Canadian Energy Research Institute

North American Natural Gas Market Dynamics:
Global LNG – A Review

Mellisa Mei

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NORTH AMERICAN NATURAL GAS MARKET DYNAMICS: GLOBAL LNG – A REVIEW

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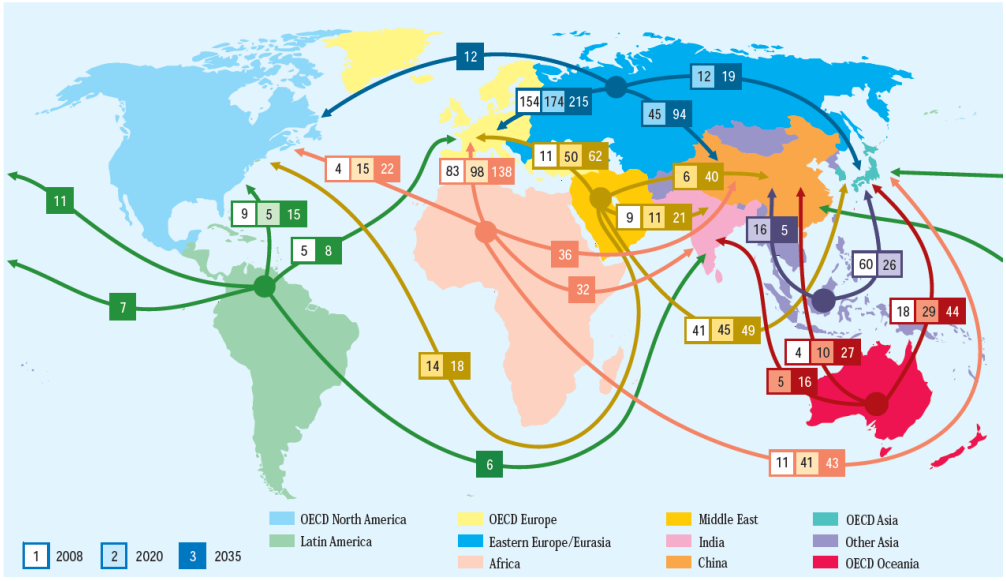
North American Natural Gas Market Dynamics: Global LNG – A Review

The global liquefied natural gas (LNG) market has grown significantly over the past decade, with the number of LNG importing nations increasing from 10 in 2000 to 22 by 2009. Over this period, new LNG markets have emerged in North America (Mexico in 2007 followed by Canada in 2009), Europe, the Middle East, Central/South America, and the Asia Pacific region. The number of LNG exporters has also grown, increasing from 12 exporters in 2000 to 18 in 2009. Between 2000 and 2009, the volume of LNG traded, on an annual basis, increased by 77.3 percent, or 3.7 TCF (10.2 BCFPD), to 8.6 TCF (23.5 BCFPD).[1] Led by increasing LNG demand in the Asia Pacific, Europe/Eurasia, and the Middle East regions, this growing trend in LNG trade is expected to continue. Although substantial shale gas resources have been identified around the world, and could have a negative impact on the demand for LNG, the industry, outside of North America, is in its infancy and the rate of growth in shale gas production remains uncertain. Under the International Energy Agency's New Policies Scenario, which accounts for a projected increase in global unconventional natural gas production (mainly from shale gas, tight gas, and coal bed methane) from 13.4 TCF in 2008 (12 percent of total natural gas production) to 30.4 TCF in 2035 (19 percent of total natural gas production), annual LNG trade will more than double from 2008 levels, to approximately 17.7 TCF, or 48.4 BCFPD, by 2035 (see Figure 1).[2]

Figure 1
Global LNG Trade Movements



Source: IEA

[1]BP Statistical Review of World Energy, BP, June 2006-2010, http://www.bp.com/liveassets/bp_internet/globalbp/globalbp_uk_english/reports_and_publications/statistical_energy_review_2008/STAGING/local_assets/2010_downloads/statistical_review_of_world_energy_full_report_2010.pdf , Accessed on March 9, 2011.
[2]World Energy Outlook 2010, International Energy Agency, ISBN: 9789264086241.

A number of new LNG re-gasification and liquefaction projects that are currently under construction will commence operations over the next few years, and construction will begin on many of the proposed LNG projects that are now in the planning phase. The purpose of this report is to present an overview of existing LNG re-gasification and natural gas liquefaction capabilities, and to provide projections of future capacity additions, at the regional and global levels. The projections are based upon the capacities and start dates of proposed projects that have been announced. Not all of the proposed LNG re-gasification and liquefaction projects will be constructed. Similarly, for the projects that are constructed, not all will be constructed on time. Rather than assuming the success or failure of each individual project, LNG re-gasification and liquefaction capacities, in each region, are summed by status and by start-up year, and probability factors for cancelling or delaying capacities, based on the status, are applied to produce a projection of future capacities. These probabilities will be adjusted depending on the region, as the likelihood of projects proceeding, or being delayed, will be affected by region-specific factors. For example, approved LNG import terminals that are located in China have a higher probability of success than projects that have been approved in the US. This report will also provide a brief discussion on existing LNG contracts and potential global LNG spot market supplies.

North America

In North America, the global LNG question has been reframed for the second time this decade. Earlier in the decade, the dominating concern was whether or not the North American market would be able to import enough LNG to supplement declining domestic natural gas supplies in order to meet the expected growth in natural gas demand. The list of proposed LNG import terminals[3] in North America ballooned, reaching over 40 projects, in anticipation of the growing LNG demand. Beginning around 2005, technological advances, such as horizontal drilling and hydraulic fracturing, took hold of the North American natural gas industry and resulted in substantial growth in the development of low cost shale gas resources. Natural gas production skyrocketed, and subsequently the North American price of natural gas declined. There was no longer a need for large volumes of LNG imports. During the 2008-2009 economic recession, natural gas demand declined across all sectors, with the exception of electricity generation. At the same time, global liquefaction projects, which were constructed in anticipation of a robust North American LNG market, came on-stream. Natural gas analysts speculated that a surge of unwanted LNG imports into North America would result in a collapse in the price of natural gas to below $3.00/MCF, and cause tremendous harm to the natural gas industry. A sharp increase in LNG imports did not occur for the following reasons: the low natural gas price in North America (resulting from a combination of recession-related demand destruction and increasing shale gas production), relative to markets in Europe and Asia, deterred LNG exporters from sending LNG to North America; LNG production issues limited the global LNG output below nameplate capacities (slow ramp up of new liquefaction projects, liquefaction facilities repairs, emerging feed-gas supply concerns); and higher than expected LNG demand in the Asia Pacific region absorbed a portion of the global LNG surplus. In 2009, the US began re-exporting foreign sourced LNG, with the first two cargoes transported to South Korea. In 2010, 7 countries (the United Kingdom, Spain, Belgium, Brazil, South Korea, Japan, and India) received re-exported LNG from the US. With high LNG demand growth expected in Asia, Europe, and the Middle East, several companies have proposed the expansion of LNG exports from North America to include domestically produced natural gas. The North American natural gas industry is now pondering a new question – can North

[3]Note that the terms “LNG import” and “LNG re-gasification” are used interchangeably throughout this report. Similarly, the terms “LNG export” and “natural gas liquefaction” are also used interchangeably.

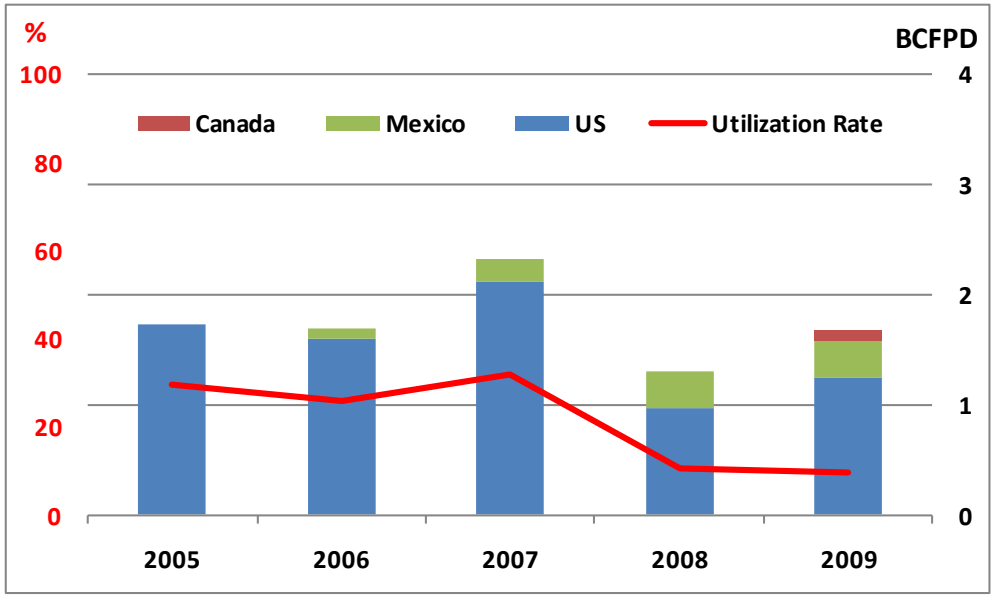
American natural gas be competitive in the global LNG market? The answer to this question will depend on many domestic, as well as global, factors that are likely to develop over the coming years.

The following sections provide an overview of North America's existing and potential LNG re-gasification and natural gas liquefaction capabilities.

LNG Re-gasification Capacity

In 2009, LNG imports accounted for a mere 2.1 percent of total natural gas consumption in North America, with the US importing the majority of North America's LNG.[4] Between 2005 and 2009, the average utilization rate of LNG import terminals in North America was 21.4 percent. Some analysts predicted that the global LNG surplus, which coincided with the global economic crisis, would result in higher North American LNG import terminal capacity utilization rates. However, North American natural gas market conditions, LNG production issues, and higher than expected LNG demand in the Asia Pacific region, particularly in China, discouraged surplus LNG from landing in North America. North America's historical import capacity utilization rates and annual LNG import volumes are illustrated in Figure 2.

Figure 2
North American LNG Imports and Capacity Utilization Rates, 2005-2009



Source: CERI, BP Statistical Review of World Energy 2006-2010

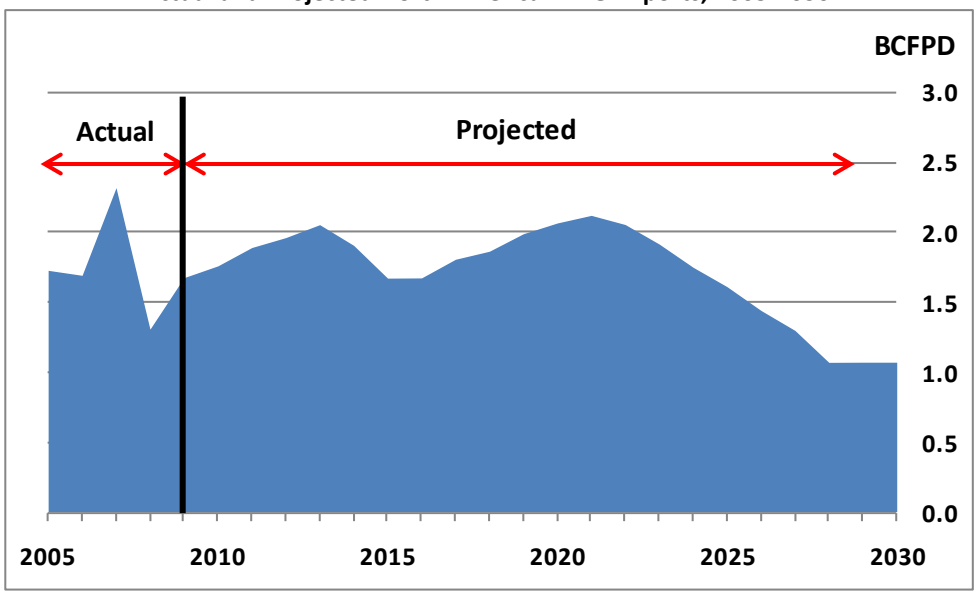
Existing LNG re-gasification facilities in North America have a combined capacity of 20.7 BCFPD from 14 import terminals. The 11 LNG import terminals that are operating in the US account for 86.8 percent of North America's total LNG re-gasification capacity. Another 2.4 BCFPD of re-gasification capacity is currently under construction in

[4]BP Statistical Review of World Energy, BP, June 2010, http://www.bp.com/liveassets/bp_internet/globalbp/globalbp_uk_english/reports_and_publications/statistical_energy_review_2008/STAGING/local_assets/2010_downloads/statistical_review_of_world_energy_full_report_2010.pdf, Accessed on March 9, 2011.

the US and Mexico, and will become available by the end of 2012, bringing the total North American capacity to 23.1 BCFPD.

Natural gas consumption in North America is projected to reach 33.9 TCF, or 92.8 BCFPD, by 2030.[5] However, given North America's remaining natural gas reserves, and significantly higher LNG prices elsewhere, imported LNG is expected to play a limited role in the North American natural gas market. A projection of North American LNG imports was derived using the US EIA's Annual Energy Outlook 2011 forecast of US LNG imports,[6] in combination with a simplifying assumption pertaining to the LNG re-gasification facility utilization rates in Canada and Mexico, over the projection period.[7] By the end of 2030, North American LNG imports will average 1.1 BCFPD, 36.1 percent less than the volume of LNG imported into Canada, Mexico, and the US in 2009. The projection of North American LNG imports, to 2030, is displayed in Figure 3, along with the actual LNG import volumes between 2005 and 2009. This projection will be referred to in a later section on global LNG contract volumes.

Figure 3
Actual and Projected North American LNG Imports, 2005-2030



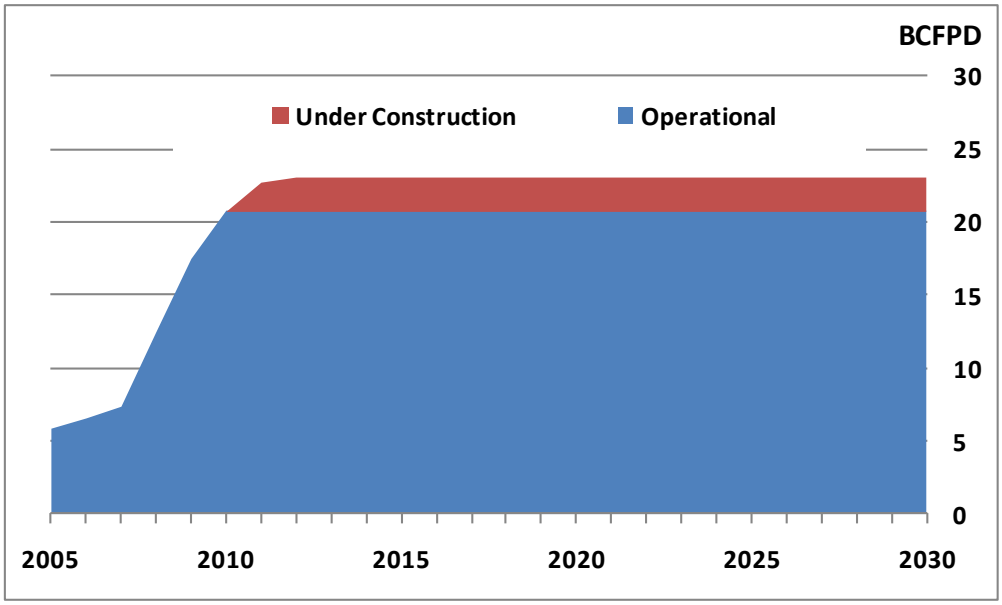
Source: CERI

Prior to North America's shale gas revolution, declining natural gas production and reserves estimates led to a sharp increase in LNG re-gasification project proposals. Several of the LNG re-gasification projects have since been suspended. Three LNG import terminals in the US have been granted authorization by the US Department of Energy to re-export previously imported LNG, and six LNG facilities (three in Canada and three in the US) are currently seeking to export domestically produced LNG to markets in Asia and Europe, where natural gas is able to fetch crude oil-linked contract prices that are far greater than the North American Henry Hub price. Planned and

[5] BP Energy Outlook 2030, BP, January 2011, http://www.bp.com/liveassets/bp_internet/globalbp/globalbp_uk_english/reports_and_publications/statistical_energy_review_2008/STAGING/local_assets/2010_downloads/2030_energy_outlook_booklet.pdf, Accessed on March 9, 2011.
[6] AEO2011 Early Release Overview, Main Reference Case Tables (2008-2035), United States Energy Information Administration, December 16, 2010, http://www.eia.doe.gov/forecasts/aeo/tables_ref.cfm, Accessed on March 10, 2011.
[7] The annual LNG re-gasification capacity utilization rates in Canada and Mexico were set equal to the average North American capacity utilization rate, calculated over the most recent five years, for which data was available (2005-2009).

speculative LNG re-gasification projects, as well as LNG re-gasification projects that have received government approvals, but have not entered the construction phase, are not anticipated to proceed for two main reasons: market saturation, and public opposition. North America's LNG re-gasification capacity, therefore, is projected to remain at the anticipated 2012 level of 23.1 BCFPD through to 2030. Figure 4 displays North America's LNG import capacity for the period 2005 to 2030.

Figure 4
North American LNG Re-gasification Capacity, 2005-2030



Source: CERI

Natural Gas Liquefaction Capacity

Two companies, ConocoPhillips and Marathon Oil, have been exporting natural gas from the US, in the form of LNG, since 1969, when the Nikiski liquefaction facility, located in Alaska's Cook Inlet, began operating. Although the US Department of Energy recently granted an export license extension for the Nikiski LNG facility, LNG supply contracts with Tokyo Electric and Tokyo Gas expired in March 2011, and were not renewed. Declining natural gas supplies in the Cook Inlet region also contributed to the decision to close the Nikiski facility. Due to the energy crisis that emerged in Japan, following the March 2011 earthquake and tsunami, the closure of the Alaska natural gas liquefaction facility was delayed until August 2011, in order to supply the Asia Pacific region with four additional LNG cargoes. In 2009, the total volume of natural gas produced in Canada, Mexico, and the US was 28.7 TCF, or 78.6 BCFPD.[8] The abundance of low cost natural gas resources propelled the US to the position of the world's top natural gas producer in 2009, with its largest lead, of 2.3 TCF (6.4 BCFPD), over the Russian Federation in the past two decades[9].

[8]BP Statistical Review of World Energy, BP, June 2010, http://www.bp.com/liveassets/bp_internet/globalbp/globalbp_uk_english/reports_and_publications/statistical_energy_review_2008/STAGING/local_assets/2010_downloads/statistical_review_of_world_energy_full_report_2010.pdf, Accessed on March 9, 2011.
[9]Ibid

Surplus natural gas supplies, and a persistently low North American natural gas price, have stimulated interest in constructing LNG export facilities in the US Lower-48 States, and in Canada. By 2017, at least 7.2 BCFPD of natural gas could be lifted from the North American market if the currently planned or proposed liquefaction projects are constructed. More projects may emerge over the coming years, particularly in Canada, as the nation's sole natural gas export market moves towards greater self sufficiency. Table 1 summarizes the proposed North American natural gas liquefaction facilities.

Table 1
Proposed North American Natural Gas Liquefaction Facilities

Project	Proponents	Capacity (BCFPD)	Proposed Start
Lake Charles	Southern Union, BG Group	2.0	2017
Sabine Pass LNG T1-T4	Cheniere Energy Partners	1.9	2015
Freeport LNG T1-T4	Freeport LNG	1.4	2015
Shell Canada LNG	Shell Canada	1.1	2017
Kitimat LNG	EOG Resources, Apache, EnCana	0.7	2015
BC LNG	Douglas Channel Energy Partnership (DCEP)	0.1	2013
Cove Point	Dominion Energy	TBD	2015

For LNG buyers, one clear advantage of the proposed North American liquefaction projects, which has been made more apparent by the recent social and political unrest in North Africa and the Middle East, is that they are located in a politically stable region. European nations, such as the United Kingdom, Italy, and Belgium, rely heavily on LNG tanker shipments travelling north through the Suez Canal (see Figure 5). Any tanker traffic disruption on the Suez Canal could result in a loss of between 50 and 90 percent of LNG supplies to some European nations.[10] Growing energy security concerns have prompted large European and Asian LNG buyers to diversify their LNG supply sources over the past few years, and several companies have expressed interest in North American LNG exports. Recently, energy companies from the Asia Pacific region (e.g., China, South Korea) have been acquiring North American shale gas assets, particularly in British Columbia, Canada, where the only currently proposed natural gas liquefaction facilities on North America's west coast will be located. Investing in North American shale gas projects could provide a secure alternative source of LNG, and allows Asian countries to develop the technological expertise to exploit shale gas resources abroad.

[10] "World Oil Transit Chokepoints", United States Energy Information Administration, Country Analysis Briefs, February 11, 2011, http://www.eia.gov/cabs/world_oil_transit_chokepoints/Full.html, Accessed on March 15, 2011.

Figure 5
The Suez Canal

Source: United States Energy Information Administration

There are several challenges to developing natural gas liquefaction projects in North America. Because the LNG export facilities will depend on robust shale gas production, one of the most significant concerns for developing the LNG projects is how shale gas production will be regulated, both federally and at the state level, in the coming years, and how that might impact the supply cost as well as production levels. For example, in April 2009, the Independent Petroleum Association of America (IPAA) estimated that federal regulation of hydraulic fracturing under the federal Underground Injection Control program (Safe Drinking Water Act of 1974) could increase incremental initial investment costs by approximately $100,000 per well.[11] Holding all else constant, increasing production costs will decrease shale gas production, and increase the market price for natural gas.

In order for North American natural gas to be competitive in the global LNG market, prices are required to remain low. This is particularly true if the target market is Europe, where natural gas buyers are attempting to move away from crude oil-linked contract prices. Liquefaction projects in British Columbia, Canada will have relatively higher costs, associated with feed-gas production, labour, and construction, but the crude oil-linked contract prices offered in the Asia Pacific region, combined with a relatively short transportation period, could also provide larger profits. Additionally, the construction of liquefaction facilities in British Columbia could increase drilling activity, beyond levels expected under a scenario in which the US remains as the only export market for Canadian natural gas.

Central and South America

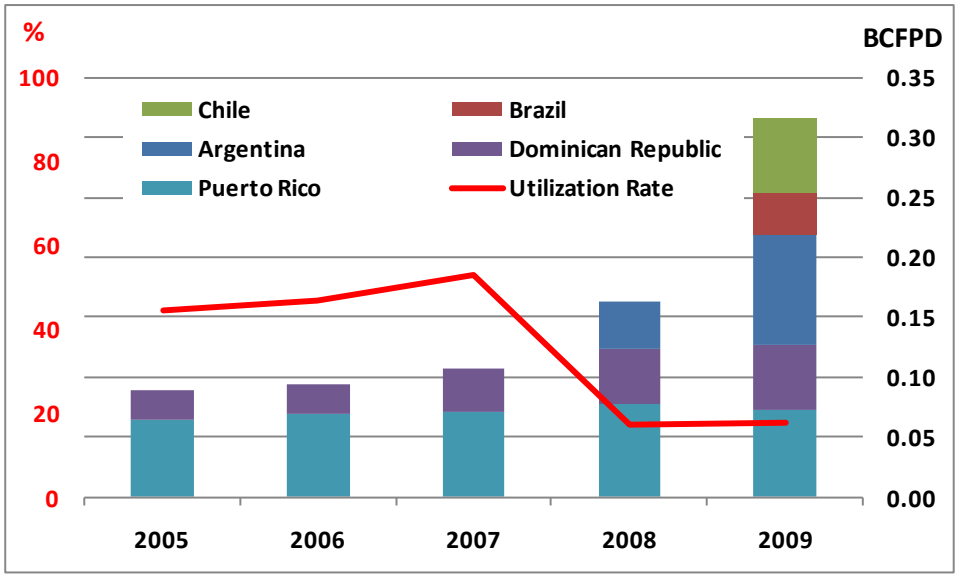
LNG Re-gasification Capacity

In 2000, Puerto Rico began importing LNG, a first for the Central/South America region. Since then, the LNG re-gasification capacity and LNG imports have increased steadily. Between 2005 and 2009, the average utilization rate of regional LNG re-gasification facilities was 35.9 percent. Although LNG demand increased by more than 250

[11] Bringing Real Information on Energy Forward: Economic Considerations Associated with Regulating the American Oil and Natural Gas Industry, Advanced Resources International, Incorporated, Prepared for: Independent Petroleum Association of America, and The Liaison Committee of Cooperating Oil and Gas Associations, April 24, 2009.

percent during this period, regional re-gasification capacity increased at a much higher rate of 787 percent. As illustrated in Figure 6, the utilization rate of LNG import facilities declined from 53.2 percent in 2007, to 17.8 percent by 2009.

Figure 6
Central/South America's LNG Imports and Capacity Utilization, 2005-2009



Source: CERI, BP Statistical Review of World Energy 2006-2010

Argentina began importing LNG in 2008, and has quickly surpassed Puerto Rico as the region's largest LNG importer. In 2009, Argentina's LNG imports accounted for 29.2 percent of Central/South America's total LNG imports.[12] Artificially low residential and commercial natural gas prices have kept the demand for natural gas relatively high, while deterring developments of Argentina's domestic natural gas resources. According to BP's 2010 Statistical Review of World Energy, Argentina's domestic natural gas consumption exceeded its production by 62.7 BCF in 2009.[13]

As a result of the natural gas supply shortages, Argentina was no longer able to export natural gas to neighbouring Chile. Chile began importing LNG in 2009, and may soon export re-gasified LNG to Argentina through the existing Gas Andes pipeline.[14]

As of 2011, Brazil's proven natural gas reserves were estimated at 12.9 TCF.[15] However, natural gas production has not kept pace with natural gas demand growth due to the low domestic price of natural gas and a lack of pipeline

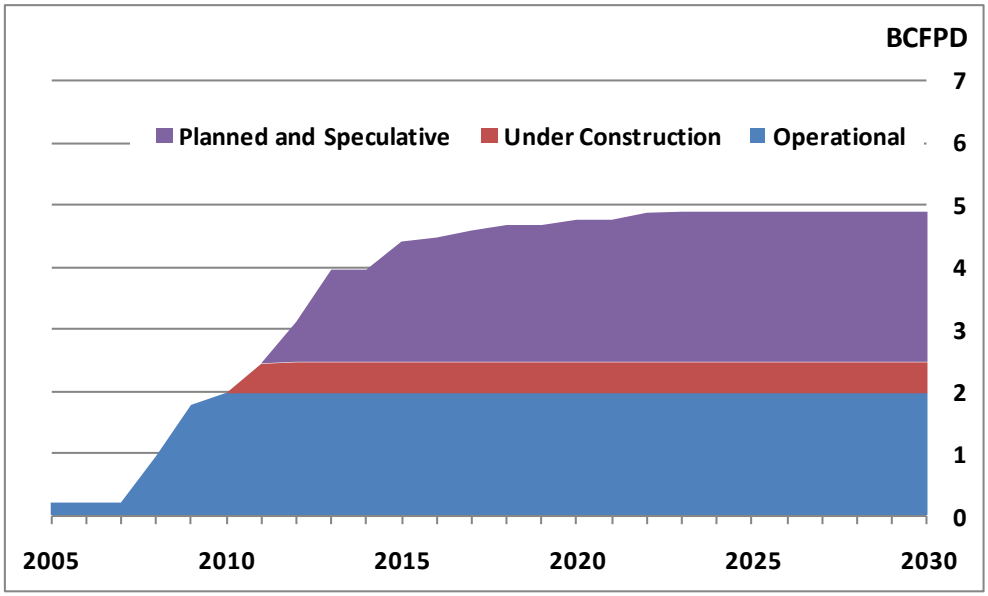
[12]BP Statistical Review of World Energy, BP, June 2010, http://www.bp.com/liveassets/bp_internet/globalbp/globalbp_uk_english/reports_and_publications/statistical_energy_review_2008/STAGING/local_assets/2010_downloads/statistical_review_of_world_energy_full_report_2010.pdf, Accessed on March 9, 2011.
[13]Ibid
[14]Gallardo, Christina, "Chile ready to begin pumping natural gas into Argentina", Ordons News, November 15, 2009, http://www.ordons.com/americas/south-america/1486-chile-ready-to-begin-pumping-natural-gas-into-argentina.html, Accessed on March 11, 2011.
[15]Brazil, Country Analysis Briefs, United States Energy Information Administration, January 2011, http://www.eia.doe.gov/countries/cab.cfm?fips=BR, Accessed on March 11, 2011.

infrastructure.[16] Currently, associated natural gas that is produced from the Lula (formerly known as Tupi) offshore field is flared because pipeline infrastructure is not yet available.[17] Meanwhile, Brazil has constructed two LNG receiving terminals, with a combined re-gasification capacity of 0.7 BCFPD, and is planning to construct another 0.5 BCFPD facility by 2013.

The Dominican Republic operates a small LNG re-gasification terminal for the purpose of fuelling a 310 MW combined-cycle electricity generating station.[18] In 2009, the Dominican Republic's LNG imports accounted for 17.1 percent of the region's total LNG imports.[19]

By the end of 2011, Central/South America's LNG import capacity will reach 2.5 BCFPD. The number of LNG importing nations in the region could potentially double,[20] and increase the total LNG re-gasification capacity to 4.89 BCFPD by the end of 2023. Figure 7 displays CERI's projection of Central/South America's LNG import capacity.

Figure 7
Central/South America's LNG Re-gasification Capacity, 2005-2030



Source: CERI

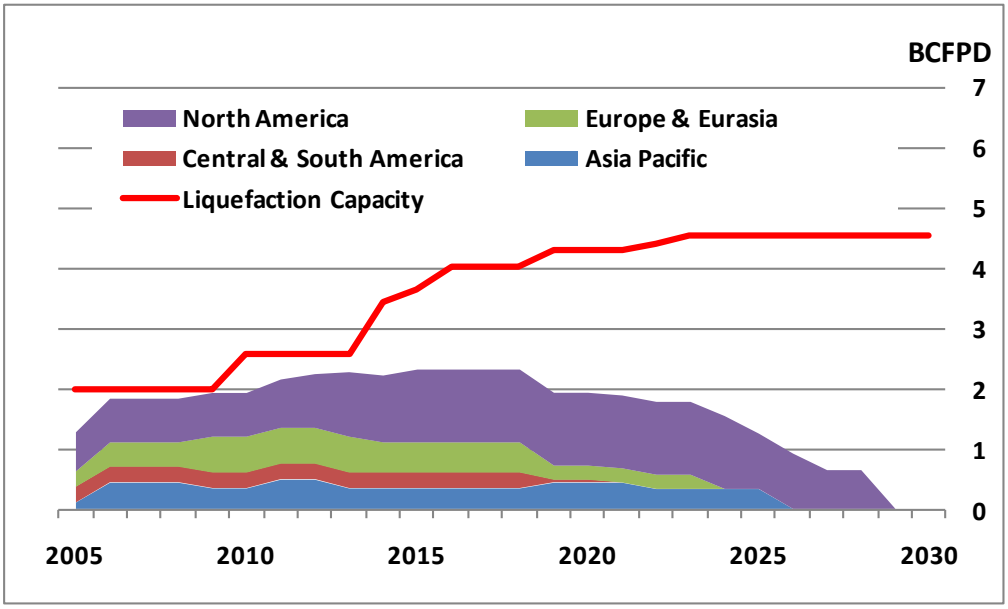
[16] Ibid
[17] Millard, Peter, "Petrobras Gets Permit to Transport Gas From Brazil's Top Field", Bloomberg, March 4, 2011, http://www.bloomberg.com/news/2011-03-04/petrobras-gets-environmental-license-for-mexilhao-field.html, Accessed on March 11, 2011.
[18] The AES Corporation, http://www.aessparrowspointlng.com/aboutus.asp, Accessed on March 11, 2011.
[19] BP Statistical Review of World Energy, BP, June 2010, http://www.bp.com/liveassets/bp_internet/globalbp/globalbp_uk_english/reports_and_publications/statistical_energy_review_2008/STAGING/local_assets/2010_downloads/statistical_review_of_world_energy_full_report_2010.pdf, Accessed on March 9, 2011.
[20] A total of five LNG re-gasification projects are currently in the planning stages in the Bahamas, El Salvador, Jamaica, Panama, and Uruguay.

Natural Gas Liquefaction Capacity

Central/South America's existing natural gas liquefaction facilities are located in Trinidad & Tobago and Peru. Together, the two nations have a combined liquefaction capacity of 2.6 BCFPD, and a five-year average capacity utilization rate of 82.6 percent.

Within the region, small volumes of LNG are shipped to Puerto Rico and Chile. The majority of existing contracts supply LNG to the European and North American markets. However, since 2006, the region has also shipped LNG to Asia, with supplies diverted from North America. Aside from some of the contracted LNG from Trinidad & Tobago, most of the LNG sold to North America can be diverted to other markets. CERI's projection of the region's LNG production capacity and contracted LNG volumes is provided in Figure 8.

Figure 8
Central/South America's Contracted LNG Supplies and Liquefaction Capacity, 2005-2030



Source: CERI

The vast majority of the LNG produced in Central and South America is sold, under sales and purchase agreements (SPAs), to the North American, European, Asia Pacific, and Central/South American LNG markets. Although Trinidad & Tobago is currently the largest supplier of LNG to North America, planned contract re-negotiations may introduce destination flexibility clauses to older (US) contracts, for which such clauses do not yet exist, and result in the diversion of LNG cargoes to higher paying markets. In 2010, LNG shipments to North America accounted for 40 percent of the LNG produced at Trinidad & Tobago's 4 train Atlantic LNG facility.[21] The remaining LNG supplies were sold to buyers in Europe (31 percent), Asia (10 percent), South America (17 percent), and the Middle East (2 percent).[22]

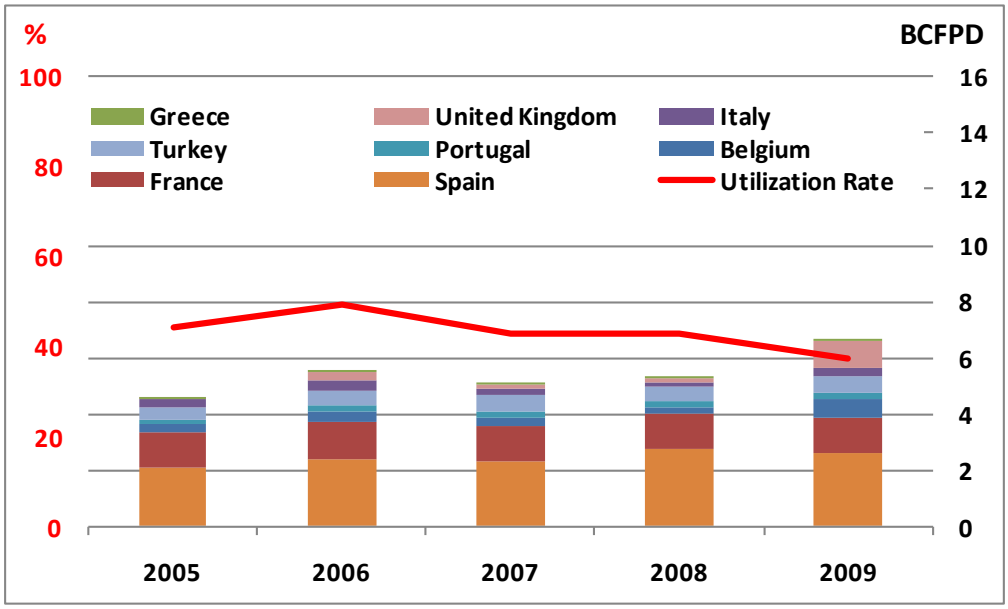
[21] Williams, Curtis, "Trinidad and Tobago minister seeking change to LNG profit formula", Oil and Gas Journal, February 9, 2011, http://www.ogj.com/index/article-display/7061901219/articles/oil-gas-journal/transportation-2/lng/20100/february-2011/trinidad-and_tobago.html, Accessed on March 15, 2011.
[22] Ibid

Europe and Eurasia

LNG Re-gasification Capacity

Europe, the world's second largest LNG market, accounted for 28.4 percent of global LNG imports in 2009.[23] Between 2005 and 2009, Europe had the highest LNG re-gasification facility utilization rate among all LNG importing regions, at 43.3 percent. Although annual LNG imports increased by 1.3 BCFPD in 2009, the addition of 5 new LNG import terminals (1 in France, 2 in Italy, and 2 in the United Kingdom) increased the region's re-gasification capacity by 5.4 BCFPD, and resulted in a 12.7 percent year-over-year decline in the utilization rate of Europe's LNG re-gasification facilities that year. European LNG import volumes and import terminal capacity utilization rates are illustrated in Figure 9.

Figure 9
Europe's LNG Imports and Capacity Utilization, 2005-2009



Source: CERI, BP Statistical Review of World Energy 2006-2010

Spain became the first country in Europe to import LNG in 1969. Between 2005 and 2009, an average of 45 percent of total European LNG imports were shipped to Spain.[24] In 2009, Spain was the third largest LNG buyer in the world, importing approximately 2.6 BCFPD of LNG, which was equivalent to 39.1 percent of total European LNG imports that year.[25] During the same period, France and the United Kingdom, Europe's second and third largest LNG consumers, imported 1.3 BCFPD and 1 BCFPD of LNG, respectively, while Belgium, Greece, Italy, Portugal, and Turkey imported a combined 1.8 BCFPD.[26] Europe sourced LNG from 12 LNG exporting nations in 2009, up from 10

[23] BP Statistical Review of World Energy, BP, June 2010, http://www.bp.com/liveassets/bp_internet/globalbp/globalbp_uk_english/reports_and_publications/statistical_energy_review_2008/STAGING/local_assets/2010_downloads/statistical_review_of_world_energy_full_report_2010.pdf, Accessed on March 9, 2011.
[24] Ibid
[25] Ibid
[26] Ibid

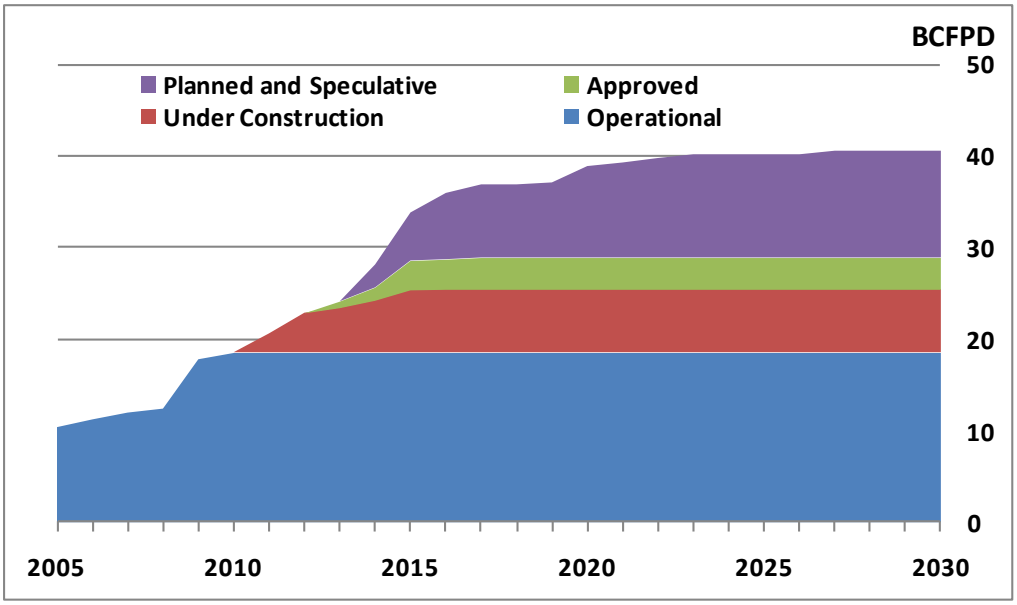
in 2005.[27] Algeria and Qatar, Europe's largest suppliers, provided the region with a combined 1.4 TCF, or 3.8 BCFPD of LNG in 2009.[28]

Energy security is a growing concern for the region, as some fear that the recent political instability in the Middle East and North Africa could spread. Although Russia has responded by sending more natural gas to Europe, Russian natural gas supplies have not always been reliable. Russia's natural gas disputes with the Ukraine, in January 2006 and January 2009, and a similar dispute with Belarus in June 2010, resulted in a loss of pipeline natural gas supplies to many European nations, and underscored the crucial importance of natural gas supply diversification. In response, European countries, seeking to reduce their reliance on Russian natural gas, have proposed the construction of LNG import facilities to access alternate sources of natural gas supplies. At the end of 2011, Sweden and the Netherlands will bring the total number of LNG importing nations in the Europe/Eurasia region to 10. Projects that are either currently under construction, approved, or planned (including speculative projects) in Albania, Croatia, Cyprus, Germany, Ireland, Lithuania, Romania, Poland, and the Ukraine are projected to nearly double the region's LNG re-gasification capacity, from 20.6 BCFPD at the end of 2011, to 40.5 BCFPD in 2030. The European market could potentially provide a home for North American LNG exports from the east coast and Gulf of Mexico regions.

Over the last three years, LNG volumes that were initially intended to serve the North American market have been diverted to European markets, as well as others, due to relatively low North American natural gas prices. Europe was able to import surplus LNG supplies at spot prices that were, at times, 30 percent below the oil-linked price of contracted natural gas supplies from Russia.[29] In 2010, the renegotiation of several European contracts, affecting more than 10 percent of Gazprom's natural gas sales, involved a temporary (3 years) adjustment of the pricing formula to include the spot price of natural gas.[30] Whether or not the new pricing formula will remain in place will depend on the LNG market situation in 2013. Figure 10 displays CERI's projection of Europe/Eurasia's LNG re-gasification capacity.

[27] Ibid
[28] Ibid
[29] Dempsey, Judy, "European Energy Giants Seek Lower Prices From Gazprom", New York Times, February 24, 2010, http://www.nytimes.com/2010/02/25/business/global/25gas.html, Accessed on March 11, 2011.
[30] Belton, Catherine, and Ed Crooks, "Gazprom in contract shake-up", Financial Times, February 25, 2010, http://www.ft.com/cms/s/0/53068c2c-2254-11df-9a72-00144feab49a.html#axzz1GV4I8YUu, Accessed on March 11, 2011.

Figure 10
Europe/Eurasia's LNG Re-gasification Capacity, 2005-2030



Source: CERI

Natural Gas Liquefaction Capacity

The region began exporting LNG in 2007, when Norway's 0.6 BCFPD Shnovit LNG facility commenced operations. However, the facility has been plagued with production problems, and was shut down on several occasions for repairs. In 2007, the facility operated at 2.4 percent of its nameplate capacity. LNG produced from the Shnovit facility has been sold under long-term contracts to four companies, with primary markets in North America and Europe, though LNG has been shipped to Asia as well. There is potential for a second liquefaction train to be constructed, but a final investment decision for the project expansion is not expected until 2013.

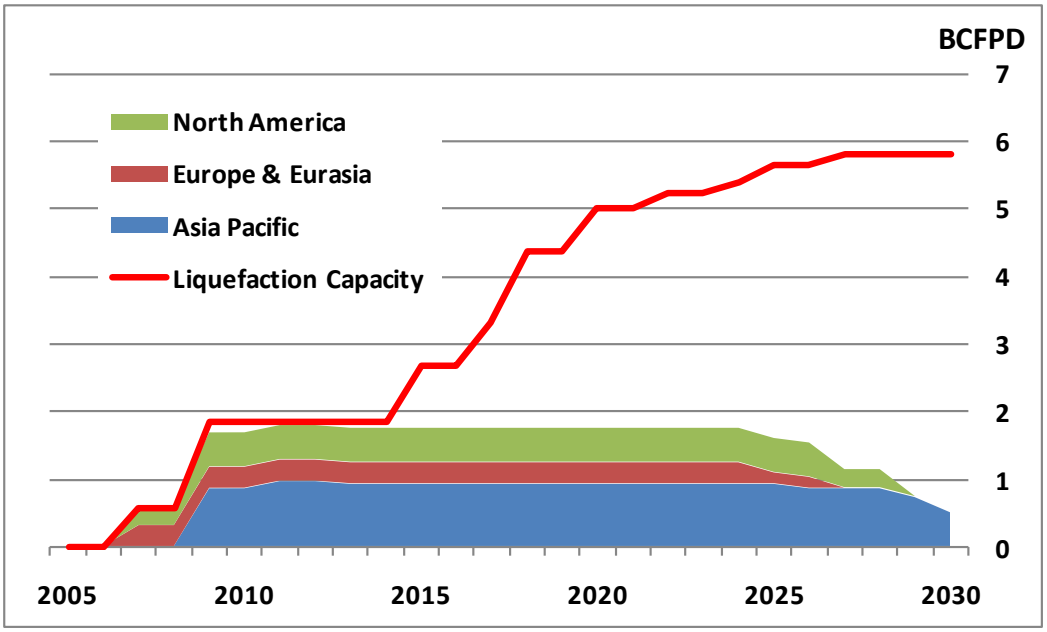
Russia's two-train Sakhalin II LNG project more than doubled the European/Eurasian liquefaction capacity in 2009, after the initial start-up date was delayed by two years. A third train at the Sakhalin site, in addition to 4 other speculative projects in Russia, could potentially add another 5.3 BCFPD of liquefaction capacity to the region. Most of the existing contracts will supply LNG to traditional buyers in Asia (Japan, South Korea, India), while some LNG volumes have been earmarked for the North American market (US and Mexico).

Aside from Norway and Russia, Georgia is the only other country in the region that has announced plans to construct a natural gas liquefaction facility. Georgia's LNG export terminal would be built as part of what is known as the AGRI (Azerbaijan-Georgia-Romania-Interconnect) project, and involves shipping natural gas through existing pipelines from Azerbaijan to a natural gas liquefaction terminal in Georgia's Port of Kulevi, and exporting the LNG to Romania to be re-gasified. This project, as well as several proposed pipeline projects, would allow Europe to import natural gas from Azerbaijan, and reduce its dependence on Russia. By 2020, Azerbaijan expects to double its current natural gas production to 1.9 TCF, or 5.2 BCFPD.[31]

[31]Elliott, Stuart, "Azerbaijan to double gas output to 54 Bcm/year by 2020: official", Platts, February 15, 2011. http://www.platts.com/RSSFeedDetailedNews/RSSFeed/NaturalGas/8545219, Accessed on March 15, 2011.

Figure 11 displays CERI's projection of Europe/Eurasia's natural gas liquefaction capacity to 2030, as well as the existing LNG volumes committed under contracts.

Figure 11
Europe/Eurasia's Contracted LNG Supplies and Liquefaction Capacity, 2005-2030



Source: CERI

Middle East

LNG Re-gasification Capacity

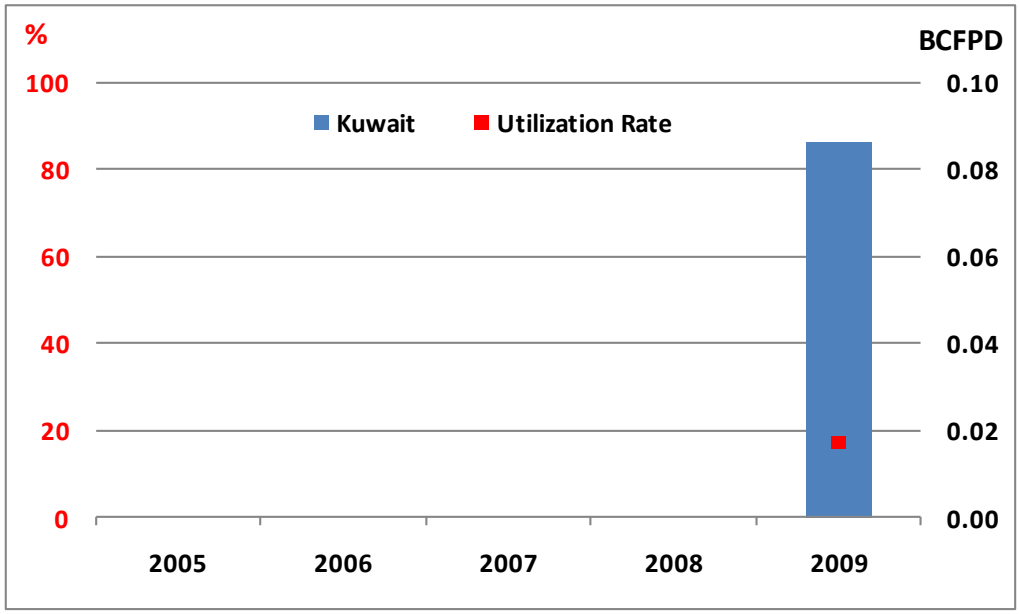
As the price of crude oil increased relative to the price of natural gas, Middle Eastern countries have implemented policies to curb domestic oil use, in favour of greater natural gas consumption, and increased exports of high priced oil. During the global economic recession, the Middle East was one of only two regions that experienced an increase in natural gas consumption,[32] which grew at a rate of 4.4 percent year-over-year.[33] The IEA estimates that the natural gas demand growth in the Middle East will account for 20 percent of the global increase in natural gas demand by 2035.[34]

Unable to supply the domestic market with sufficient supplies of natural gas, Kuwait became the first nation in the Middle East to import LNG in August 2009. LNG imports are intended to supply the electricity generation sector during the summer months (April to October), when air conditioning demand peaks.[35] Because the demand for

[32] Natural gas consumption in the Asia Pacific region increased by 3.4 percent between 2008 and 2009.
[33] BP Statistical Review of World Energy, BP, June 2010, http://www.bp.com/liveassets/bp_internet/globalbp/globalbp_uk_english/reports_and_publications/statistical_energy_review_2008/STAGING/local_assets/2010_downloads/statistical_review_of_world_energy_full_report_2010.pdf, Accessed on March 9, 2011.
[34] World Energy Outlook 2010, International Energy Agency, ISBN: 9789264086241.
[35] "Kuwait resumes seasonal LNG imports, official says", Reuters, April 22, 2010, http://uk.reuters.com/article/2010/04/22/kuwait-lng-idUKLDE63L1ED20100422, Accessed on March 11, 2011.

LNG is seasonal, the utilization rate of Kuwait's LNG import terminal was less than 20 percent in 2009. Figure 12 displays Kuwait's LNG import and re-gasification facility utilization rate during its first year of operation.

Figure 12
Middle East LNG Imports and Capacity Utilization, 2005-2009



Source: CERI, BP Statistical Review of World Energy 2010

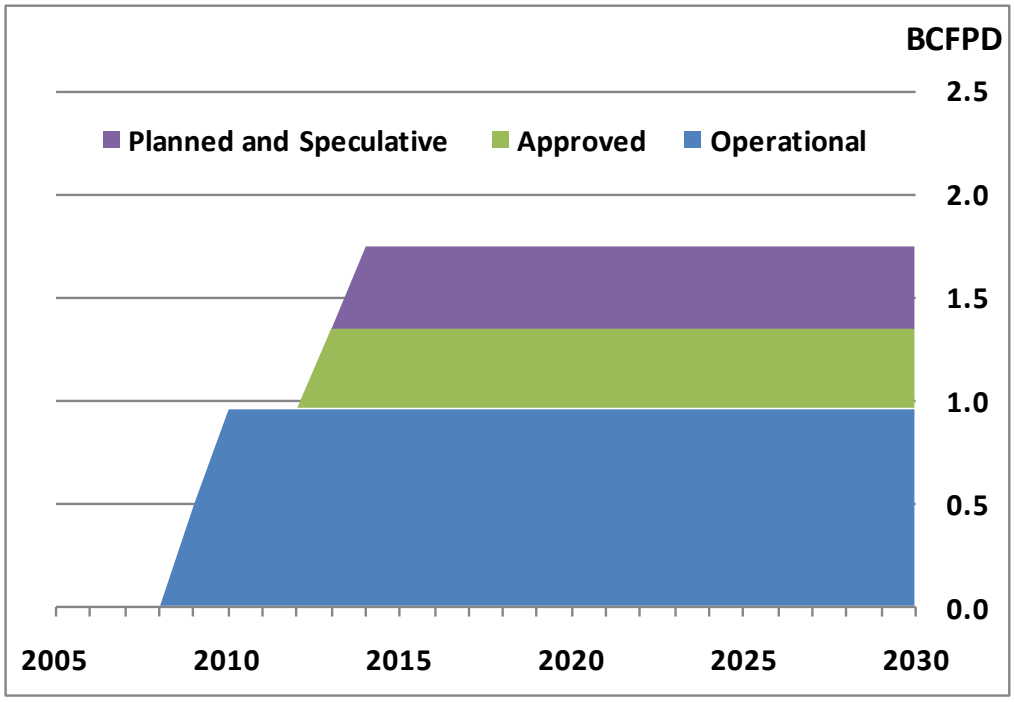
Dubai began importing LNG in 2010 through a floating storage and re-gasification unit, located at the Jebel Ali Port. Dubai plans to transform into a major international natural gas hub, importing and re-gasifying LNG within the country before the natural gas is transported to northern emirates through existing pipelines.[36]

The government of Israel considered suspending plans to import LNG when offshore natural gas discoveries were made. However, recent events in Egypt that halted natural gas exports to Israel for over a month prompted the government instead to hasten its LNG plans. In February 2011, a site off of the Mediterranean coast at Hadera was approved by the Israeli National Infrastructure Ministry for Israel's first LNG facility.[37] The re-gasification terminal is anticipated to commence operations in 2013.

Bahrain is also keen on becoming a natural gas hub and plans to construct the country's first LNG re-gasification terminal by 2014. CERI's projection of LNG re-gasification capacity in the Middle East is shown in Figure 13.

[36]Tippee, Bob, "Gas-hungry Dubai importing LNG; eyes role as hub", Oil and Gas Journal, January 21, 2011. http://www.ogj.com/index/article-display/2568371843/articles/oil-gas-journal/exclusive-online-features/the-editors-perspective-2/20100/01/gas-hungry-dubai_importing.html, Accessed on March 12, 2011.
[37]Sandler, Neal, "Israel national Planning Council approves LNG terminal site at Hadera", Platts, February 9, 2011, http://www.platts.com/RSSFeedDetailedNews/RSSFeed/Oil/7055279, Accessed on March 12, 2011.

Figure 13
Middle East LNG Re-gasification Capacity, 2005-2030



Source: CERI

Natural Gas Liquefaction Capacity

The LNG industry in the Middle East experienced remarkable growth between 2005 and 2010, increasing its LNG export capacity by 140 percent. Yemen became the fourth LNG producer in the Middle East when the two-train Yemen LNG terminal was completed in 2009. Of the current 13.3 BCFPD of natural gas liquefaction capacity in the region, 77.4 percent (10.3 BCFPD) is located in Qatar. The region will maintain its status as the largest LNG exporting region until 2014, when it is expected to be overtaken by the Asia Pacific region.

While production from other LNG producers, Oman and the UAE, remained relatively constant between 2005 and 2009, LNG output from Qatar increased by 2.2 BCFPD, to 4.8 BCFPD in 2009.[38] Approximately 72 percent of the LNG exports from the Middle East were produced in Qatar during 2009.[39] Further expansion of Qatar's natural gas liquefaction capacity is not expected. The region's only potential capacity additions on the horizon are from Iran, which has two projects in the construction phase, and Iraq. Aside from the 2 liquefaction projects that are currently being constructed in Iran, the country had plans to construct 4 other LNG export terminals. Since the projects were announced, 2 have been cancelled, and 2 are considered to be speculative.

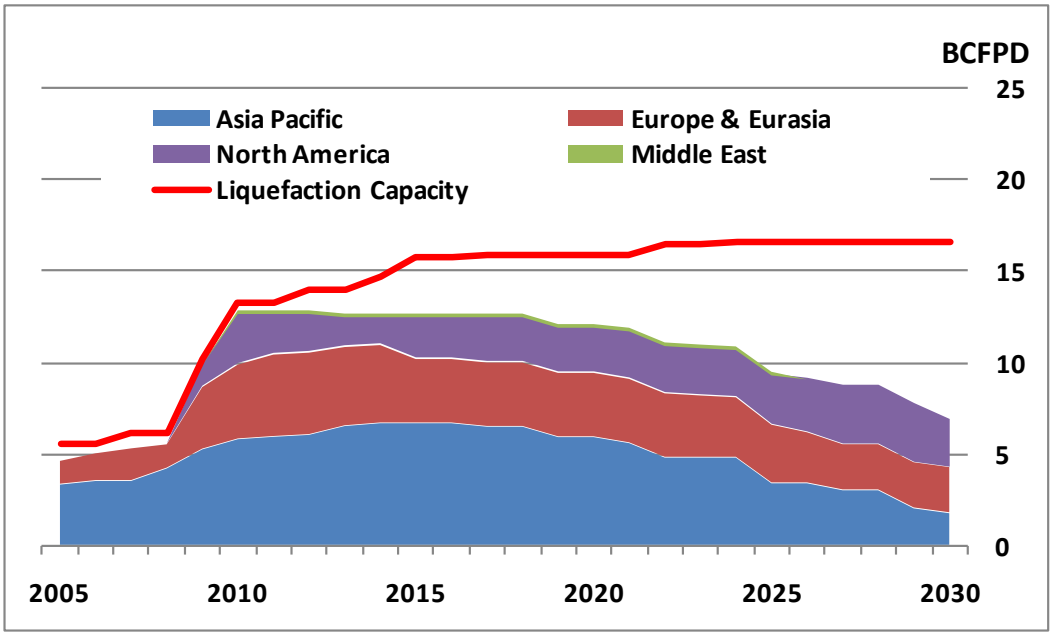
The majority of the contracted LNG supplies have been committed to markets in the Asia Pacific region (Japan, South Korea, India, China, Taiwan, and Thailand). Contracts for LNG volumes that were initially intended to serve

[38] BP Statistical Review of World Energy, BP, June 2010, http://www.bp.com/liveassets/bp_internet/globalbp/globalbp_uk_english/reports_and_publications/statistical_energy_review_2008/STAGING/local_assets/2010_downloads/statistical_review_of_world_energy_full_report_2010.pdf, Accessed on March 9, 2011.
[39] Ibid

the North American market are believed to contain destination flexibility provisions. This allows LNG that has been contracted to North America to be diverted from North America to buyers in higher priced markets. The Middle East (Kuwait and Dubai) accounts for only a small portion of the region's committed LNG volumes. LNG exporters in the Middle East also hold supply contracts with buyers in Europe (Spain, Belgium, the United Kingdom, France, Italy, and Poland). The gap between liquefaction capacity and contracted LNG volumes results from Iran and Iraq not having supply contracts in place for projects that are either under construction or in the planning stages, and existing contracts coming to an end.

CERI's projection of the LNG production capacity in the Middle East, as well as contracted LNG volumes, is displayed in Figure 14.

Figure 14
The Middle East's Contracted LNG Supplies and Liquefaction Capacity, 2005-2030



Source: CERI

Asia Pacific

LNG Re-gasification Capacity

Existing LNG import terminals, located in the world's two largest LNG importing nations, Japan and South Korea, have the capacity to re-gasify 25.5 BCFPD and 10.8 BCPFD, respectively. In 2009, the combined LNG demand from the two Asian nations amounted to 11.6 BCFPD.[40] Japan and South Korea's LNG imports are expected to remain high over the next two decades. The US EIA projects that by 2035 LNG imports will reach 10.7 BCFPD in Japan, and 4.9 BCFPD in South Korea.[41]

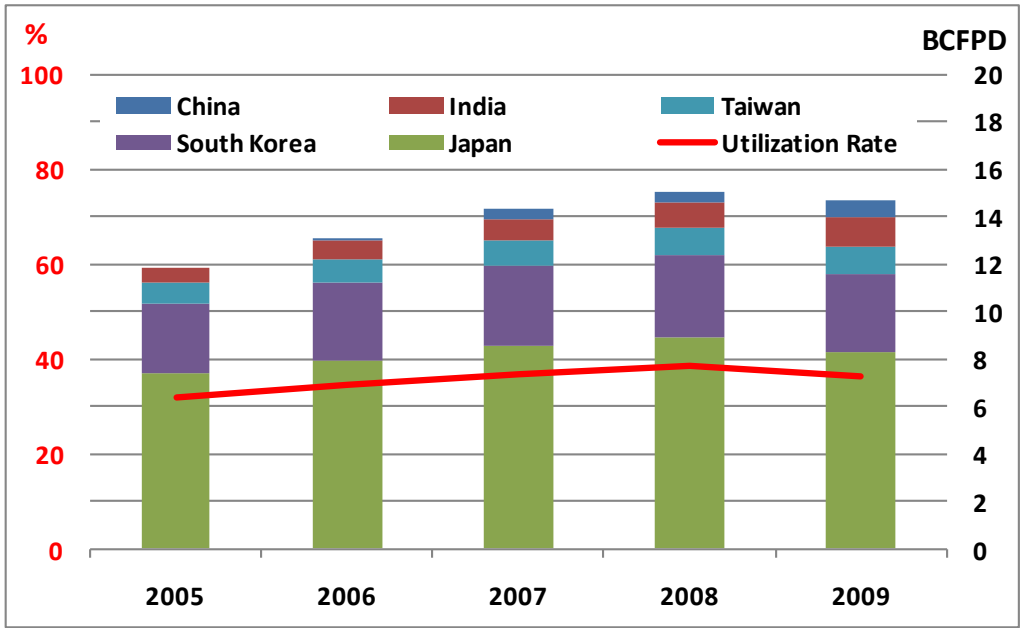
[40] Ibid
[41] International Energy Outlook 2010, United States Energy Information Administration, July 27, 2010. http://www.eia.doe.gov/oiaf/ieo/graphic_data_natgas.html, Accessed on March 13, 2011.

Japan's LNG imports will increase dramatically over the short- to medium-term, following the massive earthquake and tsunami that struck the country on March 11, 2011. Replacing the electricity generated from the 11 nuclear reactors that were shut down would require LNG imports to increase by an estimated 1.3 BCFPD.[42] This would represent a 14.3 percent increase over Japan's estimated 2010 LNG imports of 9.3 BCFPD in 2010.[43] Should policy makers in Japan deem the use of nuclear power for electricity generation too risky, the country's long-term LNG demand would remain permanently higher than previous estimates. LNG volumes that have been committed to the North American market, through destination flexible supply contracts, will likely be made available to Japan.

In 2008, China's natural gas consumption accounted for only 3 percent of the country's total energy demands. However, the government of China plans to increase the natural gas share of total energy consumption to 10 percent by 2030.[44] Natural gas demand in China has grown significantly over the past decade, and began exceeding domestic production levels in 2007. Although the country's LNG imports are still considered to be quite low, relative to the LNG imports of other countries in the region, between 2006 and 2009 China's LNG demand has increased by 662.5 percent to 0.7 BCFPD.[45] In 2009, China's LNG re-gasification facility utilization rate was among the highest in the region, at 61.5 percent, surpassed only by Taiwan (81.4 percent), and India (67.8 percent). The Asia Pacific region's average LNG import capacity utilization rate was 36.2 percent in 2009. Figure 15 displays the region's LNG import volumes and re-gasification facility utilization rates.

[42]Farey, Ben, and Robert Tuttle, "European Gas Rises After Japan Quake, German Reactors Decision", Bloomberg Businessweek, March 15, 2011, http://www.businessweek.com/news/2011-03-15/european-gas-rises-after-japan-quake-german-reactor-decision.html, Accessed on March 15, 2011.
[43]Bethune, Graeme, "Record LNG imports by North Asian buyers in 2010: likely to grow further in 2011", Energy Quest, March 15, 2011, http://www.energyquest.com.au/insightsandanalysis.php?id=90, Accessed on March 15, 2011.
[44]China, United States Energy Information Administration, Country Analysis Briefs, November 2010, http://www.eia.doe.gov/countries/cab.cfm?fips=CH, Accessed on March 13, 2011.
[45]BP Statistical Review of World Energy, BP, June 2010, http://www.bp.com/liveassets/bp_internet/globalbp/globalbp_uk_english/reports_and_publications/statistical_energy_review_2008/STAGING/local_assets/2010_downloads/statistical_review_of_world_energy_full_report_2010.pdf, Accessed on March 9, 2011.

Figure 15
Asia Pacific LNG Imports and Capacity Utilization, 2005-2009



Source: CERI, BP Statistical Review of World Energy 2006-2010

The strong natural gas demand growth that is anticipated in the Asia Pacific region will likely be led by non-OECD countries, such as China and India. To accommodate the expected growth in demand, both countries are currently constructing new LNG import terminals, or expanding existing terminals. By 2013, the LNG re-gasification capacity in China and India could reach 4.1 BCFPD and 3.1 BCFPD, respectively. Several LNG re-gasification facilities are also in the planning stages, and could significantly increase the Asia Pacific region's total LNG import capacity.

The IEA estimates that China's natural gas consumption will grow at an average annual rate of 6 percent and will account for more than 20 percent of the total increase in global natural gas demand by 2035.[46] This growth in demand will be met with a combination of pipeline natural gas imports from Turkmenistan, LNG SPAs, and domestic production from China's estimated 107 TCF of proven natural gas reserves.[47] LNG will be purchased on the spot market to fill any supply gaps.

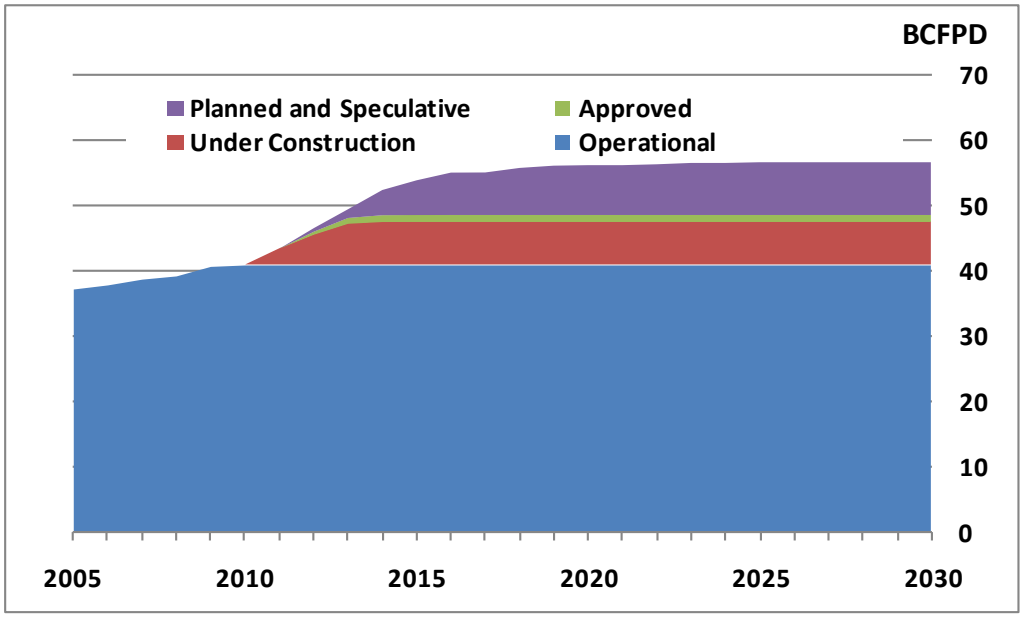
India's demand growth will be driven largely by the electricity generation and fertilizer industries, which account for almost 75 percent of India's total natural gas demand.[48] Beginning in 2004, LNG imports were needed, supplementing the country's domestic natural gas production, in order to meet the local demand for natural gas.

Currently, the total LNG import capacity of the Asia Pacific region is 40.8 BCFPD, by far the largest regional capacity in the world. If all of the announced LNG re-gasification projects proceed as planned, the Asia Pacific region will include 8 new LNG importing nations by 2015, including 2 nations that are currently exporters of LNG: Bangladesh,

[46]World Energy Outlook 2010, International Energy Agency, ISBN: 9789264086241.
[47]China, United States Energy Information Administration, Country Analysis Briefs, November 2010, http://www.eia.doe.gov/countries/cab.cfm?fips=CH, Accessed on March 13, 2011.
[48]India, United States Energy Information Administration, Country Analysis Briefs, August 2010, http://www.eia.gov/countries/cab.cfm?fips=IN, Accessed on March 13, 2011.

Indonesia, Malaysia, Pakistan, Philippines, Singapore, Thailand, and Vietnam. The Asia Pacific region's LNG re-gasification capacity, between 2005 and 2030, is provided in Figure 16.

Figure 16
Asia Pacific LNG Re-gasification Capacity, 2005-2030



Source: CERI

Natural Gas Liquefaction Capacity

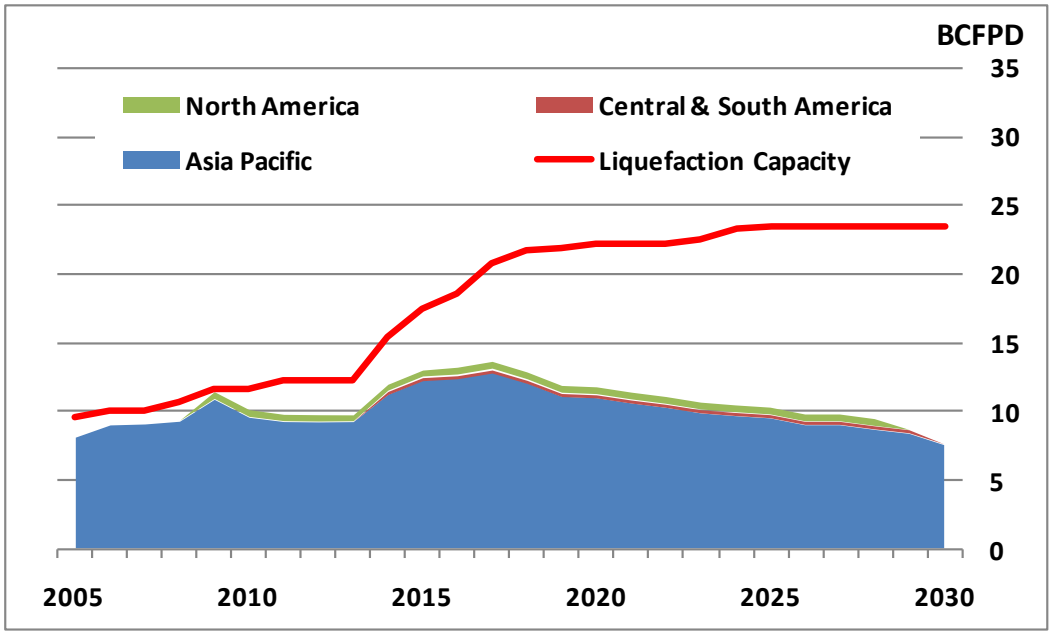
In 2014, the Asia Pacific region is anticipated to become the largest LNG exporting region in the world, when new LNG export facilities that are currently under construction in Australia and Papua New Guinea commence operations. By 2030, the Asia Pacific region is projected to have a combined natural gas liquefaction capacity of 23.5 BCFPD, which is equivalent to the total volume of LNG that was traded globally in 2009.[49] At the end of 2010, the combined liquefaction capacity from the 4 LNG producers located in the Asia Pacific Region (Australia, Brunei, Indonesia, and Malaysia) was 11.7 BCFPD, and accounted for 30.9 percent of global liquefaction capacity.

Australia has the largest number of proposed LNG projects in the region, and could potentially increase the region's liquefaction capacity by another 10.4 BCFPD. However, the final investment decisions for several projects have not yet been announced, and it is unlikely that all of the projects will be constructed. Some of the challenges facing the expansion of Australia's LNG export capacity include the delays and cost overruns associated with skilled labour shortages, high exploration and development costs, the high cost of construction materials, and Australia's proposed climate change legislation. Alternatively, substantial natural gas discoveries, and the anticipated LNG demand growth in the Asia Pacific region, will help push some of the liquefaction projects forward.

[49] BP Statistical Review of World Energy, BP, June 2010, http://www.bp.com/liveassets/bp_internet/globalbp/globalbp_uk_english/reports_and_publications/statistical_energy_review_2008/STAGING/local_assets/2010_downloads/statistical_review_of_world_energy_full_report_2010.pdf, Accessed on March 9, 2011.

Unlike other LNG producing regions, the contracted volumes of LNG that are produced in the Asia Pacific region are expected to remain almost entirely within the region. LNG volumes that have been sold, under existing contracts, to traditional markets (China, India, Japan, South Korea, and Taiwan), as well as new markets (Singapore, Malaysia, and Indonesia), will reach 12.8 BCFPD in 2017. Figure 17 displays CERI's projection of liquefaction capacity in the region, as well as LNG contract volumes.

Figure 17
Asia Pacific's Contracted LNG Supplies and Liquefaction Capacity, 2005-2030



Source: CERI

Africa

Africa's natural gas consumption was approximately 9.1 BCFPD in 2009, or 46 percent of the natural gas produced in the region that year.[50] Natural gas demand is expected to more than double by 2030, to 19.9 BCFPD, while regional production increases by 144 percent between 2009 and 2030 from 19.7 BCFPD to 48.1 BCFPD.[51] Africa is the only region that currently does not have plans to construct LNG re-gasification facilities.

Natural Gas Liquefaction Capacity

In 1970, Libya became the first nation in Africa to export LNG, with 0.4 BCFPD of natural gas liquefaction capacity. By 2008, the construction of new liquefaction projects in Algeria, Egypt, Equatorial Guinea, and Nigeria increased the region's LNG export capacity to 8.3 BCFPD. Projects that are currently in the construction phase will increase Africa's LNG export capacity by 1.9 BCFPD, to 10.2 BCFPD by 2014. An additional 4 BCFPD of natural gas liquefaction capacity is expected to result from proposed and speculative LNG projects in Cameroon, Equatorial Guinea, and Nigeria by the end of 2030.

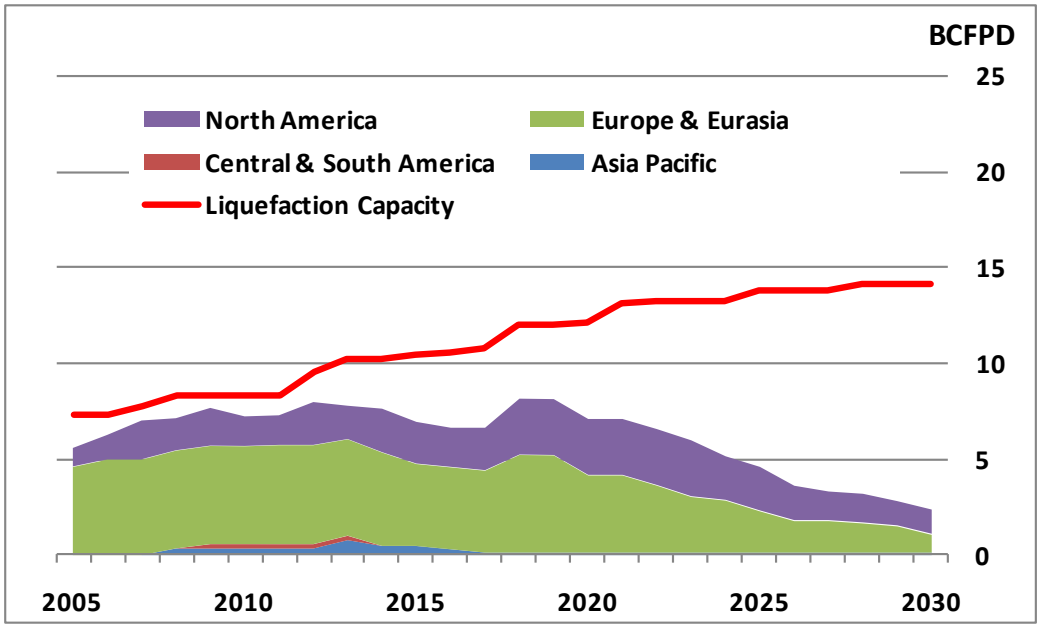
[50] Ibid
[51] BP Energy Outlook 2030, BP, January 2011, http://www.bp.com/liveassets/bp_internet/globalbp/globalbp_uk_english/reports_and_publications/statistical_energy_review_2008/STAGING/local_assets/2010_downloads/2030_energy_outlook_booklet.pdf, Accessed on March 9, 2011.

Algeria, Egypt, and Nigeria were the top three African LNG producers in 2009, accounting for a combined 90 percent of the region's total LNG output.[52] Nigeria, which holds the largest natural gas reserves in Africa, currently has a natural gas liquefaction capacity of 2.8 BCFPD. Several proposed LNG projects could potentially raise Nigeria's LNG export capacity by 6.7 BCFPD. However, the proposed LNG projects are currently in the early planning stages and are considered to be speculative. Project cancellations and delays are expected to dampen the proposed supply additions.

Long-term supply contracts are currently in place to supply the Americas, Europe, and the Asia Pacific region with 7.3 BCFPD. LNG volumes that are sold under contracts are expected to peak at 8.1 BCFPD in 2017. After 2017, approximately 1 BCFPD of LNG has been committed under non-binding agreements, and may or may not result in SPAs.

Figure 18 displays Africa's liquefaction capacity and contracted LNG volumes. The gap between Africa's LNG production capacity and total LNG volumes sold under contract exists because many of the speculative projects that are still in the planning stages have not yet secured LNG buyers. Also, the gap widens as existing contracts come to an end.

Figure 18
Africa's Contracted LNG Supplies and Liquefaction Capacity, 2005-2030



Source: CERI

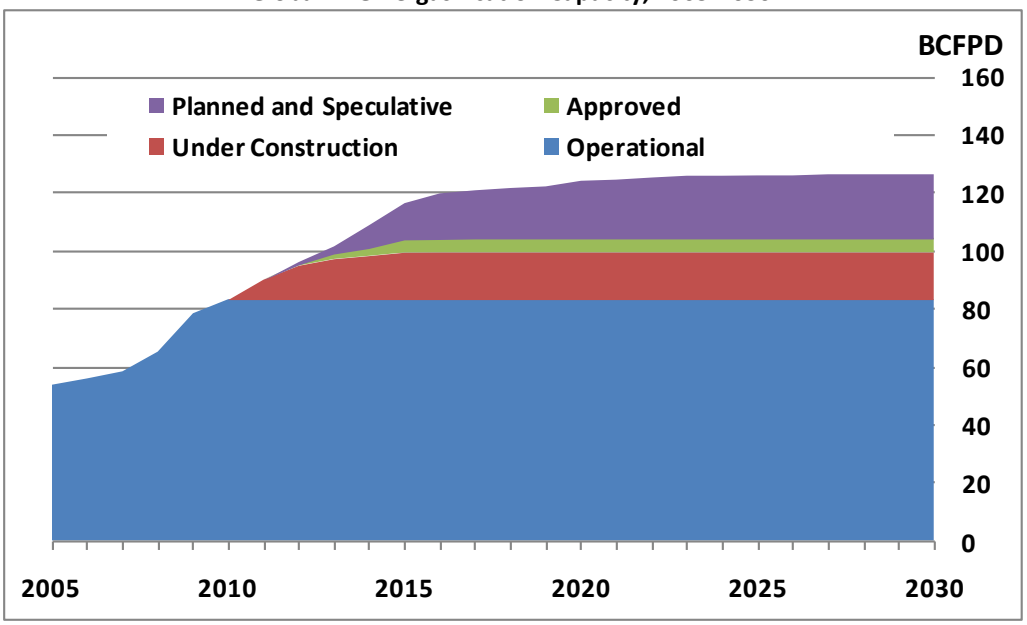
Global LNG Summary

This section combines the regional projections of LNG re-gasification and natural gas liquefaction capacities to obtain global capacity values. Regional contract data is also aggregated and reported at the global level before the destinations of LNG volumes sold under contract to North American buyers are adjusted to reflect CERI's projection of North American LNG imports. A discussion on potential global LNG spot market supplies is to follow.

[52] Ibid

At the end of 2010, the cumulative LNG re-gasification capacity in North America, Central/South America, Europe/Eurasia, and Asia Pacific was 83.1 BCFPD. An additional 16.3 BCFPD of LNG import capacity will become available by the end of 2015, once the re-gasification projects that are currently under construction, including new projects and expansions of existing projects, commence operations. Taking into account the probabilities of cancellations and delays for projects that are currently in the planning phase, global LNG re-gasification capacity is estimated to reach 126.8 BCFPD by 2027, and remain constant thereafter. In 2030, the two largest LNG importing regions, Asia Pacific and Europe/Eurasia, will account for 45 percent (56.7 BCFPD) and 32 percent (40.5 BCFPD) of the global re-gasification capacity, respectively. Figure 19 displays CERI's projection of global LNG re-gasification capacity.

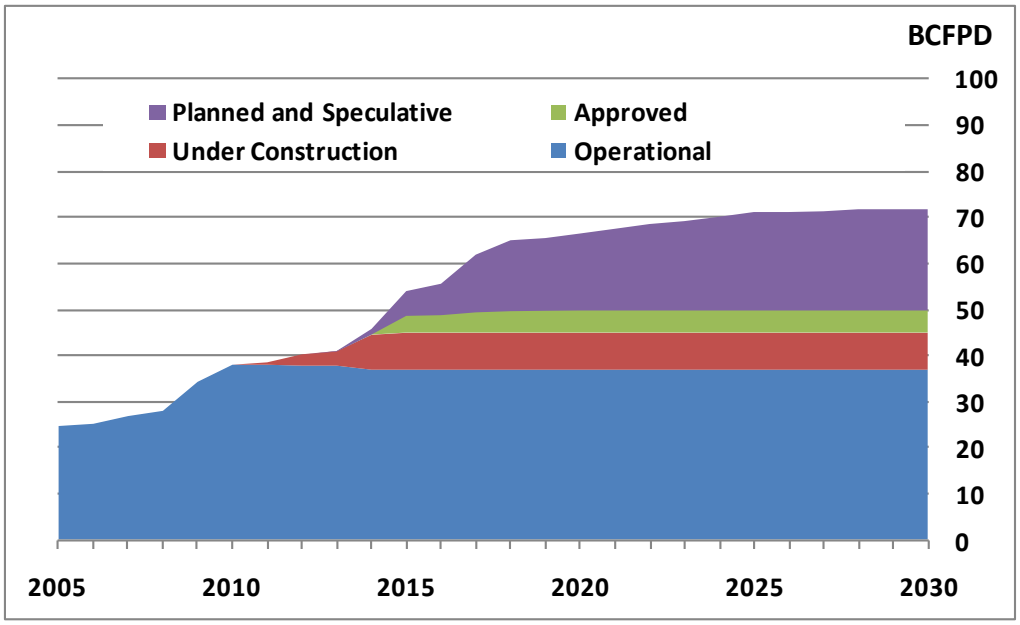
Figure 19
Global LNG Re-gasification Capacity, 2005-2030



Source: CERI

The global natural gas liquefaction capacity is projected to reach a peak of 70.8 BCFPD by the end of 2028. Liquefaction projects in the Middle East, Africa, and the Asia Pacific region, with a combined capacity of 54.3 BCFPD, will account for 75.6 percent of the total. The regions of Europe/Eurasia and Central/South America are projected to have LNG export capacities of 5.8 BCFPD and 4.5 BCFPD, respectively. North America could provide at least 7.2 BCFPD of additional liquefaction capacity, if plans to export unconventional natural gas from Canada and the US move forward. CERI's projection of global liquefaction capacity is presented in Figure 20.

Figure 20
Global Natural Gas Liquefaction Capacity, 2005-2030

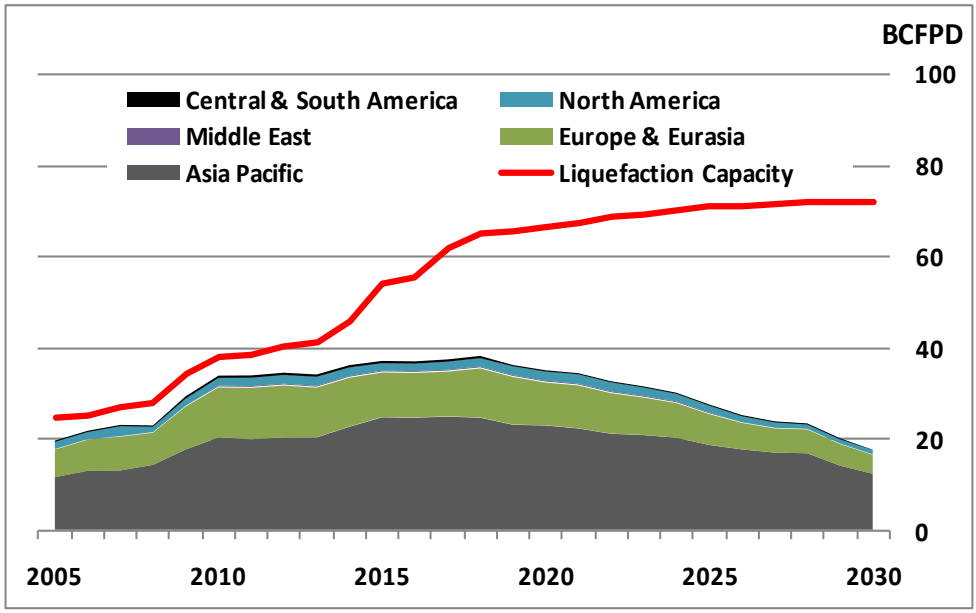


Source: CERI

The contracted LNG volumes from each of the LNG exporting regions were aggregated, by destination, in order to illustrate the global LNG volumes that have been committed to each LNG importing region. Calculating the total LNG volumes destined for the North American market, however, produced LNG volumes that far exceeded any reasonable estimate of North American LNG imports over the next two decades. Although North America possesses sufficient LNG re-gasification capacity to accept foreign sourced LNG, market conditions do not support the import of significant LNG volumes. A projection of North American LNG imports was derived using the US EIA's Annual Energy Outlook 2011 forecast of US LNG imports, in combination with a simplifying assumption pertaining to the LNG re-gasification facility utilization rates in Canada and Mexico over the projection period (see Figure 3).[53] Given that many LNG supply contracts now include destination flexibility clauses, North American LNG contract volumes in excess of the projected North American LNG imports, are assumed to be diverted to the Europe/Eurasia and Asia Pacific regions, with a 20-80 (Europe/Eurasia-Asia Pacific) split between the two regions, beginning in 2010. The LNG market price, however, will ultimately dictate where North America's unnecessary LNG contract volumes land. Figure 21 displays total LNG volumes that are committed under contracts and global liquefaction capacity.

[53]The annual LNG re-gasification capacity utilization rates in Canada and Mexico were set equal to the average North American capacity utilization rate, calculated over the most recent five years, for which data was available (2005-2009).

Figure 21
Global Liquefaction Capacity and Contracted LNG Volumes, 2005-2030



Source: CERI

In each of the LNG export regions, and at the global level, a "surplus" of LNG exists, and is represented by the area below the liquefaction capacity projection and above the committed LNG volumes. The "surplus" of LNG can loosely be viewed as the maximum volume of LNG that could be made available to the global LNG spot market. However, it is highly improbable that spot LNG volumes will reach this level for the following reasons:

1. Several of the approved, planned and speculative projects that have been included in the natural gas liquefaction capacity projection have not yet signed sales contracts. SPAs are likely to be signed as these projects move closer to a final investment decision. As a result, the area between the global liquefaction capacity and the committed LNG volumes would become smaller.
2. Existing LNG volumes that are under contract appear to peak in 2018, at 38.2 BCFPD, and decline thereafter. Many of the existing short-, medium- and long-term contracts that are set to expire during the projection period will likely be renewed and, in some cases, buyers may re-negotiate higher contract volumes under the extended contract term. The effect of contract extensions is a reduced LNG "surplus".
3. On the supply side, the global natural gas liquefaction projection does not necessarily reflect a projection of LNG output from all facilities. In 2009, the average liquefaction facility capacity utilization rate, across all LNG producing regions, was 68.6 percent.[54]
4. Not all projects will proceed as planned or as projected. Potential project delays and cancellations are factored into the projection of regional natural gas liquefaction capacities by applying probability weights, which vary depending on the LNG export region. Should growing political instability further decrease the probabilities of success that are assumed for the purpose of generating the regional liquefaction capacity

[54] BP Statistical Review of World Energy, BP, June 2010, http://www.bp.com/liveassets/bp_internet/globalbp/globalbp_uk_english/reports_and_publications/statistical_energy_review_2008/STAGING/local_assets/2010_downloads/statistical_review_of_world_energy_full_report_2010.pdf, Accessed on March 9, 2011.

projections, less LNG will be available for the global LNG spot market, and for contracted LNG volumes if sales agreements were already in place.

Over the next two decades, LNG will play an important role in meeting the increasing global demand for natural gas. In fact, the IEA estimates that LNG trade will reach 48.4 BCFPD in 2035. With growing LNG demand expected across most regions of the world, North America will continue to act as the market of last resort for global LNG producers. The largest demand growth potential exists in the Asia Pacific market, where Japan and South Korea will continue to dominate, in terms of the absolute volumes of LNG imported, and China and India compete aggressively for additional LNG supplies. Strong LNG demand growth is also anticipated in Europe/Eurasia, Central/South America, and the Middle East.

Plans are moving forward to construct natural gas liquefaction facilities in Canada and the US Lower-48 states. Whether or not North American natural gas can be competitive in the global LNG market will depend on the cost of production, relative to other exporting regions, the ability to maintain or increase domestic production, and the contract terms that can be negotiated with LNG buyers. Policies that increase the cost, or restrict the production, of shale gas in North America will hinder the success of proposed natural gas liquefaction projects. Counteracting political forces, pushing for increased energy independence, and increased energy exports, present an additional challenge to proposed natural gas liquefaction projects that are located in the US Lower-48 states.