Opportunities for Canadian Supply and Service Companies in Mature Oil & Gas Fields in Colombia

A Market Study Prepared for the Government of Alberta,
Global Affairs Canada, Export Development Canada,
the Leduc-Nisku Economic Development Association, and dmg::events

January 4, 2016

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GLOSSARY

Enhanced oil recovery	In this study, any oil recovery method beyond the primary recovery methods. Commonly abbreviated as EOR.
Mature field	In this study, an oil or gas field that would require secondary or tertiary recovery methods or a field that has passed the maximum production threshold and begun a declining phase with reduction in production volumes.
Primary recovery[1]	The first stage of hydrocarbon production, in which natural reservoir energy, such as gasdrive, waterdrive, or gravity drainage, displaces hydrocarbons from the reservoir, into the wellbore and up to surface.
Reserves	In this study, proved reserves, also referred to as P1.
Reserves-to-production ratio[2]	R/P ratios represent the length of time that those remaining reserves would last if production were to continue at the previous year's rate. They are calculated by dividing remaining reserves at the end of the year by the production in that year.
Secondary recovery[3]	The second stage of hydrocarbon production during which an external fluid such as water or gas is injected into the reservoir through injection wells located in rock that has fluid communication with production wells.
Tertiary recovery[4]	Traditionally, the third stage of hydrocarbon production, comprising recovery methods that follow waterflooding or pressure maintenance. The principal tertiary recovery techniques used are thermal methods, gas injection, and chemical flooding. The term is sometimes used as a synonym for enhanced oil recovery (EOR), but because EOR methods today may be applied at any stage of reservoir development, the term tertiary recovery is less commonly used than in the past.

[1] Schlumberger Oilfield Glossary, in http://www.glossary.oilfield.slb.com/

[2] BP Statistical Review of World Energy 2015

[3] Schlumberger Oilfield Glossary, in http://www.glossary.oilfield.slb.com/

[4] Same as above.

ACRONYMS

ACIPET	Colombian Association of Petroleum Engineers (*Asociación Colombiana de Ingenieros de Petróleo*)
ACP	Colombian Petroleum Association (*Asociación Colombiana del Petróleo*)
ANDI	Colombian Entrepreneurs National Association (*Asociación Nacional de Empresarios de Colombia*)
ANH	National Hydrocarbon Agency (*Agencia Nacional de Hidrocarburos*)
bbl	Barrels (of oil)
bpd	Barrels per day
BSW	Basic sediment and water
CAD	Canadian dollar
CAMPETROL	Colombian Chamber of Oil & Gas Supply & Service Companies (*Cámara Colombiana de Bienes y Servicios Petroleros*)
CCS	Colombian Safety Council (*Consejo Colombiano de Seguridad*)
COP	Colombian peso
cuft	Cubic feet
EIA	U.S. Energy Information Agency
EDC	Export Development Canada
EOR	Enhanced Oil Recovery
E&P	Exploration and Production
ICP	Colombian Petroleum Institute (*Instituto Colombiano de Petróleo*)
ISO	International Organization for Standardization
MME	Colombian Ministry of Mines and Energy (*Ministerio de Minas y Energía*)
RUC	Colombian Unified Contractors Registry (*Registro Unificado de Contratistas*)
SAGD	Steam-assisted gravity drainage
USD	U.S. dollar
UTC	Coordinated universal time

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EXECUTIVE SUMMARY

This market study presents opportunities for Canadian supply and service companies in mature oil & gas fields in Colombia. The study was prepared by Austral Consulting for the Government of Alberta, Global Affairs Canada, Export Development Canada, the Leduc-Nisku Economic Development Association, and dmg::events.

The study's content includes results from a survey conducted among mature oil & gas field operators in Colombia, in order to identify specific product, service, and technology needs.

The survey was conducted between December 1 and 15, 2015, while the study itself was prepared during December 2015 and delivered on January 4, 2016.

Chapter 1 presents some general key figures and maps of Colombia.

Chapter 2 introduces general facts about the oil & gas sector in Colombia, including some important upstream figures, a list and a map of the main producing basins and fields, a brief history of the industry in the country, a list of the main oil & gas–related associations, and data demonstrating the relative weight of the hydrocarbons sector among total foreign investment in the country.

Chapter 3 goes deeper into the mature-field market topic by explaining the role of the National Hydrocarbons Agency (ANH) as the market regulator, listing the operators with production activities in the country, presenting the publicly announced opportunities for growth in mature fields, and reviewing the supply tradition of Canadian companies to the Colombian mature-field market.

Chapter 4 details some recent mature-field development projects undertaken by Ecopetrol as well as by independent operators.

Chapter 5 advances some future projects planned by Ecopetrol and independent operators in mature fields in Colombia.

Chapter 6 details a number of specific technologies that operators will need in their activities in mature fields in the short to medium term, as per a survey conducted through interviews and phone calls.

Chapter 7 collects relevant information regarding registration and contracting practices in the sector in Colombia.

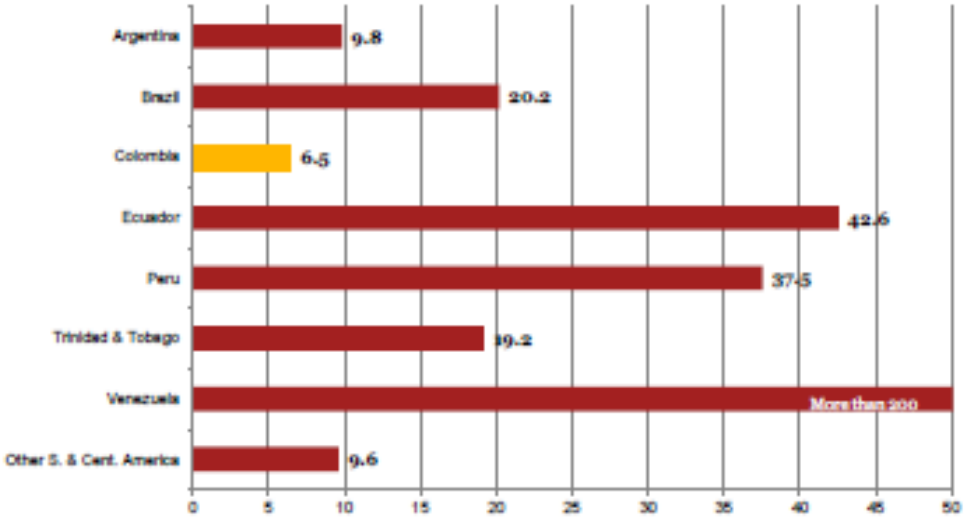
Finally, Chapter 8 presents business development recommendations for Canadian companies willing to enter the Colombian market, including a valuable perception of the Canadian supplier from the Colombian perspective, as well as some international comparables to give a perspective of the Colombian market in a global context.

INTRODUCTION

During the past 10 years, Colombia has emerged as one of Latin America's leading hydrocarbon producers. With just over one million barrels per day (bpd) of production in 2015, Colombia trailed only Mexico, Venezuela, and Brazil in the region. On a relative basis, natural gas production, at 1.2 Bcuft/d, is more modest, but has grown every year but one since 2003.

The primary problem the industry faces in Colombia is limited reserves. The biggest oil and gas fields in the country were discovered in the 1970s and 1980s, but since then very few important discoveries have been made. The result is that today Colombia has one of the lowest reserves-to-production ratios among the world's major oil producers.

Figure 1
South and Central America Oil Reserve-to-Production Ratios in 2013[5]



Improving the recovery factor from existing fields is one of the four main challenges that Colombia currently faces in order to increase its production and reserves, the other three being the discovery and processing of heavy oils, the exploitation of unconventional resources, and the offshore frontier.

Furthermore, the current relatively low price of oil favours production optimization strategies rather than new exploration.

In this environment, Colombia stands as one of the most promising markets for those Canadian supply and service companies who are willing to bring their mature-field specialized technologies abroad.

[5] Pwc, "Colombia Oil & Gas Industry 2014," from BP Statistical Review of World Energy 2013.

1 COLOMBIA AT A GLANCE

Official Name	Republic of Colombia
Total Area	1,141,748 km^2 (440,831 sq. mi.)
Population	48.93 million
Capital	Bogotá
Official Language	Spanish
Political System	Constitutional republic
Currency	Colombian peso (COP)
Current Exchange	1 CAD = 2,288 COP
Nominal GDP	377.87 billion USD
GDP Growth	+6.6% (2011) +4.0% (2012) +4.9% (2013) +4.6% (2014)
Total Trade/GDP	37.53%
Merchandise Imports from Canada	935.64 million CAD
Canadian Direct Investment	2,228 million CAD
Time Zone	UTC –5
Calling Code	+57

Figure 2
Colombia in the World

Figure 3
Colombia in Its Region

Figure 4
Colombia Physical

2 COLOMBIA OIL & GAS FACTS

2.1 Upstream Facts

Table 2
Colombia Upstream Oil & Gas Facts

Proved oil reserves (Jan. 2015)	2.4 Bbbl[6]
Proved gas reserves (Jan. 2015)	6.4 Tcuft[7]
Total oil production (Sept. 2015)	1.009 Mbpd[8]
Total gas production	1,050 Mcuft/d[9]
Oil reserves/production ratio	6.8[10]
Gas reserves/production ratio	13.7[11]
Number of exploratory blocks	325[12]
Number of exploration companies	89[13]
Ecopetrol vs. independent-operated blocks	13% / 87%[14]

[6] U.S. Energy Information Agency (EIA), "Colombia Energy Data and Analysis," December 22, 2015, in https://www.eia.gov/beta/international/analysis.cfm?iso=COL

[7] Same as above.

[8] Agencia Nacional de Hidrocarburos (ANH), "Producción Mensual de Petróleo," December 22, 2015, in http://www.anh.gov.co/Operaciones-Regalias-y-Participaciones/Sistema-Integrado-de-Operaciones/Paginas/Estadisticas-de-Produccion.aspx

[9] Agencia Nacional de Hidrocarburos (ANH), "Producción Mensual de Gas en Colombia," December 22, 2015, in http://www.anh.gov.co/Operaciones-Regalias-y-Participaciones/Sistema-Integrado-de-Operaciones/Paginas/Estadisticas-de-Produccion.aspx

[10] British Petroleum, "Statistical Review of World Energy," June 2015, in http://www.bp.com/content/dam/bp/pdf/energy-economics/statistical-review-2015/bp-statistical-review-of-world-energy-2015-full-report.pdf

[11] Same as above.

[12] Agencia Nacional de Hidrocarburos (ANH), "Listado de Áreas," December 22, 2015, in http://www.anh.gov.co/Asignacion-de-areas/Paginas/Mapa-de-tierras.aspx

[13] Same as above.

Onshore vs. offshore blocks	300 / 25[15]
Number of producing fields	471[16]
Number of producing companies	48[17]
Ecopetrol vs. independent-operated fields	33.5% / 66.5%[18]
Onshore vs. offshore fields	470 / 1[19]

[14] Agencia Nacional de Hidrocarburos (ANH), "Listado de Áreas," December 22, 2015, in http://www.anh.gov.co/Asignacion-de-areas/Paginas/Mapa-de-tierras.aspx

[15] Same as above.

[16] Same as above.

[17] Same as above.

[18] Same as above.

[19] Same as above.

2.2 Main Producing Basins and Fields

Table 3
Main Producing Basins and Fields in Colombia[20]

Main Basins	Main Oil Fields	Main Gas Fields
Caguán - Putumayo	Oritos Costayaco	Moqueta
Catatumbo	Tibú	Tibú
Guajira	–	Chuchupa Ballena Riohacha
Llanos Orientales	Caño Limón Cupiagua Castilla Rubiales Cusiana	Cusiana Cupiagua Gibraltar
Valle Inferior del Magdalena	Cicuco	La Creciente Nelson
Valle Medio del Magdalena	La Cira-Infantas Yariguí-Cantagallo Jazmín Casabe	Provincia
Valle Superior del Magdalena	Guando San Francisco	–

[20] Modified from: Vergara, M. F., & Tovar, L. R., "Cuencas Sedimentarias de Colombia," 2010, in http://www.scribd.com/doc/27311861/Cuencas-sedimentarias-en-Colombia#scribd; Garcia, M., *et al*., "Evaluación del Potencial Hidrocarburífero de las Cuencas Colombianas," April 2009, pp. 169–173, and;Ministerio de Minas y Energia (MME), "Balance de Gas Natural en Colombia," February 2015, pp. 10-11.

Figure 5
Main Oil & Gas Producing Fields in Colombia[21]

[21] Open Oil, “Almanaque del Petróleo en Colombia,” 2012.

2.3 History of the Oil & Gas Industry in Colombia

Table 4
Colombia Oil & Gas Timeline[22]

1905	First concessions assigned. Exploration on those concessions eventually led to the discovery of the Cira-Infantas field.
1918	First commercial oil well drilled in the Cira-Infantas field.
1921	Tropical Oil starts operation in the Cira-Infantas field.
1951	Foundation of Ecopetrol. Ecopetrol takes over operation of the Cira-Infantas field.
1964	Creation of ACIPET.
1983	Ecopetrol discovers the Chuchupa field.
1983	Ecopetrol in association with Occidental discovers the Caño Limón field.
1988	Ecopetrol in association with BP discovers the Cusiana field.
1988	Establishment of Campetrol.
1993	Ecopetrol in association with BP discovers the Cupiagua field.
2003	Creation of the ANH. Ecopetrol is released from its previous regulatory functions.
2007	The ANH organizes 1st Bid Round for exploratory blocks.
2013	Gas production reaches its all-time peak at 1,200 Mcuft/d (April).
2015	Oil production reaches its all-time peak at 1.035 Mbpd (January).

[22] Modified from Open Oil, “Almanaque del Petróleo en Colombia,” 2012.

2.4 Industry Associations

Table 5
Oil & Gas Industry Associations in Colombia[23]

	ACIPET	ACP	ANDI	CAMPETROL
Name	Colombian Association of Petroleum Engineers (*Asociación Colombiana de Ingenieros de Petróleo*)	Colombian Petroleum Association (*Asociación Colombiana del Petróleo*)	Colombian Entrepreneurs National Association (*Asociación Nacional de Empresarios de Colombia*)	Colombian Chamber of Oil & Gas Supply & Service Companies (*Cámara Colombiana de Bienes y Servicios Petroleros*)
Members	Industry Professionals	Private Companies in the Exploration, Production, Transportation & Distribution of Oil & Gas Business	Multi-sector Operating, Supply & Service Companies	Oil & Gas Supply & Service Companies
Website	www.acipet.com	www.acp.com.co	www.andi.com.co	www.campetrol.org

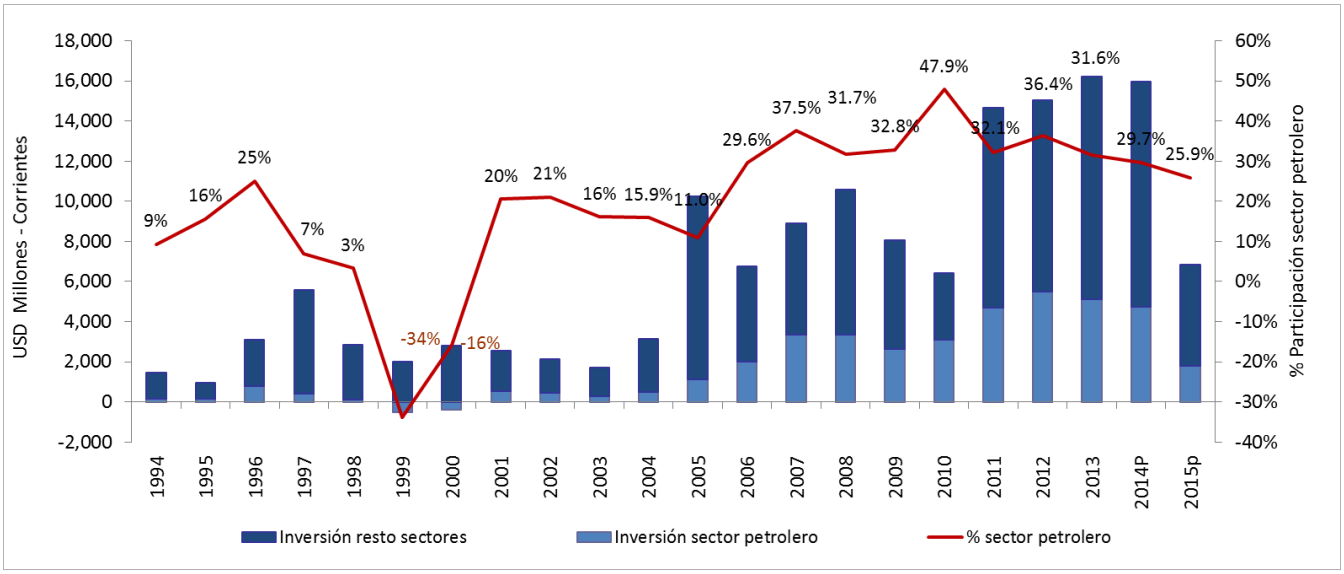
2.5 Oil & Gas Share of Direct Foreign Investment in Colombia

Figure 6 shows the evolution of total direct foreign investment in Colombia between 1994 and 2015 as well as the hydrocarbon sector share of it. Since 2011 total direct foreign investment in Colombia has remained relatively stable at between USD 15 billion and USD 16 billion yearly. The annual figures for 2011–2015 are quite outstanding when compared to those of the preceding 15 years and are approximately double the annual average investment received in the 2005–2010 period. This is certainly a good indicator of the current attractiveness of Colombia as a place to conduct business.

Over the last 10 years, the oil industry's share of all foreign investment in the country increased from 11.0% in 2005 to a peak of 47.9% in 2010, and then eased to 25.9% in 2015. This confirms that oil remains one of the main sources of foreign investment in Colombia.

[23] Extracted from the corresponding associations' websites.

Figure 6
Oil & Gas Share of Direct Foreign Investment in Colombia[24]



From a Canadian perspective, Colombia ranks as the fifth-largest destination for Canadian direct investment in South and Central America[25].

[24] Asociación Colombiana del Petróleo (ACP), "Informe Estadístico Petrolero," October 2015.

[25] Canada, "Embassy of Canada to Colombia, Trade and Investment", in http://www.canadainternational.gc.ca/colombia-colombie/bilateral_relations_bilaterales/index.aspx?lang=eng&menu_id=3

3 OVERVIEW OF THE MATURE-FIELDS MARKET IN COLOMBIA

3.1 Market Regulator

Since 2003, the hydrocarbon market regulator in Colombia is the Colombian National Hydrocarbon Agency (ANH, *Agencia Nacional de Hidrocarburos*). The ANH is an agency created within the Ministry of Mines and Energy (MME, *Ministerio de Minas y Energía*).

The ANH has the following mandates that are relevant to both the mature-field market and the interests of Canadian suppliers wanting to do business in Colombia[26]:

- Identify and evaluate the country's hydrocarbon potential;
- Design, evaluate, and promote investment in hydrocarbon exploration and production activities according to international best practices;
- Design, promote, negotiate, enter into, and manage contracts and agreements for exploration and production of hydrocarbons owned by the nation, with the exception of contracts of association held by Ecopetrol until December 31, 2003, as well as monitoring the fulfillment of all associated obligations;
- Assign the areas for exploration and/or production subject to modalities and types of engagement adopted by the ANH for this purpose;
- Support the Ministry of Mines and Energy in the formulation of governmental policies in hydrocarbons matters, the elaboration of sectorial plans, and fulfillment of the respective objectives;
- Structure studies and research in geology and geophysics to generate new knowledge of the sedimentary basins of Colombia with a view to plan and optimize the use of hydrocarbon resources and generate interest and investment in exploration;
- Agree on exploration and production contracts, terms, and conditions subject to which the contracting company will carry out programs for the benefit of the communities located in the areas of influence of the corresponding contracts;
- Support the Ministry of Mines and Energy and other competent authorities in matters related to communities, environment, and safety in areas affected by oil and gas projects;
- Establish hydrocarbon prices for the purpose of determining royalties;

[26] Agencia Nacional de Hidrocarburos (ANH), "Functions," December 23, 2015, in http://www.anh.gov.co/en-us/la-anh/paginas/Funciones.aspx

- Track compliance with technical standards relating to the exploration and production of hydrocarbons aimed at the exploitation of resources in a rational and comprehensive manner;

- Check the specifications and destination of imported material in the sub-sector of hydrocarbons in order to ascertain compliance with exemptions provided for in the Petroleum Code or Regulations modifying the Code.

3.2 Operators

Forty-eight companies currently produce hydrocarbons at 471 fields in Colombia. Table 6 ranks the main operators by both number of producing fields and production.[27]

Table 6
Main Oil & Gas Producing Operators in Colombia

#	Company	# of Fields	#	Company	Production (bpd)
1	Ecopetrol	158	1	Ecopetrol	379,329
2	Pacific	42	2	Meta	223,462
3	Perenco	41	3	Equión	52,944
4	Petrominerales	29	4	Mansarovar	40,109
5	Cepcolsa	19	5	Petrominerales	29,192
6	Occidental	16	6	Perenco	28,950
7	GeoPark	13	7	GeoPark	26,419
8	Parex	13	8	Cepcolsa	23,623
9	Emerald	11	9	Pacific	21,979
10	Equión	10	10	Hocol	21,908
11	Vetra	9	11	Gran Tierra	21,610
12	Petronorte	9	12	Occidental	17,479

[27] Agencia Nacional de Hidrocarburos (ANH), “Listado de Áreas,” December 22, 2015, in http://www.anh.gov.co/Asignacion-de-areas/Paginas/Mapa-de-tierras.aspx

13	New Granada	9	13	Parex	12,924
14	Mansarovar	8	14	Vetra	10,761
15	Other (33)	84	15	Other (33)	50,821

Please refer to Appendix A for the complete list of oil & gas producing operators in Colombia.

While most of the current 48 producing companies operate mature fields (i.e., fields that have reached their natural production peak and are now on a declining stage), only seven of them have enhanced oil recovery (EOR) projects in place. Table 7 ranks the operators by the number of fields with EOR projects in place.[28]

Table 7
Operators with EOR Projects in Colombia

#	Company	# of Fields with EOR Projects
1	Ecopetrol	35
2	Mansarovar	2
3	Vetra	2
4	Equión	1
5	Hocol	1
6	Meta	1
7	Parex	1
8	Other (41)	0

3.3 Contractors and Service Companies

Dozens of local and international contractors and oilfield firms service the E&P companies operating in Colombia. Established contractors and service companies may offer partnership

[28] Agencia Nacional de Hidrocarburos (ANH), "Producción de Campos con Proyectos EOR," modified from "Producción Fiscalizada de Petróleo por Campo en Superficie," September 30, 2015.

opportunities to Canadian companies and may represent a convenient, easier way of accessing the Colombian mature field market. Table 8 shows a non-exhaustive list of both local and international contractors in the country.

Table 8
Contractors and Service Companies in Colombia[29]

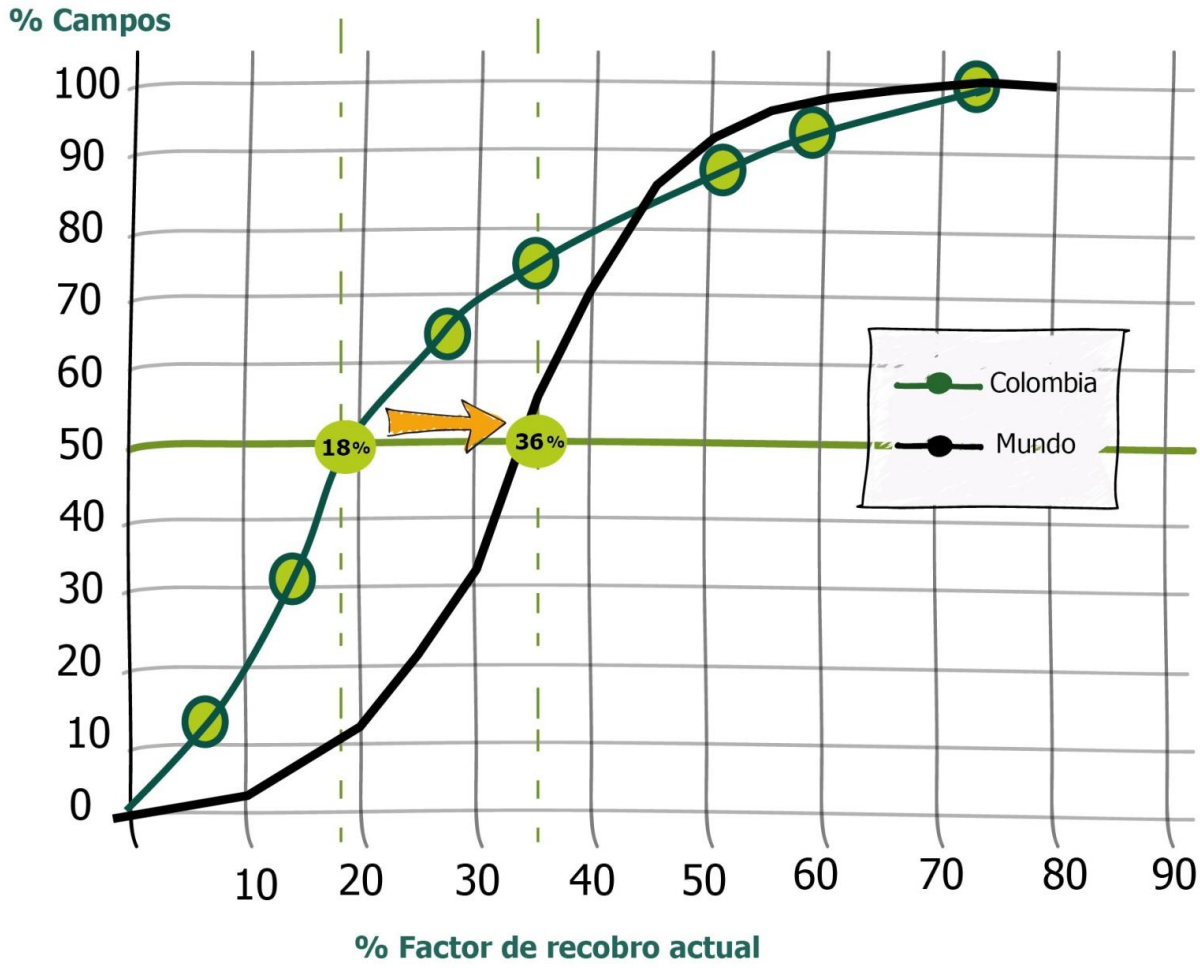
Company
ABB
Amec Foster Wheeler
Cameron
Casaval
Erazo Valencia
Estrella International
Halliburton
Indequipos
Industrial Consulting
Panthers Machinery
Petroases
Schlumberger
Superior Energy
Trienergy
Tuvacol
Vicpar
Weatherford

[29] ACIPET, PetroGuía 2016.

3.4 The EOR Opportunity in Mature Fields in Colombia

Colombia has an average recovery rate of 18%, well below the world average of 36%, mainly because Colombian fields are relatively younger than fields in other countries.

Figure 7
Recovery Rate in Colombia vs. World[30]



It is the official intent of the ANH and Ecopetrol to reduce the recovery rate gap in Colombia.

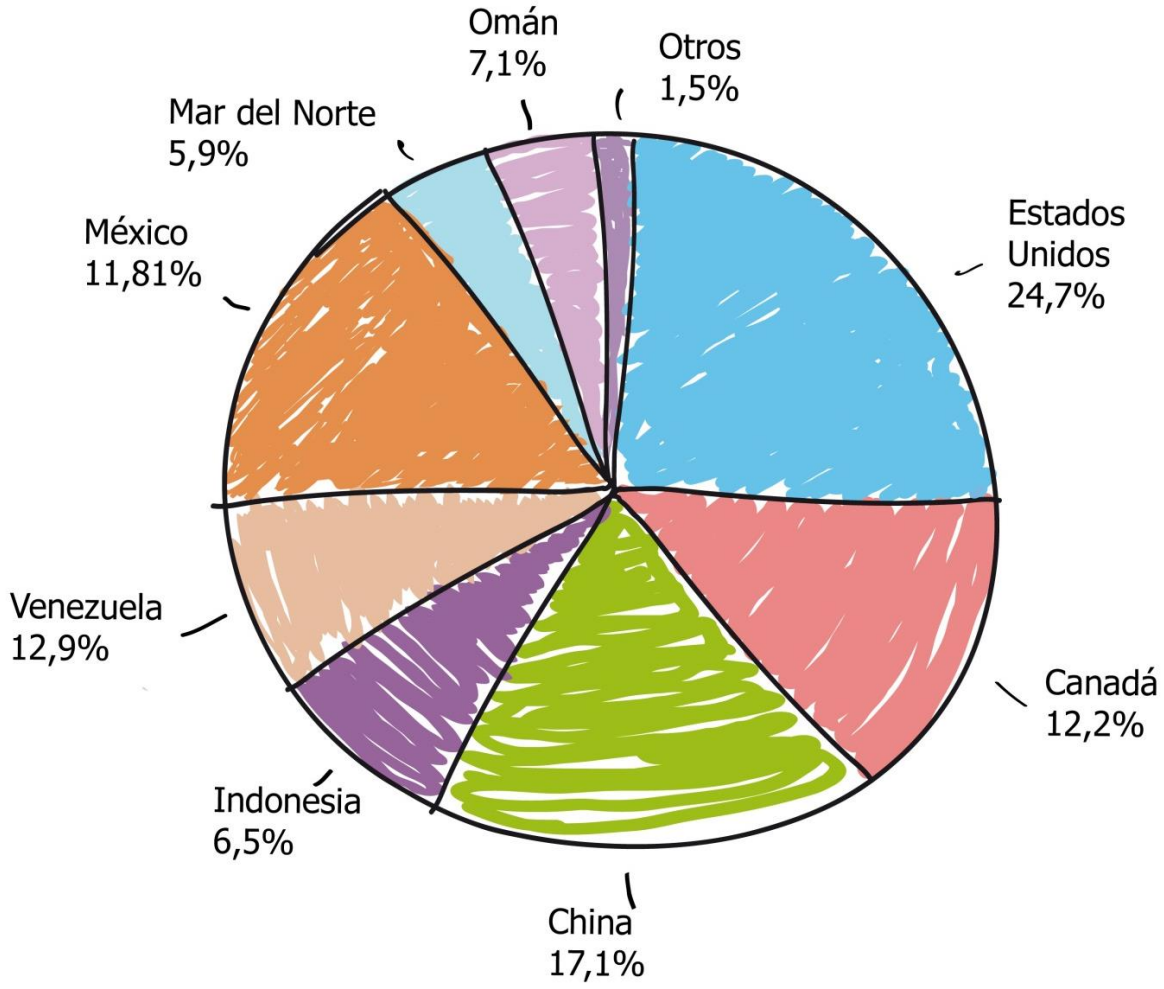
In fact, most of the current 471 producing fields have reached their natural production peak and are now on a declining stage, but only 43 of them have EOR methods in place. That represents slightly over 9% of the total number of fields. However, as of September 2015 production from

[30] Ecopetrol, "II Foro Mundial de Recobro Mejorado," 2015.

fields where EOR projects were in place represented approximately 28% (280,876 bpd) of Colombia's total production.[31]

More specifically, Ecopetrol currently produces 62% by primary recovery methods and 33% by secondary recovery. As well, Ecopetrol currently exceeds the world average production by tertiary recovery methods. Approximately 3% (2.9 Mbpd) of the oil currently produced in the world comes from tertiary recovery, while Ecopetrol has made it possible to reach 5% of its total production. Figure 8 shows the share of tertiary recovered oil by country.

Figure 8
Current Share of Tertiary Recovered Oil in the World[32]



[31] Agencia Nacional de Hidrocarburos (ANH), "Producción de Campos con Proyectos EOR," modified from "Producción Fiscalizada de Petróleo por Campo en Superficie," September 30, 2015.

[32] Ecopetrol, "II Foro Mundial de Recobro Mejorado," 2015.

3.5 Canadian Tradition in the Colombian Mature-Fields Market

Since the Colombian exploration and production market opened to foreign companies in 2003, a number of Canadian companies have obtained rights to explore and/or produce hydrocarbons after taking part in one or more round bids organized by the ANH. At the same time, acquisitions and mergers have been frequent in the last several years. Some companies keep their brand after being acquired, which sometimes makes it difficult to track the origin of the current ownership of specific companies. Table 8 alphabetically lists a number of Calgary-headquartered companies currently conducting production operations in oil fields in Colombia.

Table 9
Canada-Headquartered Operators in Colombia[33]

Company
Canacol
Gran Tierra
Meta
Pacific
Parex
Petrominerales
Verano

Canadian supply and service companies have been active in Colombia far longer than Canadian operators. However, the presence of Canadian operators in Colombia has obviously helped to increase the arrival of suppliers and service companies from Canada. Table 9 is a non-exhaustive alphabetical list of Canadian suppliers with a relevant history of activity in Colombia.

[33] Obtained from 'company websites.

Table 10
Canada-Headquartered Suppliers in Colombia[34]

Company
Canadian Anchors
Canadian Drilling and Completion
HEF Petrophysical Consulting
Katch Kan
Kodiak Wireline
Optimax
Packers Plus
Pajak
Pason
QMax
Shear Bits
Tuscany

3.6 Survey of Market Players

A significant part of the information provided in this study, and especially the section related to specific technology needs for operating mature fields, was obtained through an Austral survey of relevant players in the mature-field market in Colombia. The survey interviews were conducted between December 1 and 15, 2015, in person and by telephone.

Interviewees were representatives from oil & gas mature-field operators, industry associations, government entities, supply-chain management platforms, and investment attraction institutions.

Appendices B and C show the questionnaire used for the survey and the persons interviewed, respectively.

[34] Obtained from a survey of operators and company' websites.

4 RECENT MATURE-FIELD DEVELOPMENT PROJECTS

4.1 Ecopetrol

Since 1957 Ecopetrol has executed 24 secondary recovery projects and 7 tertiary recovery projects. An additional 32 pilot projects have been under development since 2012. Table 10 details the recovery methods considered in these projects and pilots.

Table 11
Ecopetrol's EOR Projects[35]

Method	Projects	Pilots
Water injection	18	16
Chemicals injection	-	8
Gas injection	6	3
Air injection	-	2
Steam injection	7	3
Total	**31**	**32**

The Ecopetrol-operated Yariguí-Cantagallo and La Cira-Infantas fields are among the most relevant examples of successful application of enhanced oil recovery methods in Colombia.

Production at the Yariguí-Cantagallo field increased by 220% to reach the level of the 1970s after a water injection project started in late 2010 and tertiary recovery commenced in early 2014.

At the La Cira-Infantas field, a water injection project in place since 2003 increased production by 800% in the period 2003–2014, returning production to the level of the 1950s.

Figures 9 and 10 graphically show the above examples.

[35] Ecopetrol, "II Foro Mundial de Recobro Mejorado," 2015.

Figure 9
Yariguí-Cantagallo Field Production History[36]

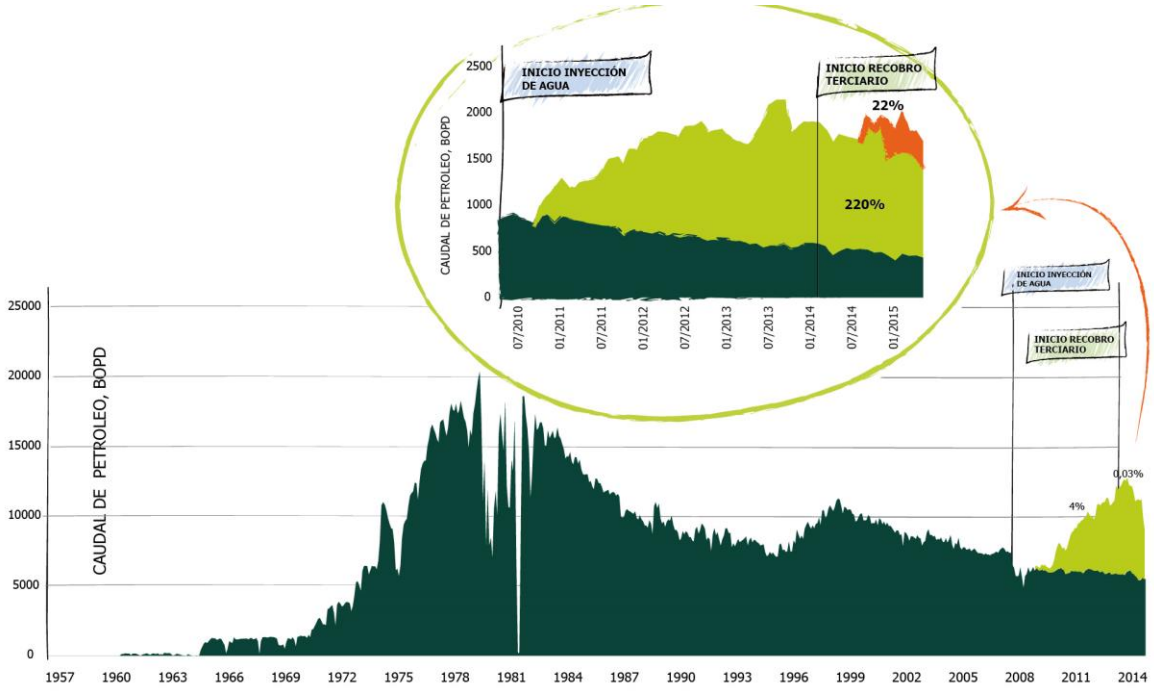
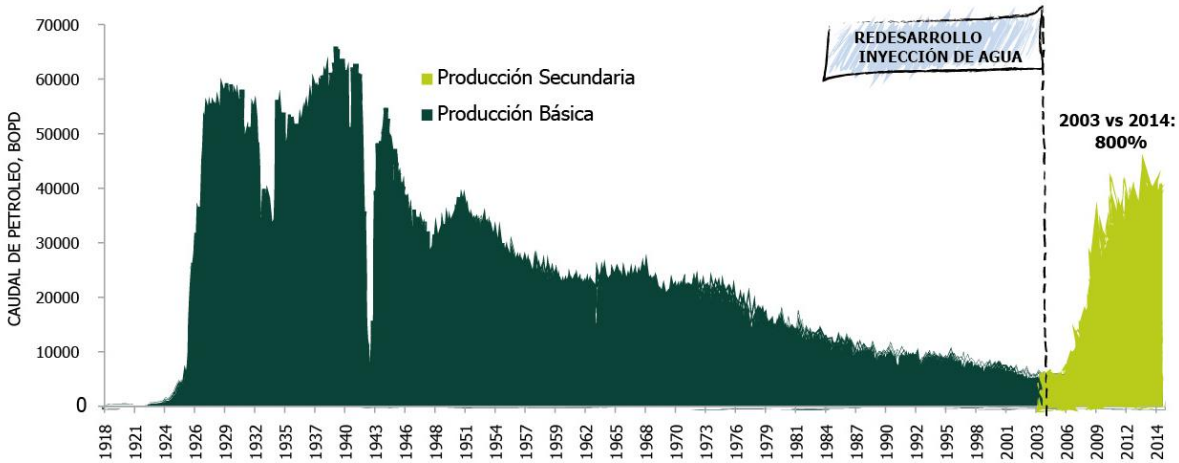


Figure 10
La Cira-Infantas Field Production History[37]

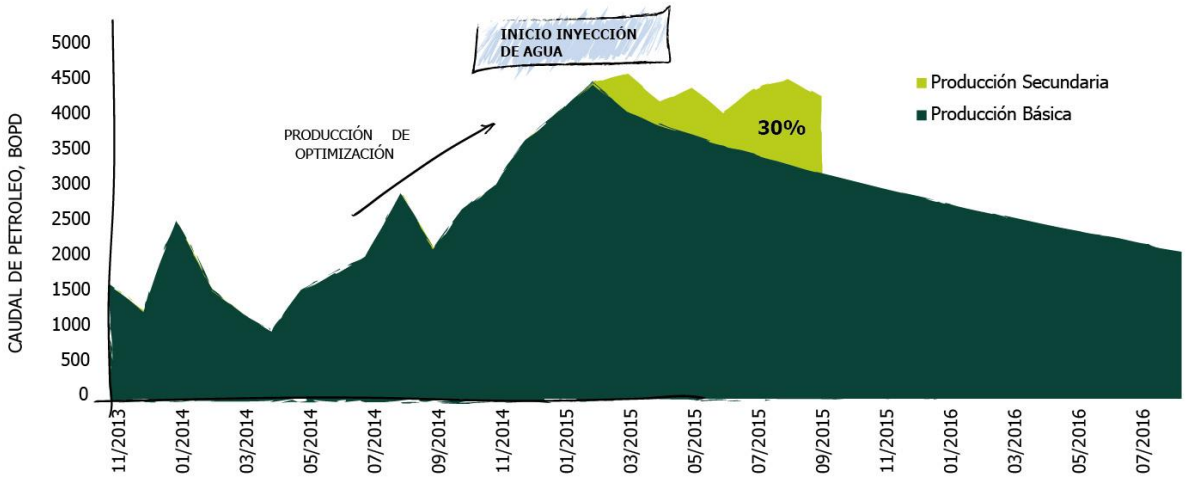


[36] Ecopetrol, "II Foro Mundial de Recobro Mejorado," 2015.

[37] Same as above.

According to Ecopetrol, all pilot projects being developed have already resulted in production increases in their respective fields. Figure 11 shows an example from the Chichimene field pilot, which resulted in a production increase of 30% as of September 2015.

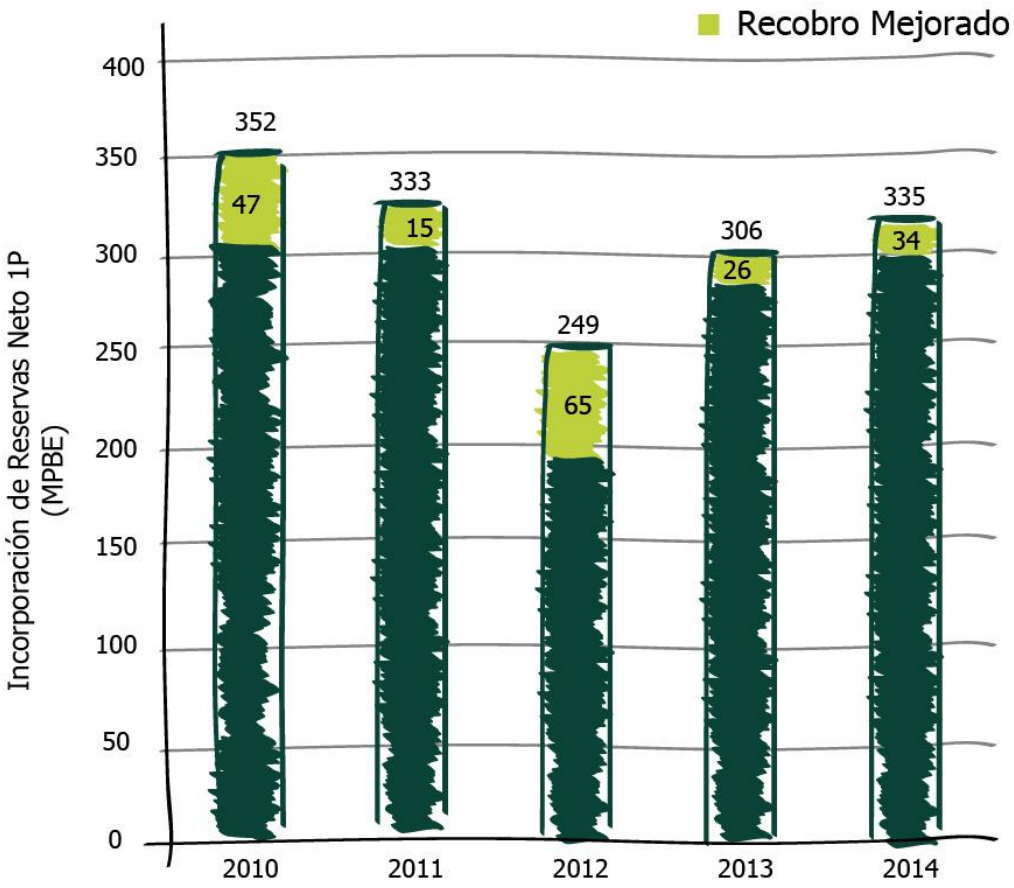
Figure 11
Chichimene Field Production History[38]



The EOR projects alone have added 187 Mbbl to Ecopetrol's oil reserves since 2010. Figure 12 shows the evolution of Ecopetrol's oil reserves and the share originating from EOR.

[38] Ecopetrol, "II Foro Mundial de Recobro Mejorado," 2015.

Figure 12
EOR-originated Oil Reserves Added by Ecopetrol since 2010[39]



4.2 Independent Operators

Independent operators vary in regard to the stage of their investment in mature fields. Table 11 gives a non-exhaustive list of EOR projects carried out by independent operators in some of their mature fields in Colombia.

[39] Ecopetrol, "II Foro Mundial de Recobro Mejorado," 2015.

Table 12
Some Recent EOR Projects by Independent Operators in Colombia[40]

Company	# of Mature Fields	Methods Applied
Canacol	2	Water injection
Cepcolsa	1	Polymer injection
Gran Tierra	4	Water injection
Hocol	16	Water & polymer injection
Occidental	1	Water injection
Petronorte	2	None yet

Past investment in mature fields has varied significantly between companies. Investment amounts declared during a survey of independent operators varied from a total of USD 3 million over the last 3 years, to USD 8 million annually during 4 years, and around USD 200 million in total over the last 4 years. Expenditures were made for drilling wells, building production and injection facilities, conducting injection, and others.

4.3 Colombian Petroleum Institute (ICP)[41]

The Colombian Petroleum Institute – ICP (*Instituto Colombiano de Petróleo*) is the main oil & gas research institution in Colombia. Founded in 1985, it currently hosts 20 labs and 33 pilot plants devoted to applied research both on the upstream and downstream sides of the industry.

ICP possesses an ISO 17025 accredited EOR lab with capability for evaluating porous medium and different EOR methods testing. The EOR lab has experience with EOR methods such as chemical, air, and gas injection as well as thermal methods. Ecopetrol estimates a benefit of USD 84 million from research programs led by ICP.[42]

[40] Extracted from interviews and surveys of companies.

[41] Instituto Colombiano del Petróleo (ICP), in http://www.ecopetrol.com.co/especiales/Portafolio%20ICP/portafolio/centro/index.htm

[42] Ecopetrol, "II Foro Mundial de Recobro Mejorado," 2015.

Figure 13
Partial View of the ICP's EOR Lab

While originally founded by Ecopetrol, ICP develops research programs for independent companies as well. ICP's facilities are located out of Bucaramanga, close to the important producing region of the Valle del Magdalena Medio.

5 UPCOMING PROJECT OPPORTUNITIES

5.1 Ecopetrol

Ecopetrol has plans to execute 27 additional secondary and tertiary recovery projects between 2015 and 2020. The goals are to reach an overall recovery rate of 26%, increase production by 500 kbpd, and add up to 1.4 Bbbl of oil reserves by 2020.[43]

Projects include technologies such as water injection (9), chemical injection (8), primary recovery (8), air injection (1), and steam injection (1). Figure 14 details the execution plan for those projects.

Figure 14
Ecopetrol's EOR Project Execution Plan[44]

These various recovery methods will contribute differently to Ecopetrol's reserves addition goal. Table 12 details the expected contribution of each method.

[43] Ecopetrol, "II Foro Mundial de Recobro Mejorado," 2015.

[44] Same as above.

Table 13
Expected Contributions of Recovery Methods to Increase in Ecopetrol's Oil Reserves by 2020[45]

Methods	Potential Contribution (Bbbl)	Expected Contribution (Bbbl)
Primary recovery	1.22	0.68
Non-thermal recovery (water, chemical, gas)	1.01	0.57
Thermal recovery (steam, air)	0.27	0.15
Total	**2.5**	**1.4**

Over the 2015–2020 period, Ecopetrol plans to invest USD 15.1 billion in Exploration and Production (E&P) operations. Recovery operations will account for around 66% of that amount, reaching USD 10 billion, the biggest investment in recovery in the history of Colombia's oil & gas industry. Table 13 shows the main numbers of Ecopetrol's 2015–2020 investment plan.

Table 14
Ecopetrol 2015–2020 Investment Plan[46]

Year	Total Investment (USD Billion)	% E&P
2015	7.9	59%
2017	6.8	78%
2020	5.9	88%

In order to realize this oil recovery plan, Ecopetrol is considering the following strategies:

- Elaborate an integrated development plan focussing on the main oil fields;

[45] Ecopetrol, "II Foro Mundial de Recobro Mejorado," 2015.

[46] Same as above.

- Pursue cost-effective execution as well as optimization and standardization of internal processes;
- Build technology alliances with suppliers, other operators, and other partners;
- Create a specific organizational model for oil recovery projects, with an agile structure focussed on pilot project execution and results.

5.2 Independent Operators

Very few independent operators agreed to disclose their short- to medium-term investment plans in mature fields; some were only willing to disclose them anonymously. As expected, most of them confirmed that the eventual execution of their projects would be highly dependent on market conditions (the price of oil being the main driver) and on the cost of technology implementation. Table 14 lists a number of relevant projects planned for the next years in Colombia.

Table 15
Some Future EOR Projects by Independent Operators in Colombia[47]

Company	Project	Investment (USD)
Operator 1	Chemical injection & heavy oil handling facilities	–
Operator 2	Drilling, surface facilities, & water injection	60 million by 2017
Operator 3	SAGD & polymer injection	–
Operator 4	Water injection & polymer injection	11–16 million by 2017
Operator 5	Polymer injection	–
Operator 6	Polymer injection	–
Operator 7	Water injection & water coning control	–

[47] Extracted from interviews and surveys of companies.

A market movement that would certainly add significant supply opportunities to the independent operation side of the industry is Ecopetrol's long-awaited farming-out of a number of fields—up to 120 leases according to certain sources—that are currently seeing very low activity. Those mature fields would likely require the application of EOR methods to bring them back to profitability.

6 IDENTIFICATION OF SPECIFIC NEEDS BY MATURE-FIELD OPERATORS

Table 15 details a number of short- to medium-term specific needs declared by oil & gas mature-field operators in Colombia.

Table 16
Specific Needs in Mature Fields in Colombia[48]

Water coning control & other water conformance technologies
Drilling & perforation technologies
Selective completion technologies
High-temperature production logging technologies
Sand control technologies
Heavy oil–handling technologies
Downhole & surface corrosion control technologies
Oil/gas/water separation & treatment technologies
Surface facility technologies
Produced water treatment technologies for BSW>80%
Piping technologies
Freshwater access technologies
EOR feasibility studies
Surface geometrics studies for injection
Water injection technologies
Chemical injection technologies
Polymer injection technologies
Steam injection technologies

[48] Extracted from surveys of mature-field operating companies.

Operators and entities also unanimously declared an interest in the more generic, less field-focussed mature market–related demands listed in Table 16.

Table 17
Generic Demands in the Mature-Field Market in Colombia[49]

International benchmarking studies on mature field royalties & incentives
Regular technical seminars with international technology-driven suppliers
Regular one-on-one business sessions with international suppliers
Regular technical conferences on the mature field topic
Local workforce training in new recovery technologies

[49] Extracted from surveys of mature-field operating companies.

7 CONTRACTING ASPECTS

7.1 Vendor List Registration & Contracting

We highly recommend that the first step toward selling products and services to Colombian oil & gas operators should be to register in each company's vendor list. While most operators manage their relationship with vendors internally, some companies have externalized these services to vendor list management platforms. The good news about these platforms is that vendors can gain exposure to several companies by registering in a single platform. Generally speaking, the registration process is relatively simple and bureaucracy-free.

The main registration platforms active in the Colombian oil & gas market today are Achilles and PAR. PAR Servicios (www.parservicios.com) is a Colombian-based supply-chain platform active in the market since 1999. Achilles (www.achilles.com) is a UK-based supply-chain platform with an office in Bogotá, and has been in the market since 1991.

Most surveyed companies contract directly. Until recent years it was common to contract suppliers through international oilfield service companies such as Halliburton or Schlumberger, but this is no longer the case.

In an effort to maintain a certain level of activity amid the current environment of relatively low oil prices, some operators have begun considering contracting on a risk-clause basis, where supply and service companies link their business to those of their customers. So far this has applied mainly to unconventional projects, but depending on the market evolution it may soon extend to EOR projects.

Table 17 details the current registration and contracting methods chosen by several relevant mature-field operators in Colombia.

Table 18
Current Registration & Contracting Methods by Operators in Colombia[50]

Operator	Vendor Management	External Platform	Direct vs. Indirect Contracting
Canacol	Internal	–	Direct
Cepcolsa	Internal	–	Direct
Ecopetrol	Internal	–	Direct

[50] Extracted from interviews and surveys of companies as well as from PAR Servicios and Achilles websites.

Equion	External	PAR	Direct
GeoPark	External	Achilles	Direct
Gran Tierra	Internal	–	Direct
Hocol	External	PAR	Direct
Mansarovar	External	PAR	Direct
Occidental	Internal	–	Both
Parex	Internal	–	Direct
Pacific	External	Achilles	Direct
Petronorte	External	Achilles	Direct
Tecpetrol	External	Achilles	Direct
Vetra	External	Achilles	Direct

More specifically on Ecopetrol, there are no restrictions for foreign corporations becoming suppliers of Ecopetrol and participating in Ecopetrol's procurement processes, provided they fulfill the requirements set out in the bid documents or terms of reference for each process.

New in 2016, Ecopetrol has implemented a single vendor platform called SIPROE Vendor Information System. SIPROE allows for consulting all the necessary information concerning the various supply processes regulated under its Procurement Manual. By means of this tool, Ecopetrol identifies potential providers of goods and/or services, review their technical capacity, and assess it pursuant to Ecopetrol's needs. Vendors can use it not only for registration, but also for reporting their experience, adding products and services offered, quality conditions, logistics, operations, HSE, economic capacity and other aspects relative to their company.

For registration under SIPROE access www.rupsiproe.com

7.2 Unified Contractors Registry (RUC)

The Unified Contractors Registry (RUC – *Registro Unificado de Contratistas*) is an information management system operated by the Colombian Safety Council (CCS – *Consejo Colombiano de Seguridad*) that gathers oil & gas suppliers' management records on industrial safety, occupational health, and the environment. RUC was adopted in 1998 by oil & gas operators in Colombia as the system to rely on when inviting suppliers to bid for provision of products and

services.[51] Listing in the registry is not mandatory, but virtually no unlisted supplier receives invitations to bid for opportunities in the oil & gas sector in Colombia.

Suppliers can follow the RUC Guide (available in Spanish only at http://ccs.org.co/img/OAUPE009_GUIA_PARA_CONTRATISTAS_RUC_REV_15(1).pdf) to understand the industry practices expected from them in Colombia.

First-time registration is conducted online at http://ccs.org.co/ruc-inscribase.php?opcion=Inscripcion (in Spanish only).

Registration renewal is also conducted online at http://ccs.org.co/ruc-inscribase.php?opcion=Renovacion (in Spanish only).

7.3 Colombia's Import Aspects

Colombia is an established market for Canadian businesses, and the Canada-Colombia Free Trade Agreement and parallel agreements benefit a wide range of exporters and service providers, as well as promote a more stable and predictable climate for Canadian investment.

Canada-Colombia two-way merchandise trade in 2014 totalled CAD 1.8 billion, making Colombia Canada's sixth-largest bilateral trading partner in Latin America and the Caribbean (excluding Mexico). Colombia was Canada's third-largest merchandise export destination in this region, with Canadian merchandise exports totalling CAD 920.67 million in 2014. Canadian merchandise imports from Colombia totalled CAD 891.59 million in 2014.[52]

Most of Colombia's import duties are consolidated into three tariff levels: 0% to 5% on capital goods, industrial goods, and raw materials not produced in Colombia; 10% on manufactured goods, with some exceptions; and 15% to 20% on consumer and "sensitive" goods. Exceptions include automobiles, which are subject to a 35% duty, and some agricultural products.

When considering exporting to Colombia, Canadian suppliers should be aware of required import licenses for their specific products.

As for virtually any other country, it is also important to comply with all aspects of Colombian regulations on documentation. A good partner and/or freight forwarder with a local office in Colombia can provide invaluable advice on documentation. The general documentation requirements for Colombia are:

- customs import declaration

[51] Consejo Colombiano de Seguridad (CCS), "RUC," in http://ccs.org.co/ruc.php

[52] Canada, "Embassy of Canada to Colombia, Trade and Investment," in http://www.canadainternational.gc.ca/colombia-colombie/bilateral_relations_bilaterales/index.aspx?lang=eng&menu_id=3

- manifest
- declaration of dutiable value
- commercial invoice
- pro forma invoice
- packing list
- certificate of origin
- air/sea waybill
- bill of lading
- Single Tax Register (RUT) of importer

8 BUSINESS DEVELOPMENT RECOMMENDATIONS

8.1 Doing Business with a Foreign Supplier from a Colombian Perspective

The Colombian oil & gas sector has a long tradition of acquiring goods and services from foreign suppliers, with Canada standing among the countries with the largest business volume. The Canada-Colombia Free Trade Agreement, in effect since August 2011, certainly helps to facilitate business between the two countries.

A survey of Colombian mature-field operators about their perception of and willingness to do business with foreign suppliers, specifically from Canada, revealed the following:

- 100% are interested in attending business seminars to learn more about new technologies developed by foreign suppliers;
- 78% prefer that foreign companies have a branch office or at least a representative in Columbia;
- 100% recommend that any in-country office opened by a foreign company be located in Bogotá;
- Each responding company expressed hope that any distribution facility to be set up would be located in proximity to where their main operations take place. Some places mentioned were Barrancabermeja, Bogotá, Orito, Villavicencio, and Yopal;
- 89% feel comfortable negotiating in English, but 100% establish their contracts and agreements in Spanish.

8.2 Doing Business in Colombia from an International Perspective

The World Bank Group's "Doing Business" Series ranks Colombia at 54th out of 189 world economies for 2016. In recent years Colombia has consistently been ranking among the easiest countries to do business in the Latin America and Caribbean region. Currently it ranks 4th in the region, behind Mexico (38), Chile (48), and Peru (50), and well ahead of important economies like Brazil (116). Colombia stands out in specific aspects such as getting credit (2nd in the world), protecting minority investors (14th), and resolving insolvency (30th). Figures 15, 16, and 17 graphically rank Colombia on the aspects mentioned above.

Figure 15
Comparison of Colombia and Neighbouring Economies on Ease of Doing Business[53]

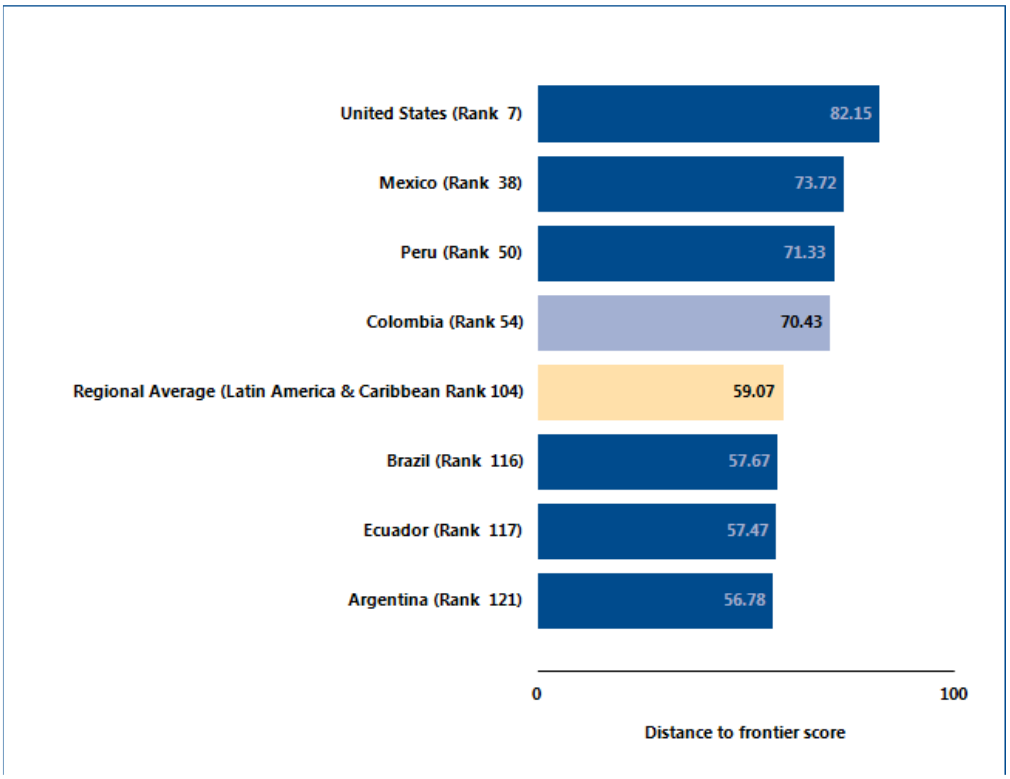
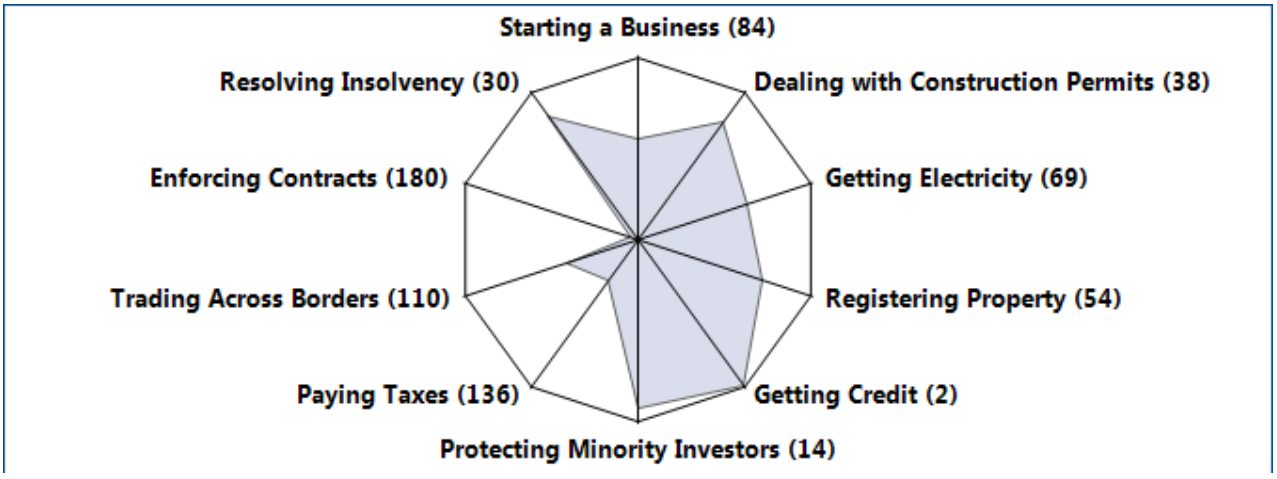


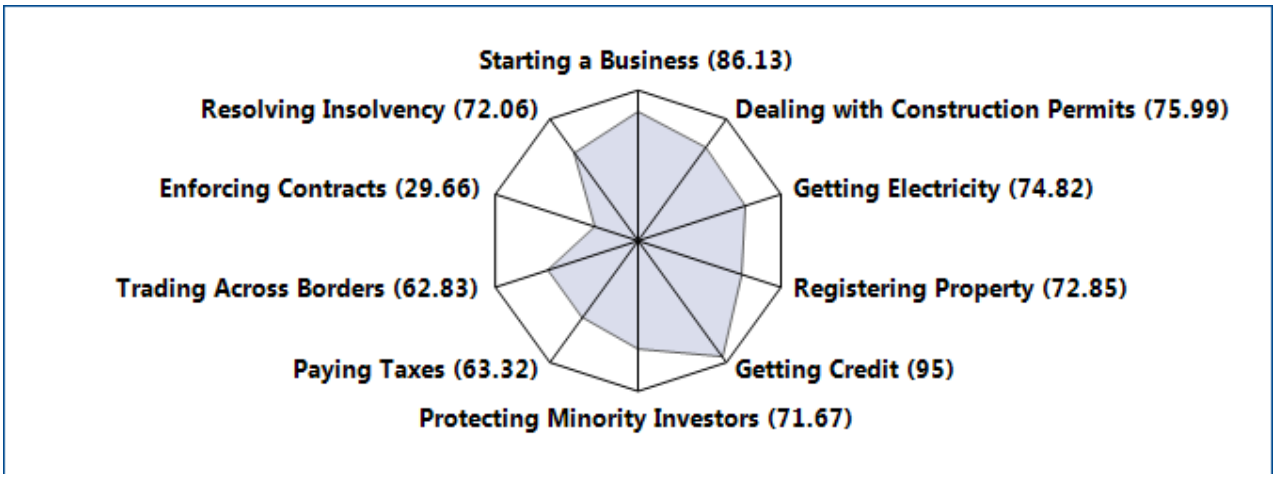
Figure 16
Colombia's Ranking on Aspects of Doing Business[54]



[53] World Bank Group, "Doing Business 2016 – Economy Profile Colombia."

[54] Same as above.

Figure 17
Colombia's Distance-to-Frontier Scores on Aspects of Doing Business[55]



From a Canadian perspective, Export Development Canada (EDC) overall ranks Colombia in the short term as a medium-risk country for Canadian investments, with an overall positive short-term payment experience.[56]

Arguably the main domestic topic being closely followed by the oil & gas industry in Colombia is the results of the current negotiations between the government of Colombia and FARC guerrillas. Both parties have announced that a peace agreement is close to being reached and might be signed as soon as March 2016, putting an end to five decades of internal conflict. While it will take years to fully implement, the agreement would reduce political violence and encourage further foreign direct investment in the country. This would probably lead to the reactivation of exploration and production activities in areas that are currently considered too risky to conduct operations. As a result, this process would certainly create opportunities for Canadian companies in the sector.

On a more generic note, the following are some useful tips for Canadian business executives travelling to Colombia[57]:

- Business travelers from Canada do not need tourist visas to enter the country. Visitors are allowed a total of 180 days every 12 months for tourism purposes without requiring special permission or residence;

[55] World Bank Group, "Doing Business 2016 – Economy Profile Colombia."

[56] Export Development Canada (EDC), "Country Risk Quarterly Report Americas Winter 2016," in http://www.edc.ca/EN/Knowledge-Centre/Economic-Analysis-and-Research/Documents/country-risk-quarterly-americas.pdf.

[57] Modified from Oxford Business Group, "The Report – Colombia 2014," in www.oxfordbusinessgroup.com

- Local business executives and senior government officials tend to have a high level of proficiency in English, while average Colombians do not speak it fluently;

- Credit cards are widely accepted, but generally not in taxis. It is a good idea to obtain some pesos at any of the exchange offices located by the luggage carrousel area upon arrival;

- Businesses operate from 7 or 8 a.m. to 5 or 6 p.m., with a break around 12 to 2 p.m.;

- Most businesses are closed during Easter and Christmas, as well as during the other 19 national holidays (which places Colombia second to Argentina for the most holidays per year). Main national holidays are May 1 (Labour Day), July 20 (Independence Day), and August 7 (Battle of Boyacá);

- As for safety, Colombia is far from the violent country it was 20 years ago. Nevertheless, travellers should be aware that there are incidents of theft and robbery in the form of snatching personal belongings, pickpocketing and, to a much lesser extent, armed robbery;

- Breakfast usually includes fruit, juice, coffee, eggs, *arepas*, and bread. Midday meals are served between 12 p.m. and 2 p.m. Most people typically dine between 7 p.m. and 9 p.m.;

- Adequate private and government health clinics can be found in major cities. Pharmacies are well stocked with international brands of medicines. Immunizations may be required in advance if visiting certain regions such as the Amazon and parts of the Pacific and Caribbean coasts.

8.3 Main Oil & Gas Business Events in Colombia in 2016

Table 19
Main Oil & Gas Events in Colombia in 2016[58]

Event	Date	Venue	City
Oil Gas Council Latin America	Jan. 27 & 28	Hilton Hotel	Bogotá
Offshore Opportunities Colombia	April 6 & 7	TBA	Bogotá
Colombia Oil & Gas Conference & Exhibition	May 24 to 26	Convention Centre	Cartagena
Expo Oil & Gas Colombia	Nov. 30 to Dec. 2	Corferias	Bogotá

8.4 Main Investment Attraction Institutions in Colombia in 2016

Table 20
Colombia Investment Attraction Institutions[59]

	Procolombia	Invest in Bogotá
Scope	National level	Local Bogotá level
Website	www.procolombia.co	www.investinbogota.org

[58] Extracted from the corresponding event's website.

[59] Extracted from the corresponding institution's website.

APPENDICES

Appendix A – OIL & GAS PRODUCING OPERATORS IN COLOMBIA, BY PRODUCTION[60]

Company	# of Production Assets	Production Aug. 2015 (bpd)
Ecopetrol	158	379,329
Meta Petroleum Corp	6	223,462
Equion Energia Ltd.	10	52,944
Mansarovar Energy Colombia Ltd.	8	40,109
Petrominerales Colombia Ltd.	29	29,192
Perenco O&G Colombia Ltd.	41	28,950
GeoPark Colombia S.A.S.	13	26,419
Cepsa Colombia S.A.	19	23,623
Pacific Stratus Energy Colombia Corp.	42	21,979
Hocol S.A.	6	21,908
Gran Tierra Energy Colombia Ltd.	8	21,610
Occidental de Colombia LLC	16	17,479
Parex Resources Corp	13	12,924
Vetra E&P Colombia S.A.S.	9	10,761
Petróleos del Norte S.A.	9	7,216
Verano Energy Ltd.	6	6,375
New Granada Energy Corp (Sinopec)	9	5,085
CNE Oil & Gas S.A.S.	5	4,971

[60] Agencia Nacional de Hidrocarburos (ANH), “Listado de Áreas,” December 22, 2015, in http://www.anh.gov.co/Asignacion-de-areas/Paginas/Mapa-de-tierras.aspx

Amerisur Exploración Colombia Ltd.	2	4,354
Hupecol Operating Co.	1	4,237
Emerald Energy PLC (Sinochem)	11	2,656
Petrosantander Colombia Inc.	6	2,351
Tecpetrol Colombia S.A.S.	2	1,926
Canacol Energy Colombia S.A.	4	1,777
Interoil Colombia E&P	5	1,692
Union Temporal Moriche (Pacific Stratus Energy)	2	1,386
Maurel & Prom Colombia B.V.	1	1,252
Sogomi Energy S.A.	3	1,204
Petróleos Sudamericanos S.A.	2	1,117
Union Temporal Omega Energy	2	1,026
Colombia Energy Development Co.	4	778
Exxon Mobil Exploration Colombia Ltd.	1	553
Santa Maria Petroleum Inc.	1	338
Panatlantic Colombia Ltd.	1	206
Petropuli S.A.S.	1	110
Turkish Petroleum International Company	1	92
Compañía Operadora PTS Petrocolombia S.A.-COPP S.A.	1	58
Cinco Ranch Petroleum Colombia Inc.	1	36
Consorcio Campos de Producción	2	23

Geoproduction Oil and Gas LLC	1	2
Lewis Energy Colombia Inc.	2	0
Tabasco Oil Company	1	0
Union Temporal Li&B	1	0
Well Logging	1	0
Drummond Ltd.	1	0
Green Power Corporation S.A.	1	0
Oiru Corp.	1	0
Petrolatina Energy Plc	1	0

Appendix B – SURVEY QUESTION BANK (IN SPANISH)

Cuestionario

Mercado de campos maduros* en Colombia

1. ¿Su empresa opera campos maduros, esto es, campos que ya han superado su pico de producción o campos en los que se aplican métodos de recuperación mejorada?
2. ¿Cuántos/Cuáles?
3. ¿Cuáles han sido los principales proyectos de inversión en los campos maduros de su empresa?
4. ¿Cuánto se gastó en ellos?
5. ¿Su empresa tiene planes de invertir en métodos de recuperación avanzada en el próximo año?
6. ¿Cuánto?
7. ¿Y a más largo plazo?
8. ¿Qué tecnologías de recuperación avanzada interesan más a su empresa?
9. ¿Cuál es el procedimiento de su empresa para una eventual contratación de proveedores extranjeros?
10. ¿Su empresa contrata siempre directamente o a través de grandes contratistas o empresas de EPC?
11. Históricamente, ¿qué empresas han sido sus principales contratistas?
12. ¿Su empresa tiene interés en participar en seminarios técnicos donde empresas proveedoras extranjeras presenten tecnologías aplicadas a campos maduros?
13. ¿Su empresa tiene interés en participar en rondas de negocios con empresas proveedoras extranjeras que posean tecnologías aplicadas a campos maduros?
14. ¿Su empresa prefiere que los proveedores extranjeros posean filial en Colombia o eso no tiene importancia a la hora de la contratación de productos o servicios?
15. Considerando la localización de la oficina central de su empresa y la localización de sus operaciones en Colombia, ¿en qué lugar del país sería más conveniente que un proveedor extranjero tuviese una oficina? ¿Y un almacén para stock de productos?
16. En su relación comercial con proveedores extranjeros, ¿se sienten confortables en usar la lengua inglesa o prefieren usar la española?
17. ¿Su empresa echa en falta algún evento técnico, con periodicidad regular, que aborde exclusivamente el tema de los campos maduros o el tema ya se cubre adecuadamente en los eventos petroleros que existen actualmente en el país?

* Por campo maduro se entiende, en el ámbito de este estudio, aquel campo de petróleo o gas que ha superado su pico de producción o en el que ya se están aplicando métodos de recuperación avanzada.

Appendix C – LIST OF INTERVIEWEES

1. ACHILLES
   Ms. Liliana Rojas, Account Executive
   www.achilles.com

2. ACIPET
   Mr. Juan Carlos Rodríguez Esparza, Executive Director
   Ms. Ana Milena Montañez, Technical Management Director
   www.acipet.com

3. AMEC FOSTER WHEELER
   Mr. John Mauricio Osorio, Engineering Manager
   www.amecfw.com

4. ANH
   Ms. Fanny Esperanza Célis Torres, Assessor of the President
   Mr. Jorge Alirio Ortiz Tovar, Operations & Reserves Manager
   Ms. Edilsa Aguilar, Production Monitoring Manager
   www.anh.gov.co

5. CANACOL
   Mr. Noel Valencia, Production Manager
   www.canacolenergy.com

6. CEPCOLSA
   Mr. Carlos Iván Vera, Production Manager
   www.cepsa.com

7. CORFERIAS
   Ms. Lilián Conde, Project Manager
   www.corferias.com

8. ECOPETROL
   Mr. César Patiño, EOR Reservoir Department
   www.ecopetrol.com.co

9. GRAN TIERRA
   Mr. Enrique Villalobos, Operations Senior Manager
   www.grantierra.com

10. HOCOL
    Mr. Oswaldo Plazas, Operations Manager
    Mr. Jorge Falla, Operations
    Mr. William Charry, Operations
    www.hocol.com

11. INVEST IN BOGOTÁ
    Ms. Lilia Manolova, Investment Officer
    Mr. Gabriel Concha, Junior Investment Officer
    www.investinbogota.org

12. OCCIDENTAL
    Mr. Luis Fernando Ararat, Chief Production Engineer
    www.oxy.com

13. PAREX
    Mr. Ron MacDonald, Vice President Drilling
    www.parexresources.com

14. PETRONORTE
    Mr. Ánderson Delgado, Operations Engineer
    www.petronorte.com

15. TRAYECTORIA OIL & GAS
    Ms. Dora Muñoz, Country Manager

To obtain contact details of the interviewees above, please write to Benigno Rojas-Moreno, Senior Director Latin America, at: benigno.rojas-moreno@gov.ab.ca

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Appendix E – ABOUT AUSTRAL CONSULTING

Austral Consulting is a Canadian company specializing in delivering consultancy services to the energy sector across the Americas. With headquarters in Vancouver, BC, Canada, Austral Consulting is a subsidiary of the Brazilian-based company Austral Consultoria Ltda.

Austral's experienced consultants deliver agile and integral business development solutions to companies and institutions in the following sectors across the Americas:

- Oil & gas
- Renewables
- Mining

Typical Austral clients are:

- Latin American companies and institutions interested in going international or in domestic technical and market aspects;
- North American companies and institutions interested in accessing the Latin American markets.

Austral's main services include:

- Market studies
- Matchmaking
- Trade missions

Please visit www.australconsultoria.com or www.australconsulting.ca for a complete list of Austral's services.