

Global Natural Gas: A Growing Resource

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Summary

The role of natural gas in the U.S. economy is expected to be a major part of the debate over energy policy in the 112th Congress. This report briefly explains key aspects of global natural gas markets, including supply and demand, as well as major U.S. developments.

Natural gas is considered a potential bridge fuel to a low carbon economy because it is cleaner burning than its hydrocarbon rivals coal and oil. Natural gas combustion emits about two-thirds less carbon dioxide than coal and one-quarter less than oil when consumed in a typical electric power plant. Natural gas combustion also emits less particulate matter, sulfur dioxide, and nitrogen oxides than coal or oil. Additionally, improved methods to extract natural gas from certain shale formations has significantly increased the resource profile of the United States, which has spurred other countries to try to develop shale gas. If the United States and other countries can bring large new volumes of natural gas to market, then natural gas could play a larger role in the world's economy. Several key factors will determine whether significant new quantities of natural gas come to market, particularly unconventional natural gas resources. These factors include price, technical capability, environmental concerns, and political considerations. Many countries, both producing and consuming, are watching how the development of U.S. unconventional natural gas resources evolves.

Key Points:

- Natural gas is likely to play a greater role in the world energy mix given its growing resource base and its relatively low carbon emissions compared to other fossil fuels.
- The world used over 100,000 billion cubic feet (bcf) of natural gas in 2009, of which the United States consumed almost 23,000 bcf, the most of any country. Between 2008 and 2009, world consumption declined about 2.6%, while U.S. consumption dropped 1.6%, or 388 bcf.
- In 2009, almost 84% of the natural gas the United States consumed was from domestic production. Another 14 % of consumption was met with Canadian imports. Liquefied natural gas (LNG), mainly from Trinidad & Tobago and Egypt, comprised just 2% of consumption.
- U.S. unconventional natural gas reserves and production, particularly shale gas, have grown rapidly in recent years. In 2009, shale gas reserves increased 76%, while production rose 47%, according to a recent U.S. Energy Information Administration (EIA) report. The new shale gas resources have changed the U.S. natural gas position from net importer to potentially a net exporter. Other countries are now exploring their own shale gas resources.

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Introduction

The role of natural gas in the U.S. economy is expected to be a major part of the debate over energy policy in the 112th Congress. This report briefly explains key aspects of global natural gas markets, including supply and demand, as well as major U.S. developments.[1]

Natural gas is considered a potential bridge fuel to a low carbon economy because it is cleaner burning than its hydrocarbon rivals coal and oil. Natural gas combustion emits about two-thirds less carbon dioxide than coal and one-quarter less than oil when consumed in a typical electric power plant.[2] Natural gas combustion also emits less particulate matter, sulfur dioxide, and nitrogen oxides than coal or oil. Additionally, improved methods to extract natural gas from certain shale formations has significantly increased the resource profile of the United States, which has spurred other countries to try to develop shale gas. If the United States and other countries can bring large new volumes of natural gas to market, then natural gas could play a larger role in the world's economy. Several key factors will determine whether significant new quantities of natural gas come to market, particularly unconventional natural gas resources.[3] These factors include price, technical capability, environmental concerns, and political considerations. Many countries, both producing and consuming, are watching how the development of U.S. unconventional natural gas resources evolves.

Key Points:

- Natural gas is likely to play a greater role in the world energy mix given its growing resource[4] base and its relatively low carbon emissions compared to other fossil fuels.
- The world used over 100,000 billion cubic feet (bcf) of natural gas in 2009, of which the United States consumed almost 23,000 bcf, the most of any country. Between 2008 and 2009, world consumption declined about 2.6%, while U.S. consumption dropped 1.6%, or 388 bcf.
- In 2009, almost 84% of the natural gas the United States consumed was from domestic production. Another 14 % of consumption was met with Canadian imports. Liquefied natural gas[5] (LNG), mainly from Trinidad & Tobago and Egypt, comprised just 2% of consumption.

[1] Data in this report are 2009 figures from the *BP Statistical Review of World Energy 2010* unless otherwise noted. For global data, BP's Statistical Review is considered an industry standard.

[2] International Finance Corporation, *Environmental, Health, and Safety Guidelines for Thermal Power Plants*, December 19, 2008, p. 8.

[3] Unconventional natural gas refers to natural gas that is not held in traditional porous rock reservoirs like limestone or sandstone, but is trapped in other types of formations. The three most common forms of unconventional natural gas are coalbed methane, shale gas, and tight gas. Coalbed methane refers to natural gas associated with coal seams. Shale gas refers to natural gas trapped in shale rock, which tends to be fine-grained sedimentary rock. Tight gas refers to natural gas trapped in impermeable and non-porous formations.

[4] Resources, or resource base, is a broad term that includes reserves (see below) as well as natural gas less likely to be produced. Resources are not subject to today's technology or price constraints as reserves are and may be produced sometime in the future.

[5] Natural gas is liquefied to make transportation by tanker economical. When natural gas is cooled to -260ºF it liquefies and reduces its volume by 1/600th. The liquefied gas is then pumped onto specially designed tankers and shipped to ports to be regasified at specially designed import terminals. Once it is back in its gaseous state, the natural gas is (continued...)

- U.S. unconventional natural gas reserves[6] and production, particularly shale gas, have grown rapidly in recent years. In 2009, shale gas reserves increased 76%, while production rose 47%.[7] The new shale gas resources have changed the U.S. natural gas position from net importer to potentially a net exporter. Other countries are now exploring their own shale gas resources.

(...continued)

pumped into a pipeline system and is no different from normal natural gas.

[6] Reserves is an industry term to define the likelihood that natural gas resources can be produced using current technology and at today's prices, according to the Society of Petroleum Engineers and the World Petroleum Congresses definition.

[7] U.S. Energy Information Administration (EIA), *Summary: U.S. Crude Oil, Natural Gas, and Natural Gas Liquids Proved Reserves 2009*, November 2010, http://www.eia.gov/pub/oil_gas/natural_gas/data_publications/crude_oil_natural_gas_reserves/current/pdf/arrsummary.pdf.

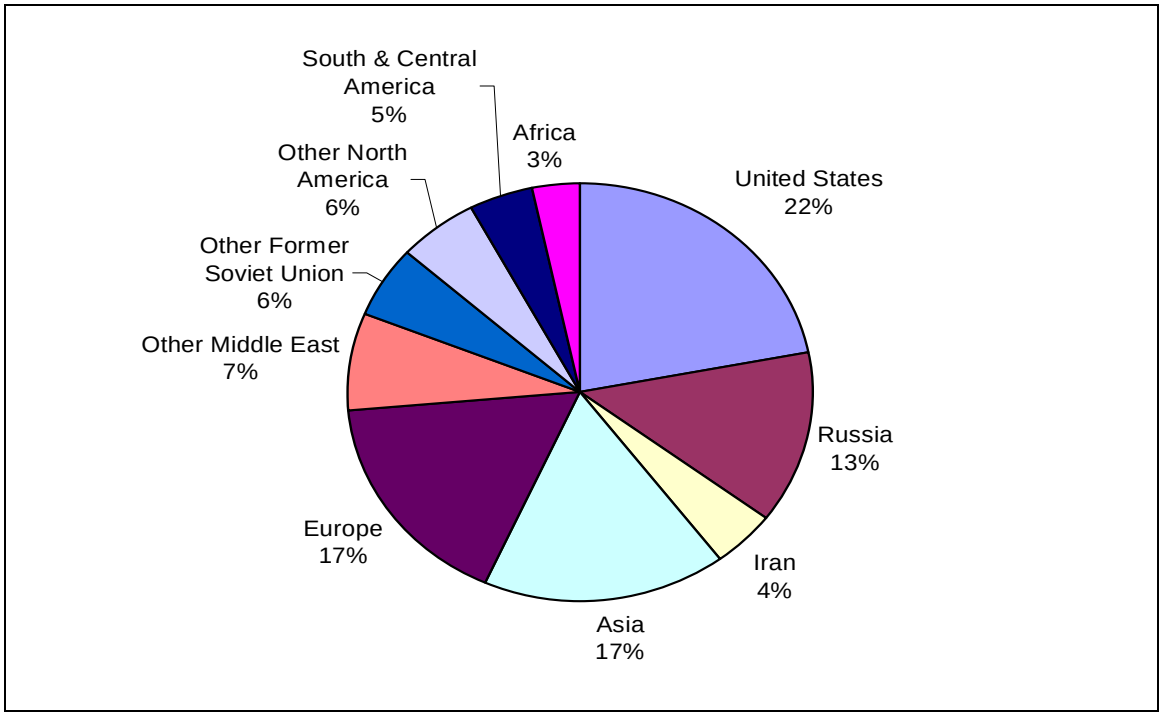
Natural Gas Consumption

Key Global Consumers

In 2009, the world consumed almost 104,000 bcf of natural gas—24% of total global energy consumption and 27% of U.S. needs. The United States was the world's largest consumer of natural gas, accounting for 22,849 bcf, or 22%, of global consumption (**Figure 1**). Consumption of natural gas declined both globally and in the United States by about 2% last year—the most rapid decline on a global basis on record[8]—which can be mainly attributed to the economic downturn.

Figure 1. Global Natural Gas Consumption

Total global consumption was 103,825 bcf in 2009



Source: *BP Statistical Review of World Energy 2010*, p. 27.

Electric power generation, residential and commercial uses, and industrial uses each account for about one-third of U.S. natural gas consumption. In 2009, electric power generation, which was the only sector to increase its gas usage above 2008 levels, led the consuming sectors with 6,900 bcf of natural gas, or a 3% rise.[9] Russia and Iran, the second and third largest consumers of natural gas, both subsidize natural gas usage, which increases their consumption. China, the fifth largest consumer last year, with a global share of just over 3%, is viewed as a growing market for natural gas, which currently comprises less than 4% of China's primary energy use.

[8] *BP Statistical Review of World Energy 2010*, p. 29.

[9] U.S. Energy Information Administration (EIA), *Natural Gas Consumption by End Use Database*, September 29, 2010.

Natural Gas Supply and Trade

Natural Gas Reserves Growing

Global proved natural gas reserves[10]—natural gas that has been discovered and can be expected to be economically produced—amounted to 6,621,153 bcf, which correlates to over a 60-year supply at current production levels. New reserves are developed every year as existing reserves are consumed, so that the ratio between the world's reserves and global production has remained around 60 years since 1980. Natural gas reserves have grown about 6% since 2007, demonstrating the success of exploration and improved recovery techniques.[11]

In 2009, U.S. natural gas reserves were 244,731 bcf (the value used for international comparisons in this report),[12] or about 12 years' supply at current production levels. However, a recently released report by the U.S. EIA revised U.S. reserves upward to 284,000 bcf, primarily driven by shale gas additions.[13] The improvements in development of shale gas resources over the last two years have changed the U.S. supply profile for natural gas. In June 2009, the Potential Gas Committee[14] released its biennial assessment of U.S. natural gas resources, including reserves, which total over 1,765,735 bcf according to the report, an increase of almost 40% over the last assessment. The increase is attributed to a re-evaluation of shale gas resources, primarily in the Appalachian basin, Mid-Continent (including parts of Arkansas, Oklahoma, and Texas), Gulf Coast, and Rocky Mountain areas.

[10] Reserves is an industry term to define the likelihood that natural gas resources can be produced using current technology and at today's prices according to the Society of Petroleum Engineers and the World Petroleum Congresses definition.

[11] Production has increased along with the addition to reserves, which is why the reserves-to-production ratio has stayed constant.

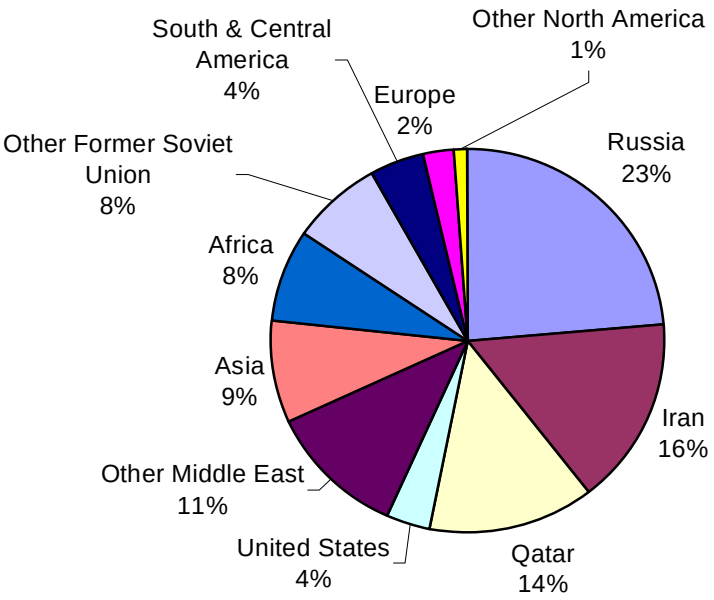
[12] *BP Statistical Review of World Energy 2010*, p. 22.

[13] U.S. Energy Information Administration (EIA), *Summary: U.S. Crude Oil, Natural Gas, and Natural Gas Liquids Proved Reserves 2009*, November 2010. This value is not used for international comparisons in this report because similar updated values do not exist for other nations.

[14] The Potential Gas Committee (PGC) is an independent, nonprofit organization made up of knowledgeable volunteer members who work in various part of the natural gas industry. PGC is loosely affiliated with the Colorado School of Mines through the school's Potential Gas Agency. Funding for PGC comes mostly from industry-related organizations.

Figure 2. Global Natural Gas Reserves

Global natural gas reserves were 6,621,153 bcf in 2009



Source: BP Statistical Review of World Energy 2010, p. 22.

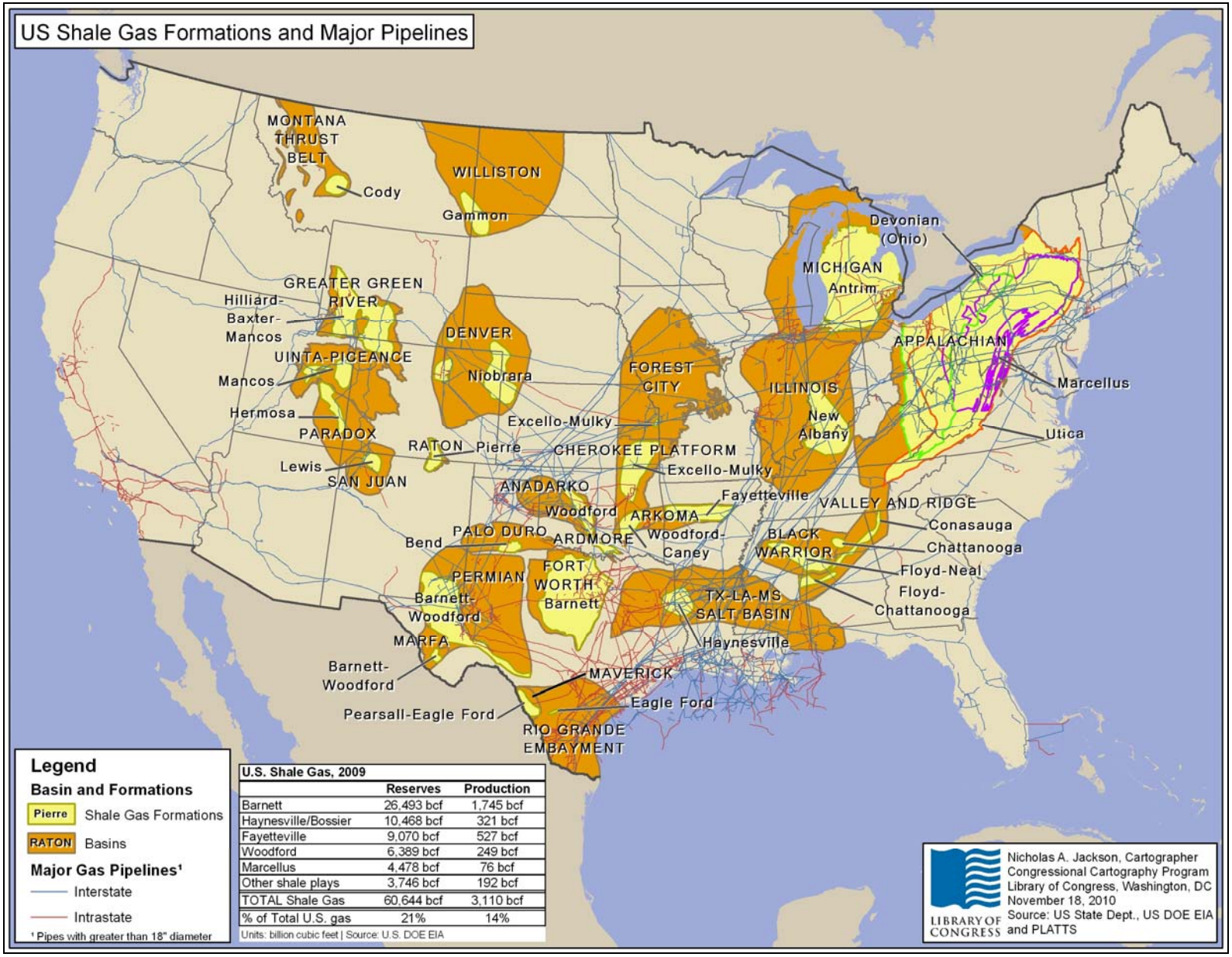
Shale gas accounted for 21% of U.S. natural gas reserves in 2009, up from 14% in 2008.[15] Nevertheless, questions still remain about the size of U.S. shale gas resources (which by most estimates is more than current U.S. natural gas reserves); the price level required to sustain their development; and whether there are technical, environmental, or political factors that might limit their development. The use and disposition of water in an industry process called hydraulic fracturing[16] is the main issue facing companies and regulators. The EPA is undertaking a study to determine any adverse effects of the practice on water supplies or other environmental areas.[17]

[15] U.S. Energy Information Administration (EIA), *Summary: U.S. Crude Oil, Natural Gas, and Natural Gas Liquids Proved Reserves 2009*, November 2010, pp. 1 and 4.

[16] Hydraulic fracturing is an industry practice of pumping water and proppant, a granular material used to hold open fractures, into wells to improve recovery of natural gas. For additional information on hydraulic fracturing, see CRS Report R40894, *Unconventional Gas Shales: Development, Technology, and Policy Issues* , coordinated by Anthony Andrews.

[17] In its FY2010 Appropriations Committee Conference Report, Congress directed EPA to study the relationship between hydraulic fracturing and drinking water.

Figure 3. U.S. Shale Gas Formations

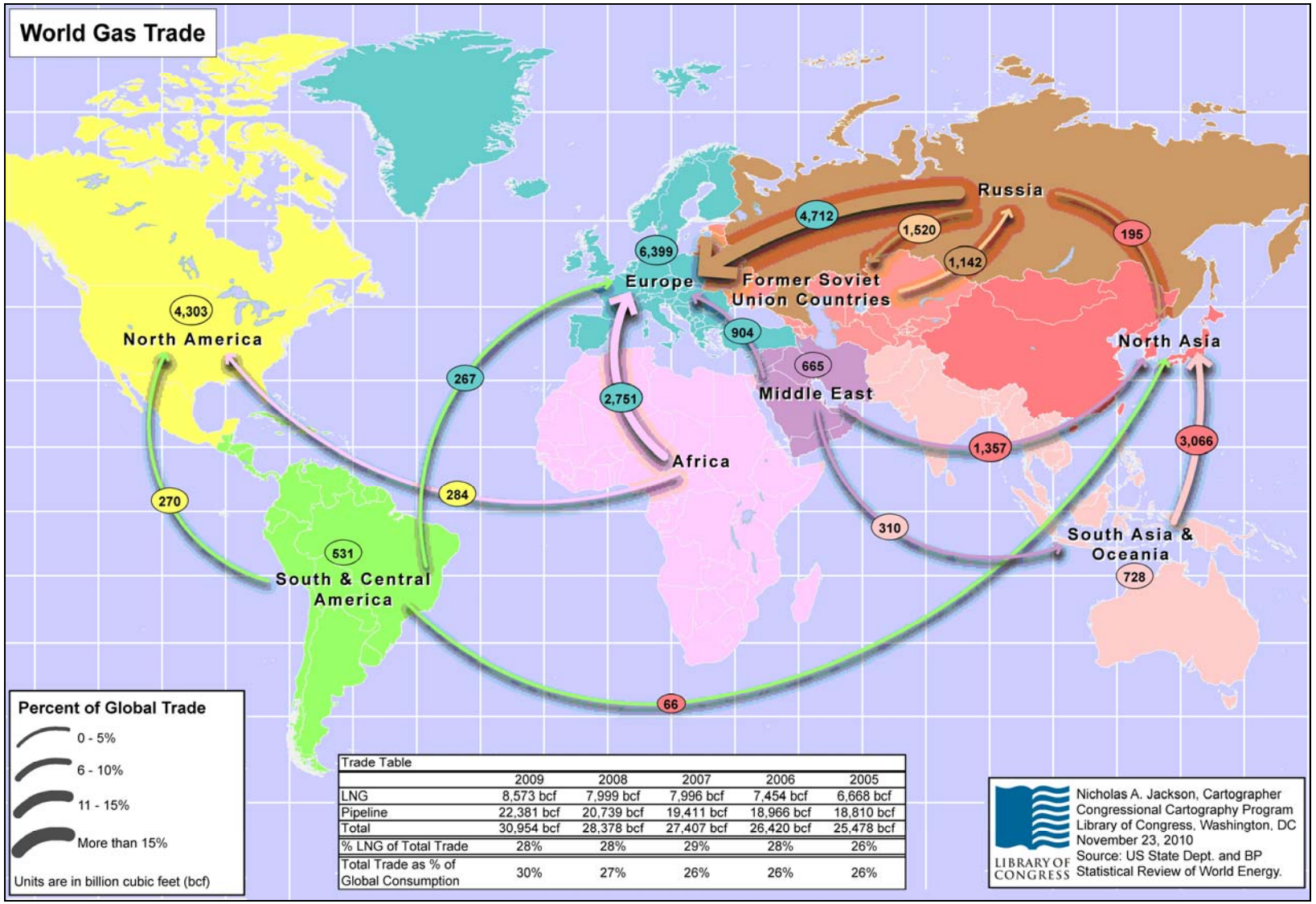


Globally, over half of the world's proved natural gas reserves are controlled by the top-10 government owned companies, with all but one being 100% state owned. Russia's Gazprom is majority owned by the state and acts as an arm of the government. Iran's National Iranian Oil Company is the largest reserve holder.

Global Natural Gas Market Becoming More Integrated

Although some natural gas is traded around the world, most natural gas is predominantly consumed in the country where it is produced (**Figure 4**). Only about 30% of natural gas is traded internationally, mostly within regional markets. Nevertheless, the amount of natural gas traded has been increasing over the last five years. Natural gas is transported in two ways: by pipeline and as a liquid in tankers, which is an expensive process. Liquefaction capacity has increased 30% since 2008, and trade in LNG has grown almost 30% since 2005. International pipeline trade is up almost 20% since 2005. Pipelines transport gas between two fixed points, while LNG provides flexibility in the final destination.

Figure 4. Global Natural Gas Trade



Trade Table	2009	2008	2007	2006	2005
LNG	8,573 bcf	7,999 bcf	7,996 bcf	7,454 bcf	6,668 bcf
Pipeline	22,381 bcf	20,739 bcf	19,411 bcf	18,966 bcf	18,810 bcf
Total	30,954 bcf	28,378 bcf	27,407 bcf	26,420 bcf	25,478 bcf
% LNG of Total Trade	28%	28%	29%	28%	26%
Total Trade as % of Global Consumption	30%	27%	26%	26%	26%

Almost all natural gas that is traded internationally is under long-term contracts, usually 20 years, whether it is by pipeline or as LNG. This is primarily because natural gas transportation is expensive and the long-term contracts are needed to finance construction of the transport facilities. Sometimes LNG consumers do not require the entire amount of natural gas in their contracts, and LNG producers can then sell that natural gas to other consumers on a one-time or short-term basis (e.g., sell it on "spot").

Russia is the world's largest natural gas exporter, primarily through its massive pipeline network to Europe. Russia opened its first LNG export terminal in 2009, primarily targeted at the Asian market, to give it flexibility in its exports. Qatar is the leading exporter of LNG, accounting for 20% of world LNG trade, with exports going to 15 countries. Europe is the largest importing region of natural gas, receiving most of its imports by pipeline from Russia, Norway, and Algeria. Asia, the most import-dependent region, relies mostly on LNG, although China is actively pursuing pipeline projects with certain neighbors and opened its first import pipeline from Turkmenistan via Uzbekistan and Kazakhstan at the end of last year.

Natural Gas Exporting Countries Forum Still Ineffective

The Gas Exporting Countries Forum (GECF), also referred to as gas OPEC, is a nascent cartel organization based in Qatar comprising 11 natural gas producing countries (**Table 1**). The GECF was formed in 2001, but only signed an organizing charter in December 2008. It controls 34% of global natural gas production and 44% of natural gas traded. Given the U.S. resource base of natural gas, it is highly unlikely that the GECF could significantly affect U.S. natural gas consumption within the next five years or, most likely, longer. Canada, by far the largest U.S. source of imported natural gas, is not a member of the GECF. Europe is probably most vulnerable to the cartel, as more than half its imports come from cartel members, particularly Russia and Algeria. Nevertheless, the current structure of natural gas markets (i.e., long-term contracts and pipelines connecting individual sellers to specific buyers) is not conducive to supply or price manipulation, and significant changes would need to be made to how natural gas is bought and sold before the GECF could have influence.

Table 1. GECF Natural Gas Statistics 2009

units = bcf

	Reserves	Production	LNG Exports	Pipeline Exports	Total Exports
Algeria*	158,916	2,875	738	1,122	1,860
Bolivia	25,073	434	0	346	346
Egypt	77,339	2,214	453	194	647
Equatorial Guinea	4,238	221	167	0	167
Iran*	1,045,668	4,633	0	200	200
Libya*	54,385	540	25	324	349
Nigeria*	185,402	879	0	565	565
Qatar*	895,934	3,154	1,746	662	2,408
Russia	1,567,266	18,629	233	6,232	6,466

	Reserves	Production	LNG Exports	Pipeline Exports	Total Exports
Trinidad & Tobago	15,538	1,434	697	0	697
Venezuela*	200,234	985	0	0	0
TOTAL GECF	4,229,995	35,999	4,059	9,646	13,705
% of World	64%	34%	47%	43%	44%

Sources: *BP Statistical Review of World Energy 2010* and Cedigaz statistical databases.

Note: * denotes a member of OPEC.

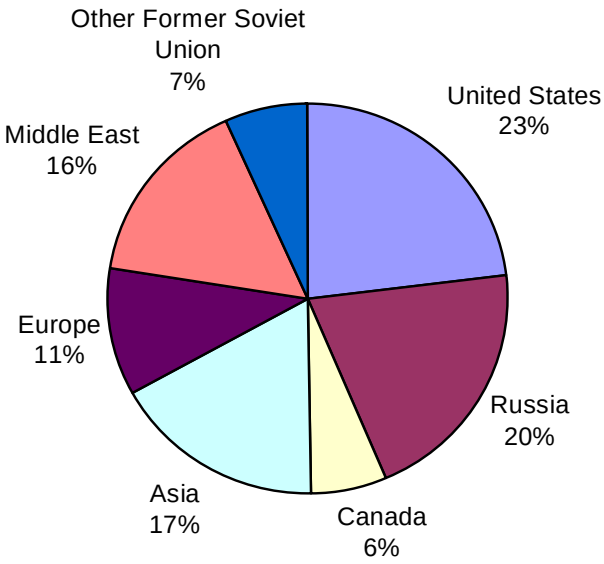
Production Widespread

Overall, global natural gas production decreased 2.1% last year, the first decline on record. This was primarily driven by the reduction in demand resulting from the widespread economic downturn.

The United States surpassed Russia as the world's largest natural gas producer last year for the first time since 2001. The success of the United States to date and the potential for further shale gas development has initiated an evaluation by most countries of their possible natural gas resources. However, outside of Canada, whose shale gas industry is developing alongside that of the United States, it is unlikely that commercial production will be achieved before the end of the decade. Most countries looking at shale gas do not have the data, technology, or equipment required to evaluate their shale gas resources, let alone successfully exploit it, at this point.

Figure 5. Global Natural Gas Production

Global natural gas production was 105,485 bcf in 2009



Source: *BP Statistical Review of World Energy 2010*, p. 24.

Natural Gas Prices Remain Low

The market price for natural gas has been relatively low compared to the contract price in more competitive markets. The price of natural gas in the United States, Canada, and the United Kingdom is set by the market, with centers or hubs providing buyers and sellers with competitive price data. The most well-known hub in the United States is the Henry Hub in Erath, LA, which is where multiple interstate and intrastate natural gas pipelines interconnect. In the United States, there are various prices for natural gas depending upon the consumer. Residential[18] consumers pay the highest price, followed by commercial users.

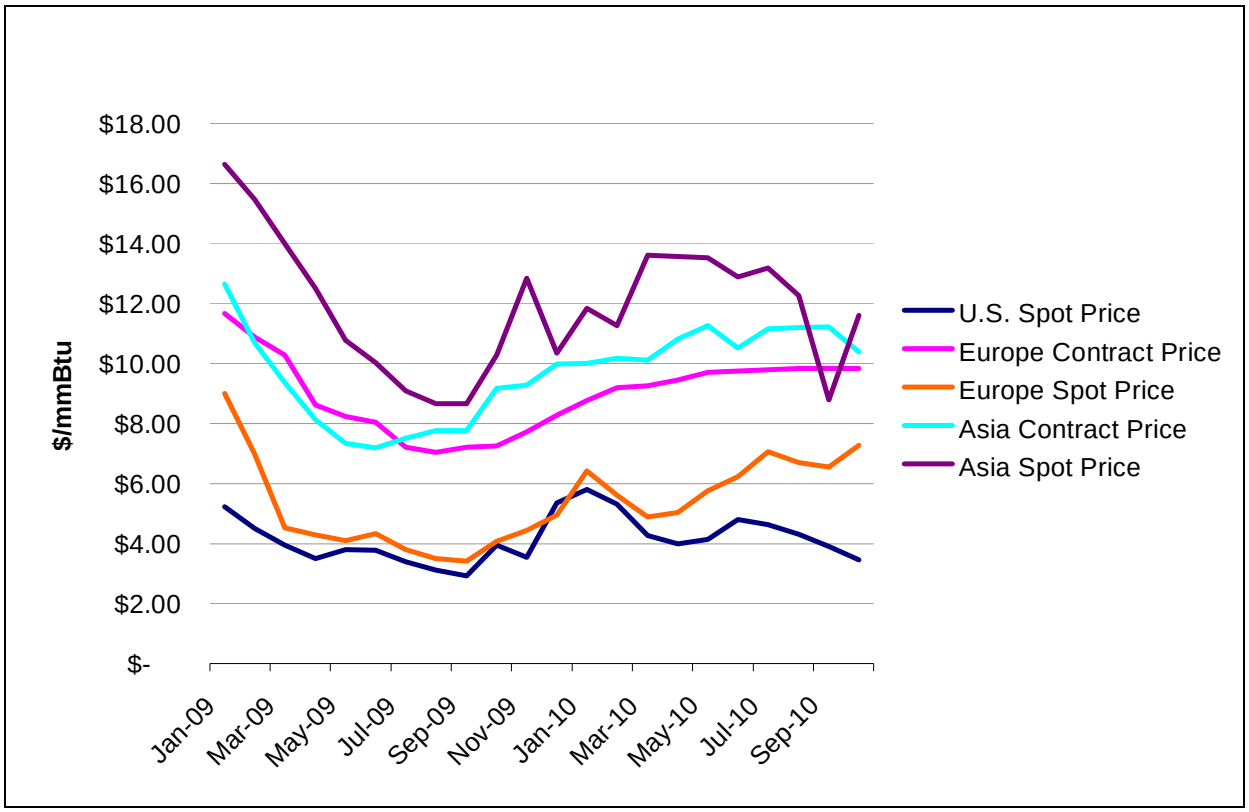
Outside the United States, Canada, and the United Kingdom, almost all wholesale natural gas is sold under long-term contracts. The price of natural gas within the contracts is commonly determined by a formula that links the natural gas price to the price of crude oil or some oil-based product. Although in many markets natural gas no longer competes against oil-based products, this vestige of the contracts has not disappeared. Over the last several years, the disparity between contract prices and spot prices has raised the pressure on producers to do away with this concept (**Figure 6)**. Producers have been reluctant, as oil prices are much higher than natural gas prices and the contract prices have been propped up by the difference. Nevertheless, some producers

[18] EIA tracks gas prices from the wellhead or at the well, which is the lowest price, industrial prices for manufacturing and other uses, commercial prices for nonmanufacturing activities, electric power, and residential use.

have started incorporating the spot price for natural gas into their pricing formulas. The price differences in **Figure 6** reflect the regional nature of the natural gas industry and the disparity between contract and spot prices. Asia, in particular, has been willing to pay high prices to secure its natural gas supplies.

Figure 6. Global Natural Gas Prices

Units = U.S. dollars per million British thermal unit



Source: PIRA Energy, November 8, 2010.

Notes: Contract price is a long-term price between a buyer and a seller, while the spot price is a short-term market price.

There are two other contract concepts that are worth highlighting: take-or-pay clauses and destination clauses. The take-or-pay clause does exactly what it says. A buyer of natural gas must pay the seller regardless of whether it actually receives the natural gas. Typically in contracts, buyers must purchase at least 80% of the total volume of natural gas contracted. For example, if a contract is for 100 bcf, but the buyer only needs 80 bcf, then that is all it pays for, but if the buyer only needs 50 bcf, it still must pay for an additional 30 bcf even if it cannot use it. A destination clause allows a cargo to be redirected to a different buyer. This clause was not common until recent years and contributes to a more efficient market.

Major Statutes

Table 2. Existing Legislation Governing Natural Gas in the United States

Act	Citation	Purpose
Natural Gas Act	15B U.S.C. § 717 et seq.	Governs siting of interstate natural gas pipelines and interstate transmission of natural gas. Also gives authority to DOE for imports and exports of liquefied natural gas (LNG).
Natural Gas Wellhead Decontrol Act of 1989	15 U.S.C. § 3301 et seq.	Removed remaining price ceilings on natural gas sales.
Mineral Leasing Act of 1920	30 U.S.C. § 181 et seq.	Governs leasing activity on federal lands, including leases for purposes of oil and natural gas exploration and production.
Outer Continental Shelf Lands Act	43 U.S.C. § 1331 et seq.	Governs activities on Outer Continental Shelf, including leasing for purposes of oil and natural gas exploration and production.
Natural Gas Pipeline Safety Act of 1968	P.L. 90-481[a]	Authorizes DOT to regulate pipeline transportation of natural gas and other gases as well as the transportation and storage of LNG.
Natural Gas Policy Act of 1978	P.L. 95-621	Gave FERC authority over intrastate and interstate natural gas production. The act also set price ceilings for natural gas.
Hazardous Liquid Pipeline Safety Act of 1979	P.L. 96-129[a]	Authorizes DOT to regulate pipeline transportation of hazardous liquids, including crude oil, petroleum products, anhydrous ammonia, and carbon dioxide.
Homeland Security Act of 2002	P.L. 107-296	Incorporated the Transportation Security Administration (TSA), which has jurisdiction for natural gas pipeline security, into the Department of Homeland Security.
Pipeline Safety Improvement Act of 2002	P.L. 107-355[a]	Strengthens federal pipeline safety programs, state oversight of pipeline operators, and public education regarding pipeline safety.

Source: Compiled by the Congressional Research Service (CRS).

Notes: The above list is not exhaustive, but highlights important statutes that relate to natural gas.

a. The Natural Gas Pipeline Safety Act of 1968, the Hazardous Liquid Pipeline Safety Act of 1979, and the Pipeline Safety Improvement Act of 2002 are re-codified at 40 U.S.C. Ch. 601.

Looking Forward

Is it finally time for natural gas to take center stage as a primary energy source? That is the main question confronting the natural gas industry over the next decade. The International Energy Agency (IEA) projects natural gas use to grow in all three of its scenarios out to 2035 in its recently released World Energy Outlook 2010.[19] Most of the new demand for natural gas is projected to come from non-OECD countries, primarily China and the Middle East. The electric power sector leads the growth in natural gas demand due to several factors, including relatively low prices, lower capital costs, and competitive financing of projects. Government policies, particularly in regard to carbon dioxide emissions, will be a key factor in determining the rate of growth of natural gas usage.

Natural gas production will increase to meet the rise in demand with growth projected in every region except Europe. Unconventional gas resources—coalbed methane, shale gas, and tight gas—will comprise 19% of production by 2035 according to the IEA report. Correspondingly, trade of natural gas is also forecast to expand, with Chinese imports growing the most.

Natural gas is likely to be addressed in multiple areas by the 112th Congress. It is one of the fuels included in a clean energy standard, particularly as a replacement for coal-fired electric power generation. Natural gas also factors into discussions on climate change, as it is the lowest carbon emitting fossil fuel per unit of energy produced when burned. Production of natural gas is included in any legislation related to drilling activity in the United States. Possible new regulations by the U.S. Environmental Protection Agency (EPA) will also impact the natural gas industry, especially shale gas development.

[19] International Energy Agency, *World Energy Outlook 2010*, November 2010.

Appendix A. Global Natural Gas Consumption (2009)

Rank	Country	Consumption (bcf)	Share of World
1	United States	22,834	22%
2	Russia	13,762	13%
3	Iran	4,651	4%
4	Canada	3,344	3%
5	China	3,221	3%
6	Japan	3,087	3%
7	United Kingdom	3,055	3%
8	Germany	2,755	3%
9	Saudi Arabia	2,737	3%
10	Italy	2,529	2%
11	Mexico	2,458	2%
12	UAE	2,087	2%
13	India	1,833	2%
14	Uzbekistan	1,720	2%
15	Ukraine	1,660	2%
16	Argentina	1,522	1%
17	France	1,504	1%
18	Egypt	1,501	1%
19	Thailand	1,384	1%
20	Netherlands	1,374	1%
	Rest of World	24,823	24%
	Global Total	103,839	100%

Source: *BP Statistical Review of World Energy 2010*, p. 27.

Appendix B. Global Natural Gas Reserves (2009)

Rank	Country	Reserves (bcf)	Share of World
1	*Russia*	1,567,266	24%
2	*Iran*	1,045,668	16%
3	*Qatar*	895,934	14%
4	Turkmenistan	286,049	4%
5	Saudi Arabia	279,692	4%
6	United States	244,731	4%
7	UAE	227,074	3%
8	*Venezuela*	200,234	3%
9	*Nigeria*	185,402	3%
10	*Algeria*	158,916	2%
11	Indonesia	112,301	2%
12	Iraq	111,948	2%
13	Australia	108,769	2%
14	China	86,874	1%
15	Malaysia	84,049	1%
16	*Egypt*	77,339	1%
17	Norway	72,395	1%
18	Kazakhstan	64,273	1%
19	Kuwait	62,860	1%
20	Canada	61,801	1%
	Rest of World	692,521	10%
	Global Total	6,621,153	100%

Source: *BP Statistical Review of World Energy 2010*, p. 22.

Note: *GECF Member*

Appendix C. Global Natural Gas Production (2009)

Rank	Country	Production (bcf)	Share of World
1	United States	20,956	20%
2	*Russia*	18,629	18%
3	Canada	5,700	5%
4	*Iran*	4,633	4%
5	Norway	3,655	3%
6	*Qatar*	3,154	3%
7	China	3,009	3%
8	*Algeria*	2,875	3%
9	Saudi Arabia	2,737	3%
10	Indonesia	2,539	2%
11	Uzbekistan	2,274	2%
12	*Egypt*	2,214	2%
13	Malaysia	2,214	2%
14	Netherlands	2,214	2%
15	United Kingdom	2,105	2%
16	Mexico	2,055	2%
17	UAE	1,723	2%
18	Australia	1,494	1%
19	Argentina	1,462	1%
20	*Trinidad & Tobago*	1,434	1%
	Rest of World	18,410	17%
	Global Total	105,485	100%

Source: *BP Statistical Review of World Energy 2010*, p. 24.

Notes: *GECF Member*

Appendix D. U.S. Natural Gas Imports and Exports

Table D-1. U.S. Imports of Natural Gas

units = billion cubic feet (bcf)

Rank	Country	2005-2009 Average	2009 Imports	Share of Imports	Imports as a Share of Consumption
1	Canada	3,586	3,271	88%	14%
2	*Trinidad & Tobago*	356	236	6%	1%
3	*Egypt*	104	160	4%	1%
4	Norway	9	29	1%	<0.5%
5	Mexico	30	28	1%	<0.5%
6	*Nigeria*	37	13	<0.5%	<0.5%
7	*Qatar*	7	13	<0.5%	<0.5%
8	*Algeria*	38	0	0%	0%
9	*Equatorial Guinea*	4	0	0%	0%
10	Malaysia	2	0	0%	0%
11	Oman	<1	0	0%	0%
TOTAL		4,163	3,737	100%	16%

Source: EIA's U.S. Natural Gas Imports by Country, http://www.eia.gov/dnav/ng/ng_move_impc_s1_a.htm.

Notes: *GECF Member.* The United States had imported LNG from Australia, Brunei, Indonesia, and UAE prior to the time period examined in this table.

Table D-2. U.S. Exports of Natural Gas

units = bcf

Rank	Country	2005-2009 Average	2009 Exports	Share of Exports	Exports as a Share of Production
1	Canada	488	701	65%	3%
2	Mexico	324	338	32%	2%
3	Japan	48	31	3%	<0.5%
4	South Korea	1	3	<0.5%	<0.5%
5	Russia	<0.5	0	0%	0%
TOTAL		862	1,073	100%	5%

Source: EIA's U.S. Natural Gas Exports by Country, http://www.eia.gov/dnav/ng/ng_move_expc_s1_m.htm

Notes: The United States has exported natural gas as LNG to both Canada and Mexico in addition to its more traditional pipeline exports. The LNG exports are incorporated into the figures above, but are relatively negligible.

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