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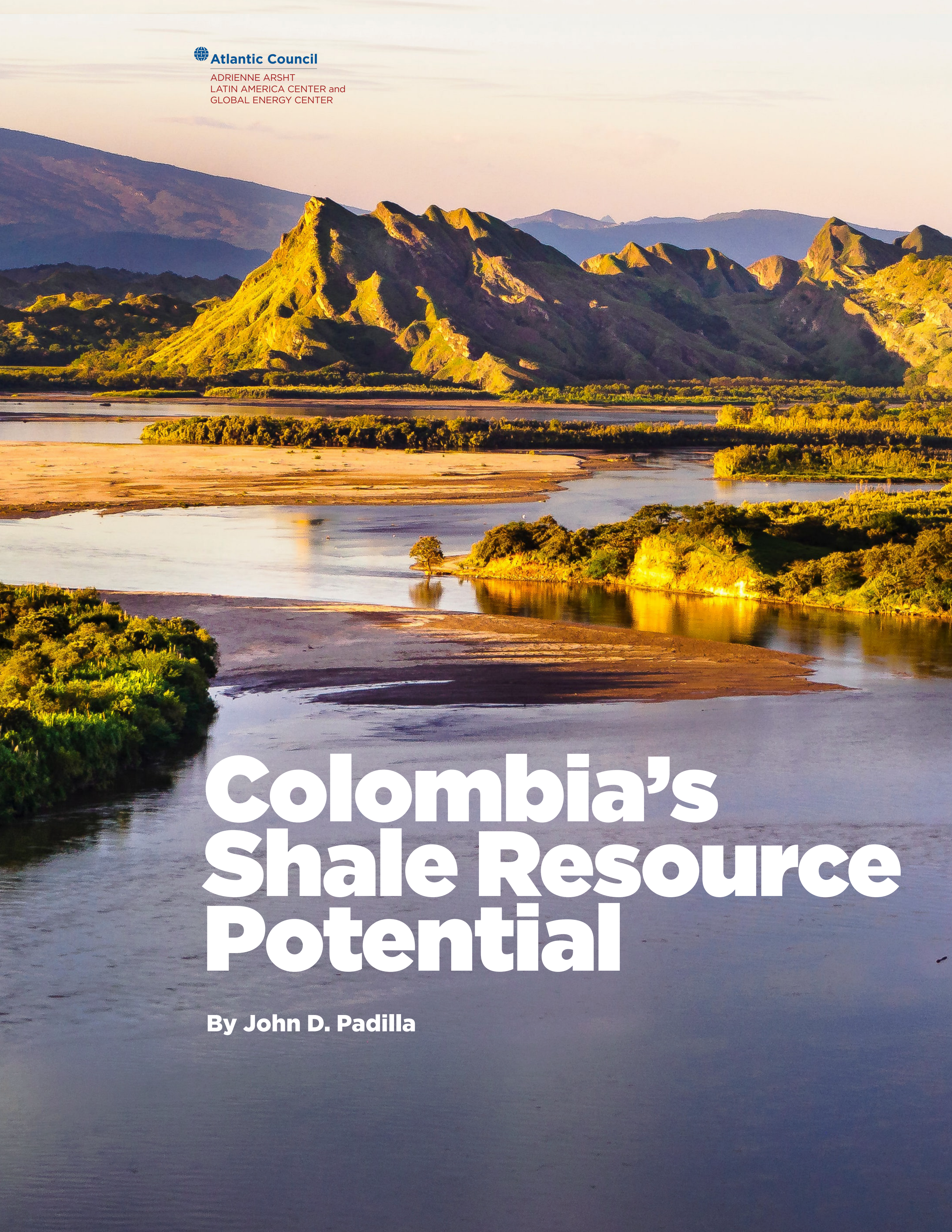
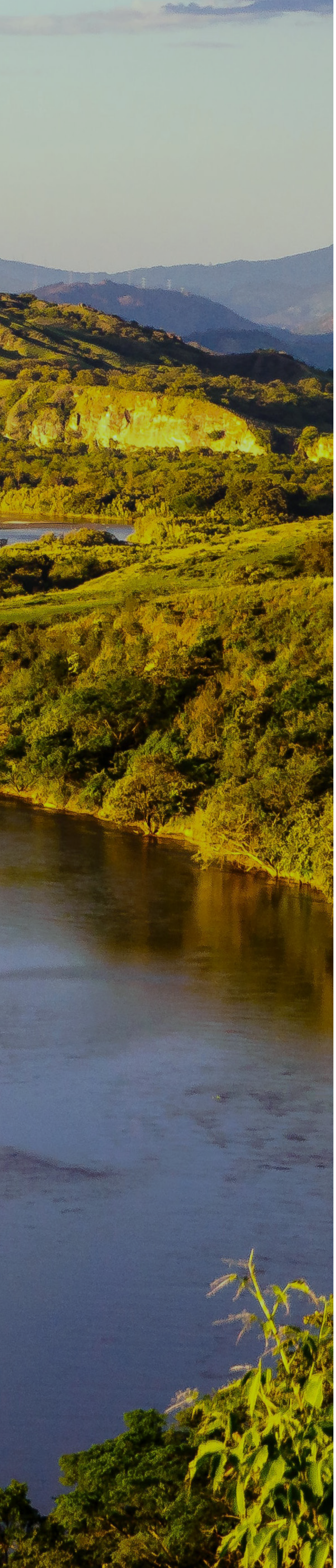


Colombia's Shale Resource Potential

By John D. Padilla



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Atlantic Council
1030 15th Street NW, 12th Floor
Washington, DC 20005

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Executive Summary

Oil and gas production has long been a significant driver of Colombia's economic growth, while gas in particular is playing a growing role in meeting domestic energy demand. However, conventional hydrocarbon production has slowed by nearly 25 percent in recent years, leaving the government to consider whether to develop abundant unconventional shale resources by undertaking investigative pilot projects (PPIIs) that can create revenues from the sector and, at the same time, stimulate economic growth as the country works to recover from COVID-19.

Indeed, Colombia's unconventional shale resources could possibly offer more value than the conventional production it has developed thus far. Colombia's conventional reserves are at just under 2.6 billion barrels of oil equivalent. Prospective unconventional reserves based in the Middle Magdalena Valley, by comparison, are 2.7 to 4.6 times larger based on estimates from Ecopetrol, the state-owned oil company.[1]

Amid such significant resource potential, Colombia's shale development has reached a turning point. Since beginning to award blocks in 2012, an eight-year-long legal process—now led by Colombia's State Council (CdE) and the administration of President Ivan Duque to establish a legal framework—is poised to conclude and lay the groundwork for pilot projects to begin. A suite of companies, led by Ecopetrol, appear prepared to undertake the PPIIs. Crucially, the close examination of the economic merits and legal consideration of unconventional drilling throughout this eight-year period has left the Duque administration well prepared to take the next step in pursuing shale development.

While this is an important moment, the development of Colombia's shale resources faces political and social opposition, based in part on the public's concerns about the environmental impact of hydraulic fracturing. Many national-level politicians, journalists, and non-governmental organizations (NGOs) oppose fracking, and their concerns will need to be addressed in order for sustainable shale development to succeed. This is not the time for the government and pilot project developers to hide behind the CdE's decision and the legal framework currently in place, but to work even harder at securing public support, engaging broadly and in a very public way.

In order to develop shale resources successfully, Colombia must implement performance-based regulations and transparency measures around the awarding of PPIIs. Companies that bid on pilot projects require assurance that the legal and regulatory frameworks are solid and not subject to political change. For its part, the industry must garner broader public support, through engagement at the national and local levels. This report recommends that the Colombian government take the following steps.

- **Undertake the PPIIs while prioritizing transparency and accountability; once their environmental, economic, and social viability has been assessed, Colombia must provide opportunity for public debate:** Although Colombia's shale resources are promising, it is unclear if commercial development will succeed without first testing the geology.

- **The government must work harder to make its case to the public for successful and sustainable shale development:** Although the Colombian government has invested great effort to prepare the PPII framework and regulations—and President Duque has changed his pre-election commitment not to promote unconventionals—the government has not yet pursued an effective public engagement strategy on this set of issues.

- **Ecopetrol and the government must work more closely together in messaging, advocacy, and public education:** Close collaboration and transparency between Ecopetrol and the Colombian

1 "Situación Mercado de Gas en Colombia," Ecopetrol, 2019, https://asoenergia.com/sites/default/files/2020-05/17.10.2019-El-futuro-de-la-oferta-de-gas-en-Colombia-campos-on-shore-y-offshore-convencionales-fracking-e-importacio%CC%81n-Pedro-Manrique.pdf.

government are imperative in order to convince the public that shale resources will benefit the economy, that they will be sustainably developed, and that local communities will be engaged appropriately.

- **Colombia should explore greater community engagement, using other successful examples as models:** The Permian Strategic Partnership provides a blueprint for community engagement between industry, state-level government, and local communities.

- **The Colombian government must prioritize broader consensus:** The government should seek opportunities for engagement and open conversation with all stakeholders involved in shale exploration.

- **Colombia should take the lead on environmental matters consistent with preserving the country's rich biodiversity:** Technologies associated with shale resource development, such as vapor recovery systems for gas flaring and venting, should be used in manners that are as environmentally sustainable as possible, and that take land and water policy considerations into account.

- **Prioritize infrastructure development:** Infrastructure development should be made a priority if shale resource development proceeds.

- **Implement constructive regulation:** Regulations should be constructive and performance based, which will help mitigate environmental impacts of shale exploration.

- **Put an economic framework in place that provides direct links to the energy transition:** An economic framework should clearly state the expectations for how commercial shale resource development will tangibly help Colombia pursue a smart and realistic energy transition.

Introduction

Colombia has initiated a contractual bidding process, eight years in the making, to have private sector oil and gas companies undertake pilot projects and assess whether the country's abundant shale resources (broadly referred to as "unconventionals") can be viably developed in an environmentally safe and sustainable fashion, for the benefit of the country and communities that will be directly impacted.[2] Should pilot projects be awarded and deemed successful on a range of fronts, commercial development would be the next step. The stakes for Colombia are high given the politically charged topic, the economic situation in which the government finds itself, and the social and environmental dynamics being confronted.

Although Colombia is not a major global hydrocarbons producer, it remains heavily dependent on its revenues and exports.[3] Gas is becoming an increasingly important component in its energy mix. In light of the economic contraction caused by the COVID-19 pandemic and current fiscal constraints, the relevance of this sector to help stimulate economic activity has only grown. With the country's conventional oil production down by more than 25 percent in recent years, its oil and gas reserves having systematically declined over the past decade, and persisting uncertainties on the cost-effectiveness of its offshore discoveries, two questions linger: how can the government best guarantee revenues from the sector, and—at the same time—diversify its economy?

Given the potential of shale resource development and the abundant hydrocarbons it might contain, it could embody one of Colombia's best options to help sustain production, reserves, government revenues, and overall economic activity. What has become increasingly evident to many sector participants is that Colombia may represent more of an unconventional hydrocarbons resource opportunity set than a conventional one.[4] In fact, the current government, which was hesitant at first, now views unconventionals as a key means of ensuring the country's energy transition goals can be achieved from both economic activity and fiscal perspectives. With Colombia's current oil production below 750,000 barrels per day (bpd), coupled with the impact of a global economic contraction, the push to determine whether shale resource development is viable and right for Colombia has taken on increased importance.

But, even if unconventional shale pilot projects move forward and are successful, there is no guarantee that commercial development will follow. Therefore, the government and the companies interested in the pilot projects should not only test the geology and assess the economic, environmental, and social risks, and the sustainability of further development, but also ensure that all relevant stakeholders and local communities are able to better understand the process firsthand in a transparent, educated, and aseptic manner. This should help ensure that potential risks can be properly mitigated, valid concerns addressed, and regulation made sufficiently robust and enforceable. Only in that context can Colombia's shale resources be adequately evaluated and determined as to whether they are appropriate for the country.

This paper seeks to lay out the various key global and local issues that will impact and determine whether sustainable shale resource development can be undertaken in Colombia. Key factors that will be analyzed, and that will be vital for successful development, include the legal and regulatory framework put in place, along with a range of political, economic, social, environmental, community-related, and other relevant considerations. Securing a robust, yet flexible, legal and regulatory framework for both pilot projects and commercial exploration and production that provides legal certainty—plus much stronger political will and leadership than has been seen to date—will be the factors to watch. Other countries would be well advised to track unconventionals developments in Colombia closely.

2 The term "unconventionals" refers to those oil and gas resources that require specialized techniques to extract. In the case of shale resources, this requires horizontal, hydraulic, multi-stage fracking that creates cracks in the formation, given the low permeability and porosity encountered. Vertical hydraulic fracking has been routinely used for decades. It is commonly referred to as "well stimulation," as it enables the resource to flow better. The major difference between vertical hydraulic fracking and horizontal, hydraulic, multi-stage fracking is that the latter requires higher volumes of liquids to be injected, and higher pressures to be used. "Energy Education," University of Calgary, ; and "How Hydraulic Fracking Is Used and the Reasons for It," STI Group, .

3 "El Emprendimiento es de Todos," Ministry of Finance, Colombia, 2020, 121, https://www.minhacienda.gov.co/webcenter/ShowProperty?nodeId=%2FConexionContent%2FWCC_CLUSTER-135563%2F%2FidcPrimaryFile&revision=latestreleased.

4 Edward Tovar, "Expectativas del Fracking en Colombia," National Association of Manufacturers (ANDI.)," October 1, 2019, http://www.andi.com.co/Uploads/Expectativas%20del%20Fracking%20en%20Colombia.%20Octubre%201%202019.pdf.

Global Considerations

Unconventionals around the world have, thus far, struggled to replicate the level of sustained success seen in the United States. Most of the global challenges for unconventionals can be traced to economics, geology and topography, environmental concerns and education, and the dynamics of legal and regulatory frameworks.[5] Over time, the industry has accumulated more experience and has been aided by an increasing number of major international players; all of this has fostered the establishment of more standard operating procedures and protocols, which have benefited all actors involved. The shale industry has transformed from its characterization as a cottage industry of small wildcatters and independents at its start to an integral component of large international oil and gas companies' portfolios.[6]

Although market oversupply, reduced oil demand, production shut-ins triggered by lower prices, and market consolidation are realities, society will remain highly dependent on hydrocarbons for the foreseeable future.[7] Society currently lacks technically and economically viable alternatives for a wealth of products, including plastics, rubber, fertilizer, pesticides, paint, coatings, detergents, and roads. In this context, shale oil and gas will likely remain relevant, provided oil and gas prices continue to behave as a commodity with inherent price swings. Although the model that spurred leveraged independent oil and gas producers to thrive has, by and large, run its course, the profound level of economic activity that shale development has spurred cannot be overlooked. As such, even greater innovation and efficiencies resulting in prudent cost-cutting capabilities and safer practices are certain to continue to evolve, ensuring shale remains a relevant component of the global hydrocarbons landscape.

The importance of robust, yet judicious, regulation for unconventionals cannot be emphasized enough. In the United States, the involvement of individual state regulation and broad community participation has been a major factor behind the country's production nearly doubling prior to the COVID-19 pandemic, transforming the United States from a foreign-oil-dependent country to the largest oil producer in the world as of 2018.[8] Although replicating the US regulatory dynamic is not possible in most countries, given individual ownership of mineral rights, it is important to consider how some of the elements achieved in US federal and state regulatory frameworks can be alternatively addressed to help secure long-lasting, successful outcomes.

The energy transition is well under way, albeit with regional differences in scope and pace at this stage. Overall, society's demand for cleaner and safer energy supply only continues to grow. Cleaner city skies during the COVID-19 pandemic have only underscored this for many urban dwellers around the world.

5 Grant Mark Nülle, "Prospects for Shale Development Outside the USA: Evaluating Nations' Regulatory and Fiscal Regimes for Unconventional Hydrocarbons," *Journal of World Energy Law & Business* 8, 3, June 2015, 232–268, https://doi.org/10.1093/jwelb/jwv014.

6 Investment by major oil companies into short-cycle production such as shale has already been occurring in the US shale patch, and it is likely to continue as smaller production companies struggle in the wake of COVID-19, making for ripe acquisition targets. Last year, Occidental Petroleum purchased Anadarko's shale assets for $55 billion. Earlier this year, Chevron acquired Noble Energy for $13 billion, and more recently ConocoPhillips acquired Concho Resources and Pioneer Resource acquired Parsley Energy for $9.7 and $4.5 billion, respectively. "Occidental Completes Acquisition of Anadarko," *BusinessWire*, August 9, 2019, https://www.businesswire.com/news/home/20190808005586/en/Occidental-Completes-Acquisition-of-Anadarko; Paul Takahashi, "Chevron Completes $13B Acquisition of Noble Energy," *Houston Chronicle*, October 5, 2020, https://www.houstonchronicle.com/business/energy/article/Chevron-13-billion-acquisition-Noble-Houston-Texas-15621496.php; Rebecca Elliott, "ConocoPhillips to Buy Shale Rival Concho for $9.7 Billion," *Wall Street Journal*, October 19, 2020, https://www.wsj.com/articles/conocophillips-to-buy-concho-resources-in-9-7-billion-stock-deal-11603107949; Rebecca Elliott, "Pioneer Natural Resources to Buy Parsley Energy for $4.5 Billion," *Wall Street Journal,* October 20, 2020, https://www.wsj.com/articles/pioneer-natural-resources-to-buy-parsley-energy-for-4-5-billion-11603224139.

7 "Glossary of Oil and Gas Terms," Colorado Oil & Gas Conservation Commission, .

8 Ellen Scholl, *The Future of Shale: The US Story and Its Implications*, *Atlantic Council*, January 8, 2019, https://www.atlanticcouncil.org/in-depth-research-reports/report/the-future-of-shale/.

Colombia's Opportunity In Context

Colombia's proven crude oil reserves (1P reserves) to production ratio (R/P)—which measures how many years of production are left based on existing proven reserves—currently stands at 6.3 years. But, this overestimates the current reality given the fall in oil prices in 2020, and the resulting number of wells that have been shut in. A general guideline is to have an R/P ratio above ten. This is a dangerous situation for a country that continues to be heavily dependent on hydrocarbons. As a percentage of gross domestic product (GDP), the oil and gas sector represented 4 percent in 2019, down from 5 percent between 2011 and 2014.[9] Oil revenues represented 32 percent of total exports in August 2020, down from 40 percent in 2019, and a high of 50 percent in 2014.[10] As a result, today oil contributes to only 12 percent of Colombia's budget, compared to 22 percent in 2012.[11]

To improve Colombia's R/P ratio, hydrocarbons production, and overall economic activity, the government created the National Hydrocarbons Agency (ANH) in 2003, which sought to augment Ecopetrol's technical capabilities. The ANH bid rounds allowed oil production to nearly double—topping one million barrels per day (1 mmbd) in 2013 and 2015—before declining, first from lower prices stemming from the 2014 oil price shock, and most recently due to the COVID-19 pandemic. Despite substantially increased activity over the past dozen years, no major discovery like Caño Limón in the 1980s (located northeast of Bogotá, in the department of Arauca, bordering Venezuela), or Cusiana/Cupiagua in the 1990s (located south of Caño Limón in the department of Casanare in the Llanos foothills) has been made to further cement Colombia's oil and gas sector on the global map. Coupled with no ANH bid rounds between 2015 and 2019, production between 2016 and September 2020 has averaged just over 856,000 bpd. The country has relied on secondary and tertiary recovery techniques to sustain, year after year, its limited proven reserves. Significant efforts such as Eastern Llanos (believed to be a continuation of the prolific Orinoco Belt in Venezuela) and Colombia's Caribbean offshore have yet to provide a meaningful bump in reserves.

The case for shale resource development in Colombia is borne out by the size of the resource potential it represents. Colombia's 1P reserves (conventional) are at just under 2.6 billion barrels of oil equivalent (bboe; this figure combines oil and gas together). Colombia's prospective unconventional reserves, by comparison, are 2.7 times to 4.6 times larger than current 1P reserves, based on Ecopetrol's estimate of shale resource potential equal to between seven and twelve bboe.[12] That is a tremendous amount of potential resources that conventional resources have not been able to add. For Ecopetrol, this potential resource is vital, given that it produces 65 percent of all domestic crude oil and 86 percent of all gas.[13] With the government owning 88.5 percent of all shares of the company (the rest are publicly traded), Ecopetrol represents the lion's share of the oil and gas revenues received by the government and its overall exports.[14]

Colombia's shale resources are principally contained in La Luna formation, with the greatest potential located in the Middle Magdalena Valley basin, home to the country's first oil production in 1918 at La Cira-Infantas. The thickness of La Luna formation, its geological

9 "Oil Rents (% of GDP)—Colombia," World Bank, https://data.worldbank.org/indicator/NY.GDP.PETR.RT.ZS?locations=CO.

10 "El Impacto de la Crisis Petrolera en los Ingresos del Gobierno Nacional Central," Contraloria General de la Republica, *Boletin Macro Fiscal*, June 20, 2016, https://www.contraloria.gov.co/documents/20194/520989/Bolet%C3%ADn+Macro+Fiscal+16.pdf/0310f5b9-e027-40b3-8502-fa46973fd4b5.

11 "Informe de Coyuntura Petrolera," Fedesarrollo, 2015, https://www.repository.fedesarrollo.org.co/bitstream/handle/11445/2918/ICP_Julio_2015.pdf?sequen.

12 "Ecopetrol (2019). Situación Mercado de Gas en Colombia."

13 "Estadísticas del Sector," Agencia Nacional de Hidrocarburos (ANH), http://www.anh.gov.co/estadisticas-del-sector/regal%C3%ADas-y-producci%C3%B3n/estadisticas-e-informes.

14 Ibid.

An area is uncovered by the lowering of the water level in the Magdalena river, the longest and most important river in Colombia, on January 14, 2016. REUTERS/John Vizcaino

maturity, and its high percentage of light oil make it particularly attractive.[15]

Given the long history of production in the region, the Middle Magdalena Valley is not a stranger to activity by the oil and gas sector. In fact, it has created better-paying and skilled jobs and opportunities than have other alternatives including agriculture, mining, and cattle ranching.[16] But, at times, production areas have witnessed major protests and blockades to production (most recently, from 2014–2016), particularly when insufficient royalties were being directed to locally impacted areas.[17] Recently passed royalty reform is widely expected to improve local community support, as detailed in the State of Play section below, but this underscores how critical close engagement with local populations will be as Colombia explores the prospects for shale development.

With oil production in Colombia having first been undertaken in the Middle Magdalena Valley basin, it is important to recognize that it is also the birthplace to the USO (Unión Sindical Obrera de la Industria de Petróleo), Colombia's dominant oil and gas union. The Middle Magdalena Valley remains its base of power. This is relevant given the importance and influence of the USO not only in the region, but throughout the country. It also has been at the center of historical union conflict that has long existed. The USO's cache is significant, and its buy-in is essential for sustainable shale resource development. Given the jobs and economic activity unconventionals would create, the USO is certainly supportive, but will want to guarantee jobs and have a say in many operational aspects of the activities carried out. It is a key stakeholder that cannot be overlooked.

15 Ricardo Veiga and Francisco Dzelalija, "A Regional Overview of the La Luna Formation and the Villeta Group as Shale Gas/Shale Oil in the Catatumbo, Magdalena Valley and Eastern Cordillera Regions, Colombia," Search and Discovery Article #10656, January 20, 2014, http://www.searchanddiscovery.com/documents/2014/10565veiga/ndx_veiga.pdf.

16 "Petroleo y Construcción Dominan el Tema Laboral," *Vanguardia*, December 24, 2019, https://www.vanguardia.com/santander/barrancabermeja/petroleo-y-construccion-dominan-el-tema-laboral-MK1804619. The article is based on information released by the Magdalena Medio Regional Studies Center, the Ministry of Labor, and the Observatory of the Labor Market.

17 "Lifting of Colombia Blockade Frees Up Oil Flow," *Argus Media*, September 29, 2014, https://www.argusmedia.com/en/news/931901-lifting-of-colombia-blockade-frees-up-oil-flow; Alexander Rustler, "Fracking Could Threaten Peace in Colombia," *State of the Planet*, October 11, 2019, https://blogs.ei.columbia.edu/2019/10/11/opinion-fracking-peace-colombia/.

State Of Play

The ANH-led bid round "Colombia Round 2012"—undertaken in the same year, and which included the awarding of blocks with unconventional resource potential—marked the country's first foray into explicitly bidding out blocks with potential shale resources. It included thirteen exploration and production (E&P) blocks and eighteen special technical-evaluation agreements (TEAs). But, a legal framework specifically focused on shale resources did not exist at the time, which set off a legal process that continues to this day.

Litigation

With a dedicated legal framework for shale resource development still in flux, Colombia's State Council (CdE)—one of Colombia's four high courts and the highest court for disputes on administrative matters such as government decrees and regulations—has become the focus of attention as it assesses two key lawsuits that have been filed, and remain pending, against the development of shale resources. In November 2018, the CdE placed a legal stay on commercial unconventionals development in response to a September 2018 lawsuit filed by the *Grupo de Litigio e Interés Público* (Litigating Group and Public Interest or GLIP), a group of lawyers affiliated with Universidad del Norte in Barranquilla. In the lawsuit, GLIP argued that fracking could potentially damage the environment and the overall health of local communities and that, until there was certainty that no such risks exist, fracking could not be conducted. The moratorium on commercial development of shale resources will remain in place until a final decision is made; it specifically places on hold the original general and technical guidelines governing the "exploration and production in unconventionals reservoirs" issued by the Juan Manuel Santos government in December 2013 and March 2014, respectively. The CdE clarified its ruling in September 2019, stating that pilot projects can move forward for "investigative purposes only."[18]

The latest round of hearings on the "moratorium" of Decree 3004/2013 and Resolution 90341/2014 (which contain the technical regulations for commercial fracking activities in the country) was slated to commence on April 22, 2020, but was postponed until September 17, 2020. The initial focus of the latest hearings has been on the two different outcomes reached by two separate expert reports—one commissioned by the government, and the other by the CdE. The CdE-commissioned study was undertaken by a set of experts in various disciplines at the National University, and resulted in two separate reports with two different conclusions (the one against fracking was signed by six members, while the one in favor was signed by three members). The six-member report commissioned by the Duque government unanimously concluded that fracking activities can be conducted in the country safely, provided that associated risks are mitigated.

With the CdE ruling that investigative pilot projects or PPIIs could move forward in September 2019, the Iván Duque administration worked hard to ready the legal and contractual framework that will govern the PPIIs. The government moved quickly and published the PPII guidelines via a decree (Decree 328/2020) at the end of February 2020. Technical regulations and social-criteria guidelines followed on July 7, 2020, via Resolution 40185, and on August 20, 2020 via Resolution 0904/2020, respectively. The environmental terms of reference (TORs) and a draft of the contractual framework that will govern the PPII contract followed. A local health-baseline methodology, to be issued by the Ministry of Health, is pending due to pressing COVID-19-related issues.[19] These regulations

18 "Communicado de Prensa," Consejo de Estado de Colombia, press release, September 17, 2019, http://www.consejodeestado.gov.co/news/comunicado-de-prensa/?savedcart=.

19 The health baseline seeks to assess the existing overall health conditions in the relevant areas where PPIIs will be conducted, in order to check if such conditions have been affected as a result of the PPIIs.

will be specific to the PPIIs. However, to move into commercial exploration and production, and beyond the pilot projects, the CdE will have to lift the de facto commercial moratorium that remains in place. If the CdE were to leave the moratorium in place following the conclusion of the PPIIs or contingent upon specific requirements and specifications being achieved, the government could attempt to enact new regulations. However, this would certainly be an uphill political, legal, and social battle, given the precedent already set by any negative ruling.

Beyond the moratorium, a legal cautionary measure and a lawsuit were also filed against the PPIIs' guideline decree (Decree 328/2020). The legal cautionary measure was filed in March 2020 by three opposition legislators. The lawsuit was filed on July 2, 2020, by a group of twenty legislators, eighteen of whom are from the political opposition to President Duque and his political party, the Centro Democrático, and the Alianza Colombia Libre de Fracking (ACLF), a civil society organization that is part of an anti-fracking alliance throughout the region.[20] The lawsuit claims, among other things, that the PPIIs will produce significant environmental damage that the regulations cannot prevent. It also claims that the government has intentionally moved forward with PPII regulations during the pandemic, affecting the ability of communities and opposition leaders to participate. The CdE agreed to hear the ACLF case and started reviewing it on July 27, 2020.

On September 4, 2020, the CdE denied the legal cautionary measure against the decree, ruling that the decree does not affect the legal cautionary principle and is in line with the recommendations of the fracking expert commission. The court clarified that the PPII process will continue until a final ruling on the ACLF lawsuit is resolved. There is broad expectation that the precedent set in the legal cautionary-measure ruling will lend legal support for Decree 328 to be upheld, allowing the PPIIs to move forward. Although expected shortly, no precise timing on the outcome of the ACLF lawsuit is known at this time.

However, the PPIIs will continue to be influenced by the two legal matters currently being assessed by the CdE. Given the CdE wording in its September 4, 2020, ruling, bidders appear willing to move forward and submit bids even without a final ruling on the lawsuit filed by the ACLF regarding the PPIIs' guidelines themselves (Decree 328/2020). As the CdE had already ruled in 2019 in favor of letting PPIIs proceed, and has now denied the legal cautionary measure against the decree, the scope of the lawsuit is likely limited to whether the draft regulations and guidelines are adequate, as well as the allegation that the government has used the pandemic to prevent communities from participating in the process. Given that the entire PPII process has been undertaken in close coordination with local communities, according to the government and ANH leadership, the ACLF's latter argument would seem moot.

However, the ACLF has not been content simply with filing the lawsuit through the judicial branch of government. Given its support from opposition legislators, it is also trying to ban fracking through Congress and make the undertaking of such activities a punishable crime. On August 10, 2020, the ACLF along with thirty-six legislators introduced a bill to ban fracking. This is in addition to the lawsuit filed, and speaks to the level of urgency being felt due to plans to launch the bids for the PPIIs. At this stage, there remains limited reason to believe that the current congressional efforts will be more successful than past ones. This is especially the case because unconventionals have been part of the past three National Development Plans (2010, 2014, and 2018). Nonetheless, it is important to point out that the entire matter is highly political and charged, as detailed in the Political and Legal Considerations section below, which makes any congressional vote less certain.

A complete and detailed chronology of key events pertaining to shale resource development in Colombia can be found in Appendix I.

PPII Contract Status

As for the status of the contract that will govern the PPIIs—Contrato Especial de Proyecto de Investigación (CEPI)—the ANH released a draft of the model contract on September 18, 2020 (originally slated for the end of August). The final TORs and CEPI were published on October 13, 2020. On October 26, the ANH announced that Ecopetrol, ExxonMobil, and Drummond had pre-qualified for the PPII process, and all three qualified officially on October 29. The PPIIs will be awarded on November 25.

20 "¿Quiénes Somos?" Alianza de Colombia Libre de Fracking, accessed October 21, 2020, https://colombialibredefracking.wordpress.com/acerca-de/.

Potential Pilot Projects and Decree 328/2020

The following list summarizes where the PPIIs would be undertaken, the principal award criteria that will be used, and a few other items worth noting that are mandated by Decree 328/2020.

- **PPIIs can only be undertaken in the Middle Magdalena Valley and Cesar Ranchería basins.**
- **A maximum of four PPIIs will be awarded, and each will be allowed to drill two wells.**
- **No more than one PPII will be awarded to a qualifying party, unless there are less than four qualifying proposals. In such a case, a qualifying party can be awarded two PPIIs. And, if there are more than four qualifying bids, winning bidders will be determined based on the highest social investment and local content offered above the base levels included in the ANH's CEPI contract.**
- **Bids can be placed on blocks on which a company does not have a contract. If two bids are received on a given block, and if one of the qualifying parties has E&P rights on that block, it will be awarded the PPII.**
- **Operators must define their local baselines for the pilot area(s) proposed.**
- **The following institutions must be involved in developing general guidelines:**
  - **Environment:** Institute of Hydrology, Meteorology, and Environmental Studies and the Alexander Von Humboldt Institute.
  - **Health:** Local health officials based on a Ministry of Health-defined methodology.
  - **Seismicity:** Colombian Geological Service.
  - **Social:** Collaboration of the MME, Ministry of Interior, and the ANH.
- **Relevant government entities will define monitoring variables over the life of the PPIIs.**
- **Decree 328/2020 establishes the guidelines governing the committees, subcommittees and commissions that will be involved throughout the PPII process.**

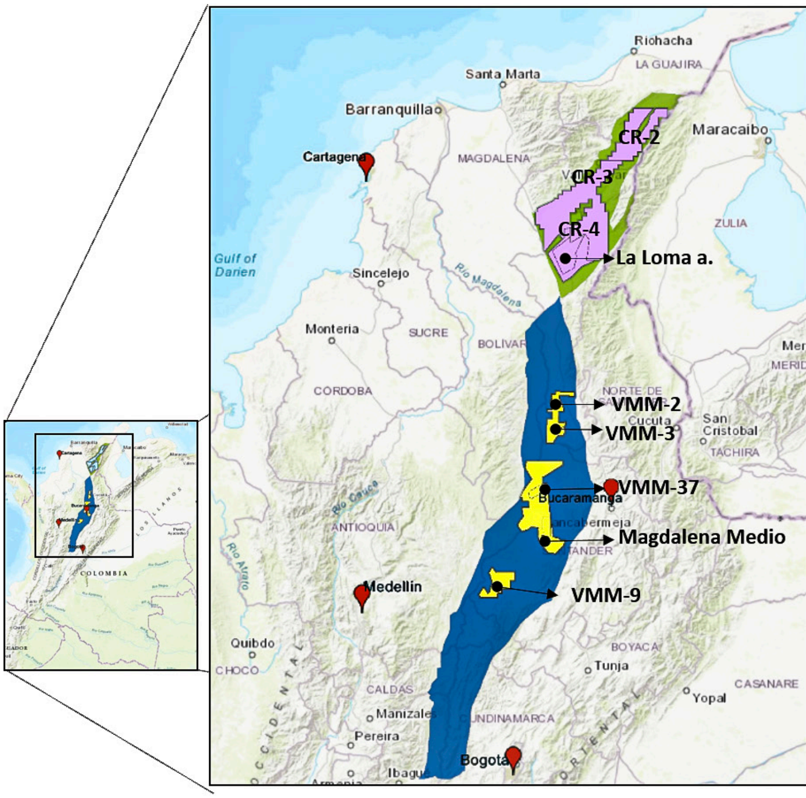
Competition

There are five groups that hold ten E&P contracts with shale resource potential in the two basins designated for the PPIIs. As seen in the map, Drummond holds four contract areas in the Cesar Rancheria basin. In the Middle Magdalena Valley basin, there are six other contract areas held by Ecopetrol, an ExxonMobil-led consortium, a ConocoPhillips-led consortium, and Parex. Beyond Magdalena Medio, Ecopetrol also holds the VMM-5 contract, but is unlikely to be a potential PPII site for the company. As such, it was not included in the map below.

Given that these contract holders retain various drilling and other contractual obligations that they must fulfill, but have only marginally been able to complete through conventional E&P activities, PPII activities undertaken will count against work obligations they have in their existing block contracts. This incentivizes many of these parties to carefully consider participating. It is worth pointing out that both Drummond via La Loma and Canacol's Carrao Energy subsidiary via the VMM-2 contract designated certain sections of their blocks exclusively for shale resource development, operating the rest of the block using conventional methods.

Overall, Ecopetrol is the clear frontrunner for the PPIIs. It is strongly motivated to make unconventionals work in Colombia, given the resource potential and its need for production and reserves, both as a publicly traded company and as a major source of government revenues. Its decision to invest $1.5 billion for a 49 percent

Potential PPIIs Sites in the Middle Magdalena Valley and Cesar Ranchería Basins



- Cesar Ranchería basin
- Middle Magdalena Valley basin

Contracts and Companies

Company	Contracts
Drummond Ltd.	CR-2, CR-3, CR-4, La Loma a.
ConocoPhillips / Canacol Energy Ltd.	VMM-2, VMM-3
Ecopetrol	Magdalena Medio
Parex Resources Inc	VMM-9
ExxonMobil / Sintana Energy	VMM-37

Source: IPD Latin America based on the ANH

stake alongside of Oxy in the US Permian in November 2019 via Rodeo Midland Basin LLC is evidence of its commitment to secure expertise that it can bring to Colombia.[21]

On July 2, 2020, Ecopetrol and ExxonMobil announced a preliminary joint venture on the PPIIs.[22] As seen in the map above, their blocks are adjacent to each other. The arrangement is subject to the approval of pending legislation and regulation. Ecopetrol has said that it will be the operator of these pilot projects, although it is understood that ExxonMobil will be the technical lead, with Ecopetrol handling social and environmental matters. This joint venture will be a key potential PPII to watch, given ExxonMobil's experience in unconventionals through its subsidiary XTO.

Political and Legal Considerations

Political Dynamics

Although the "Colombia Round 2012" was initiated under the first term of former President Juan Manuel Santos, his second term was heavily focused on the peace process, leaving unconventionals and a host of other previous priorities to take a back seat. With the dramatic drop in oil prices and fewer royalties collected starting at the end of 2014, the oil industry and unconventionals were considered by many to be the reason why there was less money. It is within that context that the unconventionals situation became even more politically complicated when President Duque vowed that he would not support fracking during his presidential

21 "Ecopetrol and Occidental Complete Investment Agreement in the US Permian Basin," *PRS Newswire*, November 13, 2019, https://www.prnewswire.com/news-releases/ecopetrol-and-occidental-complete-investment-agreement-in-the-us-permian-basin-300957549.html.

22 "2020 Second Quarter Results. August 2020," Ecopetrol, 3, https://www.ecopetrol.com.co/wps/wcm/connect/41e44fb5-ed1a-4bc9-b410-4d01219c28d6/Q2+Earnings+Release+-+ENG+-+VF.pdf?MOD=AJPERES&id=1596535705431.

Colombia's Mines and Energy Minister Maria Fernanda Suarez speaks during an interview with Reuters in Bogota, Colombia March 7, 2019. SOURCE: REUTERS/Luisa Gonzalez

campaign in early 2018.[23] But, given budgetary and economic realities along with unrelenting advocacy from his former Minister of Mines and Energy Maria Fernanda Suarez (also former vice president of strategy and finance at Ecopetrol), Duque changed his position over his first twelve months in office. Following the CdE's green light in September 2019, the government began working to put a legal and contractual framework in place to govern the PPIIs.[24] Former Minister Suarez routinely supported shale resource development during her nearly two years in the post before resigning on June 25, 2020. She was replaced by Vice Minister Diego Mesa, who continues to advocate for shale resource development, albeit less intensively and more in line with the president's lower-key public approach to date.

Although President Duque saw a surge in his popularity during the first few months of the COVID-19 pandemic due to his initial responsiveness (his popularity increased from 20 percent at the end of 2019 to 41 percent in June 2020), the economic implosion resulting from the COVID-19 pandemic and an array of other recent political developments is already starting to negatively impact his popularity.[25] With Colombia facing serious constraints on what was already an aggressive budget, and having chosen to add significant debt in recent months to deal with COVID-19, tensions with Congress will only escalate further. With former President Álvaro Uribe having stepped down as a senator following his house arrest in August 2020, President Duque lost his biggest advocate and a level of clout in Congress. Duque was able to marginally increase his congressional support by broadening the government coalition with other political parties (Cambio Radical and Unidad Nacional), but this support seems tenuous at best. As such, the president will have less political sway he can utilize to leverage

23 "'En Colombia No se Hará Fracking: la Promesa de Iván Duque Durante su Campaña Presidencial," W Radio, February 15, 2019, https://www.wradio.com.co/noticias/actualidad/en-colombia-no-se-hara-fracking-la-promesa-de-ivan-duque-en-campana-presidencial/20190215/nota/3864510.aspx.

24 "Decree 328 of February 28, 2020," Gestor Normativo de la Función Pública, https://www.funcionpublica.gov.co/eva/gestornormativo/norma.php?i=107874.

25 "Invamer Colombia Poll No. 37," Invamer, June 2020, https://www.valoraanalitik.com/wp-content/uploads/2020/06/Resultados-Poll-137.pdf.

broader support for the PPIIs and commercial fracking efforts.

Social discontent—first visibly manifested under this administration through marches that occurred between November 2019 and January 2020—was on the rise prior to the COVID-19 pandemic. The marches included students, pro-peace-agreement advocates, unions, environmentalists, and indigenous communities. Increased unemployment and growing public desperation, a deteriorating security situation in rural areas, and increasing social unrest and political polarization are demanding government attention and may divert attention away from other pressing issues, which include the development of unconventionals.

Lastly, presidential elections will take place in May 2022, and political infighting and posturing are well under way in Colombia. Given Duque's newfound support for shale resource development, the topic has become a major focal point of political fights, as evidenced by the ACLF lawsuit and congressional efforts to ban fracking. The administration's support of the guidelines and regulatory framework for the PPIIs has been substantial, and has included close coordination and collaboration from sixteen different government entities. The aggressive schedule has been lost on no one, from those who want to see the PPIIs realized in 2021 with the possibility of commercial contracts put in place before Duque's term ends in 2022, to those who fear that outcome.

Many congresspeople, the oil and gas sector, industry experts, and others who support fracking note that anti-fracking policymakers are focused on penalizing Colombia's legal industries, instead of trying to eradicate the vast and highly permeating number of illegal activities that continue to do significant harm to both communities and the environment.

Lost in the overall debate on shale resource development is how the government is going to generate revenues and economic activity on one side, and how it must responsibly address environmental and community issues on the other. Instead, the topic remains largely a debate across society based on rather narrowly held beliefs. This impasse is not helping either side.

As Colombia has continued to debate the merits of fracking over the last eight years, it has allowed for valuable institutional and knowledge building that will benefit the country should shale resource development proceed. But, if the president and the government are fully committed to advancing shale resource development, this would be the moment to show determined political will. No one within the government (except for former Minister Suarez and, to a lesser extent, current Minister Mesa) has unequivocally championed the pro-PPII camp and been willing to take the political heat. Ecopetrol, which has a strong interest in shale development given its limited reserves, has not engaged in strong and continuous advocacy, and seems to have a different view on timing than that of the government. The current government's tepid approach only makes its position on the topic more vulnerable, despite the work already completed. A court-backed legal framework alone will not be enough for long-term sustainable shale resource development, for the reasons detailed throughout this paper.

Legal Certainty and Continuity

Legal certainty is of growing relevance in Colombia following a few recent judicial decisions. Of particular concern has been the February 2016 overruling of grandfathering that was given to mining concessions to operate in select areas, especially high alpine meadows or plateaus above the forest line in the Andes and rich in biodiversity. Another example of this was the cancelation of an environmental license near the environmentally rich La Macarena region in April 2016. After questionable claims were made that hydrocarbons activities being conducted by Hupecol would cause irreversible damage to the area, then-President Juan Manuel Santos decided to suspend the license that had been granted a few weeks before.[26] Hupecol spent around $1 million and several years to fulfill the requirements to secure the environmental license, according to the company. Despite specific situations and circumstances, the overruling of binding legal measures put at risk rule-of-law issues for the country. It will be vital that, should the outcomes of the two unconventionals lawsuits favor development, strong legal certainty is included that protects the parties involved.

Legal certainty and continuity issues have once again surfaced with the royalties unconventionals producers were to pay dating back to the contractual framework put in place in 2012. This is discussed in detail in the Royalties section below.

26 Adriaan Alsema, "Colombia Suspends Fracking License Near Unique Ecosystem After Wave of Indignation," *Colombia Reports*, April 15, 2016, https://colombiareports.com/following-public-indignation-santos-suspends-fracking-license-near-unique-ecosystem/.

Economic Considerations

Colombia's economy remains heavily dependent on hydrocarbons, making it particularly vulnerable to price and production swings. Between January and May 2020, oil and oil-related products represented 30 percent of the country's total exports, compared to 40 percent in 2019, which shows how the drop in oil prices starting in March is impacting the economy and government revenues. In the first half of 2020, foreign direct investment (FDI) in the oil and mining sectors represented more than 55 percent of total FDI, according to Colombia's Central Bank. If Colombia were to stop exporting the roughly five hundred thousand barrels per day it currently does, it would amount to an approximately $11.2-billion loss in export revenues, based on 2019 prices. Royalties collected from oil and gas activities in 2019 generated another $1.8 billion.

The COVID-19 crisis is having a particularly profound economic impact on Colombia. The government's 2020 budget was already strained by many economic concessions it made following year-end marches, and the United Nations Economic Commission for Latin America and the Caribbean (ECLAC) now expects economic contraction of 5.6 percent for 2020.[27] With COVID-19 cases continuing to rise, the economic damage to the economy and government revenues has been devastating. According to the Colombian Statistics Department, unemployment reached 20.1 percent in July 2020, doubling pre-pandemic numbers, although it recovered to 16.8 percent in August 2020.[28]

Although economic diversification in Colombia has been occurring in recent years in areas such as tourism and services, the COVID-19 pandemic is magnifying the need for accelerated diversification efforts. Like many countries in Latin America, Colombia remains far too dependent on commodity exports. Opening its markets to greater competition, including stimulating entrepreneurial and small-business activity, and continuing to build out its basic infrastructure over its challenging terrain will lead to the increased domestic consumption the country demands. These needs have become magnified by the current economic crisis. But, diversifying away from commodity exports will take time and, in the meantime, the country will be even more dependent on such exports. As the pandemic's economic effects become more acute, all policymakers will have to figure out what solutions—beyond more debt borrowing and another push for tax reform—must be pursued for Colombia's medium- and long-term economic needs. Currently, those conversations are markedly absent.

In the short to medium term, shale resource development represents one of the country's best opportunities to stimulate broader infrastructure buildout and general economic activity, not just in the area of direct activity, but throughout the region. As unconventionals are more of a manufacturing process than traditional oil and gas production activities, they will require massively improved road and transport infrastructure, vast supply networks to be developed, and local development of a wealth of other items to support such activity.

Colombia's decision to eliminate its fiscal deficit-ceiling limit and borrow significantly to meet the challenges of the COVID-19 pandemic was not warmly received by the investment community. On July 13, 2020, Standard & Poor's (S&P) warned of a potential country credit-rating downgrade to junk level (below BB-) within the next eighteen months.[29] Banco de Bogotá, a major local bank, projected that the downgrade could happen within the next six to twelve months. Beyond new tax reforms that will have limited effect and carry high political cost, selling public assets may ultimately be required for short-term needs. The government owns some one hundred and five companies, but will be reluctant to part with them given the political patronage they provide. Significant congressional interest, and a range of vested interests that directly and indirectly benefit from such political benefaction, will also fiercely oppose such efforts. But, much may depend on how long economic contraction in the country continues, and how severe it becomes.

Royalties

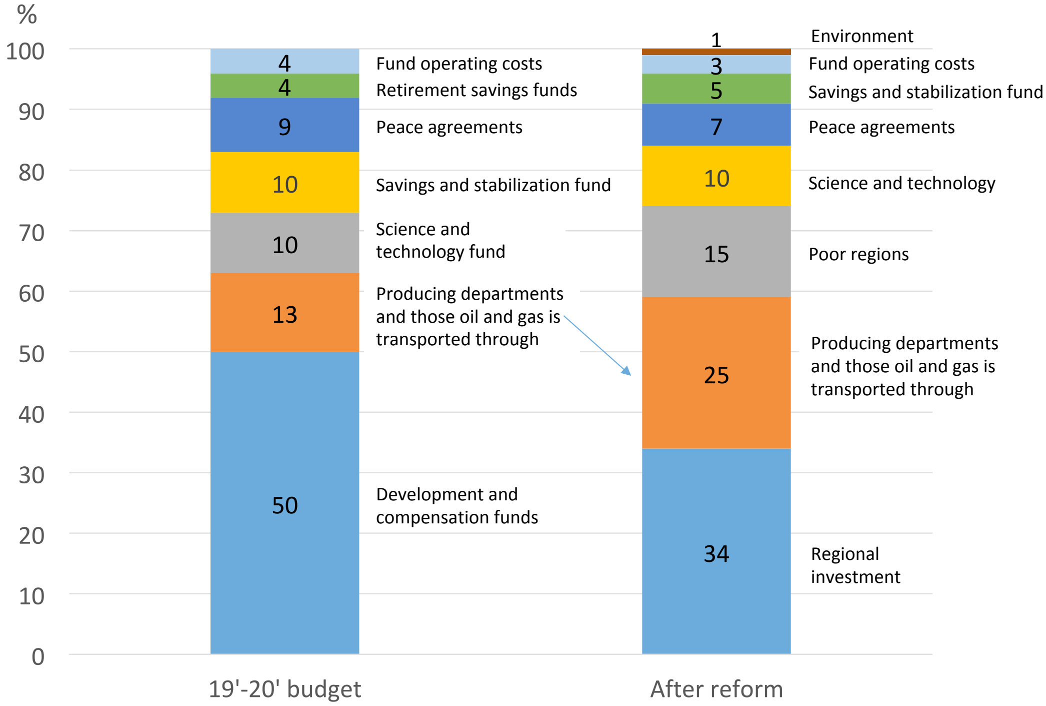
Oil and gas royalty distribution has long been contentious in what is a highly centralized country. Royalties are a particularly important topic for shale resource development, and hydrocarbons production in general, given that they represent the primary mechanism to be able to tangibly

27 "Addressing the Growing Impact of COVID-19 with a View to Reactivation with Equality: New Projections," Economic Commission for Latin America and the Caribbean, July 15, 2020, https://repositorio.cepal.org/bitstream/handle/11362/45784/4/S2000470_en.pdf.

28 "Mercado Laboral," National Statistics Department (DANE), 2020, https://www.dane.gov.co/index.php/estadisticas-por-tema/mercado-laboral/empleo-y-desempleo.

29 "S&P Advierte Baja Potencial en Calificación de Colombia en los Próximos 18 Meses," Valora Analitika, July 13, 2020, https://www.valoraanalitik.com/2020/07/13/s-p-advierte-baja-potencial-en-calificaci-n-de-colombia-en-pr-ximos-18-meses/.

Royalty System Reform (Executed in December 2019)



Source: Adapted from IPD Latin America based on National Association of Financing Institutions (ANIF) and Ministry of Finance

show their benefit to both the country and the communities they impact (in the absence of private mineral-rights ownership as exists in the United States, subsurface rights in Colombia are owned by the country—as is the case in most parts of the world). Historically, a share of royalty monies in Colombia has been misappropriated or subject to graft that has not benefited the broader population.[30] A 2012 major reform sought, among other things, to fight this dynamic. But, despite its goals, it was established when the price of oil was above $100 per barrel and the country had doubled its production, so royalties were abundant—enough to distribute between production regions and the rest of the country. Yet, following the 2014 oil-price shock, communities with oil and gas production saw a sharp reduction in incoming funds, which generated a perception that their living conditions were not improving as they originally expected. It resulted in even more social discontent as communities and local authorities saw a reduction in monies and extremely cumbersome processes to use them. Unconventionals came on the scene at this time, and to a large extent became the poster child of the view that government and big business were colluding, with local communities getting short changed.[31]

A new royalty reform, which required a constitutional amendment passed in December 2019, was designed to change these dynamics and ensure that meaningful monies are received by producing regions. It is also aimed to streamline processes to make a more efficient use of funds. Local communities have been actively engaged in the process to try to strengthen the linkage to where production occurs and the value they receive. But, a long history of graft and misallocation of funds has resulted in a high level of skepticism that will only be diminished when tangible results are visible; i.e., one can point to tangible money and projects.[32] Following the passage of required new royalty reform regulations by both Colombia's Senate and House, the new royalty regime took effect on September 9, 2020. Nonetheless, more work is still needed to strengthen institutional oversight and improve rule-of-law issues at the regional level, so monies do not go missing.

As part of efforts to prevent unconventionals development from moving forward, the political opposition in Congress seized upon the final implementation of the constitutional royalty reform that was passed in December 2019, but which still required passage of its regulation, which was initiated in August 2020. As a

30 Speech from Edgardo Maya, then Colombia's general comptroller, during a 2018 conference on the Royalty System. Edgardo Maya, "The Royalty System Failed Due to Corruption and Inefficiency," May 3, 2018, https://www.elpais.com.co/colombia/sistema-general-de-regalias-fracaso-por-corrupcion-e-ineficiencia-contraloria.html.

31 Ibid.

32 Ibid.

result of heavy lobbying and the current state of political affairs in Colombia, Congress chose to eliminate a 40 percent royalty reduction that was originally put in place in the 2012 royalty law 1530/2012 (Article 14) to incentivize unconventionals production. There is little doubt that the elimination of the reduced royalty that unconventionals production would pay if allowed to commercially produce is a blow to potential operators, but it is too early to understand how big of an economic impact it will have until the geology is fully tested. Beyond how economically impactful this change may be on the commercial viability of unconventionals, the bigger issue is that the decision taken by Congress undermines contract sanctity and legal certainty, this time reversing a key economic provision that companies factored into their economic analysis when bidding for the blocks they were awarded in the "Colombia Round 2012."

A comparison of the old and new royalty schemes can be seen above. As can be seen in the graph, producing regions and those with supporting infrastructure will start to receive 25 percent of all royalties, nearly twice as much as they previously did. Regional investment (a newly focused category) will receive 34 percent of all royalties to help promote regional economic activity, while 15 percent of all royalties will go directly to poor regions. This more focused allocation of funds is expected to have a more tangible impact, which is sorely needed.

Environmental Considerations

The discussion regarding shale resource development in Colombia has been highly controversial from the start. Water, more than any other issue, remains a crucial topic. It has long been a sensitive area of focus due to historically poor mining oversight, continued and expansive illegal mining, and poor water infrastructure found across the country.[33] The political sensitivities surrounding water policy have influenced public opinion toward fracking, which requires substantial amounts of water. The notion that a decision on fracking comes down to choosing between oil or water has permeated the conversations of many individuals who oppose fracking. It will be vital if the PPIIs move forward to demonstrate that both surface water and aquifers that are situated at much shallower depths than shale resources can be left undisturbed. Significant education and broad public discussion and debate are needed.

Colombia receives the most rainfall of any country, which is more than 4.5 times the average rainfall in the United States.[34] The issue in Colombia is not precipitation, but a lack of adequate collection and overall infrastructure. On the freshwater front, minimizing its usage is entirely possible today. Ecopetrol and private sector companies should continue to examine the possibility of using produced water from operations for hydraulic fracturing. Additionally, water can be recycled, and brine can work perfectly well for fracking needs. The PPIIs will allow operators to explore whether there are deep underground saline water sources that can be used, as has been done in Canada and elsewhere. There is no reason to depend on freshwater resources, given the inadequate infrastructure that exists in the country despite the abundance of rainfall received.

Given the significant amount of illegal mining and lack of adequate mining oversight Colombia has witnessed, a sizeable portion of society has grown highly skeptical of extractive activities over the years. This is even more relevant as the Middle Magdalena Valley is a complex environmental area. The Magdalena River, which runs through the basin, is the most important waterway in Colombia. The region possesses a significant number of preserved wetlands and tropical forests. According to the Wildlife Conservation Society, the region is home to more than one hundred and fifty species of mammals, six hundred and thirty species of fowl, fifty species of amphibians, one hundred and twenty species of fish, and more than four thousand species of plants.[35] Many of these species are exclusive to the region, and several face the threat of extinction. Additionally, human activities linked to armed conflict, illegal activities, and locals' subsistence activities (including unauthorized agriculture, deforestation, and cattle ranching), have had a notable impact on these local ecosystems.

Increased legal activities, such as oil and gas development, could help curb illegal activity that is having a highly damaging environmental impact. Creating taxable business activities that generate further infrastructure buildout will benefit a much larger base of the local population and reduce the volatile, risky, and frequently violent illegal activities that typically only

33 Jose Isaza, "La Amenaza del "Fracking" para los Acuíferos del País," Heinrich Böll Stiftung, January 29, 2020, https://co.boell.org/es/2020/01/29/la-amenaza-del-fracking-para-los-acuiferos-del-pais.

34 "Average Precipitation in Depth (mm per Year)—Country Ranking," Index Mundi, https://www.indexmundi.com/facts/indicators/AG.LND.PRCP.MM/rankings.

35 "Paisajes Magdalena," Wildlife Conservation Society–Colombia, 2020, https://colombia.wcs.org/es-es/Paisajes/Andes/Magdalena.aspx.

benefit a minority of the population. And, although potential PPII blocks intersect certain populated areas, most possible drilling areas are far from them.

An example of effective management of shale resources and environmental concerns in Latin America is in Vaca Muerta, in the northern Patagonia region of Argentina; it is the one successful case to date of shale resource development in Latin America.[36] The Vaca Muerta is largely arid, but it hosts rich biodiversity and ecosystems. Whether a possible development area is water rich or arid, environmental protection is imperative to preserve the ecosystems that impact populations and overall biodiversity. Although the Colombian government has looked at and analyzed the Eagle Ford, Permian, Marcellus, and Vaca Muerta, it would be valuable as part of the national discourse to take an even closer look at Argentina to better understand what environmental measures have worked, and which ones could be adapted or improved to fit the Colombian context.

Locally Impacted Communities

Numerous vested interests have played a role in deterring certain levels of local support for shale resource development in the Middle Magdalena region. As previously noted, illegal activities in the area are widespread. Derived from ineffectual government presence, illegal groups—both from the radical left and right (including paramilitary groups, left-wing guerrillas, and drug-trafficking organizations)—have had a long-standing presence in the region. The oil sector has been a major target mainly through attacks against infrastructure, and sometimes through kidnappings and extortions. Today, the area serves as a strategic route for drug trafficking, which provides ample incentives to oppose any kind of increased legal activities.

At the same time, and despite being home to an active hydrocarbons industry for more than a century, the Middle Magdalena region continues to suffer from issues such as high unemployment and poverty rates, lack of infrastructure, and insufficient social services.[37] Many locals may not see the intersection of national and departmental priorities as benefiting them. Yet, data from the National Planning Department support the argument that communities in production regions are better off in the Multidimensional Poverty Index than those that are not.

Royalties have frequently resulted in graft and misuse of funds at a local level, instead of benefiting local communities. The perception that oil revenues have not resulted in better living conditions has resulted in protests over the years. It is what triggered the latest royalty reform discussed in the Royalties section above. The ANH and the government claim that they have worked closely with local communities as part of the PPII process, and the new royalty scheme should have a positive effect, provided royalty distributions are well administered and overseen. Local communities should end up better incentivized to play a much more constructive role, as they will have much more of a vested stake. Nonetheless, community support must continue to be cultivated with education and transparency by both the government and market participants in a solid and coordinated fashion.

The potential development of unconventionals poses a major opportunity to overcome many of the historical dynamics noted above, building desperately needed infrastructure, spurring more constructive relationships between communities and the industry, and catalyzing broader and sustainable legal economic activity. It is paramount that local and national authorities significantly strengthen the rule of law, transparency, and institutional oversight, so potential new revenues directly benefit communities and do more than just serve as handouts. The PPII regulatory framework, as well as the royalty reform, would be well served to ensure community involvement inclusion to improve and address participatory planning and budgeting concerns. Efforts made thus far are a positive start, but will require continued involvement and vigilance.

Public Opposition and the Media

The pro-fracking discourse in Colombia is mostly concentrated between government officials and sector experts. The most significant advocates of shale resource development have focused on the Ministry of Mines and Energy, the Colombian Association of Oil and Gas Companies (ACP), and a handful of journalists, academics, and congresspeople, including former President and Senator Alvaro Uribe (although he is now more focused on the legal case against him). Concerted efforts to involve the public at large, and explain the importance and the benefits of unconventionals could provide, have been markedly absent.

36 Silvia Naishtat, "Vaca Muerta: la Nueva Pampa Húmeda Generará US$30.000 Millones," *El Clarin*, August 26, 2018, https://www.clarin.com/economia/economia/vaca-muerta-nueva-pampa-humeda-generara-us-30-000-millones_0_HknYRap8m.html.

37 "En 15 Municipios del Magdalena Medio el Indice de Pobreza Supera el 70%," *Vanguardia*, April 1, 2016, https://www.vanguardia.com/santander/barrancabermeja/en-15-municipios-del-magdalena-medio-el-indice-de-pobreza-supera-el-70-LDVL352933.

Opposition to fracking is well organized and visible. In addition to Alianza Colombia Libre de Fracking, which is one of the largest and perhaps most vocal NGOs in Colombia against fracking, there are regional environmental organizations that are staunchly opposed to shale exploration. One example is the Asociación Interamericana de Defensa Medioambiental (AIDA), which applauded the 2019 suspension of the licensing process for fracking, calling the decision a "positive example for nations across Latin America and the world."[38] There are examples of Colombian regional press elevating the voices of Colombian environmental advocates, specifically on questions related to the impact of fracking on the environment and local communities.[39]

The concerns of national and regional environmental organizations will need to be addressed if sustainable shale development has any chance of succeeding. Their expressed public concerns are mostly concentrated on environmental matters, the potential impact on human health, and future water supply. These items should be the starting point for broader dialogue and factually based conversations.

These dynamics make clear that the pro-fracking camp lacks sufficient advocacy and a true champion from the government side. It can be argued that the government priority has been the legal framework, but it will not be nearly enough, even if the PPIIs move forward. A lack of real effort by the government to make the economic case for shale development and demonstrate to the public that concerns about sustainability and community engagement will be prioritized and managed transparently has only exacerbated a lack of trust between pro- and anti-fracking camps.

People participate in a demonstration in Bogota, called by Colombian indigenous people to demand the government to protect their territories, on October 19, 2020. REUTERS/Luisa Gonzalez

38 Carlos Lonzano Acosta and Juana Hofman, "Colombia Makes the Right Move by Suspending Fracking Project," Interamerican Association for Environmental Defense, July 15, 2019, https://aida-americas.org/en/press/colombia-makes-right-move-suspending-fracking-project.

39 Nilson Romo Mendoza,"El Fracking Está Cada Vez Más Distante en Colombia: Santiago," *El Heraldo,* February 27, 2020, https://www.elheraldo.co/economia/el-fracking-esta-cada-vez-mas-distante-en-colombia-santiago-704684; Lorena Rubiano, "No al fracking," *Nuevo Siglo,* September 27, 2018, https://www.elnuevosiglo.com.co/articulos/09-2018-no-al-fracking; Tatiana Pardo Ibarra, "Ambientalistas se Oponen a Luz Verde al 'Fracking' el País," *Tiempo*, August 28, 2017, https://www.eltiempo.com/vida/medio-ambiente/ambientalistas-se-oponen-al-fracking-en-colombia-123888.

Conditions for Successful Shale Development

The Colombian government is finalizing the legal framework that will apply to the PPIIs, and it will need to do the same for commercial development of its shale resources should it be approved by the CdE. This remains the first condition for successful shale development. The outcome of the two pending lawsuits being heard by the CdE will determine the overall trajectory of shale resource development in Colombia.

As such, if the PPIIs move forward and are deemed successful, and the moratorium on unconventionals exploration and production is lifted, work must be done to modernize and improve the 2013–2014 legal framework. Such work needs to go beyond the historic commodity-related focus on royalty distributions, safety, and strong contractual considerations. These traditional considerations will not be enough. The Colombian government must look closer at trying to replicate or address some of the objectives that, after trial and error, allowed the United States to achieve a successful model. The commission of experts, pilot projects, and royalty reform are a good start, but they are not enough on their own. The new legal framework must not only be robust, enforceable, and balanced, but also flexible and adaptable.

In this regard, regulation should be more performance based than prescriptive, particularly in a new and rapidly evolving area like this one. The limitations of prescriptive regulation must be considered as this entire process moves forward in Colombia. This is particularly pertinent with respect to environmental regulations, which have frequently delayed resource development. Striking a proper balance that addresses valid concerns and operational realities is vital.

As a second condition, provided that the PPIIs are permitted to proceed, more transparency and engagement—at the local and national levels with industry—will be imperative. As highlighted above, increased focus on eradicating graft and corruption is necessary, and this process must start with enforcement.

This leads to a third condition that will be critical: broader public support. This will not be achieved before the PPIIs are awarded. However, gaining public support requires immediate and urgent attention and planning. In many respects, the work of securing broad public support will only start after the PPIIs are awarded. Given that most public opposition remains at a national level, it will need to be a key area of focus. All this will require close cooperation by the government and pilot project developers. And, beyond increased engagement, more education, contentious public debates, and tremendous transparency will be needed to demonstrate that the investigative project developments are doing precisely what they have been tasked with doing: dispelling misconceptions and issues that may emerge over time.

Securing more public support will be perhaps the most important element governing the long-term sustainability of shale resource development in Colombia. Sustainable community and social buy-in will take time. It needs to remain the priority of all actors involved, and not merely another pro forma action. Infrastructure buildout can support these objectives, but will need to be done in a way that has tangible and visible benefits to all relevant stakeholders. The unprecedented Permian Strategic Partnership (PSP), made up of twenty member companies, should be closely studied if shale resource development moves forward. Operationalized in 2019, the PSP is focused on making the Permian Basin a world-class place to live and raise a family. It is focused on many of the topics that will be pertinent to development in the Middle Magdalena and Cesar Rancheria basins: infrastructure, education, healthcare, workforce development, and housing. The multiplying and leveraging effects that the PSP is affording local communities are worth considering. The PSP provides the type of template that will be necessary on some level to create sustainable development in other potential shale resource development jurisdictions such as Colombia. Just like the Permian, the Middle Magdalena Valley has a long history of hydrocarbons activity. As such, there exist many of the building blocks from which to work.

Overall, the concept of such an effort represents an opportunity for the oil industry in Colombia to establish a distinctly different, and better, long-term relationship with communities.

As a fourth condition, the pilot projects will provide the perfect opportunity to move from theory to first-hand evidence on one of the biggest issues that concerns a wide array of citizens, and one that the CdE is clearly looking at closely: the environmental component. Government and pilot project developers will need to think methodically and creatively as to how they can best engage, and start to gain the trust and support of, the majority. They must start to show how shale resource development can improve the local environment by helping reduce illegal activities that cause a wide array of environmental damage, as well as through royalties deployed and investments made by operators in further protecting the environment. Many of the topics discussed above in this section will also go a long way toward achieving these objectives.

However, more attention is urgently needed to help Colombia construct a vision that goes beyond short-term political interests that dominate the landscape today, and one that is based on the very real challenges the country faces. Colombia's shale resource potential is significant and, should the PPIIs prove successful, policymakers need to seriously weigh the options available and determine the economic development path that will allow its citizens to become much closer to par with those of its new Organistation for Economic Co-operation and Development (OECD) peers. Long-term planning will be crucial. To be clear, any successful shale resource development will do little to benefit the Duque government, given the timeframes discussed. Long-term thinking and vision are markedly absent at present, and are elements that demand increased attention and consideration to try to meet the future needs of the country.

But, all of the above conditions will prove moot without an appealing contractual and legal framework that can attract investors. Lost in much of the discussion and debate to date is that potential PPII bidders will be possibly committing hundreds of millions of dollars to these test projects with little guarantee of future returns. Naturally, they are interested in understanding how success will be defined, and what the path forward looks like should they achieve success.

In short, for companies to bid and invest in the pilot projects, they need legal certainty and security. Regulation must be clear and reasonable, pilot assessments must be objective, and companies must know how to move from the pilot projects to commercial production, and what protections they will have if political dynamics upend what has been put in place.

Policy Recommendations

If the Colombian government wishes to pursue development of shale resources and meet the conditions necessary to ensure that production is both successful and sustainable, the following policy recommendations provide useful guideposts to consider. These recommendations are principally directed at the Colombian government, but are vital for all relevant stakeholders to take into consideration for sustainable shale resource development to be achieved.

- **Undertake the PPIIs, do them in as controlled and safe a way as possible, prioritize transparency and accountability, assess their viability (environmentally, economically, and socially), and allow for broad-based, informed, and open discussion and debate to follow:** Colombia has a potentially significant resource that may not only help provide needed government fiscal support and stability, but also allow for the creation of jobs and broader economic development. However, until the geology is tested, it is unclear if commercial development will be viable, acceptable, and practical.

- **The government must be substantially more vocal in making its case to the public, and exercise political will to convince stakeholders that shale development can be done in a successful and sustainable manner:** Although the government has taken a monumental effort to prepare the PPII framework and regulations, the president and a broader array of government officials have placed limited political capital on the line. Although economic and budgetary realities facing President Duque's government—as well as a better understanding of shale resource development changing his pre-election commitment not to promote unconventionals—he has failed to communicate that conviction to push the PPIIs forward to the broader population. President Duque has the unique opportunity to share his vision for economic growth, and to use the political capital necessary to try to make the issue of shale resource development less divisive.

- **Ecopetrol and the government must work more closely together in messaging, advocacy, and public education:** As the state-owned oil and gas player in Colombia, Ecopetrol has the most to gain from securing a green light to move forward with commercial development of unconventionals, as well as the greatest responsibility. Close collaboration and transparency are imperative in order to convince the public that shale resources will benefit the economy, will be sustainably developed, and that local communities will be engaged appropriately.

- **Colombia should explore how greater community engagement can be achieved beyond just jobs and royalties:** Taking a close look at the Permian Strategic Partnership would be a good place to start. And, with Ecopetrol's joint venture with Oxy in the Permian Basin in the United States, the government has a great opportunity to study this closely and determine how many of the overarching objectives, with respect to healthy industry-community-government relations, can best be achieved.

- **The Colombian government must prioritize broader consensus:** Opportunities for engagement and open conversation, such as town hall-style meetings in the Middle Magdalena Valley, would encourage stakeholders to exchange viewpoints.

- **Colombia should take the lead on environmental matters, consistent with preserving the country's rich biodiversity:** Given the wealth of technologies that that have been developed, such as vapor recovery systems, gas flaring should be restricted to emergency-only purposes, e.g., in order to prevent accidents when unexpected pockets of gas are encountered in wells. Additional concerns about water use, as well as flaring and venting, should be addressed through clear rules and transparent enforcement, and it is also an area where shale development elsewhere can provide valuable lessons. Signals from Bogota that it can—and will—get ahead of these concerns is a necessary step to gain the confidence of local communities and environmental advocates.

- **Prioritize infrastructure development:** Infrastructure development should be made a priority—directly and by using royalties and other policy mechanisms—if shale resource development proceeds.

- **Implement constructive regulation:** Constructive regulation can go a long way toward addressing environment issues such as emissions (flaring, not permitting the use of diesel-powered equipment, etc.), requiring the cleaning and recycling of water, ensuring vigilant wastewater disposal, use and monitoring of chemicals, and providing proper incentives in all these areas and others. Additionally, seismic activity can absolutely be properly monitored with the technology available today.

- **Put an economic framework in place that provides direct links to the energy transition:** An economic framework should clearly state how shale resource development can tangibly help Colombia pursue a smart and realistic energy transition. Directly tying royalties from shale resource development to clear energy transition objectives should be considered. These objectives may include installing more sustainable solar and wind generation, securing electricity to Colombia's non-interconnected zones, helping eliminate electric sector subsidies through increased redundancy and a stable grid, or the implementation of smart grids. However, all of these goals require long-term vision, economic resources, buy-in from the majority, time to implement, and time for benefits to be realized. The value and opportunity that shale resources may provide at the national, regional, and local levels should not be squandered.

In summary, shale resource development is a unique opportunity for Colombia. However, it still faces an uphill battle to achieve long-term sustainable development if proven viable. It will require even more pronounced and proactive approaches and work by the government, industry, and local communities to properly succeed. Failure to do so will only make the development of unconventionals vulnerable to the political winds of change. Given the distinctive set of circumstances that Colombia faces, it must properly assess the pilot projects and determine whether they are a viable option for the country.

About the Author

John D. Padilla

John D. Padilla is a Managing Director at IPD Latin America. John is an energy sector expert with nearly 30 years of expertise on the consulting and financing side of the business. He has a strong entrepreneurial track record, having led IPD's expansion into Mexico in 2001 and Colombia in 2009. Based in Bogota, Colombia, since April 2011, John has substantial international experience that extends throughout the region, Asia, and Europe. He is routinely sought out on the consulting and advisory fronts, as well as in the international press, and on the conference circuit.

Appendix I

A chronology of key events related to shale resource development during the last eight years follows.

September 2012

The Comptroller's Office (Contraloria General), sends the government a *Control de Advertencia* document, highlighting the necessity to apply a precautionary principle on fracking, given that its potential harmful effects were largely unknown. Colombia's ANH had included several blocks with unconventional potential in its 2012 bid round.

December 2013

The Santos administration executes **Decree 3004/2013**, which establishes the general guidelines for "exploration and production in unconventionals reservoirs."

March 2014

The Ministry of Mines and Energy executes **Resolution 90341/2014**, containing the technical guidelines for "exploration and production in unconventionals reservoirs."

April 2014–August 2018

Despite Decree 3004/2013 and Resolution 90341/2014 being in place, much of the rest of the framework lagged, particularly environmental licenses. Heavy debate over popular consultations was front and center, and social mobilization against fracking grew substantially during this period. Politics were firmly in the mix, and President Santos turned his attention during his second term to other priorities.

December 2017

ConocoPhillips seeks an environmental license from ANLA for its E&P block called VMM 3. This block was originally awarded back in 2012. In April 2018, ConocoPhillips seeks the same for its other E&P block, called VMM-2. Both requests are formally set aside in October 2018 by ANLA, citing a vague "lack of sufficient information available to base a decision."

September 2018

An organization of lawyers known as Grupo de Litigio e Interes Publico, affiliated with Universidad del Norte in Barranquilla, files a lawsuit with the Consejo de Estado (CdE) against both the above-referenced decree and resolution executed by the government on fracking guidelines.

October 2018

Ecopetrol introduces the idea of pursuing a pilot project in its block named Magdalena Medio (next to VMM-37) and requests an environmental license from the ANLA. The objective is to assess the real effects of multi-stage horizontal fracking.

November 7, 2018

The CdE declares a moratorium on Decree 3004 and Resolution 90341, stating that horizontal fracking could have a serious impact on the environment and human health. The CdE also based its decision on the September 2012 Comptroller's Office report. A few days later, the Ministry of Mines and Energy submits an appeal ("recurso de suplica"), seeking to stop the lawsuit from the CdE. The CdE ultimately rejects the appeal in September 2019 (see below).

November 2018

The government creates the expert commission on fracking. It is composed of thirteen experts in areas such as environment, geology, and social studies.

February 2019

The government-appointed expert commission says that fracking can be conducted in the country under a series of conditions, including institutional strengthening, community participation, and transparency, etc. It recommends moving forward with the pilot projects, which are named Proyectos Pilotos de Investigación Integral in its final report published on April 3, 2019.

June 2019

Amid calls that the first expert commission was not sufficiently independent, the CdE requests a new report conducted by an interdisciplinary commission composed of members of the National University in Bogota.

July 2019
The ANLA decides to temporarily suspend the licensing process for Ecopetrol's Middle Magdalena Valley pilot project, requested back in October 2018, stating that there is no legal framework in place to allow it to move forward.

September 2019
The CdE rules to maintain the moratorium on regulation. However, it rules that the PPIIs can move forward, provided they are for investigation purposes only.

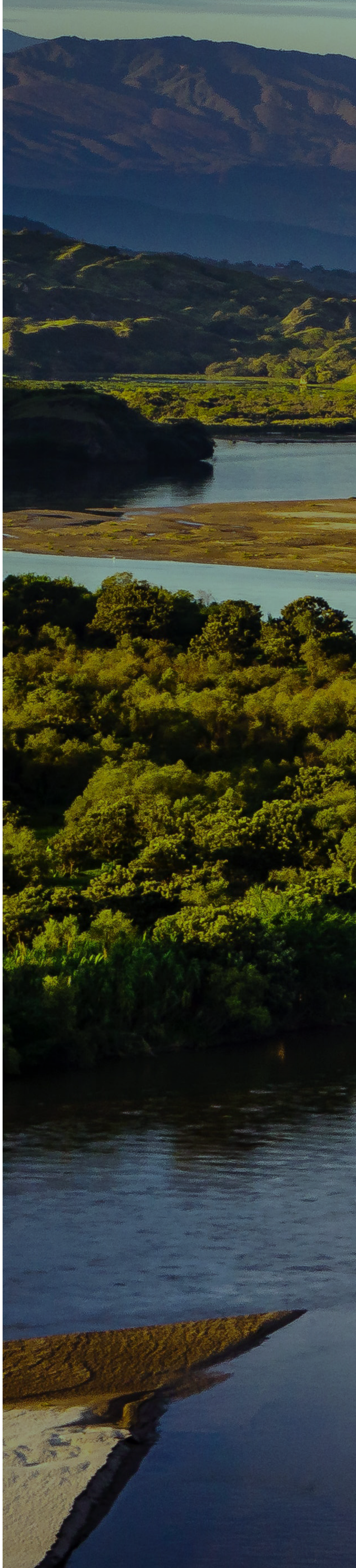
February 28, 2020
The government publishes **Decree 328/2020**, which establishes the framework that will govern PPIIs.

March 2020
In a 460-page report, the majority of the interdisciplinary, National University commission members conclude that fracking cannot be conducted responsibly in the country due to the risks associated to this technique, "which cannot be controlled, nor guaranteed."

July 2, 2020
Alianza Colombia Libre de Fracking (ACLF), a civil-society organization, files a lawsuit (*acción de desacato*) against Decree 328/2020.

July 15, 2020
The CdE accepts to study the lawsuit filed by the ACLF.

July 27, 2020
The CdE starts to review the ACLF lawsuit on July 27. It separately calls for hearings on the fracking moratorium in place since November 2018, to commence on August 20, 2020. The court is certain to take a close look at the two different commissions' reports, which came to completely different conclusions.



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Atlantic Council
1030 15th Street, NW, 12th Floor,
Washington, DC 20005
(202) 463-7226, www.AtlanticCouncil.org