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*April 2005*

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## Peru

*The Camisea natural gas project will likely turn Peru into an important exporter of liquefied natural gas in the near future.*

*Note: Information in this report is the best available as of April 2005.*



### BACKGROUND

Peru has achieved a strong economic performance in recent years. The country's gross domestic product (GDP) grew at 5.1 percent in 2004, an increase from the 4.0 percent growth rate of 2003. Analysts predict that the economy will further grow at a 4.8 percent rate during 2005.

In 2004, Peru passed the fourth and final review of its two-year \$380 million "Stand-By Arrangement" with the International Monetary Fund (IMF). In line with the arrangement, Peru brought the country's fiscal deficit under the IMF target of 1.9 percent of GDP, with the deficit expected to decline further in the future. The Peruvian economy has benefited from high prices for its mineral exports and good performance from its export-oriented fishing and agriculture

sectors.

Despite its high level of economic growth, Peru still suffers from several pressing economic problems. The official unemployment rate in the country is above 10 percent, and many analysts believe that the actual unemployment rate could be much higher. There is also widespread poverty in Peru, especially amongst the country's rural population.

Peru is a member of the Andean Community, set up in March 1996 by leaders of Bolivia, Colombia, Ecuador, Peru, and Venezuela. At that time, the five national leaders expressed their intent to move towards a single market along the lines of the European Union, although significant policy differences will need further consideration. The Community is working towards integrating its member countries' energy sectors, particularly in the electricity and natural gas areas, through network interconnections and harmonized regulatory frameworks. In November 1997, Peru joined

the Asia Pacific Economic Cooperation (APEC) forum. Peru has also been participating in the Free Trade Area of the Americas (FTAA) negotiations.

## OIL

Peru has proven crude oil reserves of 253 million barrels, according to *Oil and Gas Journal (OGJ)*. The country produced 94,120 barrels per day (bbl/d) of oil (including crude oil and natural gas liquids) in 2004, a 1 percent decrease from the previous year. Oil production in Peru has declined steadily over the past two decades, as the country's fields have matured and no major new discoveries have provided additional reserves. In contrast to production, Peru's oil consumption has grown over the past 20 years, reaching 161,000 bbl/d in 2004. Peru has been a net importer of oil since 1992, with most imports coming from Ecuador and other South American countries.

The largest oil producer in Peru is Argentina-based Pluspetrol, which controls over one-half of the country's entire crude oil production. Other major producers include Occidental Petroleum, Petrobras, and Petro-Tech Pueruana. Peru mostly privatized the former state-owned oil company, Petroperu, in 1993. Still, Petroperu continues to control the country's only crude oil pipeline, most of the refineries, and a majority of the retail oil products market.

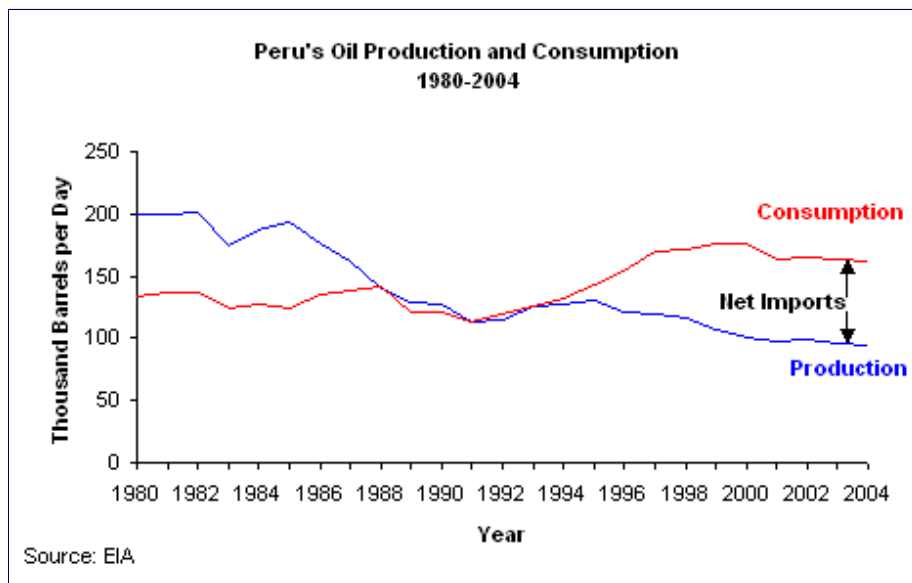
## Exploration and Production

Peru's crude oil production is concentrated in the northern part of the country. In particular, the largest oil blocks are Block 1-AB (Pluspetrol) along the border with Ecuador, Block 8 (Pluspetrol) in the northeastern Amazon region, Block X (Petrobras) in the northwest, and Block Z-2B (Petro-tech Pueruana) off the northwest coast. Block 1-AB and 8 account for over 65 percent of Peru's total crude oil production. Most of the crude oil produced in Peru is a heavy, sour variety known as "Lorento," with 20° API and 1.2 percent sulfur content.

In 2003, the Peruvian government established a new royalties schedule and introduced tax incentives in an attempt to increase oil production and attract foreign investment. This new schedule spurred a revival of interest in exploration activities in the country. In March 2005, Global Energy Development, a subsidiary of Harken Energy, signed a new exploration and production contract for Block 95 in the Marañon

basin of north-east Peru. The Peruvian government also approved a contract for Burlington Resources in Block 104 of the Marañon basin.

In 2004, Occidental Petroleum announced that it had discovered at least 100 million barrels of recoverable reserves in Block 64, located in the Amazon basin; the company also announced that it would increase its investments in Blocks 101 and 103 in the same area. In March 2004, Nuevo Energy announced that it had signed a contract to explore Block Z-1, located off the northwest coast, while BPZ Energy also has exploration activities in the adjacent Blocks XIX and 19. In



2003, Repsol-YPF and Burlington Resources created a partnership to launch exploration activities in Blocks 90 and 57, located in the Ucayali basin in the central-east region of the country.

### **Pipelines**

Petroperu operates the country's sole crude oil pipeline, Norperuano, which links the export terminal at Bayovar to oil fields in Peru's interior. Norperuano has two branches, one (190 miles) starting at San Jose de Saramuro in the Ucayali basin, the other (160 miles) starting at Andoas in the Marañon basin. Both branches meet at a central pumping station, where they join into a 35-inch system that carries crude oil 340 miles to the Pacific coast. Norperuano has a maximum capacity of 250,000 bbl/d, but declining production in recent years means that current utilization of the system is only 30-40 percent.

### **Downstream Activities**

Peru has six major oil refineries, according to *OGJ*, with total capacity of 192,950 bbl/d. Repsol-YPF controls the largest facility in the country, La Pampilla, located in Lima, with a capacity of 102,000 bbl/d. The other privately-operated refinery in the country is the 3,250-bbl/d Purcallpa, operated by Maple Gas. Petroperu operates the remaining four refineries and the largest network of retail oil products distribution. According to Peru's Ministry of Energy and Mines, refinery utilization in the country was 85 percent in January 2005. The Peruvian government planned to further privatize downstream facilities, but opposition from labor unions and legislators has delayed these efforts.

### **NATURAL GAS**

According to *OGJ* (1/1/05), Peru has proven natural gas reserves of 8.7 trillion cubic feet (Tcf), the fourth-largest amount in South America. In 2002, the country produced and consumed 15.5 billion cubic feet (Bcf) of natural gas, an 18 percent increase from the previous year. In coming years, Peru will likely become a net exporter of natural gas as the Camisea project comes fully on-stream (see below). Natural gas production in September 2004, the first full month of Camisea production, was 3.68 Bcf, double the level of September 2003. Besides Camisea, the largest concentrations of Peru's natural gas production include the Aguaytia gas field (Maple Gas) in central Peru, Block X (Petrobras) in the northwest region, and Block Z-2B (Petro-Tech) located off the northwest coast.

### **Exploration and Production**

#### *Camisea*

The Camisea project consists of several natural gas fields located in the Ucayali basin of southeastern Peru, principally in Block 88 along the Camisea River. Analysts estimated that Block 88 contains 8.7 Tcf of proven natural gas reserves and 410 million barrels of associated natural gas liquids (NGLs). An international consortium led by Hunt Oil has developed the upstream portion of Camisea, with production starting in August 2004. Initial production capacity at Camisea is 450 million cubic feet per day (Mmcf/d) of natural gas and 34,000 bbl/d of NGL, but current gas production is below that maximum level due to a lack of domestic demand and absence of export infrastructure. Transportadora de Gas del Peru (TGP), a consortium led by Techint, constructed and now operates parallel natural gas and NGL pipelines that carry Camisea production to Lima and to a fractionation plant in Paracas. The Camisea project will provide natural gas for domestic consumption, with Belgium's Trachtebel holding a contract for gas distribution to industrial consumers and gas-fired power plants in Lima. Trachtebel has also expressed an interest in constructing additional facilities to distribute natural gas to other parts of the country.

Natural gas production from the Camisea project will likely exceed domestic demand for the foreseeable future, so project sponsors would like to export any excess production. Hunt Oil leads the Peru LNG consortium, which seeks to build a liquefied natural gas (LNG) export terminal at

Pampa Melchorita, 105 miles south of Lima. To provide additional natural gas for the Pampa Melchorita facility, the Camisea consortium has secured production rights from Block 56, adjacent to Block 88, which contains an additional 3.5 Tcf of proven natural gas reserves. Several issues, including a land dispute with local governments, have delayed the project, but Peru LNG has committed to begin construction on the facility by the end of 2005. The Peru LNG facility will have an initial output of 600 Mmcfd, with most production destined for North American markets. However, Peru LNG has also held discussions with ENAP, Chile's state-owned oil company, about exporting LNG to that country. Even though the countries share a land border, trading natural gas via LNG could be more cost-effective than the construction of a natural gas pipeline, since both countries already have plans to build the necessary LNG infrastructure.

#### *Other Developments*

BPZ Energy announced that it had reached agreements to send natural gas from its offshore Block Z-1 to power plants in Peru and southern Ecuador. The project would initially supply 74 Mmcfd of natural gas to three electricity generators in Arenilla, Ecuador, with an eventual extension to Guayaquil. BPZ also planned to construct a gas-fired power plant in Peru that would source gas from the Block Z-1 fields (see below). Analysts estimate that Block Z-1 contains 130 Bcf of proven reserves and at least 3 Tcf of total possible reserves.

### **Downstream Developments**

#### *Pipelines*

Trachtebel has reportedly held negotiations with Chilean natural gas distributors and consumers about the construction of a 930-mile pipeline linking the Camisea project with northern Chile. This project could present an alternative to the aforementioned LNG trading scheme between the two countries. Currently, Chile sources most of its natural gas imports from Argentina, but gas shortages in Argentina have caused several supply disruptions in recent years. The project would depend upon the availability of surplus gas from Camisea, which has already contracted large volumes of future production to domestic needs and LNG export plans. Camisea's operators, though, have stated that there will be enough excess supply for both an LNG terminal and an export pipeline.

#### *LNG*

Besides the Peru LNG project, there have been talks about a potential LNG partnership with Bolivia. That country has the second-largest natural gas reserves in Latin America, but it lacks the coastal access necessary to pursue LNG exports. One proposal under consideration would connect the Margarita gas fields in southern Bolivia to the Peruvian port of Ilo. However, the economic and political feasibility of this proposal is in doubt, and there are no concrete plans to date. For more information on the natural gas sector in Bolivia, please see the [Bolivia Country Analysis Brief](#).

### **ELECTRICITY**

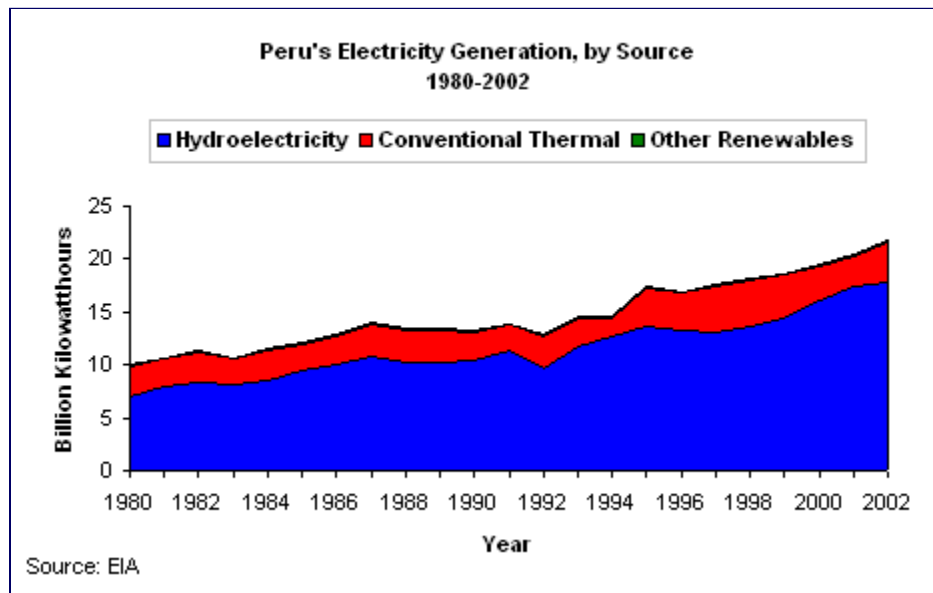
Peru had 6.0 gigawatts (GW) of installed generating capacity in 2002. In that year, the country generated 21.7 billion kilowatthours (Bkwh) of electric power while consuming 20.2 Bkwh. Even though installed capacity is evenly divided between hydro and conventional thermal, 88 percent of Peru's total electricity supply is generated by hydroelectric facilities, with thermal plants providing supply only during peak usage or when natural conditions dampen hydroelectric output. The largest hydro facility in the country is the Mantaro Complex in southern Peru, operated by state-owned Electroperu. Two hydroelectric plants at the complex generate over one-third of Peru's total electricity supply from 900 megawatts (MW) of installed capacity.

With the start of natural gas production from the Camisea project, the Peruvian government has encouraged greater investment in gas-fired power plants as a way to reduce reliance upon

hydroelectricity. BPZ Energy plans to build a 140-MW, gas-fired power plant in Caleta Cruz. In September 2004, Etevensa, the Peruvian subsidiary of Spain-based Endesa, began construction of a combined cycle, gas-fired turbine (CCGFT) at its existing Ventanilla plant, the largest thermal power plant in Peru. The upgrade project will increase the capacity of the facility to 380 MW. Many industrial users and independent power producers have also begun transitioning to natural gas.

### Sector Organization

Peru privatized its electricity sector for the most part in the 1990s, but opposition from organized labor and rural areas prevented the government from achieving full privatization. The largest generating company in Peru is Electroperu, majority-owned by the Peruvian government, which operates the Mantaro hydroelectricity complex. According to Peru's Ministry of Energy and Mines, the largest private electricity producers in the country include Edegel, a subsidiary of Endesa, and Egenor, a subsidiary of US-based Duke Energy.



The Peruvian government maintains financial interests in the power distribution sector, but private companies now hold majority control over the most important distributors in the country. The largest electricity distributor in Peru is Edelnor, a subsidiary of Endesa. According to Peru's Ministry of Energy and Mines, Edelnor served over 880,000 customers in 2002, mostly in the

Lima metropolitan area. The second-largest distributor is Luz del Sur, majority-owned by a consortium consisting of PSEG Global and Sempra Energy; Luz del Sur also operates in the Lima area, providing electricity to 690,000 customers in 2002. Smaller distributors owned by the Peruvian government operate in the rest of the country. The government has begun to offer financial incentives to spread electricity service to rural areas, where coverage remains spotty and unreliable.

Peru has two main power transmission grids, one covering the north and center parts of the country, the other serving the south. An interconnector, owned and operated by Hydro-Quebec International, runs between the two along the Pacific coast. The largest transmission company in Peru is the Colombia-based ISA Group, which controls over half of the transmission grid in the country through its subsidiaries Red de Energia del Peru and Interconexion Electrica ISA Peru. Smaller companies, many of which are state-owned, control the remainder of the grid. Investment in Peru's transmission grid has outpaced actual demand, therefore there is a considerable surplus of spare capacity. Peruvian law ensures that all generating and distributing companies have fair, non-discriminatory access to the national transmission grid.

### Regional Integration

Peru has also been in the process of integrating its power grid with those of Bolivia, Ecuador, and

Chile. These efforts are part of a larger movement by the Andean Community to create a common electricity market. Once the integrated market is operating, the transmission lines will allow for a permanent flow of power between each one of the electric power systems, allowing each country to purchase power under the most favorable conditions. Construction of an interconnector between Peru and Ecuador began in 2002, and the two countries expected to begin trading electricity by the end of 2005. The Peruvian and Chilean governments have begun negotiations for the construction of an interconnector between the two countries. The line would allow gas-fired power plants in northern Chile to sell excess electricity supply to Peru, especially when a shortage of rainfall reduces the output of Peru's hydroelectric facilities. Finally, talks of an electricity connection between Peru and Bolivia are in the preliminary stages.

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*Sources for this report include: Aguaytia Energy Group; Business News Americas; Business Wire; CIA Factbook; Dow Jones; Economist Intelligence Unit; Electric Utility Week International; Electroperu; Energy Day; Financial Times; Fonafe; Global Insight; Global Power Report; International Energy Agency; International Oil Daily; International Water Power and Dam Construction; Interpress Service; Latin America Monitor; Latin Petroleum; Natural Gas Week; Noticias Financieras; Oil and Gas Journal; Oil Daily; Peru's Ministry of Energy and Mines; Perupetro; Petroleum Economist; Petroperu; Platts; Reuters; U.S. Energy Information Administration; World Markets Analysis.*

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## **COUNTRY OVERVIEW**

**President:** Alejandro Toledo (elected April 2001)

**Independence:** July 28, 1821 (from Spain)

**Population (2004E):** 27.5 million

**Location/Size:** Western South America, between Chile and Ecuador; 796,836 square miles (slightly smaller than Alaska)

**Major Cities:** Lima (capital)

**Languages:** Spanish (official); Quechua (official); Aymara

**Ethnic Groups:** Indian (45%); mestizo (37%); white (15%); black, Japanese, Chinese, and other (3%)

**Religions:** Roman Catholic (90%)

## **ECONOMIC OVERVIEW**

**Minister of Economy and Finance:** Pedro Pablo Kuczynski

**Currency:** 1 Nuevo sol (Ns) = 100 centimos

**Market Exchange Rate (3/30/05):** US\$1 = NS 3.26

**Nominal GDP (2004E):** \$68 billion

**Real GDP Growth Rate (2004E):** 5.1% **(2005F):** 4.8%

**Inflation Rate (consumer prices, 2004E):** 3.7% **(2005F):** 2.1%

**Unemployment Rate (2004E):** 10.1%

**Merchandise Exports (2004E):** \$12.5 billion

**Merchandise Imports (2004E):** \$9.8 billion

**Merchandise Trade Balance (2004E):** \$2.7 billion

**Major Export Products:** fish and fish products, gold, copper, zinc, crude petroleum and byproducts, lead, coffee, sugar, cotton

**Main Destinations of Exports (2003E):** United States (27%), United Kingdom (12%), China (7%), Switzerland (8%), Chile (5%), Japan (4%)

**Major Import Products:** machinery, transport equipment, foodstuffs, petroleum, iron and steel, chemicals, pharmaceuticals

**Main Origins of Imports (2003E):** United States (29%), Spain (10%), Chile (8%), Brazil (5%), Colombia (5%)

**Total Foreign Debt (2003E):** \$29.9 billion

### ENERGY OVERVIEW

**Minister of Energy and Mines:** Glodomiro Sanchez Mejia

**Proven Oil Reserves (1/1/05):** 253 million barrels

**Oil Production (2004E):** 94,120 bbl/d, of which 79,900 bbl/d was crude oil

**Oil Consumption (2004E):** 161,000 bbl/d

**Net Oil Imports (2004E):** 66,880 bbl/d

**Crude Oil Refining Capacity (1/1/05):** 192,950 bbl/d

**Natural Gas Reserves (1/1/05):** 8.7 Tcf

**Natural Gas Production (2002E):** 15.5 Bcf

**Natural Gas Consumption (2002E):** 15.5 Bcf

**Recoverable Coal Reserves (2001E):** 1.17 billion short tons

**Coal Production (2002E):** 20,350 short tons

**Coal Consumption (2002E):** 1.21 million short tons

**Electric Generation Capacity (2002E):** 6.0 gigawatts, of which hydroelectricity (50%), conventional thermal (50%)

**Electricity Generation (2002E):** 21.7 Bkwh

**Electricity Consumption (2002E):** 20.2 Bkwh

### ENVIRONMENTAL OVERVIEW

**Total Energy Consumption (2002E):** 0.57 quadrillion Btu\* (0.14% of world total energy consumption)

**Energy-Related Carbon Dioxide Emissions (2002E):** 28.3 million metric tons (0.12% of world total, energy-related carbon dioxide emissions)

**Per Capita Energy Consumption (2002E):** 21.3 million Btu (vs. U.S. value of 339.1 million Btu)

**Per Capita, Energy-Related Carbon Dioxide Emissions (2002E):** 1.1 metric tons (vs. U.S. value of 20.0 metric tons)

**Energy Intensity (2002E):** 4,790 Btu/\$1995 (vs U.S. value of 10,620 Btu/\$1995)\*\*

**Carbon Dioxide Intensity (2002E):** 0.24 metric tons/thousand \$1995 (vs U.S. value of 0.63 metric tons/thousand \$1995)\*\*

**Fuel Share of Energy Consumption (2002E):** Oil (60.0%), Hydroelectricity (31.7%), Coal (5.5%), Natural Gas (2.5%), Other Renewables (0.3%)

**Fuel Share of Carbon Dioxide Emissions (2002E):** Oil (85.7%), Coal (10.7%), Natural Gas (3.7%)

**Status in Climate Change Negotiations:** Non-Annex I country under the United Nations Framework Convention on Climate Change (ratified June 7th, 1993). Signatory to the Kyoto Protocol signed November 13th, 1998 and ratified September 12, 2002.

**Major Environmental Issues:** Deforestation; overgrazing of the slopes of the cost and sierra leading to soil erosion; desertification; air pollution in Lima; pollution of rivers and coastal waters from municipal and mining wastes.

**Major International Environmental Agreements:** A party to the Antarctic-Environmental Protocol, Antarctic Treaty, Biodiversity, Climate Change, Desertification, Endangered Species, Hazardous Wastes, Nuclear Test Ban, Ozone Layer Protection, Ship Pollution, Tropical Timber 83, Tropical Timber 94, Wetlands and Whaling.

\* The total energy consumption statistic includes petroleum, dry natural gas, coal, net hydro, nuclear, geothermal, solar, wind, wood and waste electric power. The renewable energy consumption statistic is based on International Energy Agency (IEA) data and includes

hydropower, solar, wind, tide, geothermal, solid biomass and animal products, biomass gas and liquids, industrial and municipal wastes. Sectoral shares of energy consumption and carbon emissions are also based on IEA data.

\*\*GDP figures from OECD estimates based on purchasing power parity (PPP) exchange rates.

## **OIL AND GAS INDUSTRIES**

**Organization:** Perupetro, which started operating in 1993, is the state company responsible for overall regulation and licensing of the country's oil and gas industries. Perupetro also negotiates oil and gas contracts with companies to explore and/or produce in Peru. Petroperu is the state oil company, and Electroperu is the state electric power company. Regional state-owned electric company Egesur (for the south), as well as state mining company Centromin, are also slated for privatization.

**Ports:** Callao, Chimbote, Ilo, Iquitos, Matarani, Paita, Pucallpa, Salaverry, San Martin, Talara, Yurimaguas

**Major Natural Gas Field:** Camisea and Aguaytia

**Foreign Energy Company Involvement:** Barrett Resources, Burlington Resources, Coastal, Duke Energy, Empresa de Energia de Bogota, ExxonMobil, Hunt Oil, Hyundai, Interconexion Eletrica, Maple Production, Occidental Petroleum, Petrobas, Petro-Tech, Phillips Petroleum, Pluspetrol, Repsol-YPF, Sapet, Shell, SK Corp., Sonatrach, Technit, Tractebel, Transelca.

**Refineries (crude oil capacity):** La Pampilla Lima (102,000 bbl/d); Talara (62,000 bbl/d); Iquitos Loreto (10,500 bbl/d); Conchan (13,500 bbl/d); Pucallpa (3,250 bbl/d); El Milagro (1,700 bbl/d)

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## **LINKS**

For more information from EIA on Peru, please see:

[EIA - Country Information on Peru](#)

Links to other U.S. government sites:

[CIA World Factbook - Peru](#)

[U.S. Department of Energy's Office of Fossil Energy's International section - Peru](#)

[U.S. Embassy in Peru](#)

[U.S. Commercial Service: "Doing Business in Peru?"](#)

[U.S. Country Commercial Guide on Peru](#)

[U.S. State Department Background Notes on Peru](#)

[U.S. State Department Consular Information Sheet on Peru](#)

[U.S. Trade and Development Agency - Latin America and the Caribbean](#)

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[Electroperú](#)

[Electropuno](#)



[Electro Sur Este](#)  
[Empresa de Energia de Bogota](#)  
[Empresa de Generación Eléctrica de Arequipa \(Egasa\)](#)  
[Energía del Sur \(Enesur\)](#)  
[Hydro-Québec TransÉnergie](#)  
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### **Government**

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### **Oil and Natural Gas Companies**

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