LSU Center for Energy Studies

Unconventional Resources and Louisiana's Manufacturing Development Renaissance

David E. Dismukes, Ph.D.
Center for Energy Studies
Louisiana State University

January 11, 2013

LSU CENTER FOR ENERGY STUDIES

TABLE OF CONTENTS

TABLE OF CONTENTS (CONTINUED)

TABLE OF CONTENTS (CONTINUED)

STUDY PURPOSE & ACKNOWLEDGMENTS

Louisiana has seen considerable unconventional natural gas reserve development in recent years that has been nothing short of "revolutionary." These resources have, and will continue to play a significant role in North American and even global energy markets. Several studies have examined the economic benefits of unconventional natural gas reserve development in Louisiana. However, none of these studies have explored the impact that these developments are having on downstream manufacturing capital investments in the state.

The Center for Energy Studies ("CES") was asked by America's Natural Gas Alliance ("ANGA") to examine the potential economic impacts associated with the numerous, recently-announced capital investments planned in response to these newly-found unconventional natural gas reserves. The purpose of the study is to educate stakeholders about the nature and motivations for these manufacturing investments and what they mean for Louisiana's economy.

CES appreciates the financial support provided by ANGA to complete this study for Louisiana stakeholders and policy makers.

EXECUTIVE SUMMARY – PROJECT SUMMARY

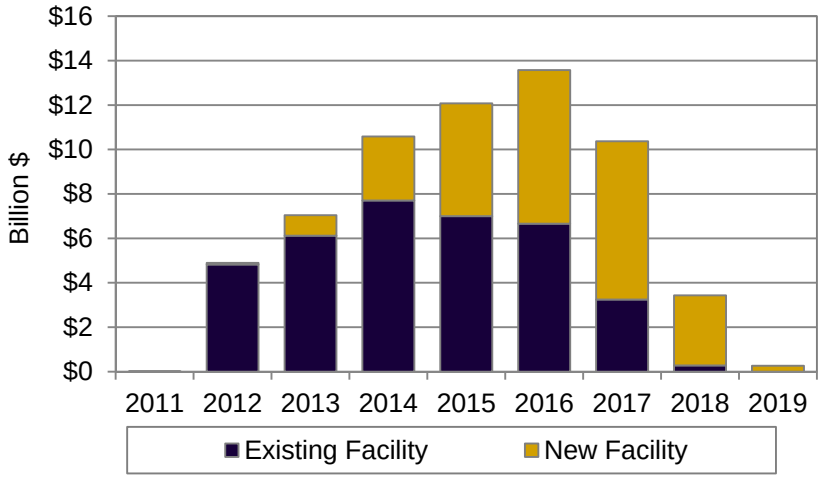
There is a **symbiotic relationship** between **natural gas prices** and **Louisiana's energy-intensive manufacturing base**. Louisiana manufacturing relies heavily on natural gas for heat, steam, power generation and most importantly, feedstock purposes. **Louisiana's chemical industry is particularly reliant upon natural gas** and natural gas liquids since both are used to produce a wide range of goods.

The synergies between natural gas use and Louisiana manufacturing have their genesis in the state's historic role as the **second largest U.S. natural gas producer**. While Louisiana's role as a major producer of natural gas is well known, the significance of its natural gas usage is not. **Louisiana ranks third in the country in total natural gas usage, and second in industrial natural gas usage**.

The **natural gas price increases** of 2000, and the dismal outlook for domestic North American natural gas supplies, **cast a long shadow on Louisiana manufacturing** that only got worse in the aftermath of the tropical activity of 2004 and 2005. Liquefied natural gas ("LNG") imports appeared to be the less-than-satisfactory solution to these gas supply problems.

The emergence of **prolific unconventional natural gas resources** however, has led to an abrupt reversal of fortune for Louisiana manufacturing. Over the past year, **a large number of proposed investments**, both expansions and new facilities, have been announced in Louisiana. These projects include LNG export terminals, gas-to-liquids facilities, ethane crackers, and methanol/ammonia plants.

EXECUTIVE SUMMARY – PROJECT ANNOUNCEMENTS



Natural gas prices, from 2000 to 2009, averaged about $5.88 per million British Thermal Unit ("BTU") and in many instances often exceeded, on a daily basis, $10/MMBTU. During this period, the volatility of prices doubled, making natural gas an exceptionally high-cost energy resource for U.S., and in particular, Louisiana manufacturing.

Natural gas prices began to retreat from these unusually high price levels during the course of the last recession and **have remained stable, between $3.00/MMBTU to $4.00/MMBTU**.

This change in price comes from the development of unconventional gas reserves located throughout the U.S. Many credible resource estimates suggest **at least 100 years of U.S. natural gas supply** from these newly-discovered resources.

The abundance of **natural gas resources** has led to a virtual **manufacturing renaissance** in Louisiana where, to date, some **$62.3 billion in new capital investments have been announced**. The majority of these proposed investments, if developed, will occur between the next five to eight years.

EXECUTIVE SUMMARY – PROJECT INVESTMENT IMPACTS

Statewide Impacts (Investment Only)

- In general, capital expenditures associated with a large manufacturing facility do not remain in one state since specialty equipment, machinery, and other materials are imported from other states, regions or international sources. If each of these natural gas induced projects were to be built, in-state capital investment in Louisiana would total $20.2 billion (out of the total of $62.3 billion) over the next nine years.
- The construction of the recently-announced natural gas induced projects is estimated to generate an economic benefit of over **$29.7 billion in economic output** over a nine-year period (2011-2019), **a cumulative increase of some 214,670 job-years**, and **$9.3 billion increase in wages** over a nine-year construction period.

Region	Output ($Billions)	Jobs-Years	Wages ($Billions)
South East	$15.64	109,355	$5.21
South Central	$4.33	30,920	$1.39
South West	$2.61	19,289	$0.78

Regional Impacts (Investment Only)

- Most of the manufacturing project announcements are anticipated to be located in South Louisiana. As such, the estimated impacts were based on three different regions. **These impacts include over $22.5 billion in output, almost 160,000 in job-years, and $7.4 billion in wages**.

Section 2:
Overview of Louisiana Manufacturing

Overview of Louisiana Manufacturing & the Importance of Natural Gas

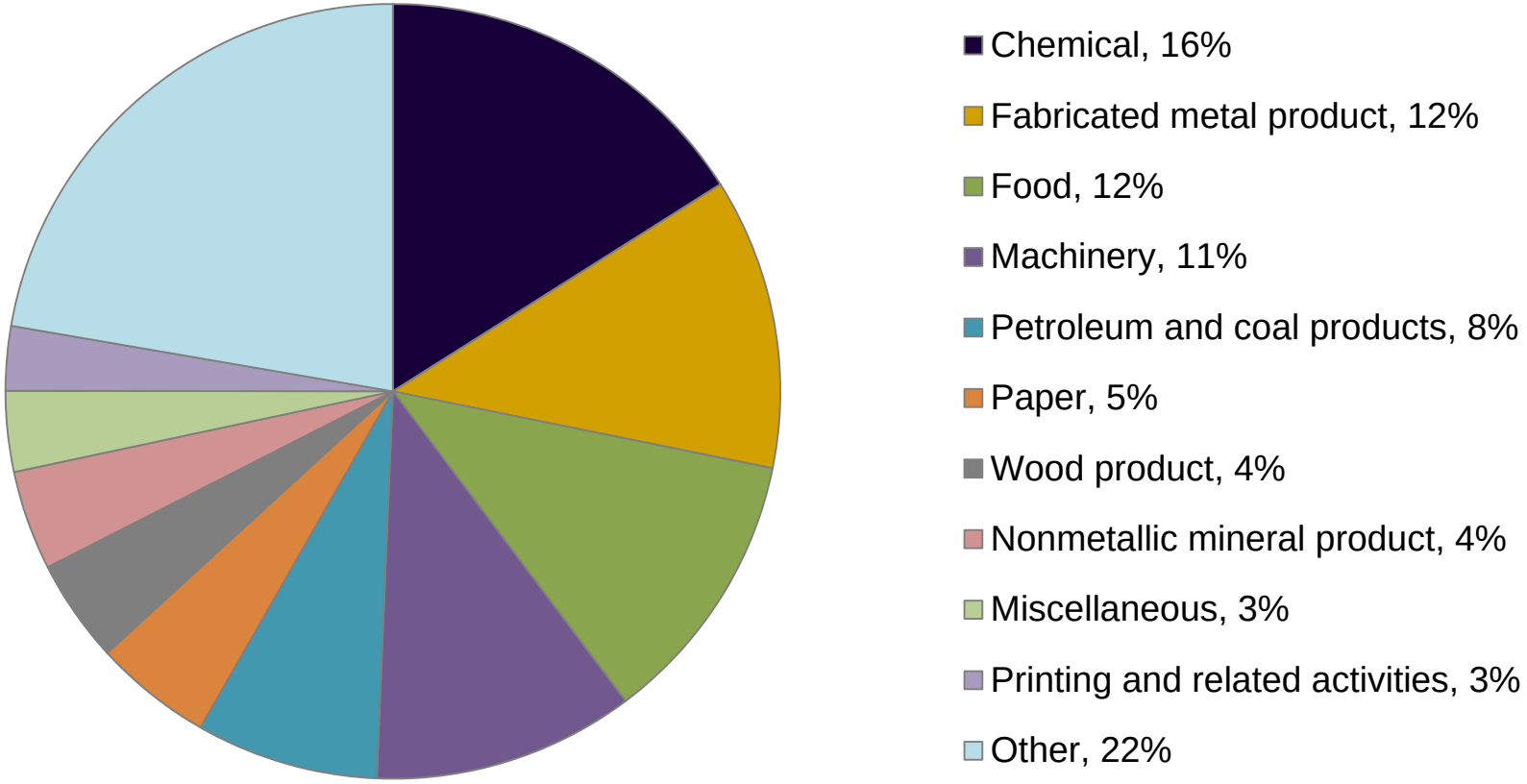
Louisiana has a large and relatively high-paying manufacturing and industrial sector. Chemicals, refining, metals, and wood products make up the key manufacturing sectors in the state and all are intensive energy users, particularly of natural gas and natural gas-fired electric power generation. Manufacturing and industry are located throughout the state, although a considerable share is concentrated along the Mississippi River in southeastern Louisiana.

Louisiana is the second largest producer of natural gas and the state's manufacturing industries have developed over the past six decades in large part to take advantage of what, prior to 2000, was a relatively low-cost and abundant energy resource and feedstock. Louisiana, in fact, is the third largest consumer of natural gas in the U.S., a level driven exclusively by the state's energy-intensive manufacturing.

Louisiana's chemical industry is one of the single largest sectors in terms of employment, output value and energy usage. This sector uses natural gas to process heat and steam, to generate a considerable amount of electricity, and as a feedstock to make everything from plastics to pharmaceuticals, and as inputs for products like cosmetics, fibers, tires, and clothing.

Manufacturing Employment (2011) by Sector and Total State

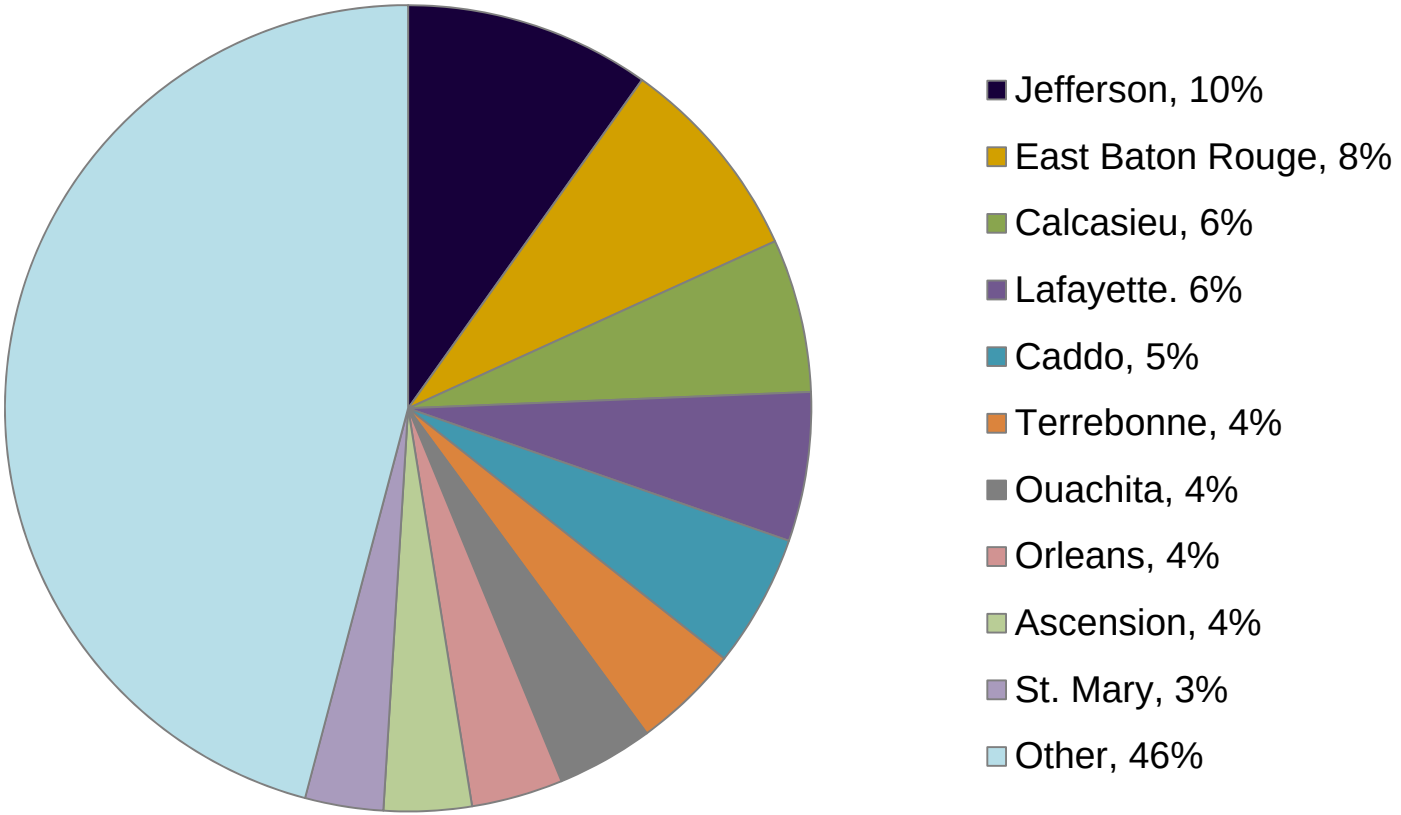
The manufacturing sector supports 147,177 jobs in Louisiana. The top five categories account for almost 60 percent of manufacturing jobs.



Source: Bureau of Economic Analysis, U.S. Department of Commerce.

Manufacturing Employment (2010) by Parish (All Sectors)

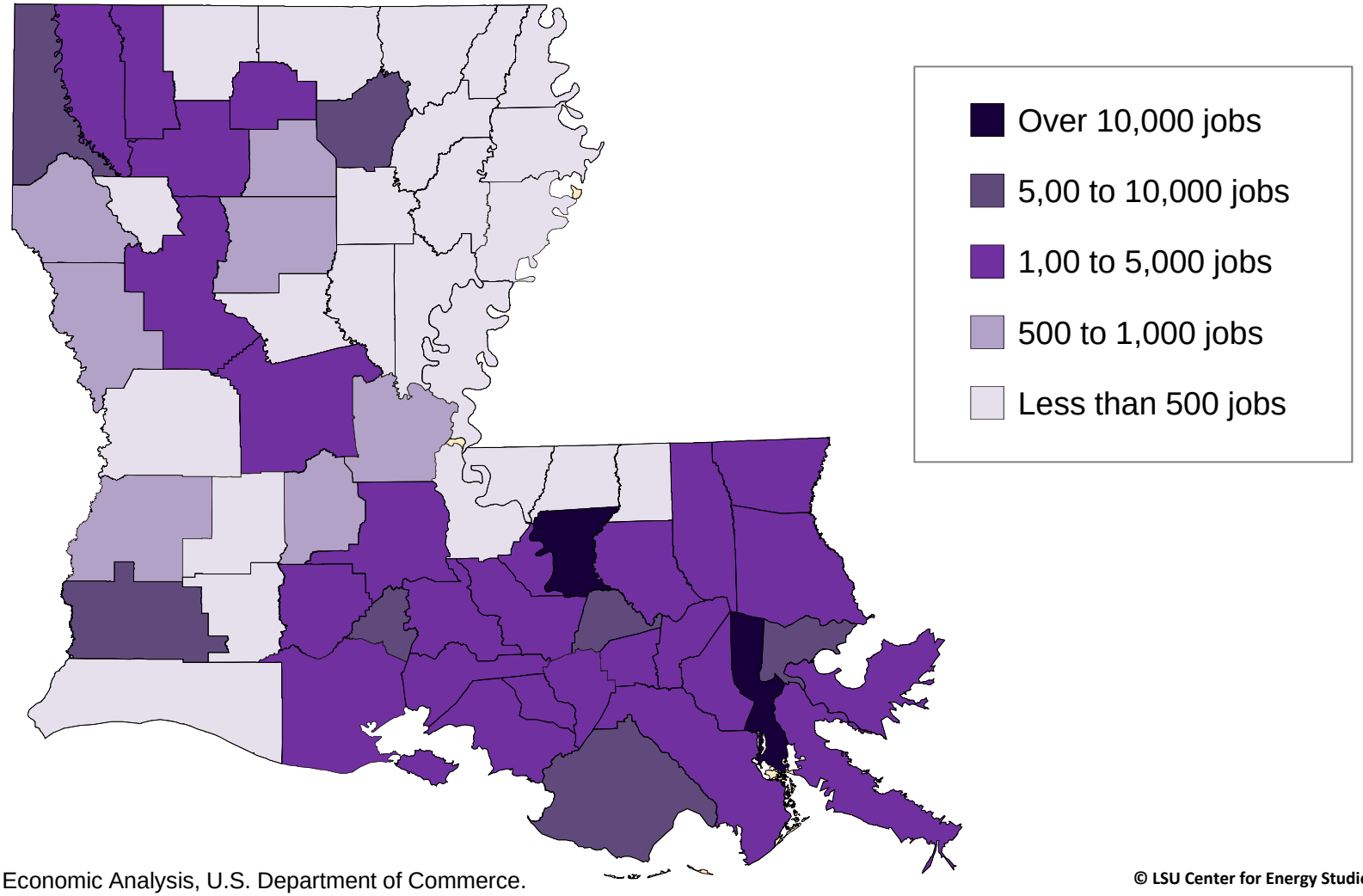
Ten parishes account for 54 percent of Louisiana's manufacturing jobs.



Source: Bureau of Economic Analysis, U.S. Department of Commerce.

Manufacturing Employment (2010) by Parish (All Sectors)

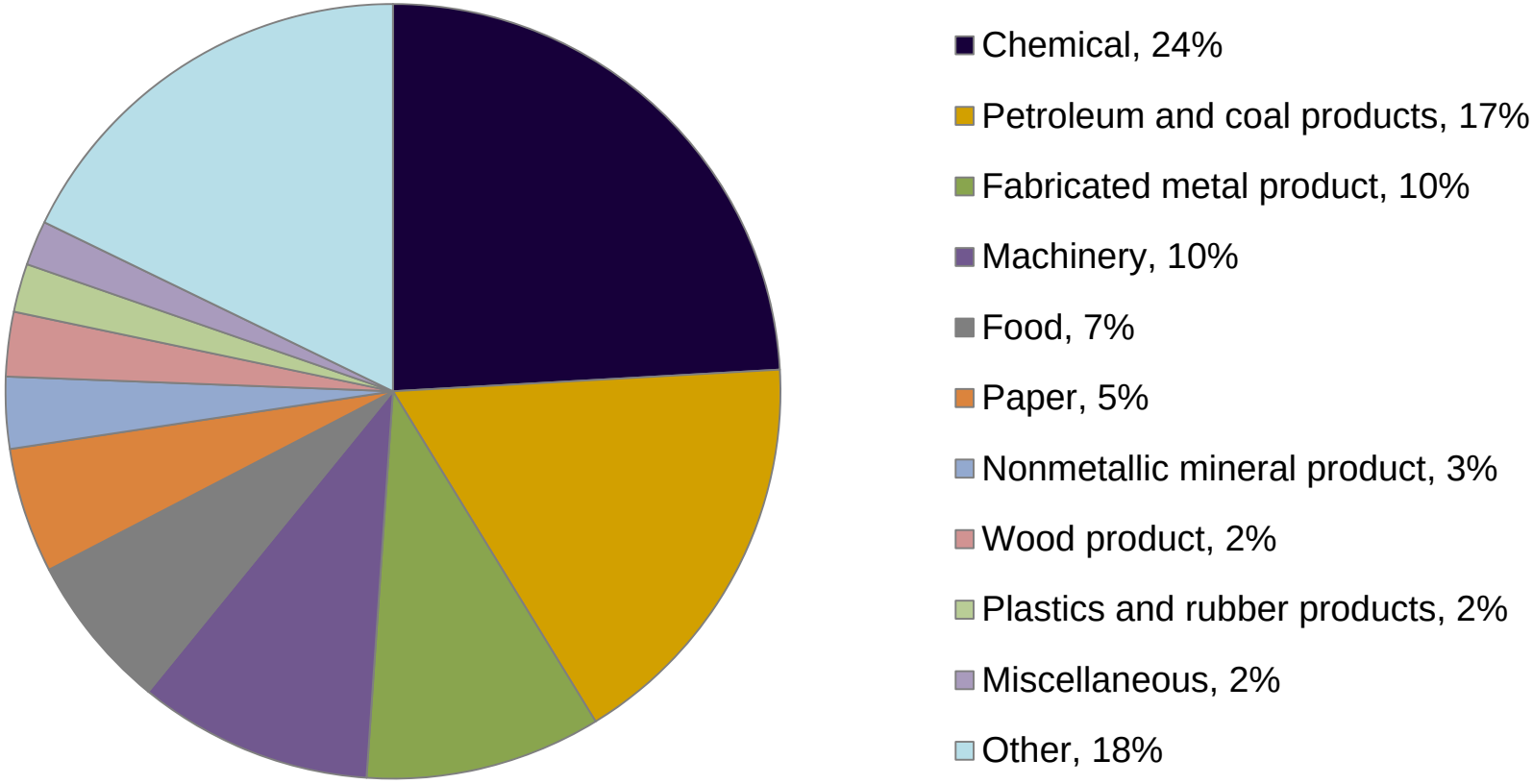
The majority of manufacturing jobs are located in the southern portion of the state.



Source: Bureau of Economic Analysis, U.S. Department of Commerce.

Manufacturing Wages (2011) by Sector and Total State

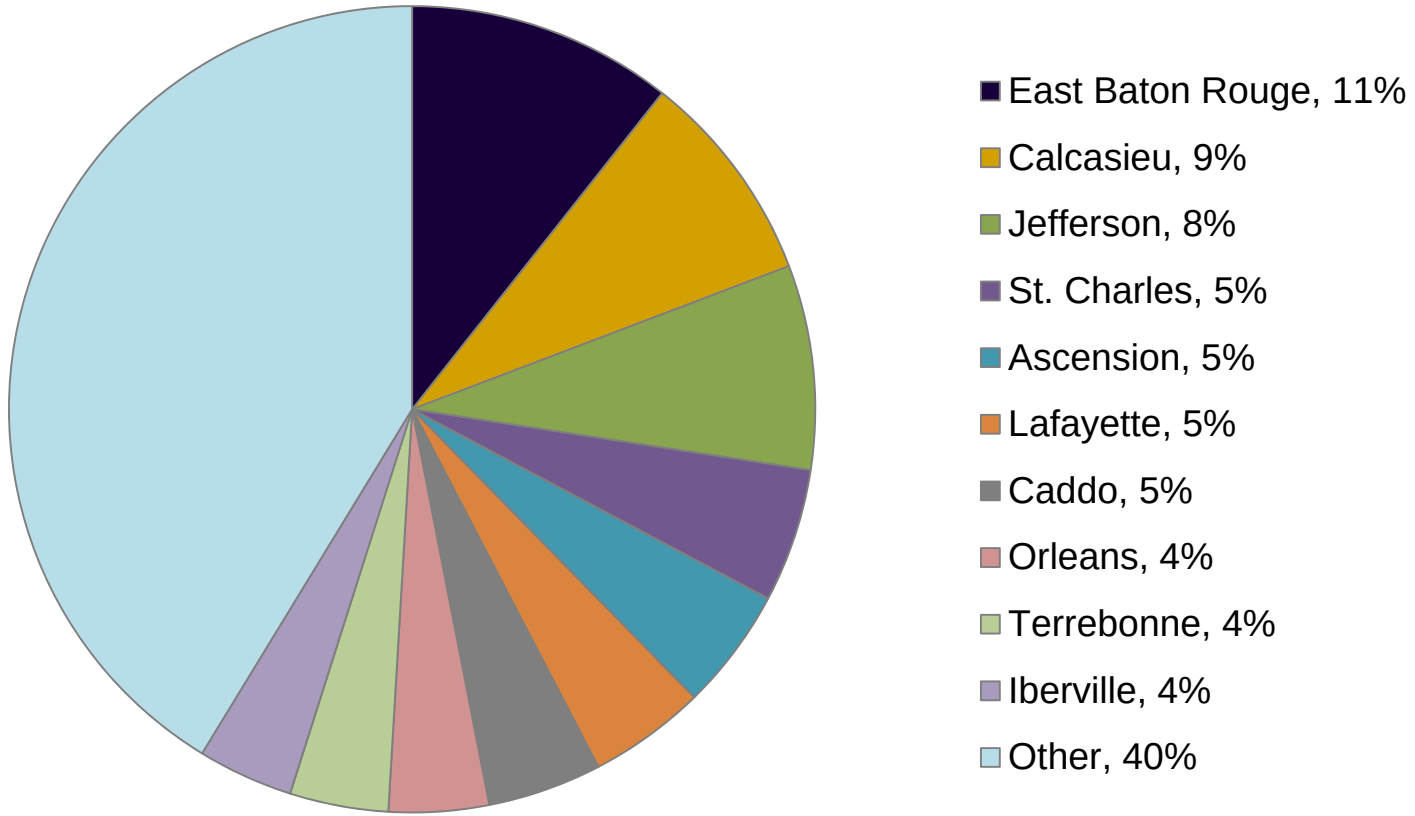
Manufacturing sector wages in Louisiana totaled $12.1 billion in 2011. The top five categories account for 68 percent of manufacturing wages.



Source: Bureau of Economic Analysis, U.S. Department of Commerce.

Manufacturing Wages (2010) by Parish (All Sectors)

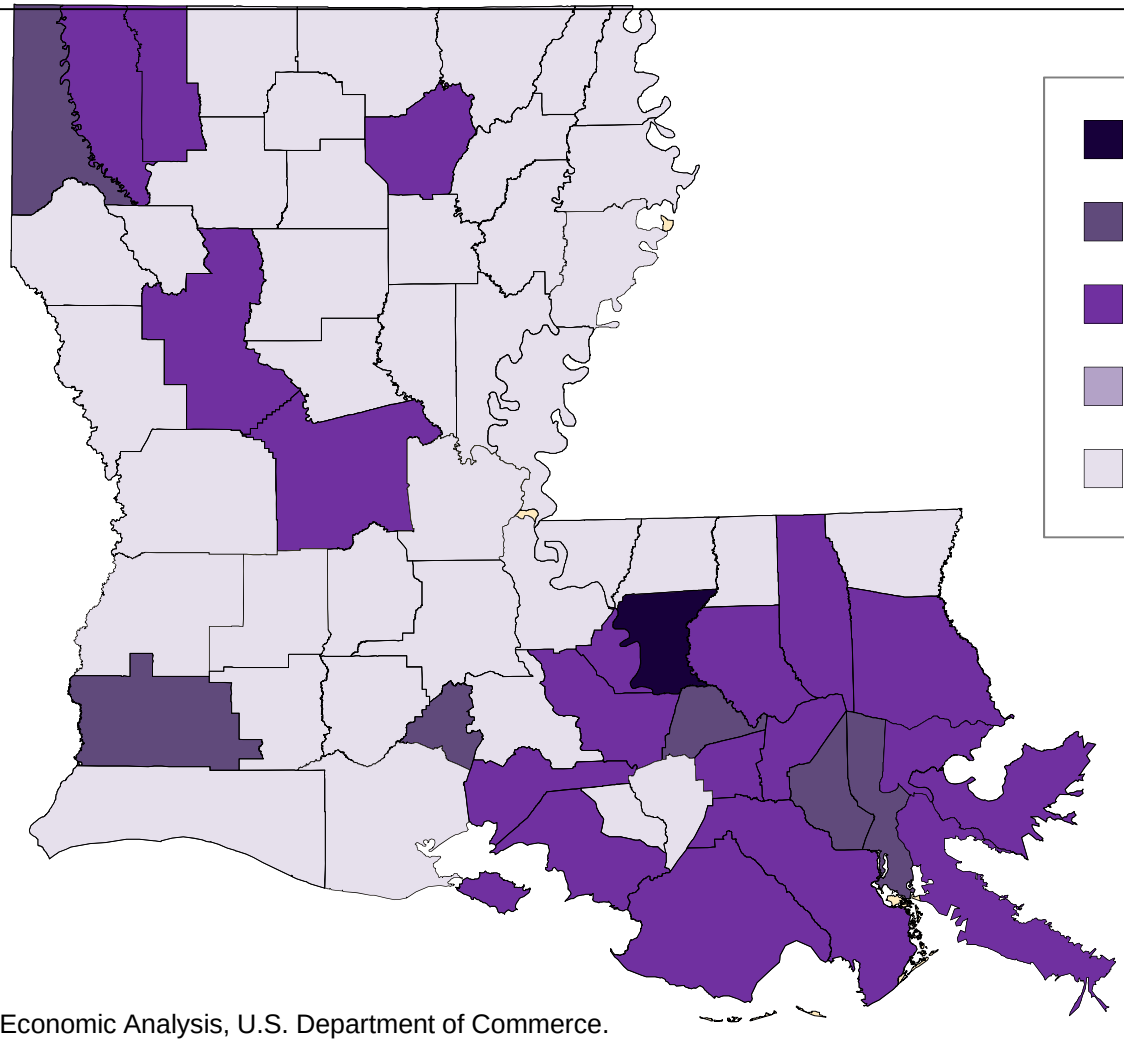
Ten parishes account for 38 percent of Louisiana's manufacturing wages.



Source: Bureau of Economic Analysis, U.S. Department of Commerce.

Manufacturing Wages (2010) by Parish (All Sectors)

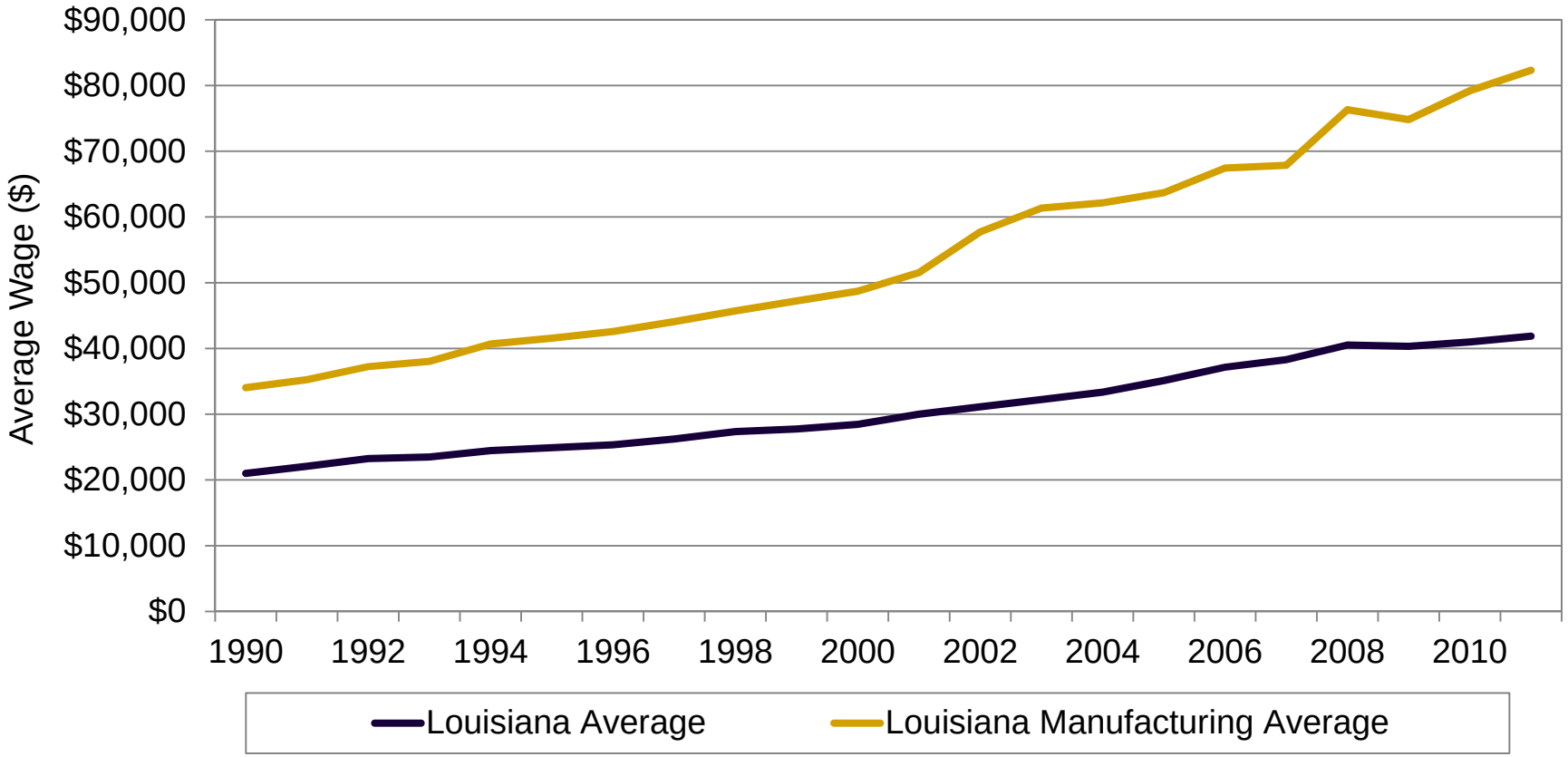
The majority of manufacturing wages, like jobs, are located in the southern portion of the state.



Source: Bureau of Economic Analysis, U.S. Department of Commerce.

Average Wage Comparison, Manufacturing versus State Average

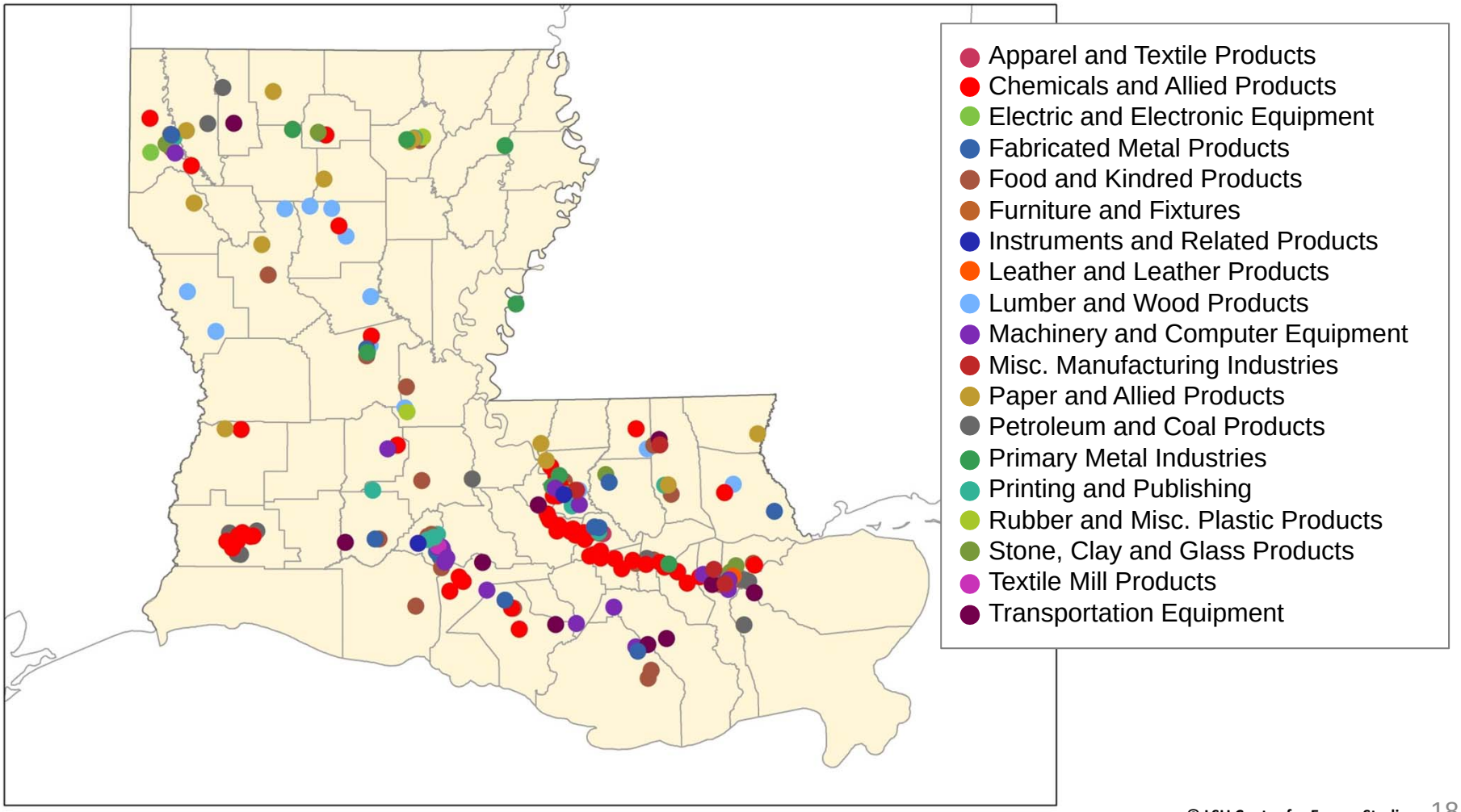
Average manufacturing wages in Louisiana are significantly higher than the average state wage. In 2011, the average manufacturing wage was double that of the average state wage. Manufacturing wages have also increased at a faster rate, an average annual rate of 4.3 percent (compared to the state average of 3.4 percent)



Source: Bureau of Economic Analysis, U.S. Department of Commerce.

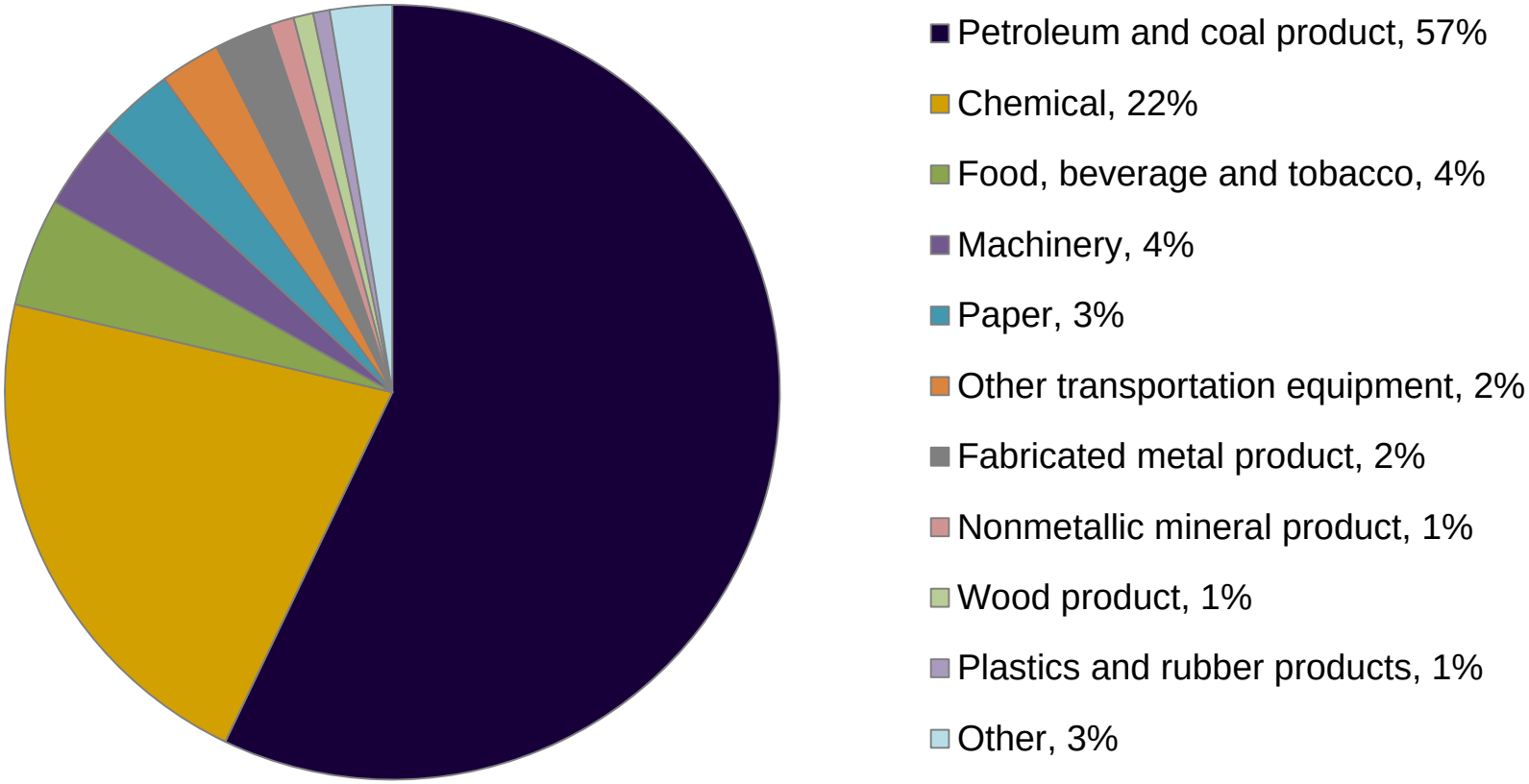
Location of Major Facilities

The majority of manufacturing facilities are located in the southern portion of the state.



GDP (2010) by Sector and Share of Louisiana Total

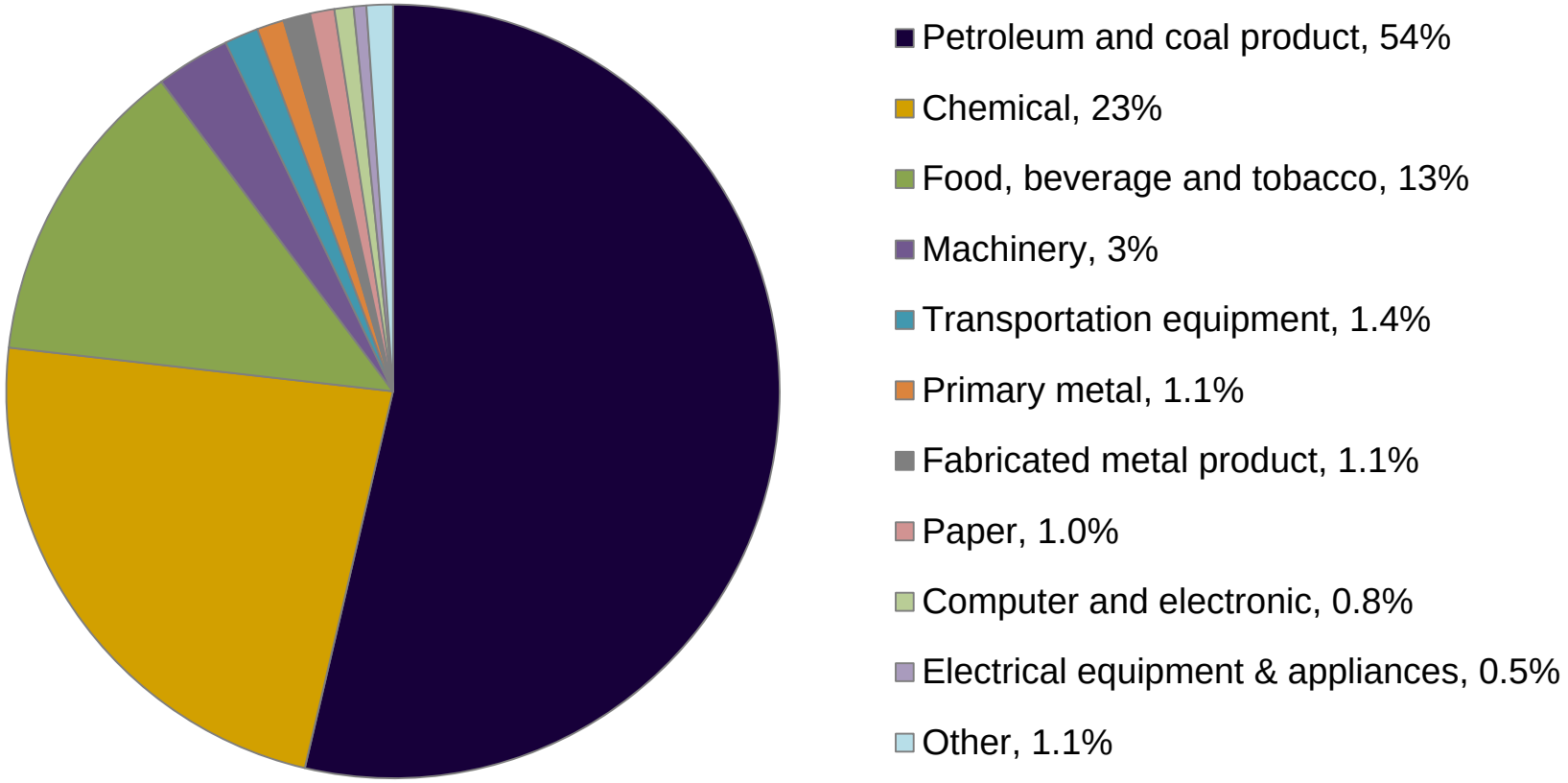
The petroleum products and chemical manufacturing sectors account for over 75 percent of Louisiana's manufacturing GDP. As a whole, manufacturing accounts for 25 percent of Louisiana's state GDP.



Source: Bureau of Economic Analysis, U.S. Department of Commerce.

Louisiana Manufacturing Exports (2011)

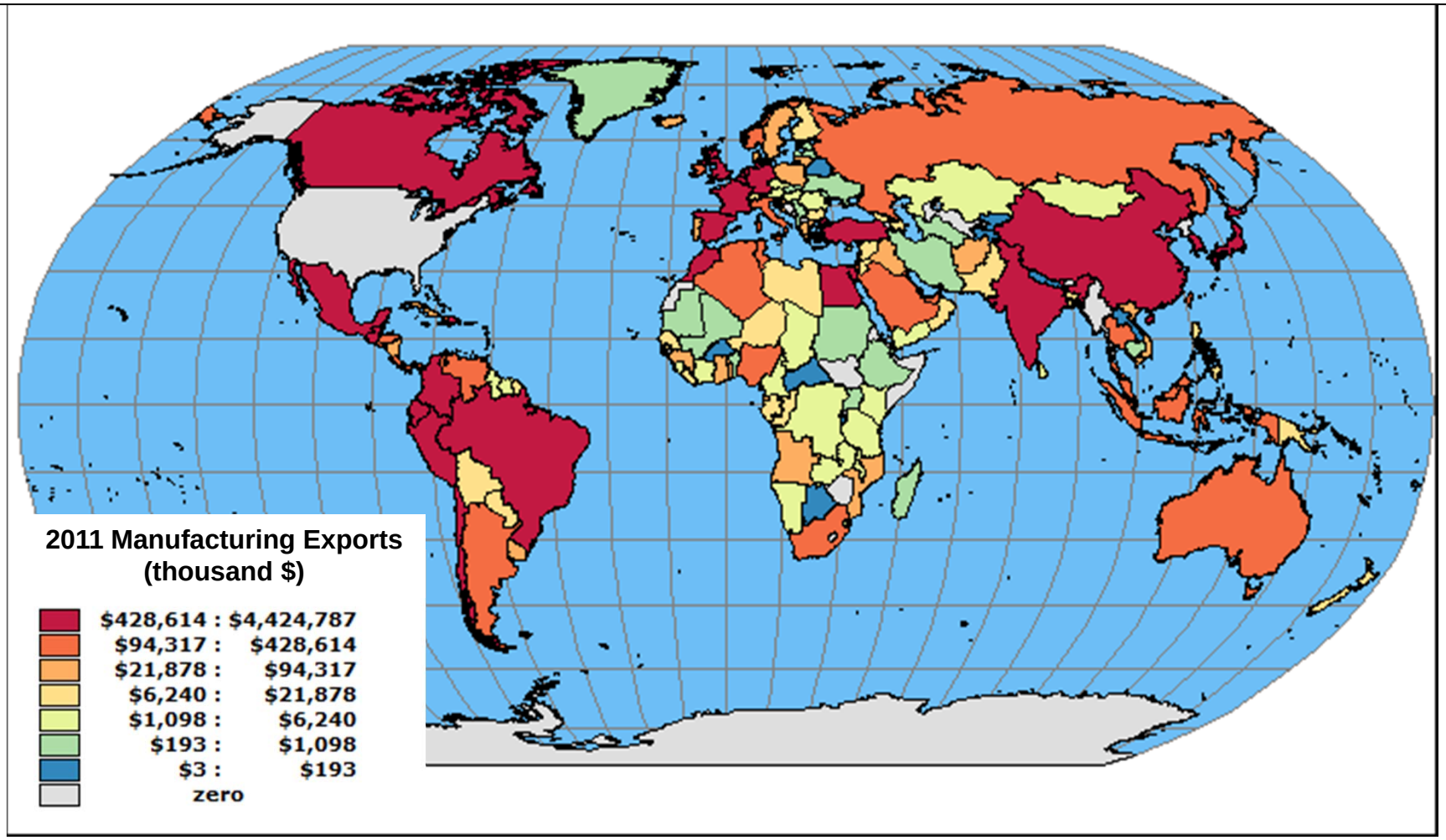
In 2011, Louisiana exports were valued at $54.9 billion, or 22 percent of Louisiana GDP. Manufactured products accounted for 64 percent of the value. Petroleum and coal product and chemicals account for 77 percent of manufactured exports.



Source: International Trade Administration, U.S. Department of Commerce.

Louisiana Manufacturing Exports

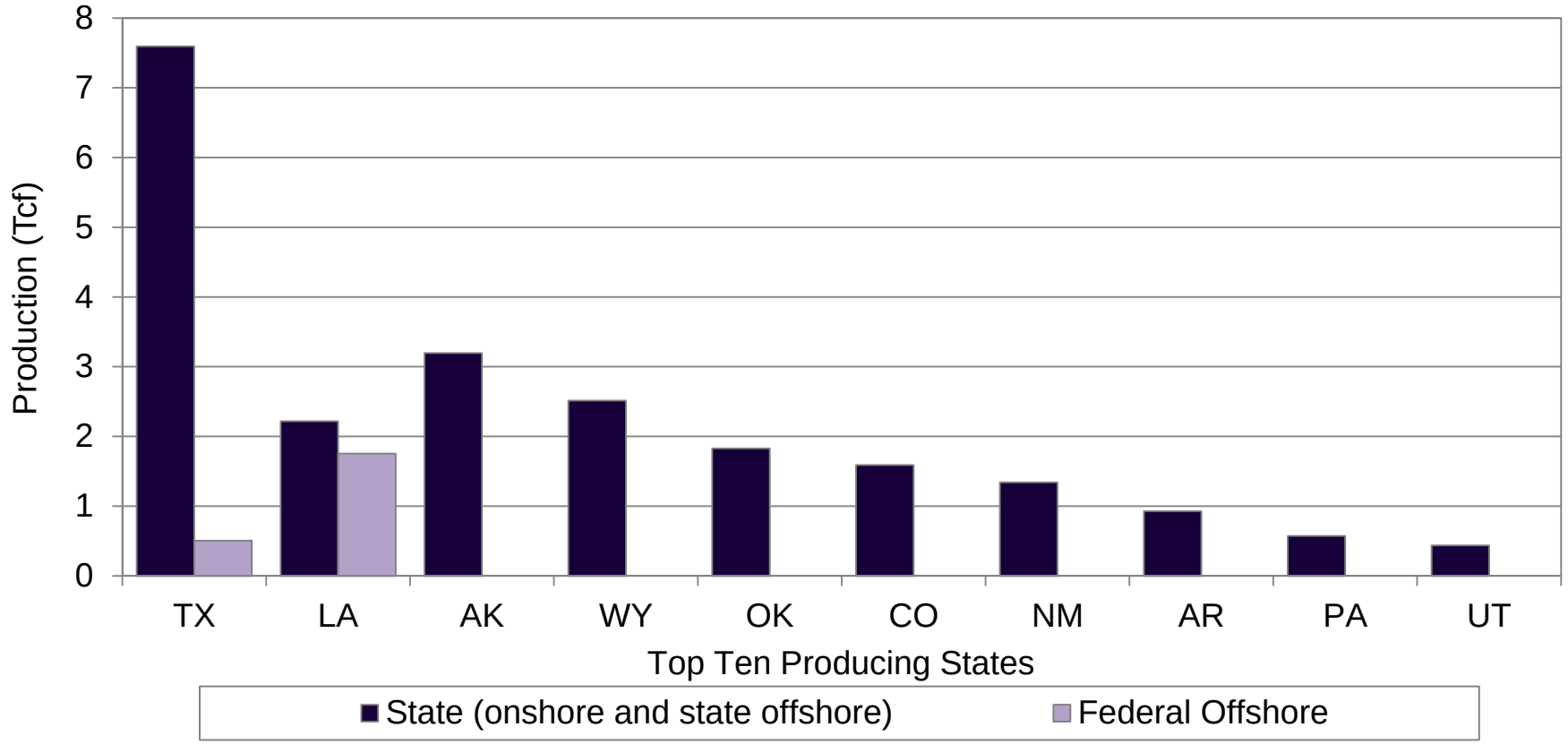
Louisiana manufacturing exports to many regions around the world, most notably to Canada, Mexico, South America, Europe and Asia.



Source: International Trade Administration, U.S. Department of Commerce.

Natural Gas Production in the U.S., 2010

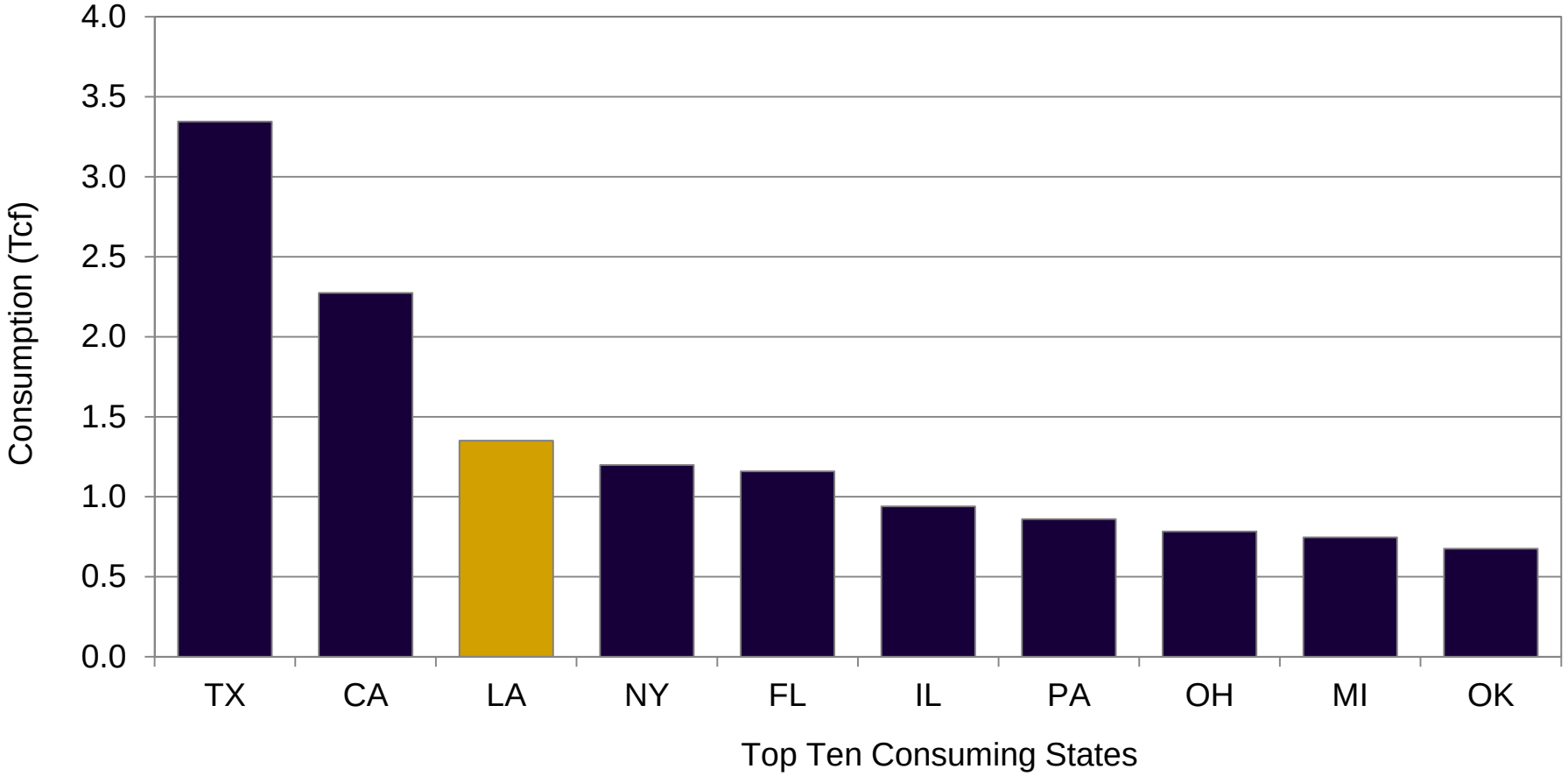
Louisiana is the second largest producer of natural gas in the U.S. and has been historically because of its prolific offshore natural gas reserves. Today, those offshore reserve are supplemented with new onshore unconventional resources produced primarily in North Louisiana.



Source: Energy Information Administration, U.S. Department of Energy.

Natural Gas Consumption in the U.S., 2010

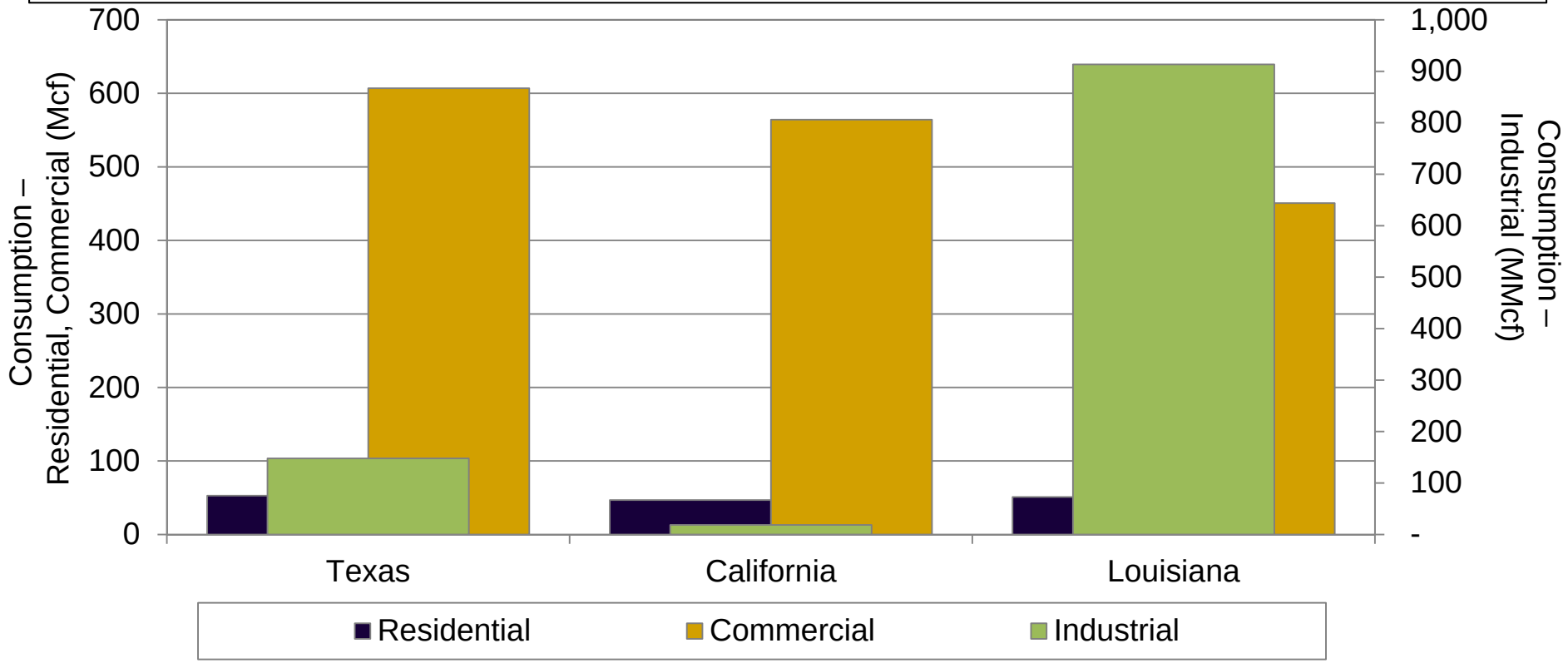
Equally important is the fact that Louisiana is the third largest consumer of natural gas in the U.S. This ranking is entirely a function of the energy-intensive manufacturing located throughout the state.



Source: Energy Information Administration, U.S. Department of Energy.

Per Customer Natural Gas Consumption by Sector, 2010

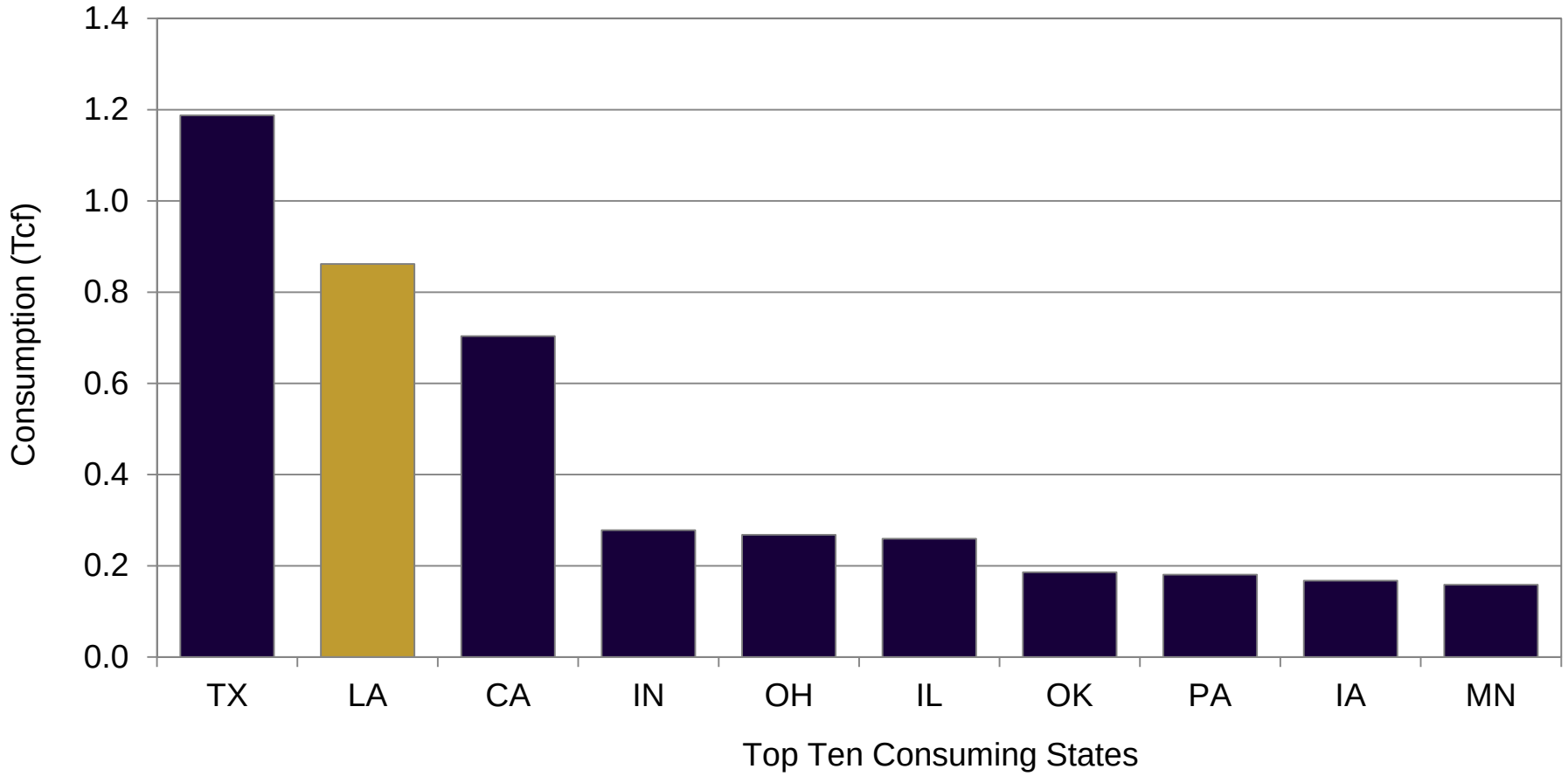
The intensity of Louisiana's energy use is clearly demonstrated by comparing per customer usage levels between the top three natural gas consuming states. Louisiana's residential and commercial use per customer are comparable to the other two states. Louisiana's industrial/manufacturing use per customer is six times higher than Texas and almost 50 times higher than California.



Source: Energy Information Administration, U.S. Department of Energy.

Industrial Natural Gas Consumption, 2010

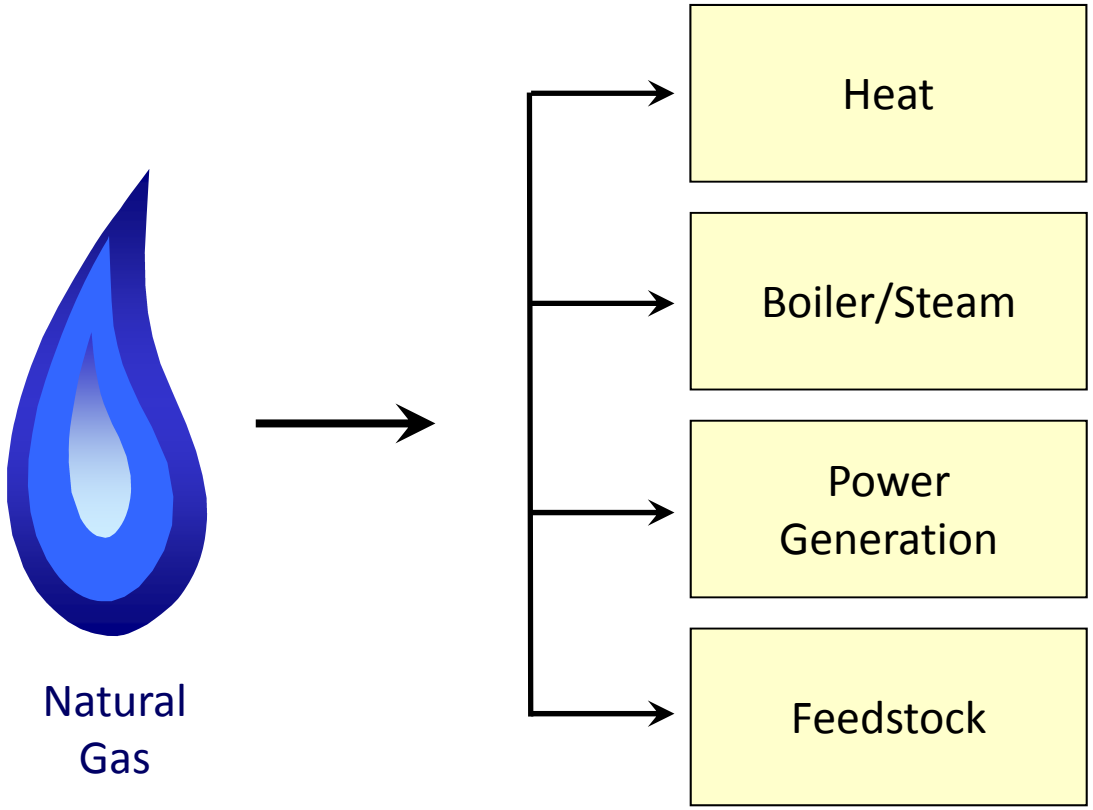
In fact, Louisiana industrial and manufacturing natural gas usage (not total natural gas usage) ranks second among the country's ten largest natural gas industrial users.



Source: Energy Information Administration, U.S. Department of Energy.

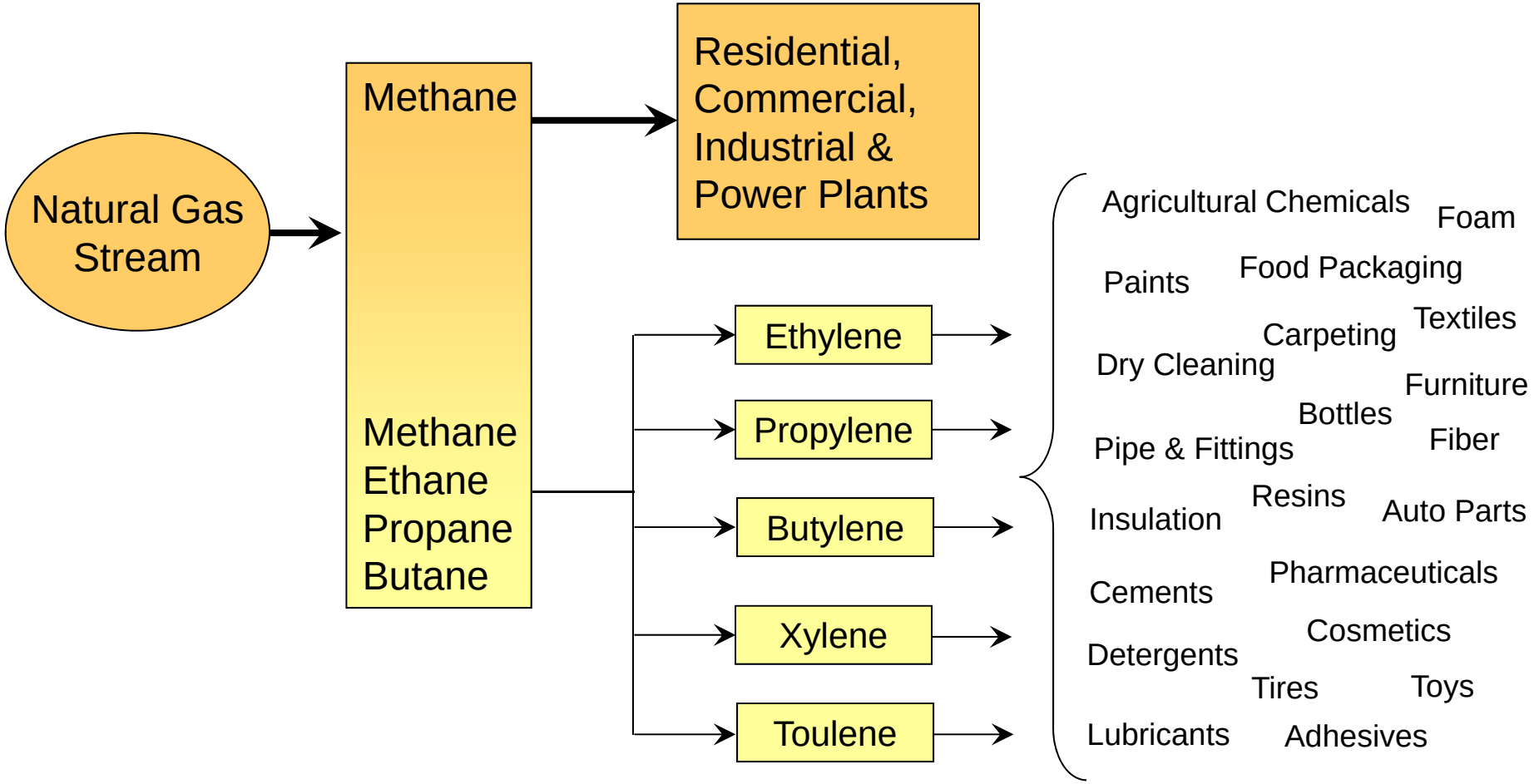
Industrial Natural Gas Usage

Louisiana's chemical industry, in particular, uses natural gas in a range of applications that include the generation of heat, steam, and power. Feedstock uses are equally important and are the building blocks of modern petrochemical manufacturing.



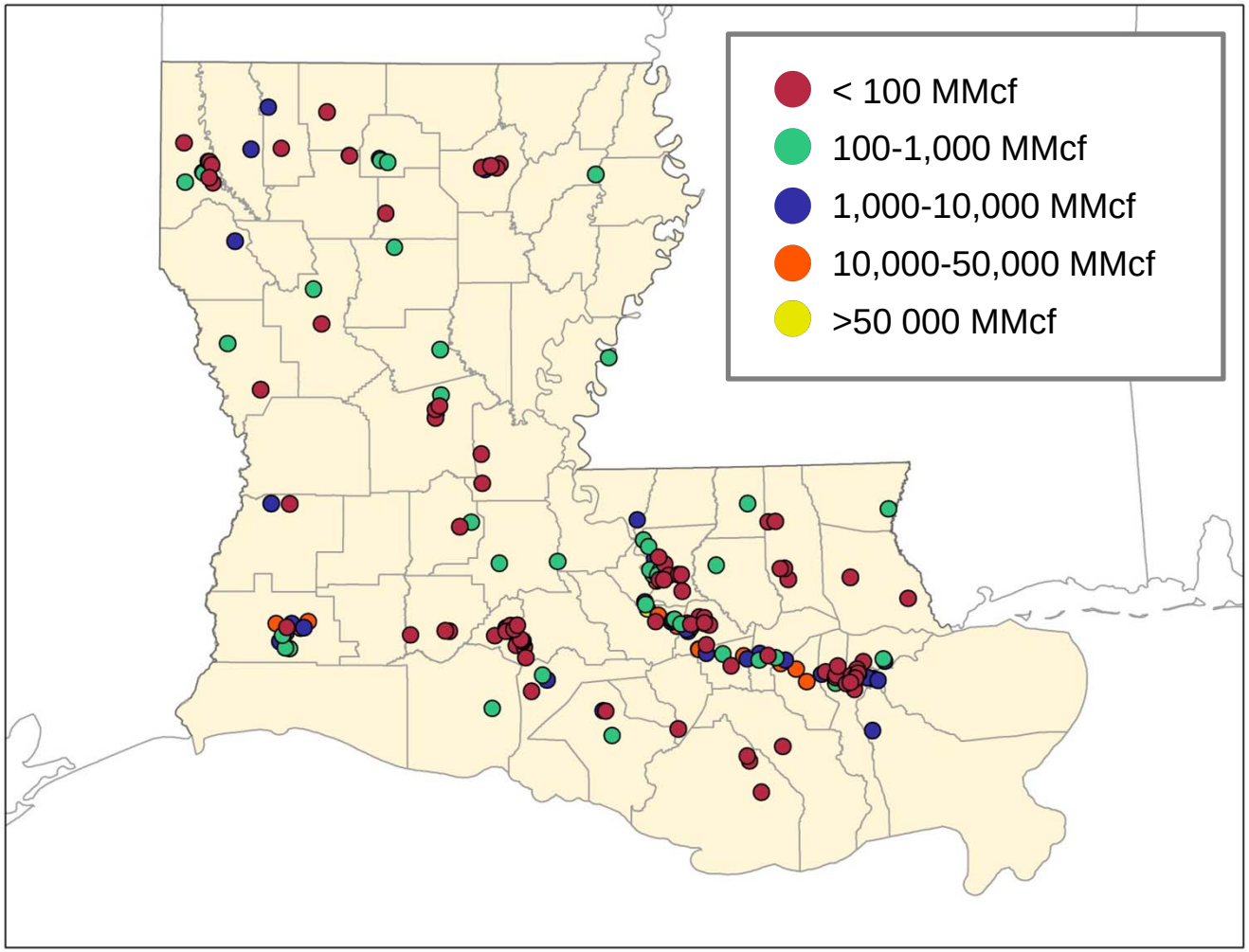
Components of Natural Gas

Natural gas and natural gas liquids, as chemical manufacturing feedstocks, are used to create a variety of products or inputs used to create a variety of products.



Louisiana Industrial Natural Gas Users

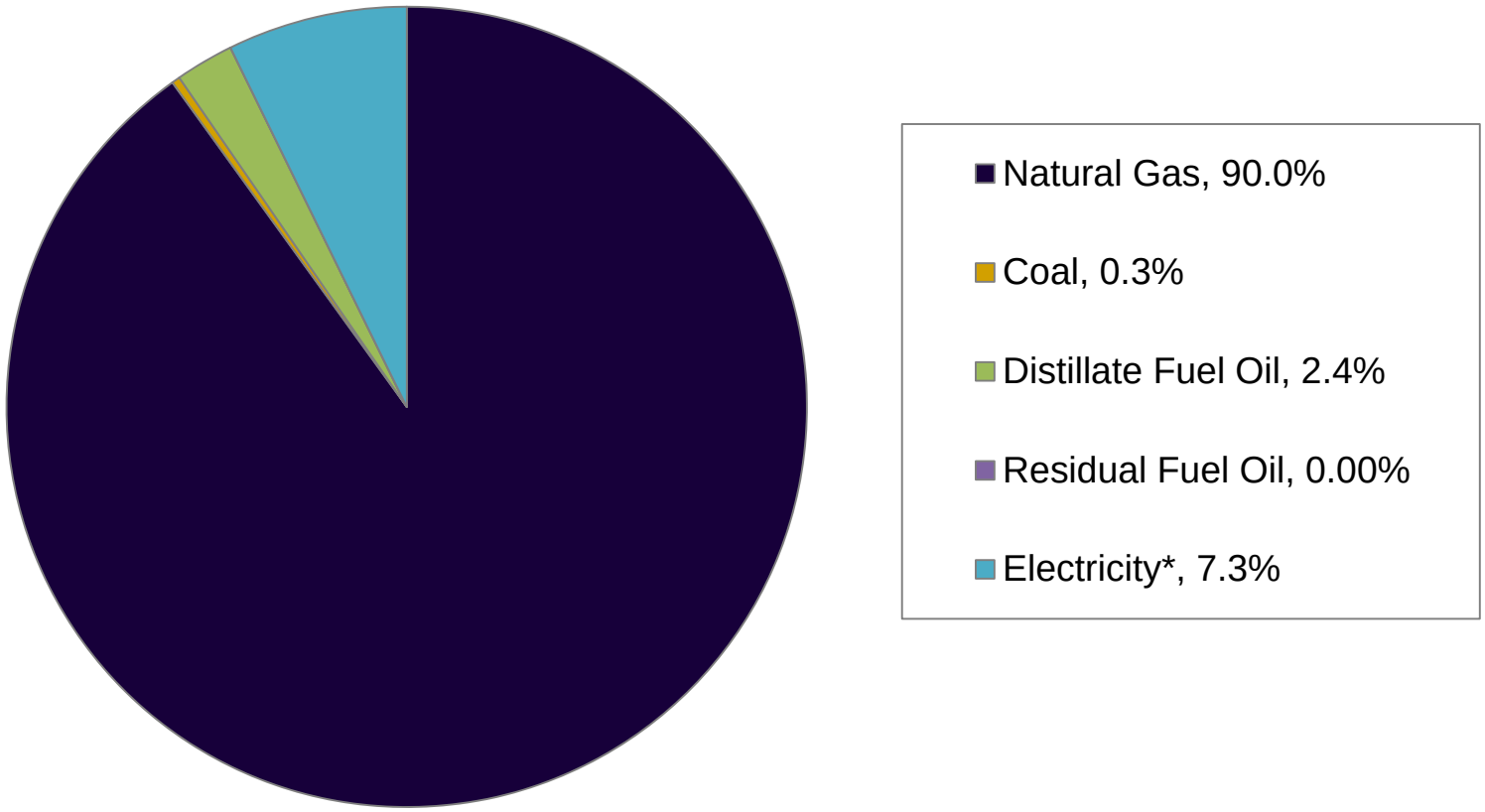
Louisiana's natural gas-intensive industries are located throughout the state.



Source: Major Industrial Plant Database, IHS Energy.

Importance of Natural Gas for Louisiana Manufacturing

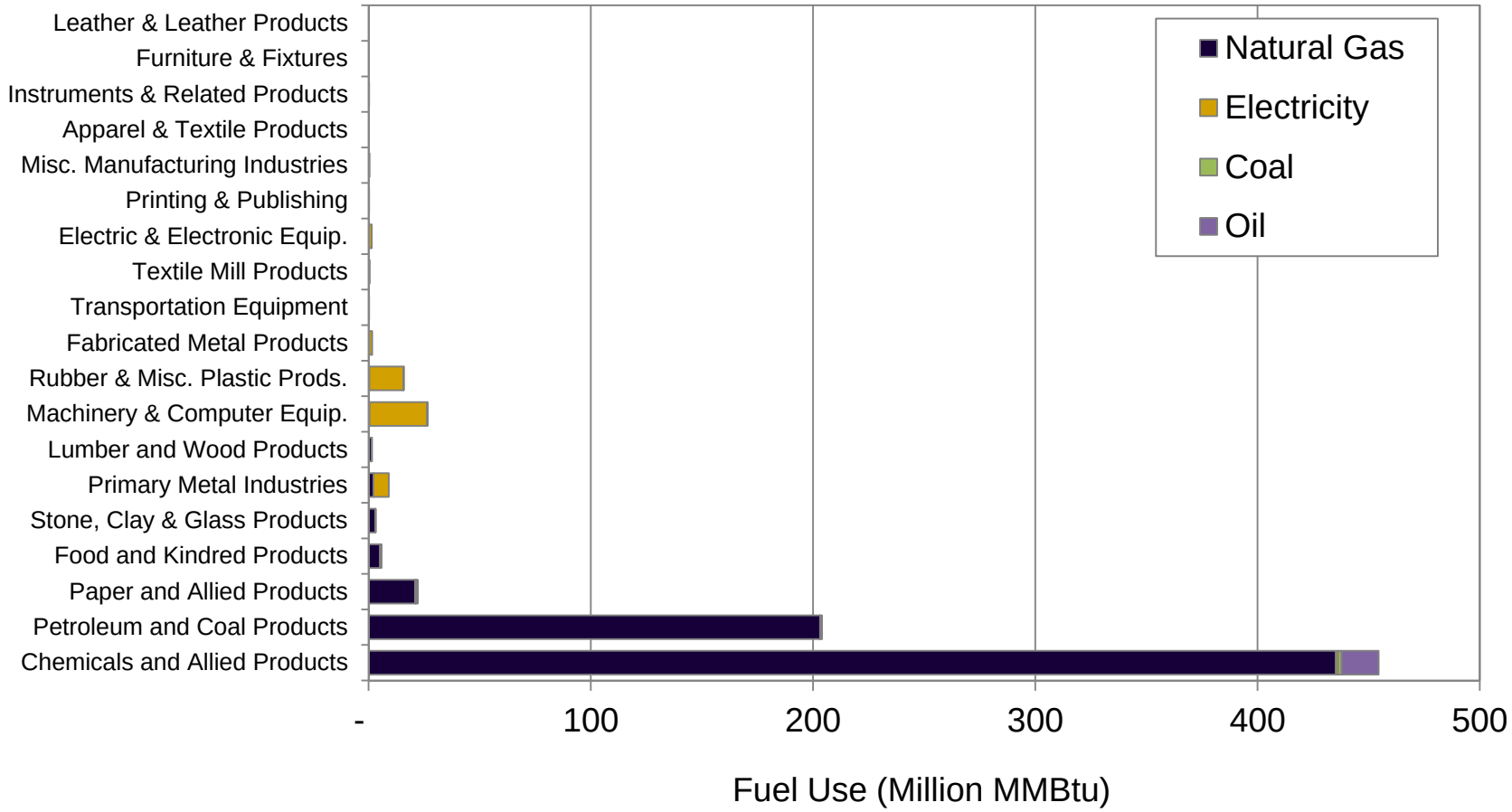
Natural gas is the primary fuel used by Louisiana manufacturing.



Note: *Electricity does not include power generated on-site. Electricity is converted to MMBtu using a conversion factor of 3.412 Btu/kWh.
Source: Major Industrial Plant Database, IHS Energy.

Manufacturing Energy Use by Sector

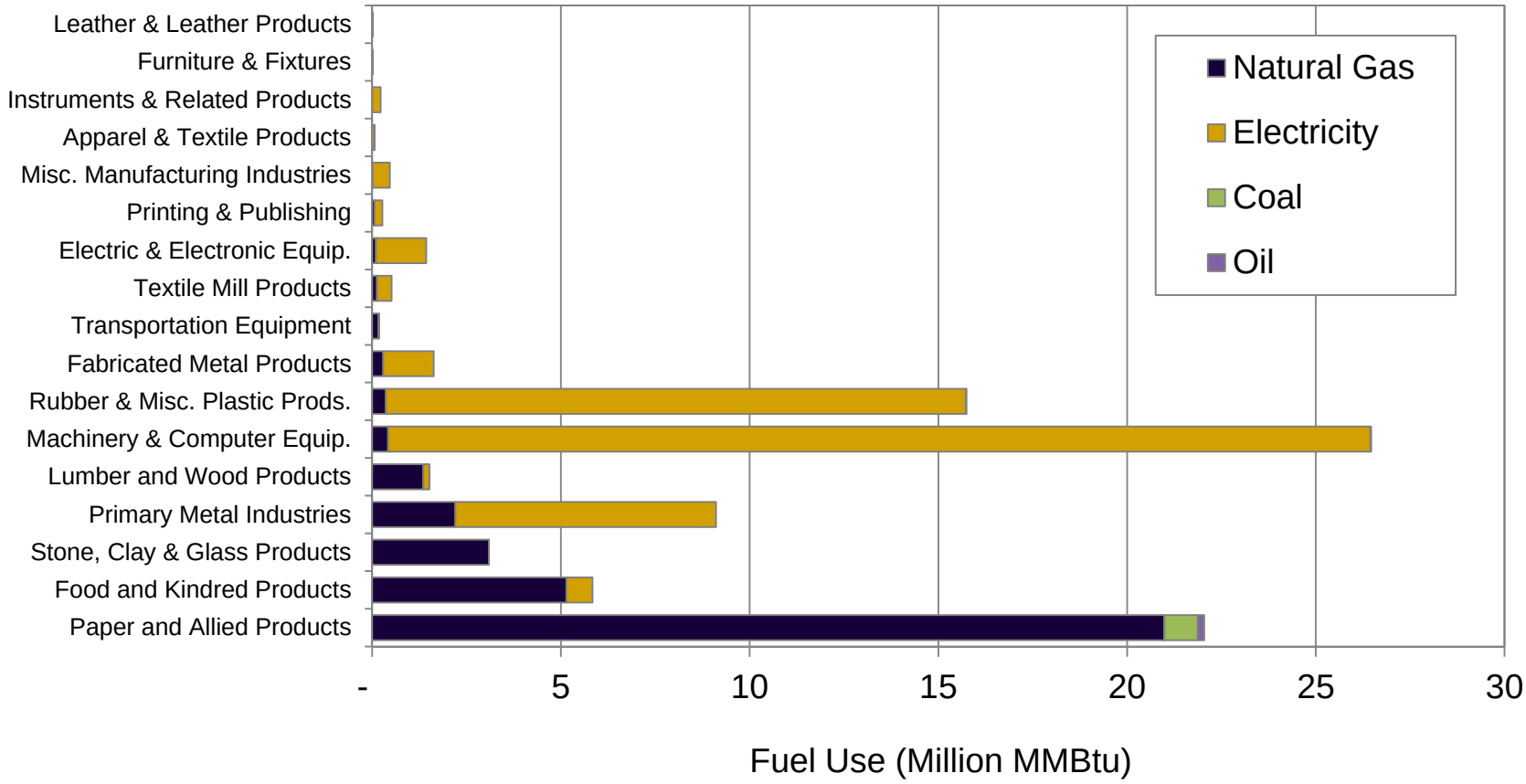
Chemicals and allied products accounts for 68 percent of the fuel used by Louisiana manufacturing. Petroleum and coal products accounts for almost 30 percent. Together, these sectors account for 98 percent of manufacturing fuel use.



Note: *Electricity does not include power generated on-site. Electricity is converted to MMBtu using a conversion factor of 3.412 Btu/kWh.
Source: Major Industrial Plant Database, IHS Energy.

Manufacturing Energy Use by Sector (without Chemicals and Petroleum Products)

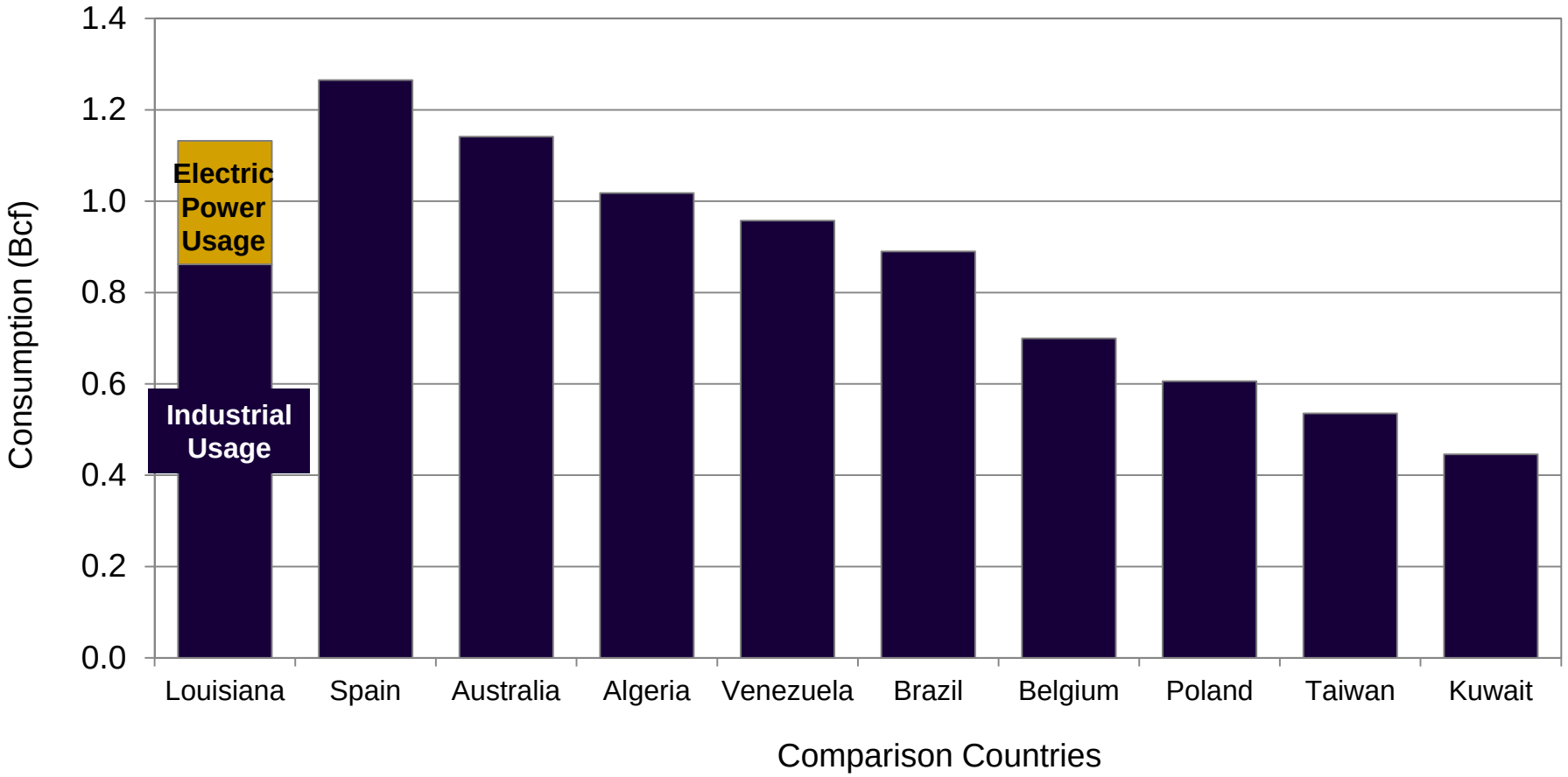
If the two major groups (chemicals and allied products; and petroleum and coal products) are removed from the picture, paper products and food manufacturing are the next largest natural gas consumers.



Note: *Electricity does not include power generated on-site. Electricity is converted to MMBtu using a conversion factor of 3.412 Btu/kWh.
Source: Major Industrial Plant Database, IHS Energy.

Natural Gas Consumption, Louisiana and World Comparison

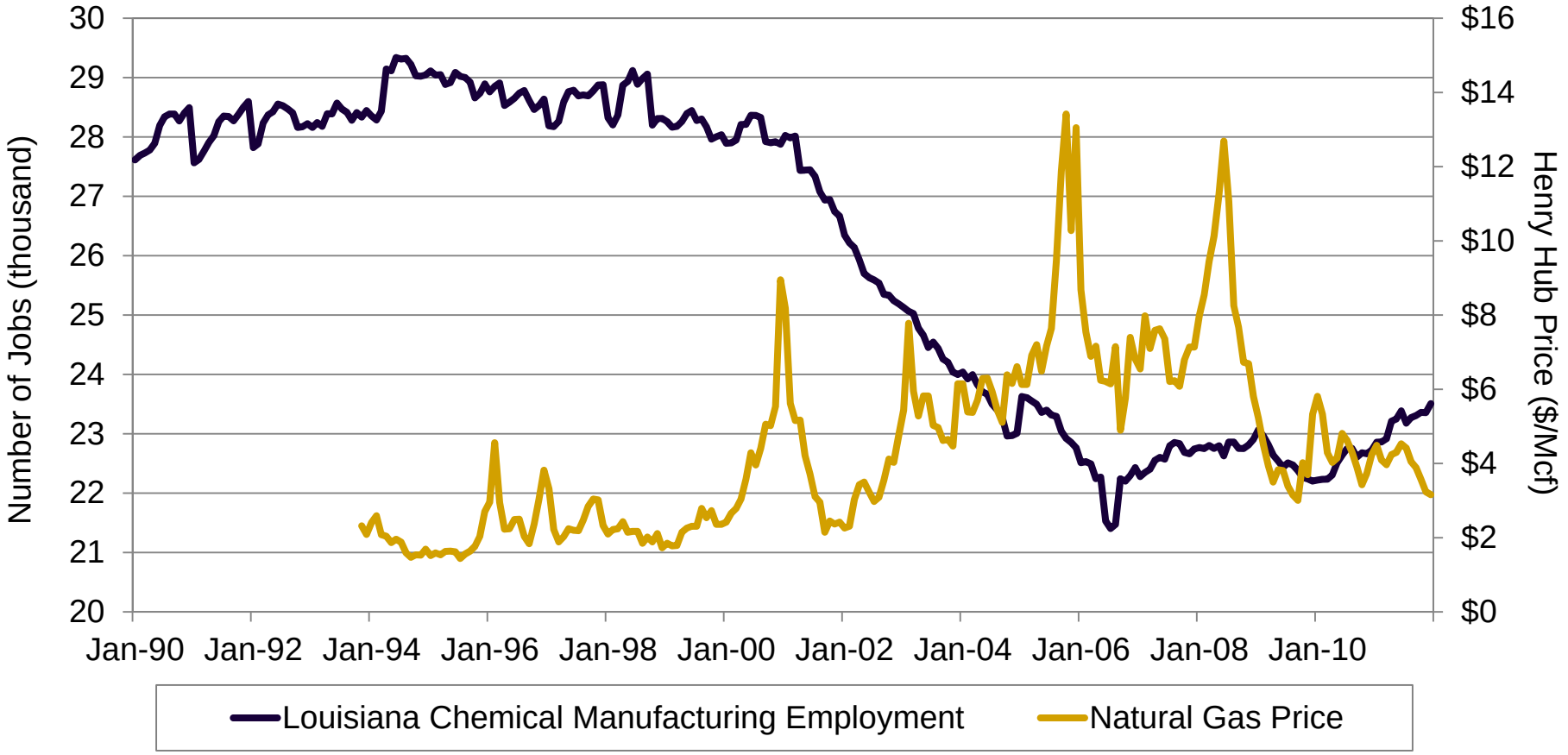
Louisiana's industrial, manufacturing, and power generation use of natural gas is larger than a number of countries.



Source: Energy Information Administration, U.S. Department of Energy.

Louisiana Chemical Industry Employment and Henry Hub Spot Price

Louisiana's chemical industry is particularly sensitive to changes in natural gas prices. As natural gas prices increase, chemical industry employment (and output) tends to decrease.



Source: Bureau of Economic Analysis, U.S. Department of Commerce; and Energy Information Administration, U.S. Department of Energy.

Section 3:
The Impact of Natural Gas Prices on Louisiana Manufacturing

The Impact of the Natural Gas Prices on Louisiana Manufacturing

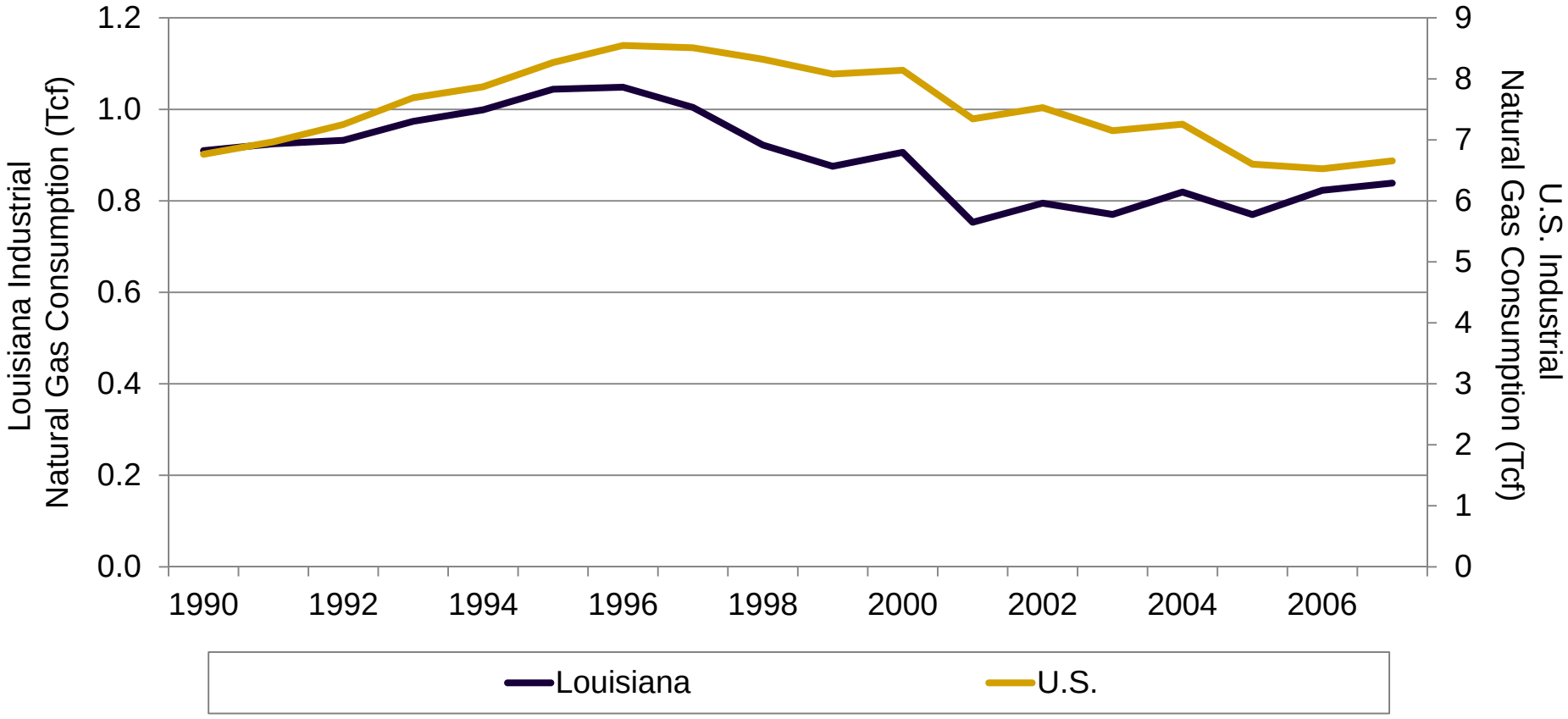
The continued economic success of Louisiana's manufacturing economy rests with the availability of abundant and reliable natural gas supplies. Louisiana's manufacturing industries were exceptionally hard-hit by the natural gas price increases that began in the winter of 2000-2001 and continued until the beginning of the most recent economic recession.

These natural gas price increases were the product of a mismatch between supply and demand with origins dating back to the 1990s. During that time, energy prices were low, and the number of rigs searching for new natural gas supplies fell to record lows. Concurrently, the demand for clean-burning and flexible natural gas for power generation increased dramatically. Lower natural gas supplies and higher demand resulted in increased prices that began in 2000, and escalated considerably in the aftermath of the 2004 and 2005 tropical seasons when offshore supplies were disrupted.

The outlook for manufacturing industry growth during this period was bleak with many companies exploring offshoring opportunities given the global uncompetitiveness of their U.S. operations created in large part by high-cost natural gas.

Natural Gas Demand Impacts: Industrial Demand Destruction

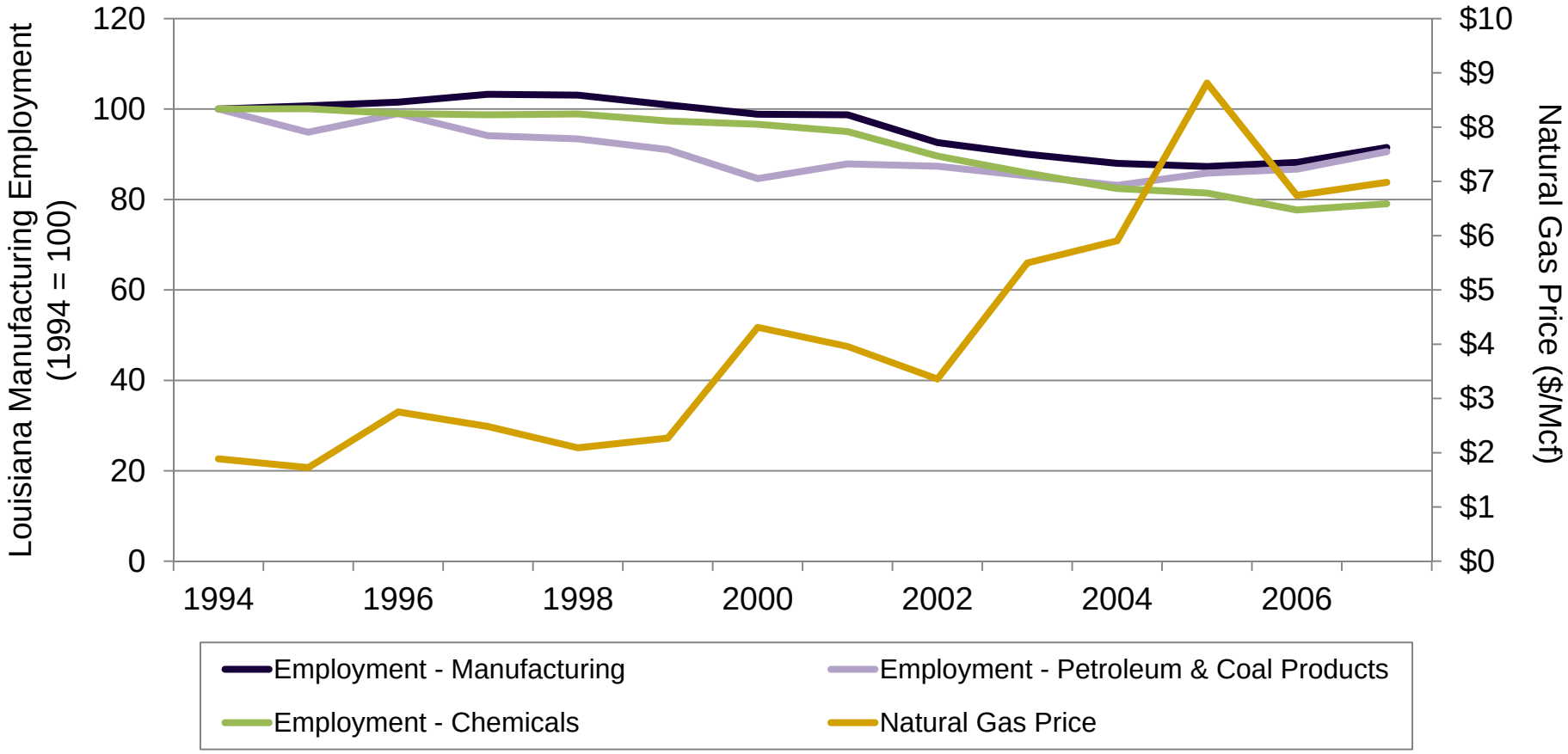
Increasing and volatile natural gas prices led to reduced industrial natural gas consumption in both Louisiana and the U.S. This reduction in usage is another measure of industry contraction during this period.



Source: Energy Information Administration, U.S. Department of Energy.

Louisiana Manufacturing Employment and Natural Gas Spot Price

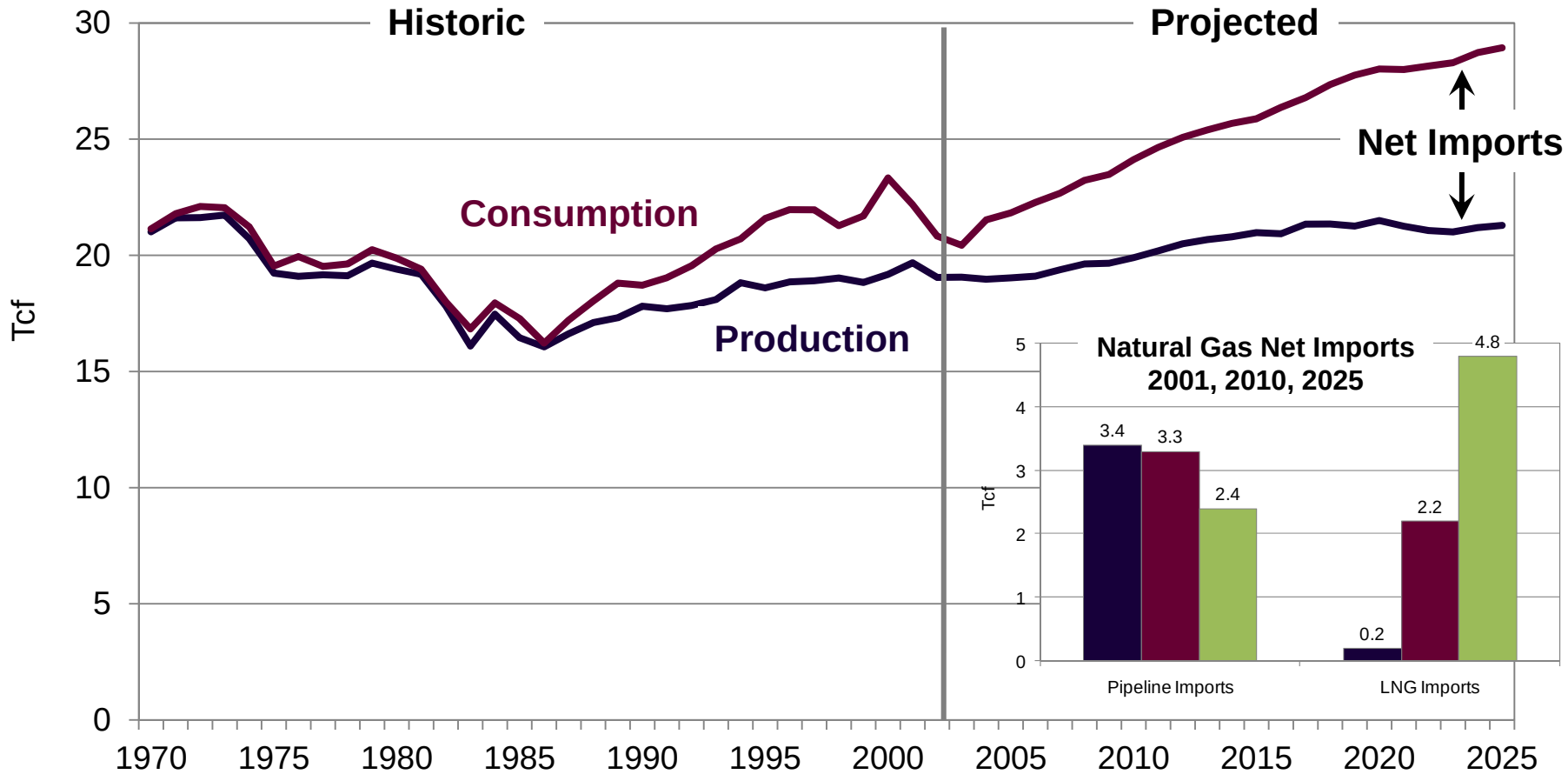
Natural gas price increases helped lead to Louisiana's manufacturing sector contractions. In fact, 2007, chemical industry employment was 60 percent of its 1998 peak. Refining employment made slight rebounds given post-Katrina refinery constraints.



Source: Bureau of Economic Analysis, U.S. Department of Commerce; and Intercontinental Exchange.

Policy Response: Forecasted Natural Gas Imports (LNG)

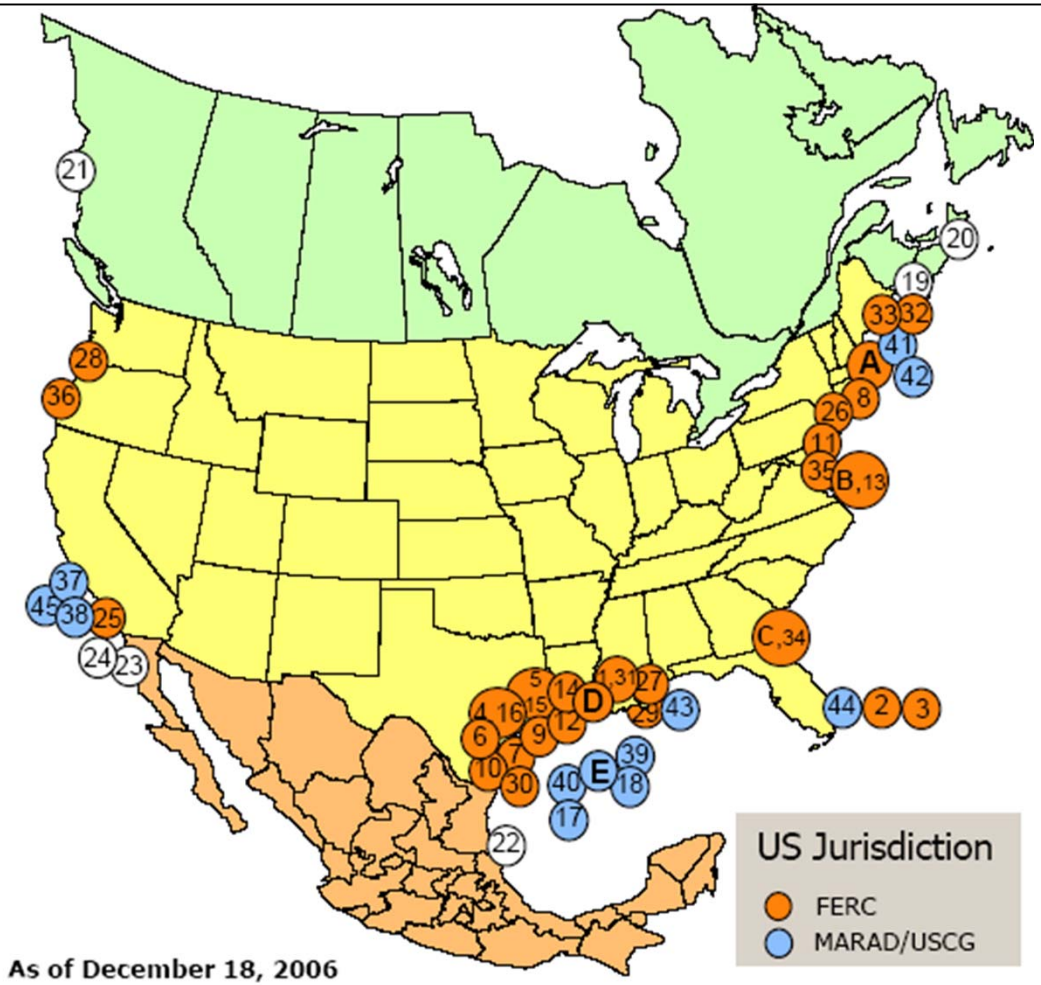
By 2004 LNG was expected to be an important component of natural gas supply.



Source: Energy Information Administration, U.S. Department of Energy.

Policy Response: Forecasted Natural Gas Imports (LNG)

At the end of 2006, there were 45 proposed LNG import projects in North America.

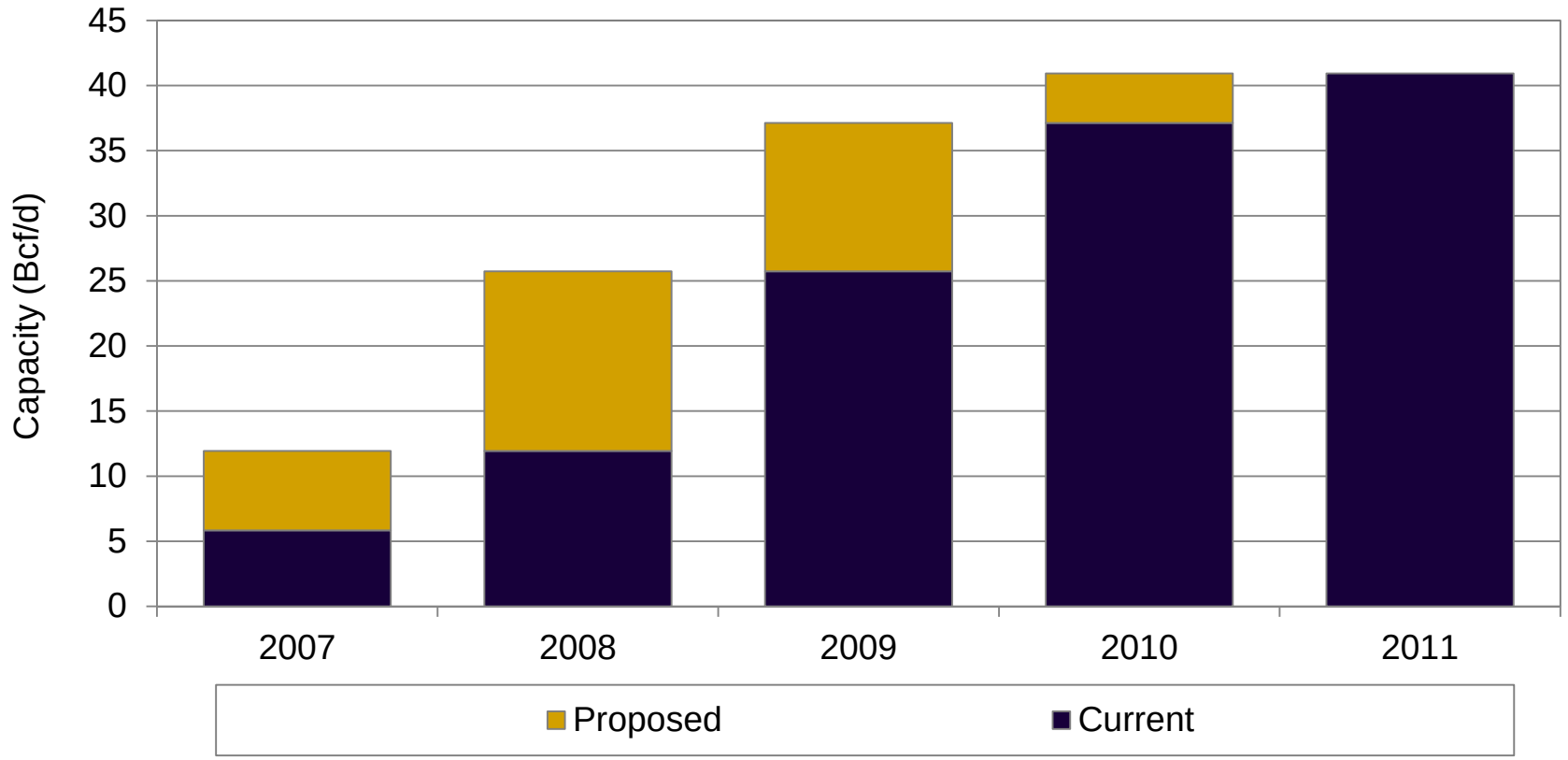


CONSTRUCTED
A. Everett, MA : 1.035 Bcfd (SUEZ/Tractebel - DOMAC)
B. Cove Point, MD : 1.0 Bcfd (Dominion - Cove Point LNG)
C. Elba Island, GA : 1.2 Bcfd (El Paso - Southern LNG)
D. Lake Charles, LA : 2.1 Bcfd (Southern Union - Trunkline LNG)
E. Gulf of Mexico: 0.5 Bcfd (Gulf Gateway Energy Bridge - Excelerate Energy)
APPROVED BY FERC
1. Hackberry, LA : 1.5 Bcfd (Cameron LNG - Sempra Energy)
2. Bahamas : 0.84 Bcfd (AES Ocean Express)*
3. Bahamas : 0.83 Bcfd (Calypso Tractebel)*
4. Freeport, TX : 1.5 Bcfd (Cheniere/Freeport LNG Dev.)
5. Sabine, LA : 2.6 Bcfd (Sabine Pass Cheniere LNG)
6. Corpus Christi, TX: 2.6 Bcfd (Cheniere LNG)
7. Corpus Christi, TX : 1.1 Bcfd (Vista Del Sol - ExxonMobil)
8. Fall River, MA : 0.8 Bcfd (Weaver's Cove Energy/Hess LNG)
9. Sabine, TX : 2.0 Bcfd (Golden Pass - ExxonMobil)
10. Corpus Christi, TX: 1.0 Bcfd (Ingleside Energy - Occidental Energy Ventures)
11. Logan Township, NJ : 1.2 Bcfd (Crown Landing LNG - BP)
12. Port Arthur, TX: 3.0 Bcfd (Sempra)
13. Cove Point, MD : 0.8 Bcfd (Dominion)
14. Cameron, LA: 3.3 Bcfd (Creole Trail LNG - Cheniere LNG)
15. Sabine, LA: 1.4 Bcfd (Sabine Pass Cheniere LNG - Expansion)
16. Freeport, TX: 2.5 Bcfd (Cheniere/Freeport LNG Dev. - Expansion)
APPROVED BY MARAD/COAST GUARD
17. Port Pelican: 1.6 Bcfd (Chevron Texaco)
18. Louisiana Offshore : 1.0 Bcfd (Gulf Landing - Shell)
CANADIAN APPROVED TERMINALS
19. St. John, NB : 1.0 Bcfd (Canaport - Irving Oil/Repsol)
20. Point Tupper, NS 1.0 Bcfd (Bear Head LNG - Anadarko)
21. Kitimat, BC: 1.0 Bcfd (Kitimat LNG - Galveston LNG)
MEXICAN APPROVED TERMINALS
22. Altamira, Tamulipas : 0.7 Bcfd (Shell/Total/Mitsui)
23. Baja California, MX : 1.0 Bcfd (Energy Costa Azul - Sempra)
24. Baja California - Offshore : 1.4 Bcfd (Chevron Texaco)
PROPOSED TO FERC
25. Long Beach, CA : 0.7 Bcfd, (Mitsubishi/ConocoPhillips - Sound Energy Solutions)
26. LI Sound, NY: 1.0 Bcfd (Broadwater Energy - TransCanada/Shell)
27. Pascagoula, MS: 1.5 Bcfd (Gulf LNG Energy LLC)
28. Bradwood, OR: 1.0 Bcfd (Northern Star LNG - Northern Star Natural Gas LLC)
29. Pascagoula, MS: 1.3 Bcfd (Casotte Landing - ChevronTexaco)
30. Port Lavaca, TX: 1.0 Bcfd (Calhoun LNG - Gulf Coast LNG Partners)
31. Hackberry, LA : 1.15 Bcfd (Cameron LNG - Sempra Energy - Expansion)
32. Pleasant Point, ME : 2.0 Bcfd (Quoddy Bay, LLC)
33. Robbinston, ME: 0.5 Bcfd (Downeast LNG - Kestrel Energy)
34. Elba Island, GA: 0.9 Bcfd (El Paso - Southern LNG)
35. Baltimore, MD: 1.5 Bcfd (AES Sparrows Point – AES Corp.)
36. Coos Bay, OR: 1.0 Bcfd (Jordan Cove Energy Project)
PROPOSED TO MARAD/COAST GUARD
37. Offshore California : 1.5 Bcfd (Cabrillo Port - BHP Billiton)
38. Offshore California : 0.5 Bcfd, (Clearwater Port LLC - NorthernStar NG LLC)
39. Offshore Louisiana : 1.0 Bcfd (Main Pass McMoRan Exp.)
40. Gulf of Mexico: 1.5 Bcfd (Beacon Port Clean Energy Terminal - ConocoPhillips)
41. Offshore Boston: 0.4 Bcfd (Neptune LNG - SUEZ LNG)
42. Offshore Boston: 0.8 Bcfd (Northeast Gateway - Excelerate Energy)
43. Gulf of Mexico: 1.4 Bcfd (Bienville Offshore Energy Terminal - TORP)
44. Offshore Florida: ? Bcfd (SUEZ Calypso - SUEZ LNG)
45. Offshore California: 1.2 Bcfd (OceanWay - Woodside Natural Gas)

Source: Federal Energy Regulatory Commission.

Policy Response: Forecasted Natural Gas Imports (LNG)

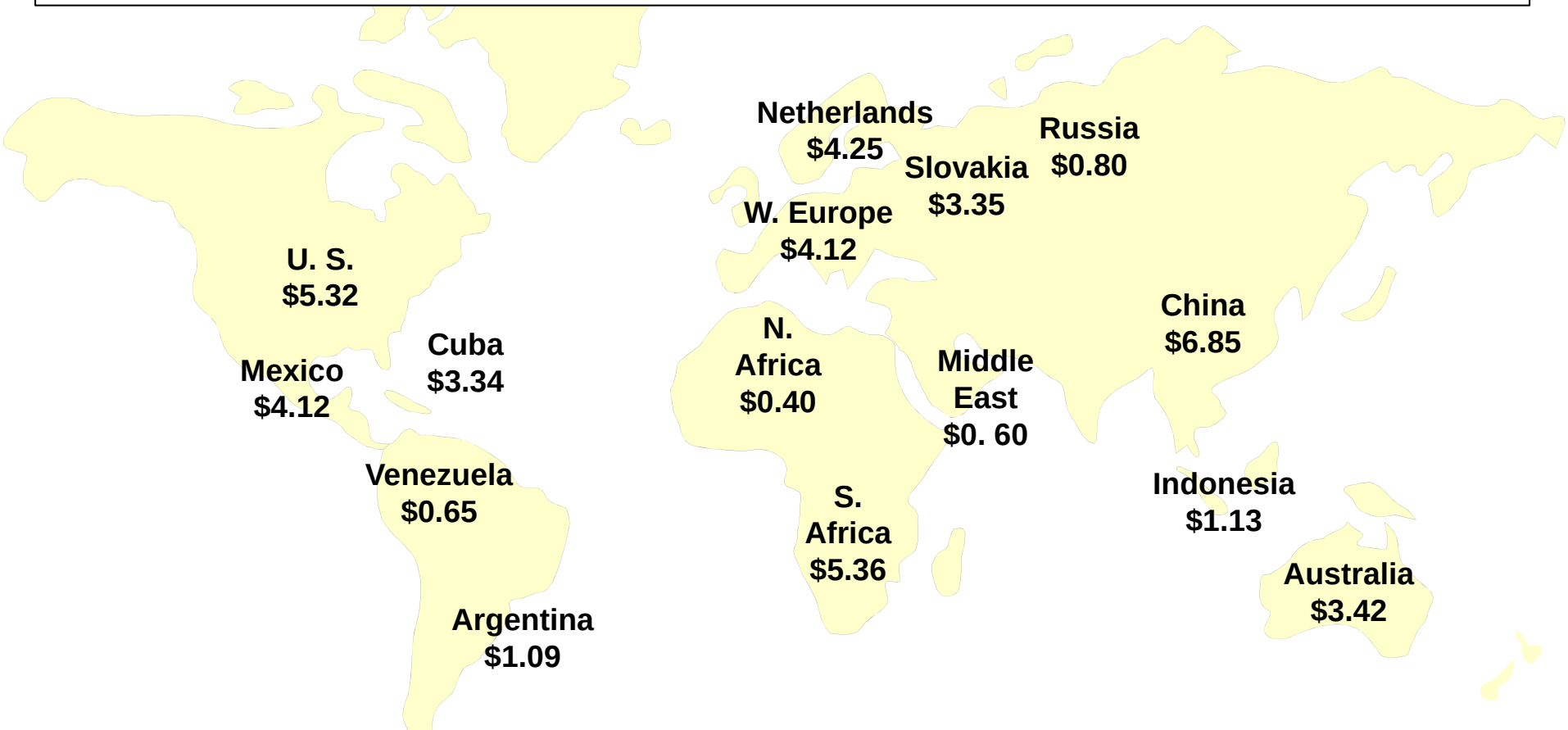
In 2007, over 35 Bcf/d of LNG import capacity was projected to come online within five years.



Source: Federal Energy Regulatory Commission.

World Natural Gas Prices for Industry ($/MMBtu), 2002

During this time period, US. natural gas prices were considerably higher than many other places in the world creating considerable competition issues and incentives for offshoring and re-directing new incremental investments away from the Gulf of Mexico region.



Source: Energy Information Administration, U.S. Department of Energy.

Section 4:
The Rise of Unconventional Resources and Louisiana Manufacturing Recovery

Price Changes and Natural Gas Markets

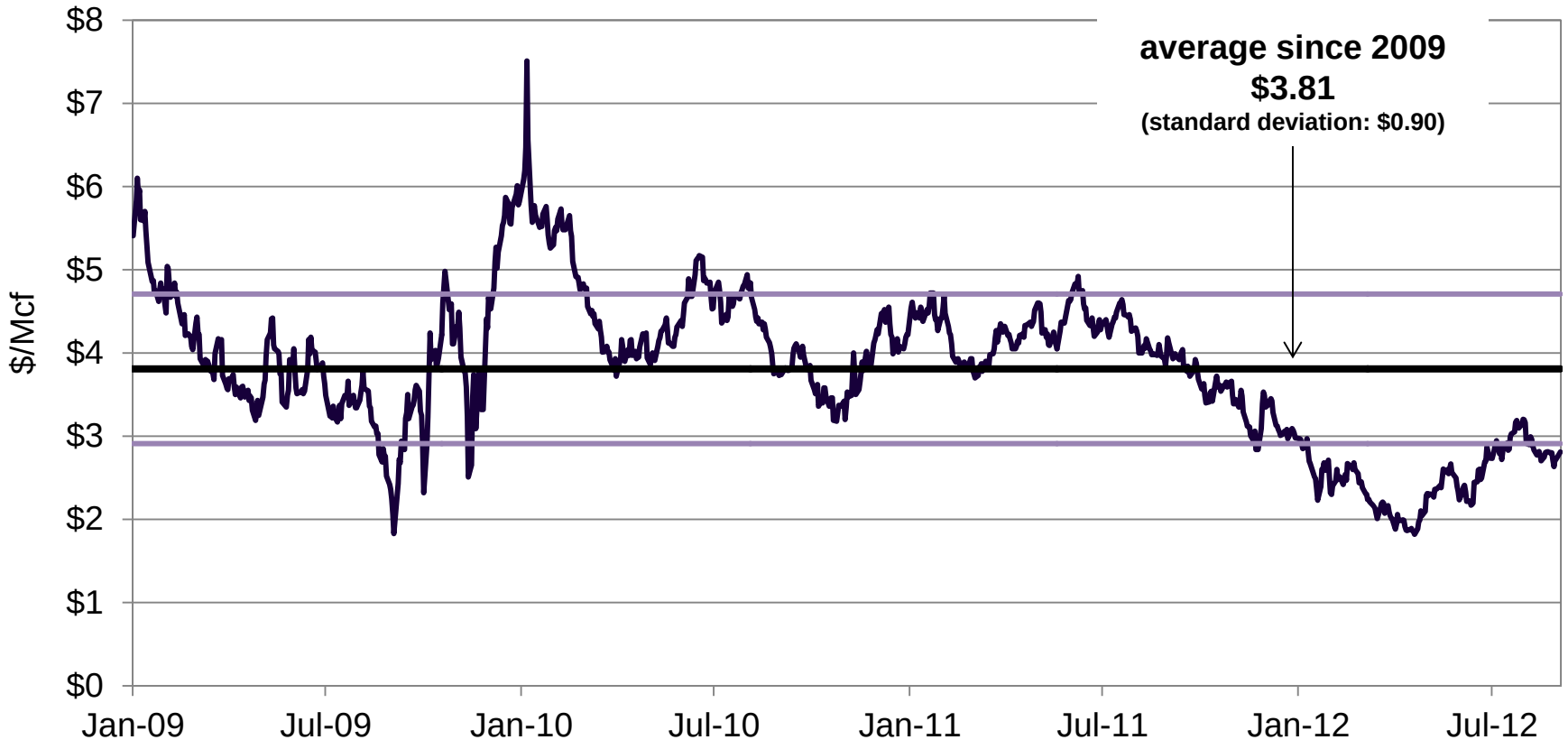
The Great Recession of 2009 resulted in a significant contraction in global economic output and energy demand. Energy prices fell precipitously as industries shuttered, business slowed, and households economized. While crude oil prices have rebounded considerably since the end of the recession, natural gas prices have remained stable.

The development of unconventional resources is the primary reason for abundant natural gas supplies. Unconventional natural gas reserve and production development is concentrated in a type of geologic formation referred to as a "shale" and began in Texas before migrating to the mid-continent region, Louisiana and several other places within the U.S. Louisiana's Haynesville Shale has been one of the most prolific producers of natural gas and has made considerable contributions to overall U.S. natural gas supplies.

Abundant natural gas supplies have already had a direct and immediately positive impact on U.S. and Louisiana manufacturing employment, output, and growth, making manufacturing one of the earliest and most important factors in pulling the U.S. economy out of recession.

Natural Gas Price Trends

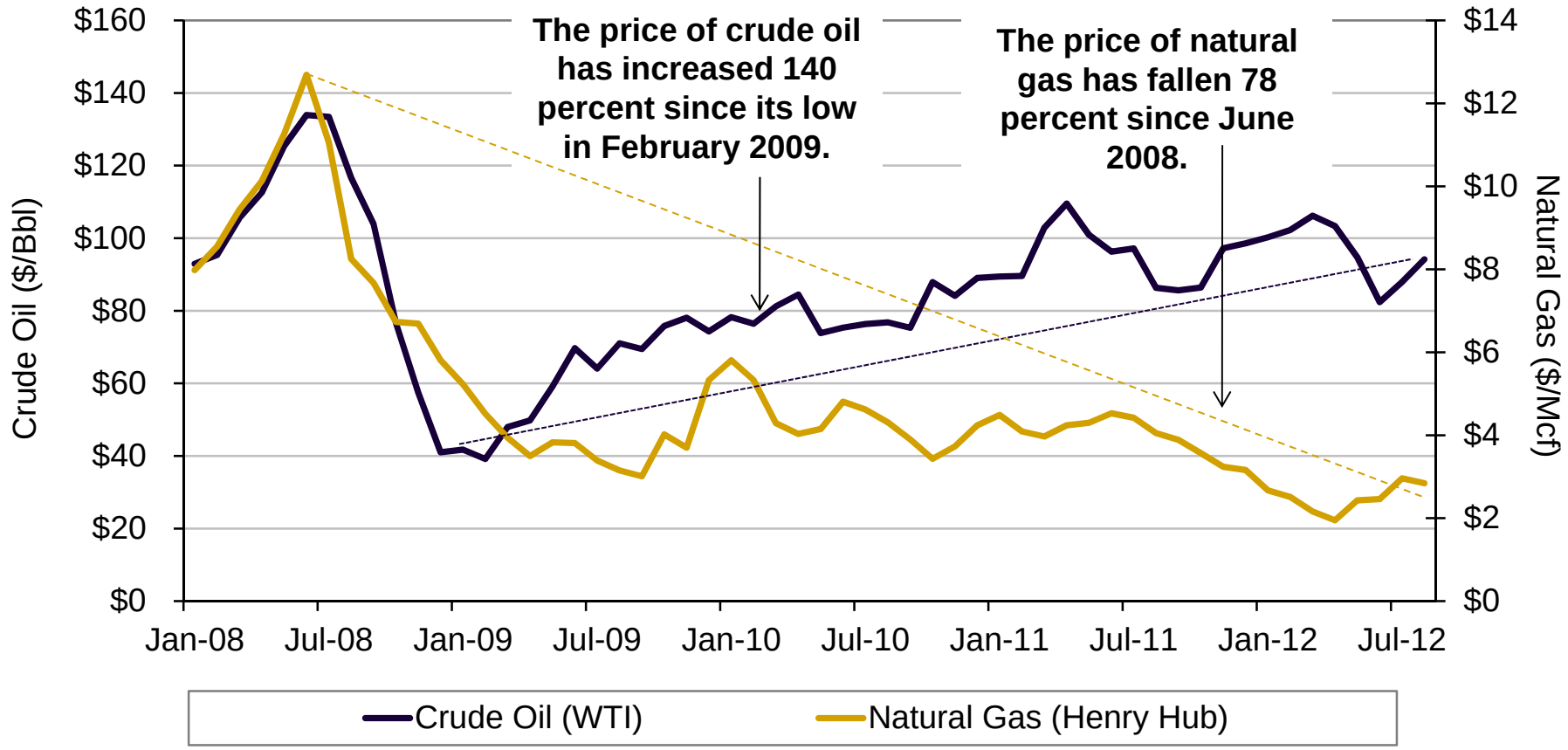
While crude oil and natural gas prices have fallen since the recession, natural gas has continued to be considerably less volatile even relative to the "good old days" of the 1990s.



Source: Energy Information Administration, U.S. Department of Energy.

Price Decoupling - Crude Oil and Natural Gas Prices

Crude oil prices have doubled in the aftermath of the recession but natural gas prices have remained stable.

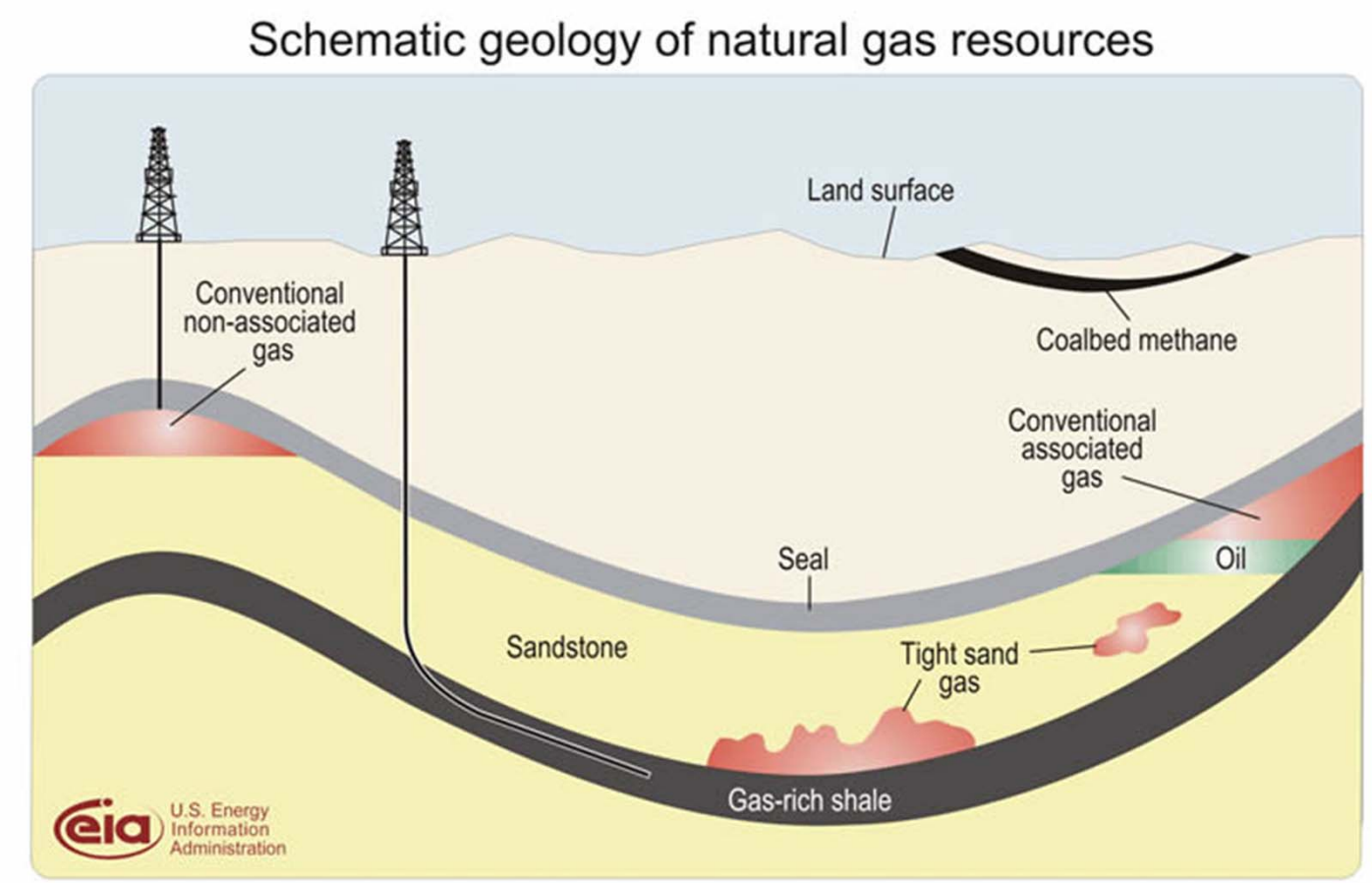


Source: Federal Reserve Bank of St. Louis.

What are Unconventional Resources?

Unconventional natural gas resources are being developed primarily in resource-rich shales located throughout the U.S.

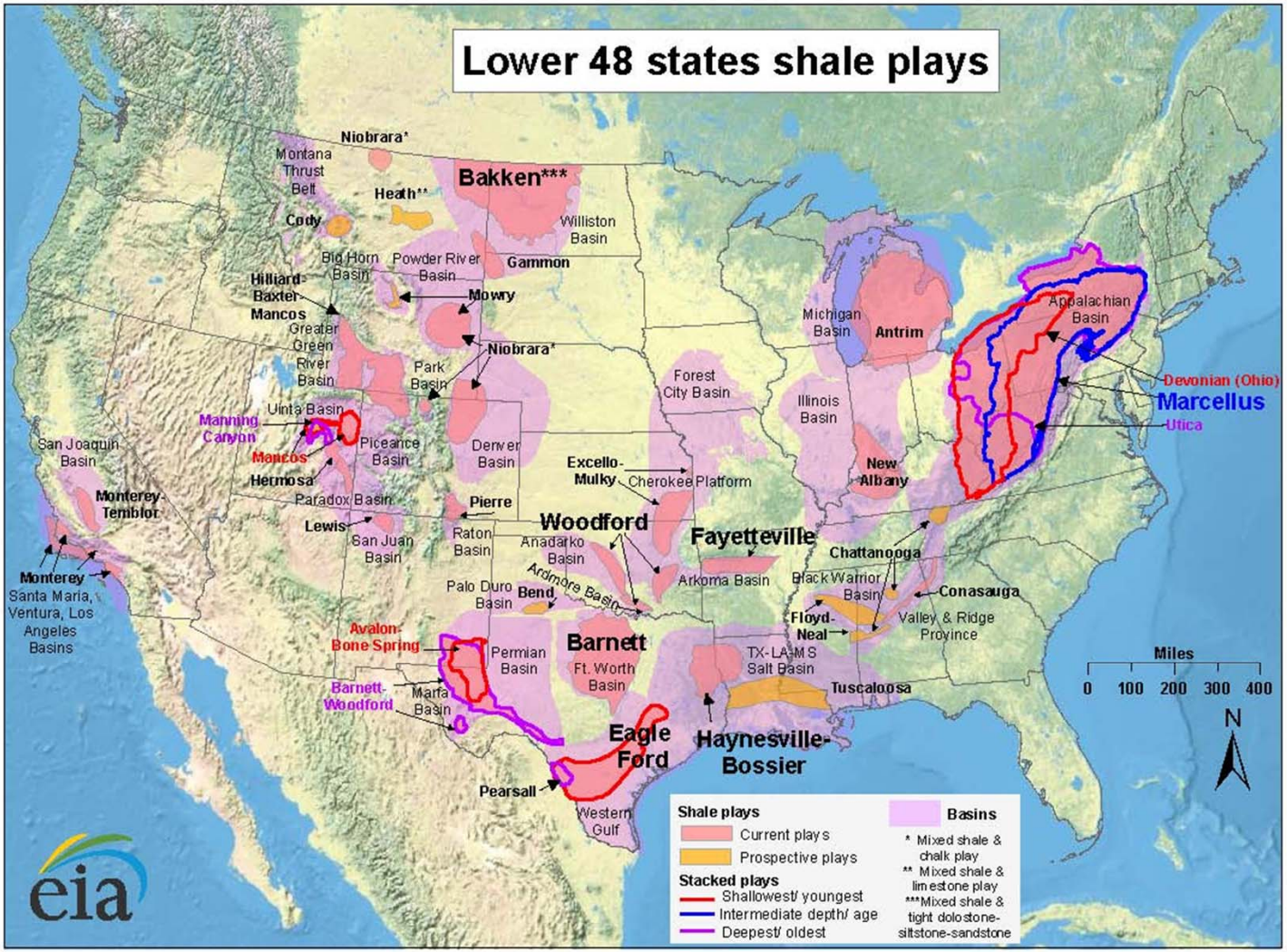
These wells are drilled differently (horizontally) and into a different type of resource (shale) than traditional vertical wells.



Source: Energy Information Administration, U.S. Department of Energy.

Domestic Shale Basins and Plays

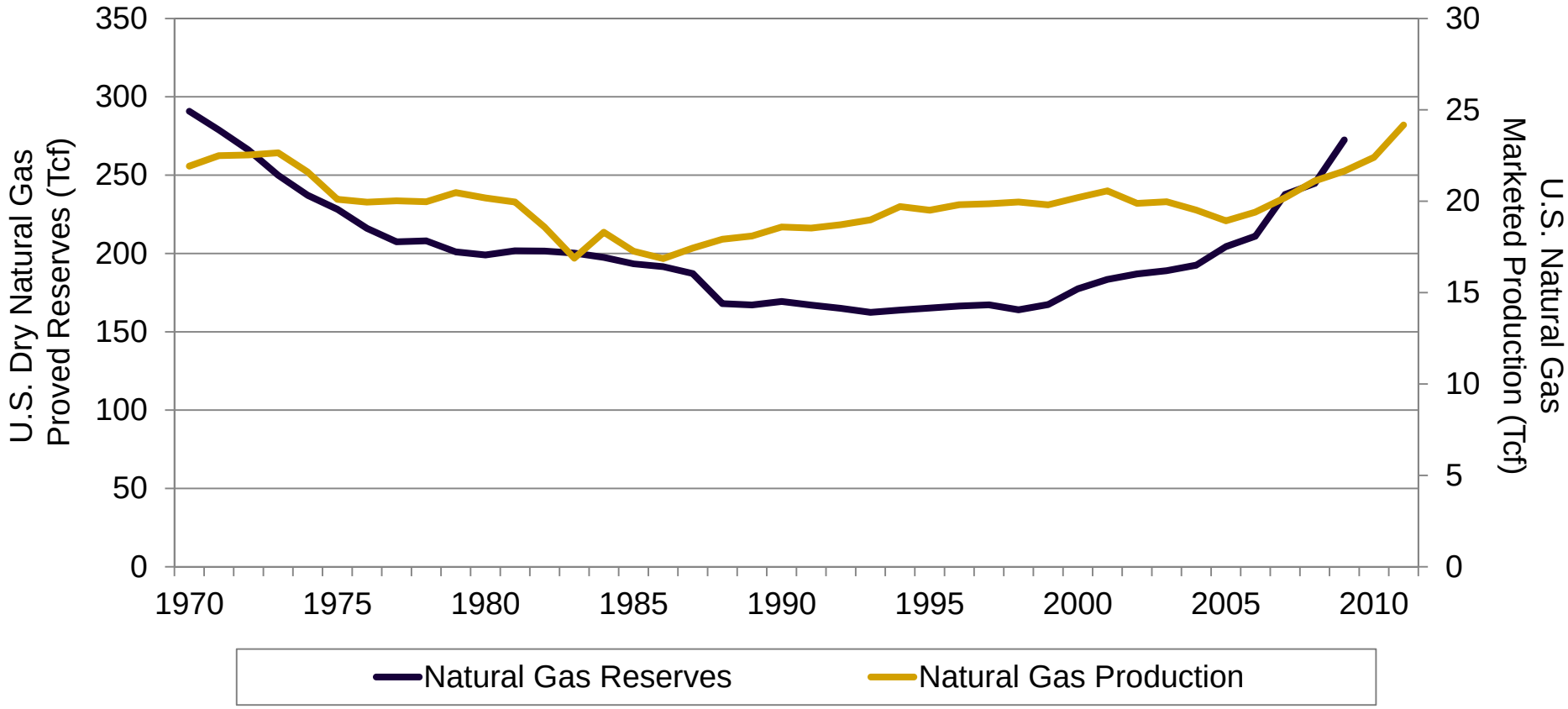
Unlike conventional resources, shale plays (natural gas, liquids, and crudes) are located throughout the U.S. and are the primary reason for the decrease in overall and regional natural gas prices.



Source: Energy Information Administration, U.S. Department of Energy

Changes in Reserves and Production

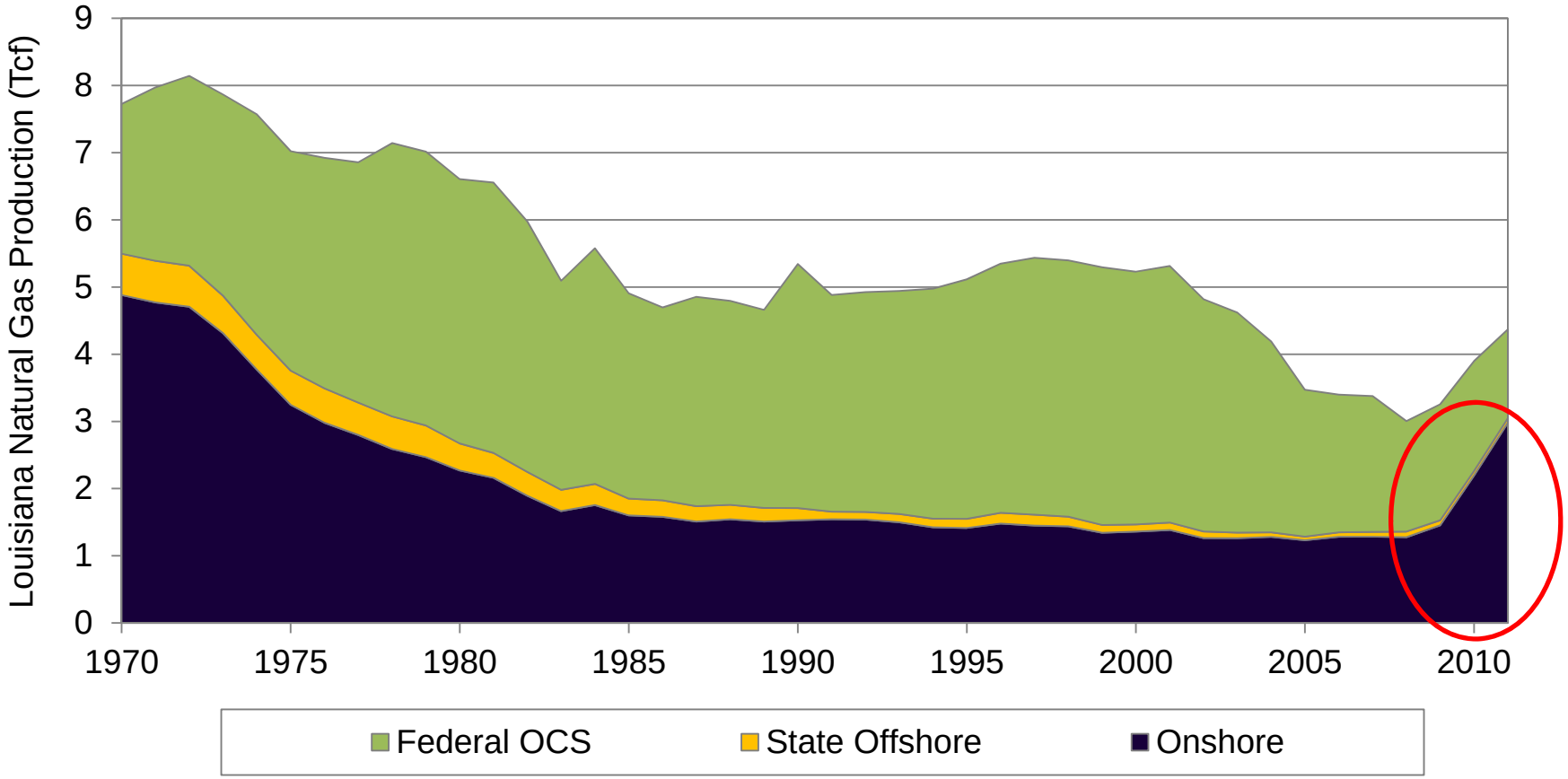
Natural gas production and reserves are at levels not seen since the 1970s. U.S. natural gas production is now at an all time recorded peak. These consistent increases should lead to a steady feedstock supply that does not impinge on other domestic natural gas uses.



Source: Energy Information Administration, U.S. Department of Energy.

State Production Levels

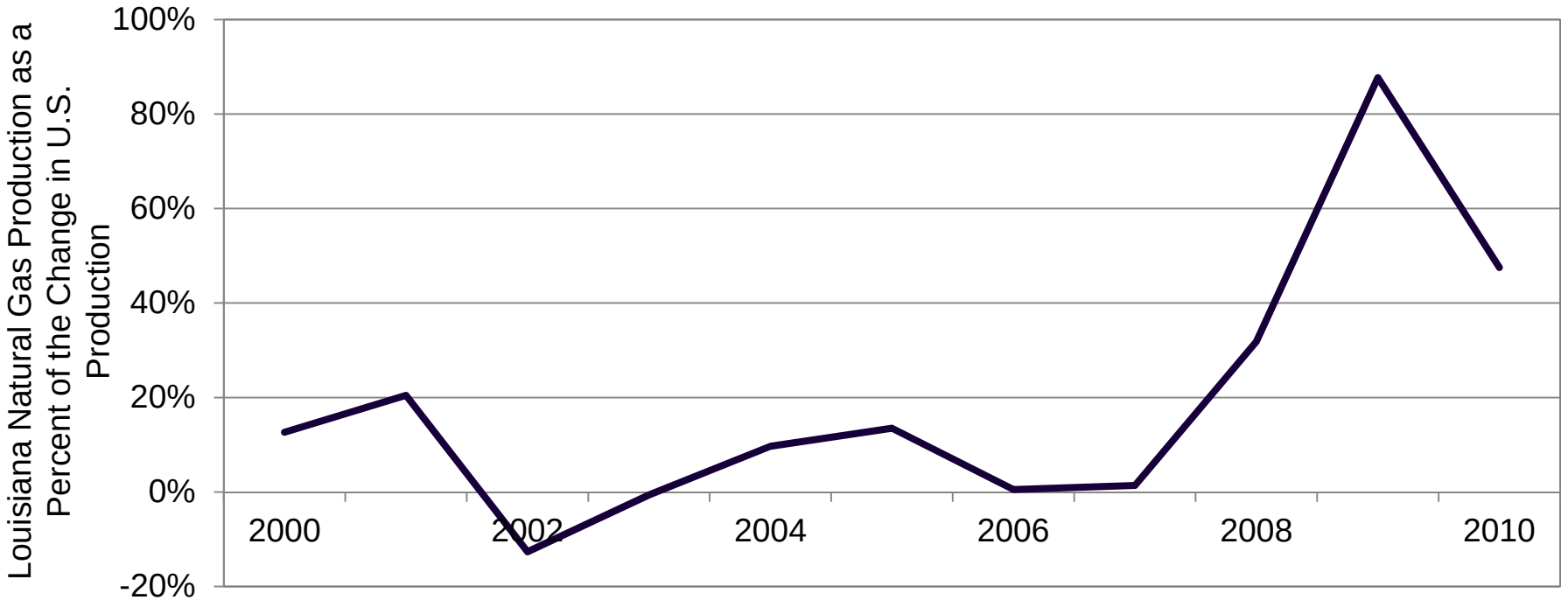
Louisiana onshore (instate) gas production has been increasing by an annual average of 34 percent since 2008 and is currently at levels not seen since the 1970s.



Source: Louisiana Department of Natural Resources.

Louisiana Production Growth

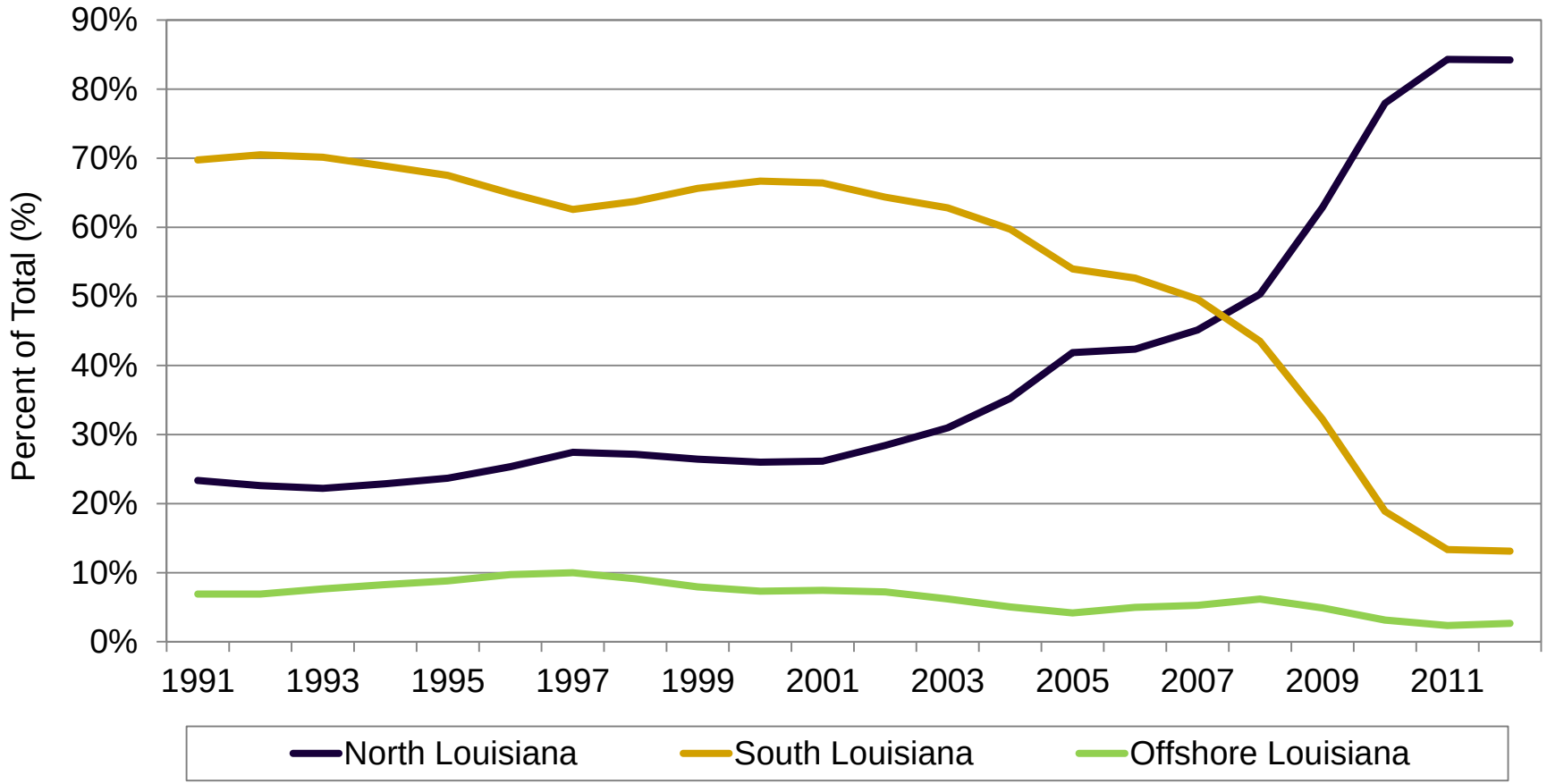
North Louisiana (Haynesville) makes an important contribution to U.S. natural gas supply increases.



Source: Energy Information Administration, U.S. Department of Energy.

Natural Gas Production Shares

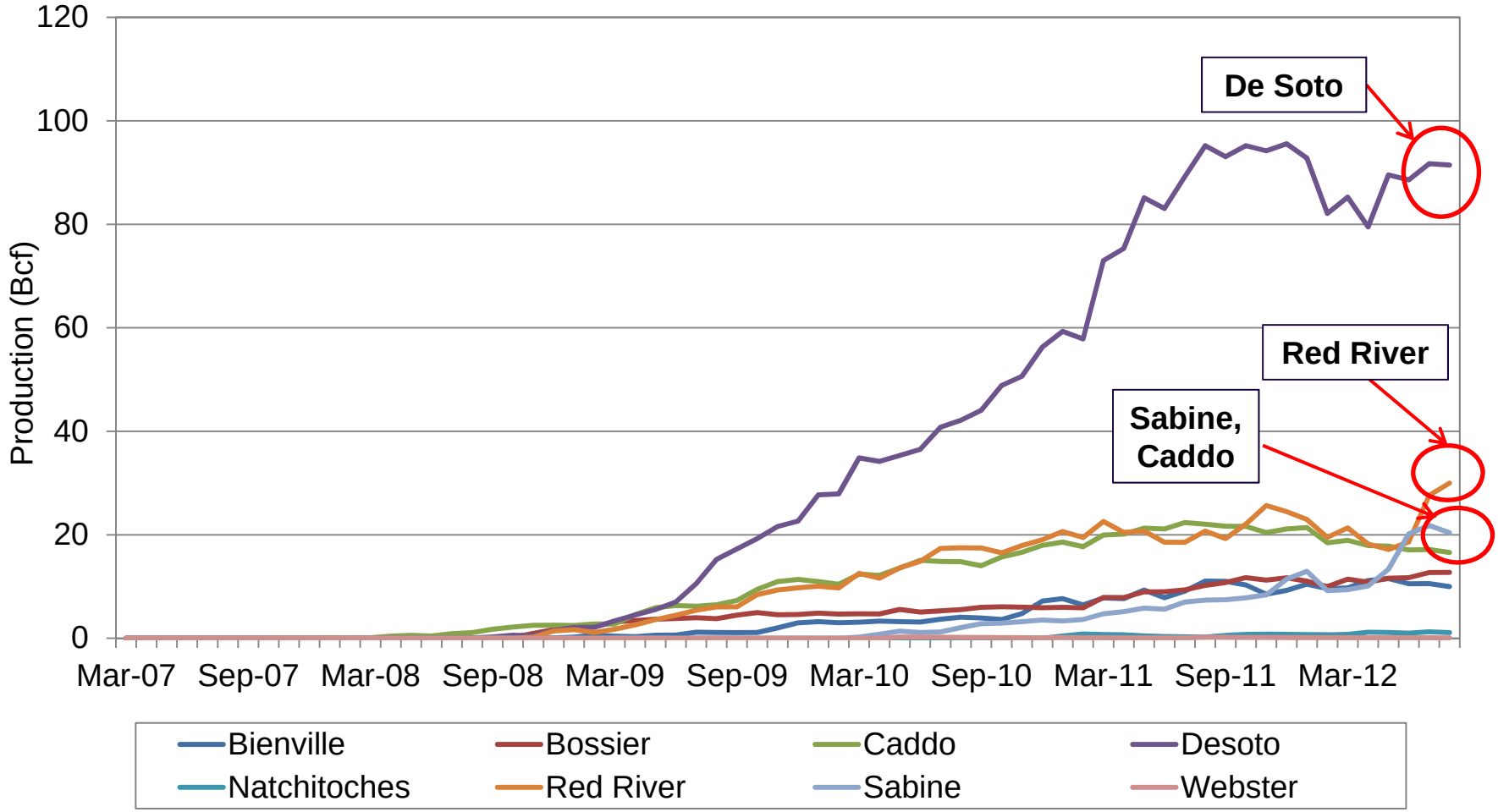
North Louisiana (unconventional) natural gas production has almost entirely replaced the contribution made by South Louisiana natural gas production.



Source: Louisiana Department of Natural Resources.

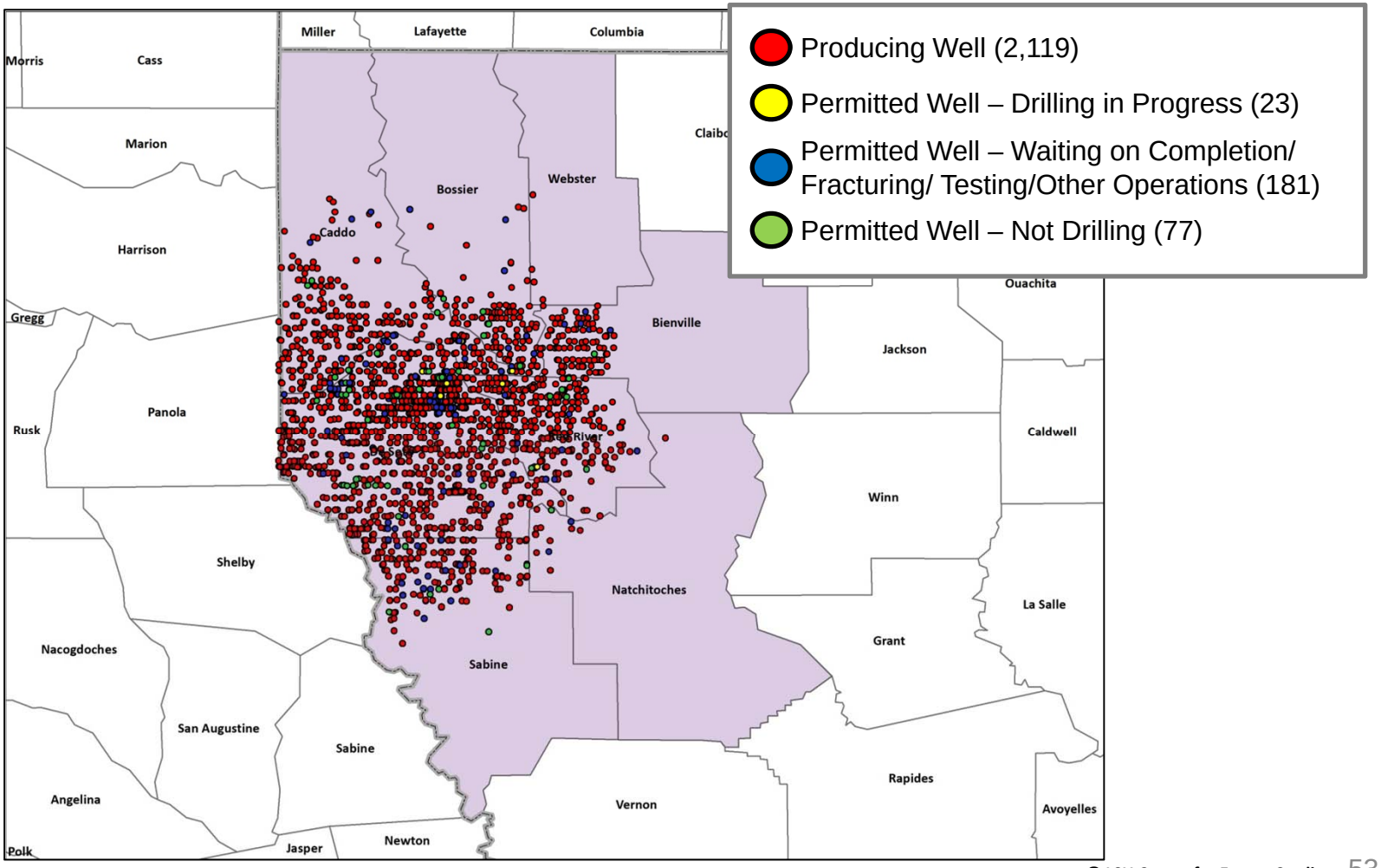
Total Louisiana Haynesville Production by Parish

North Louisiana production comes primarily from about four or five parishes.



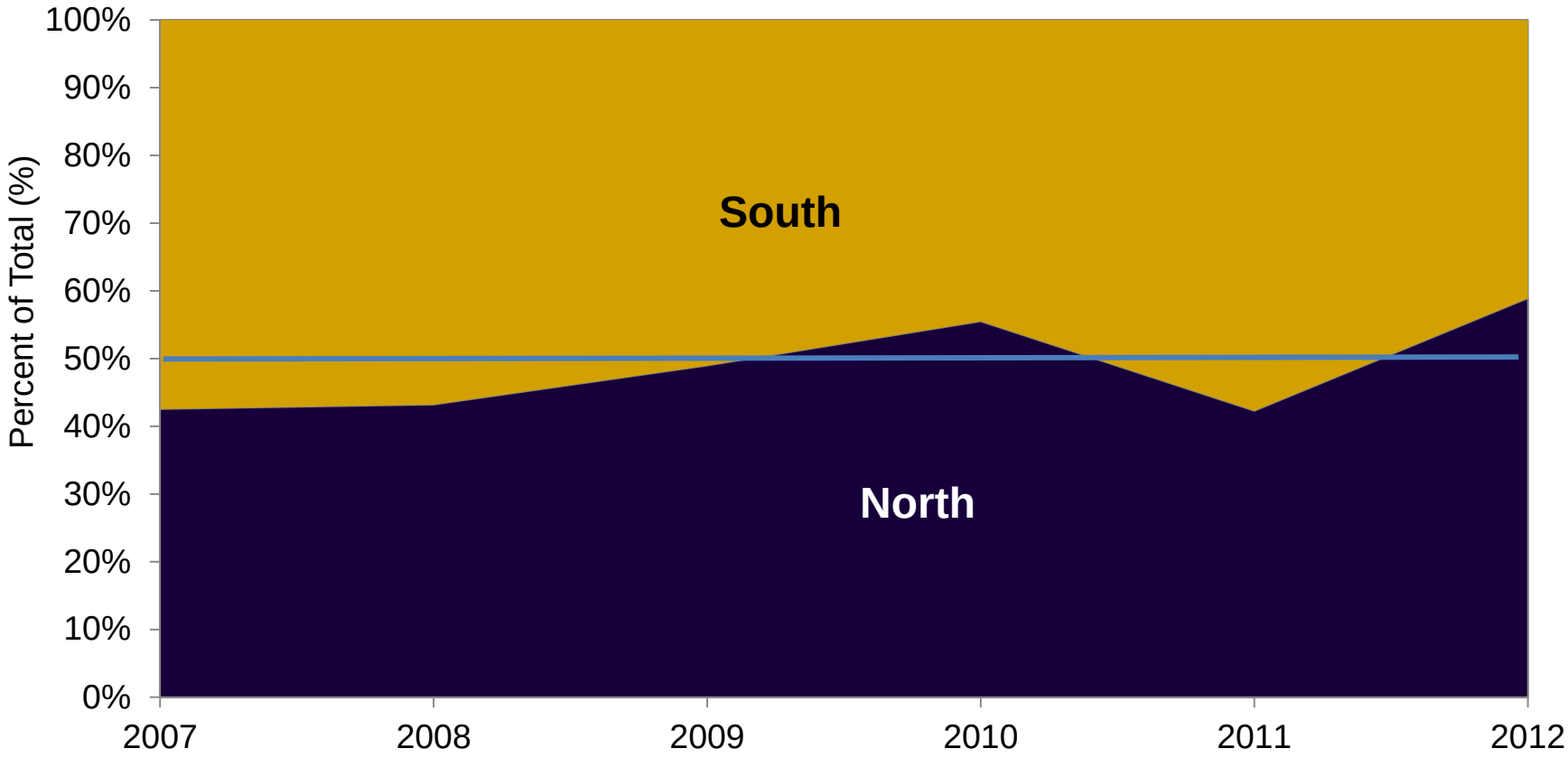
Haynesville Wells

Over 2,100 unconventional wells have been completed in North Louisiana over the past several years.



Natural Gas Severance Tax Collections

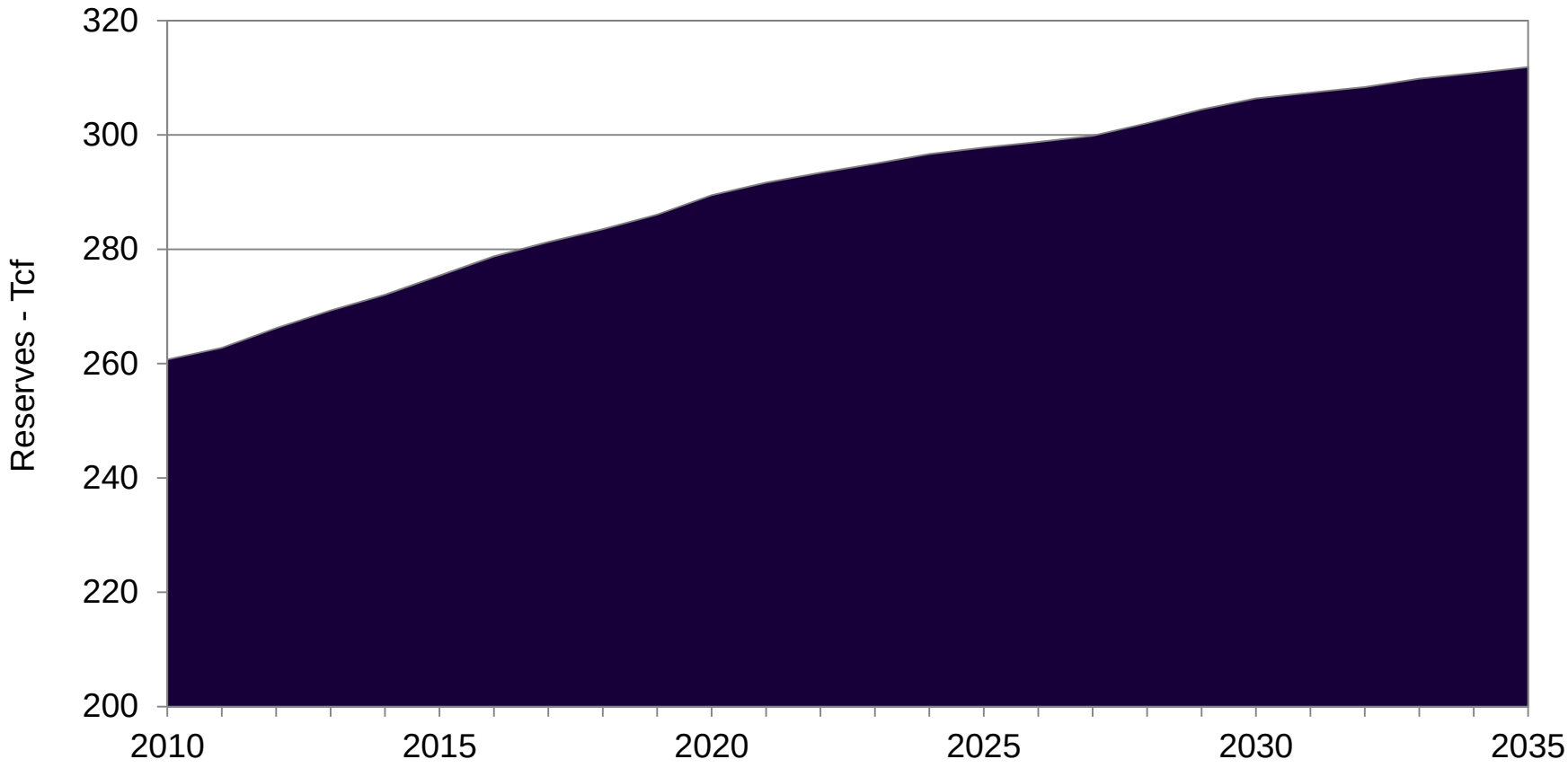
North Louisiana natural gas production makes an overwhelming contribution to state mineral revenues.



Source: Louisiana Department of Revenue.

Annual Energy Outlook, Natural Gas Reserves

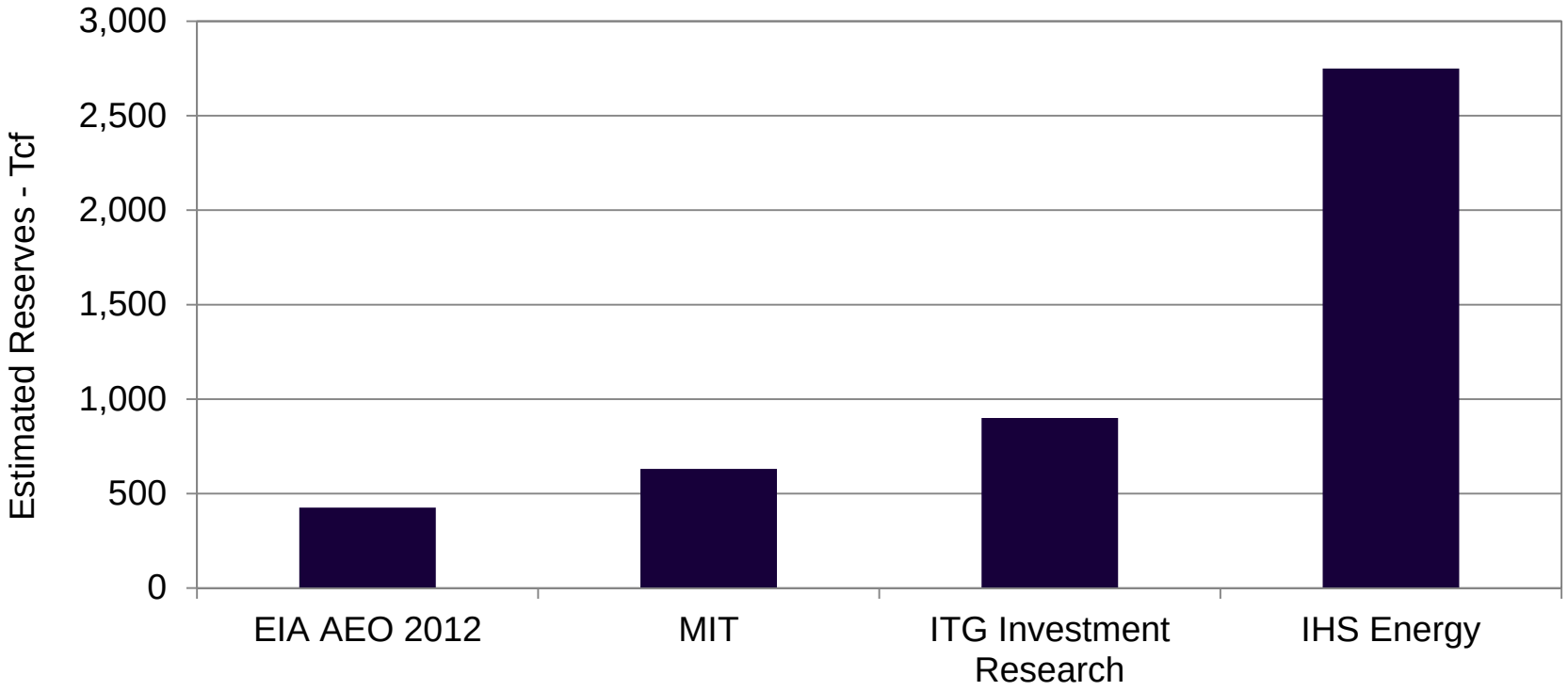
Unconventional resources are not a "flash in the pan" and are anticipated to continue to increase over the next two decades or more.



Source: Energy Information Administration, U.S. Department of Energy.

Alternative Natural Gas Reserves

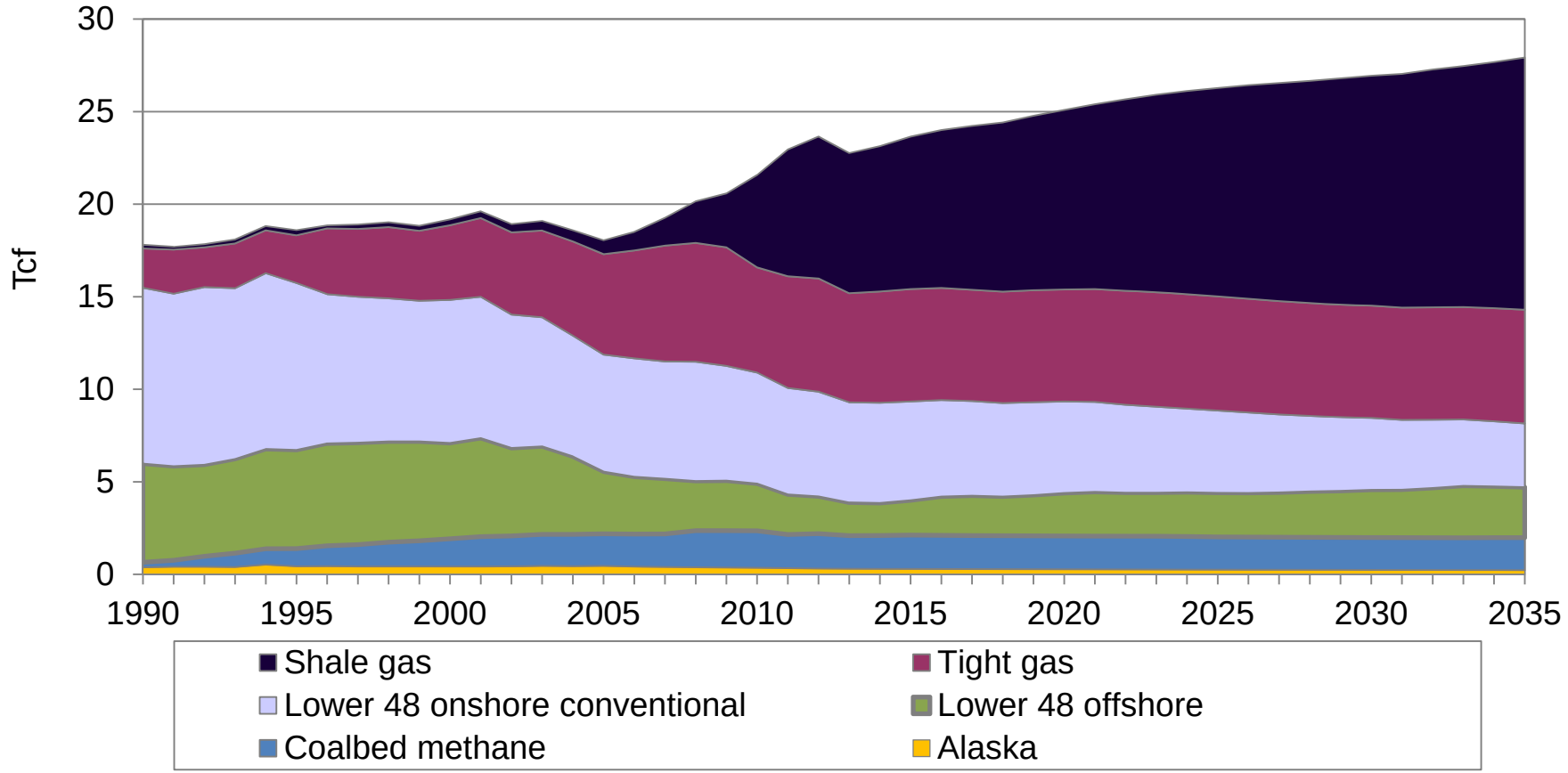
There are a wide range of unconventional shale gas reserve estimates that are as low as 436 Tcf to as high as 2,750 Tcf. This represents a range of between 18 years and over 100 years of available natural gas resources based upon current consumption levels.*



Note: *Assumes an annual consumption level of 24.3 Tcf.
The MIT study reached a mean estimate of technically recoverable resources of 631 Tcf with an 80 percent confidence interval of 418 to 871 Tcf. The ITG estimates of recoverable resources is for 10 overlapping plays, totaling 900 Tcf. These are the same 10 plays as estimated by the EIA's AEO (resulting in 426 Tcf). IHS Energy estimates show that total recoverable shale in the U.S. could be as high as 2,750 Tcf, significantly higher than their estimate of 1,268 in 2010.

U.S. Natural Gas Production Growth Forecast

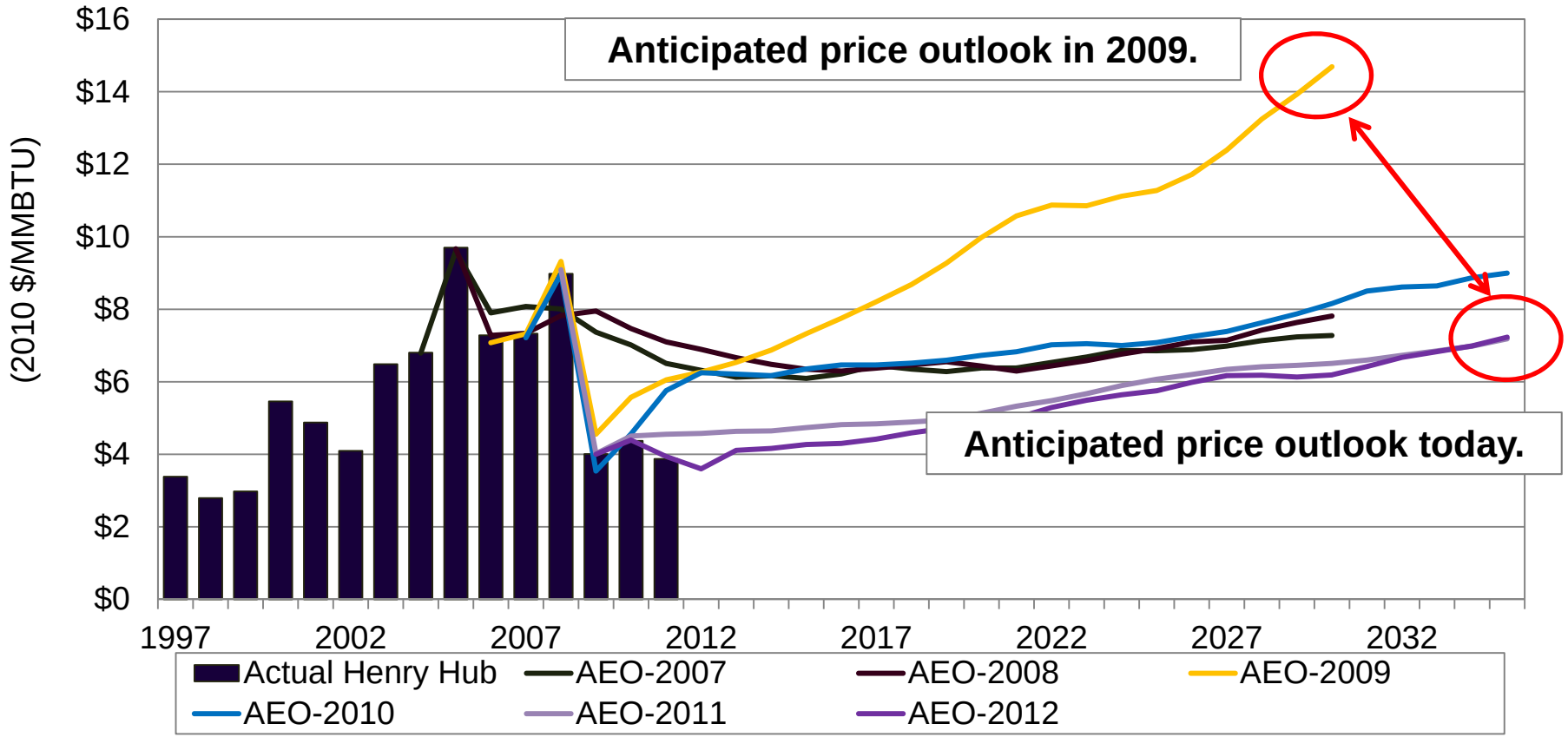
Shale availability is driving U.S. natural gas supply and will likely account for over half of U.S. natural gas production in the 2025-2035 time period.



Source: Energy Information Administration, U.S. Department of Energy.

Natural Gas Price Outlook – Annual Energy Outlook ("AEO")

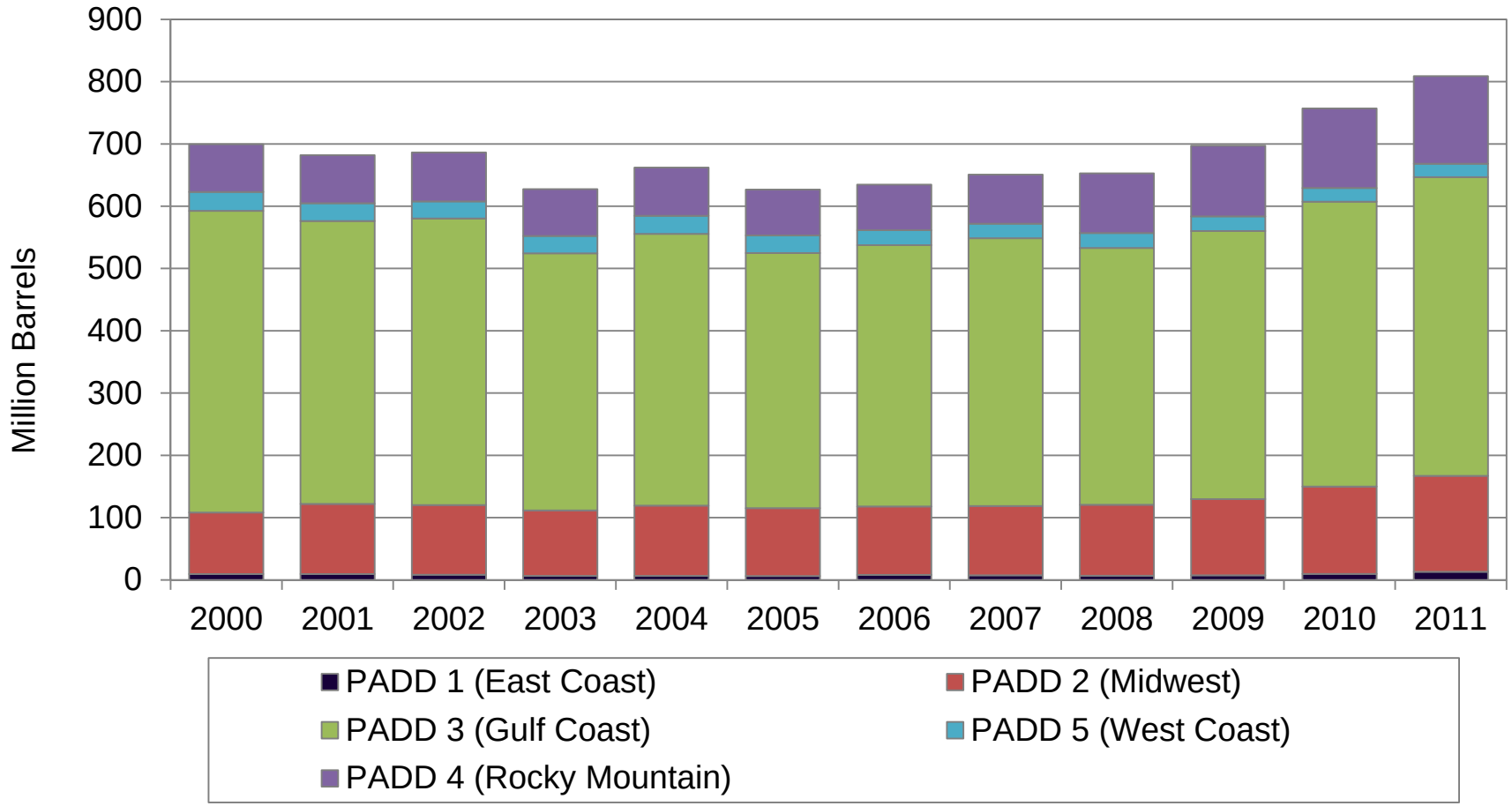
Shale reserves have a significant impact on future price outlook. Abundant supplies should keep prices stable. The current AEO forecasts natural gas prices in 2030 at $6.29/Mcf (40 percent less than the 2009 AEO forecast).



Source: Energy Information Administration, U.S. Department of Energy.

Gas Plant Production of NGLs

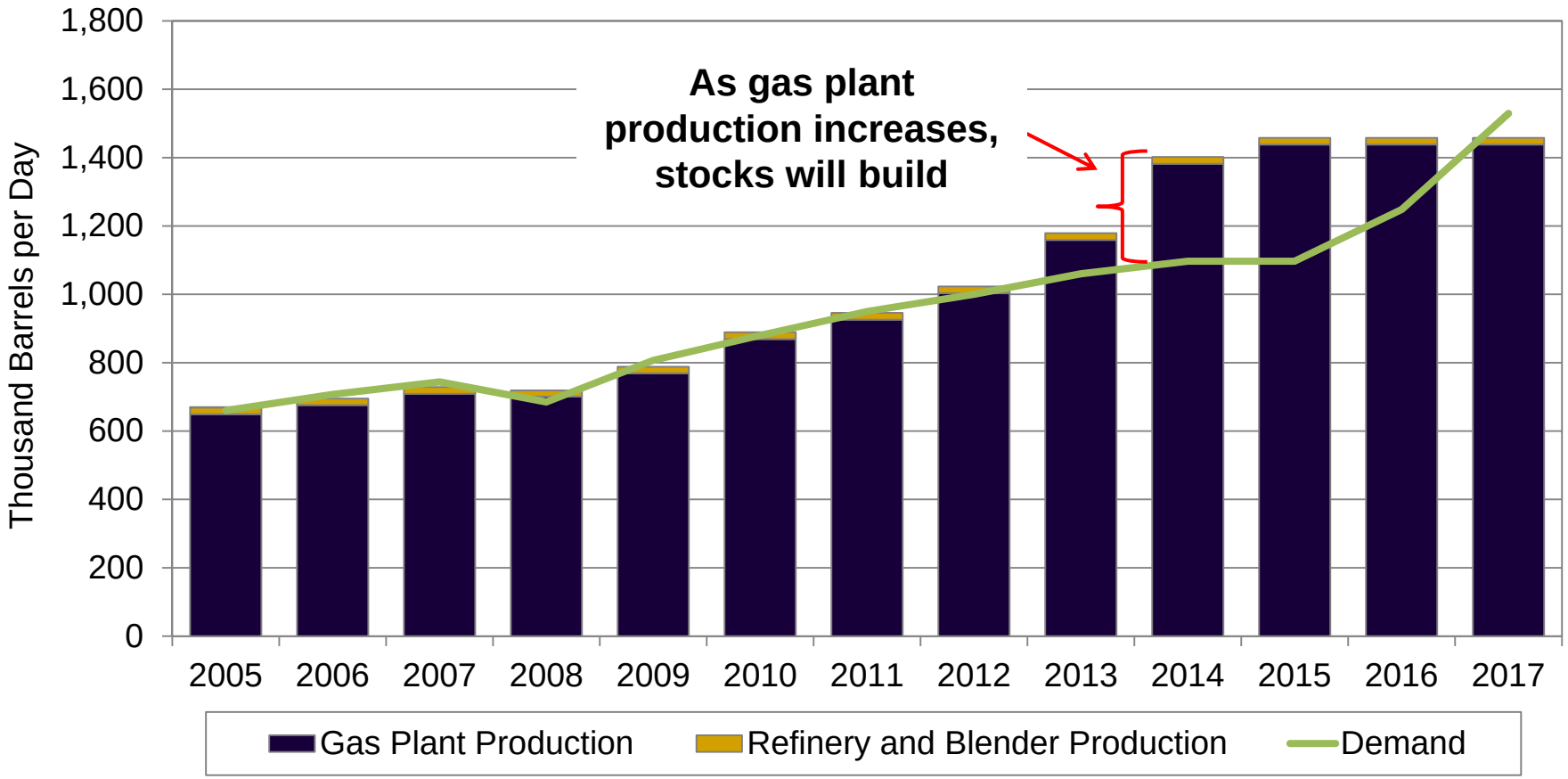
The production of NGLs is on the rise given the increase from liquids-rich shales throughout the U.S. These NGLs are used as a feedstock for petrochemical companies and serve as the basic building blocks of modern chemical production.



Source: Energy Information Administration, U.S. Department of Energy.

U.S. Ethane Supply and Demand

Both supply and demand of ethane have been increasing. Production and supply are expected to continue to increase and ethane stocks will build.



Source: Simmons & Company International.

Section 5:
Unconventional Resources and Louisiana's Manufacturing Renaissance

Recent Investment Announcements

The outlook for abundant and diversified natural gas supplies has created a number of incentives for U.S. manufacturing investments. In fact, Louisiana is in the process of a new manufacturing investment "renaissance" with close to $50 billion in new investment announcements.

These projects are anticipated to be completed within the next three to five years, and are all associated with energy intensive industries. The new investment opportunities have all been documented to have been facilitated primarily by abundant natural gas supplies. Some of the investments are new "greenfield" developments while several others represent expansions at existing Louisiana manufacturing facilities.

At least 20 manufacturing investment opportunities in a variety of areas have been announced over the past two years that can be categorized broadly into such areas as: (a) petrochemical (ethane cracker/polymers); (b) methanol/ammonia; (c) gas-to-liquids projects; (d) liquefied natural gas export facilities; and (e) a number of "other" miscellaneous investments.

Proposed Projects

Project Type / Project	Company	Parish	New or Existing Facility		Estimated Investment (million $)	Anticipated Online Date
LNG Export						
Sabine Pass LNG Terminal	Cheniere	Cameron	Existing	$	6,000	2015
Cameron LNG Export Terminal	Sempra Energy	Cameron	Existing	$	6,000	2016
Trunkline Lake Charles LNG Export Terminal	Trunkline LNG Company (Energy Transfer Equity, L.P.)	Calcasieu	Existing	$	7,500	2018
GTL						
Westlake GTL Project[1]	Sasol	Calcasieu	New	$	12,500	2018
Gulf Coast GTL Project	Shell	n.a.	New	$	10,000	2019
Methanol/Ammonia						
Waggaman Facility Expansion	Dyno Nobel International	Jefferson	Existing	$	800	2015
Chile-to-US Relocation/Expansion	Methanex	Ascension	New	$	550	2014
South Louisiana Methanol	ZEEP	Southern Region	New	$	1,018	2015
Mosaic Ammonia	Mosaic Company	St. James	New	$	700	2016
Cracker/Polymer						
Dow Olefins Expansion	Dow Chemical	St. Charles	Existing	$	4,000	2012
Dow Olefins Expansion	Dow Chemical	Iberville	Existing	$	4,000	2014
Hutsman MDI Plant	Huntsman Corp.	Ascension	Existing		n.a.	2018
Garyville Expansion	Nalco Company	St. John the Baptist	Existing	$	19	2012
Sasol Calcasieu Expansion	Sasol	Calcasieu	Existing	$	175	2013
Sasol Calcasieu Expansion	Sasol	Calcasieu	Existing	$	6,000	2018
Lake Charles Expansion	Westlake Chemical	Calcasieu	Existing	$	128	2012
Lake Charles Expansion	Westlake Chemical	Calcasieu	Existing	$	128	2014
Williams Olefins Expansion	Williams	Ascension	Existing	$	375	2013
Other						
Natural Gas Power Plant	Entergy	Jefferson	Existing	$	721	2015
Project Sundrop	Sundrop Fuels	Rapides	New	$	450	2014
Geismer Plant	Avalon Rare Metals, Inc	Ascension	New	$	300	2016
Steel Mill	Benteler Steel/Tube	Caddo	New	$	900	2015
TOTAL				**$**	**62,262**	

Note: The Westlake GTL Project is estimated to cost between $11 and $14 billion.

Project Type: LNG Export

- With an abundance of natural gas supply, a number of companies have applied for a license to export LNG.
- Eighteen project sponsors have applied to DOE for authorization to export domestically produced LNG to free trade agreement (FTA) and non-free trade agreement (non-FTA) countries, totaling 27.4 Bcf/d of capacity.
- Of these applications, 14 project sponsors totaling 25.1 Bcf/d, are located on the Gulf Coast.
- Project sponsors must also seek Federal Energy Regulatory Commission (FERC) approval to construct liquefaction facilities to liquefy natural gas for exports

Project Type: Gas-to-Liquids ("GTL")

- "Gas-to-liquids" refers to technologies designed to convert natural gas to liquid fuels, as an alternative to the traditional refining of crude oil.
- Typical outputs for a GTL process include ultra-clean diesel fuel, naphtha and LPGs, lubes and waxes. Prime markets for GTL products are the transportation fuel market and the chemical feedstock mark depressed gas prices.
- Growing interest in GTL development stems from several factors:
  - Strong demand for diesel fuel for transportation (Europe, Asia);
  - Stringent environmental specifications for diesel fuel;
  - Need to monetize conventional natural gas in locations where gas markets are small or there are value-added manufacturing opportunities; and
  - Affordably-priced natural gas makes GTL economically viable since the energy-adjusted differential between gas and crude are significant and anticipated to remain high even if natural gas prices moderately recover.

Project Type: Methanol/Ammonia

- **Because of its many uses, ammonia is one of the most highly-produced inorganic chemicals.**
- **Most of the ammonia produced is used for fertilizing agricultural crops.**
- **Ammonia is also used for the production of refrigerant in household, commercial and industrial refrigeration systems, plastics, fibers, explosives, cleaning solutions, pharmaceuticals and intermediates for dyes.**

- **A typical modern ammonia-producing plant first converts natural gas or LPG into gaseous hydrogen. The method for producing hydrogen from hydrocarbons is referred to as "steam reforming". The hydrogen is then combined with nitrogen to produce ammonia.**

Project Type: Ethylene Cracker/Polymer

- An ethylene cracker is a petrochemical plant that uses a feed of gas hydrocarbons (dry gas, propane, butane), and heats it (to about 850 °C) to "crack" the molecules into smaller ones.
- After being heated, the product becomes a mixture of different gases and some liquids. These are then separated (refined) into different products. The primary product is ethylene.

- Most ethylene crackers also have a hydrogenation section. This is a series of reactors which hydrogenate (add hydrogen) and acetylene turning it into ethylene. This increases the ethylene yield.
- Ethylene is a major building block of alcohol- and plastic-based products, such as solvents, surfactants and polymers.

Project Type: Other Investment Types

Other facilities under development include:

A natural gas-fired generation unit. The proposal would add an additional natural gas-fired generation unit at an existing generating facility.

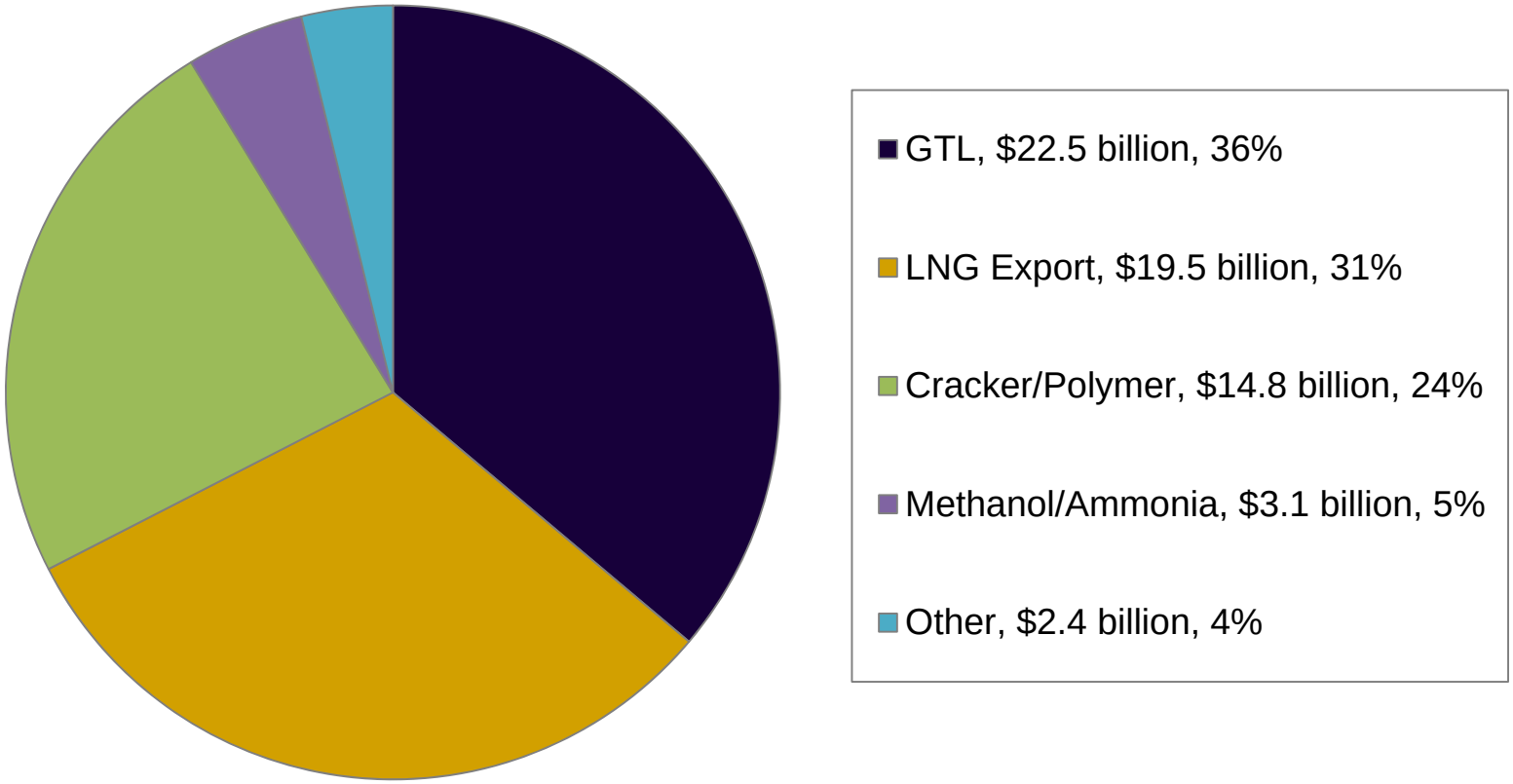
A biofuels plant. The proposed biofuels plant will salvage wood waste for use as a feedstock. It would also extract hydrogen from natural gas, combining it with carbon extracted with the woodwaste, to create a renewable "green gasoline".

A rare earth separation plant that would isolate and refine the individual light and heavy rare earth oxides and chlorides and produce a mixed rare earth concentrate.

A steel mill that would produce seamless steel tubing.

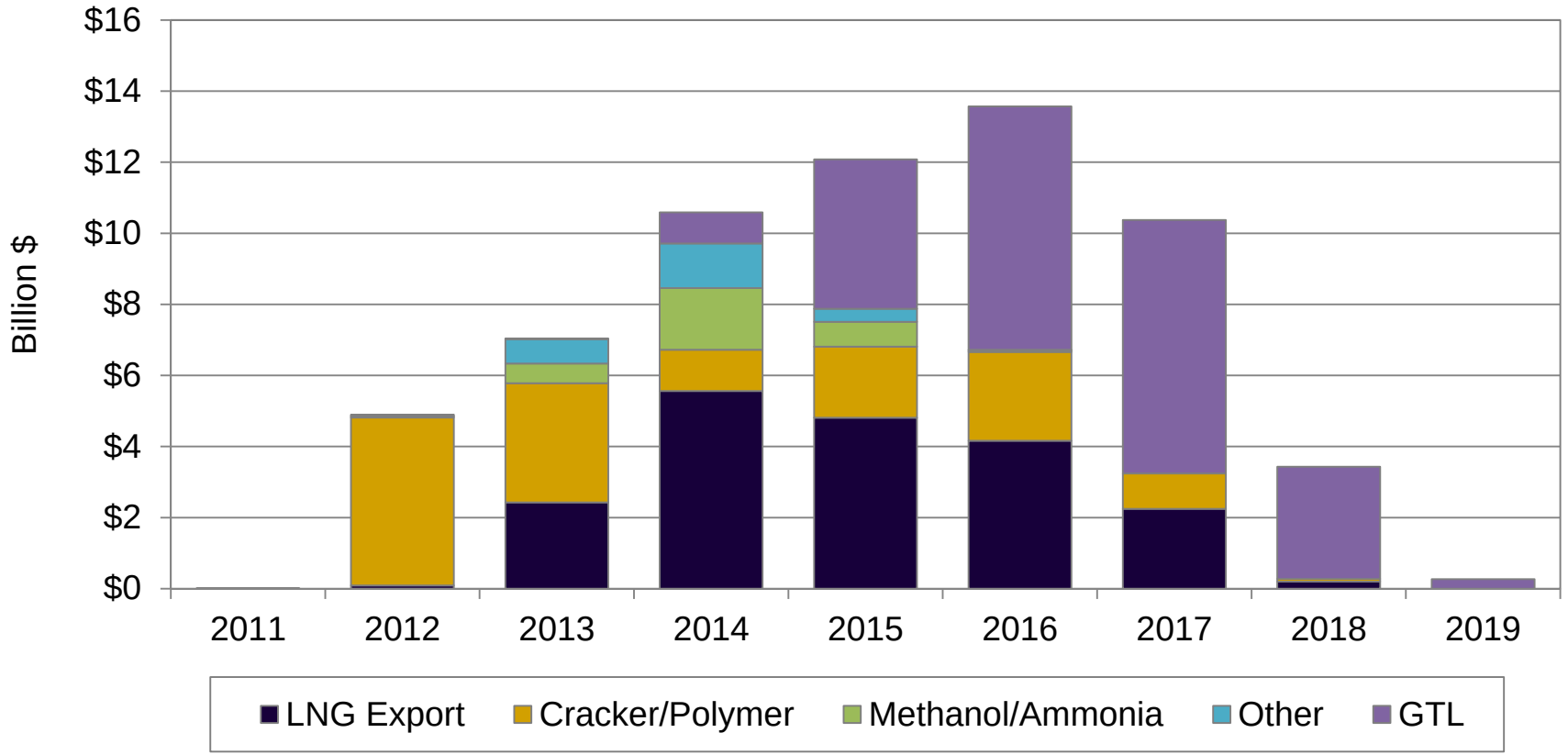
Total Capital Expenditures by Sector

Of the proposed facility expansions in Louisiana, gas-to-liquids and LNG export comprise the majority of proposed capital spending.



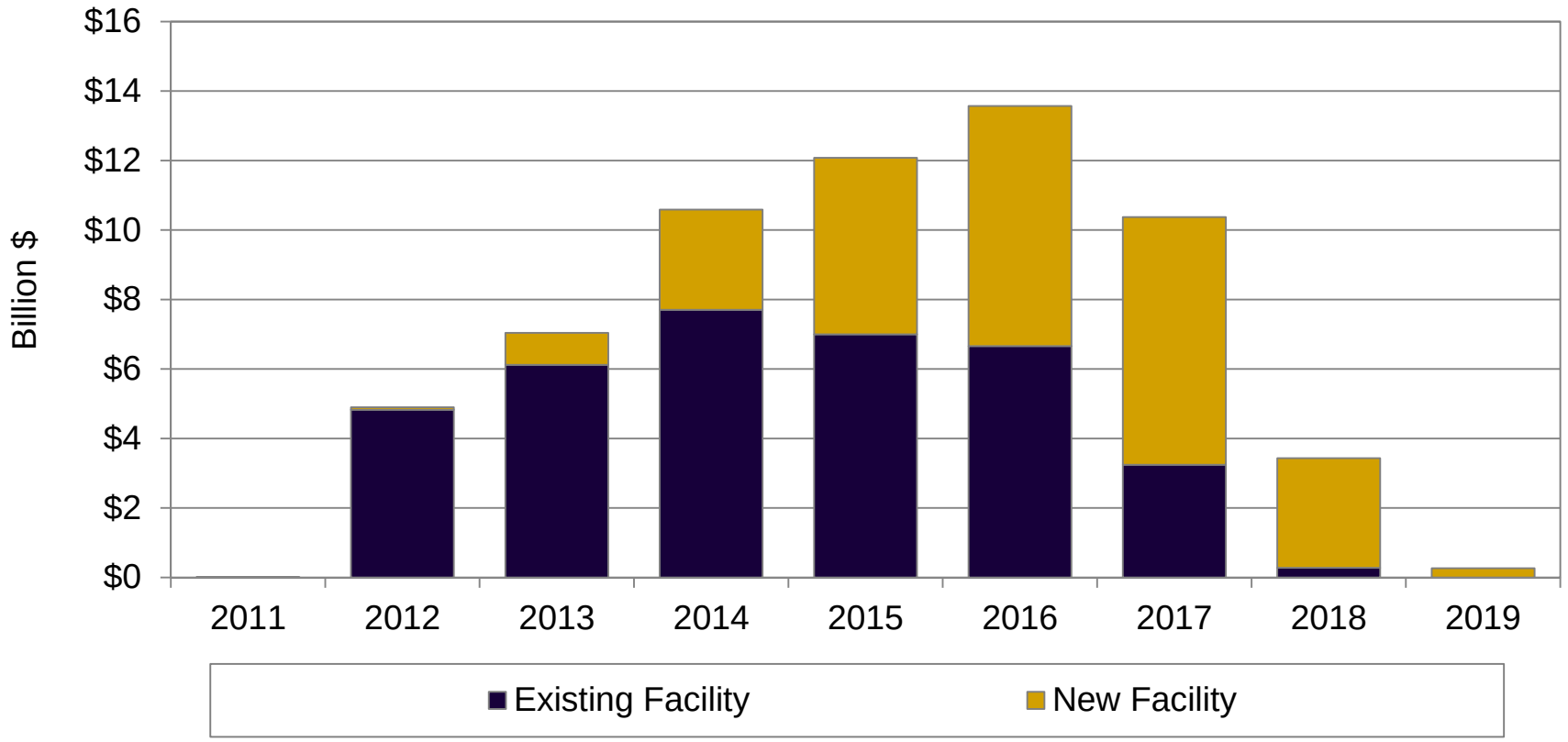
Total Capital Expenditures by Sector

The total capital investment associated with all announced natural gas-driven manufacturing investments in Louisiana totals over $62 billion. Most of the investment is anticipated to occur between 2014 and 2017.



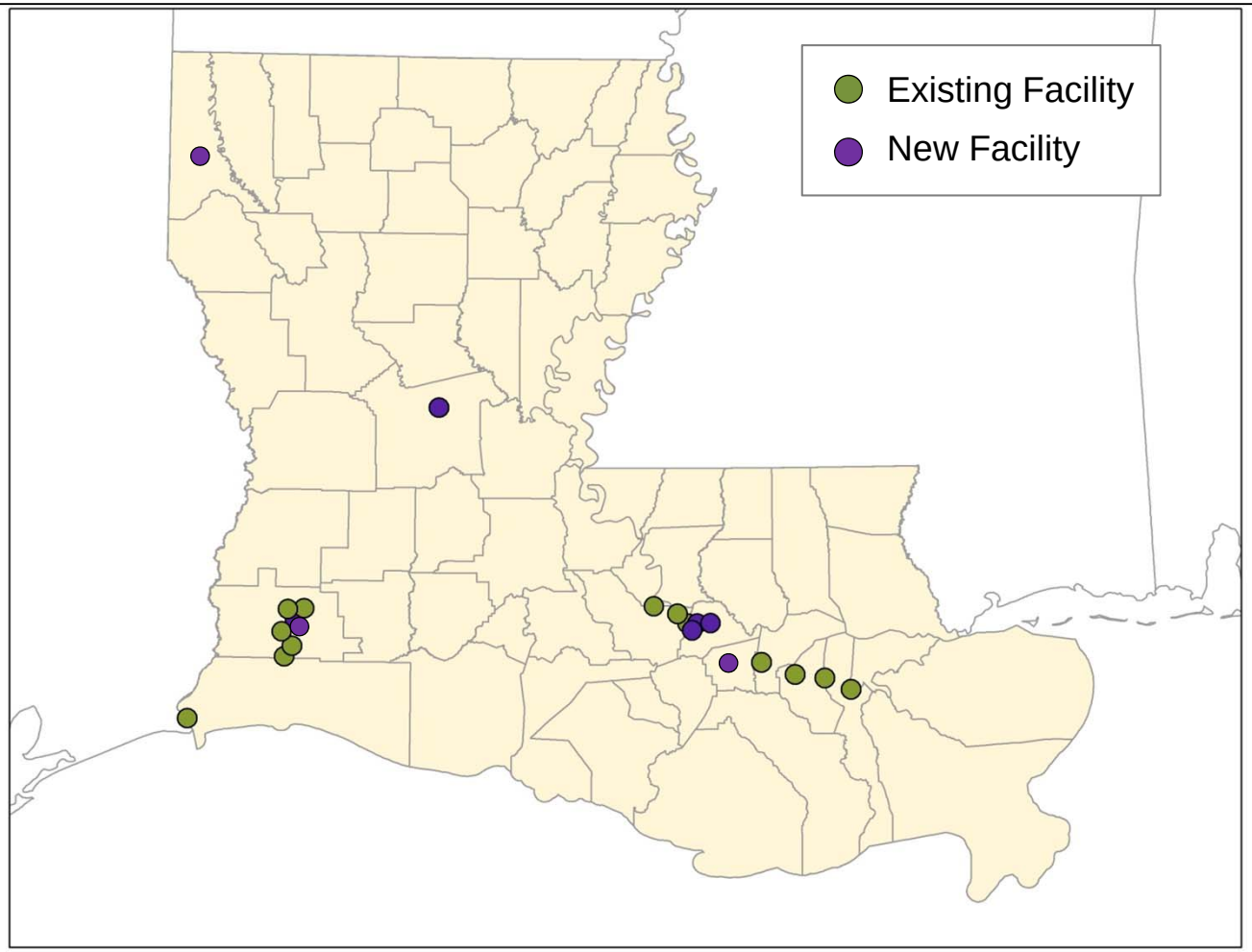
Total Capital Expenditures by Facility Status (Existing, New)

Investments at existing facilities comprise approximately 58 percent of total investment. New facility investments will take longer to materialize and occur in the 2015-2017 time period.



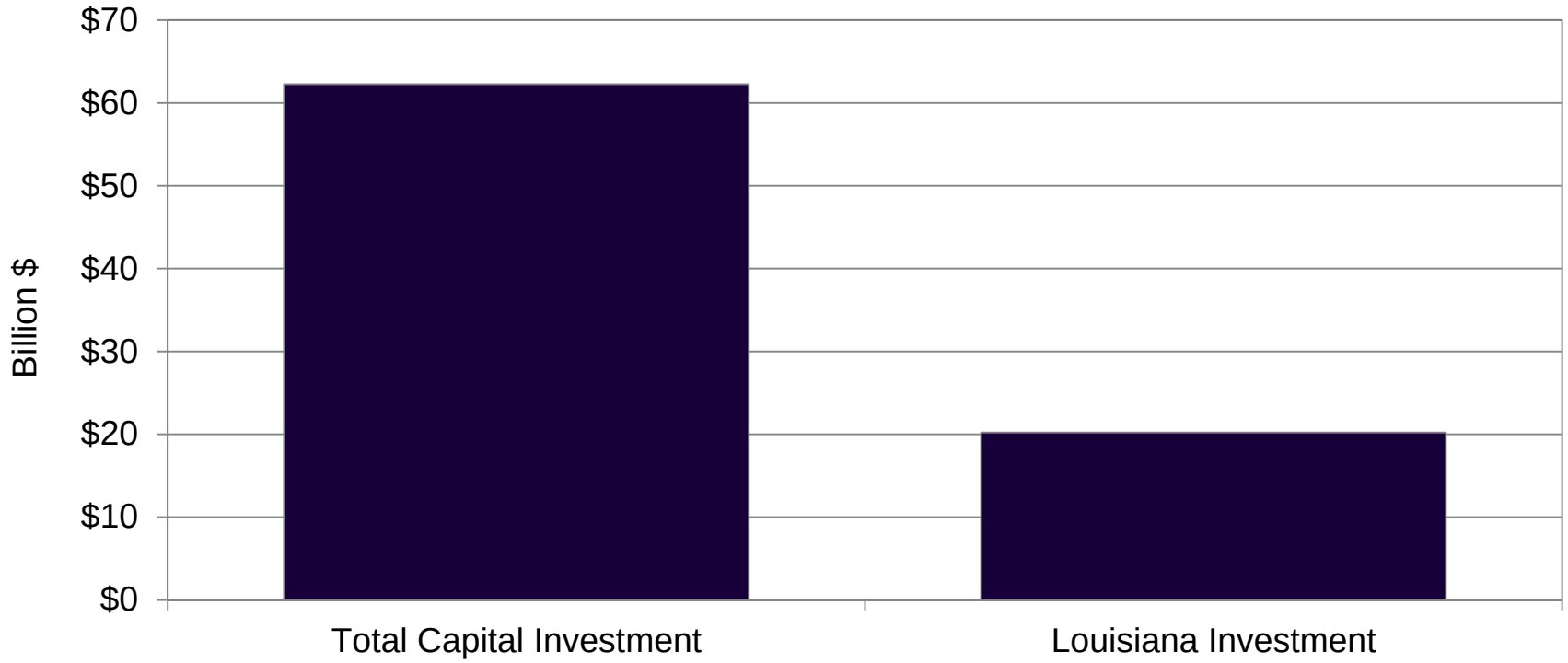
Facility Locations

A large number of the natural gas driven manufacturing investments will occur in South Louisiana given the fact that they are expansions on existing facilities.



In-State Expenditures

Not all of the total capital investment associated with the natural gas driven manufacturing expansions will occur in Louisiana since a large amount of materials and equipment will be purchased out of state. However, despite this "leakage" there is still an anticipated $20.2 billion that will be spent in Louisiana over the several years representing one of the largest, most concentrated levels of capital expenditures in the state's history.



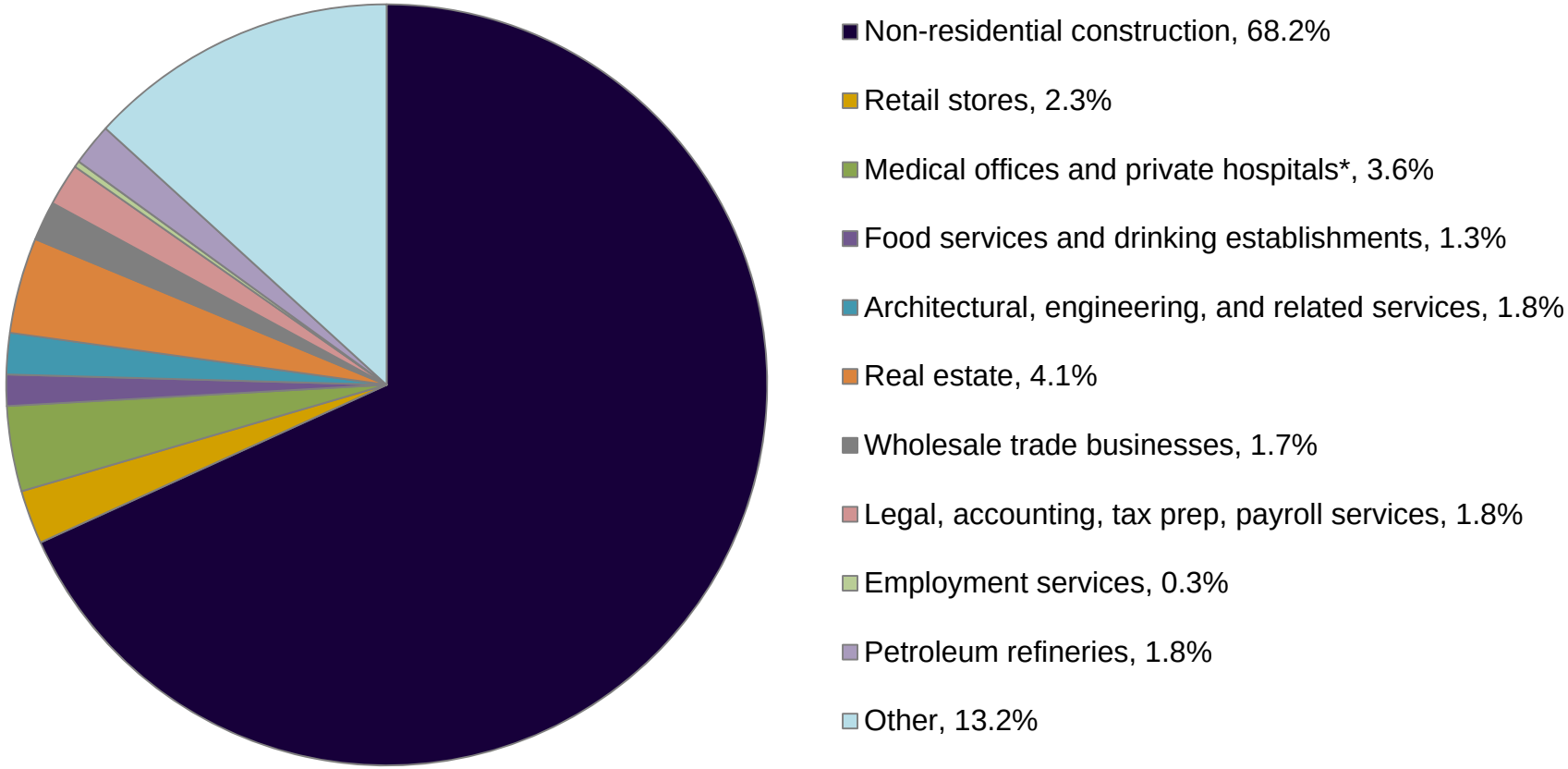
Potential Economic Impacts/Benefit: Construction, State

If developed, all Louisiana natural gas driven project investments will result in a total state-wide economic impact of some $29.7 billion, the creation of over to 214,000 employment opportunities, and $9.3 billion in new wages.

	Construction Impacts									
	Total	2011	2012	2013	2014	2015	2016	2017	2018	2019
Output (million $)										
Direct	$ 20,205.2	$ 4.4	$ 1,715.4	$ 2,461.9	$ 3,630.9	$ 3,907.5	$ 4,255.9	$ 3,150.0	$ 1,002.5	$ 76.8
Indirect	$ 3,243.9	$ 0.7	$ 275.4	$ 395.2	$ 582.9	$ 627.3	$ 683.3	$ 505.7	$ 160.9	$ 12.3
Induced	$ 6,287.8	$ 1.4	$ 533.8	$ 766.1	$ 1,129.9	$ 1,216.0	$ 1,324.4	$ 980.3	$ 312.0	$ 23.9
Total	**$ 29,736.8**	**$ 6.4**	**$ 2,524.6**	**$ 3,623.2**	**$ 5,343.7**	**$ 5,750.8**	**$ 6,263.6**	**$ 4,636.0**	**$ 1,475.4**	**$ 113.0**
Employment (jobs)										
Direct	136,900	30	11,623	16,680	24,601	26,475	28,836	21,343	6,792	520
Indirect	21,885	5	1,858	2,667	3,933	4,232	4,610	3,412	1,086	83
Induced	55,885	12	4,745	6,809	10,043	10,807	11,771	8,712	2,773	212
Total	**214,670**	**47**	**18,225**	**26,156**	**38,576**	**41,515**	**45,217**	**33,467**	**10,651**	**816**
Wages (million $)										
Direct	$ 6,585.1	$ 1.4	$ 559.1	$ 802.3	$ 1,183.3	$ 1,273.5	$ 1,387.1	$ 1,026.6	$ 326.7	$ 25.0
Indirect	$ 952.0	$ 0.2	$ 80.8	$ 116.0	$ 171.1	$ 184.1	$ 200.5	$ 148.4	$ 47.2	$ 3.6
Induced	$ 1,766.3	$ 0.4	$ 150.0	$ 215.2	$ 317.4	$ 341.6	$ 372.0	$ 275.4	$ 87.6	$ 6.7
Total	**$ 9,303.4**	**$ 2.0**	**$ 789.8**	**$ 1,133.5**	**$ 1,671.8**	**$ 1,799.2**	**$ 1,959.6**	**$ 1,450.4**	**$ 461.6**	**$ 35.4**

Potential Economic Impacts/Benefits: Output Distribution, State

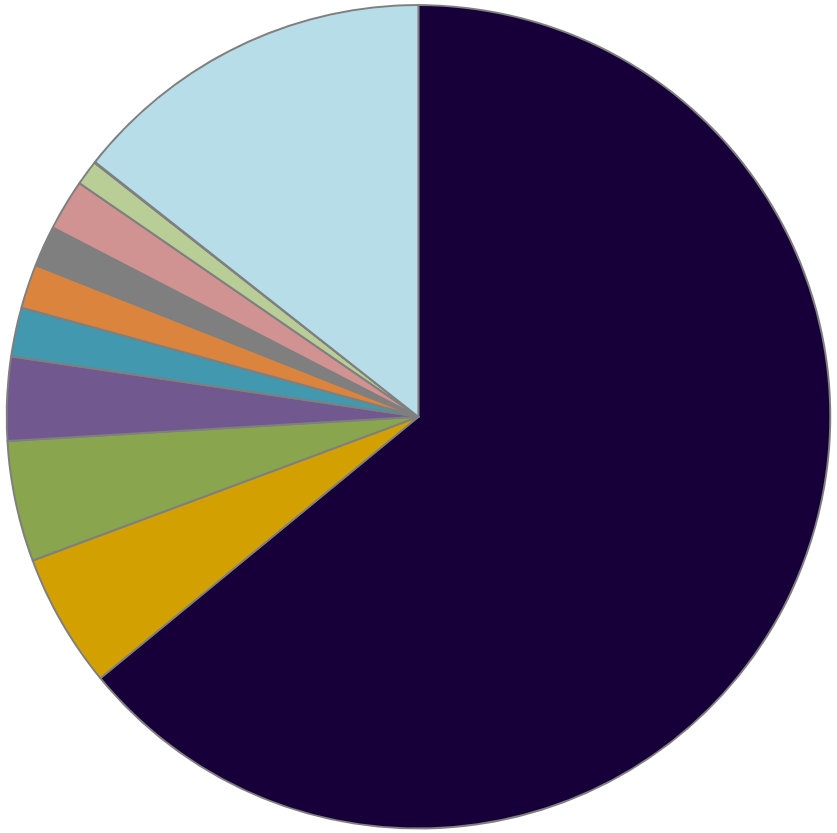
Over 68 percent of the total economic output (sales) are associated with the manufacturing/industrial construction sector. Other large sales impacts occur in the retails, food/entertainment sectors.



Note: *Includes: Offices of physicians, dentists, and other health practitioners, home health care services, medical and diagnostic labs, private hospitals, and nursing and residential care facilities.

Potential Economic Impacts/Benefits: Employment Distribution, State

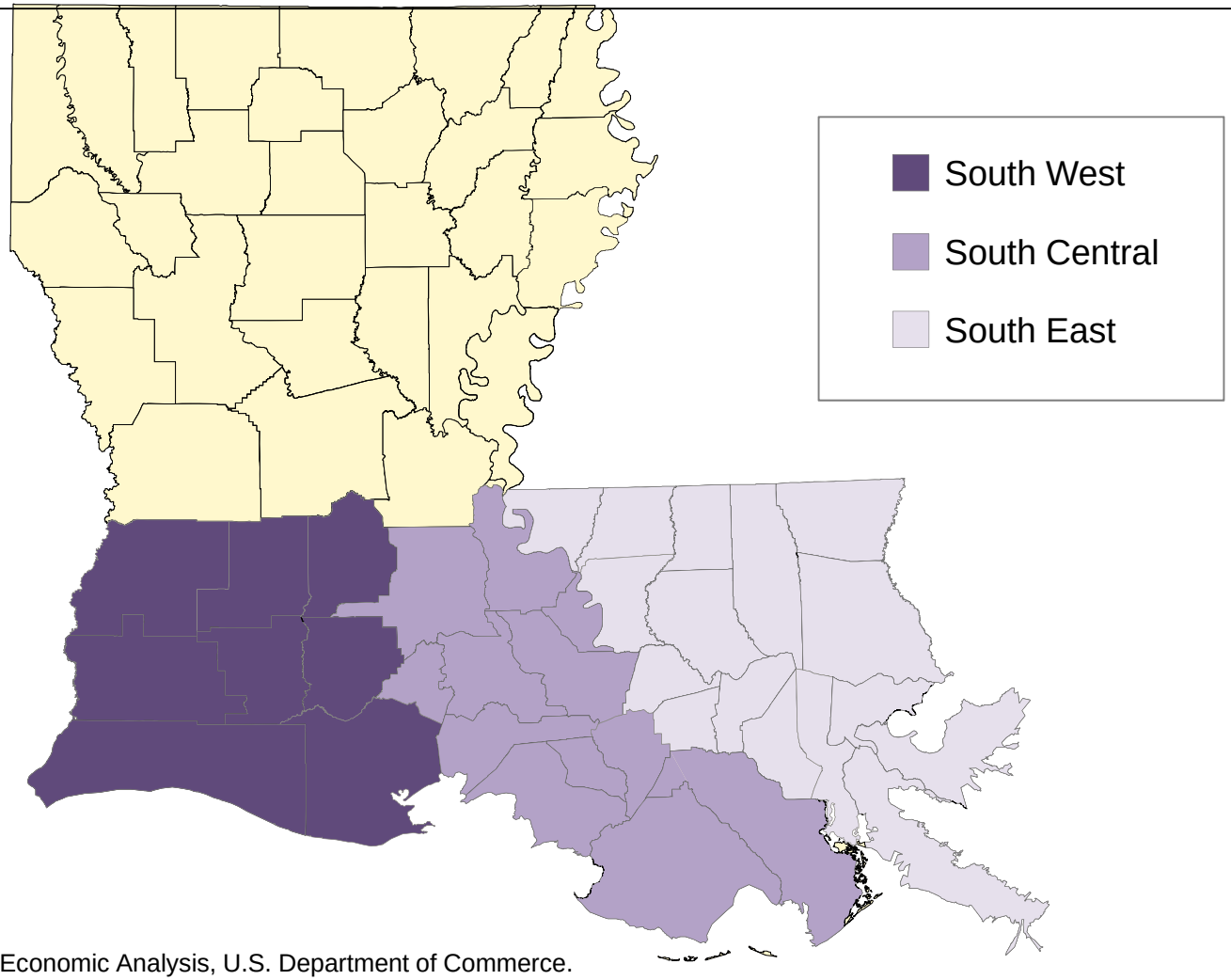
Over 64 percent of the total new employment opportunities occur in the manufacturing/industrial construction sector.



Note: *Includes: Offices of physicians, dentists, and other health practitioners, home health care services, medical and diagnostic labs, private hospitals, and nursing and residential care facilities.

Manufacturing Employment (2010) by Parish (All Sectors)

Regional economic impacts are estimated for three sub-regions of the state where the majority of the direct investment is likely to occur.



Source: Bureau of Economic Analysis, U.S. Department of Commerce.

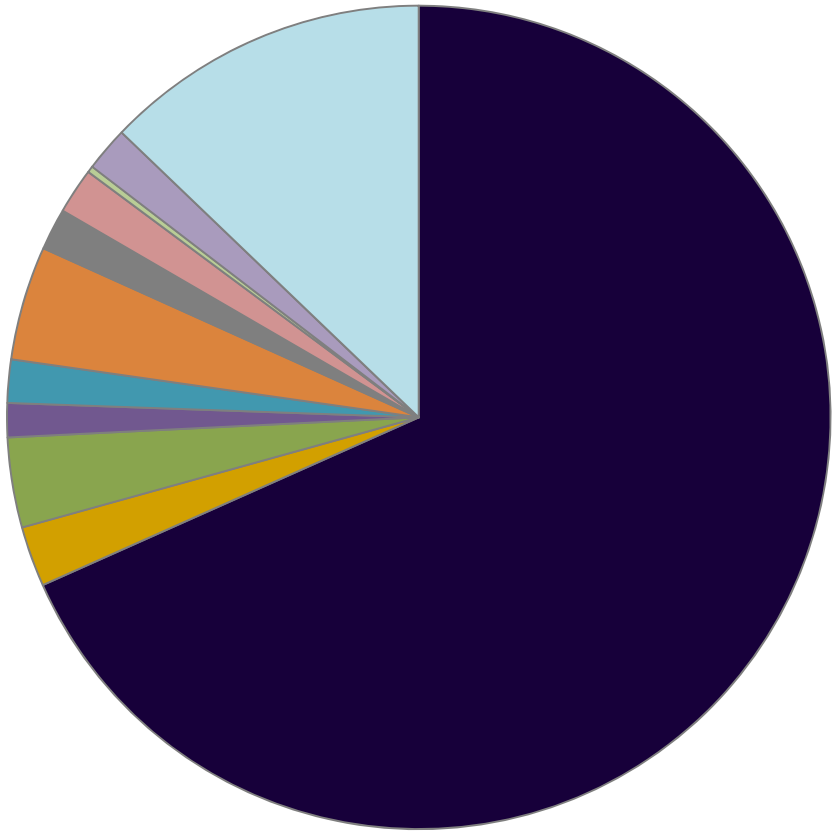
Potential Economic Impacts/Benefits: Construction, South East Region

Southeastern Louisiana is likely to see over $15 billion in total economic activity if all of the natural gas driven project investments occur. These are over 109,000 employment opportunities and $5.2 billion in new wages estimated for the region.

	Construction Impacts - South East									
	Total	2011	2012	2013	2014	2015	2016	2017	2018	2019
Output (million $)										
Direct	$ 10,648.4	$ 2.3	$ 904.0	$ 1,297.4	$ 1,913.5	$ 2,059.3	$ 2,242.9	$ 1,660.1	$ 528.3	$ 40.5
Indirect	$ 1,621.4	$ 0.4	$ 137.6	$ 197.6	$ 291.4	$ 313.6	$ 341.5	$ 252.8	$ 80.4	$ 6.2
Induced	$ 3,369.8	$ 0.7	$ 286.1	$ 410.6	$ 605.5	$ 651.7	$ 709.8	$ 525.3	$ 167.2	$ 12.8
Total	**$ 15,639.6**	**$ 3.4**	**$ 1,327.8**	**$ 1,905.6**	**$ 2,810.4**	**$ 3,024.5**	**$ 3,294.2**	**$ 2,438.2**	**$ 776.0**	**$ 59.4**
Employment (jobs)										
Direct	69,482	15	5,899	8,466	12,486	13,437	14,635	10,832	3,447	264
Indirect	10,636	2	903	1,296	1,911	2,057	2,240	1,658	528	40
Induced	29,237	6	2,482	3,562	5,254	5,654	6,158	4,558	1,451	111
Total	**109,355**	**24**	**9,284**	**13,324**	**19,651**	**21,148**	**23,034**	**17,049**	**5,426**	**416**
Wages (million $)										
Direct	$ 3,713.1	$ 0.8	$ 315.2	$ 452.4	$ 667.3	$ 718.1	$ 782.1	$ 578.9	$ 184.2	$ 14.1
Indirect	$ 502.6	$ 0.1	$ 42.7	$ 61.2	$ 90.3	$ 97.2	$ 105.9	$ 78.4	$ 24.9	$ 1.9
Induced	$ 993.7	$ 0.2	$ 84.4	$ 121.1	$ 178.6	$ 192.2	$ 209.3	$ 154.9	$ 49.3	$ 3.8
Total	**$ 5,209.5**	**$ 1.1**	**$ 442.3**	**$ 634.7**	**$ 936.1**	**$ 1,007.5**	**$ 1,097.3**	**$ 812.2**	**$ 258.5**	**$ 19.8**

Potential Economic Impacts/Benefits: Output Distribution, South East Region

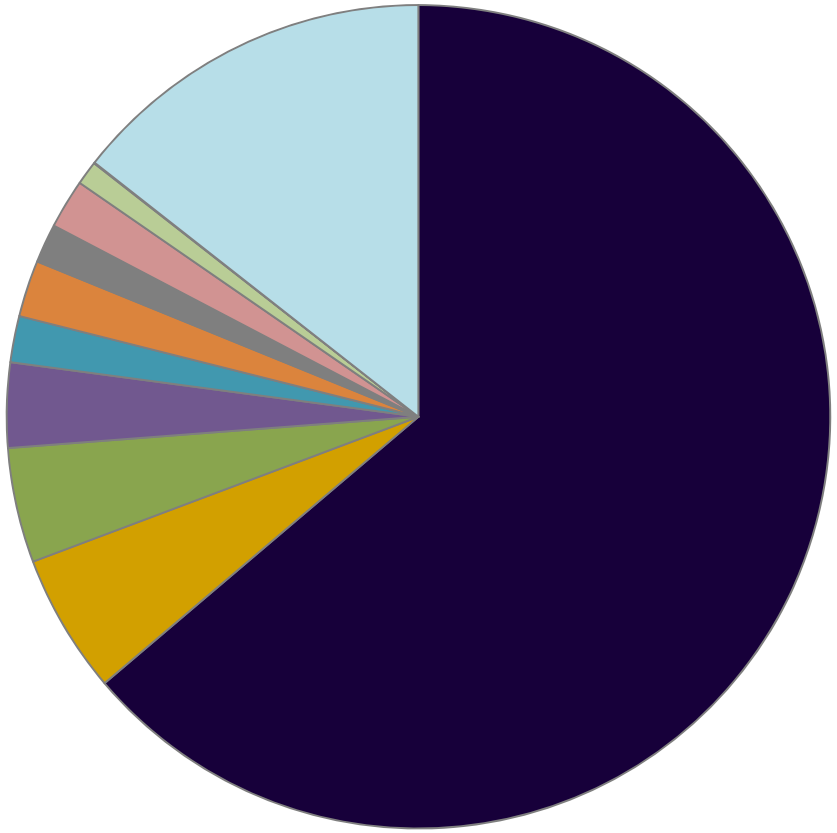
Over 68 percent of the total economic output (sales) for southeastern Louisiana are associated with the manufacturing/industrial construction sector. Other large sales impacts occur in the retails, food/entertainment sectors.



Note: *Includes: Offices of physicians, dentists, and other health practitioners, home health care services, medical and diagnostic labs, private hospitals, and nursing and residential care facilities.

Potential Economic Impacts/Benefits: Employment Distribution, South East Region

Almost 64 percent of the total new employment opportunities in southeastern Louisiana are expected to occur in the manufacturing/industrial construction sector.



Note: *Includes: Offices of physicians, dentists, and other health practitioners, home health care services, medical and diagnostic labs, private hospitals, and nursing and residential care facilities.

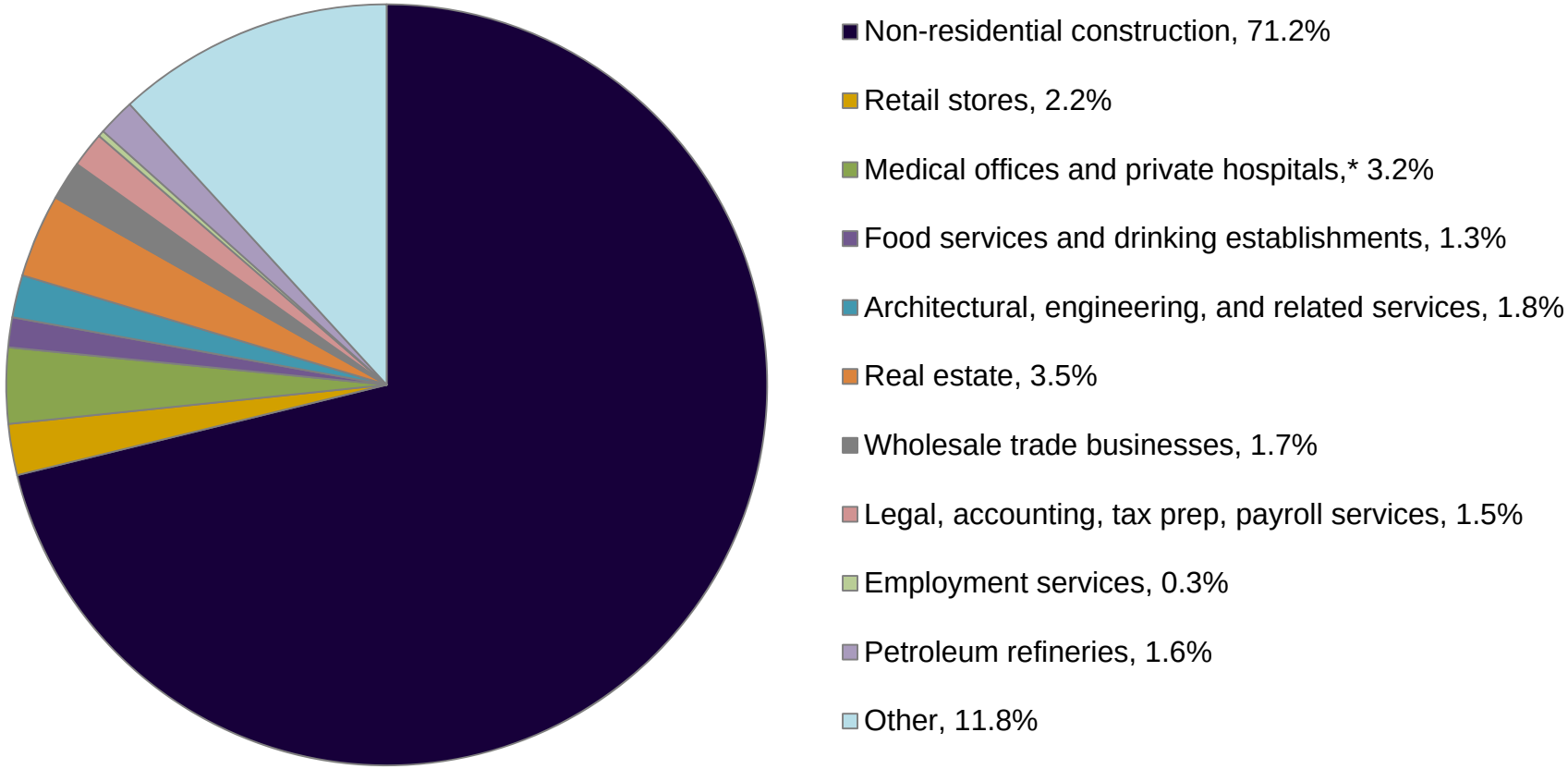
Potential Economic Impacts/Benefits: Construction, South Central Region

South Central Louisiana is likely to see about $4.3 billion in total economic activity if all of the natural gas driven project investments occur. There are close to 31,000 employment opportunities and $1.4 billion in new wages estimated for the region.

Construction Impacts - South Central	Total	2011	2012	2013	2014	2015	2016	2017	2018	2019
Output (million $)										
Direct	$ 3,070.1	$ 0.7	$ 260.6	$ 374.1	$ 551.7	$ 593.7	$ 646.7	$ 478.6	$ 152.3	$ 11.7
Indirect	$ 460.0	$ 0.1	$ 39.1	$ 56.1	$ 82.7	$ 89.0	$ 96.9	$ 71.7	$ 22.8	$ 1.7
Induced	$ 798.2	$ 0.2	$ 67.8	$ 97.3	$ 143.4	$ 154.4	$ 168.1	$ 124.4	$ 39.6	$ 3.0
Total	**$ 4,328.4**	**$ 0.9**	**$ 367.5**	**$ 527.4**	**$ 777.8**	**$ 837.1**	**$ 911.7**	**$ 674.8**	**$ 214.8**	**$ 16.5**
Employment (jobs)										
Direct	20,605	4	1,749	2,511	3,703	3,985	4,340	3,212	1,022	78
Indirect	3,082	1	262	376	554	596	649	481	153	12
Induced	7,233	2	614	881	1,300	1,399	1,524	1,128	359	27
Total	**30,920**	**7**	**2,625**	**3,767**	**5,556**	**5,980**	**6,513**	**4,821**	**1,534**	**118**
Wages (million $)										
Direct	$ 1,025.4	$ 0.2	$ 87.1	$ 124.9	$ 184.3	$ 198.3	$ 216.0	$ 159.9	$ 50.9	$ 3.9
Indirect	$ 136.8	$ 0.0	$ 11.6	$ 16.7	$ 24.6	$ 26.4	$ 28.8	$ 21.3	$ 6.8	$ 0.5
Induced	$ 224.1	$ 0.0	$ 19.0	$ 27.3	$ 40.3	$ 43.3	$ 47.2	$ 34.9	$ 11.1	$ 0.9
Total	**$ 1,386.3**	**$ 0.3**	**$ 117.7**	**$ 168.9**	**$ 249.1**	**$ 268.1**	**$ 292.0**	**$ 216.1**	**$ 68.8**	**$ 5.3**

Potential Economic Impacts/Benefits: Output Distribution, South Central Region

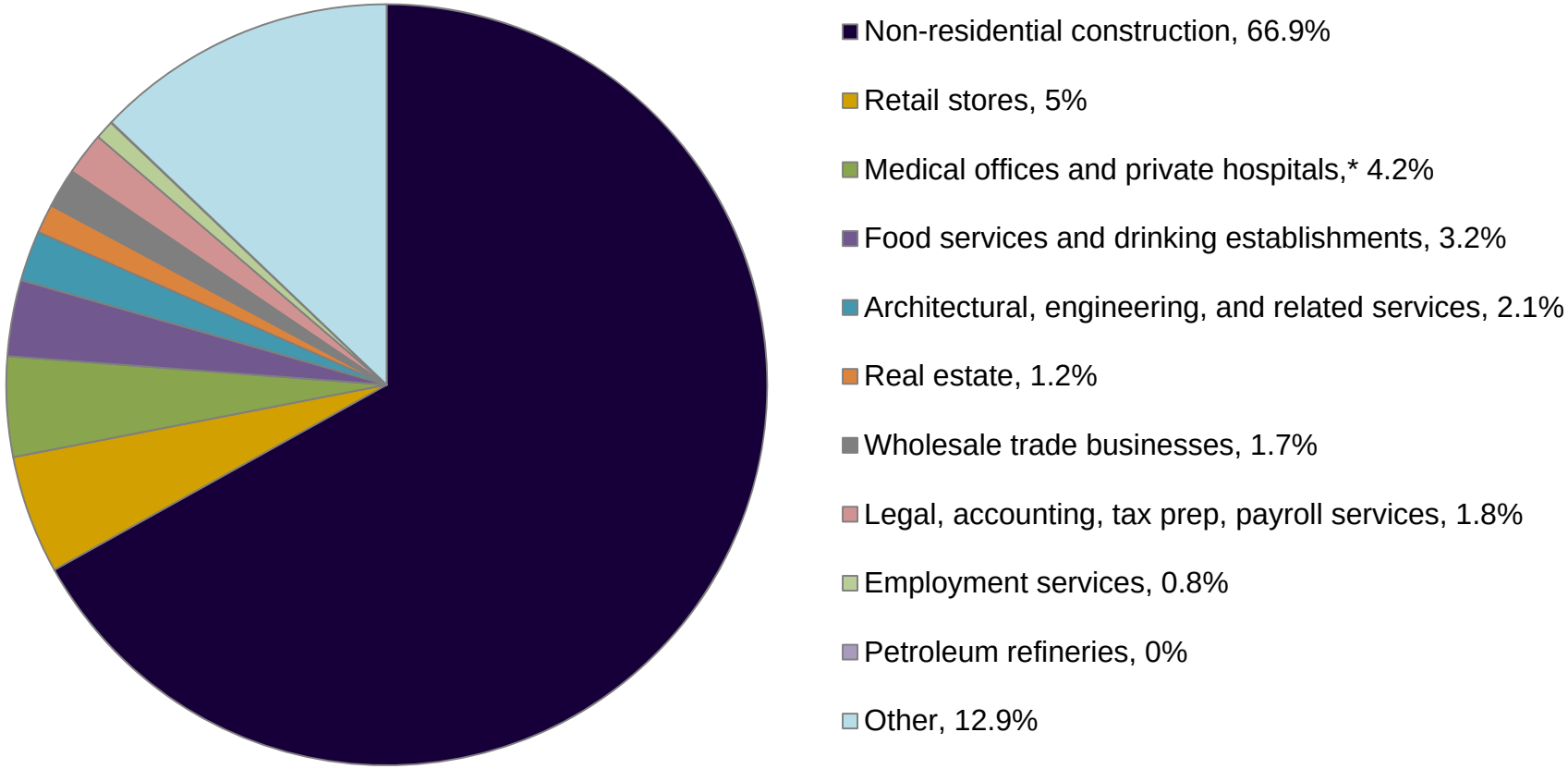
Over 71 percent of the total economic output (sales) for South Central Louisiana are associated with the manufacturing/industrial construction sector. Other large sales impacts occur in the retails, food/entertainment sectors.



Note: *Includes: Offices of physicians, dentists, and other health practitioners, home health care services, medical and diagnostic labs, private hospitals, and nursing and residential care facilities.

Potential Economic Impacts/Benefits: Employment Distribution, South Central Region

About 67 percent of the total new employment opportunities in South Central Louisiana are expected to occur in the manufacturing/industrial construction sector.



Note: *Includes: Offices of physicians, dentists, and other health practitioners, home health care services, medical and diagnostic labs, private hospitals, and nursing and residential care facilities.

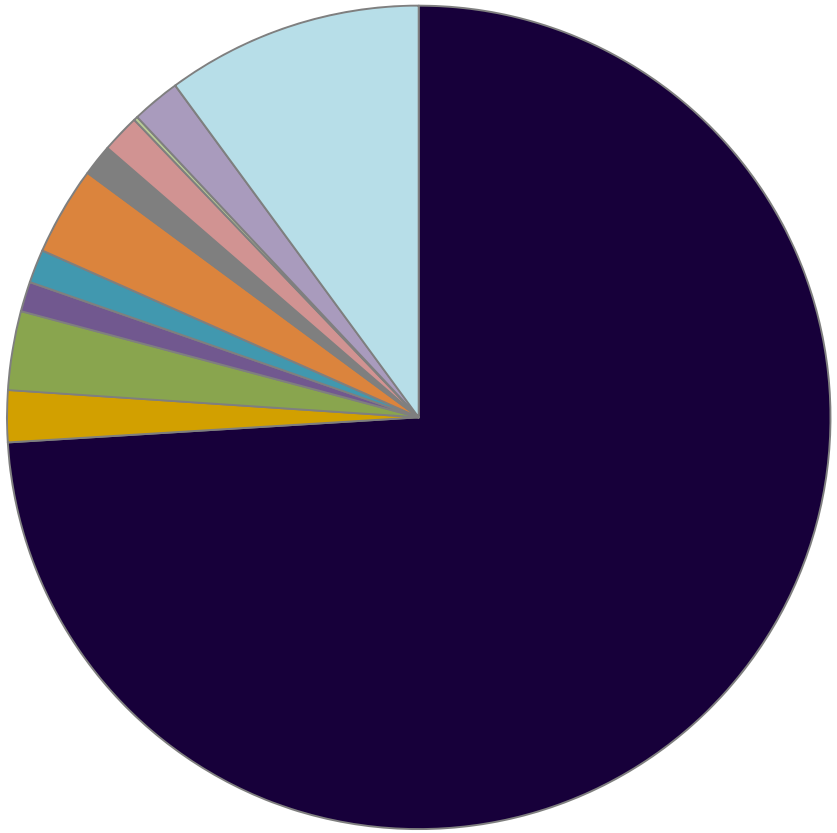
Potential Economic Impacts/Benefits: Construction, South West Region

Southwestern Louisiana is likely to see over $2.6 billion in total economic activity if all of the natural gas driven project investments occur. There are over 19,000 employment opportunities and about $776 million in new wages estimated for the region.

Construction Impacts - South West	Total	2011	2012	2013	2014	2015	2016	2017	2018	2019
Output (million $)										
Direct	$ 1,923.3	$ 0.4	$ 163.3	$ 234.3	$ 345.6	$ 371.9	$ 405.1	$ 299.8	$ 95.4	$ 7.3
Indirect	$ 242.5	$ 0.1	$ 20.6	$ 29.6	$ 43.6	$ 46.9	$ 51.1	$ 37.8	$ 12.0	$ 0.9
Induced	$ 440.6	$ 0.1	$ 37.4	$ 53.7	$ 79.2	$ 85.2	$ 92.8	$ 68.7	$ 21.9	$ 1.7
Total	**$ 2,606.5**	**$ 0.6**	**$ 221.3**	**$ 317.6**	**$ 468.4**	**$ 504.1**	**$ 549.0**	**$ 406.4**	**$ 129.3**	**$ 9.9**
Employment (jobs)										
Direct	13,455	3	1,142	1,639	2,418	2,602	2,834	2,098	668	51
Indirect	1,659	0	141	202	298	321	350	259	82	6
Induced	4,175	1	354	509	750	807	879	651	207	16
Total	**19,289**	**4**	**1,638**	**2,350**	**3,466**	**3,730**	**4,063**	**3,007**	**957**	**73**
Wages (million $)										
Direct	$ 606.5	$ 0.1	$ 51.5	$ 73.9	$ 109.0	$ 117.3	$ 127.8	$ 94.6	$ 30.1	$ 2.3
Indirect	$ 60.0	$ 0.0	$ 5.1	$ 7.3	$ 10.8	$ 11.6	$ 12.6	$ 9.4	$ 3.0	$ 0.2
Induced	$ 109.9	$ 0.0	$ 9.3	$ 13.4	$ 19.8	$ 21.3	$ 23.2	$ 17.1	$ 5.5	$ 0.4
Total	**$ 776.4**	**$ 0.2**	**$ 65.9**	**$ 94.6**	**$ 139.5**	**$ 150.2**	**$ 163.5**	**$ 121.0**	**$ 38.5**	**$ 3.0**

Potential Economic Impacts/Benefits: Output Distribution, South West Region

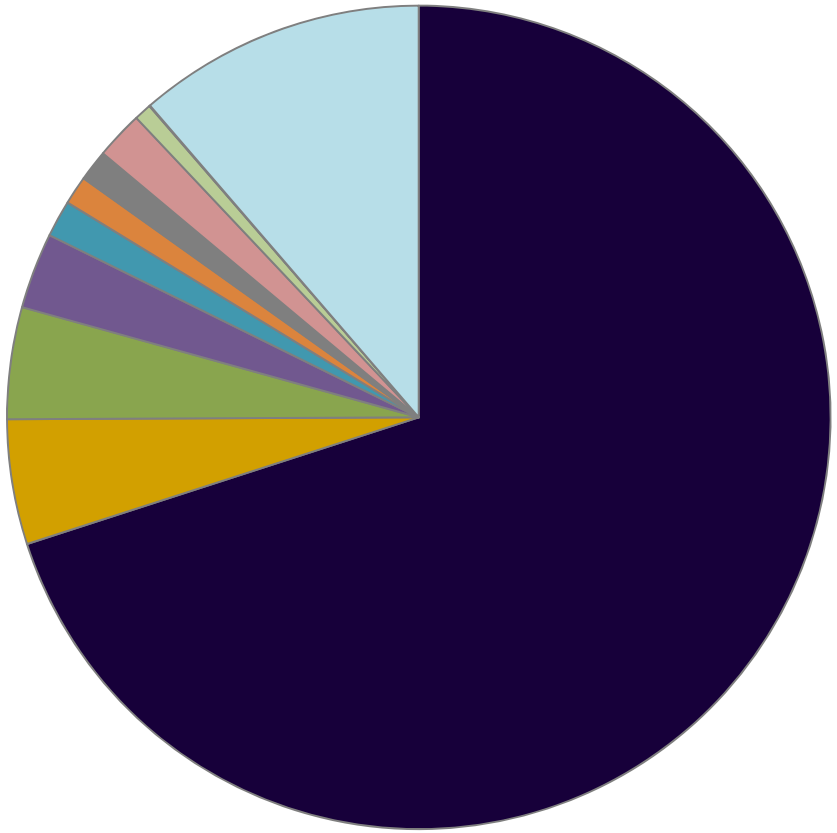
About 74 percent of the total economic output (sales) for southwestern Louisiana are associated with the manufacturing/industrial construction sector. Other large sales impacts occur in the retails, food/entertainment sectors.



Note: *Includes: Offices of physicians, dentists, and other health practitioners, home health care services, medical and diagnostic labs, private hospitals, and nursing and residential care facilities.

Potential Economic Impacts/Benefits: Employment Distribution, South West Region

About 70 percent of the total new employment opportunities in southwestern Louisiana are expected to occur in the manufacturing/industrial construction sector.



Note: *Includes: Offices of physicians, dentists, and other health practitioners, home health care services, medical and diagnostic labs, private hospitals, and nursing and residential care facilities.

Section 6: Conclusions

Conclusions

Unconventional oil and gas development (drilling, production) has already led to hundreds of thousands of jobs, hundreds of millions in direct royalty and bonus payments, as well as local, parish and state tax revenues. While the economic benefits of these upstream activities are relatively well-recognized and documented, their positive downstream implications have been less appreciated.[1]

Abundant and less volatile-priced natural gas supplies are leading to a renaissance of manufacturing announcements and industrial activity throughout the U.S. This is particularly true in Louisiana where over $62.3 billion in new capital investments, in a variety of different projects, has been announced over the past 12 months. All of these announcements are based upon the new realities of abundant and affordable natural gas supplies, and the proximity to one of the largest sources of supply, the Haynesville Shale, in the U.S.

While all $62.3 billion of these expenditures are not likely to be made directly in Louisiana, some $20.2 billion is expected to be spent entirely within the state on construction-related activities developing or expanding new manufacturing or industrial sites. The construction of these recently-announced natural gas induced projects is estimated to generate an economic benefit of over $29.7 billion in economic output over a nine-year period (2011-2019), a cumulative increase of some 214,670 job-years, and $9.3 billion increase in wages over a nine-year construction period.

[1]See Scott, Loren C. *The Economic Impact of the Haynesville Shale on the Louisiana Economy: 2009 Analysis and Projections for 2010-2014*. April 2010. And Scott, Loren C. *The Energy Sector: Still a Giant Economic Engine for the Louisiana Economy*. Mid-Continent Oil and Gas Association. August 2011.

Appendix A:
Press Clippings

Selected Press Clippings

May 23, 2012: Dyno Nobel Announces Feasibility Study for $800 million Project in Jefferson Parish
"Gov. Jindal said, 'Dyno Nobel's interest in building a new facility here speaks volumes about the affordable, abundant supply of natural gas across Louisiana, the performance of our energy markets, the state's strong business climate, and our world-class workforce. With the new production of unconventional natural gas plays in Louisiana, more and more companies are recognizing that our state is uniquely positioned to provide major supplies of natural gas to companies all over the country. We're confident that when the company's due diligence is done and a formal investment decision is made early next year that this project will move forward and bring tremendous economic benefits to this region.'"
...
"'We are excited to welcome Dyno Nobel to Louisiana,' said Greg Zoglio, CEO of Cornerstone Chemical Company, 'The U.S. Gulf Coast economic model has changed due to the advent of advanced drilling and extraction techniques and the associated impact on natural gas pricing. Dyno Nobel's foresight of this paradigm shift, coupled with the brownfield offering by Cornerstone Chemical Company and project support provided by the State of Louisiana, will allow the resurgence of world-class ammonia production in the state.'"

May 8, 2012: DMC Carter Chambers Announces Plans for New Baton Rouge Headquarters
"Gov. Jindal said '…The decision to stay and expand in Baton Rouge speaks volumes about Louisiana's strong business climate and the strength of our oil and gas, chemical, power, petrochemical, and paper industries. Indeed, for years, we often read news stories about companies leaving to go to Texas because of the business climate and the proximity to oil and gas companies. Now, companies like DMC are choosing Louisiana over Texas and other states because we have created an environment where businesses can invest and succeed.'"

Selected Press Clippings

May 3, 2012: Sempra Secures Final Agreement for New $6 Billion LNG Facility in Louisiana
"Governor Jindal said, 'Sempra's decision to move forward in developing a new LNG export terminal in Louisiana is great news for our state and our people. With expanded natural gas production from the Haynesville Shale and other shale plays, companies are recognizing what a great place Louisiana is for energy investments because of our abundant, reliable supply of natural gas and because of our strong business climate. Facilities like this will help support thousands of jobs in the energy industry across our state and will ensure quality jobs for Louisiana families for years to come.'"

March 5, 2012: K&B Machine Announces $40 Million Manufacturing Investment
"K&B will benefit not only from traditional oil and gas exploration in Louisiana, but from new formations, such as the Haynesville and Tuscaloosa shales, that will drive additional demand for oilfield pipe fabrication and services."

February 14, 2012: Union Pacific Announces $200 Million Investment in South Louisiana
"A stable, abundant supply of natural gas in Louisiana has prompted many industrial producers who rely on that feedstock to make forward-looking investments and grow their presence in the state."

January 18, 2012: Methanex Selects Louisiana for Potential Methanol Production Facility
"With a competitive and rapidly improving business climate combined with the benefits of low, stable natural gas prices, Louisiana is poised for a renaissance in its energy and chemical industries."
…
"'The outlook for low North American natural gas prices makes Louisiana an attractive location in which to produce methanol,' said Methanex President and CEO Bruce Aitken."

Selected Press Clippings

January 12, 2012: Houston Plating & Coating Announces $9 Million Investment in Scott
"…LP&C's corrosion-protection services will support the continued growth and expansion of our region's shale gas exploration and production businesses."
…
"The new LP&C facility to be built in Scott represents a valuable addition to Louisiana's oil and gas sector,' said LED Secretary Stephen Moret. 'We rely on innovative companies to forecast future oilfield supply needs and to expand their capacity to provide key services to the state's energy industry. Given the strong demand and price trends for oil and the growth of unconventional shale plays in the state, this sector continues to be one of our most promising economic leaders."

November 30, 2011: Sasol Announces Feasibility Study for Potential $4.5 Billion Ethylene Production Complex in South Louisiana
"'Today, Gov. Bobby Jindal said a Sasol Ltd. decision to explore building a $3.5 billion to $4.5 billion ethylene production site in Louisiana further cements the state's reputation as one of the world's best locations for natural gas-related investments.'"
…
"'We believe strategic growth in chemicals will take full advantage of the natural gas opportunities along the U.S. Gulf Coast and the anticipated growth will strengthen Sasol's overall portfolio,' said Sasol CEO David Constable, who described the study as an important next step in the growth of Sasol's chemical business.'"

Selected Press Clippings

November 22, 2011: Sundrop Fuels Announces $450 Million Biofuels Refinery in Alexandria Area
"Sundrop Fuels also will extract hydrogen from abundant supplies of Louisiana natural gas, combining the hydrogen in a proprietary reactor with carbon extracted from wood waste. "
…
"LED's Lead Development Group identified and began actively cultivating Sundrop Fuels in early 2011, and the Alexandria area emerged as a promising location because of its access to major electrical and natural gas supplies and because of the abundance of wood byproducts the region boasts."
…
"'Sundrop Fuels' first facility will provide America with millions of gallons of renewable gasoline and establish our transformative gasification technology while supporting Louisiana's natural gas and sustainable forestry industries,' said Simmons, the Sundrop Fuels CEO."

October 25, 2011: BASF Dedicates Methylamines Plant in Louisiana
"'BASF's investment joins a growing roster of major petrochemical investments in Louisiana that are being driven by our abundant supply of natural gas, very affordable prices for that supply, and a steadily improving business climate that ranks among the very best in the U.S.'"