Energy Information Administration www.eia.doe.gov

COUNTRY ANALYSIS BRIEFS

Argentina

Last Updated: Jul. 24, 2012

Background

Argentina is a significant South American oil and natural gas producer, but in recent years its production has been in decline while energy demand has grown robustly.

Argentina is South America's largest natural gas producer and a significant producer of oil. However, the heavily regulated energy sector includes policies that limit the industry's attractiveness to private investors while shielding consumers from rising prices. Consequently, demand for energy in Argentina's rapidly growing economy continues to rise while production of both oil and gas are in decline – leading Argentina to depend increasingly upon energy imports.

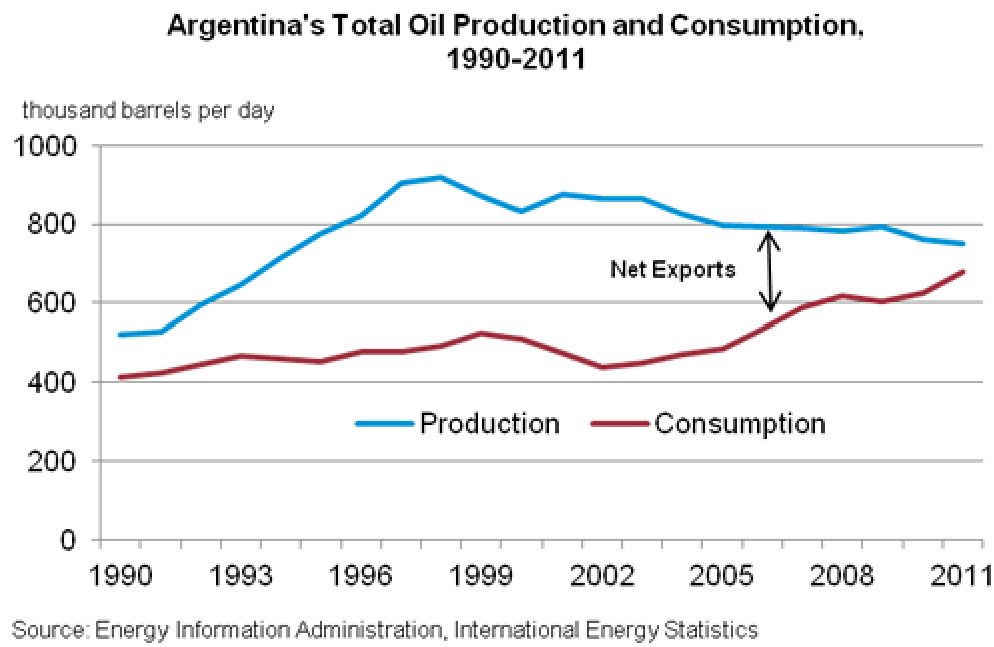
Argentina consumed an estimated 3.3 quadrillion British thermal units (Btu) of energy in 2009, just shy of the 3.5 quadrillion Btu of total energy produced. Natural gas – used widely in the electricity, industrial, and residential sectors, and increasingly in transportation – comprises approximately one-half of Argentina's total energy consumption. Much of the remainder of total energy demand is met by oil, which is a dominant fuel in the transportation sector. Smaller shares of the country's total energy consumption are attributable to nuclear, coal, hydropower, and other renewable resources that are used for electricity generation, and biofuels for transportation.

Argentina's dispute of the United Kingdom's claim to the nearby Falkland Islands (Islas Malvinas) is relevant to the energy sector, as oil and gas exploration has recently occurred there notwithstanding the Argentine government's objections. Yet despite multiple test wells and high hopes about the Falkland's offshore potential, only one company has thus far discovered a field that is likely to be commercially viable.

Oil and Other Liquids

Despite stagnant production and rising consumption, Argentina remains a net exporter of oil.

Argentina is largely self-sufficient in crude oil, but imports oil products. Relatively low levels of exploration activity, combined with natural declines from maturing fields, explain the gradual erosion of oil production from its peak in 1998.



Labor unrest has periodically shut-in Argentina's oil production, with concomitant impacts on exports, refinery runs, and local product supply. Separate disruptions affecting up to 100,000 barrels of output per day (bbl/d) plagued the sector in late 2010 and early 2011. The most recent disruption occurred in the Cerro Dragón oil field, which produces about 95,000 bbl/d, or roughly 15 percent of Argentina's total output. Production was significantly curbed at the field in late June when workers went on strike and blocked road access to the field. Negotiations between the field's operator, Pan American Energy (PAE), and labor representatives have reduced tensions and output at the field began to slowly ramp up in July 2012.

Sector Organization

Argentina's provinces have ownership and control over the development of onshore hydrocarbons. Energía Argentina Sociedad Anónima (ENARSA), the state energy company since 2004, is responsible for concessions relating to new offshore resources. Federal regulatory oversight of the oil sector is directed by the Ministerio de Planificación Federal, Inversión Pública y Servicios (Ministry of Federal Planning, Public Investment, and Services) and its Secretaría de Energía (Energy Secretariat).

The fiscal terms for Argentine oil exploration include a tax on profits of 35 percent and a 12 percent royalty on the value of oil production, but this can vary by province according to contracts with operators. In order to ensure that domestic demand is met, oil is subject to export taxes and restrictions on export volumes, which limit the profits that companies are able to generate from selling Argentine production abroad. The Petroleum Plus program aims to entice exploration and production by entitling firms to sell output from new and unconventional fields above prevailing prices.

Argentine fuel prices are not routinely set by the government, but some subsidies exist and the government occasionally intervenes to control inflation.

Major Companies

In early May 2012, the Argentine government passed legislation confirming the expropriation of the YPF oil and gas firm. The Spanish firm Repsol had majority ownership of YPF since 1999, about six years after YPF was privatized. The recent expropriation affected only Repsol's 51 percent share of the company. The government alleged that Repsol was under investing in the country's hydrocarbon sector, which the government believed contributed to the decline in the country's total oil production. Prior to the expropriation, some provinces had rescinded exploration and production licenses from YPF claiming underinvestment as well. Many provinces, through the organization OFEPHI, the federal organization of hydrocarbon-producing provinces, have increased pressure on oil companies this year to increase output volumes.

YPF is the largest oil producer in the country, and prior to the license cancellations, it accounted for one-third of the country's total output. It also holds significant interest in four refineries, and produces over 20 percent of the country's total natural gas output, making it the second largest natural gas producer. YPF's year-on-year production and income earnings fell in 2011, with net profits down by 8.5 percent in 2011. Repsol still maintains a 12 percent stake in YPF and has sought compensation for the stake seizure.

The second leading oil producer is Pan American Energy (PAE), which is owned by BP and the Bridas Corporation. The Bridas Corporation is a 50-50 joint venture between the China National Offshore Oil Corporation (CNOOC) and Bridas Energy Holdings. PAE currently operates one of Argentina's largest oil fields, the Cerro Dragón field and in 2011 the company produced about 114,000 bbl/d or 20 percent of Argentina's daily oil output.

Aside from YPF and CNOOC, international oil companies that have had a significant presence in Argentina include Chevron (U.S.), Petrobras (Brazil), and Sinopec Group (China). In late 2010, Sinopec purchased Occidental's Argentine assets, which included 23 exploration and production blocks that collectively ranked Occidental among the country's five largest oil producers. Though the move marked Sinopec's first exposure to the country, it is consistent with a broader trend of increased Chinese involvement in South American energy interests.

Reserves

According to *Oil & Gas Journal* (*OGJ*), Argentina had 2.5 billion barrels of proved oil reserves as of January 1, 2012. Argentine government data suggest that Golfo San Jorge Basin (predominantly Chubut and Santa Cruz provinces) claims over 60 percent of remaining proved reserves, followed by Neuquén Basin at 25 percent. PAE's Anticlinal Grande-Cerro Dragon concession in Golfo San Jorge contains almost 30 percent of the country's reserves.

Though most of the recent enthusiasm in Argentina regarding unconventional fossil fuel resources has centered on natural gas, last year YPF announced a large discovery of shale oil in the Loma La Lata field in the Neuquén province in the Vaca Muerta shale formation, the estimated size of which has increased to 741 million barrels of recoverable shale oil.

Exploration and Production

EIA estimates that Argentina's total oil supply in 2011 was just below 750,000 bbl/d, of which roughly 588,000 bbl/d was crude oil and lease condensate, with the remainder comprised of natural gas liquids (NGLs), biofuels, and other liquids. The Neuquén and Golfo San Jorge basins comprise the vast majority of Argentine crude oil production, each accounting for slightly more than 40 percent of national output. Chubut (Golfo San Jorge basin) is the most prolific oil province, followed by Neuquén, Santa Cruz, and Mendoza.

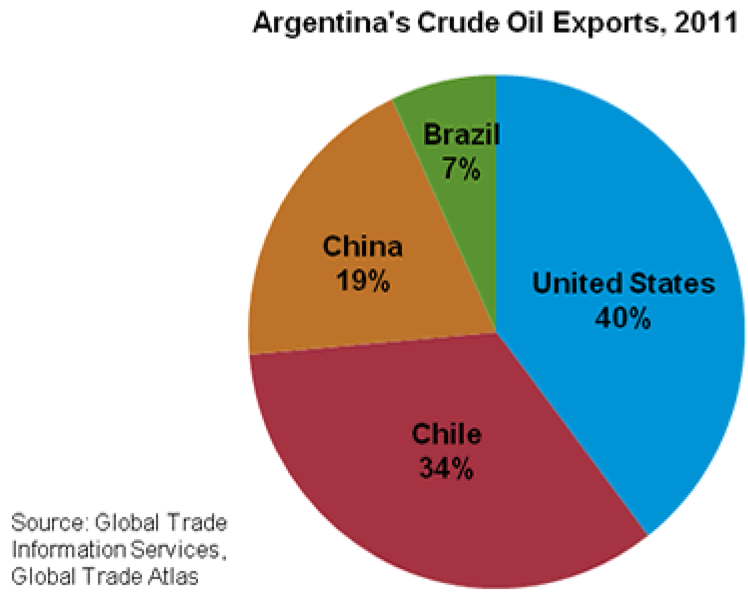
The Argentine government launched an offshore exploration program that was undertaken by a consortium led by YPF, PAE, and Petrobras in Argentine waters near the Falkland Islands. However, as of yet, exploration has not yielded any commercial finds. In 2011, state energy company, ENARSA, cancelled plans to tender new deepwater offshore exploration contracts, claiming that market conditions were not conducive for successful exploration. Consequently, there has been little oil exploration offshore and new discoveries in the offshore San Jorge basin have been disappointing.

Diplomatic tensions between Argentina and the United Kingdom (UK) over ownership of the Falkland Islands, located in the South Atlantic Ocean, have escalated as UK companies commenced exploratory drilling in 2010, despite Argentine government objections. The islands are officially recognized as UK territory, but Argentina claims the area was historically under its sovereignty. Argentina has enforced restrictions on some companies pursuing oil activities in the Falkland Islands. Although there have not been any large oil discoveries yet, the offshore waters of the islands are believed to contain potential reserves of oil and natural gas.

Exports

Argentina exported just over 60,000 bbl/d of crude oil in 2011, almost a 40 percent decline from the previous year due to increased domestic consumption and decreased production. The United States and Chile accounted for three-quarters of exports, followed by China and Brazil.

Argentina's exports to the United States in 2011 included 28,000 bbl/d of crude oil and 4,000 bbl/d of petroleum products, according to EIA data.



Refining

Argentina claims ten refineries with a combined 630,575 bbl/d of crude refining capacity, according to *OGJ*, nearly half of which is controlled by YPF. The vast majority of capacity derives from just four refineries: YPF's refinery in La Plata (189,000 bbl/d), Shell's refinery in Buenos Aires (113,000 bbl/d), YPF's recently upgraded refinery in Lujan de Cuyo (106,000 bbl/d), and ExxonMobil's refinery in Campana (87,000 bbl/d).

Outputs from Argentina's refinery capacity do not satisfy all internal fuel demand. As a result, Argentina imports significant volumes of finished products – including an average of 42,000 bbl/d from the United States in 2011, which is more than double the amount imported the previous year.

Biofuels

Argentina is among the world's largest producers of biodiesel, and the largest exporter. Its soybean-based biodiesel production reached almost 47,500 bbl/d in 2011, according to the Argentine government. Biodiesel production has dramatically increased over the past 5 years, including an increase of over 25 percent from 2010 to 2011. Exports increased by almost 20 percent to nearly 30,000 bbl/d in 2011.

The vast majority of Argentine biodiesel exports are sent to European markets and about half were traditionally sent to Spain. However, Spain recently passed legislation prohibiting the importation of biodiesel outside of the European Union (EU). Argentine exporters hope to redirect that portion to other European countries. Exports may also be affected by the rise in domestic biodiesel consumption, which grew rapidly in 2010 with the entry into force of a mandate that stipulates that diesel must be blended with 7-percent biodiesel by volume (B7). Nonetheless, biodiesel exports in the first quarter of 2012 rose by almost 30 percent compared to the same time period last year, according to statistics published by CARBIO, the Argentine Biofuels Association.

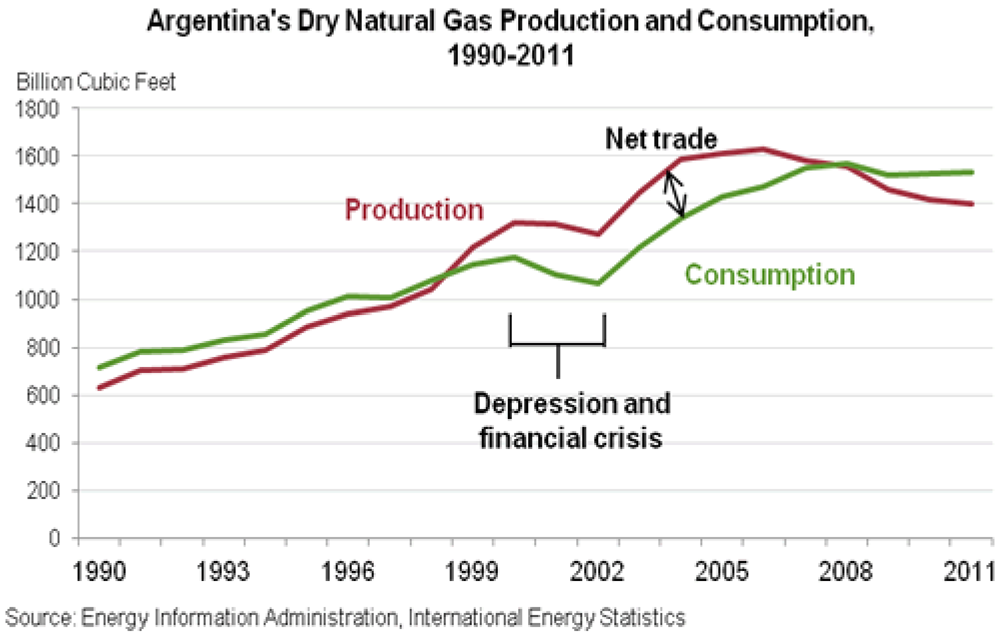
Bioethanol production reached an average of 368 tons per day (2,600 bbl/d) in 2011 and is expected to rise as more investment into the industry will bring online new additional plants in 2013. Currently, bioethanol is produced by the local sugar industry, but the two new plants expected to begin production next year will be grain-fed. The U.S. Department of Agriculture (USDA) projects that production will reach nearly 7,000 bbl/d of bioethanol next year with capacity increasing to over 12,000 bbl/d with the start of the new plants.

Natural Gas

Argentina is the largest producer and consumer of natural gas in South America, and has a globally significant unconventional resource base.

Overview

Argentina produces more natural gas than any other country in mainland South America, but its output has declined over 10 percent from peak levels in 2006. It is also the continent's largest natural gas consumer. Though once a net exporter of natural gas to neighboring countries, Argentina became a net importer in 2008. Recent assessments suggest that Argentina possesses one of the world's largest endowments of shale gas, which has become a focus of efforts to reverse the sector's recent decline.



Slightly less than one-third of natural gas consumed in Argentina is used to generate electricity at thermoelectric power plants, while industry and the residential sector each account for 28 and 24 percent of Argentina's natural gas demand, respectively. About 7 percent of natural gas consumption is also used in the transportation sector, as roughly 1.9 million of Argentina's vehicles operate on compressed natural gas.

Argentina has suffered severe wintertime shortages of natural gas – reportedly of up to 40 percent of demand at prevailing prices – that have adversely impacted industrial users whose supplies were interrupted or diverted to satisfy basic residential needs. Seasonal shortages of natural gas also plague some summer months, as electricity demand soars with high temperatures. To avert similar problems in the future, the state energy company has taken steps to import greater volumes of liquefied natural gas (LNG).

Sector Organization

The Ministerio de Planificación Federal, Inversión Pública y Servicios (Ministry of Federal Planning, Public Investment, and Services) includes two relevant natural gas market institutions: the Ente Nacional Regulador de Gas (ENARGAS) and Secretaría de Energía (Energy Secretariat). The Secretaría de Energía oversees the relatively deregulated upstream production sector, while ENARGAS regulates the more tightly controlled natural gas transportation and distribution activities.

Price controls, which were imposed in 2001 to combat inflation and aid consumers during the economic crisis, remain in place and cause natural gas to be relatively inexpensive by regional standards. Industry analysts argue that frozen prices for natural gas have deterred investment and production, stimulated consumption, and driven the country to rely on greater volumes of imports.

In order to leverage Argentina's promising unconventional natural gas resources and revitalize domestic production, the government instituted the Gas Plus program that entitles companies to sell natural gas from new or unconventional fields at higher prices. Projects that were recently approved under the Gas Plus program will reportedly be allowed to charge around $5 per million Btu (MMBtu) for their production, roughly double the national average price.

Major Companies

Total, through its presence in Argentina as Total Austral, is the country's largest natural gas producer. Together, Total and the second-largest producer, YPF, produce about one-half of Argentina's natural gas. Other significant players include Pan American Energy, Petrobras (Brazil), Pluspetrol (Argentina), Tecpetrol (Argentina), and Apache Energy (U.S.).

Reserves

OGJ estimates that Argentina had proved natural gas reserves of 13.4 trillion cubic feet (Tcf) as of January 1, 2012, a decline of approximately 50 percent from reserve levels of a decade ago. Almost three-quarters of proven reserves are in the Neuquén basin (42 percent) and Austral basin (30 percent), with the remainder in the Noroeste (Northwest), Golfo San Jorge, and Cuyana basins.

According to recent analysis by EIA and Advanced Resources International, Argentina has 774 Tcf of technically recoverable shale gas resources – the world's third largest assessed endowment, behind only China and the United States. The Neuquén Basin in western Argentina contains more than half of the country's technically recoverable shale gas resources.

Shale Gas Basins in Southern South America

Source: U.S. Energy Information Administration, "World Shale Gas Resources: An Initial Assessment of 14 Regions Outside the United States," March 2011.

Last year YPF announced the discovery of a large formation of commercially promising tight gas and shale gas – thought to total 4.5 Tcf – in the vicinity of Neuquén's Loma La Lata field, which for decades has been a leading source of conventional production.

Exploration and Production

Argentina produced about 1.4 Tcf of dry natural gas in 2011, or approximately 4 billion cubic feet per day (Bcf/d). Roughly half of Argentina's conventional natural gas production derives from the Neuquén province. An even greater share of Argentina's natural gas production derives from the Neuquén basin, which also encompasses parts of the Mendoza, Rio Negro, and La Pampa provinces. Neuquén includes the country's most prolific natural gas field, Loma La Lata, operated by YPF.

Roughly 13 percent of Argentina's 2011 natural gas production was from offshore resources, which mostly entailed the Cuenca Marina Austral 1 concession that is operated by Total, with the remainder from concessions operated by Sipetrol Argentina, a subsidiary of Chile's national oil company ENAP Sipetrol. All offshore natural gas production derives from the Austral-Magallanes Basin in the country's extreme south, which includes federal waters off of the provinces of Tierra del Fuego and Santa Cruz.

Dozens of projects to exploit Argentina's unconventional tight sand and shale gas resources – most of them in Neuquén – are under review or development. Many firms, including ExxonMobil, Apache, Pluspetrol, Total, and YPF, are attempting to take advantage of the more attractive fiscal terms offered by the government for unconventional projects. According to some sources, Argentina already produces over 230 million cubic feet of unconventional natural gas per day (MMcf/d), or about 5 percent of total production.

Pipelines

According to the U.S. Central Intelligence Agency, Argentina has 18,269 miles of natural gas pipelines. Transportadora de Gas del Sur (TGS), the leading natural gas transportation company, claims to operate the most extensive pipeline system in Latin America. Its predominant pipelines are Neuba I, Neuba II, and San Martin, which connect producing provinces in the Neuquén, San Jorge, and Austral basins with Buenos Aires and other demand centers. The other primary natural gas transportation company is Transportadora de Gas del Norte (TGN).

The Argentine government recently opened bidding on the ambitious and long-contemplated Gasoducto del Noreste Argentino (GNEA). The stated purpose of GNEA is to connect Argentina's remote northeastern provinces, which are currently reliant on more expensive liquid fuels, to the domestic natural gas grid and serve them with the larger volumes of gas that Bolivia has pledged for future years.

Bolivia → Argentina

Argentina imports natural gas through pipelines that originate in Bolivia. The YABOG pipeline, which runs from Río Grande, Bolivia to Salta, Argentina, was completed in 1972 with a capacity of 200 MMcf/d. Argentina and Bolivia inaugurated another cross-border pipeline, known as the Juana Azurduy Integration Pipeline, at the end of June 2011.

Argentina → Chile

Argentina and Chile pursued various natural gas pipeline projects in the 1990s as Chile sought to diversify its energy supply and both countries attempted to strengthen their bilateral relationship through more extensive political and economic ties. The GasAndes pipeline, which traverses the mountainous terrain between Mendoza province and the Chilean capital of Santiago, was commissioned in 1997. It was followed by the Gasoducto del Pacífico between Neuquén and the Concepción area of Chile; the NorAndino and GasAtacama pipelines on the countries' extreme northern border; and three pipelines in the south to supply methanol plants in Chile.

Argentina → Brazil

The Transportadora de Gas del Mercosur pipeline connects with the TGN network to deliver natural gas from Paraná to a power plant in Uruguayana, Brazil. There is also a proposal to expand the pipeline onwards to Porto Alegre in Brazil.

Argentina → Uruguay

The Gasoducto Cruz del Sur consortium operates the Buenos Aires-Montevideo natural gas pipeline, which has been in operation since 2002 under a 30-year concession. A smaller pipeline connects Colón, Argentina and Paysandú, Uruguay.

Imports

Bolivia

Bolivia is the source of virtually all of Argentina's natural gas imports via pipeline. A contract between Bolivia's national oil company and ENARSA extends through 2026 and stipulates a current trade volume of 7.7 million cubic meters of natural gas per day (272 MMcf/d), which is up from 5 million cubic meters per day (177 MMcf/d) in 2010 and due to grow to 27.7 million cubic meters per day (nearly 1 Bcf/d) by 2017.

Liquefied Natural Gas (LNG)

Argentina imported 21 LNG cargoes, or almost 1.1 million tons (50 Bcf of natural gas), of LNG in 2010. Trinidad and Tobago accounted for nearly 90 percent of those imports, with the remainder arriving from Qatar. Argentine government tenders suggest that LNG import volumes most likely doubled in 2011.

ENARSA has contracted with YPF to develop and execute a LNG strategy. Argentina began importing LNG in 2008 with the installation of the Bahía Blanca GasPort, a dockside receiving terminal and regasification vessel that uses proprietary technology from Excelerate Energy. In

June 2011, a second and larger Excelerate Energy floating storage and regasification vessel, also financed by YPF and ENARSA, was inaugurated in Escobar (GNL Escobar) with baseload and peak throughput capacities of 500 and 600 MMcf/d, respectively.

Argentina is pursuing bilateral arrangements to secure greater and more predictable supplies of LNG. Argentina and Uruguay plan to jointly issue a tender for construction of a floating LNG terminal to be located near Montevideo, the supplies from which the two countries would share equally. ENARSA is also developing a regasification project through a partnership with PDVSA, the state oil company of Venezuela. Finally, Argentina and Qatar have signed an agreement to study the desirability of constructing a third LNG terminal that would be supplied with 5.4 million tons of Qatari LNG per year (720 MMcf/d of natural gas).

Exports

Though Argentina is a net importer of natural gas, it continues to export natural gas to its neighbors – largely Chile and, to a lesser extent, Uruguay. However, Argentina's reliability as a regional natural gas exporter has occasionally been undermined by supply interruptions during periods of domestic shortages. Exports of dry natural gas have dramatically fallen from its peak of 274 Bcf in 2004 to 15 Bcf in 2010.

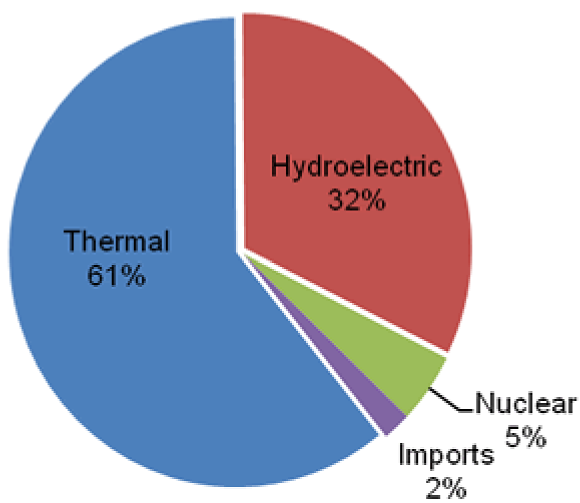
Electricity

Overview

Argentina is the second-largest consumer of electricity in South America, after Brazil.

Argentina generated 121,216 gigawatts per hour (GWh) from installed power sources in 2011, up from 115,735 GWh in 2010, according to CAMMESA (Compañía Administradora del Mercado Mayorista Eléctrico), the country's administrator of the wholesale electricity market. Two-thirds of Argentina's electricity generation was from conventional thermal plants that primarily burn natural gas. Argentina maintains transmission interconnections and trade in electricity with Brazil, Chile, Paraguay, and Uruguay. The country imported 2,412 GWh of power from neighboring countries in 2011, slightly more than the 2,351GWh imported in 2010. Argentina's power exports have significantly declined in recent years; dropping from 1,292 GWh in 2009 to 359 GWh in 2010 and 265 GWh in 2011, as domestic demand for electricity has increased.

Electricity Generation Sources in Argentina, 2011



Source: CAMMESA (Compañía Administradora del Mercado Mayorista Eléctrico)

Nuclear

Argentina has two nuclear power plants in operation and another near completion, all of which are or will be operated by Nucleoeléctrica Argentina S.A. Argentina's first nuclear power plant, Atucha I, was commissioned in 1974 in the province of Buenos Aires. It has an electric generation capacity of 370 megawatts (MW). A larger and newer plant, Embalse, is located in Córdoba with a net capacity of 650 MW. According to CAMMESA, 5,892 GWh of nuclear power was generated in Argentina in 2011. Argentina's newest nuclear plant, Atucha II, is currently under construction and is scheduled to be completed sometime in 2012. It will be the country's largest nuclear power plant at a net capacity of 692 MW. The agency that is responsible for research, development, promotion, and control of nuclear energy in Argentina is Comisión Nacional de Energía Atómica.

Hydroelectricity

Hydroelectricity is an important component of Argentina's power profile. Though hydroelectric output fluctuates and has often declined in recent years, it is typically responsible for between one-quarter and one-third of Argentina's total electricity generation. Argentina's most significant hydroelectric capacity exists in Neuquén, followed by border provinces that share hydroelectric output with surrounding countries. Argentina and Paraguay divide power from the large Yacyreta plant, which sits astride the Paraná River (Corrientes province) with a total installed capacity of 3.1 GW. Likewise, the Salto Grande hydroelectric plant on the Uruguay River (along Entre Ríos province) has a capacity of 1.89 GW, from which output is split evenly between Argentina and Uruguay. In 2011, total hydroelectric generation was 39,339 GWh, according to CAMMESA.

Other Renewables

The Argentine government is actively supporting the deployment of non-hydro renewable sources of electricity, including through a feed-in tariff for qualifying technologies, a mandatory connection policy that obligates utilities to purchase wind-generated electricity, and an 8-percent Renewable Portfolio Standard by 2016.

Patagonia, a remote region that encompasses southern Argentina and Chile, has been assessed as one of the world's most promising corridors for wind power development. The distance between Patagonia and significant load centers is one impediment to harnessing commercially its wind potential. However, the government is attempting to reduce transmission costs by connecting Patagonia to the national grid. Several turbines have been installed in the area to serve local electricity demand. EIA estimates that wind electricity net generation in the country peaked at 0.071 billion kWh in 2005 and gradually decreased to 0.040 billion kWh in 2010.

Sector Organization

The Ente Nacional Regulador de la Electricidad (ENRE) regulates Argentina's electricity sector and sets its tariffs, while the Consejo Federal de la Energía Eléctrica acts as an advisory and investment body under the broader authority of the Secretaría de Energía. CAMMESA manages the wholesale power market.

Electricity is generated by dozens of private and state-owned companies in a relatively liberalized marketplace, while the transporters and distributors of electricity are heavily regulated as natural monopolies. Transener is the owner of the largest transmission network, while three companies – Edenor, Edesur, and Edelap – dominate the electricity distribution sector. The electricity industry is characterized by vertically integrated firms, of which Pampa Energía is the largest due to its ownership or co-control over generation assets, the Transener transmission network, and the Edenor distribution utility.

Sources

Associated Press
Baker Institute/Stanford PESD Geopolitics of Natural Gas Study
BBC News
CARBIO
Comisión Nacional de Energía Atómica
Compañía Administradora del Mercado Mayorista Eléctrico Sociedad Anónima
Consejo Federal de la Energía Eléctrica
Energía Argentina Sociedad Anónima
Emprendimientos Energéticos Binacionales Sociedad Anónima
Energy Intelligence Group
Ente Nacional Regulador de Electricidad
Ente Nacional Regulador de Gas
Excelerate Energy
Global Insight, IHS
Global Trade Information Services
International Energy Agency
International Monetary Fund
Latin America Oil and Gas Monitor (LatAmOil)
Ministerio de Planificación Federal, Inversion Publica y Servicios
Organización Latinoamerica de Energía (OLADE)
Pan American Energy
Platts
Reuters
Secretaría de Energía
U.S. Central Intelligence Agency
U.S. Department of Agriculture
U.S. Department of Commerce
U.S. Department of State
U.S. Energy Information Administration
YPF

Contact Info

cabs@eia.gov
(202) 586-8800
cabs@eia.gov