

COUNTRY ANALYSIS BRIEFS

Iberian Peninsula

Last Updated: July 2007

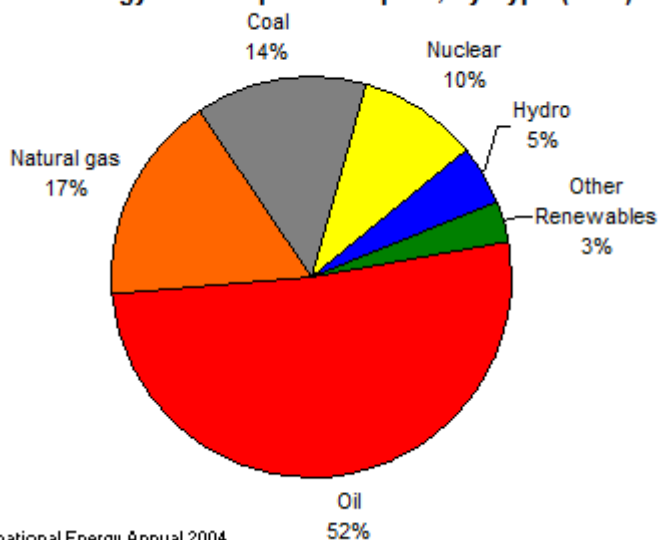
Background

Economic growth has driven a large increase in energy consumption in Spain and Portugal.

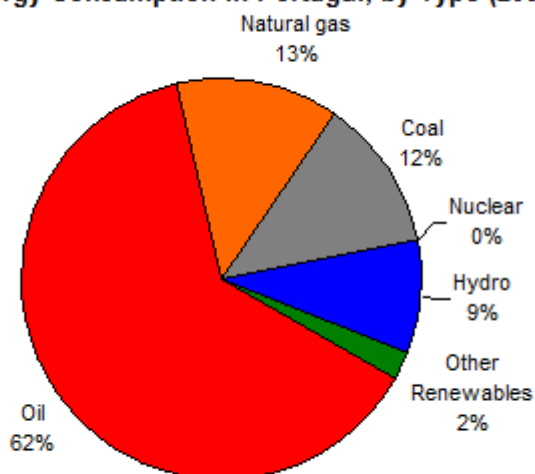
Both Spain and Portugal have been members of the European Union (EU) since 1986. EU membership has led to an increased standard of living and economic growth in the Iberian Peninsula and billions of dollars worth of EU structural funds flowing into the two countries. Nevertheless, both countries continue to face economic challenges. Spain's unemployment rate remains stubbornly high, while Portugal has repeatedly exceeded the EU's limits on budget deficits.



Economic growth spurred by EU membership has led to increases in energy consumption. For example, Spain's energy demand has increased over 100 percent since the mid-1970s. The Iberian Peninsula has limited energy resources, so both Spain and Portugal must depend upon imports for the bulk of their energy needs. Attempts to develop domestic energy sources, though, have focused on hydropower and renewables. Both countries have also sought greater integration of the Iberian energy sector through policy coordination and infrastructure projects. The two announced in 2001 that they would create a single Iberian electricity market without limits on transnational ownership or market participation. However, repeated delays have pushed implementation of this market, called Mibel, until October 2007.

Total Energy Consumption in Spain, by Type (2004)

Source: EIA International Energy Annual 2004

Total Energy Consumption in Portugal, by Type (2004)

Source: EIA International Energy Annual 2004

Oil

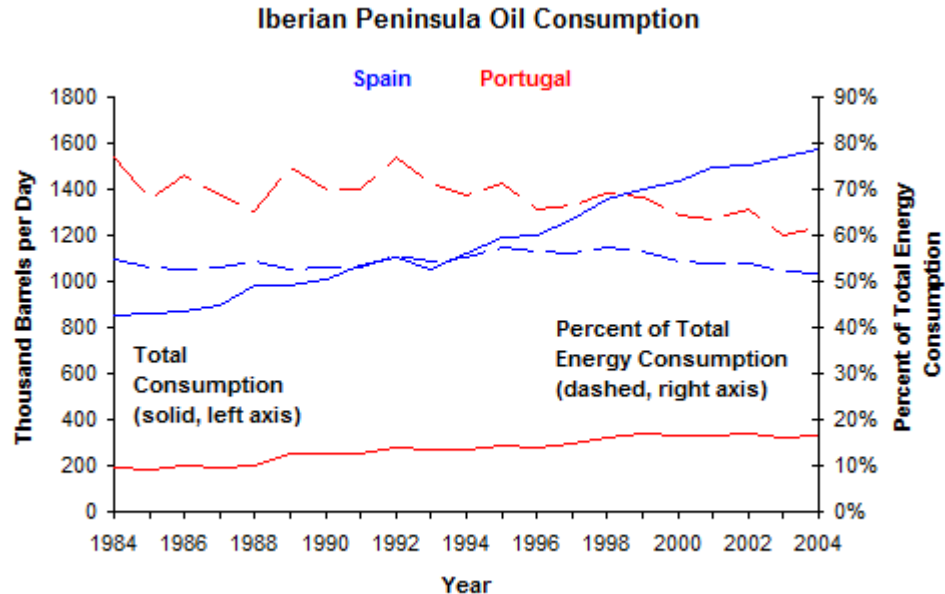
Spain and Portugal depend upon imports for almost all of their oil consumption.

According to *Oil and Gas Journal (OGJ)*, the Iberian Peninsula had a combined 150 million barrels of proven oil reserves in January 2007. Oil consumption in 2006 stood at 1.89 million barrels per day (bbl/d), with Spain contributing the bulk (84 percent) of that amount. Even though oil consumption has increased in absolute terms over the past two decades, its percentage of total energy consumption has declined. Due to the lack of significant domestic oil production, Spain and Portugal depend upon oil imports, with the largest suppliers including Russia, Libya, and Saudi Arabia.

Sector Organization

The largest oil company in Spain is Repsol-YPF, created in 1999 through the merger of Repsol, the former, state-owned oil company of Spain, and Yacimientos Petrolíferos Fiscales (YPF), formerly owned by the Argentine government. The combined group is one of the world's largest integrated oil operators, with activities in over 28 countries. After Repsol-YPF, Cepsa is the second-largest oil company in Spain. Cepsa has exploration and production activities in Algeria and Colombia, with future expansion planned in Yemen and Iran. The Compania Logistica de Hidrocarburos (CLH) is a private holding company for the domestic oil and petroleum products

transportation system. Ten oil and gas companies hold shares in CLH, the largest being Enbridge, Respol-YPF, and Cepsa.



The largest oil company in Portugal is Petrogal, a wholly-owned subsidiary of Galp Energia. Galp Energia is owned by the Portuguese government and a collection of international oil and gas operators. Petrogal controls the domestic midstream and downstream oil sectors in Portugal, and it also maintains modest production activities in Angola and Brazil. In October 2006, the government completed an initial public offering of Galp shares that earned the government \$1.4 billion, though it still continues to hold a small amount of Galp shares.

Exploration and Production

Spain produced only 3,000 bbl/d of crude oil in 2006, while Portugal had no commercial production. According to *OGJ*, Spain has seven active fields, all operated by Repsol-YPF: Alga, Ayoluengo, Barracuda, Boqueron, Casablanca, Chipiron, and Rodaballo.

Downstream Activities

According to *OGJ*, Spain has nine oil refineries with a combined capacity of 1.27 million bbl/d. The largest facility in the country is Cepsa's Cadiz refinery (240,000 bbl/d), though Repsol-YPF controls the largest refining capacity of any single company. Repsol-YPF and Cepsa also have joint ownership of a bitumen plant, Aseca, located at the Tarragona refinery.

Portugal has two refineries, both operated by Petrogal. Located in Sines and Porto, the facilities have a combined capacity of 304,000 bbl/d. Petrogal also controls the retail market for refined oil products and operates the country's oil pipeline network.

Biofuels

According to the Spanish Association of Alternative Energy Producers, biofuels represented 0.53 percent of transportation fuel sales in Spain in 2006. Ethanol represented the bulk of this total, followed by biodiesel. The group also reported strong biodiesel exports to the rest of Europe. In March 2007, Natura opened a new biodiesel plant in Ocana, with a production capacity of 2,000 bbl/d.

Natural Gas

There are no significant natural gas reserves in the Iberian Peninsula. Spain only produced 5.6 billion cubic feet (Bcf) of natural gas in 2005, mostly from a single offshore field, Poseidon, operated by Repsol-YPF. Portugal does not have any commercial natural gas production, though there have been repeated exploration attempts in its offshore basins.

Natural gas consumption in the Iberian Peninsula has grown rapidly in the past decade.

In 2005, Spain consumed 1.1 Tcf of natural gas. Natural gas consumption in the country has risen dramatically since the 1980s, and Spain has one of the fastest-growing natural gas markets in the world. Between 1994 and 2004, Spain's natural gas consumption tripled, driven mostly by the large-scale introduction of gas-fired power plants. The Portuguese natural gas sector has also grown considerably over the past few years. Consumption was nearly non-existent prior to 1997, but in 2004, consumption of natural gas reached 152 Bcf. The increase in natural gas consumption can be attributed to the construction of import infrastructure, including pipeline links with North Africa and liquefied natural gas terminals.

Sector Organization

The largest natural gas supplier in Spain is Gas Natural (GN), the result of a 1992 merger between Catalana de Gas, Gas Madrid, and the gas infrastructure assets of Repsol Butano. Gas de Portugal (GdP), a wholly-owned subsidiary of Galp Energia, dominates Portugal's natural gas sector. GdP directly controls natural gas importation, transportation, and supply, while it indirectly controls distribution through its stakes in Portugal's six regional distribution companies.

Pipelines

Enagas operates most of Spain's domestic natural gas transportation system. Enagas controls 4,500 miles of pipelines in Spain, consisting of six main trunk lines that connect Spain's liquefied natural gas (LNG) and pipeline import terminals with the country's interior. As mentioned above, GdP owns and operates Portugal's natural gas transmission system.

International Pipelines

Spain imports natural gas through two international pipelines. The Trans-Pyrenean pipeline, linking Calahorra, Spain to Lacq, France, began operations in 1993. This pipeline has a capacity of 330 million cubic feet per day (MMcf/d), allowing Spain to import natural gas from Norway via France. The second import pipeline is the 1,000-mile, 1.1-Bcf/d Maghreb-Europe Gas (MEG, also called Pedro Duran Farell). MEG, completed in 1996, connects Algeria's Hassi R'mel gas field with Cordoba, Spain, via Morocco.

In July 2001, a consortium led by Spain's Cepsa (20 percent) and Algeria's Sonatrach (20 percent) agreed to build the Medgaz natural gas pipeline, a second link between Algeria and Europe. The 120-mile, \$1.3 billion Medgaz would link Beni Saf, Algeria to Almeria, Spain, with an eventual extension to France. In September 2002, the consortium completed a study of the line's feasibility, but delays have pushed back initial construction on the project. If completed, Medgaz would have an initial capacity of 770 MMcf/d. In 2007, a dispute between Sonatrach, the Algerian state energy company, and the Spanish government regarding Sonatrach's ability to sell natural gas from Medgaz in Spain threatened to derail the project.

In June 2006, France's Total inaugurated the Euskadour pipeline linking the LNG terminal in Bilbao, Spain to Lussagnet, France. The system will allow Spain to re-export natural gas to the north. The 19-mile pipeline, running along the Bay of Biscay, has an initial capacity of 48 MMcf/d.

Portugal has two pipeline connections with Spain: Tarifa (1.08 Bcf/d) and Tuy (40.6 MMcf/d).

Spain is one of Europe's largest LNG importers.

Liquefied Natural Gas (LNG)

Spain is one of Europe's largest LNG importers. Enagas operates three LNG receiving terminals in Spain: Barcelona (2.5 Bcf/d), Cartagena (1.4 Bcf/d), and Huelva (1.7 Bcf/d). The Bahia de Bizakaia Group, a consortium of BP, Repsol-YPF, Iberdrola, and Ente Vasco de la Energia (EVE), operates an LNG terminal at Bilbao, with a capacity of 1.2 MMcf/d. The Sagunto LNG terminal, owned by a consortium of Union Fenosa, Iberdrola, and Endesa, has a capacity of 1.2 Bcf/d. In May 2007, the El Ferrol LNG terminal in northwest Spain received its first commercial shipment. The plant currently has a sendout capacity of 350 MMcf/d.

In October 2003, Portugal completed its first LNG terminal in Sines, with an output capacity of 530 MMcf/d of natural gas. The Sines terminal, operated by Galp Energia subsidiary Galp Atlantico, allows Portugal to seek greater independence of its natural gas supply, which is dependent on Spain's natural gas network to process and transport natural gas to the country.

Planned Facilities

There are three LNG regasification terminals proposed for Spain that are in various stages of the planning process. Engas is the proposed operator for a new facility in El Musel, in the Asturias region of Spain. Construction on the project could begin by 2009. In 2005, Compania

Transportista de Gas Canarias (GasCan) completed an environmental impact assessment for its proposed LNG terminal on Tenerife, in the Canary Islands. That project would have an initial capacity of 33.9 MMcf/d and would mostly fuel a nearby power plant. GasCan also proposed building another LNG terminal in the Canary Islands, on Grand Canaria.

Coal

The last coal mine in Portugal closed in 1994, while production in Spain is in decline.

Coal is Spain's most plentiful indigenous energy source, with reserves of 584 million short tons (Mmst) in 2003. The country produced 22.7 Mmst in 2003, while consuming 45.6 Mmst, relying on imports for the balance. Overall coal consumption has remained relatively flat over the past decade, with Spain's electricity sector constituting the largest share. Private companies produce most of the coal in Spain, though the single-largest company is Hunosa, owned by the government through the Sociedad Estatal de Participaciones Industriales (SEPI) holding company. Similar to other EU members, Spain's coal industry has struggled to remain competitive vis-à-vis imported coal and other energy sources.

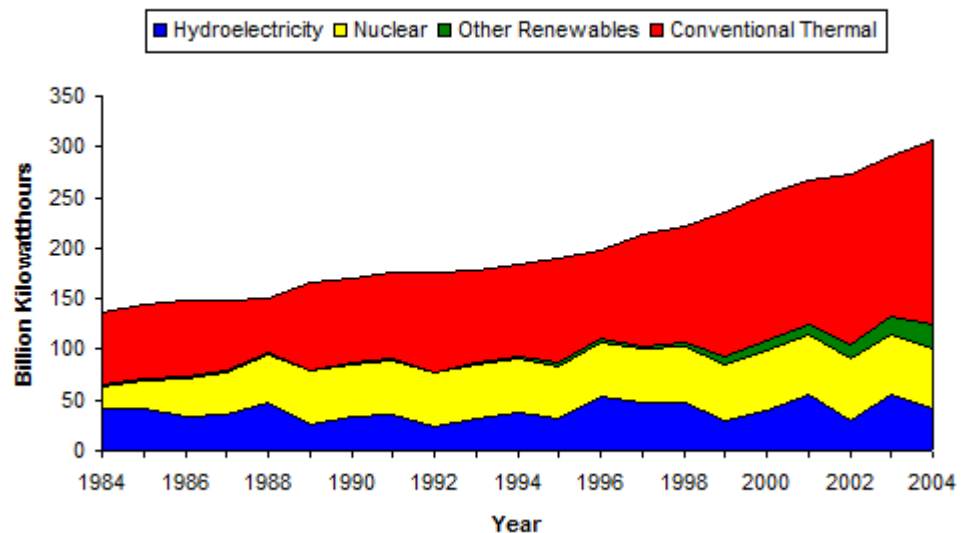
Portugal has not produced coal since its last mine closed in 1994. In 2003, Portugal consumed 5.9 Mmst of coal, mostly for electricity generation.

Electricity

Spain has seen a rapid growth in electricity generation from natural gas-fired plants.

Spain produced 263.3 billion kilowatthours (Bkwh) in 2004, while consuming 241.8 Bkwh. The largest share of Spain's electricity generation came from conventional thermal plants, followed by hydroelectricity. There have been a number of new gas-fired power plants built in Spain in recent years to satisfy rapidly-growing demand. In 2004, Portugal consumed 46.1 Bkwh and generated 42.5 Bkwh of electricity. Portugal has long depended upon hydropower to provide a large part of its electricity needs; however, hydropower's share of total electricity generation has declined from 53 percent in 1980 to 23 percent in 2004. The volatility and unpredictability of hydropower (see chart) has caused the Portuguese government to promote thermal generating capacity, especially natural gas-fired, as an alternative to hydroelectricity.

Iberian Peninsula Electricity Generation, by Source



Source: EIA International Energy Annual 2004

Sector Organization

Endesa is the largest power generating and distributing company in Spain, with over 21,600 megawatts (MW) of installed generating capacity. The company controls about half of the regulated electricity market and one-third of the liberalized market. The largest source of Endesa's generating capacity is coal-fired plants, followed by nuclear. Spain's second-largest power utility overall is Iberdrola, though the company controls the largest share of the deregulated portion of the market. Other important players in Spain's electricity sector include Union Fenosa, Hidrocanabrico, and Gas Natural. Red Electricia de Espana (REE), owned by the Spanish government and numerous electricity companies, owns and operates Spain's electricity grid.

There are two electricity markets in Portugal, the Public Electricity System (PES) and the Independent Electricity System (IES). PES is the regulated market with power supplied at fixed rates under long-term contracts. The IES consists of smaller producers and consumers that allows unrestricted access by generators and distributors. Formerly state-owned Electricidade de Portugal (EdP) maintains a dominant position in both markets. EdP controls almost all of the generating capacity in the PES and holds significant stakes in generating capacity in the IES. EdP's wholly-owned subsidiary, EdP Distribuicao, controls distribution in the PES. Electricity transmission in both markets is controlled by national grid operator Rede Electrica Nacional (REN), majority-owned by the Portuguese government.

Single Iberian Electricity Market (Mibel)

In January 2004, Spain and Portugal formally signed an agreement to create a pan-Iberian electricity market (Mibel). The new market will allow generators in the two countries to sell their electricity on both sides of the border. The country's two energy market regulators, Spain's OMEL and Portugal's OMIP, will merge to create a single operator for the integrated electricity market. Repeated delays have plagued the implementation of Mibel, though the official launch date is now slated for October 2007.

Despite administrative delays, there has been some progress towards integrations, namely, a new 40-kilovolt transmission line between the prospective countries at Cartelle-Lindosa. In January 2005, OMIP oversaw the cancellation of long-term power contracts between EdP and REN, which will open up access to the grid to third-party generators.

Electricity Generation Sources

Conventional Thermal

Spain's conventional thermal generating capacity contributes over half of the country's total power supply. Over the past several years, this capacity has begun to shift from an emphasis on coal towards natural gas, specifically combined-cycle, gas-fired turbines (CCGFT). Spain has promoted CCGFTs in order to increase existing generating capacity and reduce its carbon dioxide emissions. Construction of CCGFTs has been one of the principle drivers behind rising natural gas demand in Spain. Portugal has also begun invested into CCGFTs, as a means to reduce dependence on hydropower that can fluctuate widely based on weather conditions.

Nuclear Power

Spain has eight operating nuclear plants, while Portugal has none. Spain decommissioned the Vandellos I reactor in July 1990, and Union Fenosa closed the Jose Cabrera plant in April 2006. Nevertheless, the output of the nuclear power sector in Spain has remained stable despite the closures, as upgrades and efficiency gains at existing plants have replaced retired capacity. However, as the Spanish government has announced a moratorium on the construction of new nuclear power plants, it is likely that nuclear's share of Spain's electricity mix will decline in the long-term.

Other Renewables

Spain is the world's second-largest producer of wind power behind Germany, according to the Global Wind Energy Council. According to the Spanish Wind Energy Association, the country currently has over 11,000 megawatts (MW) of installed wind generating capacity. According to the Portuguese government, that country has 1,700 MW of installed wind generating capacity, which includes 970 wind turbines spread across 140 separate wind farms.

In March 2007, Portugal inaugurated the Serpa solar power plant, one of the largest such facilities in the world. The plant has an installed capacity of 11 MW and covers 150 acres of land in the southern part of the country.

Links

EIA Links

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U.S. Government

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[U.S. State Department Consular Information Sheet - Spain](#)

[U.S. State Department Country Commercial](#)

[U.S. Department of Labor, Bureau of Labor Statistics, International Section](#)
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Foreign Government Agencies

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Electricity

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Sources

Agence France Presse
Asia Africa Intelligence Wire
BBC Worldwide Monitoring
Direccao-Geral de Energia
Dow Jones International News
CIA World Factbook
Economist
Economist Intelligence Unit
Electric Utility Week
Electricidade de Portugal
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Red Electrica de Espana
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