Trends and Issues in the Natural Gas Industry and the Development of LNG: Implications for Louisiana

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Why are Gas Industry Changes Important?

- Changes in the natural gas industry have considerable implications for Louisiana and its economy.
  - Louisiana is the second largest producer of natural gas in the U.S.
  - Louisiana is the third largest consumer of natural gas in the U.S.
- As a result, changes in the gas industry impact Louisiana in two primary ways:
  - **Production:** (Positive Impact) higher prices should stimulate increased drilling and production.
  - **Consumption:** (Negative Impact) higher prices cripple gas-sensitive industries.
- If production cannot increase to meet natural gas demand ***at reasonable prices***, what is the alternative?
  - Liquefied Natural Gas (LNG)

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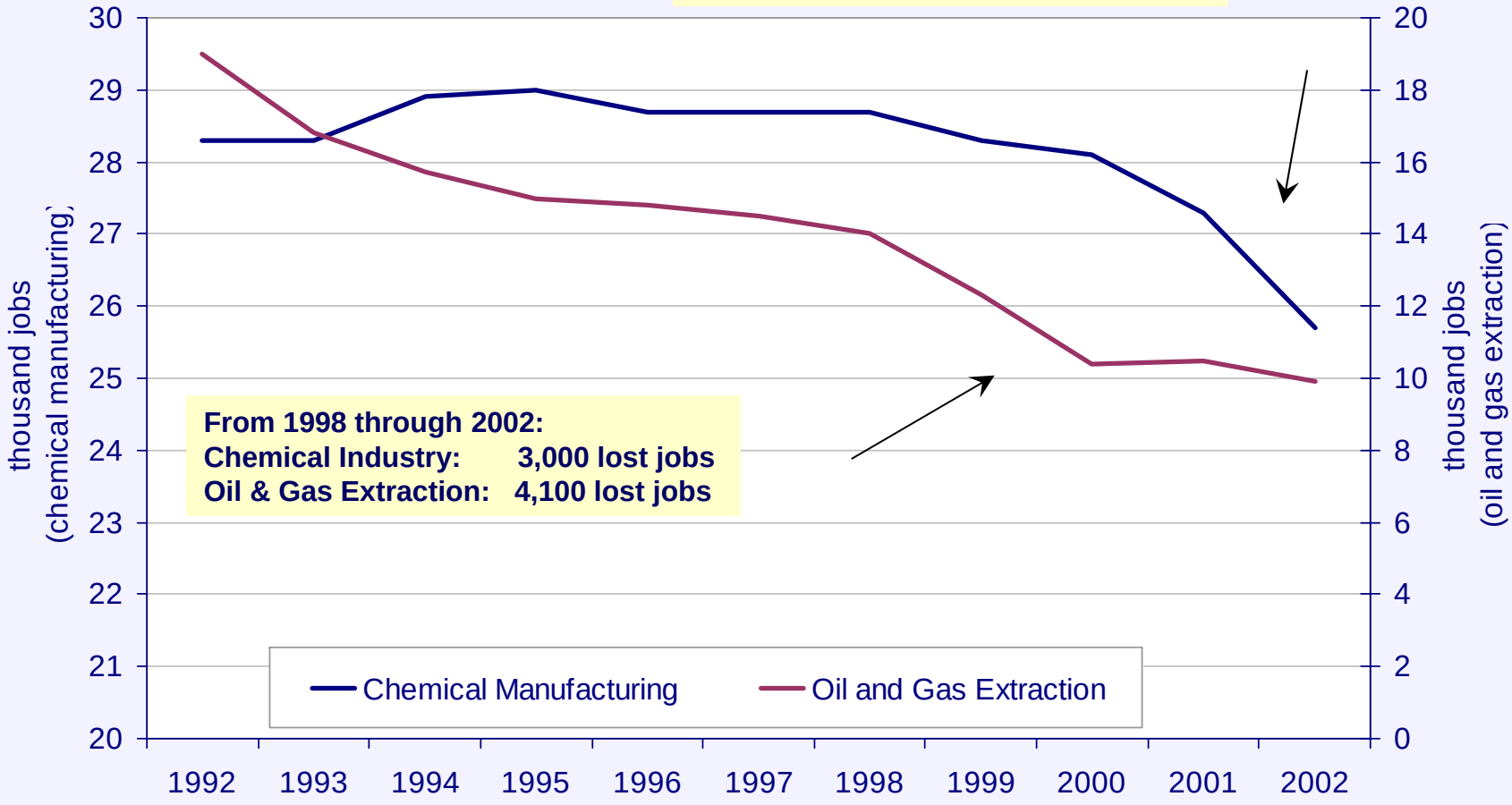
Number of Jobs in Chemical and Oil & Gas Extraction Industries (1992 – 2002)

From 2000 through 2002:
Chemical Industry: 2,400 lost jobs
Oil & Gas Extraction: 500 lost jobs



From 1998 through 2002:
Chemical Industry: 3,000 lost jobs
Oil & Gas Extraction: 4,100 lost jobs

Source: Louisiana Department of Labor

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LNG Benefits Louisiana's Energy Intensive Industries

- Extensive LNG development (in the GOM and entire US) are 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, and higher resulting prices, could hurt Louisiana industries
  - As much as $1,237 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 of LNG development to materialize**, 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 **$3,407 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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Discussion Topics

- Overview of the Importance of Natural Gas to the Louisiana Economy
  - Gas Price Changes on Local Industry
  - Gas Price Changes on National Industry
  - Gas Price Changes and Production/Supply Response
- The Potential for LNG in Louisiana
  - Importance of LNG to Supply Disposition
  - Background on LNG
  - Why LNG and Louisiana are a Good Fit
- Economic Impacts of LNG and Gas Prices
  - Impact of LNG Development
  - Impact of LNG-Induced Price Changes on Louisiana Industry
  - Impact on Power Generation
  - Impact on Households
- Conclusion

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

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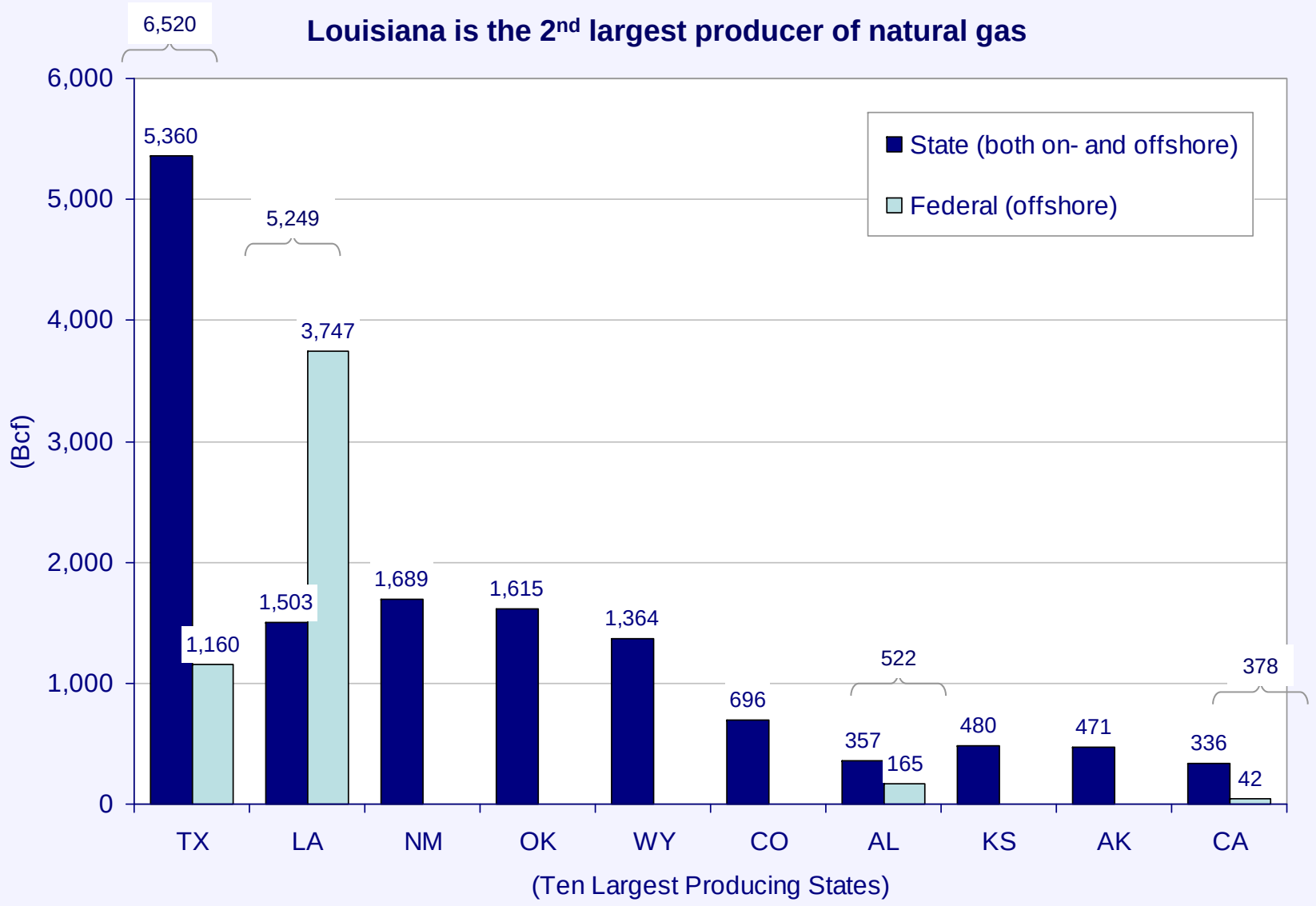
Marketed Production of Natural Gas by State (2001)



Source: Energy Information Administration, Department of Energy.

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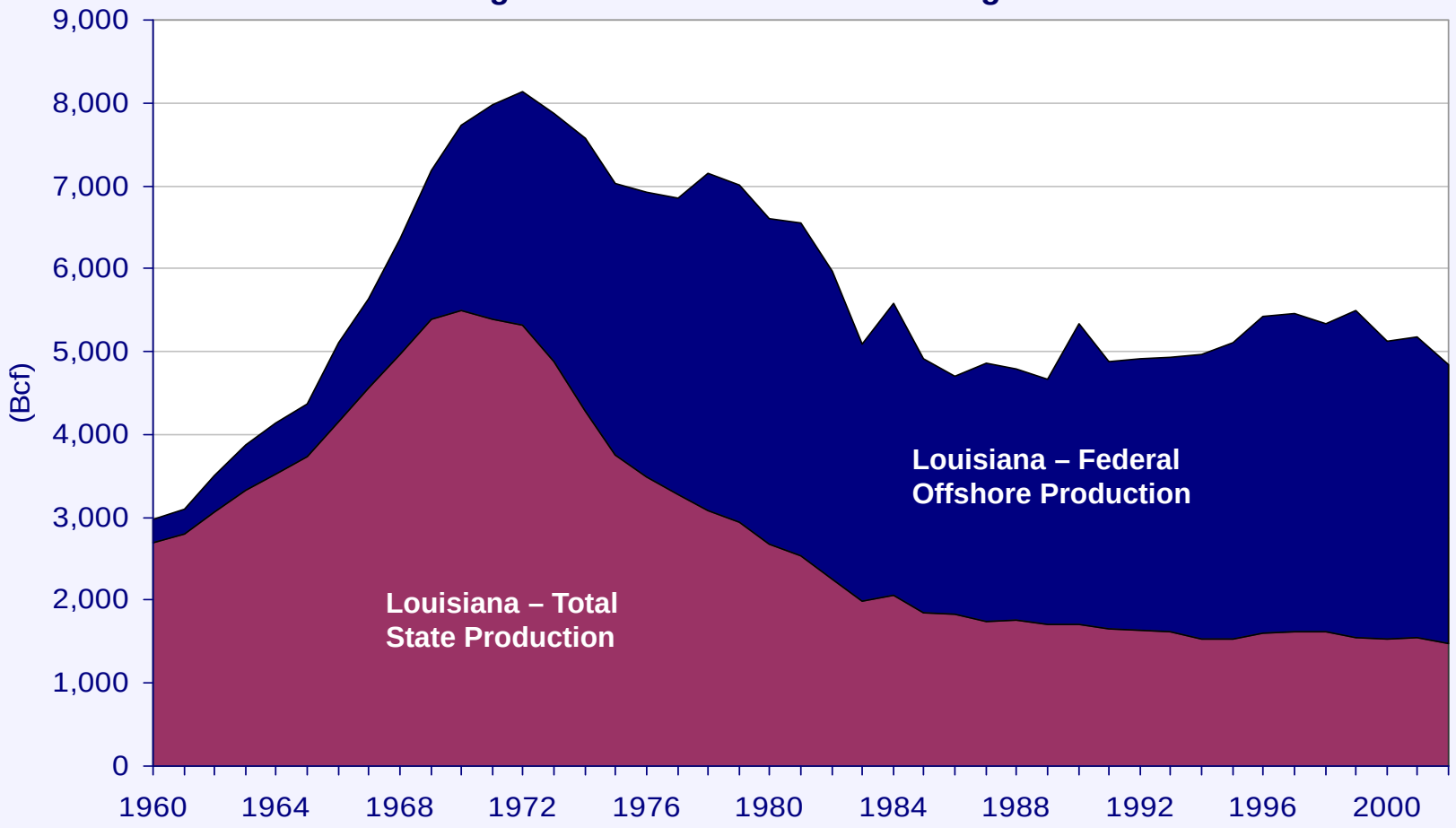
Historic Production of Natural Gas in Louisiana (1960-2002)

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



Source: Louisiana Department of Natural Resources.

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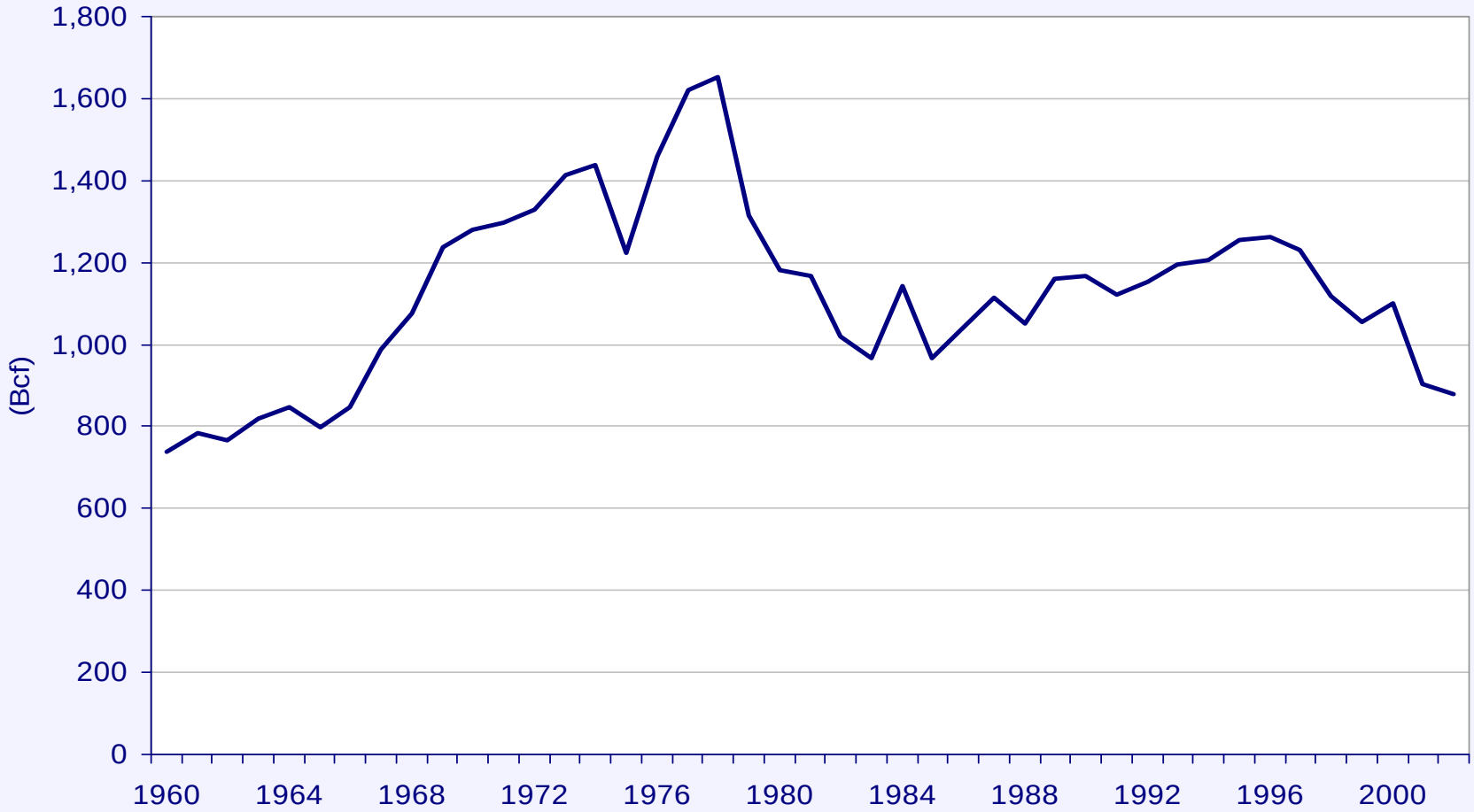
Historic Industrial Consumption of Natural Gas in Louisiana (1960-2002)

Industrial natural gas consumption, while significant, has been decreasing



Source: Energy Information Administration, Department of Energy.

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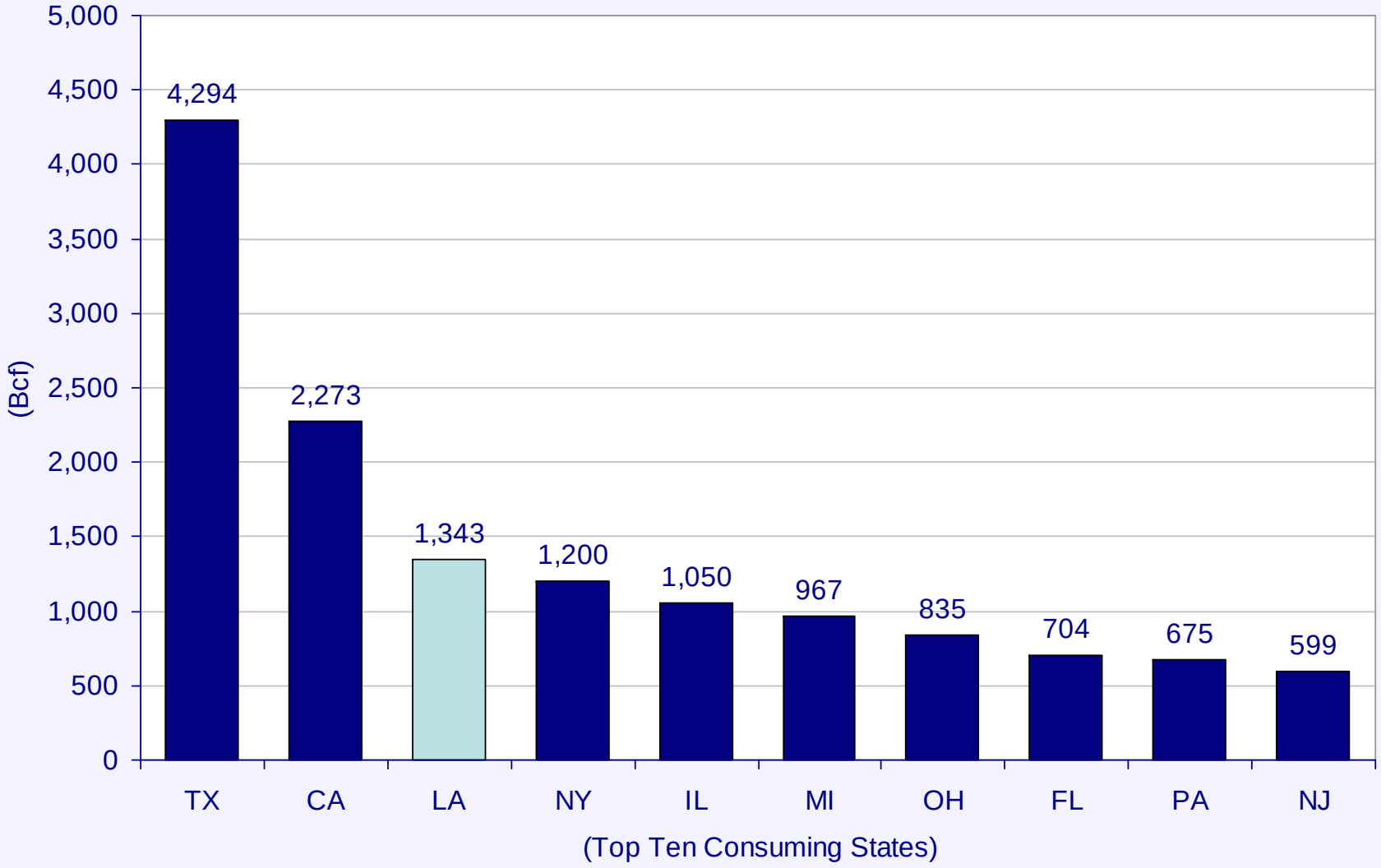
Natural Gas Consumption in the U.S. (2002)

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



Source: Energy Information Administration, Department of Energy.

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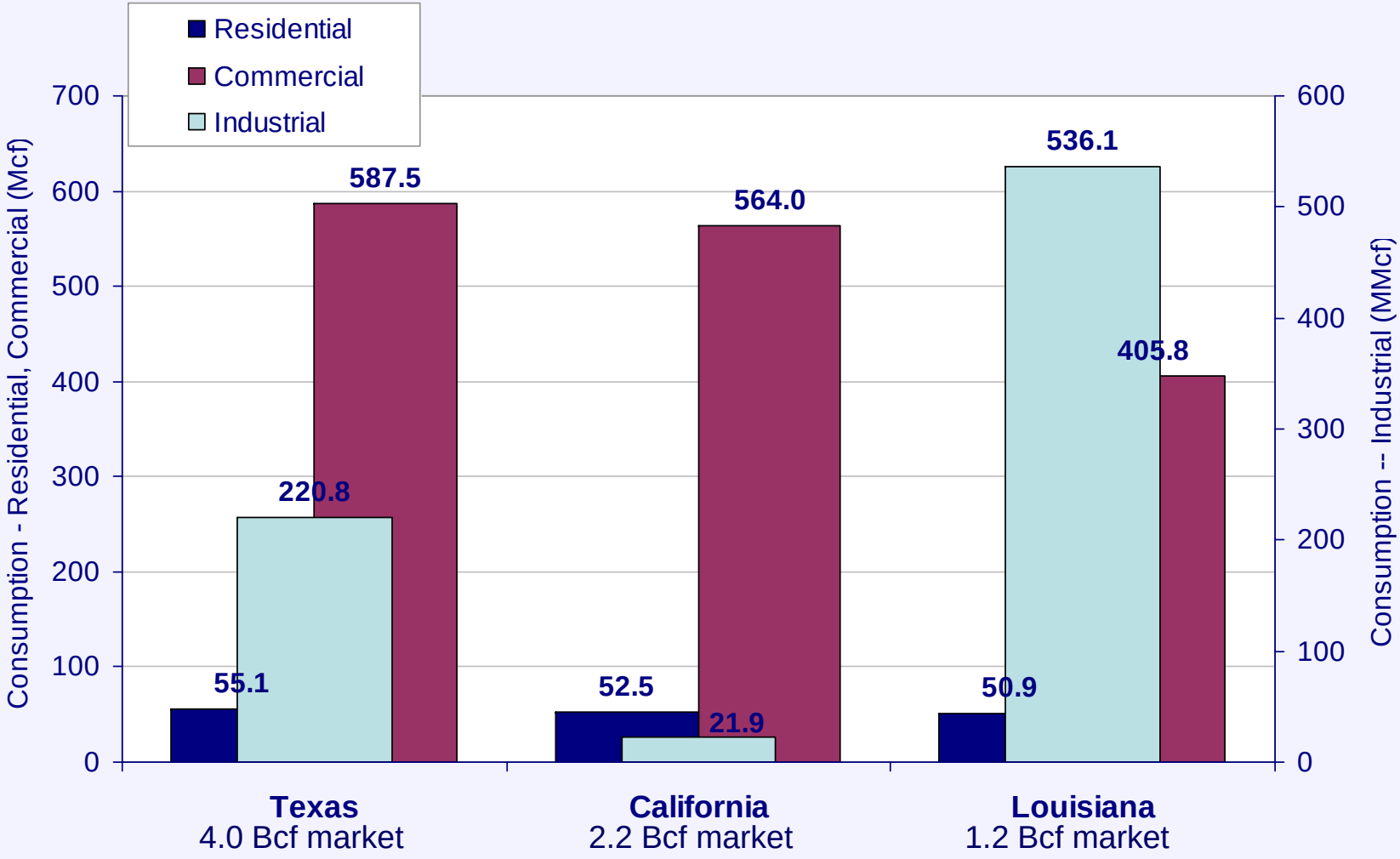
Per Customer Natural Gas Consumption by Sector (2002)

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



Source: Energy Information Administration, Department of Energy.

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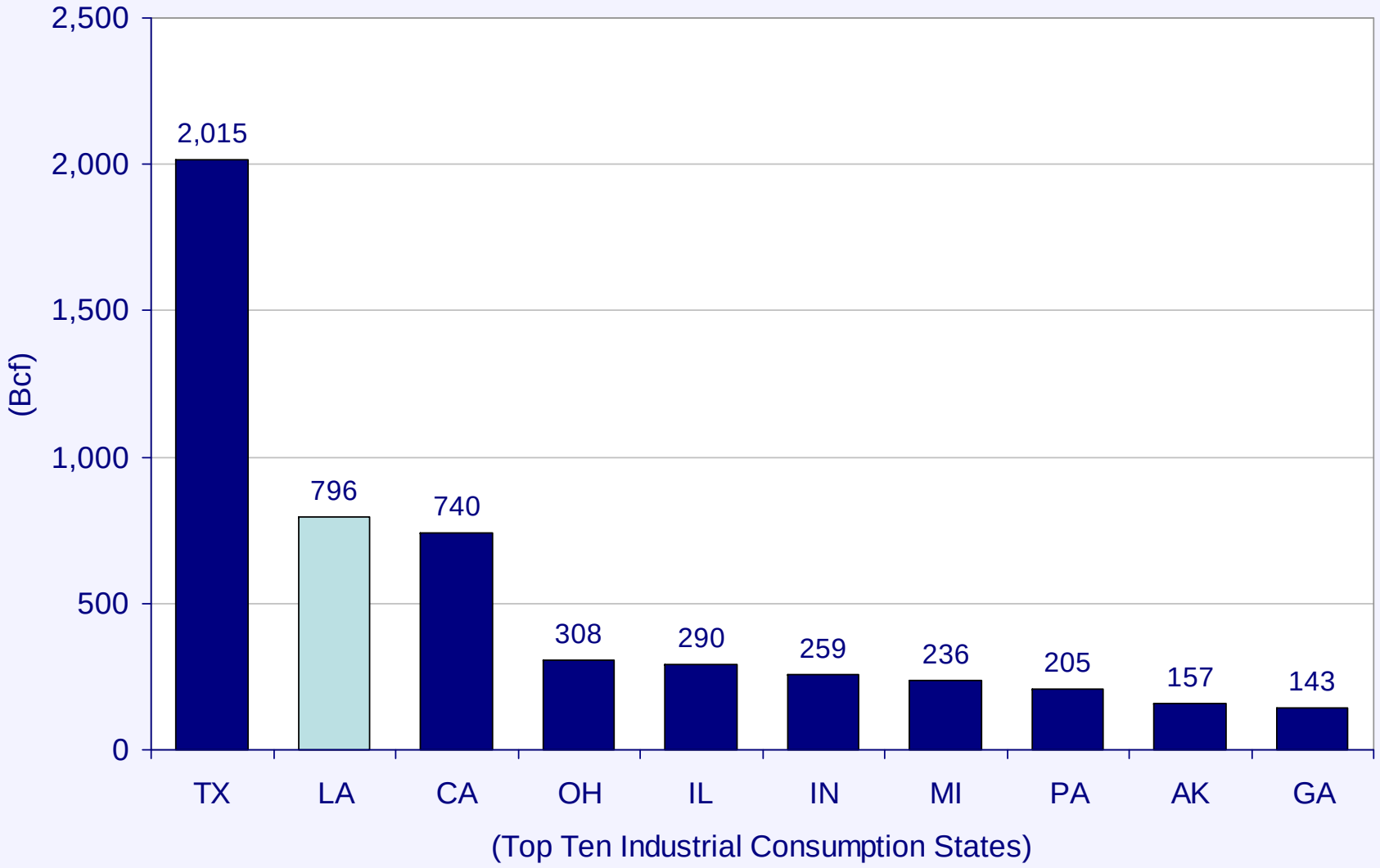
Industrial Natural Gas Consumption (2002)

Louisiana industrial consumption ranks 2nd in the US



Source: Energy Information Administration, Department of Energy.

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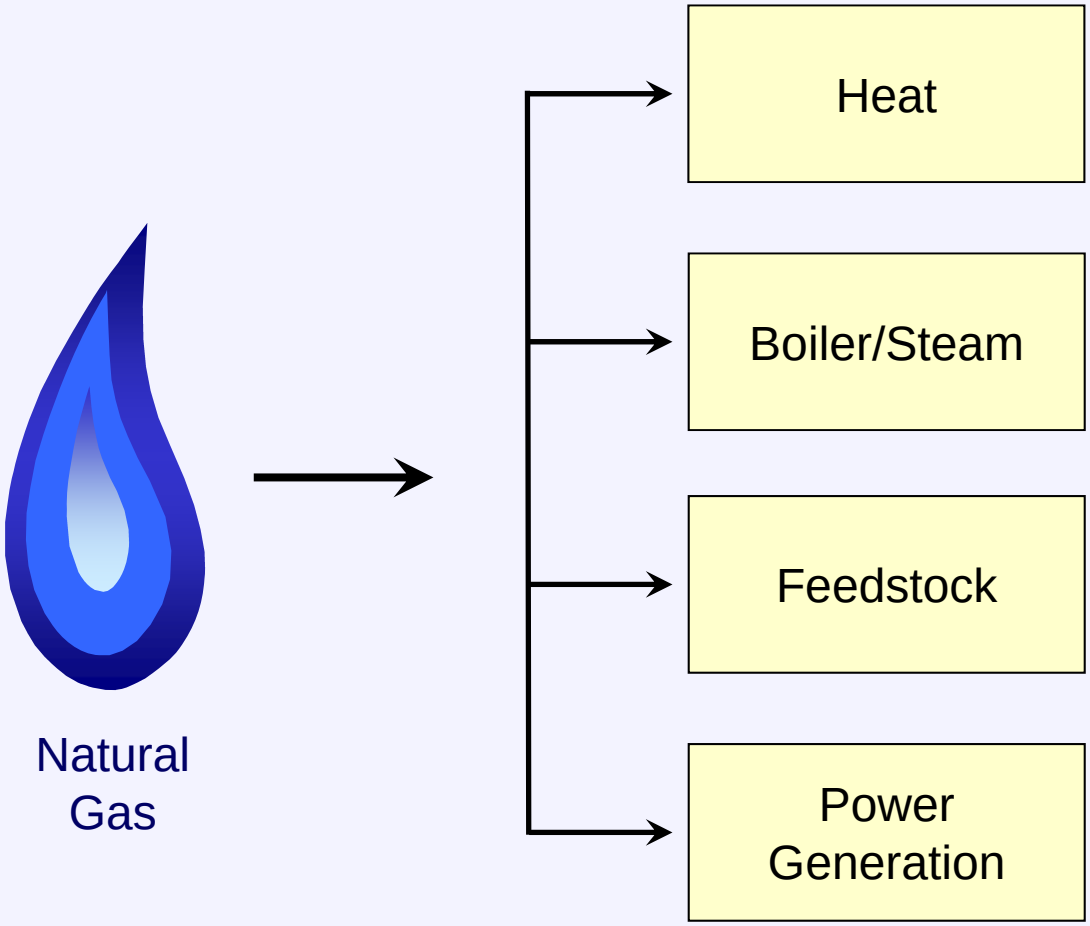
Industrial Natural Gas Usage

Natural Gas is used in a number of different industrial processes



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

	Natural Gas as a Percent of Total Energy	Percent of Natural Gas Used for: Boiler	Furnace	Feedstock
28 Chemicals and Allied Products	**95.4%**	**45.9%**	**41.0%**	**15.5%**
2873 Nitrogenous Fertilizers	93.2%	23.5%	46.8%	29.6%
2869 Industrial Organic Chemicals	99.5%	60.5%	38.6%	8.2%
2819 Industrial Inorganic Chemicals	99.9%	36.1%	63.4%	0.0%
2812 Alkalies & Chlorine	96.6%	78.6%	8.7%	13.1%
Other	84.2%	52.5%	37.6%	9.7%
29 Petroleum and Coal Products	**60.9%**	**46.7%**	**51.4%**	**0.6%**
2911 Petroleum Refining	56.2%	56.6%	41.3%	0.7%
2999 Petroleum & Coal Products	100.0%	0.0%	99.3%	0.0%
2992 Lubricating Oil & Greases	100.0%	5.0%	95.0%	0.0%
26 Paper and Allied Products	**20.2%**	**69.3%**	**30.7%**	**0.0%**
2621 Paper Mills	20.5%	72.1%	27.9%	0.0%
2631 Paperboard Mills	19.7%	66.7%	33.3%	0.0%
2653 Corrugated & Solid Fiber Boxes	98.6%	84.1%	15.9%	0.0%
2671 Laminated Packaging Paper & Film	100.0%	78.6%	21.4%	0.0%
2674 Uncoated Paper & Multiwall Bags	100.0%	87.1%	12.9%	0.0%
2679 Converted Paper Products, Nec	0.0%	0.0%	0.0%	0.0%
20 Food and Kindred Products	**87.7%**	**85.5%**	**14.3%**	**0.0%**
24 Lumber and Wood Products	**65.8%**	**54.1%**	**45.9%**	**0.0%**
33 Primary Metal Industries	**91.0%**	**14.3%**	**78.5%**	**7.2%**
32 Stone, Clay & Glass Products	**100.0%**	**2.1%**	**97.5%**	**0.0%**
37 Transportation Equipment	**97.1%**	**83.0%**	**16.7%**	**0.0%**
22 Textile Mill Products	**100.0%**	**91.8%**	**8.2%**	**0.0%**
Other (includes 9 other industries)	**89.5%**	**58.6%**	**44.0%**	**0.0%**

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

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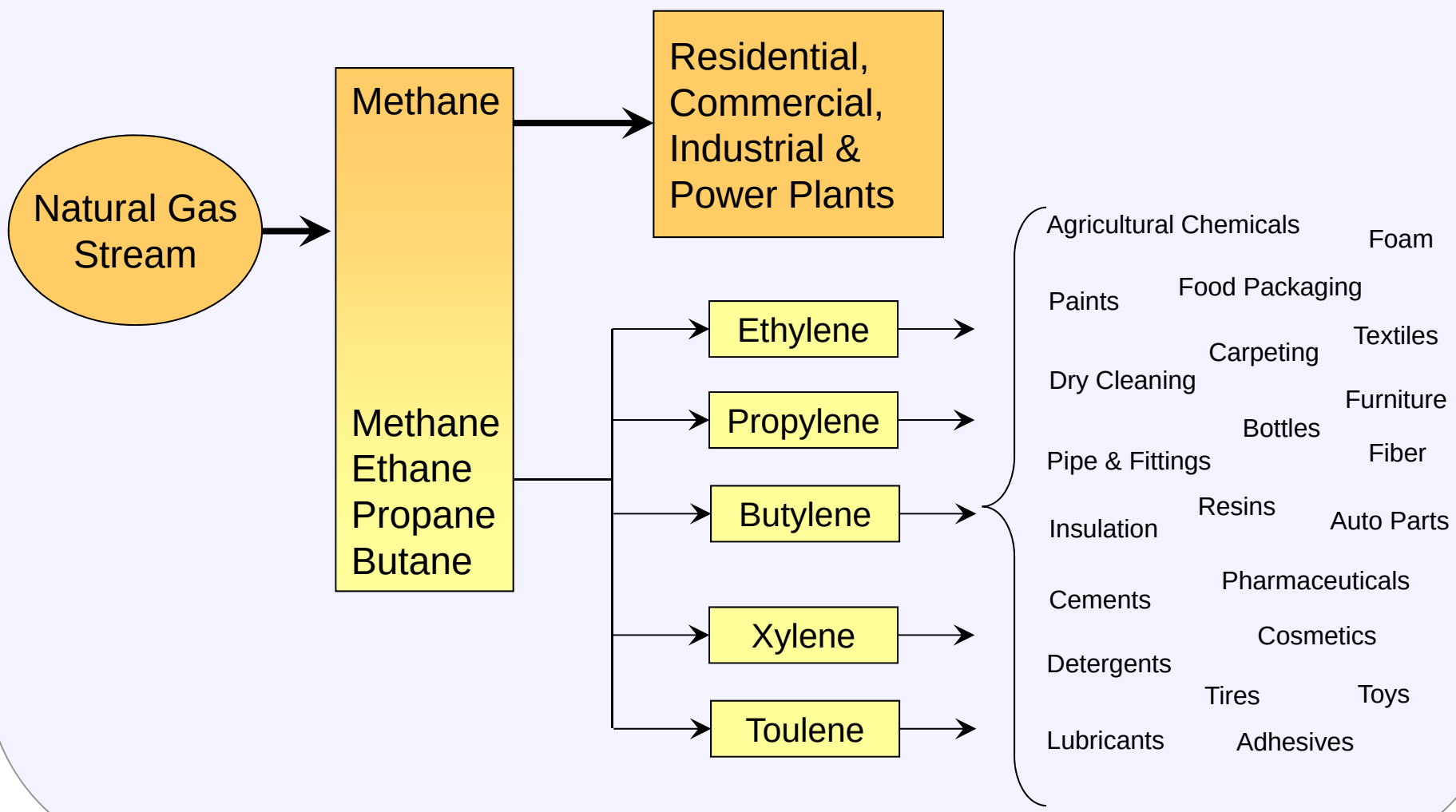
Components of Natural Gas



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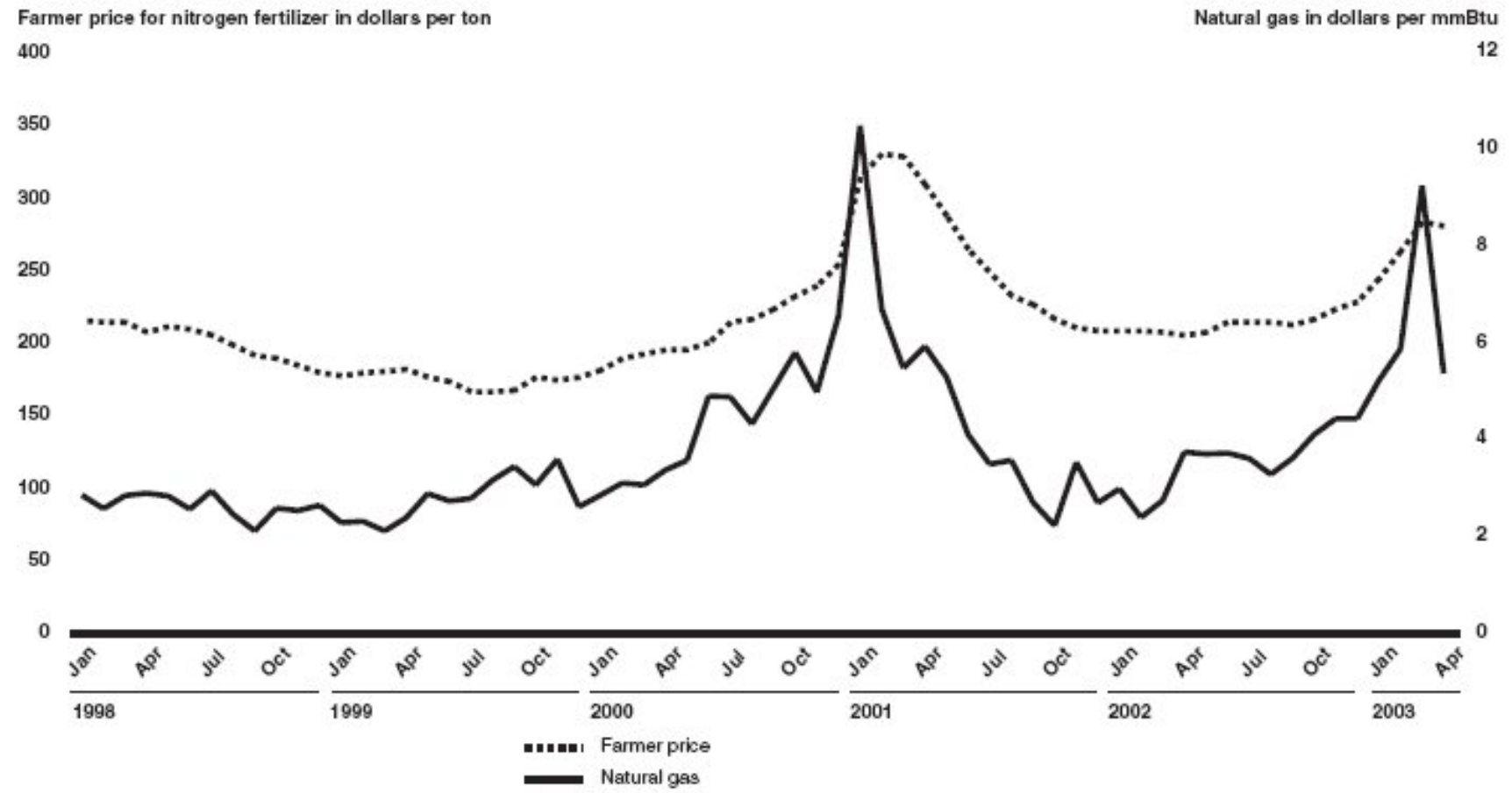
Farmer Prices for Nitrogen Fertilizer Relative to Natural Gas Prices (1998 – March 2003)



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

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Implications of Change in Natural Gas Prices on Local Industry

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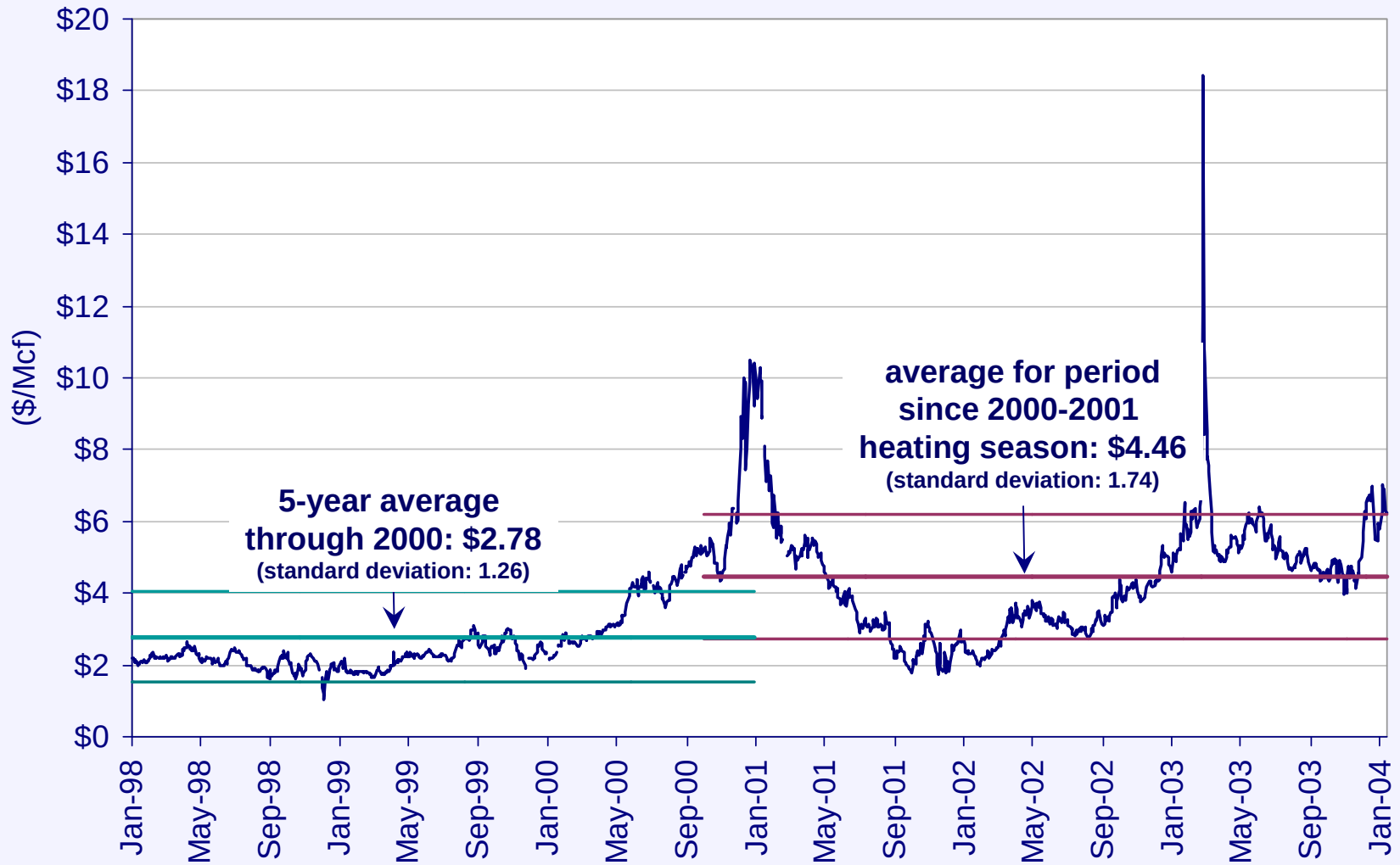
Daily Henry Hub Prices (1998-Present)



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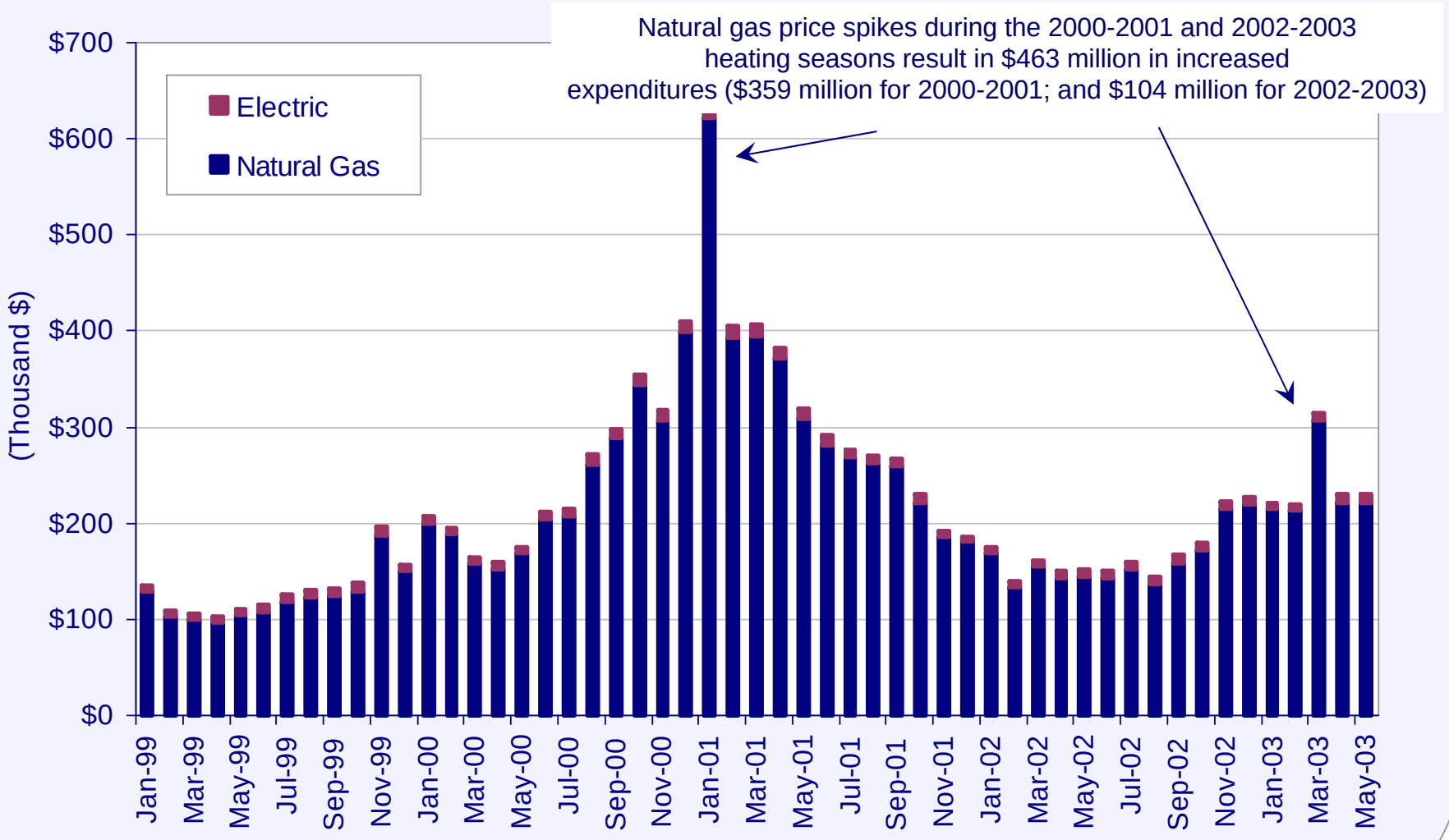
Average Monthly Expenditures by Industrial Customers in Louisiana for Natural Gas and Electric (1999 – 2003)



Note: Number of Customers used to calculate expenditures is annual average; 2002 natural gas expenditures based on estimated number of customers.

Source: Energy Information Administration, Department of Energy.

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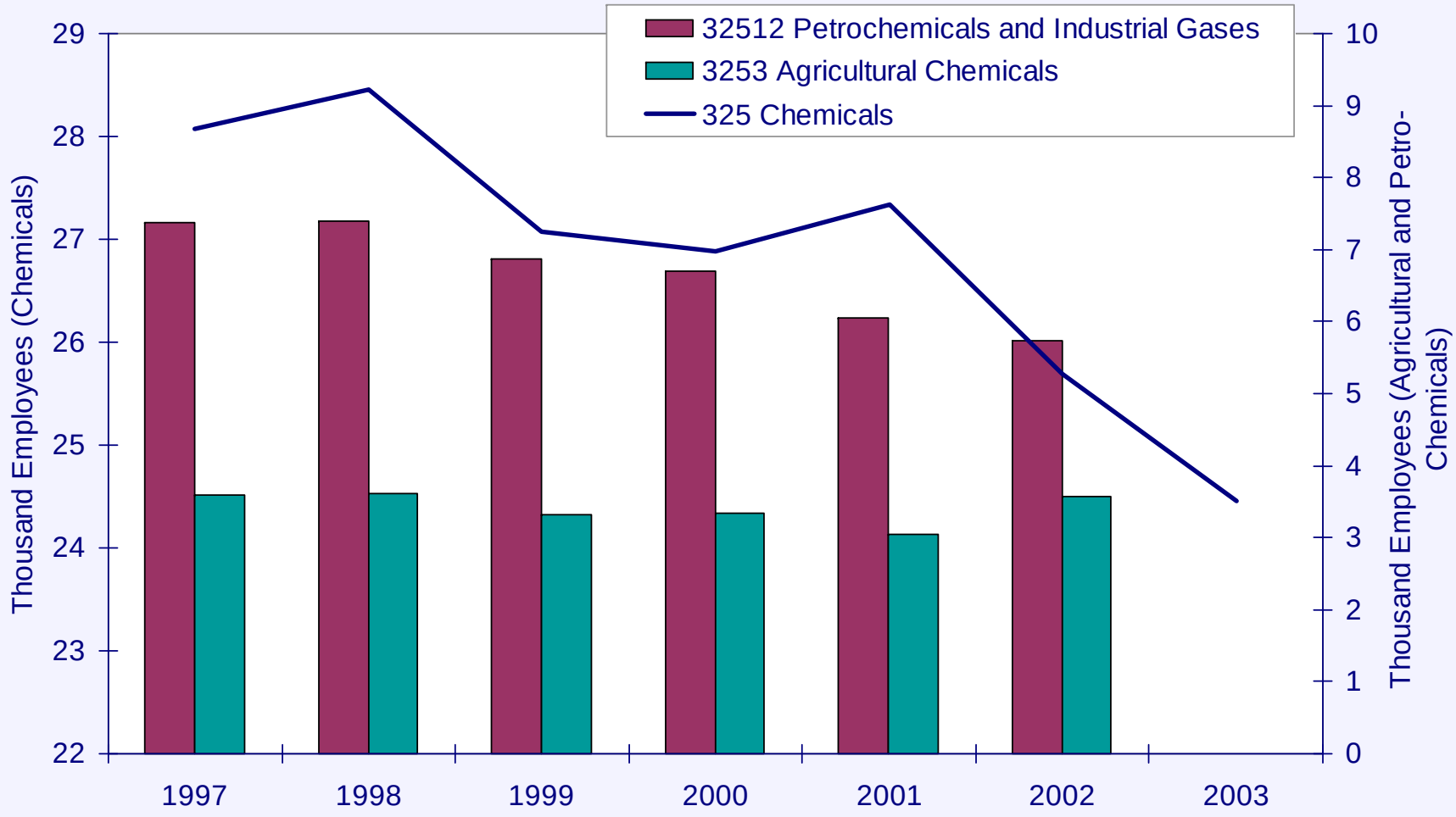
Employment in Chemical, Fertilizer and Petrochemical Industry in Louisiana (1997- 2003)

The Louisiana chemical industry has been losing a significant numbers of jobs since 2001



Source: Bureau of Labor Statistics, Department of Labor

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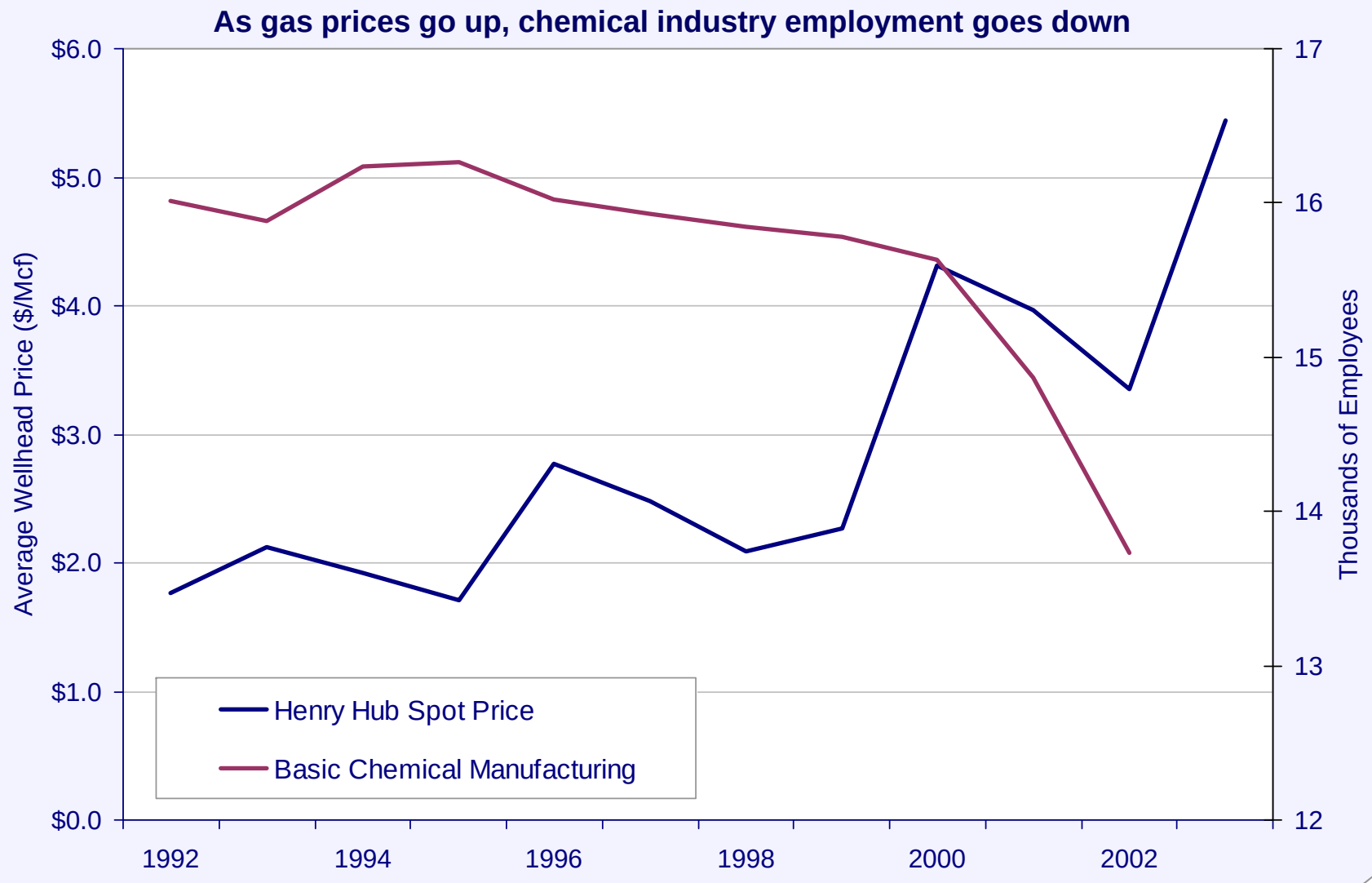
Henry Hub Spot Price and Louisiana Chemical Industry Employment (1990 – 2002)



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

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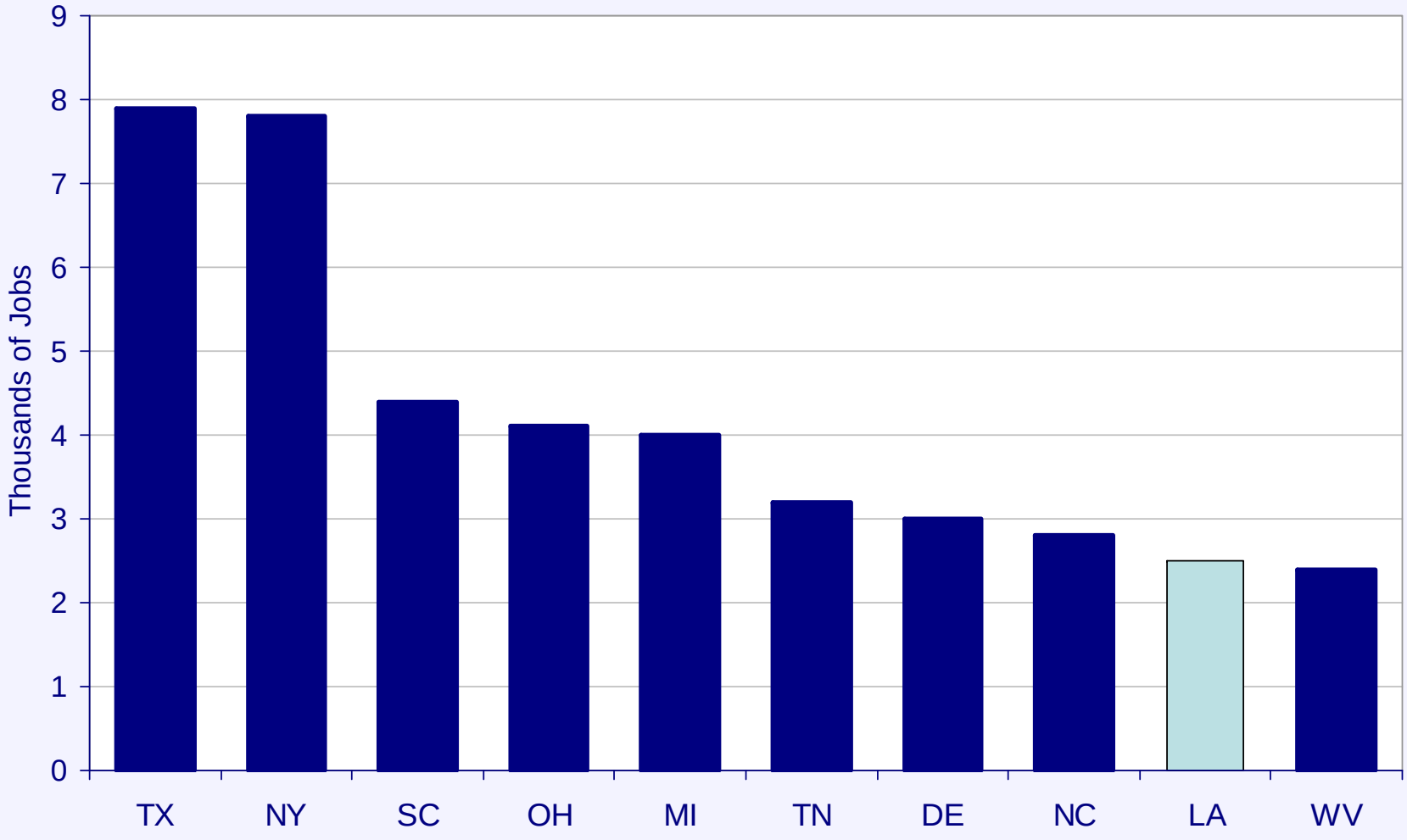
Loss of Chemical Industry Number of Employees (1999 – 2002)

Louisiana has lost close to 2,500 chemical industry jobs since 1999



Source: Bureau of Labor Statistics, Department of Labor

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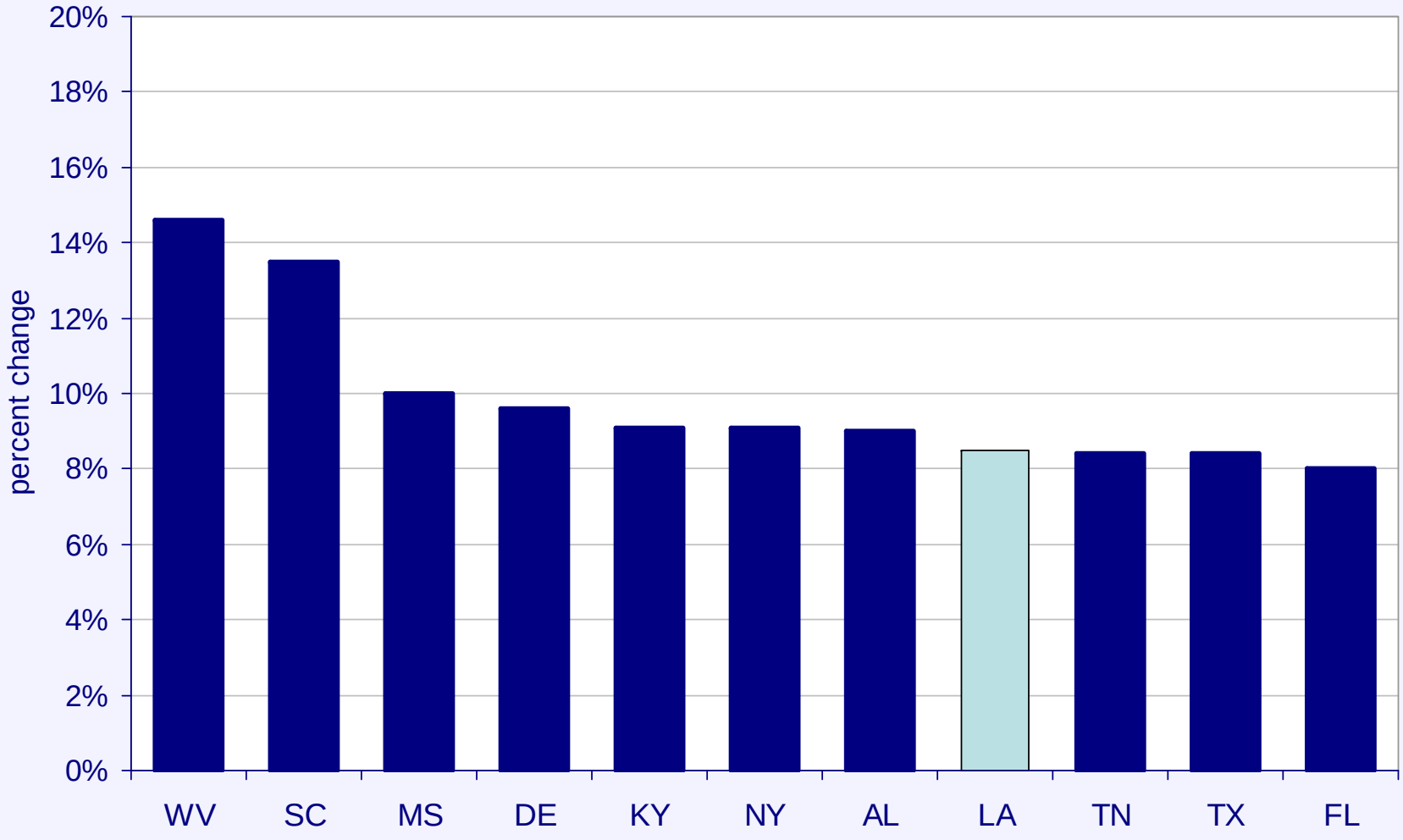
Loss of Chemical Industry Number of Employees (1999 – 2002)

Louisiana has lost over 8 percent of its chemical industry jobs since 1999



Source: Bureau of Labor Statistics, Department of Labor

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Implications of Change in Natural Gas Prices on US Industry

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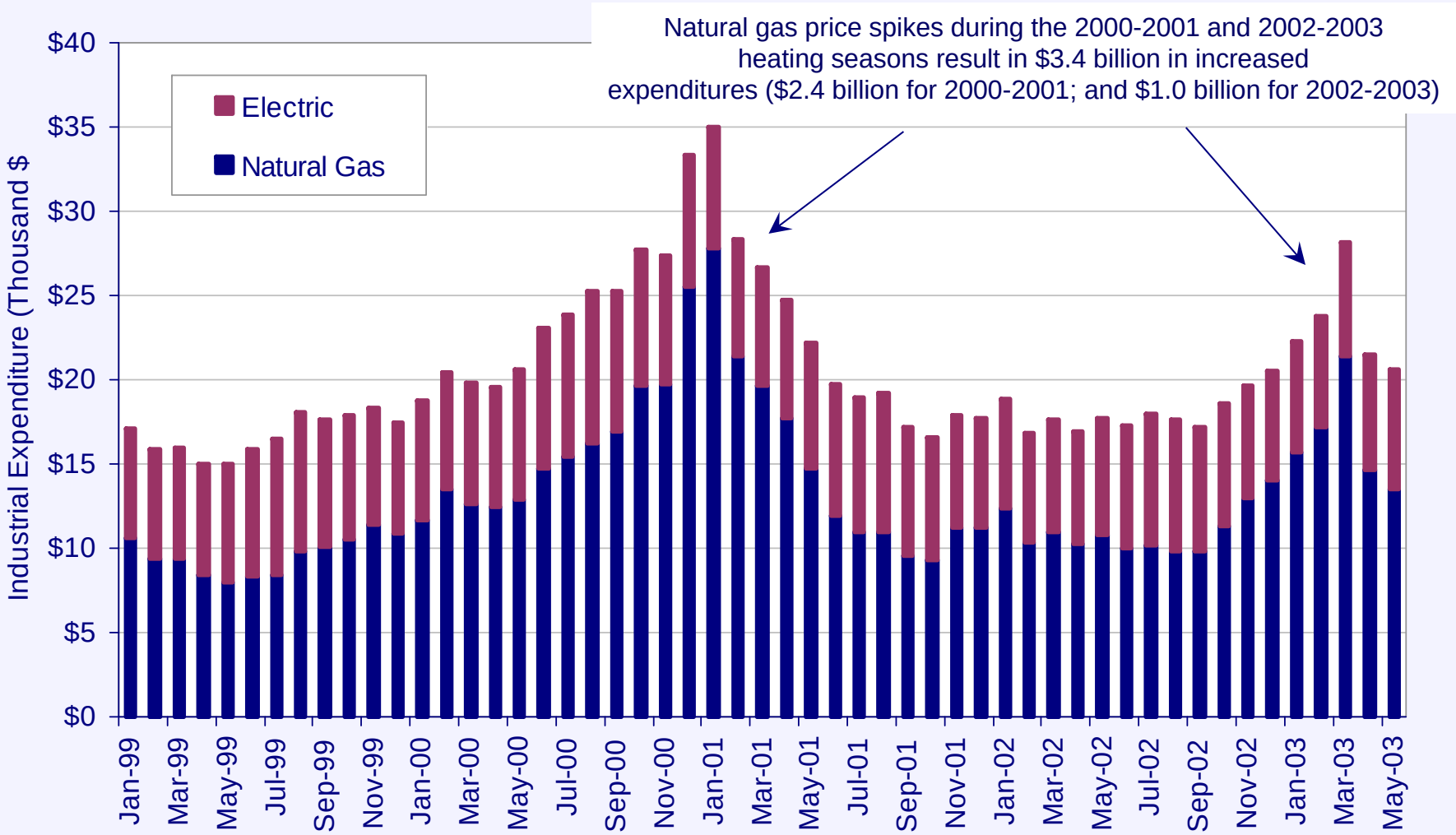
Average Monthly Expenditures by Industrial Customers in US for Natural Gas and Electric (1999 – 2003)



Note: Number of Customers used to calculate expenditures is annual average; 2002 natural gas expenditures based on estimated number of customers.

Source: Energy Information Administration, Department of Energy..

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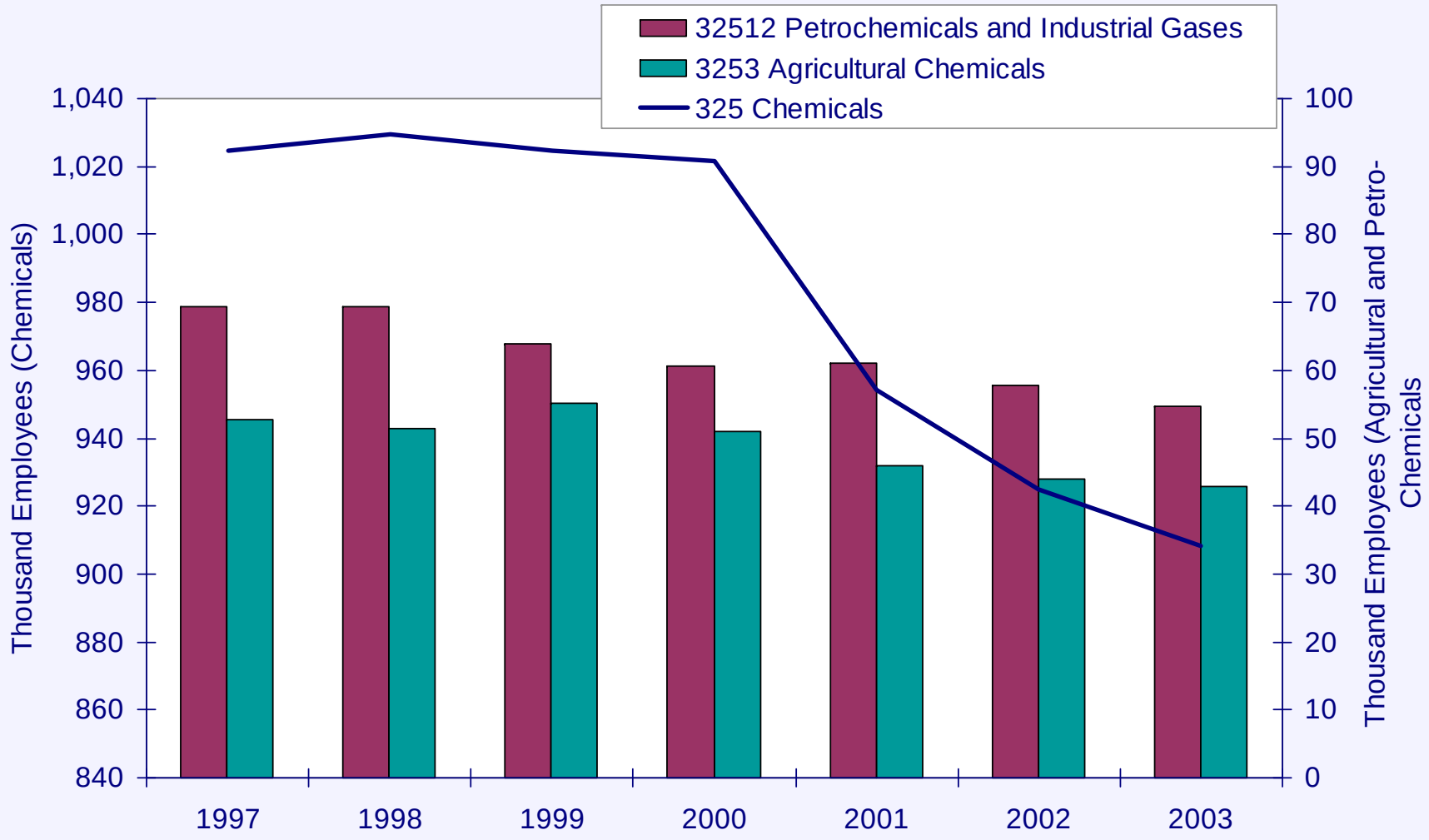
Employment in Chemical, Fertilizer and Petrochemical Industry in the U.S. (1997 - 2003)

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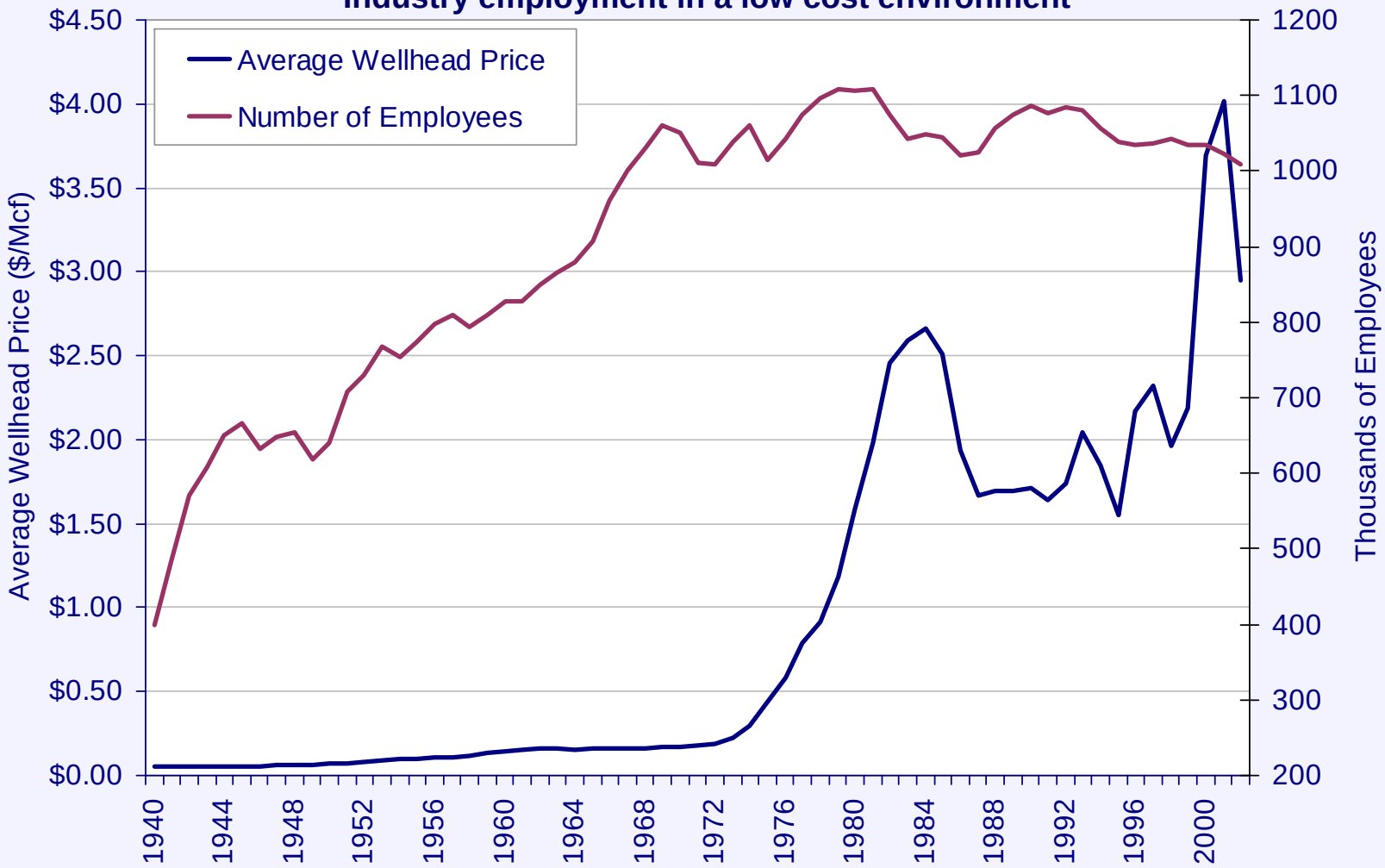
Historic Annual U.S. Average Wellhead Price and Chemical Industry Employment (1940 - 2002)

Historic trends show the development of chemical Industry employment in a low cost environment



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

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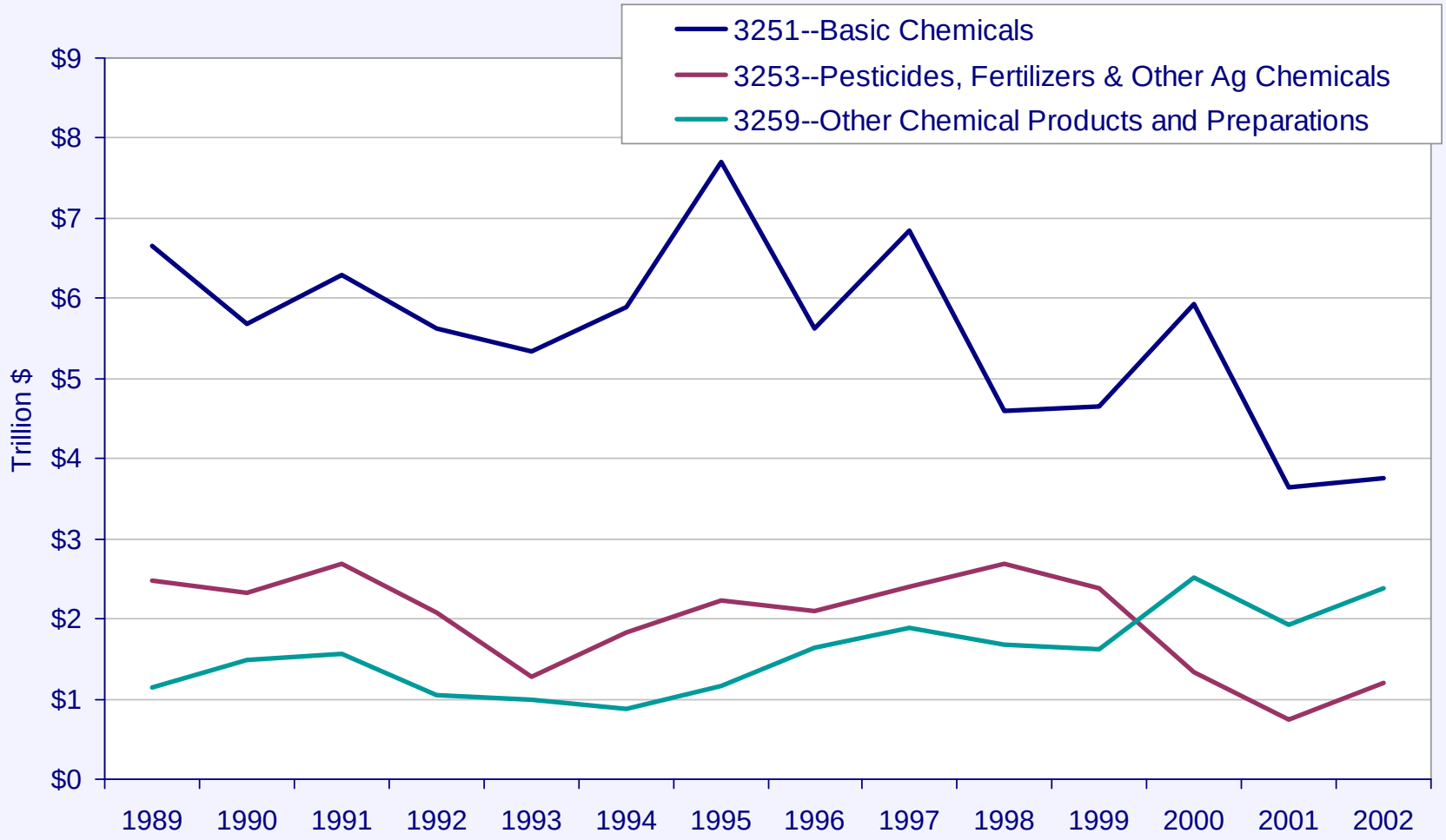
Value of Net Exports -- Chemicals (1989 - 2002)



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)

Source: Energy Information Administration

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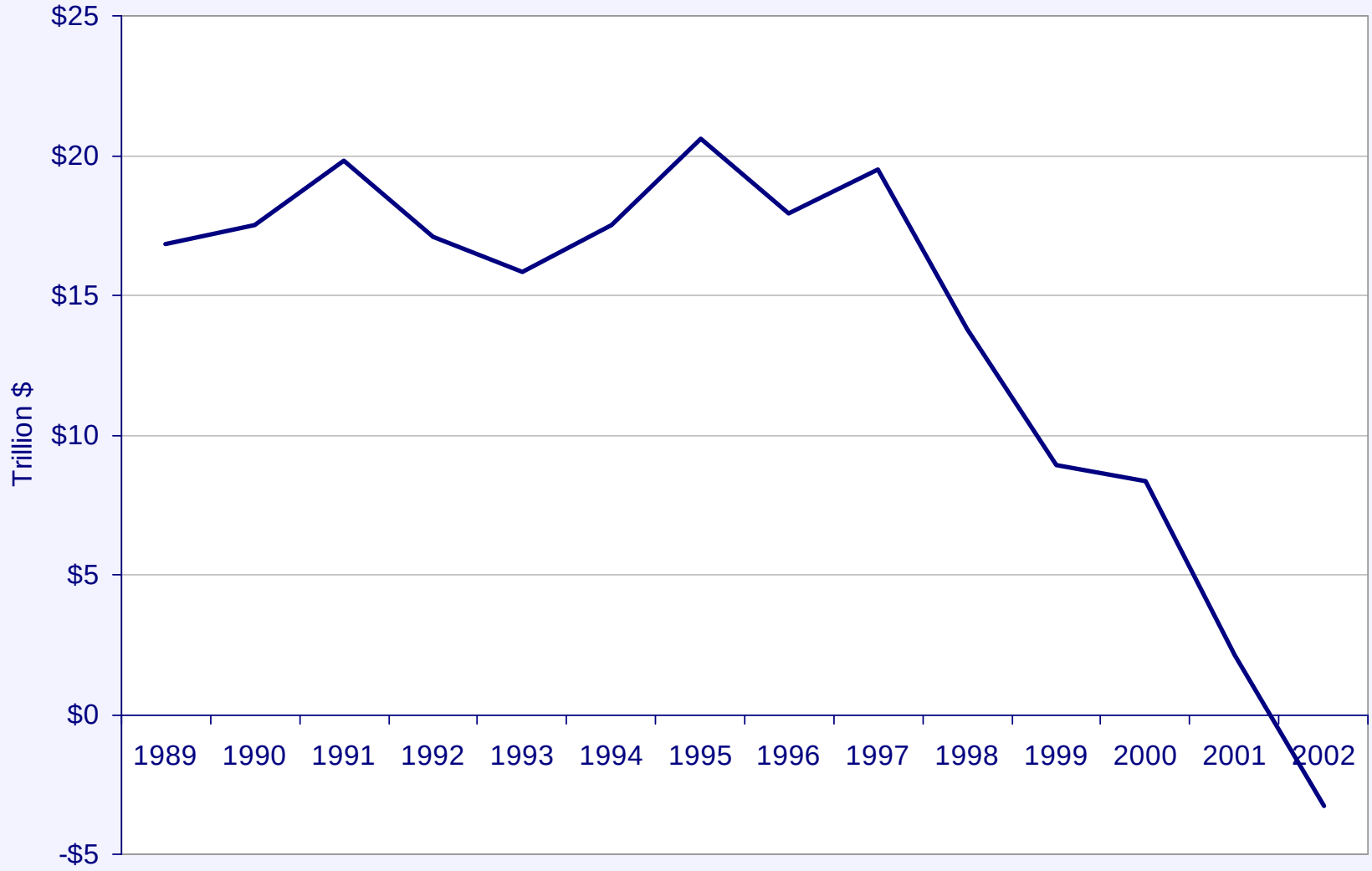
Value of Net Exports of NAICS 325 – Chemicals (1989 - 2002)

In 2002 the US became a net importer of chemicals



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

How Has Gas Supply Responded to These Changes?

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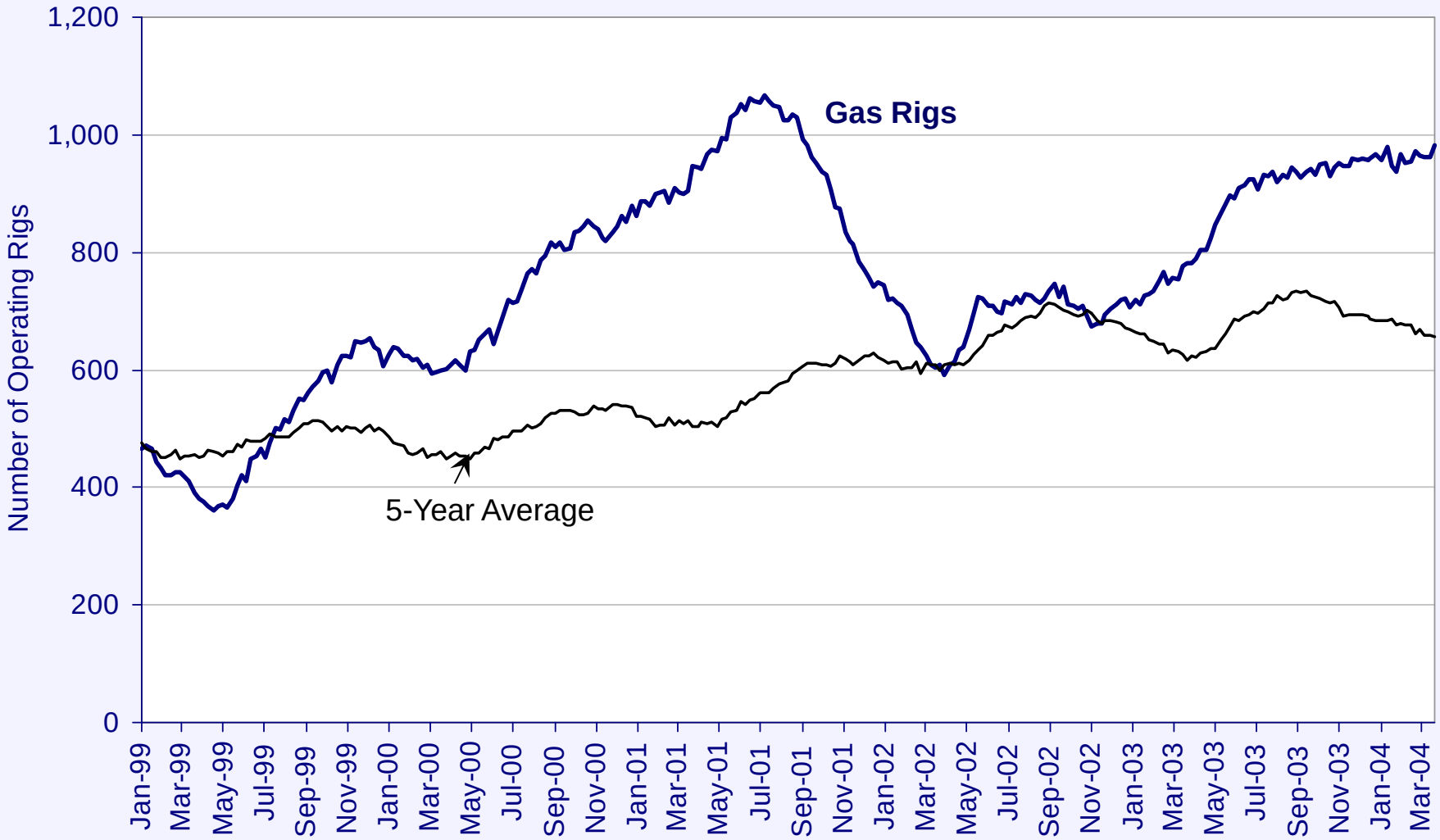
Weekly Counts of Natural Gas Rotary Rigs in Operation (1999–Present)



Source: Baker-Hughes Inc.

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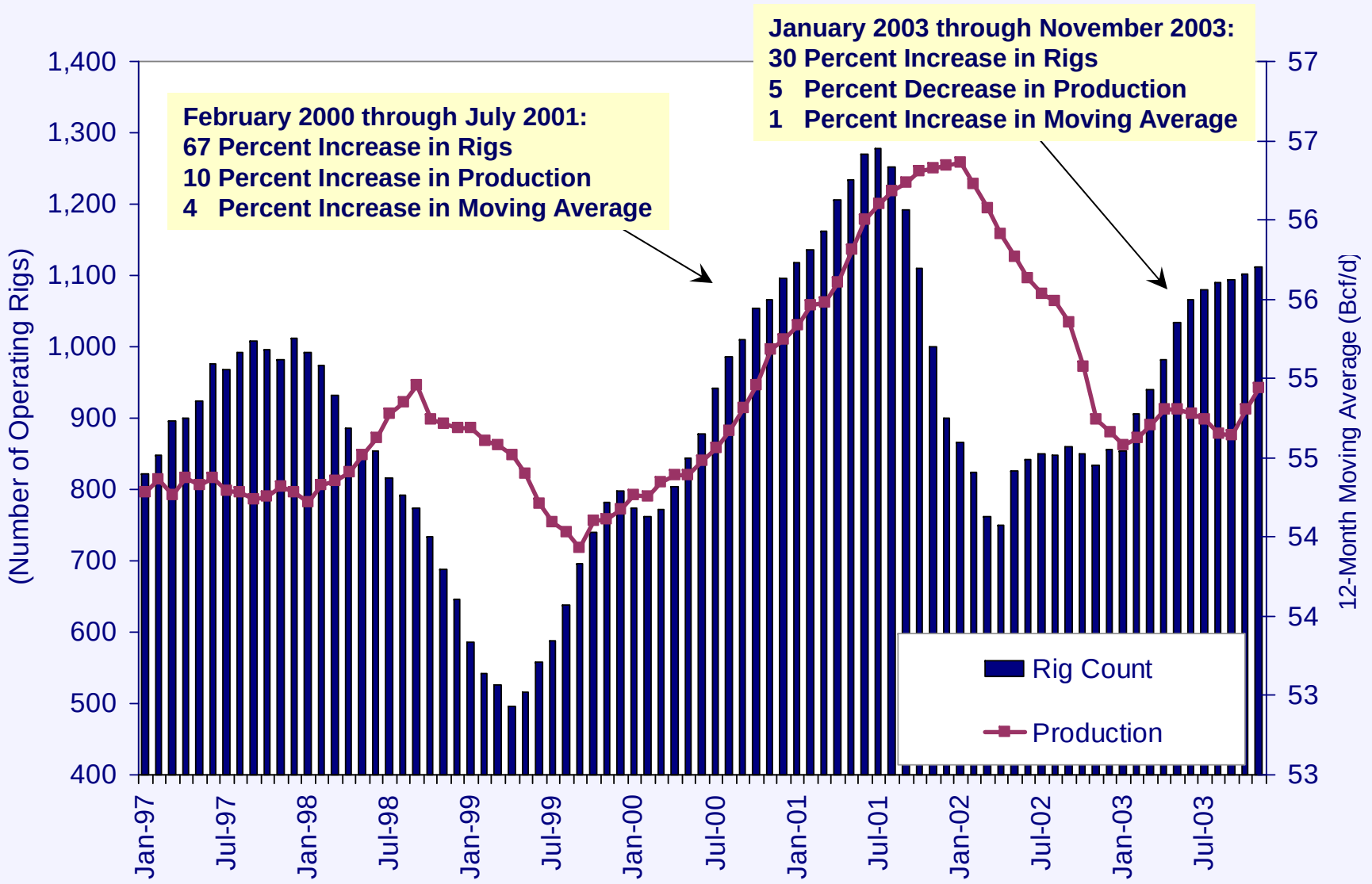
U.S. Natural Gas Production and Monthly Rig Count (1997 – Present)



Source: Energy Information Administration, Department of Energy; and Baker-Hughes Inc.

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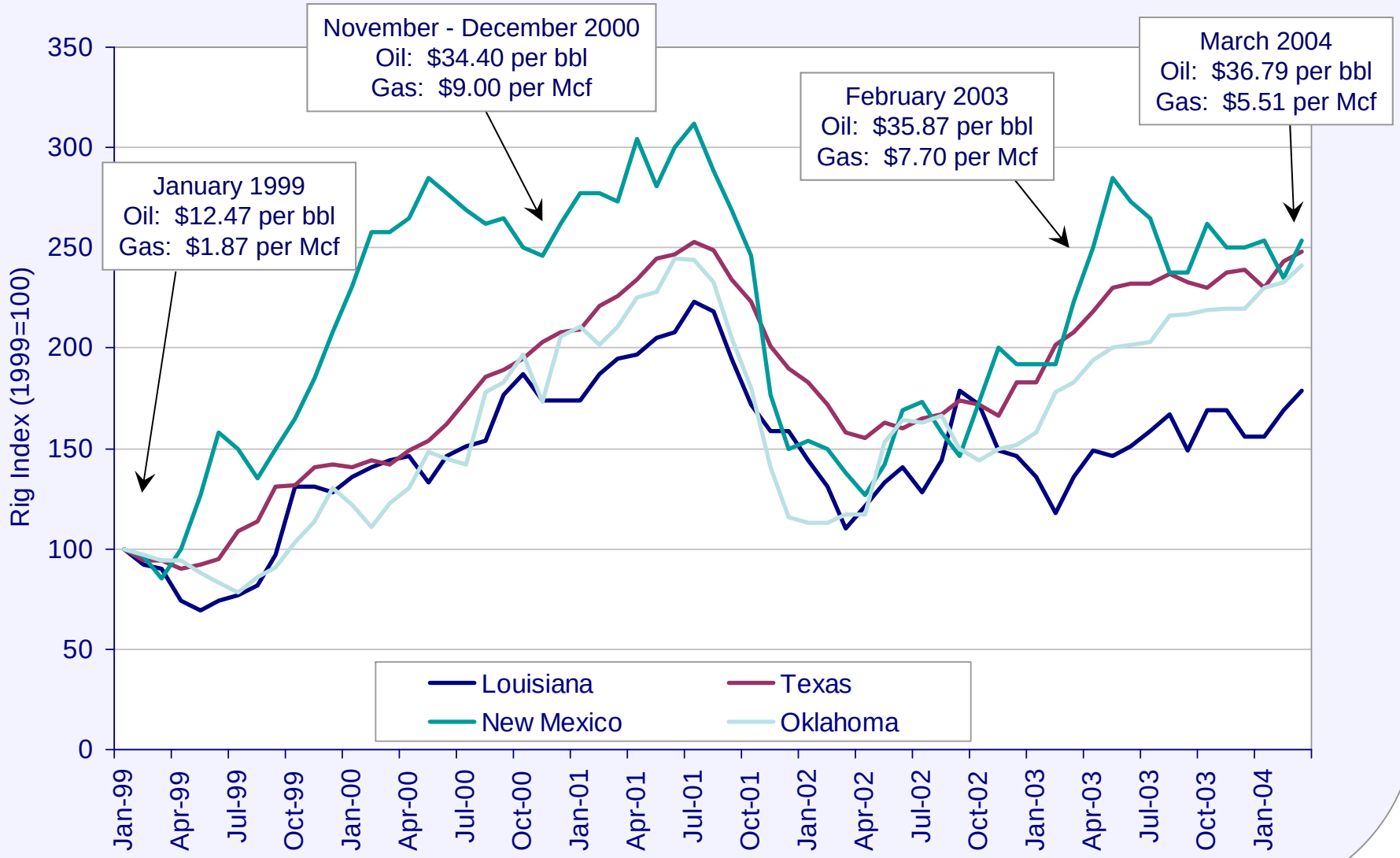
Monthly Rig Count by Top 4 Rig States (Land Only)
Standardized to January 1999



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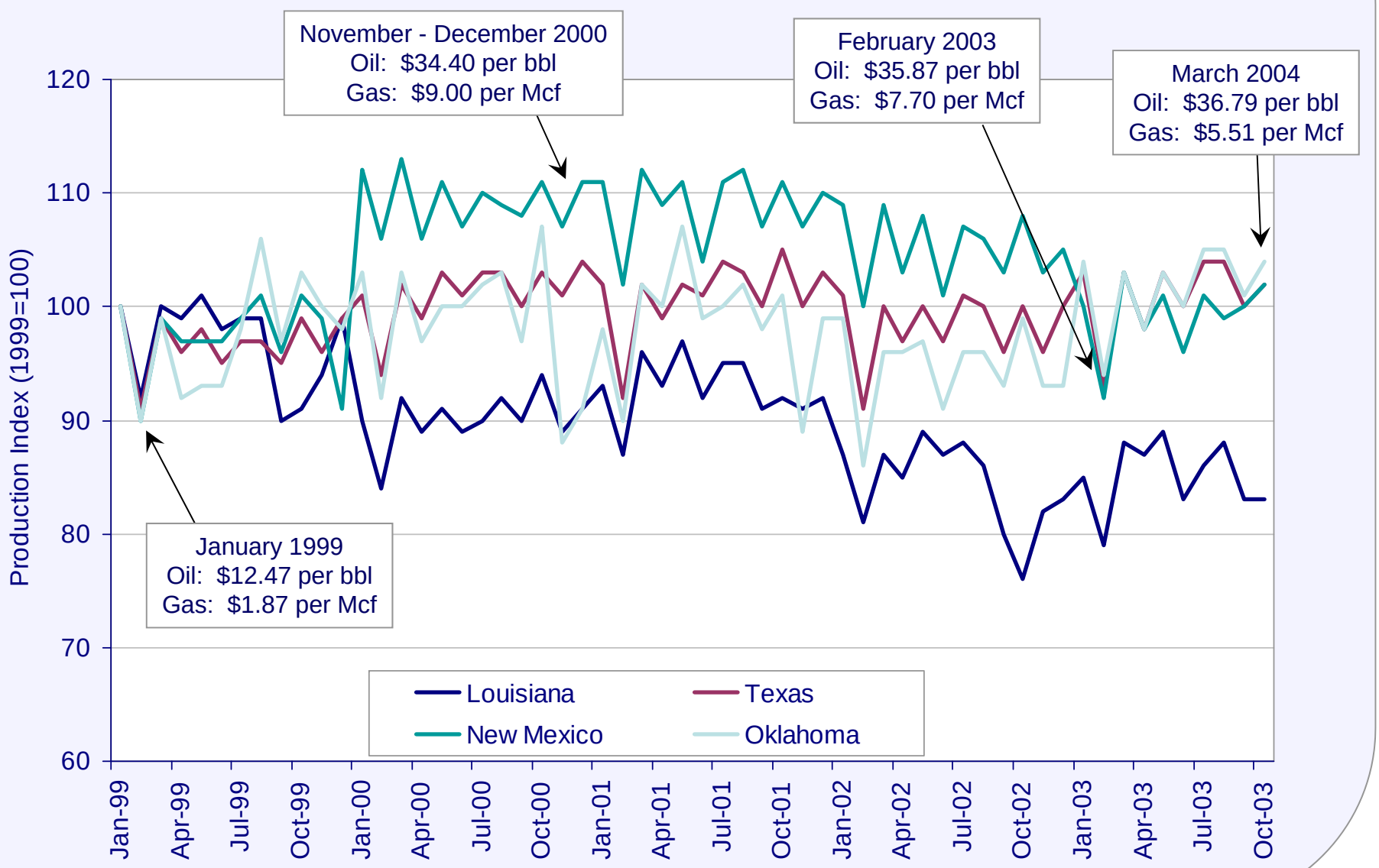
Monthly Production by Top 4 Production States
Standardized to January 1999



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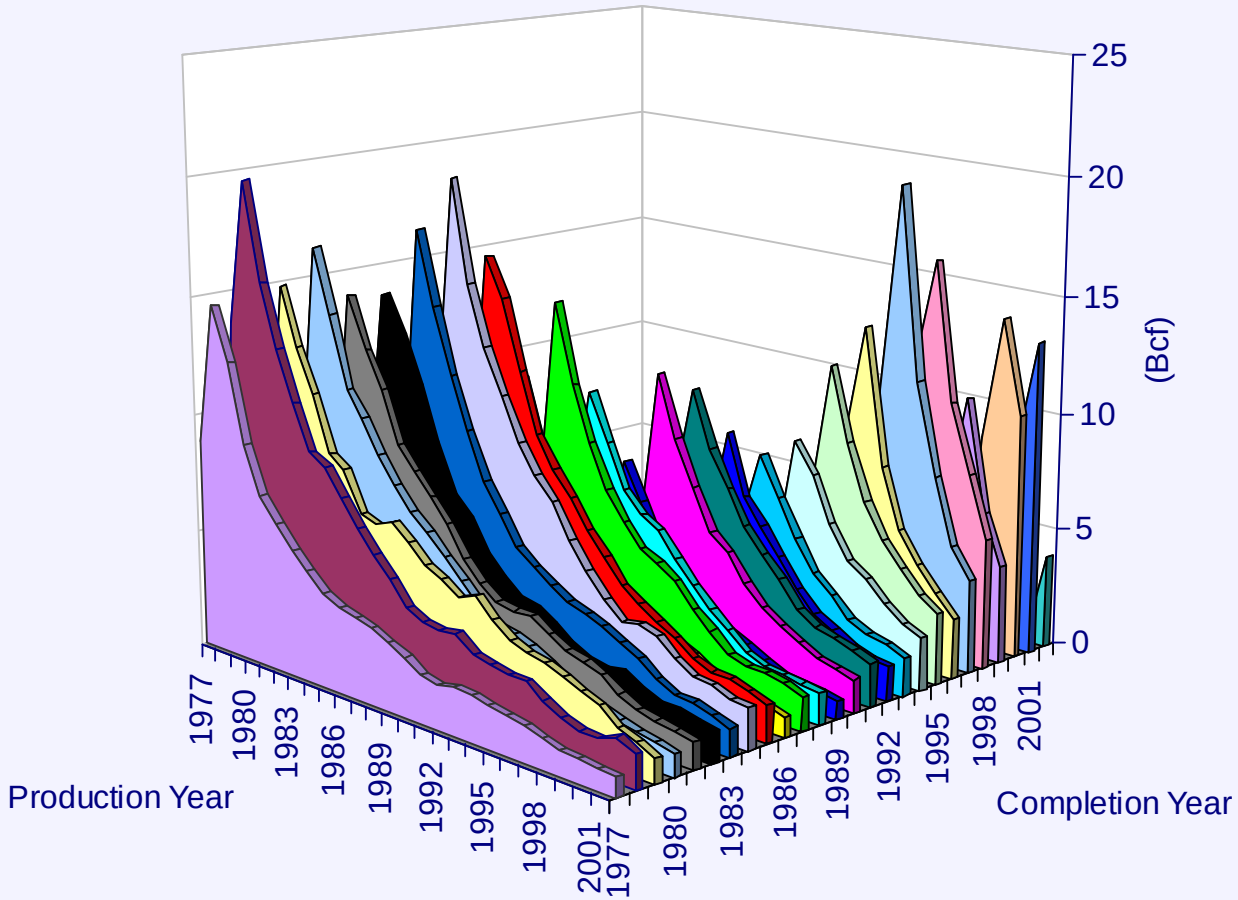
Louisiana Natural Gas Production By Well Completion Year



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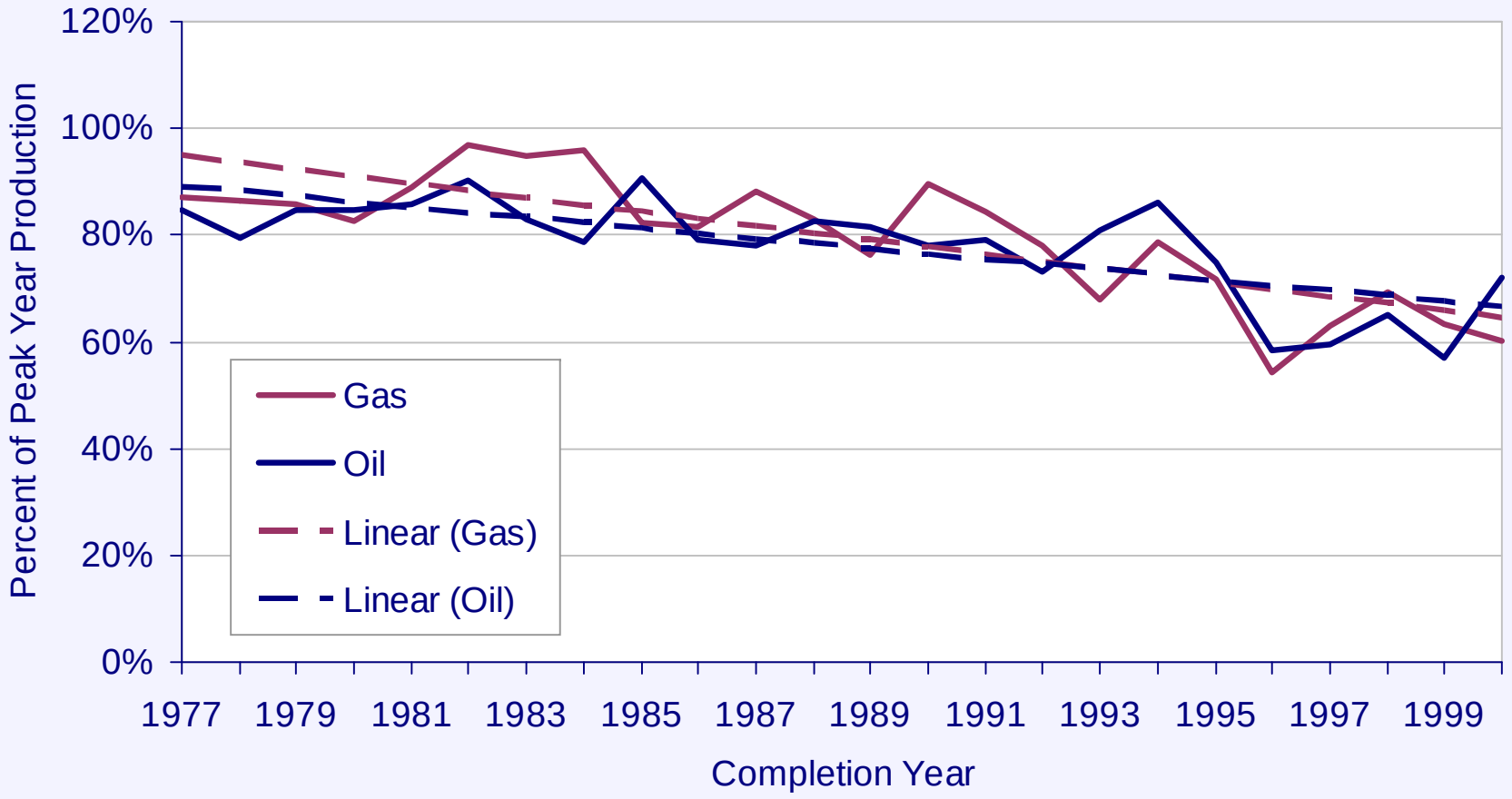
Post- Peak Year Decline Ratios
Louisiana Natural Gas Production
By Well Completion Year



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Importance of LNG on Future US Supply Disposition

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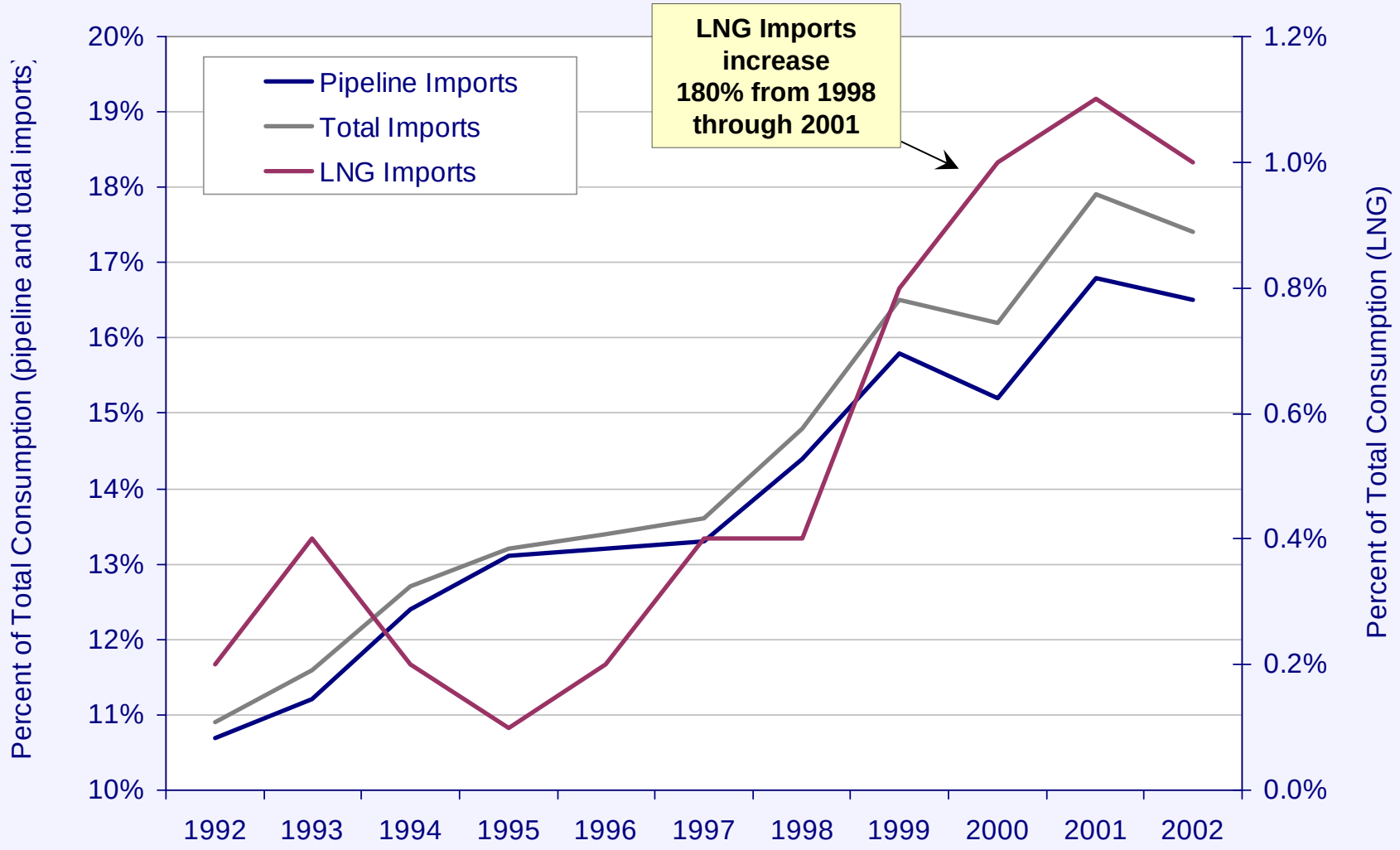
US Imports as a Percent of Total Consumption (1992 - 2002)



Source: Energy Information Administration, Department of Energy.

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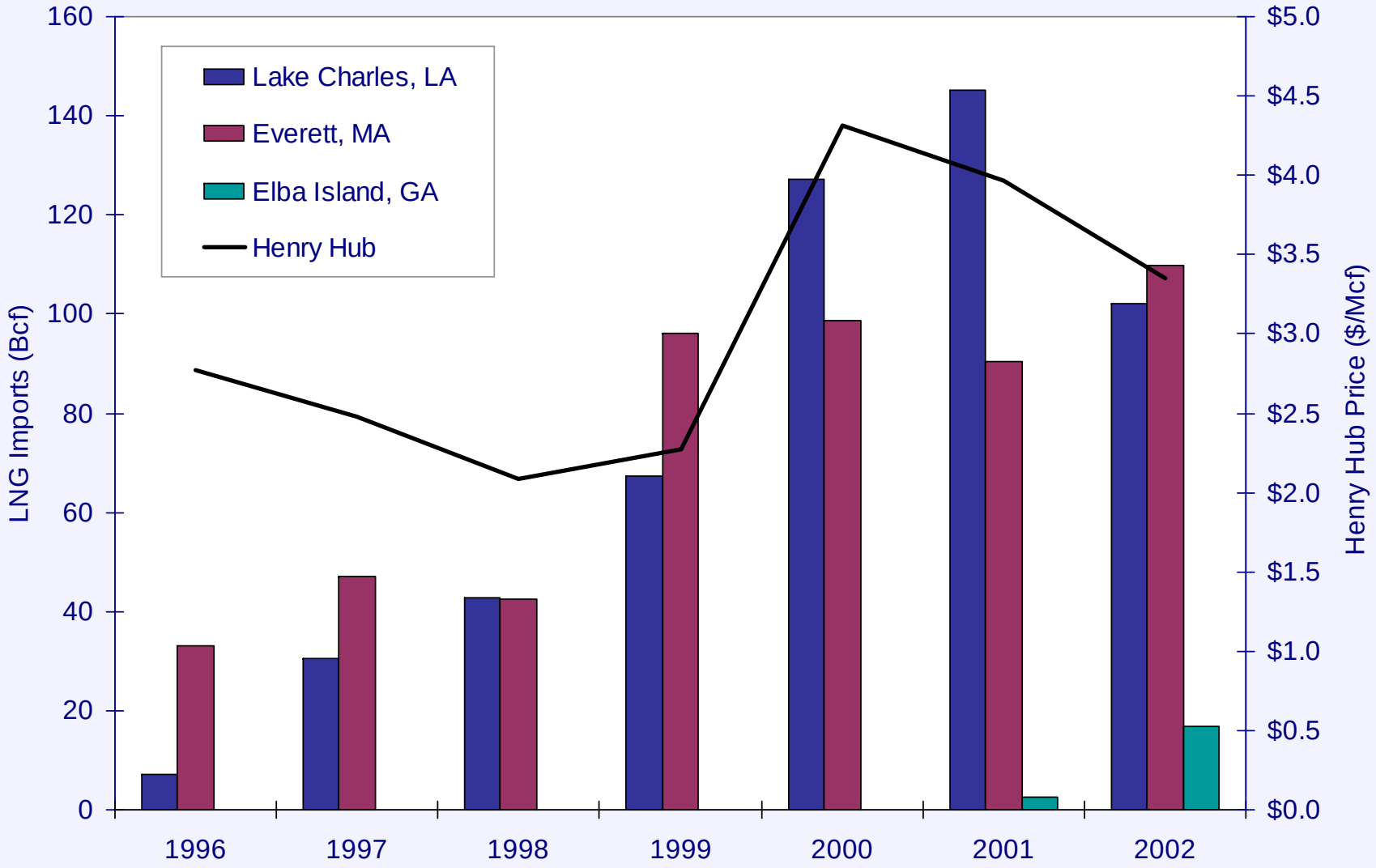
U.S. LNG Imports by Terminal
1996 - 2002

LNG imports tend to increase as natural gas prices increase



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

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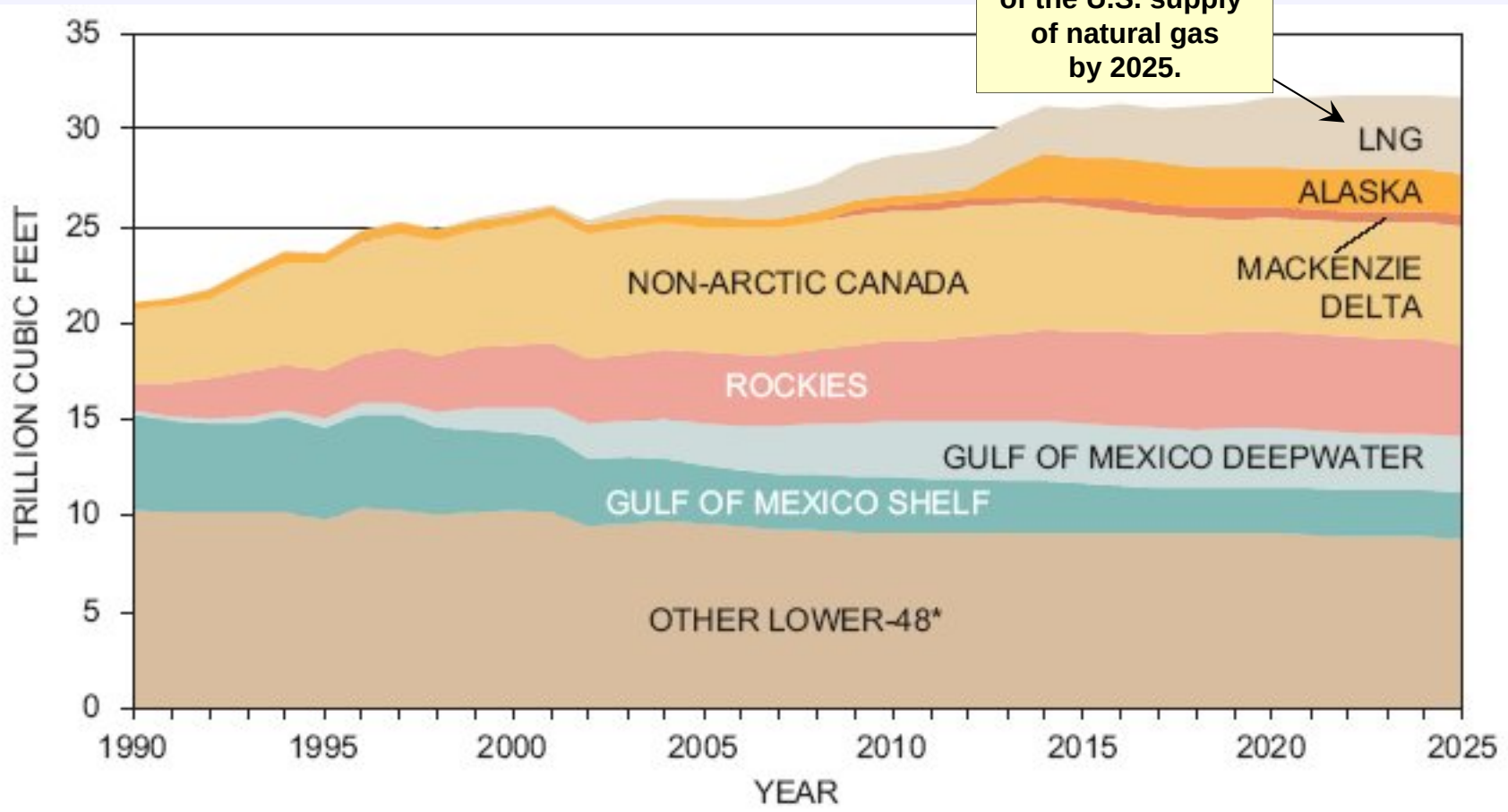
U.S. and Canadian Natural Gas Supply

LNG provides 14% of the U.S. supply of natural gas by 2025.



* Includes lower-48 production, ethane rejection, and supplemental gas.

Source: National Petroleum Council

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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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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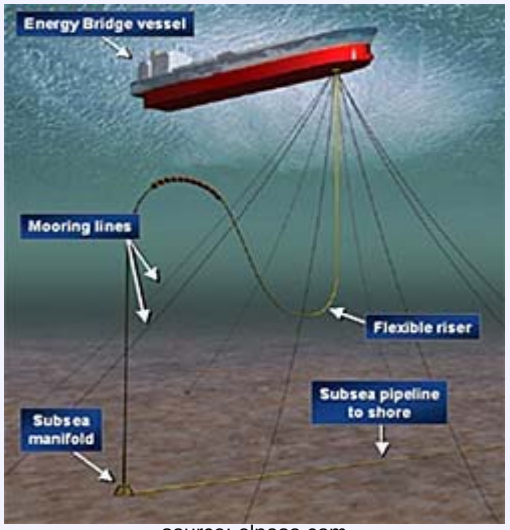
Types of Offshore LNG Receiving Terminals



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.

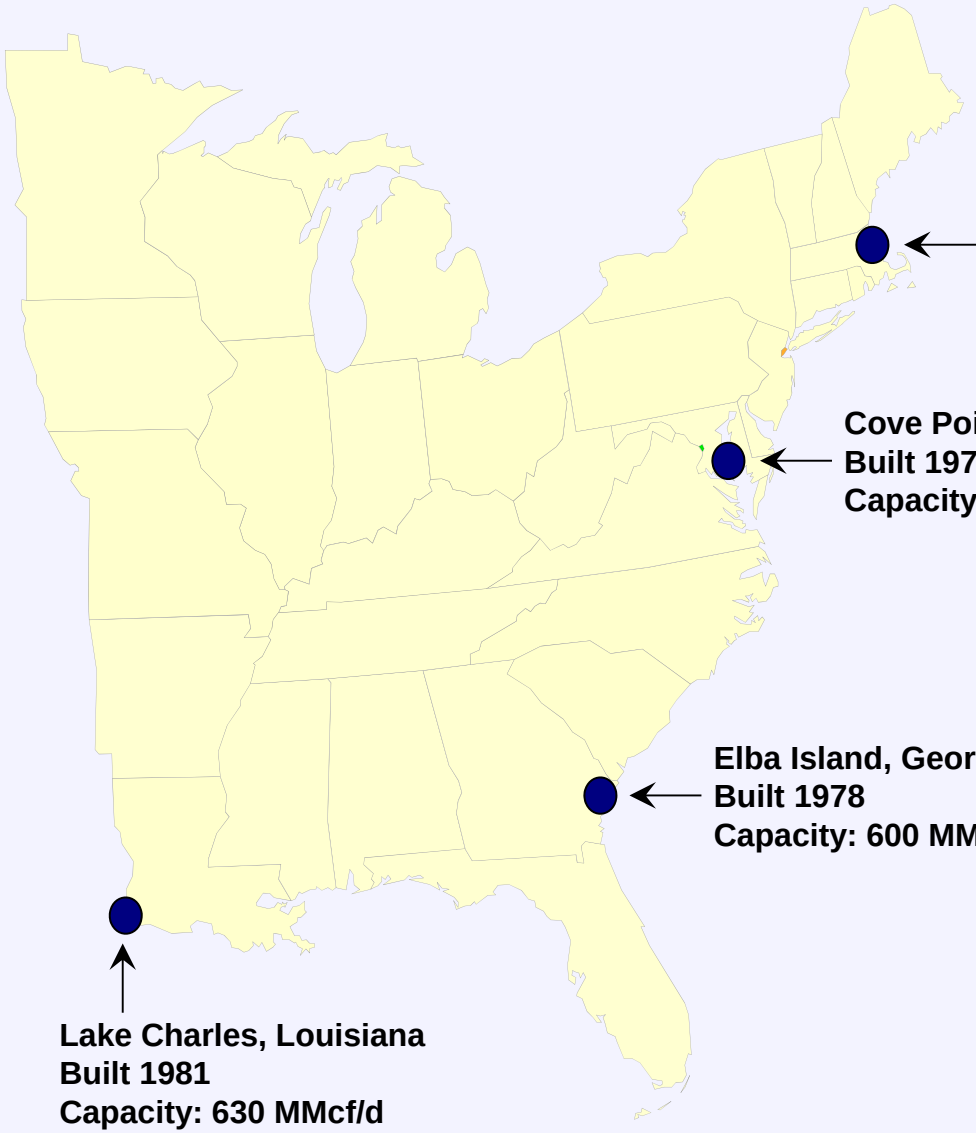
Source: lngsolutions.bhpbilliton.com

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



Everett, Massachusetts
Built 1971
Capacity: 435 MMcf/d

Cove Point, Maryland
Built 1974
Capacity: 430 MMcf/d

Elba Island, Georgia
Built 1978
Capacity: 600 MMcf/d

Lake Charles, Louisiana
Built 1981
Capacity: 630 MMcf/d

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)

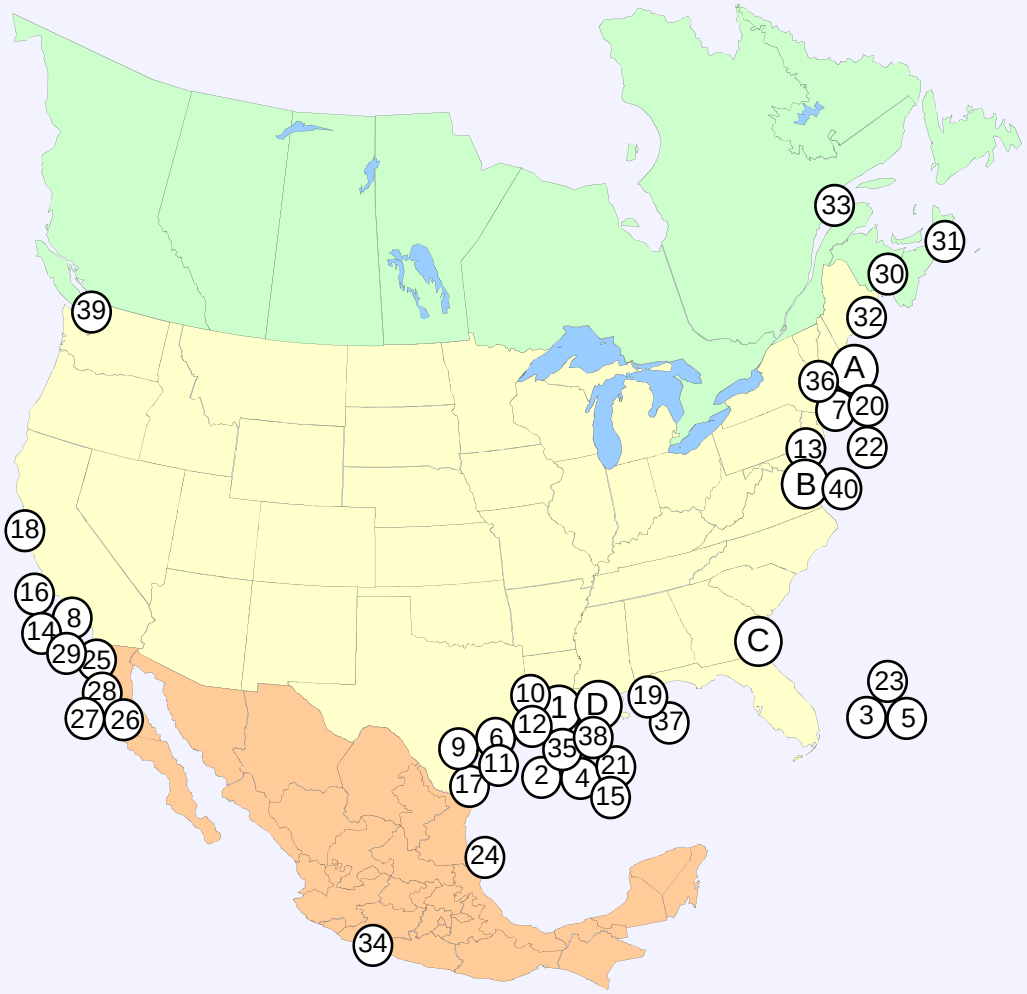
Proposed Terminals – Coast Guard

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

Center for
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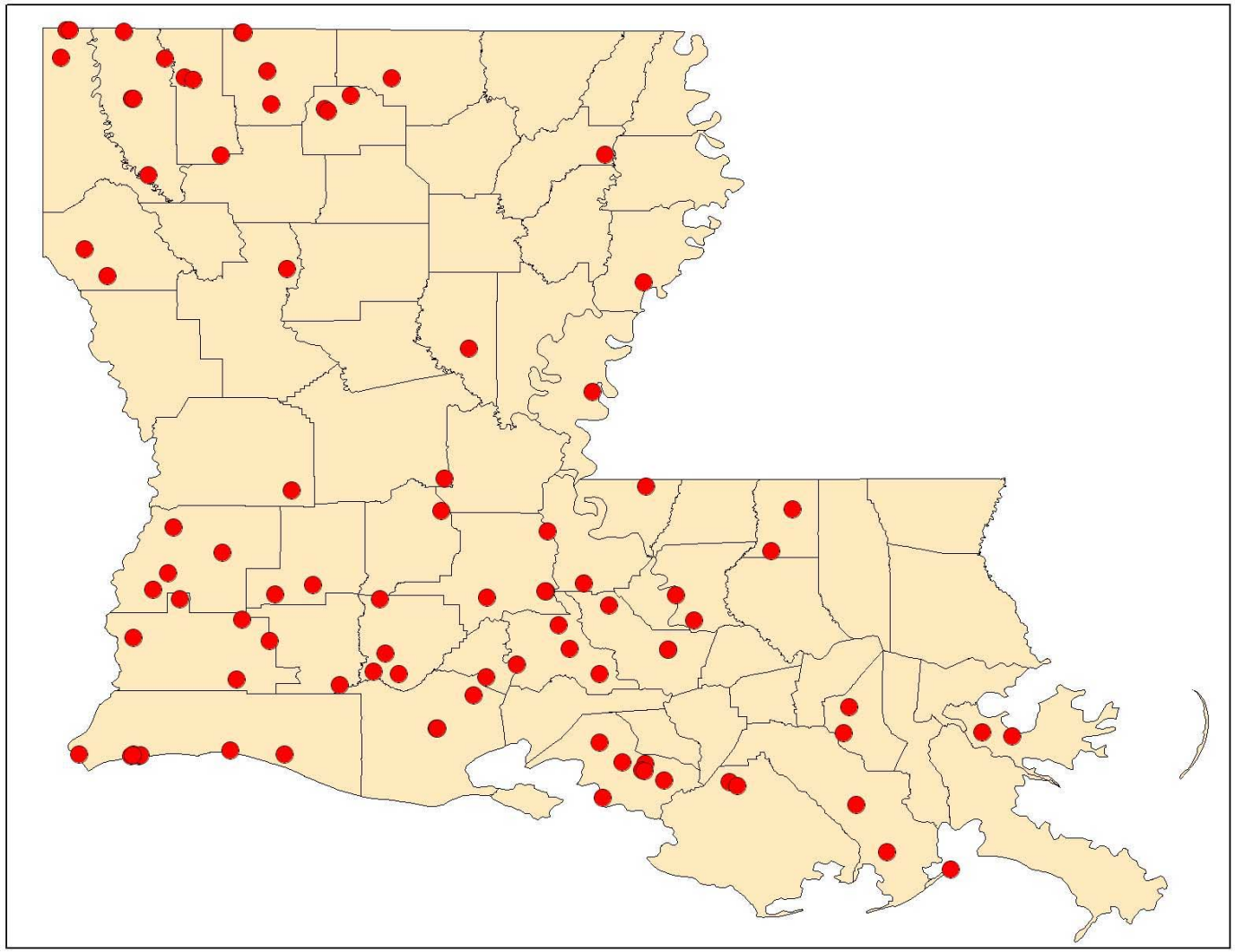
Why LNG and Louisiana Are A Good Fit:

Existing Infrastructure that Supports LNG

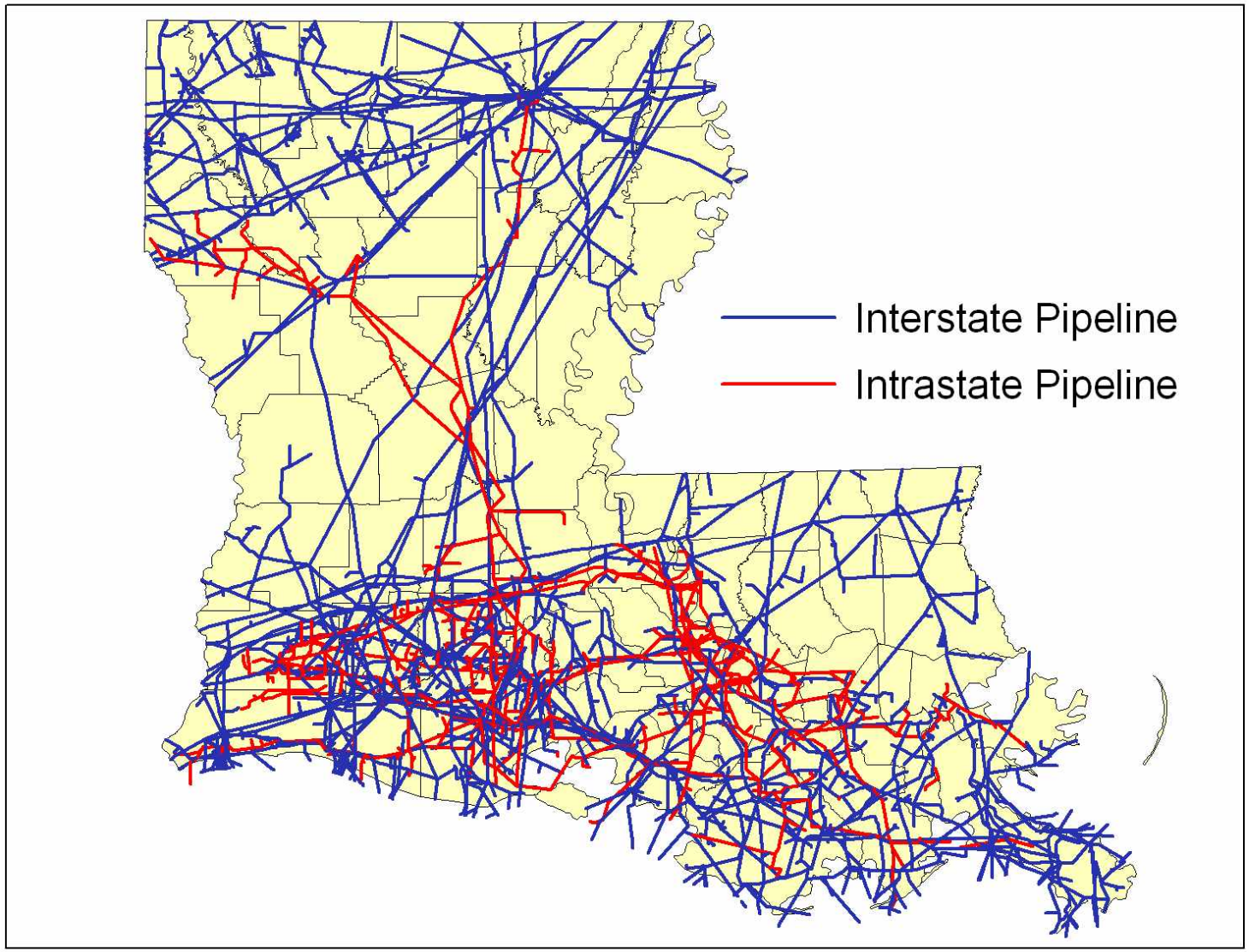
Center for
Energy Studies

Louisiana Natural Gas Processing Plants



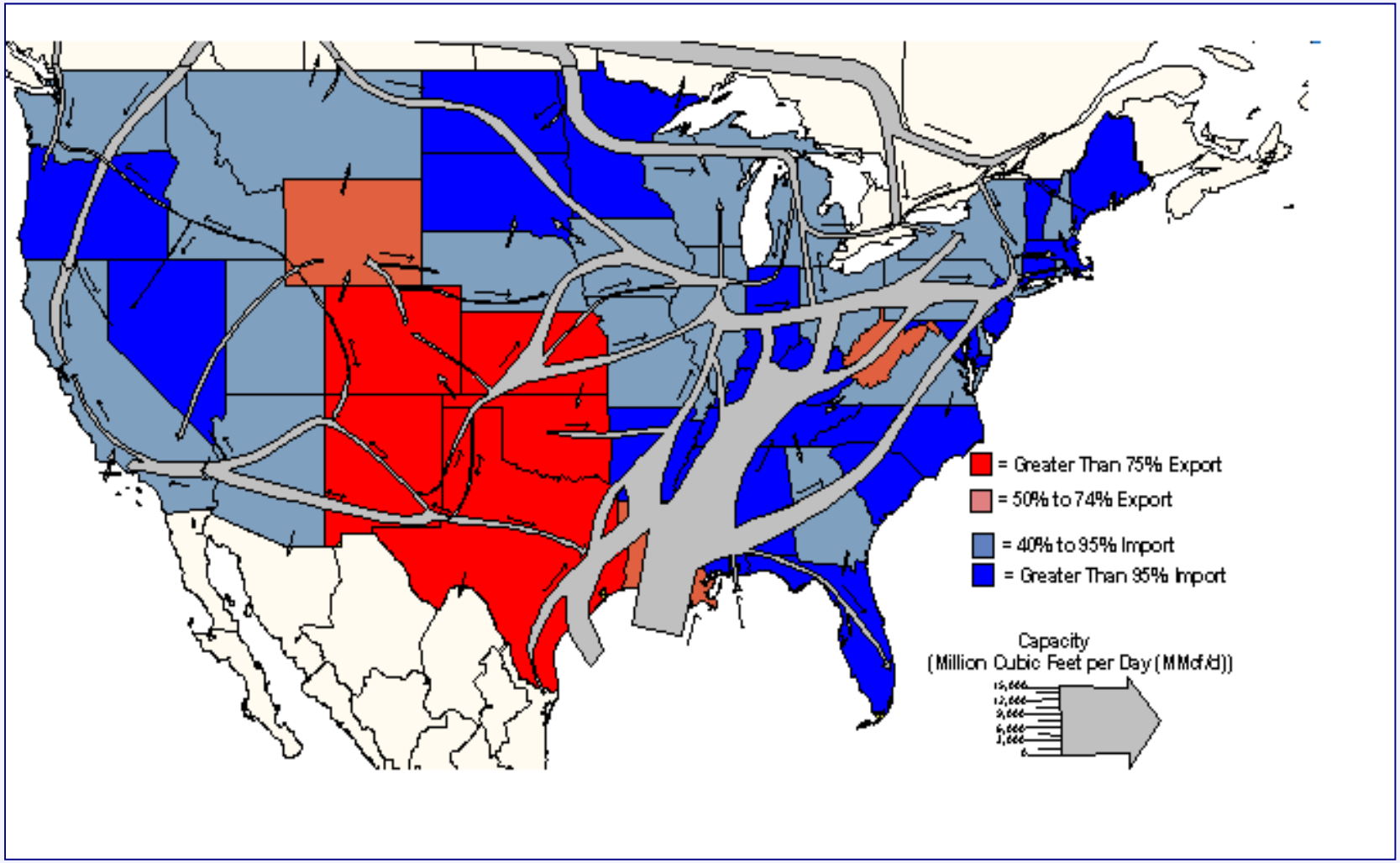
Note: Point locations are approximate
Source: IHS Energy Group Inc., Major Industrial Plant Database, 2002

Louisiana Natural Gas Transmission Pipelines



Source: Energy Information Administration, Department of Energy.

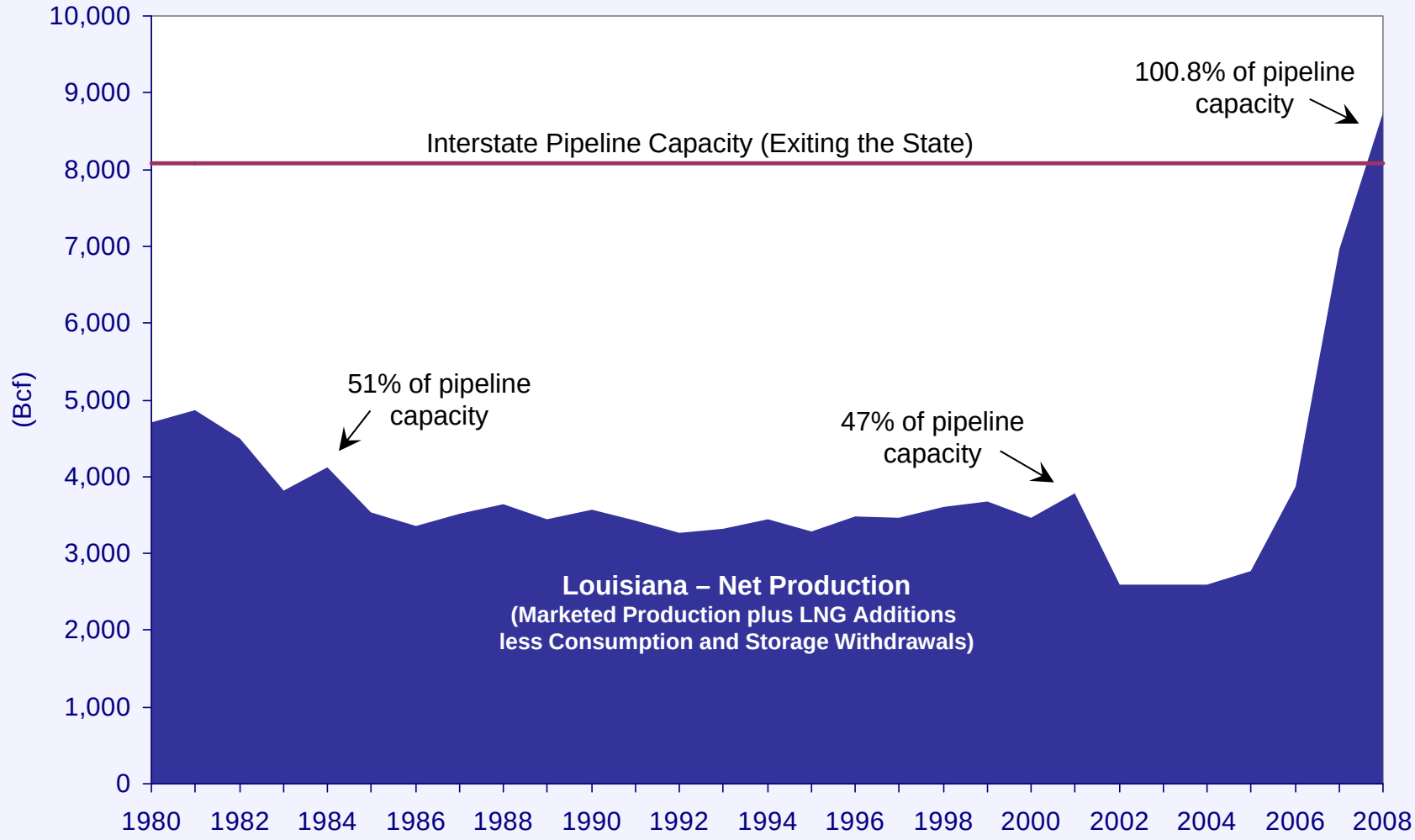
Louisiana Natural Gas Transmission Pipelines



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.

Center for
Energy Studies

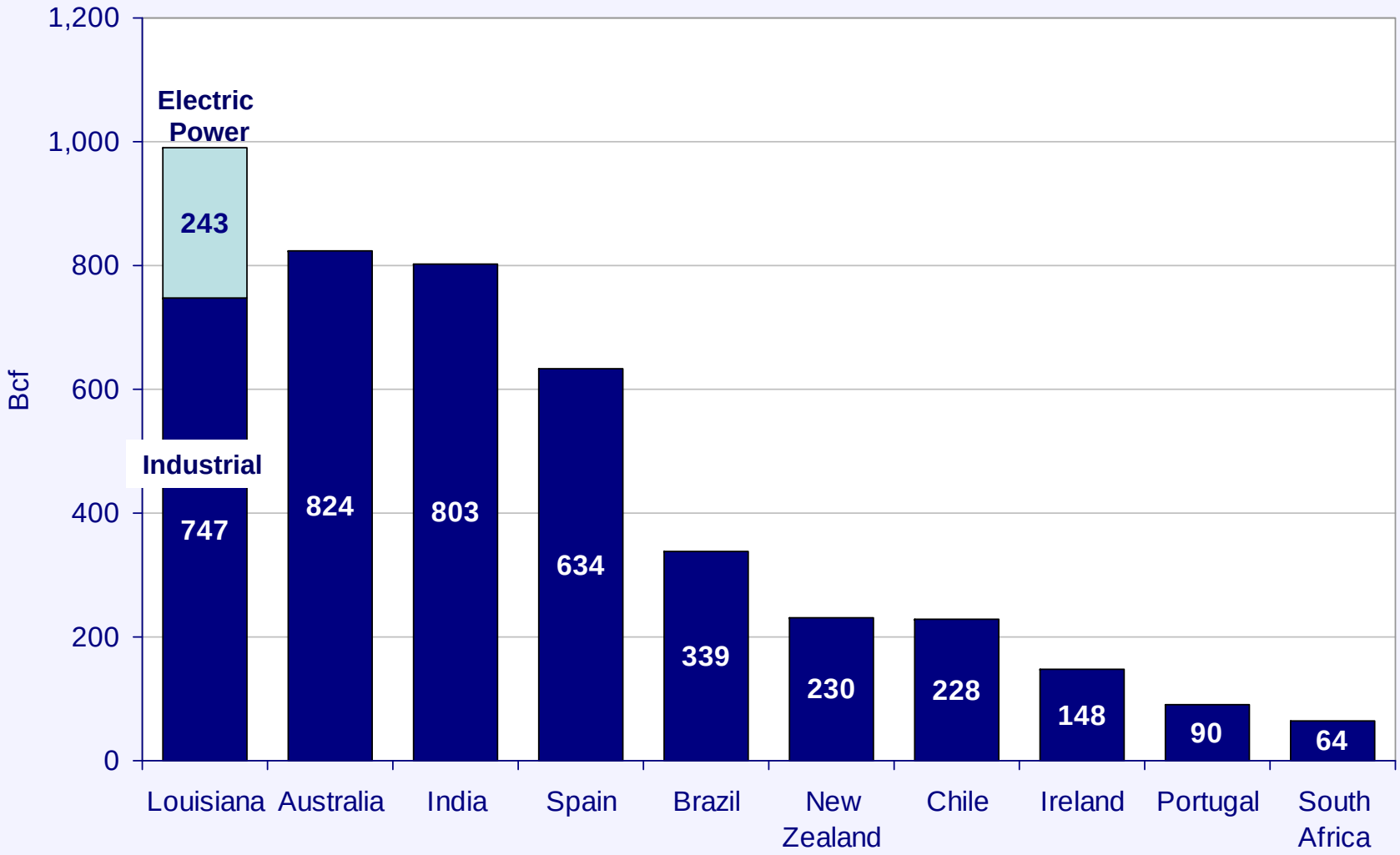
Why LNG and Louisiana Are A Good Fit:

Large Market for Natural Gas Users

Center for
Energy Studies

Natural Gas Consumption
Louisiana and World Comparison
(2001)

Louisiana gas consumption is larger than a number of countries

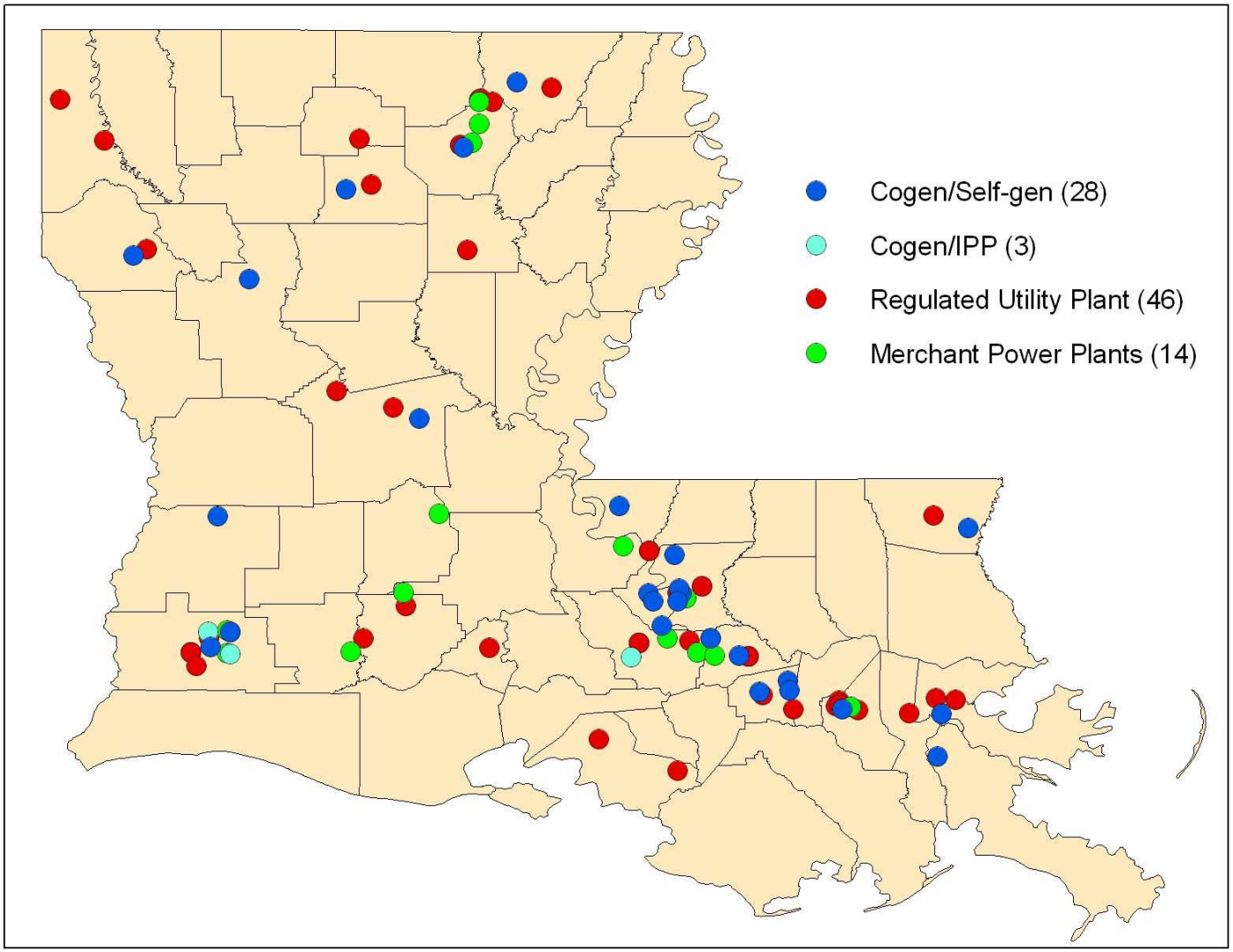


Source: Energy Information Administration, Department of Energy.

Center for
Energy Studies

Louisiana Natural Gas Fired Power Plants

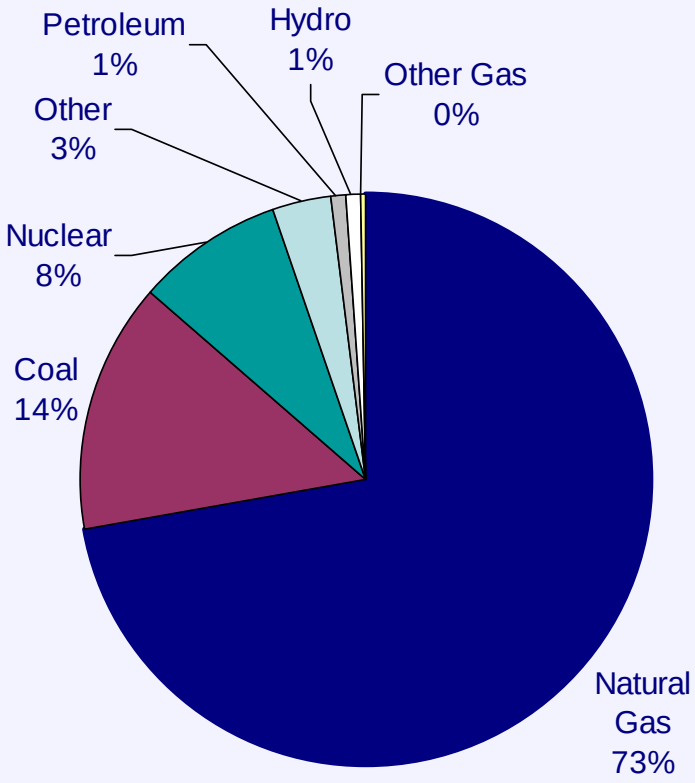
Total of 91 gas-fired power generators in Louisiana



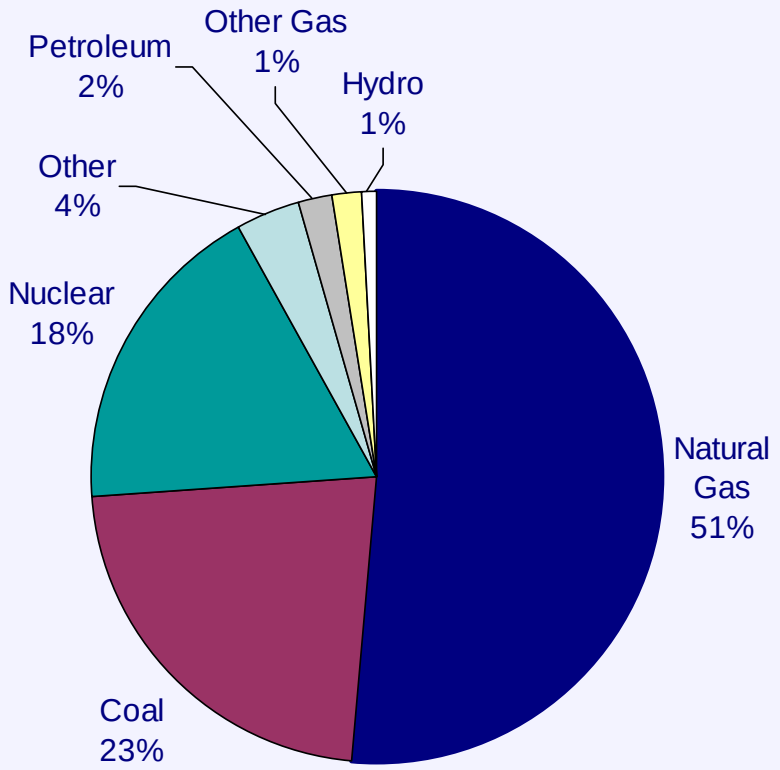
Note: Point locations are approximate
Source: IHS Energy Group Inc., Major Industrial Plant Database, 2002

Center for
Energy Studies

Louisiana Generation Fuel Mix



**Percent of Total Generation Capacity
By Fuel Type, 2002**

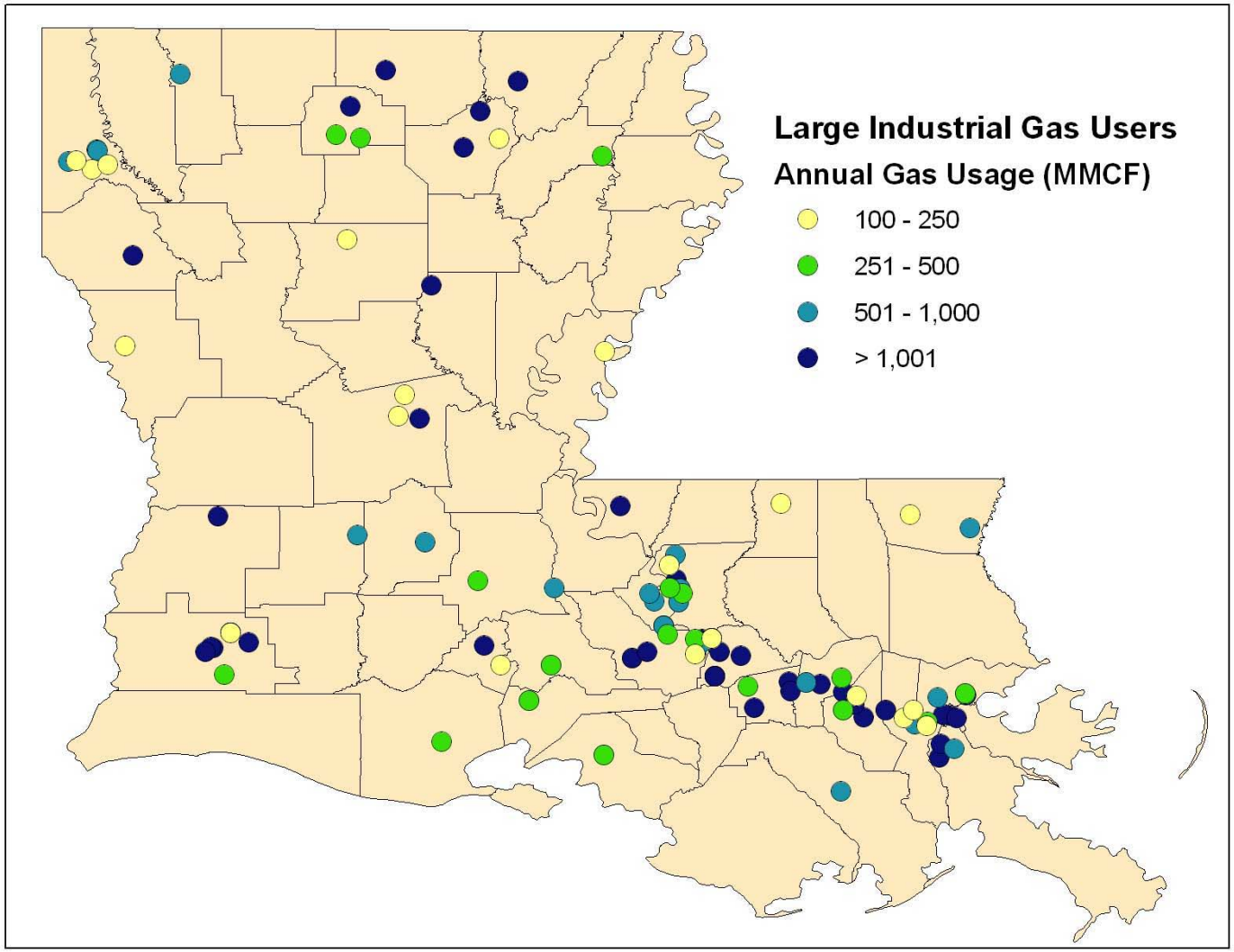


**Percent of Total Net Generation
By Fuel Type, 2002**

Source: Energy Information Administration, Department of Energy.

Center for
Energy Studies

Louisiana Industrial Natural Gas Users



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

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

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.

Center for
Energy Studies

Economic Impact of LNG Development

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	$ 423,057,733	$ 390,163,909	**$ 2,348,505,907**
Employment	7,196	2,852	3,828	**13,877**
Total Value Added	$ 409,739,748	$ 236,551,808	$ 217,774,431	**$ 864,065,987**
Employee Compensation	$ 235,194,975	$ 133,809,603	$ 111,641,721	**$ 480,646,298**

Center for
Energy Studies

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

Total Economic Impact

Louisiana Share of Operations Expenditures

Total Operation

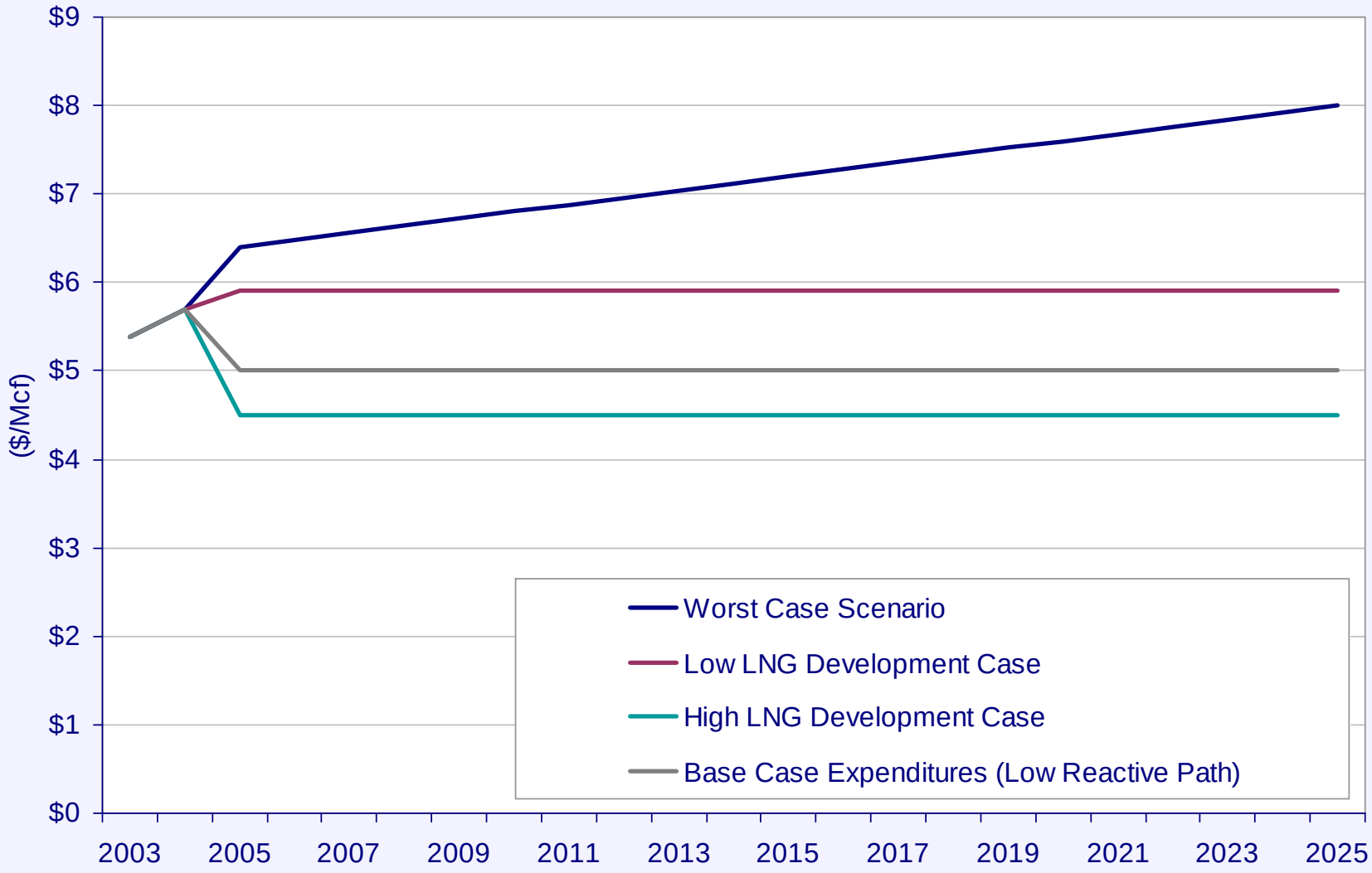
	Direct	Indirect	Induced	Total
Total GOM Annual Operations Expenditures	$ 170,000,000			
Output	$ 148,441,132	$ 48,153,683	$ 47,172,537	**$ 243,767,351**
Employment	925	286	396	**1,607**
Total Value Added	$ 56,137,030	$ 26,341,022	$ 26,329,889	**$ 108,807,940**
Employee Compensation	$ 43,135,771	$ 14,467,032	$ 13,497,975	**$ 71,100,778**

Center for
Energy Studies

Economic Impacts of LNG Development on Louisiana's Industrial Base

Center for
Energy Studies

Potential Price Scenarios



Source: Energy Information Administration, Department of Energy

Center for
Energy Studies

Potential Increases in Industrial Natural Gas Expenditures

SIC	Code and Description	Change in Industrial Expenditures: Base Case Less High Case 2002	Base Case Less High Case 2005	Base Case Less Low Case 2002	Base Case Less Low Case 2005	Base Case Less Worst Case 2002	Base Case Less Worst Case 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)	$ (89.12)	$ (178.23)	(1,780)	(1,215)	(2,995)	$ (89.12)	$ (27.91)	$ (117.02)
22	Textile Mill Products	$ (26.84)	$ (26.84)	$ (53.68)	(377)	(218)	(595)	$ (26.84)	$ (3.63)	$ (30.47)
23	Apparel & Textile Products	$ (10.83)	$ (10.83)	$ (21.65)	(801)	(465)	(1,266)	$ (10.83)	$ (5.35)	$ (16.17)
24	Lumber and Wood Products	$ (31.91)	$ (31.91)	$ (63.83)	(1,017)	(966)	(1,982)	$ (31.91)	$ (19.26)	$ (51.17)
26	Paper and Allied Products	$ (1.50)	$ (1.50)	$ (3.01)	(19)	(11)	(29)	$ (1.50)	$ (0.38)	$ (1.88)
27	Printing & Publishing	$ (22.66)	$ (22.66)	$ (45.32)	(1,025)	(634)	(1,659)	$ (22.66)	$ (12.85)	$ (35.51)
28	Chemicals and Allied Products	$ (156.43)	$ (156.43)	$ (312.85)	(1,128)	(821)	(1,949)	$ (156.43)	$ (39.71)	$ (196.14)
29	Petroleum and Coal Products	$ (77.76)	$ (77.76)	$ (155.52)	(370)	(383)	(753)	$ (77.76)	$ (18.38)	$ (96.15)
30	Rubber & Misc. Plastic Prods.	$ (16.44)	$ (16.44)	$ (32.87)	(482)	(296)	(778)	$ (16.44)	$ (7.05)	$ (23.49)
32	Stone, Clay & Glass Products	$ (14.84)	$ (14.84)	$ (29.68)	(514)	(350)	(864)	$ (14.84)	$ (8.23)	$ (23.06)
33	Primary Metal Industries	$ (0.43)	$ (0.43)	$ (0.86)	(11)	(6)	(17)	$ (0.43)	$ (0.15)	$ (0.58)
34	Fabricated Metal Products	$ (45.19)	$ (45.19)	$ (90.39)	(1,408)	(801)	(2,209)	$ (45.19)	$ (19.43)	$ (64.62)
35	Machinery & Computer Equip.	$ (35.93)	$ (35.93)	$ (71.86)	(1,050)	(610)	(1,661)	$ (35.93)	$ (17.59)	$ (53.52)
36	Electric & Electronic Equip.	$ (18.21)	$ (18.21)	$ (36.43)	(414)	(238)	(651)	$ (18.21)	$ (7.27)	$ (25.48)
37	Transportation Equipment	$ (60.73)	$ (60.73)	$ (121.46)	(1,828)	(894)	(2,722)	$ (60.73)	$ (40.63)	$ (101.36)
38	Instruments & Related Products	$ (3.87)	$ (3.87)	$ (7.74)	(139)	(83)	(222)	$ (3.87)	$ (2.48)	$ (6.35)
39	Misc. Manufacturing Industries	$ (5.96)	$ (5.96)	$ (11.92)	(334)	(213)	(547)	$ (5.96)	$ (3.18)	$ (9.14)
Total for Major Louisiana Industries		**$ (618.65)**	**$ (618.65)**	**$ (1,237.30)**	**(12,699)**	**(8,203)**	**(20,902)**	**$ (618.65)**	**$ (233.47)**	**$ (852.12)**

Center for
Energy Studies

Economic Impact to Louisiana Industries Associated with Worst Case Scenario

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	$ (233.95)	$ (159.61)	$ (393.56)	(5,242)	(3,576)	(8,819)	$ (107.38)	$ (73.26)	$ (180.64)
22	Textile Mill Products	$ (69.80)	$ (63.77)	$ (133.58)	(1,089)	(630)	(1,718)	$ (16.31)	$ (9.43)	$ (25.74)
23	Apparel & Textile Products	$ (28.15)	$ (0.00)	$ (28.15)	(2,311)	(1,343)	(3,654)	$ (23.95)	$ (13.91)	$ (37.86)
24	Lumber and Wood Products	$ (84.93)	$ (130.82)	$ (215.75)	(3,081)	(2,927)	(6,008)	$ (53.95)	$ (51.24)	$ (105.19)
26	Paper and Allied Products	$ (4.18)	$ (4.08)	$ (8.26)	(62)	(36)	(98)	$ (1.83)	$ (1.05)	$ (2.88)
27	Printing & Publishing	$ (58.93)	$ (57.54)	$ (116.47)	(2,959)	(1,829)	(4,788)	$ (54.06)	$ (33.41)	$ (87.47)
28	Chemicals and Allied Products	$ (424.26)	$ (511.89)	$ (936.15)	(3,559)	(2,592)	(6,152)	$ (147.90)	$ (107.71)	$ (255.61)
29	Petroleum and Coal Products	$ (211.48)	$ (363.50)	$ (574.99)	(1,175)	(1,215)	(2,390)	$ (48.34)	$ (50.00)	$ (98.34)
30	Rubber & Misc. Plastic Prods.	$ (42.80)	$ (41.50)	$ (84.30)	(1,395)	(855)	(2,250)	$ (29.96)	$ (18.36)	$ (48.33)
32	Stone, Clay & Glass Products	$ (39.08)	$ (42.62)	$ (81.70)	(1,525)	(1,037)	(2,562)	$ (31.85)	$ (21.66)	$ (53.51)
33	Primary Metal Industries	$ (1.19)	$ (1.09)	$ (2.29)	(37)	(20)	(57)	$ (0.79)	$ (0.43)	$ (1.22)
34	Fabricated Metal Products	$ (117.54)	$ (105.64)	$ (223.18)	(4,064)	(2,312)	(6,376)	$ (88.82)	$ (50.53)	$ (139.35)
35	Machinery & Computer Equip.	$ (95.39)	$ (89.68)	$ (185.07)	(3,167)	(1,841)	(5,008)	$ (80.35)	$ (46.70)	$ (127.05)
36	Electric & Electronic Equip.	$ (48.03)	$ (44.30)	$ (92.34)	(1,229)	(706)	(1,936)	$ (33.36)	$ (19.17)	$ (52.53)
37	Transportation Equipment	$ (158.26)	$ (122.53)	$ (280.79)	(5,298)	(2,591)	(7,889)	$ (216.52)	$ (105.88)	$ (322.40)
38	Instruments & Related Products	$ (10.07)	$ (9.49)	$ (19.56)	(402)	(240)	(642)	$ (10.80)	$ (6.45)	$ (17.25)
39	Misc. Manufacturing Industries	$ (15.50)	$ (15.60)	$ (31.10)	(965)	(615)	(1,579)	$ (12.96)	$ (8.26)	$ (21.22)
Total for Major Louisiana Industries		**$ (1,643.55)**	**$ (1,763.67)**	**$ (3,407.22)**	**(37,561)**	**(24,365)**	**(61,926)**	**$ (959.13)**	**$ (617.46)**	**$ (1,576.59)**

Implications for Louisiana Power Generation

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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**

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Potential Change in Electric Power Fuel Rates ($/MWh)

	Weighted Average Generation 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%

Implications for Louisiana Households

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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%**

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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%**

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Conclusions

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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)

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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

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Comments & Questions

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