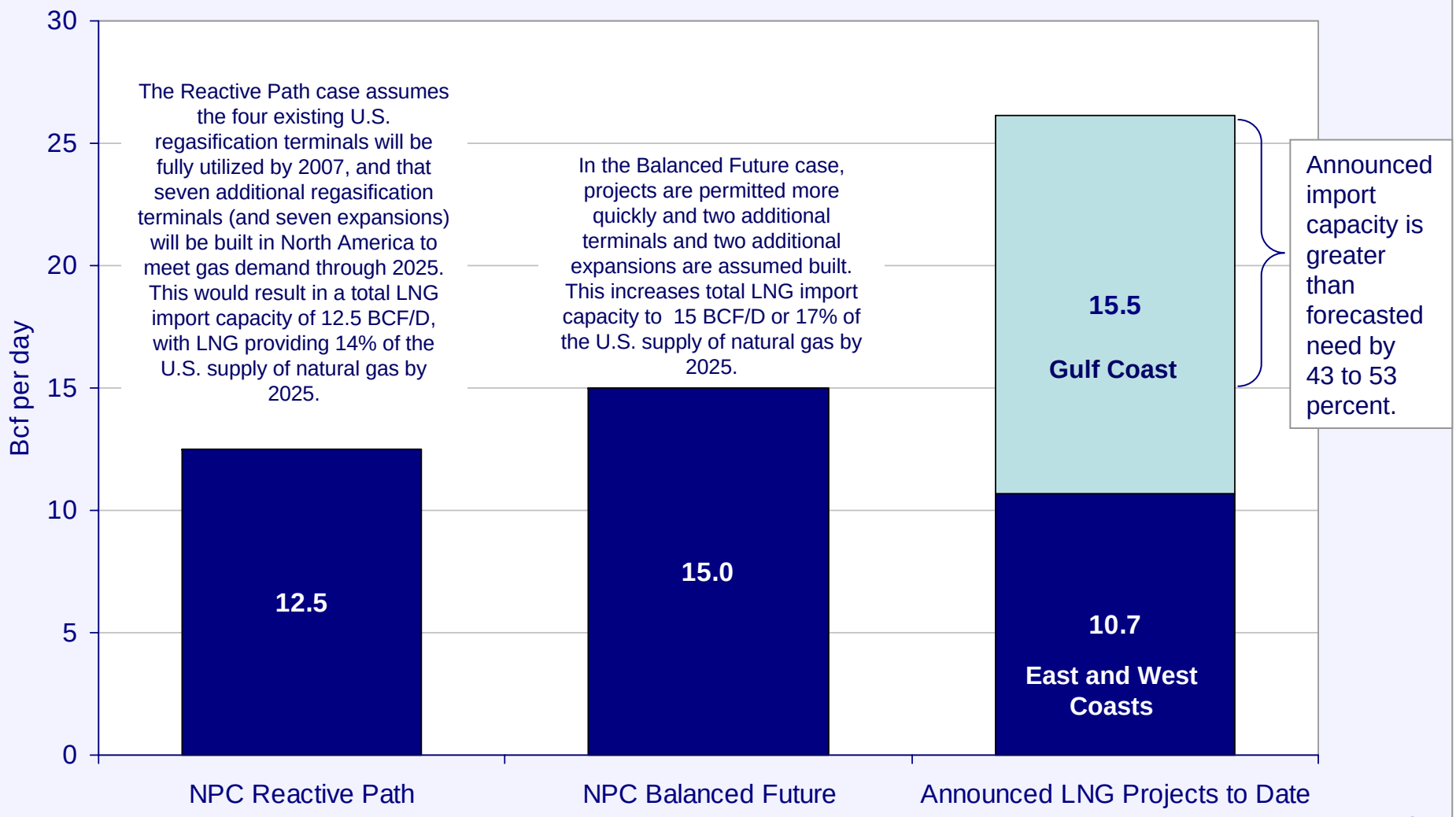
	Region		
	East Coast	West Coast	Gulf Coast
Gas Market	Moderate	Moderate	Very Large
Concentration of Large Users	Some	Some	Abundant
Interstate Deliverability	None	None	Significant
Storage Capabilities	Numerous	Several	Significant
Local Familiarity with Large Energy Infrastructure Projects	Very Little	Very Little	Significant
Local Hostility to Energy Infrastructure Developments	High	High	Little
Sparsely Populated Coastal Areas	Few	Few	Numerous
Local and State Permitting	Difficult/Time Consuming	Difficult/Time Consuming	Moderate

Project Development Risks
Onshore Versus Offshore Facilities

	Onshore	Offshore
Industry Experience	Significant	None
Price Risk	Less Sensitive	More Sensitive
Permitting Risks	Possible	Less Likely
Investment Costs	High	Very High
Investment Cost Over-Run Profitability	Lower	Higher
Operating Costs	Low	High
Operating Cost Over-Runs	Less Likely	Possible
Sensitivity to New Regulations	Some	Some

Center for Energy Studies

Project Development Risks Filling the Gap



Recommendations

Considerable Opportunities for LNG Development in State

- Significant Capital Investments
- Significant On-Going Impacts
  - Operation of facilities
  - Infrastructure utilization
  - Lower Cost Resources for Industries, Power Generation and Households
- The Key for Louisiana Will Be in Encouraging the Speed of Development (LNG development is a race to the finish line)

State Actions of LNG Development

1. Encourage and support LNG development – resolutions have had favorable impacts for other infrastructure development

2. Steady and consistent policies on taxing and permitting

3. Speed of permitting may need to be considered. Timing is everything and could be an issue in determining which facilities get developed where

4. Consider the implications/barriers to long-term gas contracting for major gas users