

Colombia: a country with energy diversity



Libertad y Orden

Ministerio de Relaciones Exteriores
República de Colombia

Prosperidad
para todos



As reflected in President Juan Manuel Santos' National Development Plan, Colombia's energy industry, in particular the **mining sector**, is one of the **five driving forces** in the country's economy.

Foreign Direct Investment in the mining sector increased 664% between 2002 and 2008, to a total of **US\$2,116 million**¹.

Power generation: the generation on the National Grid at September 2010 is composed of **78.2%** hydro generation, **16.45%** thermal and **5.3%** from small plants and co- generators ².

In the world ranking for mining in 2009, Colombia is **first in emeralds** with 55% of world production, **7th in nickel** with 4.83%, **10th in coal** with 2%, and **20th in gold** with 0.87%³.

In the field of power interconnection, Colombia is at present developing the infrastructure to set up the Panama-Colombia-Chile interconnection project.

1. Ministry of Mines and Energy, October 2010

2. Market Experts, Monthly Report Market Analysis, International Exchanges, September 2010 XM S.A. <http://www.xm.com.co/boletinXM/Pages/MECOct12.aspx>

3. International Energy Agency, Energy Information Administration – EIA and US Geological Surveys

1. Colombia's **energy sector** in figures

Colombia is fourth in Latin America and the Caribbean in hydro-generation.

Colombian **oil** production has grown in recent years as a result of new discoveries, and now totals **920,000 barrels per day**. According to the Ministry of Mines and Energy, this level will be maintained through to the end of **2011**. **In gas**, Colombia produces **1,100 mcft of gas per day**, and expects to increase this to **1,350 mcft per day by the end of this four-year period**.

In mining, **Colombia is the largest coal producer in Latin America and the 10th largest in the world**, with more than 74,000 tonnes of production in 2010.

Colombia has a 4.928 km long oil pipeline system (oil lines and polyducts carrying crude from the source production to the refineries or export points)⁴

Production up to April 2010, according to National Hydrocarbons Agency, was **760,000 barrels of oil per day, and 1100 mcft of gas per day**.

According to British Petroleum, Colombia is third in the region in oil production and has **reserves of 1,990 million barrels**.

In terms of exports, oil totaled **US\$ 3,394 million** (33.6%), coal **US\$6,105 million** (15.1%) and oil products **US\$3,091 million** (7.8%), together accounting for **56.5% of total exports**.

Colombia received **US\$7,391 million** in Foreign Direct Investment at June 2011, an increase of **79.6%** compared to **US\$4,115 million** in the first half of **2010**. A good part of the rise in Foreign Direct Investment in this period was due to mining and oil, which received **US\$6,299 million**, an increase of 59.3% in comparison to the balance of payments figure for the same period of **2010**, which was **US\$3,953 million**.

It is expected that there will be an average growth in coal production of 3.5%, with an increase of 2.3% in exports in the next five years. It is estimated that the highest level of revenues will be reached in 2012.

In September 2010, electricity exports from Colombia to Ecuador were 72,393.2 MWh, 52.7% lower than the same month of the previous year⁵.

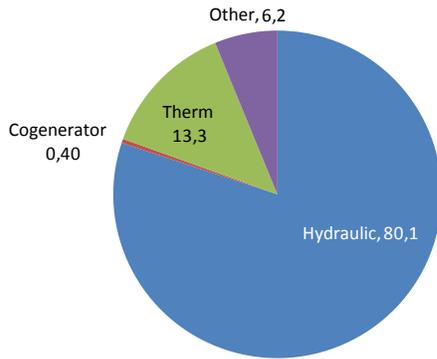
The average scenario shows average production growth of 3.5% in the next five years, and 2.3% of exports. It is estimated that the high point of revenues will be reached in 2012.

4. UPME. Cadena de Petróleo 2009.

5. Market Experts. Monthly Report Market Analysis. International Exchanges. September 2010. XM S.A. http://www.xm.com/informes%20Mensuales%20de%20Anlisis%20del%20Mercado/05_Informe_Internacionales_TXR_09_2010.pdf

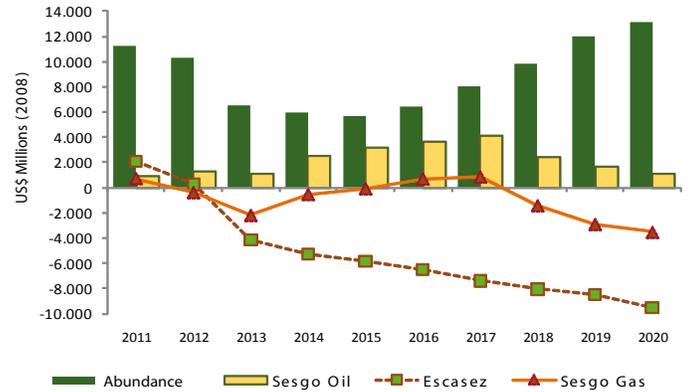


Distribution of power generation in Colombia, September 2010



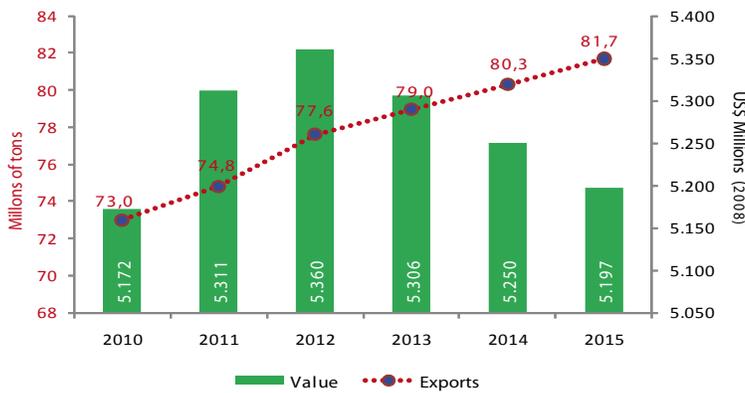
Source: XM. S.A. E.S.P. monthly report of market analysis in June 2011

Projections



Source: Unidad de Planeación Minero Energética (UPME). Mining, hydrocarbons and energy in the external sector of the Colombian economy in May 2010.

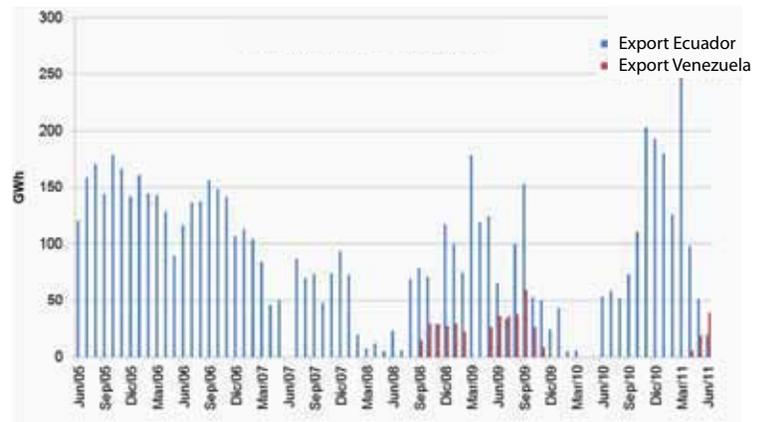
Projection of revenue from exports of coal



Source: Unidad de Planeación Minero Energética (UPME). Mining, hydrocarbons and energy in the external sector of the Colombian economy in May 2010.

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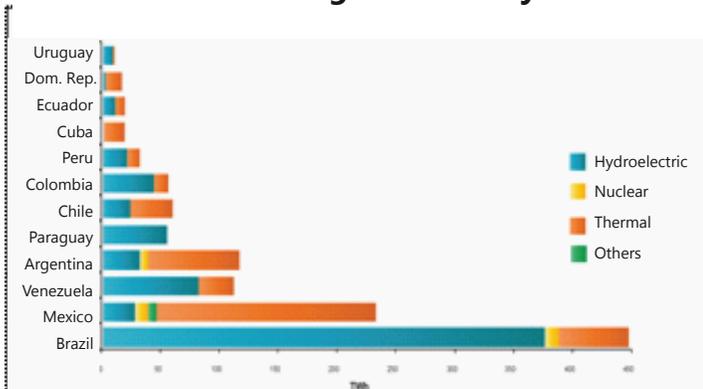
Electricity exports



Source: XM S.A. E.S.P.

Projects under construction will allow an increase in electricity exports to Central America. Exports are expected to rise in the next few years.

Electric generation by fuel



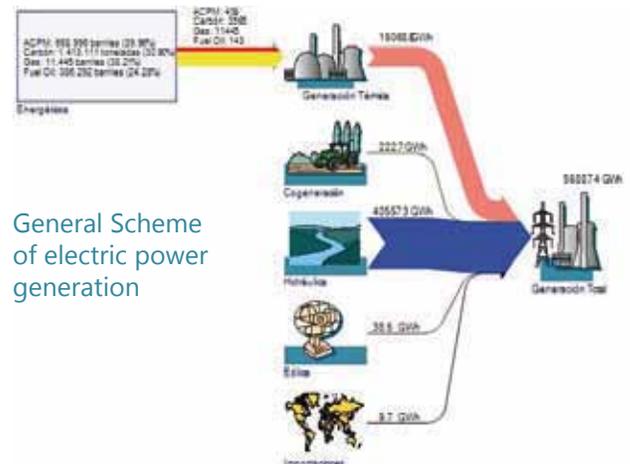
Source: Latin American Energy Organization

Hydroelectric potential



Source: Latin American Energy organization

Renewable Energy



Source: Balance of electricity generation 2010, UPME.

In 2008, Colombia's renewable energy production was 46,403 GWh in hydro generation, 590 GWh in solid biomass, and 54 GWh in wind generation⁷.

Solar energy. There are areas suited to large-scale development in the Magdalena, La Guajira, San Andres and Providencia.

Wind generation. The north of Colombia has the best potential to generate this resource. In the Upper Guajira, Empresas Públicas de Medellín (EPM), has put the first windfarm into operation -Jepirachi- with 15 turbines providing 19.5 MW to the National Grid.

Biomass. There are biomass production studies using sugarcane with an estimated annual production of 1.5 million tonnes, and of rice husks in volumes of more than 450,000 tonnes a year. The most suitable places for generating this form of energy are the departments of Santander and Norte de Santander, the Llanos Orientales, and the Caribbean coast.

Geothermal energy. The Geothermal Atlas of Colombia shows that the areas with the highest potential are Chiles-Cerro Negro, the Azufral volcano in Nariño, Sierra Nevada National Park, and the geothermal area of Paipa-Iza Boyaca.



At the forefront of **BIOFUELS.**⁸

Colombia has implemented a solid policy designed to produce a regulatory framework and create instruments and financial conditions to promote sustainable production of biofuels.

Biofuels producers have access to a special regime which allows them to import machinery duty-free. They enjoy a special flat rate of income tax, at 15%. As incentives to the sale of biofuels - both ethanol and biodiesel for mixture with gasoline and diesel - producers are exempted from consumption tax.

Colombia's production capacity: 1.1 million litres/day of ethanol and 1.8 million litres/day of biodiesel. Plants for the production of biodiesel will shortly come into operation in Barrancabermeja and Castilla La Nueva (Meta), which, added to the six existing plants, will bring production up to 1.8 million litres/day.

In the context of the Meso-America project, Colombia replicated its experience in other Latin American countries. In 2009, it installed two biodiesel plants, one in El Salvador and one in Honduras, designed and built in Colombia and using local technology, with a capacity of up to 10,000 litres/day, and the ability to use different sources of raw materials (palm oil in Honduras, and *jatropha curcas* in El Salvador). This makes Colombia a leader in the development of its own technologies in the transfer of knowledge and in the production of biofuels.

Colombia leads the biofuels discussion group in the Meso-America project.

8. Ministry of Agriculture and Rural Development, Report to Congress 2006-2010

Colombia can offer cooperation in:

Biofuels (*Research and development, ethanol and biodiesel*) residual biomass energy for non-interconnected zones, infrastructure and transmission, hydro generation.



Prosperidad para todos