GOING GLOBAL
PHASE 3

EDC

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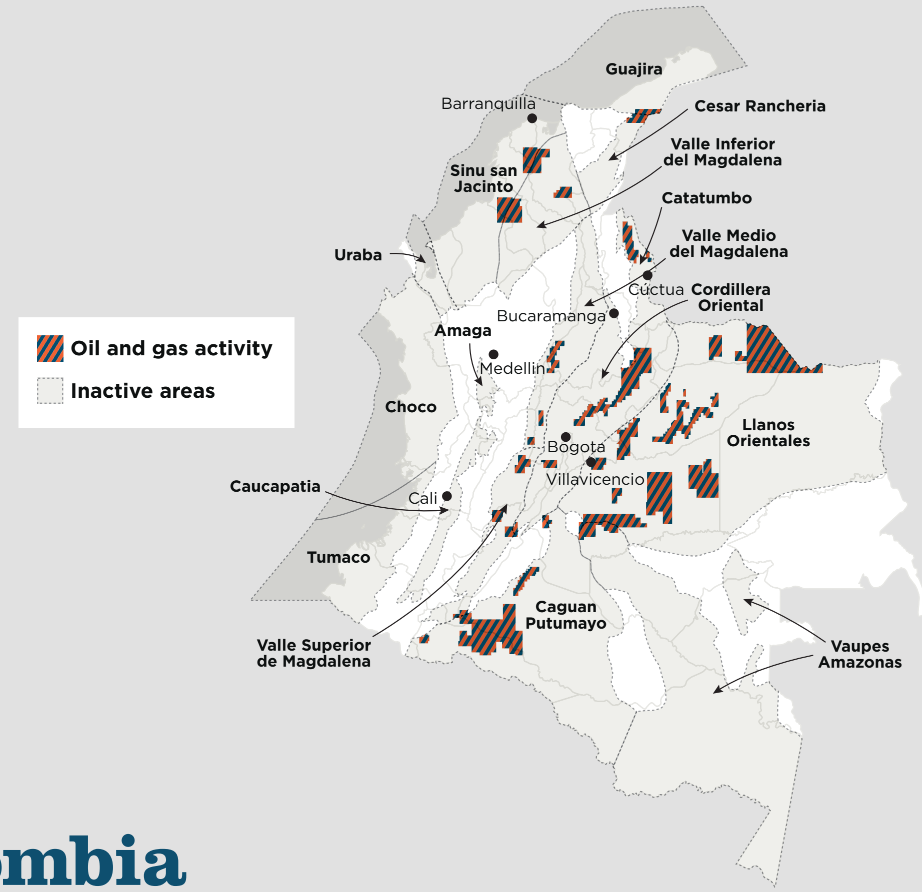


Colombia

OVERVIEW

Colombia produced 1.1 million boe/d in 2016, weighted 85 per cent to oil production.

The country has been open to foreign investment in its industry since 2003 when the government removed state oil company Ecopetrol's monopoly on development of all hydrocarbon resources. Upstream sector initiatives give foreign oil companies the right to own 100 per cent stakes in oil ventures and to compete with Ecopetrol.

There are currently 83 exploration and development companies operating in Colombia as a result of the reforms, including nine Canadian companies.

After the 2003 reforms took hold, Colombia's oil production increased by an annual average of 11 per cent from 2008 to 2013, but growth has slowed in recent years, and production was relatively flat after 2013 as increased rebel attacks on oil infrastructure and a lower world oil price led to a leveling off of production in 2014-2016. Falling oil revenues have led producers to focus on optimizing existing production to maintain current levels rather than exploring for new petroleum reserves.

According to the Colombian central bank, the oil sector received $4.8 billion in foreign direct investment (FDI) in 2014, accounting for 30 per cent of total FDI in Colombia.

OIL & GAS RESERVES
2,066 (million boe)

RESERVE LIFE
6.9 years

OIL & GAS PRODUCTION
1,160 (thousand boe/d)

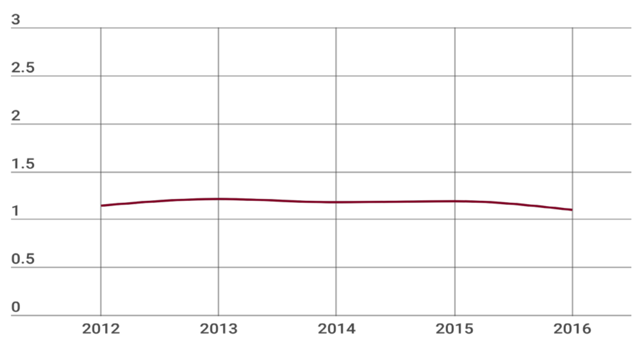
PRODUCTION FIVE-YEAR CAGR
-0.82%

ACTIVE E&P COMPANIES/ACTIVE CANADIAN E&P COMPANIES
83/9

OIL PRODUCTION **85%**

GAS PRODUCTION **15%**

FIVE YEAR PRODUCTION (MILLION BOE/D)



The largest producing oil field in Colombia is the Rubiales heavy oil field, located in the Arauca department. Low levels of production began at Rubiales in the late 1980s, but increasing investment and the completion of a new pipeline allowed production rates to rise from 96,000 bbls/d in 2009 to 212,000 bbls/d by August 2013. Since 2013, however, production at Rubiales has fallen, averaging 164,000 bbls/d in 2015.

OPPORTUNITIES

Columbia ranks as low-risk/high-return export market according to our analysis. It has opportunities in heavy oil and enhanced recovery, along with an emerging unconventional resource sector.

Ecopetrol is expected to spend around $4 billion on upstream development in 2018. Private companies are expected to invest around $4.5 billion.

The U.S. ITA expects Colombia to import around $1.7 billion in equipment annually leading up to 2020.

Enhanced oil recovery

In order to maintain the sustainability of the industry, the importance of discovering new reserves of crude oil and improving the recovery factors from existing fields is a top priority.

Both the government and Ecopetrol have announced their intent to improve the recovery gap in Colombia through enhanced recovery techniques, believing that this is the fastest way to impact reserve growth with the lowest cost.

Currently only nine per cent of Colombian production is under enhanced recovery methods, but those fields are responsible for 28 per cent of production.

Ecopetrol currently produces 62 per cent from primary recovery mechanisms, 33 per cent is in secondary recovery and just five per cent is in tertiary recovery. Ecopetrol has plans to execute 27 additional secondary and tertiary recovery projects between 2015 and 2020.

Unconventional resources

In 2011, the Colombian government published a decree outlining a plan to increase domestic natural gas production. Policies aimed at increased domestic natural gas consumption and exports, combined with increased demand from the power sector as a result of weather-related hydroelectric shortages, have made expanding natural gas production a priority for the government.

In 2013, the country produced 360 billion cubic feet of natural gas and consumed 269 billion cubic feet with half of all gas production re-injected to aid in enhanced oil recovery. The remainder of the gas was exported to Ecuador and Venezuela.

Colombia is currently in the early stages of exploration for both coalbed methane (CBM) and shale gas resources. Colombia has significant coal reserves that have a coal rank suitable for CBM exploitation, with a total potential resource of 11–35 trillion cubic feet, although only a portion of these reserves will be economically recoverable.

The country's model contract for unconventional gas includes eight-year exploration and 24-year production terms. Preferential terms are in place for shale gas investment, including a 40 per cent reduction in royalties.

Colombia has three basins with representative prospectivity: Middle Magdalena Valley, Cordillera, and Cesar Rancheria. The potential is estimated at about 32 TCF of recoverable volumes (Arthur D. Little analysis).

Comparisons have already been drawn between the La Luna field in the Middle Magdalena basin and the US.'s giant Eagle Ford shale. Further shale oil and gas deposits lie in the Cesar basin to the north, Catatumbo, near the Venezuelan border, and the Boyacá province to the north of Bogota.

IHS estimates Colombia's shale could hold over 3,000 Tcf of gas, and the country's oil industry association pegs its unconventional resources at 92 billion boe on a P50 proven and probable basis. In 2012, consultancy Arthur D Little ignited interest in the Andean country after putting recoverable shale and tight gas reserves at 35 Tcf and shale oil potential as high as 14 billion boe.

Onshore heavy oil

Colombia is known as a heavy oil producer, with over 40 per cent of Ecopetrol's legacy production coming from heavy oil reservoirs.

Most heavy oil development is in the eastern plains region of the country, where there are 33 fields under development.

Industry estimates there are around 5.5 billion barrels of original heavy oil in place in the eastern plains region, providing running room for future exploration.

Colombia is also thought to have a bitumen resource as high as 50 billion barrels, although little work has been done to quantify or develop the resource.

Ecopetrol said it will drill hundreds of new wells in the Rubiales oilfield, depending on crude prices, in a bid to keep the area's output at 135,000 bbls/d. Ecopetrol took full control of the oilfield, after Canada's Pacific Exploration handed over its previous 43 per cent stake.

The company expects to drill up to 1,000 new wells in the coming years in the heavy oil field, depending on oil prices.

Oilfield service market

With a long history of oil development and a diverse exploration and development company base, Colombia has a good foundation for developing its resources.

But it still faces some development challenges, including significant technology needs, higher capital requirements, reservoir management complexities, gathering, transportation and marketing challenges, and environmental challenges.

There is demand for seismic activity services (both 2-D and 3-D) and better analytical seismic computer modelling.

Drilling equipment, including directional drilling, and drilling fluids will also be needed as unconventional resource development takes off.

Wellhead equipment, such as Christmas trees, valves, compressors, pumps, piping equipment, safety equipment, well completion, casing and cementing equipment, is in demand.

Crude oil and natural gas pipeline design and construction services are also growing markets.

Local content

Colombian authorities encourage contractors to grant a preferential right to local, regional and national suppliers of goods and services and provide equally competitive working conditions. Its regulations state 30 per cent of skilled workers and all unskilled workers should be from the area where the work takes place.

Canadian market penetration

While numerous Canadian operating companies have developments in Colombia, service companies have not followed. This is partially due to Colombia having a strict labour code with high local employment requirements for any company with over 10 employees. A second issue has been long-term security concerns due to an ongoing civil war in the country.

Infrastructure

Columbia has seven major oil pipelines and three main gas pipelines.

Canadian pipeline giant Enbridge is building an export mainline, lateral line, diluent import pipeline and terminal facilities in the country.

In 2012, agreements were made with China Development Bank to finance a 600,000-bbl/d pipeline to transport Colombian and Venezuelan oil to China.

DOING BUSINESS IN COLOMBIA

Colombia is a mid-sized economy with a 2017 GDP of US$688 billion.

The Canada-Colombia Free Trade Agreement (FTA) manages trade between the two countries.

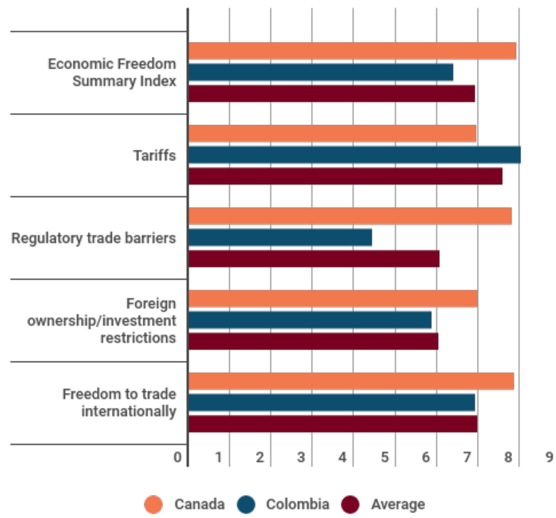
Administrative and regulatory responsibility for the country's hydrocarbon resources lies with the Agencia Nacional de Hidrocarburos. In 2012, additional restructuring consolidated responsibility for upstream and downstream planning and oversight in the Ministry of Mines and Energy.

Growing investor and exporter interest in Colombia is being driven by a favourable combination of business friendly policies, economic and political stability, successful government-led security strategy and a diversified economy with a large domestic market.

Colombia's fiscal regime is a combination of corporate income tax and royalty base taxation. Colombia has fiscal stability contracts to protect investors for three to 20 years against adverse changes in laws, regulations and rulings (the cost is one per cent of the investment during the year). There are foreign exchange controls—an exemption may be applied for by an oil exploration and production company or a technical service company working in the area.

The Frasier Institute economic freedom index ranks Colombia the 112th most free economy, with a score of 6.41 out of 10. For freedom to trade, it scores 6.91 out of 10.

FRASER INSTITUTE FREEDOM TO TRADE SCORES COMPARED TO CANADA AND GROUP AVERAGE (SCORE OUT OF 10)

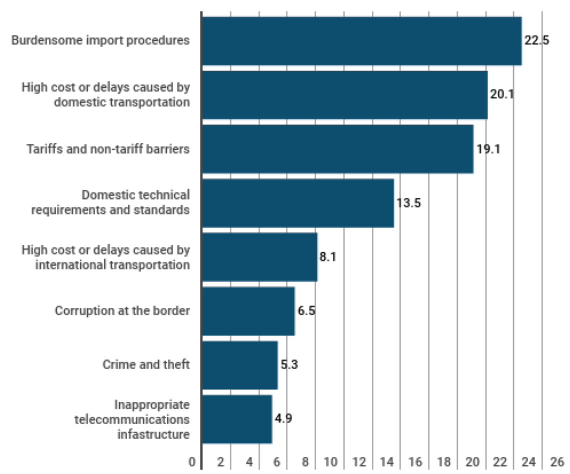


SOURCE: FRASER INSTITUTE

Colombia ranks 85th out of 136 countries on the World Economic Form Enabling Trade Index. It performs well in terms of market access, with a fairly simple tariff structure, and its exports enjoy friendly terms abroad.

WEF EXECUTIVES' RANKING OF THE MOST PROBLEMATIC FACTORS FOR IMPORTING TO COLOMBIA

% OF RESPONDERS RANKING AS # 1 ISSUE

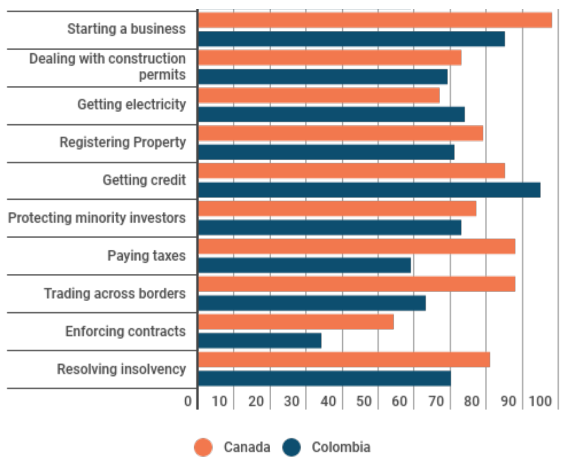


Note: From a list of factors, respondents were asked to select the five most problematic factors in their country and rank them. The scores correspond to the responses weighted according to their rankings

Colombia's borders, however, remain key bottlenecks, with compliance on both the import and export side being time intensive and costly. Colombia scores well on its ICT infrastructure, but transport, especially rail and road, lags behind. The overall operating environment, especially in terms of its public institutions, stands as another barrier to enabling trade over the medium term. On this pillar, Colombia ranks near the bottom globally overall, though with openness to foreign investment serving as a positive note.

The World Bank Group's Doing Business series currently ranks Colombia at 59th in the world.

WORLD BANK *DOING BUSINESS* RANKING COMPARED TO CANADA



This distance to frontier score helps assess the absolute level of regulatory performance over time. An economy's distance to frontier is reflected on a scale from 0 to 100, where 0 represents the lowest performance and 100 represents the best performance across all economies and across time.

SOURCE: 2018 WORLD BANK *DOING BUSINESS* REPORT

WORKING IN COLOMBIA

Work visas

Business visas are usually issued in Colombia to high-ranking executive workers representing foreign and multinational companies. These business visas aim to create business links and deals over a temporary time frame.

The primary business visa is called an NE1 and applies to foreigners who enter the country for the purpose of conducting business and business management, fostering economic exchange, investing and creating business.

Business visas apply for a maximum of three years. It allows multiple entries of up to six months at a time, but does not allow the holder to reside in Colombia. The visa can be renewed for a period of up to two years, in accordance with an evaluation of the job contract.

A work visa can be obtained for workers who have acquired work in the country, but wish to do so for a temporary period.

Multiple entries are allowed on this visa; however, it becomes invalid if you leave Colombia for more than 180 days continuously. The requirements for applying for this visa are similar to the business visa; however, it should be noted that this visa only lasts for up to two years.

Taxes

Personal income tax rates in Colombia range from 10 per cent to 33 per cent depending on income.

Non-residents are only taxed on their income from Colombia. A non-resident is someone who spends less than 183 days in the country during a tax year (January 1–December 31).

For financial matters, a person is considered a resident of Colombia if they spend longer than 183 days in the country during the tax year. Residents are taxed on their worldwide income, no matter where it is generated.

PESTEL ANALYSIS

Category	Analysis
POLITICAL	Colombia remains politically unstable with rebels continuing to challenge the government in many areas. Job creation remains a significant challenge. The country is in the process of developing new tax incentives and free-trade zones to encourage investment.
ECONOMIC	Despite the unrest, Colombia's economy continues to expand at a rate of over three per cent annually the last five years. However, the petroleum industry has struggled with low prices.
SOCIAL	The oil industry and local communities in Colombia have often struggled to co-exist. There is already some resistance to fracturing that will likely increase as exploration begins.
TECHNOLOGICAL	Colombia has failed to develop a local technology sector, resulting in the importation of most oilfield solutions. With a free trade agreement in place, Canada could play a role in technology transfer.
ENVIRONMENT	The government has yet to define environmental regulations for unconventional resource development.
LEGAL	Colombia ratified the Indigenous and Tribal Peoples Convention, meaning there must be informed consent with indigenous and Afro-Colombian populations prior to starting any local project. This could have significant implications for any new developments.

RECOMMENDATIONS

- Colombia continues reworking its regulatory environment and fiscal regime to attract investment. The Canada-Colombia FTA has helped to solidify Canada's established and rising trade and investment relationship with Colombia.

- Colombia has undertaken an aggressive program to increase its oil and gas reserve base, a sector where Canada is a major investor and recognized supplier of goods and services.

- The mature-fields market currently represents the best opportunity for Canadian supply and service companies willing to do business in the oil and gas sector in Colombia. There could be emerging opportunities in unconventional resources.

INSIGHTS

- Handling wastewater from well stimulations could grow in Colombia
- Well costs are three times higher in Colombia than Canada
- Focus on the recoverability of mature fields
- Waste management and getting the water to remote areas is a challenge
- There are many Canadian operators in Colombia. Canadian service providers have missed big networking opportunities in Colombia
- Coil tubing is a great business opportunity
- Well completions is a big opportunity, but there isn't legislation in place for fracture stimulations at the moment
- Canadian companies have advantages. Some similarities to Canadian SAGD—heavier oil with steam injection. Similar tech, process, language, equipment as Canada