

Chile

Oil & Gas Report

Includes 10-year forecasts to 2027



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Key View

Key View: Chile's oil and gas industry will experience little change through 2020, characterised by limited prospects and a heavy reliance on energy imports. The Magallanes region will remain the focal point of hydrocarbon exploration and production activities, though achieving significant progress will be challenged by spending pullbacks among upstream firms.

HEADLINE FORECASTS (CHILE 2016-2022)							
Indicator	2016e	2017e	2018f	2019f	2020f	2021f	2022f
Crude, NGPL & other liquids prod, 000b/d	6.8	4.2	3.8	3.6	3.7	3.7	3.7
Refined products production, 000b/d	179.6	170.6	180.8	195.3	203.1	209.2	211.3
Refined products consumption & ethanol, 000b/d	325.1	319.0	328.9	340.4	352.3	366.4	381.1
Dry natural gas production, bcm	0.9	0.8	0.8	0.8	0.8	0.8	0.8
Dry natural gas consumption, bcm	4.9	5.1	5.2	5.4	5.5	5.7	5.9
Brent, USD/bbl	45.13	54.75	75.00	80.00	82.00	84.00	85.00

e/f = Fitch Solutions estimate/forecast. Source: JODI, Fitch Solutions

Latest Updates:

- A series of cabinet-level scandals and decelerating economic growth will undermine public support for Chilean President Sebastián Piñera. Confidence around the new administration's pro-business stance, higher copper prices and base effects fueled robust growth in H118, averaging 4.7% y-o-y growth. However, the country is unlikely to replicate this performance moving forward. This is due to falling copper prices, rising interest rates and stagnation in business and consumer confidence readings.
- The Chilean peso will see relatively little upside over the next two years, because of limited gains in copper prices, deteriorating investor sentiment, and low real interest rates. Additionally, risks are to the downside, stemming largely from the possibility of a US-China trade war.
- We maintain our downbeat outlook on the prospects for policy formation and enactment under the new administration. November 2017's legislative elections resulted in no coalition holding a majority of seats in either the House or the Senate, due to changes in the election format and the emergence of the third party Frente Amplio.
- We have upgraded our Brent price forecast to USD75.0 per barrel for 2018, with firming global demand, high compliance with the ongoing OPEC cuts and rising political risks informing our annual price forecast. We expect OPEC+ production management to remain in place, but expect to see barrels returned to the market through H218; primarily to address collapsing Venezuelan production and the loss of Iranian barrels under sanctions.
- In July, Argentina announced it would begin exporting natural gas to Chile from October, following a meeting between the governments of both countries. The gas will come primarily from the Vaca Muerta shale field in the Neuquen basin, and will be sent over the Andes mountain range to Chile's southern province of Biobio.
- In August, Chile's national oil company **Empresa Nacional del Petróleo** released its Q218 results. The company posted a net profit of USD2mn down from USD10mn over Q217. Gas production rose slightly to 26,000boe/d from an average of 23,000boe/d in Q217. However, growth was driven by projects in Argentina. Oil production was flat versus Q118 at 35,000b/d. This was up from 33,000b/d in Q217, 3,000b/d of which was produced domestically.

SWOT

SWOT Analysis

Strengths

- Strong business environment, favourable investment terms, and a concerted interest in attracting foreign partners to the oil and gas sector
- Investments supported by country's strong rule of law and low levels of corruption throughout the sector's operations

Weaknesses

- Small and dwindling proven reserve base and limited exploration success outside the Magallanes region
- Increasingly dependent on imports to meet domestic demand
- Financially weak national oil company (Empresa Nacional del Petróleo) is legally required to be involved in all upstream investments

Opportunities

- Exploration has been limited, perhaps opening opportunities for geologic analysis that could reveal overlooked reserves
- Empresa Nacional del Petróleo 2014-2025 Strategic Plan offers triple the annual spending, totalling USD800mn per year, targeting nonconventional exploration and production as well as additional LNG import facilities
- Empresa Nacional del Petróleo's planned modernisation of its oil refineries will increase the quantity and quality of fuels produced in Chile
- Developments of unconventional resources in the southernmost Magallanes region could yield additional domestic output
- The Empresa Nacional del Petróleo is receiving cash from the government to build an LNG terminal and accelerate unconventional exploration while seeking partners for both endeavours
- Foreign investors such as Spanish giant Enagás continue to identify scope for investment and growth in Chile
- Spanish giant Enagás' operator pledged to re-invest in the country capital gained from a potential share purchase relating to its Quintero terminal

Threats

- Highly reliant on imports to satisfy domestic demand
- Rising oil prices will reduce revenues as feedstock costs for refining operations increase - lowering profit margins
- Economic growth is less robust than in past years - declining copper prices, weakened private consumption and fixed investments
- Currency has been weak against the US dollar - raising domestic prices

Industry Forecast

Upstream Exploration

Key View: *Chile's proven crude oil and natural gas reserves will decline over the next 10 years, maintaining the country's deep reliance on energy imports. Greater development of its unconventional reserves, particularly in the Magallanes, offers limited upside risk in the long term.*

Latest Updates

- Since 2017, there have been no oil-directed rigs in Chile, and no more than four active natural gas rigs. Drilling activity rose slightly in Q417, to three natural gas units from an average of two units over H117. Drilling activity declined over the first seven months of 2018.
- **GeoPark** plans to invest between USD1mn and USD2mn in 2018, focusing on business optimisation in addition to environmental and unconventional studies in the Fell Block.
- As of June 2018, 28% of state-owned **Empresa Nacional del Petróleo's** (ENAP) oil and gas reserves were located in Chile. The 37% majority were located in Argentina while 29% were located in Ecuador.
- In August, GeoPark announced the successful drilling and testing of the Jauke-1 exploration well Chile's Fell block. The well was drilled and completed to a total depth of 2.9km. A production test through different chokes in the Springhill formation resulted in an average production rate of 5.8 million standard cubic feet per day of gas.

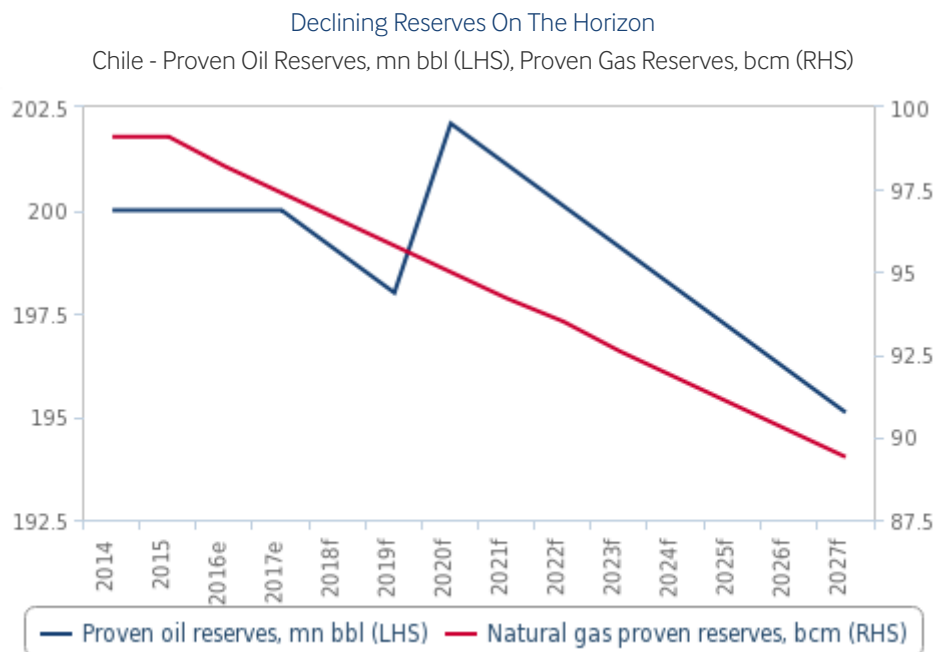
Structural Trends

Chile suffers from a lack of hydrocarbon resources. Crude oil and natural gas reserves are at 150mn bbl and 150bn cubic meters, respectively, as of 2017.

While energy demands are growing, reserve growth has struggled to keep pace, making Chile increasingly reliant on imported feedstock. Crude oil and gas reserves are expected to deplete over the next decade, with oil reserves declining by an average of 0.4% a year, hitting 195bn bbl by 2027.

With respect to natural gas, limited domestic stock coupled with rising demand will undermine Chile's energy sector. Chilean gas reserves were a modest 98.0bcm in 2017, with annual production of 820Mcm servicing approximately 18% of the country's domestic demand.

While reserves will decline by an average of 0.9% a year for the next decade, demand is projected to rise. This is primarily due to improving living standards and an increased reliance on gas-powered electricity to fuel the country's vital mining sector. By 2027, we expect Chile will be able to fulfill approximately 12% of national gas requirements from domestic sources. We forecast the country's gas reserves will fall to 89bcm by the end of our 10-year forecast period to 2027, from an estimated 97.0bcm in 2018.



e/f = Fitch Solutions estimate/forecast. Source: EIA, Fitch Solutions

The most promising region of the country, the southernmost Magallanes, is estimated to contain up to 2.4bn bbl of shale oil and condensate and 235bcm of technically recoverable shale gas. This area has attracted the vast majority of upstream investment over the past several years and will remain the focus of both state-owned and private companies.

UK-listed explorer **GeoPark Holdings** (the largest producer in the country) reported successful oil and gas discoveries across four blocks in the Magallanes basin. The four blocks are the Campanario, Tranquilo, Flamenco and Isla Norte. GeoPark plans to drill 21 exploratory wells in the region as part of a USD100mn investment. In 2018, the company expects to invest between USD1mn and USD2mn, focusing on business optimization in addition to environmental and unconventional studies in the Fell Block.

New Zealand exploration and production firm **Greymouth Petroleum** explored the Porvenir block (through subsidiary **PetroMagallanes**) and has plans to drill up to 30 additional exploration wells. PetroMagallanes has been an active explorer in the area since 2007, acquiring more than 563km of 2D and 548 square km of 3D seismic data to date.

In the summer of 2014 (December-March), state-owned oil company ENAP announced plans to triple annual investment spending to USD800mn and double hydrocarbons output by 2020. This plan represents a significant effort by the country's national oil company to expand development of unconventional resources while encouraging greater consumption of natural gas-powered electricity.

Shortly thereafter, ENAP signed a joint venture agreement with **ConocoPhillips** in August 2014 to explore and map oil and gas potential in the Magallanes. The company hopes to boost supplies of gas to run two methanol production lines at **Methanex Corp's** plants in Punta Arenas. These facilities were restarted in September 2014 following ENAP's production from tight-gas deposits in the area.

While promising, we caution that ConocoPhillips will remain focused on its most profitable acreage, limiting its involvement in Chile. In October 2017, the company announced that a continued focus on generating profits would weigh on capex for the foreseeable future, falling to USD5.5bn through 2020 (from the original 2016 forecast of USD7.7bn and USD10.1bn in 2015). We believe ENAP's limited expertise and a lack of private involvement in domestic unconventional plays will undermine a material change in Chile's total reserves.

Despite our relatively pessimistic outlook, interest in Chile's unconventional potential is beginning to grow. In June 2016,

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ConocoPhillips signed an agreement with ENAP to explore for shale gas in the Coiron block, Magallanes basin, which could potentially see total investment in the region of USD70.0-100.0mn over the next four years. In May 2017, ENAP announced the country's first multi-frack stage well would be drilled by the end of the year. Furthermore, in November 2016, ENAP's CEO Marcelo Tokman disclosed plans to invest up to USD3.2bn over 2017-2020 on refinery upgrades and unconventional exploration and development.

The Magallanes: Losing Its Production Potential
Chile - Map Of Magallanes Region



Source: Fitch Solutions

Chile's energy market will therefore remain dominated by imports, barring a seismic shift in domestic discovery rates. President Michelle Bachelet's administration released its 2014-2025 strategic plan for energy soon after taking office, acknowledging the reality of sustained import dependence by committing to the country's third LNG liquefaction terminal. In addition, the plan includes incremental improvements to state-owned ENAP's three refineries, the encouragement of unconventional exploration and sizeable investments in expanding renewables energy capacity.

The victory for centre-right presidential candidate Sebastián Piñera in December 2017's presidential run-off will likely see a shift in policy direction from that of centre-left President Michelle Bachelet. That said, while Piñera will pursue a new agenda his policies are well known and broadly mainstream within Chilean politics, he will pursue them solely through conventional policymaking channels, and legislative constraints will limit his ability to implement widespread changes. This implies broad continuity with the Bachelet agenda with respect to the upstream.

Upstream Projects

KEY UPSTREAM PROJECTS IN CHILE						
Name	Field Name	Companies	Status	Est. Peak Oil/ Liquids Range (b/d)	Est. Peak Gas Output (bcm)	Type of Project
Magallanes Basin	Block Dorado-Riquelme	ENAP (50%), Methanex (50%)	Appraisal	-	-	Gas
Magallanes Basin	Brotula Block	Greymouth Petroleum (100%)	Appraisal	-	-	Gas & Condensate
Magallanes Basin	Caupolicán Block	Greymouth Petroleum (40%), Methanex (20%), ENAP (40%)	Appraisal	-	-	Gas
Magallanes Basin	Campanario Block	GeoPark Holdings (50%), ENAP (50%)	Discovery	-	-	Oil
Magallanes Basin	Coiron Block	ENAP (51%), ConocoPhillips (49%)	Drilling	-	-	Gas
Magallanes Basin	Flamenco Block	GeoPark Holdings (50%), ENAP (50%)	Discovery	-	-	Oil & Gas
Magallanes Basin	Isla Norte Block	GeoPark Holdings (60%), ENAP (40%)	Discovery	-	-	Oil & Gas
Magallanes Basin	Tranquilo Block	Pluspetrol Chile (50%), GeoPark Holdings (50%)	Discovery	-	-	Gas
Magallanes Basin	Porvenir Block	Greymouth Petroleum (100%)	Exploration	-	-	Oil & Gas
Magallanes Basin	Arenal Block	ENAP (100%)	Production	-	-	Tight Gas
Magallanes Basin	Fell Block	GeoPark Holdings (100%)	Production	-	-	Oil & Gas

Source: Fitch Solutions Upstream Projects Database, Fitch Solutions

Upstream Oil Production

Key View: Chile's crude oil and liquids production will experience only moderate gains over the next decade as a combination of limited investment, low prospectivity of underexplored basins, restricted finances and lack of technical expertise drag on growth.

Latest Updates

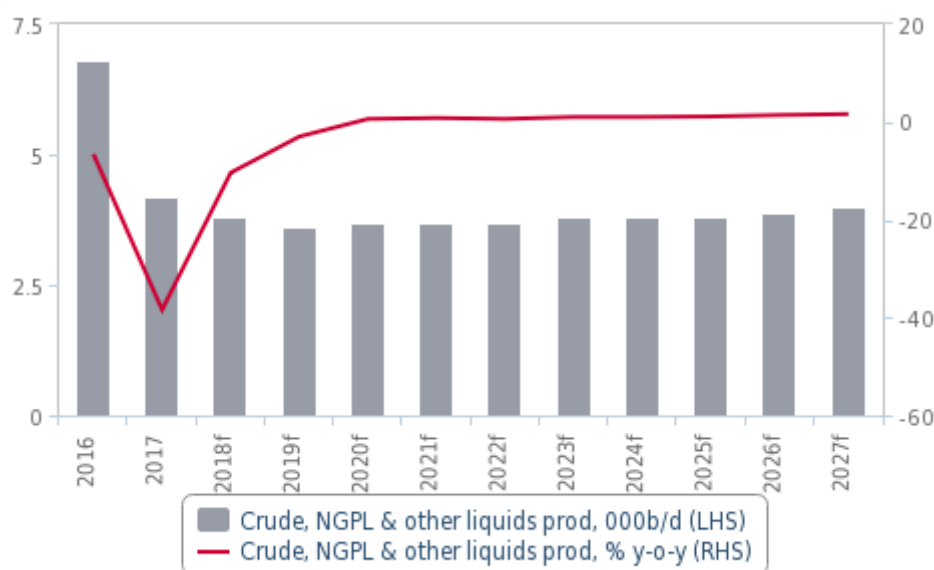
- We maintain our downbeat outlook on crude and liquids production in Chile on the back of prolonged oil price weakness. Output fell by an average 23.8% y-o-y in 2017 and will fall an additional 14.0% y-o-y in 2018 following a continued pullback in investment.
- In August, **ENAP** announced its Q218 results. Oil production was flat q-o-q at 35,000 barrels per day (b/d) but were up compared with a 2017 average of 33,000b/d. Crude output from Chile remained flat at 3,000b/d. Higher crude prices increased the company's total debt from USD4.1bn in Q217 to USD4.7bn in Q218. The company's Net Debt/EBITDA rose to 7.2x, which will weigh on upstream investment.

Structural Trends

Liquids production remains limited in Chile with production averaging 4,200 b/d in 2017, representing a 38.4% y-o-y decline. This was led by a 23.8% decline in crude output, averaging 3,200b/d over 2017.

The country's best prospect for boosting oil production in the coming years lies in unconventional exploration projects underway in the southernmost Magallanes region. Due to their early stage of development, coupled with sustained lower oil prices, Chile's limited production rates and high import dependence are likely to continue for the foreseeable future.

Oil Production Forecast
(2016-2027)



f = Fitch Solutions forecast. Source: EIA, JODI, Fitch Solutions

GeoPark is the largest producer in the Chilean upstream, with interest in five blocks, all in the Magallanes region. According to its website, the company became the first private sector producer in Chile in 2006, and produced approximately 996b/d of crude as of Q417, down from 1,352b/d in Q316. While the company plans to continue exploring in Chile, strong natural declines and rising operating costs are dampening upstream development efforts.

The Magallanes region also attracted the interest of **ConocoPhillips**, illustrated through the signing of a joint technical agreement with state-owned **Empresa Nacional del Petróleo** (ENAP) in August 2014 whereby the company would contribute its technical expertise and technology in the development of studies to define areas of interest for future upstream activity. In June 2016, the two firms signed an agreement to jointly explore and exploit oil and gas deposits in the region.

However, while the agreement could see Conoco invest up to USD70.0-100.0mn through 2020, this could prove difficult as low oil prices restrict the firm's finances. In particular, Conoco's decision to rein in its capital expenditure to approximately USD5.5bn per year -down from USD17.1bn in 2014 - suggests the company will have limited ability to allocate resources to Chile. Progress on this front will be more difficult over the next several years as the weak oil price environment directs private producers to its core upstream assets in more established markets.

GEOPARK HOLDINGS IN CHILE, SUMMARY BY BLOCK

Block	Partners	Working Interest	Basin	Gross Area (Acres)	Concession Expiration Year
Fell	na	100	Magallanes	367.3	Production: 2032
Tranquilo	Pluspetrol, IFC, Wintershall, Methanex	50	Magallanes	92.4	Exploration: 2013; Production: 2043
Isla Norte	ENAP	60	Magallanes	97.6	Exploration: 2019; Production: 2044
Campanario	ENAP	50	Magallanes	144.2	Exploration: 2020; Production: 2044
Flamenco	ENAP	50	Magallanes	160.0	Exploration: 2019; Production: 2044

na = not available. Source: GeoPark Aug 2018 presentation

ENAP has also embarked on a campaign to increase hydrocarbon production from 15,000boe in 2014 to 32,000boe by 2020 through the 2014-2025 Strategic Plan, launched in September 2014. This endeavour will focus on expanding exploration and production activity in the more energy-dependent Magallanes region with the goal of meeting 100.0% of the region's domestic energy needs for 20 years.

While these efforts will encourage modest growth, we believe this plan is ambitious. This is due to ENAP's high debt burden and a heavy reliance on dwindling government funding, requiring significant efforts to meet rising domestic demands. Though y-o-y income has increased, ENAP's net debt remains elevated, threatening its ability to execute its upstream strategy. Moreover, ENAP's lack of technical expertise will perpetuate its reliance on private consultation to further its strategic goals, as demonstrated by its joint agreement with ConocoPhillips.

OIL PRODUCTION (CHILE 2016-2021)

Indicator	2016	2017	2018f	2019f	2020f	2021f
Crude, NGPL & other liquids prod, 000b/d	6.8	4.2	3.8	3.6	3.7	3.7
Crude, NGPL & other liquids prod, % y-o-y	-6.6	-38.4	-10.4	-3.0	0.6	0.8

f = Fitch Solutions forecast. Source: EIA, JODI, Fitch Solutions

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OIL PRODUCTION (CHILE 2022-2027)

Indicator	2022f	2023f	2024f	2025f	2026f	2027f
Crude, NGPL & other liquids prod, 000b/d	3.7	3.8	3.8	3.8	3.9	4.0
Crude, NGPL & other liquids prod, % y-o-y	0.6	1.0	1.0	1.1	1.4	1.6

f = Fitch Solutions forecast. Source: EIA, JODI, Fitch Solutions

Upstream Gas Production

Key View: *Chile's natural gas production will decline at an average rate of 0.1% over the next decade, driven by a lack of upstream investment amid sustained commodity price weakness. Greater exploitation of Chile's unconventional resources poses upside risks, though it faces headwinds from low oil prices, high project costs, and technological shortfalls.*

Latest Updates

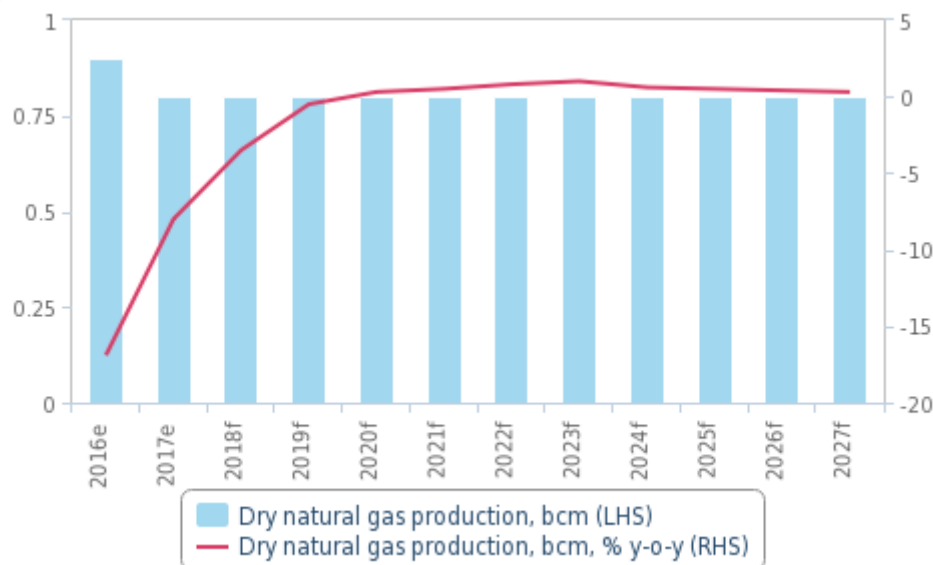
- **GeoPark** plans to spend USD4-5mn in capital expenditures in Chile over 2018. The company remains focused on work programmes in the Fell block (where GeoPark holds 100% interest), and planned to drill four wells in 2018 (two development wells and two exploration).
- **Empresa Nacional del Petróleo's** (ENAP) natural gas production in Chile over Q218 declined to an average rate of 16,000boe/d from an average of 17,000boe/d over 2017.
- Chile's natural gas production in 2017 fell an estimated 8% y-o-y to 0.82bnm following a 17% y-o-y decline in 2016. Output will fall a further 3.5% y-o-y in 2018.

Structural Trends

Chile's domestic natural gas production in 2027 will be largely flat from 2017 levels, with modest exploration successes moderating declining reserves. We acknowledge some upside risk to our long-term production forecasts, highlighting that the country's recent efforts to expand shale gas potential could bolster output and reduce Chile's heavy import burden. With unconventional development in the country still in a beginning phase, we have yet to factor this into our forecasts.

In July 2013, ENAP successfully produced its first unconventional natural gas in the Arenal block of the Magallanes, utilising hydraulic fracturing techniques on two exploration blocks. Initial flow rates were encouraging with average production of around 120,000 cubic metres per day, though this has decreased since.

Gas Production Forecast
(2016-2027)

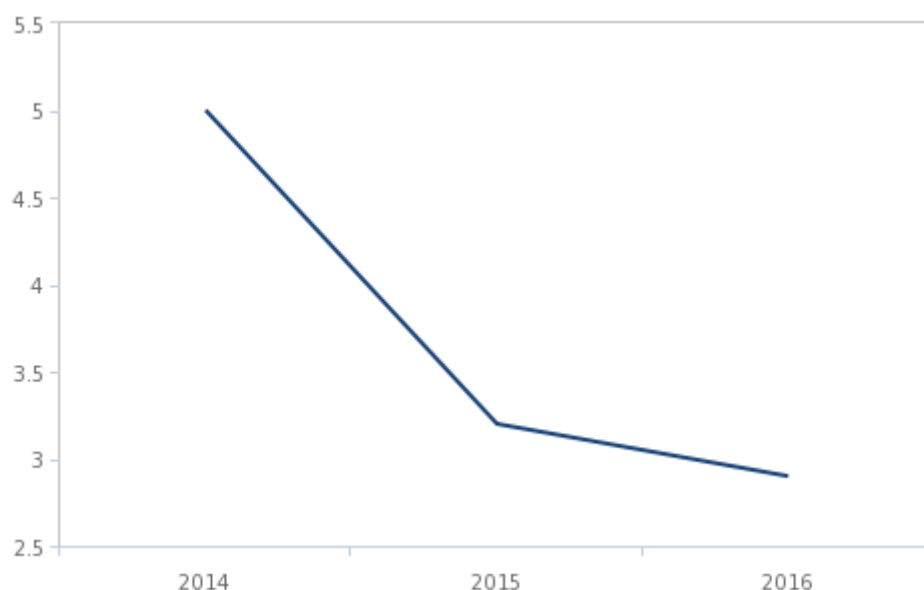


e/f = Fitch Solutions estimate/forecast. Source: EIA, JODI, Fitch Solutions

Though preliminary, the production figures indicate the presence of a tight gas field contributing to Chile's limited domestic output. Although the population served by this supply is barely 1% of Chile's 17.6mn inhabitants, continued development of this block could prove significant over the long term.

If the company continues to optimise its extraction techniques, hydraulic fracturing (fracking) could be applied on a wider scale, suggesting some upside risk to our Chilean gas production forecasts. As of year-end 2016, the cost per well in the Magallanes had fallen to an estimated USD2.9mn, compared to USD5.0mn in 2014. Fracking, however, would require a longer timeline to implement, given the complexity of the region's geography and the limited expertise of ENAP.

Becoming More Competitive
ENAP - Cost Per Well In The Magallanes, USDmn



Source: ENAP, Fitch Solutions

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As part of its plan to increase annual investment spending from USD286mn to USD800mn per year over the next decade, ENAP hoped to increase tight gas production from 450,000 cubic metres per day to 1Mcm/d. As of year-end 2016, the company produced 1.5Mcm/d in the Magallanes, suggesting its strategy of optimising upstream is working. The 60-well drilling plan approved in January 2016 poses further upside risk to our outlook. However, we maintain that any upstream gains are unlikely to become a reality before 2020.

Southernmost Region Holds Most Promise
Map of Magallanes Region



Source: Fitch Solutions

The **Contrato Especial de Operación Petrolera** (CEOP) joint venture signed between ENAP and **ConocoPhillips** in June 2016 targets the Magallanes. CEOP hopes to increase investment inflows over the next four years, with investment expected to reach USD70-100mn, depending on exploration and appraisal results within the play. Whilst we view the agreement favourably with respect to strategic aims, we believe it will not provide significant production upside over the next several years owing to continued operating headwinds.

First, operating costs in the Magallanes' unconventional acreage remain somewhat elevated. ConocoPhillips' efforts to reduce operating costs at its existing assets - which have fallen by an estimated 42% since 2014 - will likely improve this trend within Chile. However, a lack of existing infrastructure will ultimately maintain elevated expenses.

Due to higher development costs, ConocoPhillips' USD70-100mn investment will have a limited impact. This range implies the CEOP would bring between 20 and 35 horizontal wells, depending on their cost. We do not believe this campaign will provide significant upside to production, given the underexplored and under-appraised nature of the area in question. While ENAP applied to drill 60 wells in late 2015, with the three rigs operating as of May 2016, this will take several years. The companies will need to continue drilling to better understand the geology and de-risk the area.

GAS PRODUCTION (CHILE 2016-2021)

Indicator	2016e	2017e	2018f	2019f	2020f	2021f
Dry natural gas production, bcm	0.9	0.8	0.8	0.8	0.8	0.8
Dry natural gas production, bcm, % y-o-y	-16.9	-8.0	-3.5	-0.5	0.3	0.5
Dry natural gas production, % of domestic consumption	18.0	16.1	15.2	14.7	14.3	13.9

e/f = Fitch Solutions estimate/forecast. Source: EIA, JODI, Fitch Solutions

GAS PRODUCTION (CHILE 2022-2027)

Indicator	2022f	2023f	2024f	2025f	2026f	2027f
Dry natural gas production, bcm	0.8	0.8	0.8	0.8	0.8	0.8
Dry natural gas production, bcm, % y-o-y	0.8	1.0	0.6	0.5	0.4	0.3
Dry natural gas production, % of domestic consumption	13.5	13.1	12.7	12.4	12.0	11.6

f = Fitch Solutions forecast. Source: EIA, JODI, Fitch Solutions

Refining

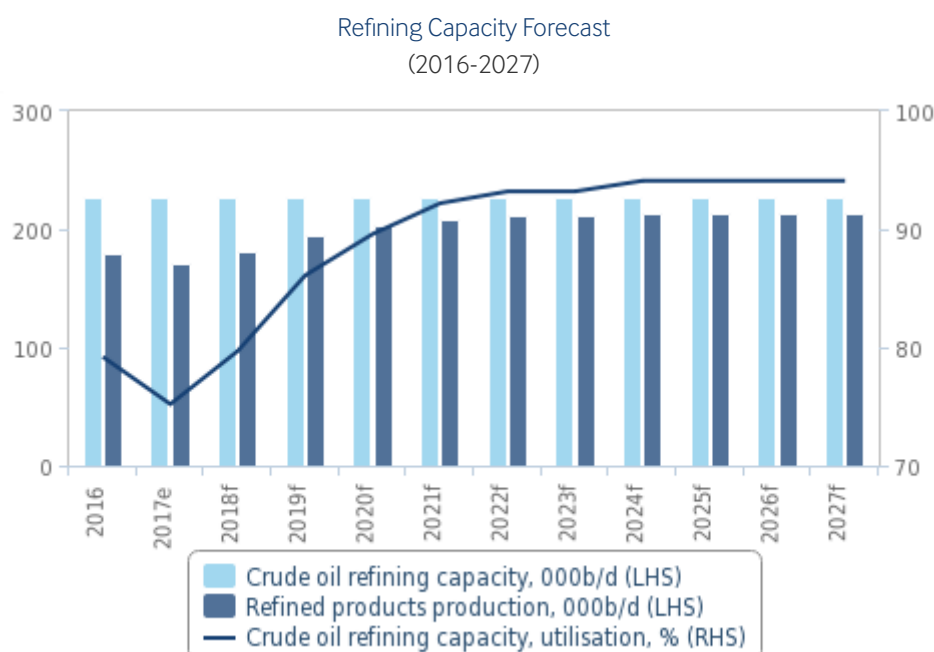
Key View: State-owned Empresa Nacional del Petróleo (ENAP) plans to undertake upgrades at its three refineries over the course of the coming decade, though new capacity additions are unlikely given the company's weaker financial position and limited funds. Output of refined fuels will increase over our five-year forecast as utilisation rates improve, but we expect them to flatten beyond 2020 in the absence of capacity expansion.

Latest Updates

- **ENAP**, the country's sole refiner, processed 5,770mcm of crude over Q218, down from 5,897mcm in Q217.
- The company produced 18,800bbl of refined fuels over H118, equivalent to a 4% y-o-y decrease compared to H117.
- ENAP's refining rates remained at 77% in Q218 versus an average rate of 76% in 2017.
- Two-thirds of Chile's fuels production slate comprises gasoline and diesel, followed by jet kerosene (10%) and residual fuel oil (7%).

Structural Trends

The downstream sector is a vital component of ENAP's operations and must contend with growing fuel demand and limited domestic feedstock. As of Q118, ENAP generates an estimated 87% of its revenue from the downstream sector. Given Chile's high dependence on costly imported feedstock, the company is facing high costs of production in the wake of rising demand for imports and higher oil prices. ENAP's three refineries have a booked refining capacity of 235,700b/d, which supplied an estimated 51% of the country's fuels needs in 2017.

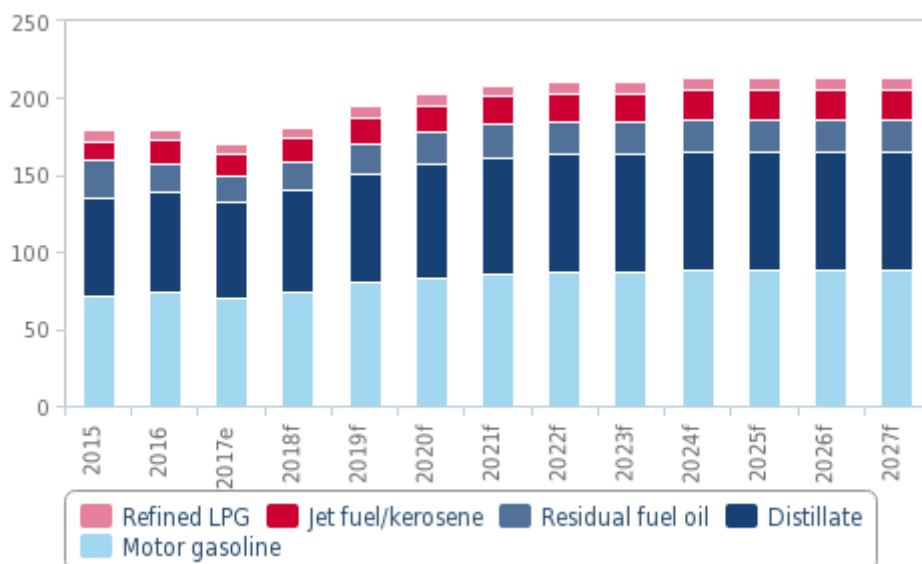


e/f = Fitch Solutions estimate/forecast. Source: EIA, ENAP, Fitch Solutions

Our projections indicate that Chile will consume approximately 500,000b/d of refined products by 2027, compared to an estimated 335,000b/d in 2017. This implies that the country will only be capable of sourcing approximately 47% of its domestic supply in the absence of downstream expansions, placing significant strain on its downstream sector.

Modernisation Could Improve Light Distillates Production

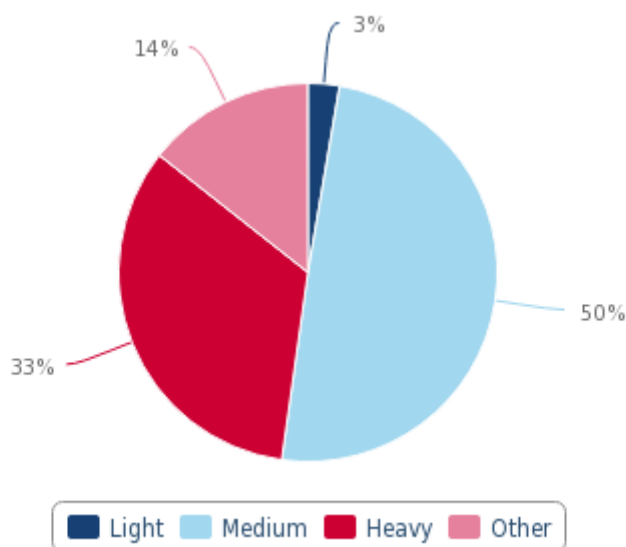
Chile - Refined Fuels Production By Fuel, 000b/d



e/f = Fitch Solutions estimate/forecast. Source: ENAP, Fitch Solutions

ENAP recognises the shortfall but, amid an ongoing financial realignment, there is limited discussion of adding to the country's refinery system. The current production slate is primarily geared towards gasoline and diesel, with the two fuels making up nearly 70% of total production. The company is also experimenting with new sources of light crude from Angola and Canada in an attempt to increase production of more high-value jet fuels.

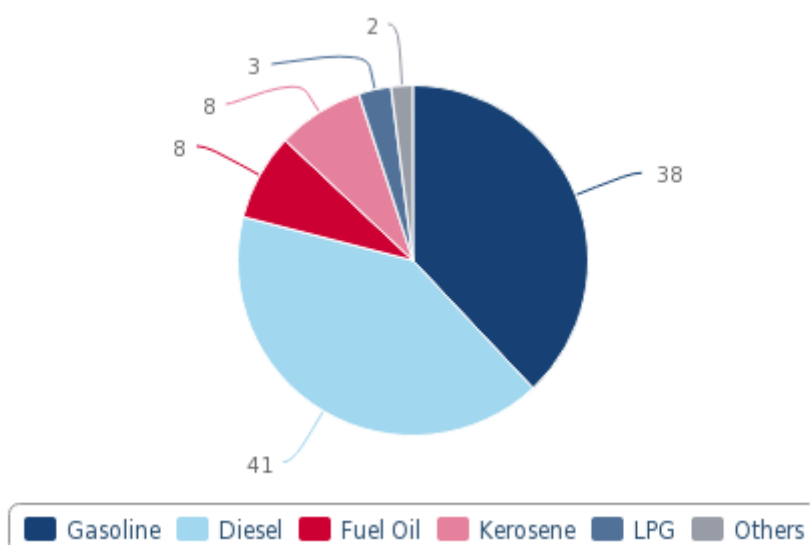
Medium Makes Up The Bulk
Chile - Refinery Crude Feedstock by Slate, %



Source: ENAP data through 2017, Fitch Solutions

After a sharp drop in refined oil production in 2016, we forecast a gradual increase beginning in 2018 once refinery maintenance at the Bio Bio facility is completed, with growth averaging 4% y-o-y between 2018 and 2022. Thereafter, growth will be limited by an exhaustion of refining capacity. ENAP is attempting to bolster its ability to accept a higher proportion of intermediate and heavier feedstocks that are produced in Latin America. This will likely improve its cost competitiveness over time and optimise production over the long run.

Gasoline And Diesel Comprise Nearly 80%
Chile - Sales by Refined Product, 2017 (%)



Source: ENAP, Fitch Solutions

As the sole refiner in the country, ENAP hopes its 2014-2025 Strategic Plan will accelerate the modernisation of Chile's three existing facilities while increasing total output, though a weaker financial position and a lack of available funds for investment will

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render any efforts to materially boost capacity difficult.

REFINING CAPACITY AND REFINED PRODUCTS PRODUCTION (CHILE 2016-2021)						
Indicator	2016	2017e	2018f	2019f	2020f	2021f
Crude oil refining capacity, 000b/d	226.8	226.8	226.8	226.8	226.8	226.8
Crude oil refining capacity, % y-o-y	0.0	0.0	0.0	0.0	0.0	0.0
Crude oil refining capacity, utilisation, %	79.2	75.2	79.7	86.1	89.6	92.2
Refined products production, 000b/d	179.6	170.6	180.8	195.3	203.1	209.2
Refined products production, % y-o-y	-17.8	-5.0	6.0	8.0	4.0	3.0
Refined products production & ethanol, 000b/d	179.6	170.6	180.8	195.3	203.1	209.2
Refined products production & ethanol, % y-o-y	-17.8	-5.0	6.0	8.0	4.0	3.0

e/f = Fitch Solutions estimate/forecast. Source: ENAP, JODI, Fitch Solutions

REFINING CAPACITY AND REFINED PRODUCTS PRODUCTION (CHILE 2022-2027)						
Indicator	2022f	2023f	2024f	2025f	2026f	2027f
Crude oil refining capacity, 000b/d	226.8	226.8	226.8	226.8	226.8	226.8
Crude oil refining capacity, % y-o-y	0.0	0.0	0.0	0.0	0.0	0.0
Crude oil refining capacity, utilisation, %	93.2	93.2	94.1	94.1	94.1	94.1
Refined products production, 000b/d	211.3	211.3	213.4	213.4	213.4	213.4
Refined products production, % y-o-y	1.0	0.0	1.0	0.0	0.0	0.0
Refined products production & ethanol, 000b/d	211.3	211.3	213.4	213.4	213.4	213.4
Refined products production & ethanol, % y-o-y	1.0	0.0	1.0	0.0	0.0	0.0

f = Fitch Solutions forecast. Source: ENAP, JODI, Fitch Solutions

Refined Fuels Consumption

Key View: Chile's consumption of refined fuels will increase at an average rate of 4.1% through to 2027. This growth will be supported by a positive macroeconomic backdrop, lower fuels prices, and a gradual strengthening of the peso. The country remains highly reliant on copper exports to power economic growth. Thus, slower demand for the goods globally will temper demand over the next few years.

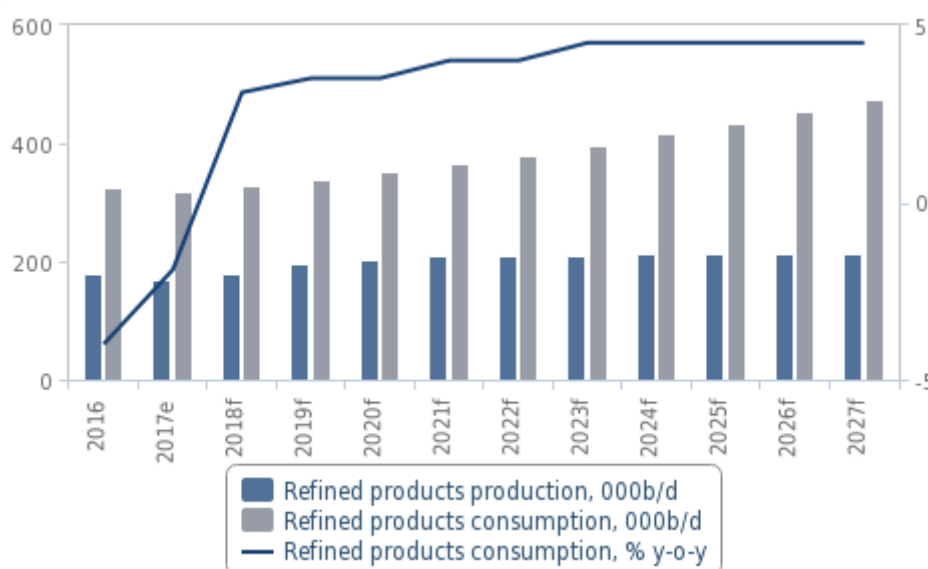
Latest Updates

- Refined fuels consumption fell by 1.9% y-o-y in 2017 after a 4% y-o-y decline in 2016. In 2018, we forecast growth of 3.1% y-o-y, averaging to 330,000b/d.
- The price of diesel rose over Q318 on the back of higher crude prices, reaching USD0.93/litre as of August 27 2018.

Structural Trends

Acceleration in Chilean real GDP growth will increase total petroleum consumption by an average rate of 3.6% y-o-y from 2018 to 2022. Our forecast is driven by an uptick in mining sector growth, and growing business confidence. Strong job generation in the manufacturing sector will boost household spending over the coming years, encouraging higher rates of consumption.

Refined Products Production and Consumption Forecast
(2016-2027)



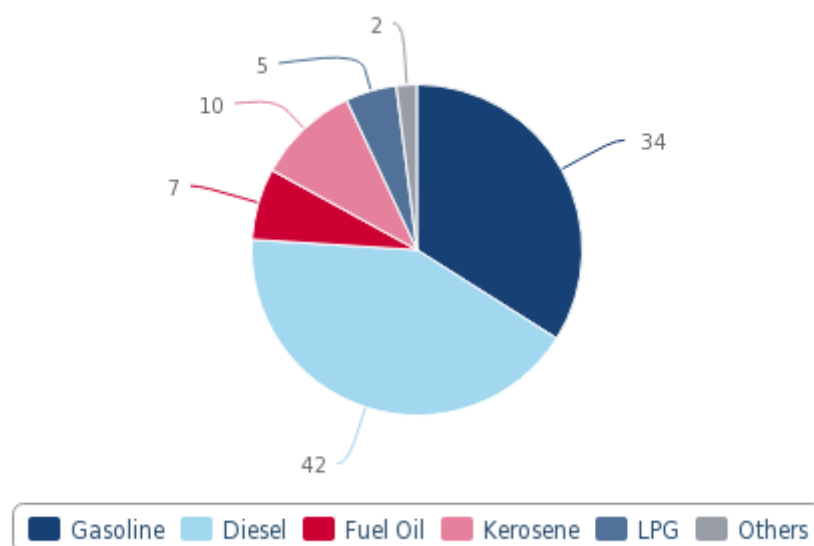
e/f = Fitch Solutions estimate/forecast. Source: EIA, JODI, Fitch Solutions

Robust performance in the mining sector will push Chile's goods exports higher in 2018, underpinning our growth forecast upgrade for the country. Chile is the world's largest producer of copper, and the country's economic fortunes have been closely tied to the metal over recent decades. Rising prices and steady demand from China have led Chilean producers to increase output over H217, a trend which has continued into the early months of 2018. Moreover, export growth has not been contained to copper alone, as non-copper mining output, agriculture and manufacturing have each seen strong growth over recent quarters. We caution that headline GDP growth, which we forecast to average 3% over 2016-2027, will remain below the historical trend until the end of the

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decade, subduing total consumption for the majority of our forecast period.

Gasoline And Diesel Comprise Nearly 80%
Chile - Sales by Refined Product, Q218 (%)



Source: ENAP, Fitch Solutions

We caution that rising crude prices could eat into demand via higher retail prices, boosting the country's import burden over the next few years. With Brent expected to average USD73-85/bbl over our five-year forecast, we believe fuel prices will likely continue to rise, thereby threatening consumption growth rates. While an improving mining sector will offset this risk, we do not discount the impacts of a more sustained appreciation in input costs.

REFINED PRODUCTS CONSUMPTION (CHILE 2016-2021)						
Indicator	2016	2017	2018f	2019f	2020f	2021f
Refined products consumption, 000b/d	325.1	319.0	328.9	340.4	352.3	366.4
Refined products consumption, % y-o-y	-4.0	-1.9	3.1	3.5	3.5	4.0
f = Fitch Solutions forecast. Source: JODI, ENAP, Fitch Solutions						
REFINED PRODUCTS CONSUMPTION (CHILE 2022-2027)						
Indicator	2022f	2023f	2024f	2025f	2026f	2027f
Refined products consumption, 000b/d	381.1	398.2	416.1	434.9	454.4	474.9
Refined products consumption, % y-o-y	4.0	4.5	4.5	4.5	4.5	4.5
f = Fitch Solutions forecast. Source: JODI, ENAP, Fitch Solutions						

Gas Consumption

Key View: *Despite growing challenges from renewable energy in the power sector, consistent growth in gas-fired electricity generation in Chile will drive comparable growth in the country's consumption of natural gas.*

Latest Updates

- Natural gas consumption in Chile reached an estimated 5.1bcm in 2017, up 3% y-o-y.
- In 2018, demand will rise an additional 2.5% y-o-y, reaching 5.2bcm.
- By the end of our 10-year forecast period, we expect consumption will rise to 7bcm.
- **GeoPark** saw local gas deliveries decline by 21% over Q317 to 1,730boe/d. A 25% in natural gas prices offset these declines, resulting in a 1% increase in revenues due to higher methanol prices.
- The increasingly low cost of supplying electricity through wind and solar power plants in Chile is creating headwinds to the development of new gas-fired power plants, though we maintain that gas will increase its share in Chile's power mix over the next 10 years (from around 15% in 2016 to almost 20% by 2027).

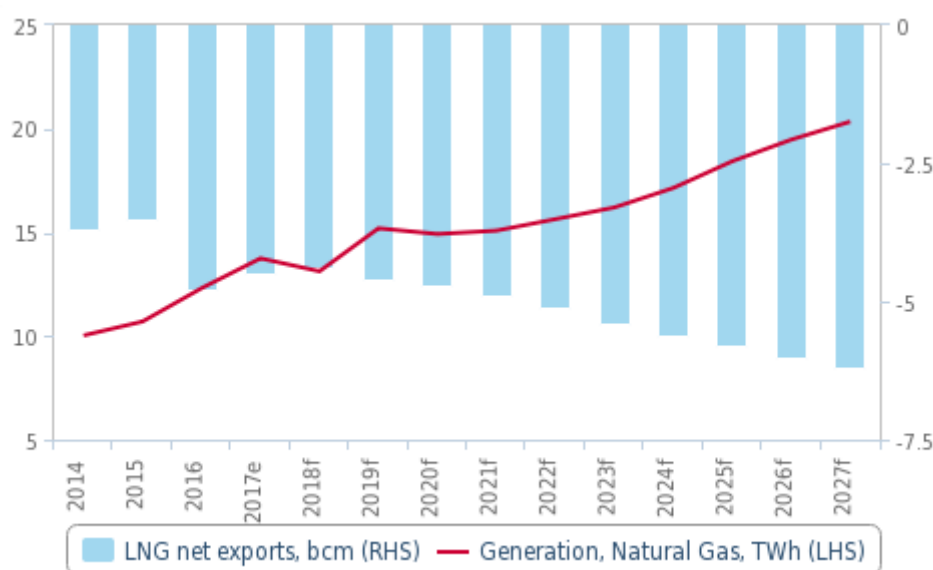
Structural Trends

Natural gas consumption in Chile will increase over the next decade primarily as a result of the government's efforts to expand gas-powered electricity generation capacity. Total gas consumption is projected to increase from an estimated 5.1bcm in 2017 to 7.0bcm in 2027, representing an average annual growth rate of 3.4% over the course of our forecast period. Due to negligible production, the vast majority of this demand will be imported, putting greater financial pressure on state-owned **Empresa Nacional del Petróleo** (ENCAP).

Although Chile's economic growth slowed to 1.5% y-o-y in 2017, we forecast real GDP to pick up over the medium term, increasing by an annual average rate of 3.3% y-o-y from 2018 to 2022. Moreover, power demand from mining activities in the country will remain robust over the next decade, as we expect commodity prices to rebound gradually and Chile's abundant copper and gold reserves to attract investment and boost growth in the sector - albeit at a lower rate than in the past.

To support this growth, we expect a significant expansion in thermal baseload capacity, which will provide a reliable back-up power supply to Chile's renewables fleet and hydropower project pipeline. We forecast natural gas-fired power generation to grow by an annual average rate of around 5% over 2016-2027. This will be supported by the government's plans to increase the country's import capacity of LNG and ramp up production of domestic natural gas.

Gas-Fired Power On LNG Imports Growth
Chile - Gas-Fired Electricity Generation & Net LNG Exports



Negative value = imports. e/f = Fitch Solutions estimate/forecast. Source: JODI, ENAP, Fitch Solutions

The Magallanes region, which suffers from extremely cold temperatures in the winter, is highly dependent on natural gas to provide heating. With costly utility subsidies in place for the southernmost area, the development of shale gas would primarily service the demands of this population as a means of reducing elevated electricity costs, benefiting both ENAP and the affected residents.

GAS CONSUMPTION (CHILE 2016-2021)

Indicator	2016	2017e	2018f	2019f	2020f	2021f
Dry natural gas consumption, bcm	4.9	5.1	5.2	5.4	5.5	5.7
Dry natural gas consumption, % y-o-y	8.8	3.0	2.5	2.8	3.0	3.5

e/f = Fitch Solutions estimate/forecast. Source: JODI, ENAP, Fitch Solutions

GAS CONSUMPTION (CHILE 2022-2027)

Indicator	2022f	2023f	2024f	2025f	2026f	2027f
Dry natural gas consumption, bcm	5.9	6.2	6.4	6.6	6.8	7.1
Dry natural gas consumption, % y-o-y	3.8	4.0	3.5	3.2	3.5	3.8

f = Fitch Solutions forecast. Source: JODI, ENAP, Fitch Solutions

Oil Trade

Key View: *Negligible production will prove increasingly insufficient to offset rising demand in Chile. Over the coming decade, the country will remain highly dependent on both crude oil and refined fuels imports.*

Crude Oil Trade Forecast

Latest Updates

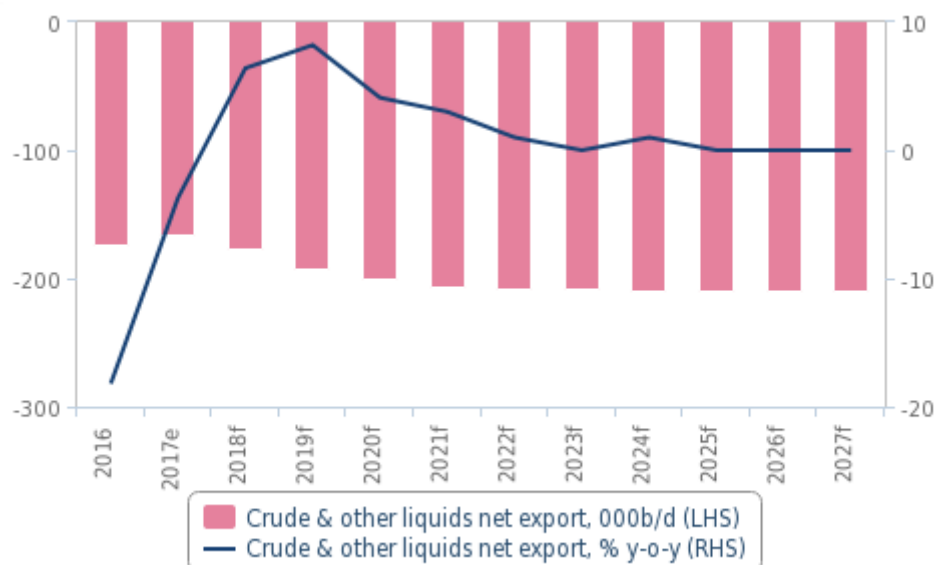
- Over Q118, crude imports averaged 202,000 barrels per day (b/d), down from 238,000b/d in Q117, representing a 14.9% y-o-y decline. 64% of imports originated in Brazil while the remaining barrels came primarily from Ecuador.
- We expect net imports of crude will increase to 175,000b/d in 2018 up from an estimated 165,000b/d in 2017. Chile's deficit will reach 210,000b/d by 2022.

Structural Trends

Dependent on imports for over 60% of its oil needs, the fall in oil prices dramatically reduced the cost of imported fuels for Chile. Our current oil price forecast for Brent and West Texas Intermediate show a continued recovery, threatening demand over the coming years. However, given the expected economic gains on the back of a strengthening mining sector, we believe fuels consumption will increase demand for feedstock, thereby raising import costs. Chile's dependence on imported crude will increase in the absence of greater upstream development. Net crude imports will rise from about 165,000b/d in 2017 to 210,000b/d by 2022.

Trade Map ICT data shows that Chile sources about 98% of its crude needs from South America, mostly from Brazil (65%), Ecuador (30%) and, to a smaller extent Argentina and Peru. The remaining volumes come from overseas, namely the UK and the United States.

Crude Oil Net Exports Forecast
(2016-2027)



Negative implies imports. e/f = Fitch Solutions estimate/forecast. Source: JODI, ENAP, Fitch Solutions

CRUDE OIL NET EXPORTS (CHILE 2016-2022)

Indicator	2016	2017e	2018f	2019f	2020f	2021f	2022f
Crude & other liquids net export, 000b/d	-172.8	-166.4	-177.1	-191.7	-199.4	-205.5	-207.6
Crude & other liquids net export, % y-o-y	-18.2	-3.7	6.4	8.2	4.1	3.0	1.0
Crude & other liquids net export, USDbn	-2.6	-3.2	-4.7	-5.4	-5.8	-6.1	-6.2

e/f = Fitch Solutions estimate/forecast. Source: JODI, ENAP, Fitch Solutions

CRUDE OIL NET EXPORTS (CHILE 2022-2027)

Indicator	2022f	2023f	2024f	2025f	2026f	2027f
Crude & other liquids net export, 000b/d	-207.6	-207.5	-209.6	-209.6	-209.5	-209.5
Crude & other liquids net export, % y-o-y	1.0	0.0	1.0	0.0	0.0	0.0
Crude & other liquids net export, USDbn	-6.2	-6.2	-6.3	-6.3	-6.3	-6.3

f = Fitch Solutions forecast. Source: JODI, ENAP, Fitch Solutions

Refined Fuels Trade Forecast

Latest Updates

- Refined fuels imports remained flat in 2017, as stronger domestic demand was offset by higher retail prices.
- Diesel imports averaged 76,750b/d in July 2018, nearly 99% of which came from the US.
- Chile exported 7,537b/d of fuel in the month of July 2018, all of which was sent to Bolivia.

Structural Trends

Chile's dependence on imported refined fuels will remain elevated, with approximately 46% of the daily required volumes brought in from abroad based on 2017 levels. We estimate this trend will rise throughout our 10-year forecast period, from an estimated

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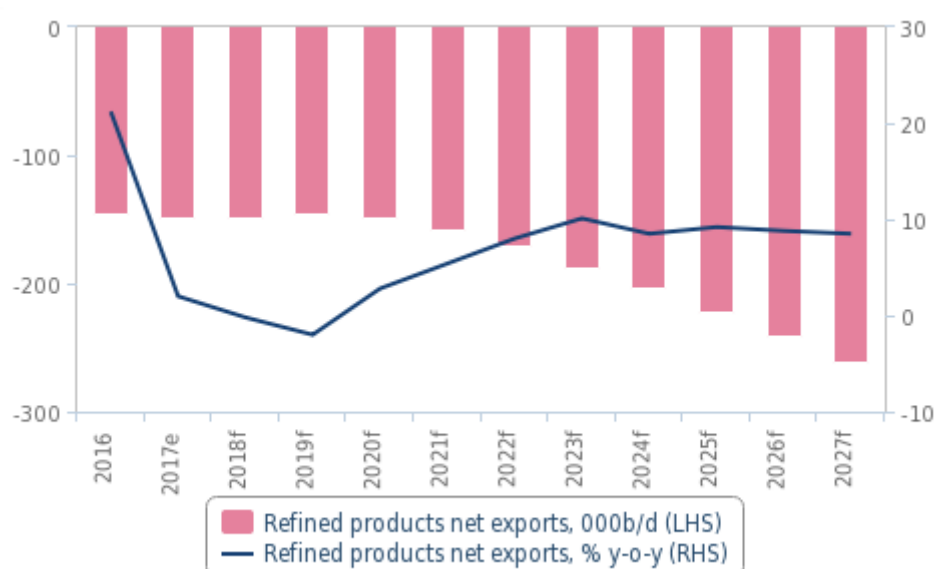
150,000b/d of imported fuel in 2017 to 260,000b/d by 2027.

State-owned **Empresa Nacional del Petróleo** will make efforts to increase downstream capacity at the Concón and Hualpén refineries through increased capital investment. As part of their 2014-2025 strategic plan, the state-owned company hopes to meet the rise in private consumption of refined fuels. However, a lack of upstream development from lower oil prices will require more crude imports to service this growing demand.

While the majority of crude imports originate in South America, refined fuel products are primarily imported from the US. The US provided approximately 52% of the country's imported gasoline, 97% of its imported diesel and 44% of its imported kerosene as of year-end 2017. Japan and South Korea are also significant exporters of diesel to Chile, but the portfolio of refined products suppliers is dominated by the US, Canada and the Netherlands (via Curaçao).

Overall, Chile's high dependence on imported crude and petroleum products will continue, despite the government's efforts to increase domestic production of unconventional resources. Given the early phase of upstream development, with little prospect for substantial improvements over the coming years, we maintain our conservative view regarding Chile's export-oriented oil sector.

Refined Products Net Exports Forecast
(2016-2027)



Negative implies imports. e/f = Fitch Solutions estimate/forecast. Source: JODI, ENAP, Fitch Solutions

By the end of our 10-year forecast in 2027, refined fuel imports will make up 55% of the country's daily needs, reflecting a continued reliance on imported supplies. This is a much higher rate relative to neighbouring countries, underscoring Chile's comparatively low resource potential.

REFINED FUELS NET EXPORTS (CHILE 2016-2021)

Indicator	2016	2017e	2018f	2019f	2020f	2021f
Refined products net exports, 000b/d	-145.5	-148.4	-148.0	-145.1	-149.2	-157.2
Refined products net exports, % y-o-y	21.2	2.0	-0.2	-2.0	2.8	5.4
Refined products net exports, USDbn	-3.0	-3.6	-4.1	-4.3	-4.6	-5.0

e/f = Fitch Solutions estimate/forecast. Source: JODI, ENAP, Fitch Solutions

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REFINED FUELS NET EXPORTS (CHILE 2022-2027)						
Indicator	2022f	2023f	2024f	2025f	2026f	2027f
Refined products net exports, 000b/d	-169.8	-186.9	-202.7	-221.4	-241.0	-261.5
Refined products net exports, % y-o-y	8.0	10.1	8.5	9.2	8.8	8.5
Refined products net exports, USDbn	-5.4	-6.0	-6.5	-7.1	-7.7	-8.3

f = Fitch Solutions forecast. Source: JODI, ENAP, Fitch Solutions

Gas Trade

Key View: Chile will remain a net importer of LNG over our 10-year forecast period, as limited domestic production growth potential drives continued dependence on foreign supplies. LNG imports will increase by nearly 50% from 2016 to 2027.

Latest Updates

- Chile's Supreme Court has revoked environmental approval for the Penco Lirquen LNG terminal and accompanying gas-fired power plant. While the terminal will likely get the go-ahead, the setback will delay the project.
- Chile exported up to 276mn cubic metres (Mcm) of gas between June 1 2017 and August 31 2017, averaging 3.0Mcm/d to offset increased heating demand in Argentina over the southern hemisphere winter months.
- In July 2018, Argentina announced it would resume exporting natural gas to Chile in October 2018 during the southern hemisphere summer (December-March), something it has not done in commercial quantities in nearly a decade. The gas will come primarily from the Vaca Muerta shale field in the Neuquen basin, and will be sent over the Andes mountain range to Chile's southern province of Biobio.
- The second expansion of the Quintero LNG terminal was derailed indefinitely in May 2017 after **Colbun** - the sole remaining participant - signed a long-term supply deal with **Empresa Nacional del Petróleo** (ENAP). The deal entailed 12 years of gas supply tied to reserved regasification capacity and will commence in January 2019.

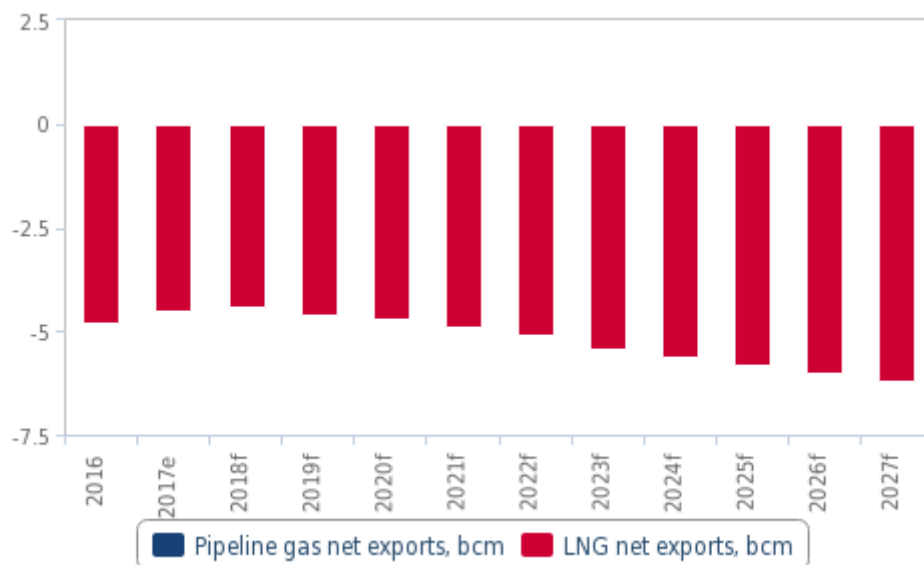
Structural Trends

Chile is highly reliant on imported natural gas, having brought in an estimated 4.5bcm in 2017 (approximately 87% of the country's daily needs). Given the country's relatively small natural resource base and little prospect for a production increase, we are forecasting a continuation of this trend through the next decade, with net natural gas imports rising to 6bcm by 2026. This would represent more than 89% of Chile's daily supply despite a slight uptick in domestic gas production.

Chile imports LNG primarily from Trinidad and Tobago, Qatar, Yemen - and to an increasing extent, the US - into two regasification terminals. The Quintero terminal, which received its first LNG shipment in July 2009, provides natural gas to the majority of the country's population largely concentrated in the central region. The facility has total send-out capacity of 4mn tpa following its expansion in 2015 from 2.7mn tpa. **BG Group** (now **Shell**) is contracted to supply the terminal with up to 1.7mn tpa over a 21-year period.

In January 2013, **Enagás** Chairman Antonio Llardén revealed that USD134.5mn had been spent on the installation of a third LNG tank at the Quintero terminal. The tank has a capacity of 150,000 cubic metres. After Enagás increased its stake, the ownership breakdown was: Enagás (40%), ENAP (20%), **Endesa Chile** (20%) and **Metrogas** (20%).

Gas Net Exports Forecast
(2016-2027)



Negative value = imports. f = Fitch Solutions forecast. Source: JODI, ENAP, Fitch Solutions

GLN Mejilones SA, the Mejilones terminal, is a floating offshore storage terminal located in the northern part of Chile, where it is well-positioned to service the lucrative Chilean copper mines. It received its first LNG shipment from Trinidad and Tobago in February 2010. Although the plant had initially expected to further increase regasification capacity (upping it by 50%) as of October 2013, these plans had been put on hold because of insufficient capacity. This appears to be changing, as the Chilean government committed itself to the construction of an additional LNG import terminal in the spring of 2014 (March-September). The project has progressed through the regulation process, having been granted environmental approval in July 2016.

From 1996 to 2008, Argentina had been the only supplier of LNG to Chile. In 2009, however, Chilean gas distributor **Metrogas** terminated its contract with Argentine suppliers due to sustained gas supply cuts which began in 2004. Increased energy insecurity, a result of volatile Argentine supplies, was a primary motivator behind the construction of the Quintero terminal - the first LNG import terminal in Latin America.

Trinidad and Tobago is the largest supplier of LNG to Chile, accounting for over 77% of total LNG imports in 2017 (from 92% in 2015); the start-up of trade with the US (18% in 2017) beginning in February 2016 materially curbed its share. The US is reaping the benefits of a newly expanded Panama Canal (since June 2016) that significantly reduced the time and cost needed for Chile to procure US supplies. Other smaller trade partners include Guinea (3.4%) and Qatar (1.5%).

Forthcoming Projects

GasAtacama unveiled plans to invest USD350mn in a floating LNG regasification terminal off the coast of northern Chile, with hopes of providing additional electricity for power-hungry copper mines in the north. The project is expected to have a capacity of 170,000cm, and import LNG from the US (with operations originally projected to start in 2018).

The latest available data reveals that GasAtacama has submitted an environmental impact study and has assigned **Golar LNG** to undertake the construction, operation and maintenance of the FSRU terminal. However, GasAtacama website cautions that development of the floating terminal is facing significant headwinds in the face of declining copper prices, increased costs and strong local opposition, making it more difficult for the company to make further progress. The project was suspended in 2017.

Penco Lirquén FSRU

President Michelle Bachelet announced that the construction of another LNG receiving terminal is a national priority. With ENAP coming in as an equity partner, using some of the USD40mn that the government is providing the NOC to improve energy performance, plans for such a terminal have advanced.

The concept of the new terminal was announced in May 2014 as part of a new national energy strategy to move away from coal-powered electricity. Given a lack of substantial gas discoveries, coupled with the country's need for additional electricity feedstock, the additional terminal will provide much-needed feedstock for power generation.

In October 2015, Spanish contractor Duro Felguera was awarded a turnkey contract to build the terminal. At the start of 2017, environmental approval for the project - which will be located in the Concepción Bay, in Chile's Biobio region - was revoked. While the terminal will likely meet the environmental requirements, it is unclear when the project will be completed. The terminal had an initial completion date of the Q218. In light of Cheniere's participation in the project, we expect LNG to be supplied by the company from its Sabine or Corpus Christi export terminals, both are currently under construction in the US with one operating in 2016 and 2018, respectively.

In December 2015, ENAP signed an agreement with Japan's **Mitsui** for the development of two combined-cycle gas-fired thermal power plants, the 760 MW Luz Minera and the 510MW Nueva Era plants, increasing demand for LNG imports. The projects - which reportedly have a cumulative investment value of almost USD1.5bn - will be built in northern and central Chile, respectively, receiving feedstock from the Quintero and Mejillones LNG import terminals. ENAP's selection of Mitsui as partner marks the end of a process that reportedly saw 16 international companies bidding for the partnership, including **Gas Natural Fenosa, Exxon, Mitsubishi, Kospo** and **Samsung**.

On February 1 2017, the energy ministers of Chile and Argentina announced that bilateral trade of natural gas would reverse in 2016 through underutilised midstream infrastructure. The agreement provided Argentina with up to 5.5mn cu m per day of natural gas through the five-month winter season in 2017 (May-September 2017), increasing both Chilean LNG imports and pipeline natural gas exports.

In May 2017, the agreement was renewed for another season. This will involve the shipment of up to 279Mcm of gas to Argentina from June 1 2017 to August 31 2017. The contract allows greater volumes to be shipped to Argentina, if Chile is able to supply it. ENAP, **Enel** and **Aprovisionadora Global de Energía** will supply 54%, 32% and 14% of the total volume, respectively.

In July 2018, Argentina announced it will begin exporting natural gas to Chile from October 2018, following a meeting between the governments of both countries. The gas will come primarily from the Vaca Muerta shale field in the Neuquen basin, and will be sent over the Andes mountain range to Chile's southern province of Biobio. Jiménez told Reuters in an interview in June that gas imported from Argentina could be used for electricity generation, replacing imports from elsewhere, or to heat homes in areas where families still depend on wood, a source of pollution in the center-south region.

These agreements were supported by the agenda of President Mauricio Macri, who has prioritised an improvement in international ties in a clear departure from his predecessor, Cristina Fernandez de Kirchner. We believe bilateral trade of natural gas will strengthen an important relationship in the region and improve prospects for a future reversal of trade flows from Argentina to Chile.

GAS NET EXPORTS (CHILE 2016-2021)						
Indicator	2016	2017e	2018f	2019f	2020f	2021f
Dry natural gas net exports, bcm	-4.0	-4.3	-4.4	-4.6	-4.7	-4.9
Dry natural gas net exports, % y-o-y	16.8	5.4	3.7	3.4	3.5	4.0
Dry natural gas net exports, USDbn	-0.8	-1.1	-1.6	-1.7	-1.9	-2.0
Pipeline gas net exports, bcm	0.0	0.0	0.0	0.0	0.0	0.0
Pipeline gas net exports, % of total	0.0	0.0	0.0	0.0	0.0	0.0
LNG net exports, bcm	-4.8	-4.5	-4.4	-4.6	-4.7	-4.9
LNG net exports, % y-o-y	38.7	-7.1	-1.0	3.4	3.5	4.0
LNG net exports, % of total gas exports	118.8	104.7	100.0	100.0	100.0	100.0

e/f = Fitch Solutions estimate/forecast. Source: EIA, JODI, Fitch Solutions

GAS NET EXPORTS (CHILE 2022-2027)						
Indicator	2022f	2023f	2024f	2025f	2026f	2027f
Dry natural gas net exports, bcm	-5.1	-5.4	-5.6	-5.8	-6.0	-6.2
Dry natural gas net exports, % y-o-y	4.3	4.5	3.9	3.6	3.9	4.3
Dry natural gas net exports, USDbn	-2.1	-2.2	-2.3	-2.4	-2.4	-2.5
Pipeline gas net exports, bcm	0.0	0.0	0.0	0.0	0.0	0.0
Pipeline gas net exports, % of total	0.0	0.0	0.0	0.0	0.0	0.0
LNG net exports, bcm	-5.1	-5.4	-5.6	-5.8	-6.0	-6.2
LNG net exports, % y-o-y	4.3	4.5	3.9	3.6	3.9	4.3
LNG net exports, % of total gas exports	100.0	100.0	100.0	100.0	100.0	100.0

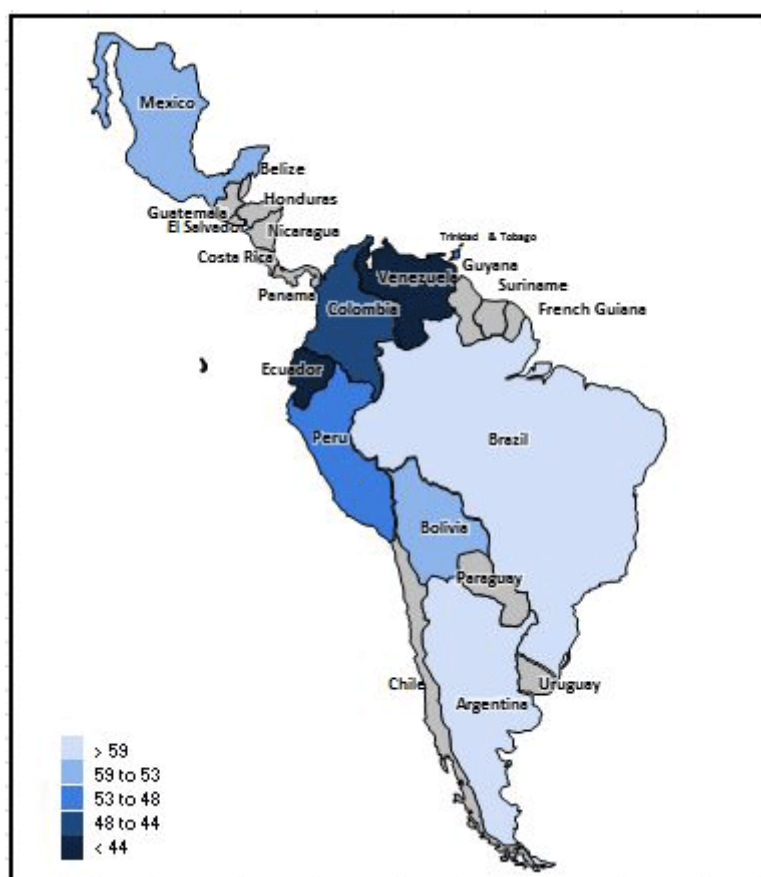
f = Fitch Solutions forecast. Source: JODI, EIA, Fitch Solutions

Industry Risk/Reward Index

Upstream Latam: Sector Reforms Offset By State Intervention

Key View: Latin America is home to some of the top upstream markets in our Upstream Oil & Gas RRI thanks to substantial untapped rewards, particularly offshore. A number of producers underperform due to heavy state-run ownership while growing government intervention threatens to slow progress in larger markets. Resource-rich Brazil remains first in the region, while a lack of investment and operational setbacks keep Venezuela at the bottom of the pack.

OPEC Markets Trailing
Heat Map of Latam Upstream RRI



Note: Scores out of 100; higher score = lower risk. Source: Fitch Solutions US RRI

Main Regional Features & Latest Updates:

- Latin America's (Latam) upstream industry scores just above the global average in our overall Upstream Risk/Reward Index (RRI) with a score of 51.1, up from 50.7 last quarter. Its performance reflects how the region's above-ground risks offset its vast hydrocarbon resource potential.
- Upstream Rewards in Latam are stronger than the global average at 52.1 due to vast proven reserves and a relatively large production base. Upstream Risks underperform at 42.8 as a result of a less-favourable regulatory framework and elevated political/operational risk in a number of producing countries.
- Regional outperformers include large oil and gas producers and those that enjoy more investor-friendly development terms. Brazil's vast deepwater potential and improving investment climate maintained its top spot in the region while an ongoing economic and political crisis continues to weigh on Venezuela's upstream performance.

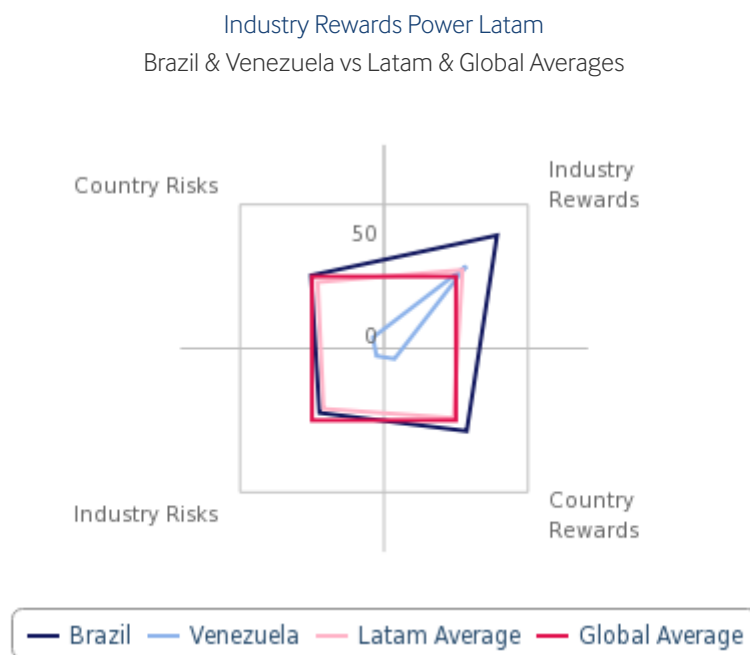
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- Though Latam holds substantial undeveloped resources, strong pullbacks by heavily indebted national oil companies (NOCs) have weighed on the region's upstream potential. Previous efforts to reform in a number of countries have accelerated but face mounting risks from renewed state-led intervention in both Mexico and Argentina.

Top Rankers Supported By Below-Ground Rewards

Latam is home to some of the most prolific resource basins in the world, particularly onshore Venezuela and deepwater Brazil. However, this alone does not equate to a stronger Upstream RRI score given the importance of the regulatory and policy-making environments with respect to the sector.

This dynamic is illustrated via our upstream rankings where Brazil remains the top performer in the region, anchored by its strong rewards profile. The country significantly outranks its peers in Latam on the back of its Industry Rewards score of 78.5. This is a result of its favourable upstream outlook and healthy below-ground prospects, much of which is located in ultra-deepwaters. Efforts to reform its licensing process in recent years also supported its score as greater private investment flows upstream.



Source: Fitch Solutions US RRI

A strong Rewards score helps elevate Brazil and second-ranked Argentina within our global Upstream RRI, at 4 and 15 respectively. This illustrates the strength of these countries' resource potential and the extent to which elevated political risk and prolonged fiscal constraints have hindered growth elsewhere in the region.

NOC Dominance Undermines Potential

A few countries' operations have been negatively impacted more than Venezuela, the last-ranking country in our Latam RRI and the 61st-ranked country out of 68, globally. The country houses the largest oil reserves in the world at nearly 300bn bbl (albeit a less desirable extra-heavy oil). However, a lack of investment upstream due to limited funds being utilised for debt repayments has all but suspended development as decline rates accelerate within the country's mature heavy oil basins.

Latam Rewards Besting Global Average
Upstream Risk/Reward Scores



Note: dashed line = global upstream average score. Source: Fitch Solutions US RRI

Fellow OPEC member Ecuador also suffered in the wake of the price crash given its dependence on state-led growth. Weak showings in both the Risks and Rewards segments of our Index have ranked the country eighth out of nine in the region, suggesting systemic inefficiencies will hold back its upstream potential for the next several quarters.

Compared to our global rankings, both Venezuela and Ecuador perform poorly. The region as a whole performs slightly above the global average; however these underperformers score well below, with Venezuela ranking 61 and Ecuador 56 out of 68 countries total. This is due in large part to the tenuous financial situations at both countries' NOCs, particularly in Venezuela.

By contrast, countries that advance efforts to boost private sector participation including Brazil and Argentina will strengthen and solidify their scores within our Upstream RRI. This has been particularly evident in Brazil where a more favourable licensing regime under the Temer administration has attracted significant private investment into the upstream. However, we caution that rising oil prices have also undermined price liberalisation efforts, spurring renewed state intervention in Brazil as well as Mexico and Argentina. We therefore caution that RRI Rewards could fall across the region in coming quarters.

Latin America Upstream RRI
Upstream Risks and Rewards

RRI	Industry Rewards	Country Rewards	REWARDS	Industry Risks	Country Risks	RISKS	RRI	Regional Rank	Global Rank
Brazil	78.5	57.5	70.1	44.8	50.7	46.0	67.7	1	4
Argentina	63.7	59.0	61.8	40.6	49.4	42.4	59.9	2	15
Mexico	69.0	37.1	56.2	57.6	58.1	57.7	56.3	3	24
Bolivia	46.7	71.1	56.5	42.5	34.5	40.9	54.9	4	27
Trinidad And Tobago	49.1	59.2	53.1	42.5	57.2	45.5	52.4	5	29
Peru	44.3	55.0	48.6	55.2	58.8	55.9	49.3	6	37
Colombia	42.8	52.2	46.6	52.4	55.1	52.9	47.2	7	40
Ecuador	39.0	37.6	38.4	36.9	42.0	37.9	38.3	8	56
Venezuela	57.2	7.2	37.2	5.2	7.7	5.7	34.0	9	61
Global Average	50.0	50.0	50.0	50.0	50.0	50.0	50.0	~	~
Regional Average	54.5	48.4	52.1	42.0	46.0	42.8	51.1	~	~

Note: Scores out of 100; higher score = better performance. Source: Fitch Solutions US RRI

Latin America Upstream Rewards
Upstream Rewards

Rewards	Oil Reserves	Gas Reserves	Discoveries Rate - last 5 years	Hydrocarbon Production	Hydrocarbon Production Growth	Industry Rewards	State Asset Ownership	Competitive Landscape	Infrastructure Integrity	Country Rewards	REWARDS	RRI	Regional Rank	Global Rank
Brazil	79.1	46.3	98.5	85.1	83.6	78.5	62.7	26.9	82.8	57.5	70.1	67.7	1	4
Argentina	53.7	44.8	87.3	62.7	70.1	63.7	68.7	53.7	54.5	59.0	61.8	59.9	2	15
Mexico	76.1	53.7	94.0	77.6	43.3	69.0	17.9	38.8	54.5	37.1	56.2	56.3	3	24
Bolivia	23.9	40.3	70.9	44.8	53.7	46.7	62.7	76.1	74.6	71.1	56.5	54.9	4	27
Trinidad And Tobago	22.4	41.8	56.0	50.7	74.6	49.1	48.5	74.6	54.5	59.2	53.1	52.4	5	29
Peru	34.3	47.8	15.7	46.3	77.6	44.3	82.8	64.2	17.9	55.0	48.6	49.3	6	37
Colombia	47.8	34.3	44.0	53.7	34.3	42.8	26.9	61.2	68.7	52.2	46.6	47.2	7	40
Ecuador	74.6	6.0	15.7	47.8	50.7	39.0	21.6	22.4	68.7	37.6	38.4	38.3	8	56
Venezuela	100.0	88.1	15.7	74.6	7.5	57.2	9.7	4.5	7.5	7.2	37.2	34.0	9	61
Global Average	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	~	~
Regional Average	56.9	44.8	55.3	60.4	55.1	54.5	44.6	46.9	53.7	48.4	52.1	51.1	~	~

Note: Scores out of 100; higher score = better performance. Source: Fitch Solutions US RRI

Latin America Upstream Risks
Upstream Risks

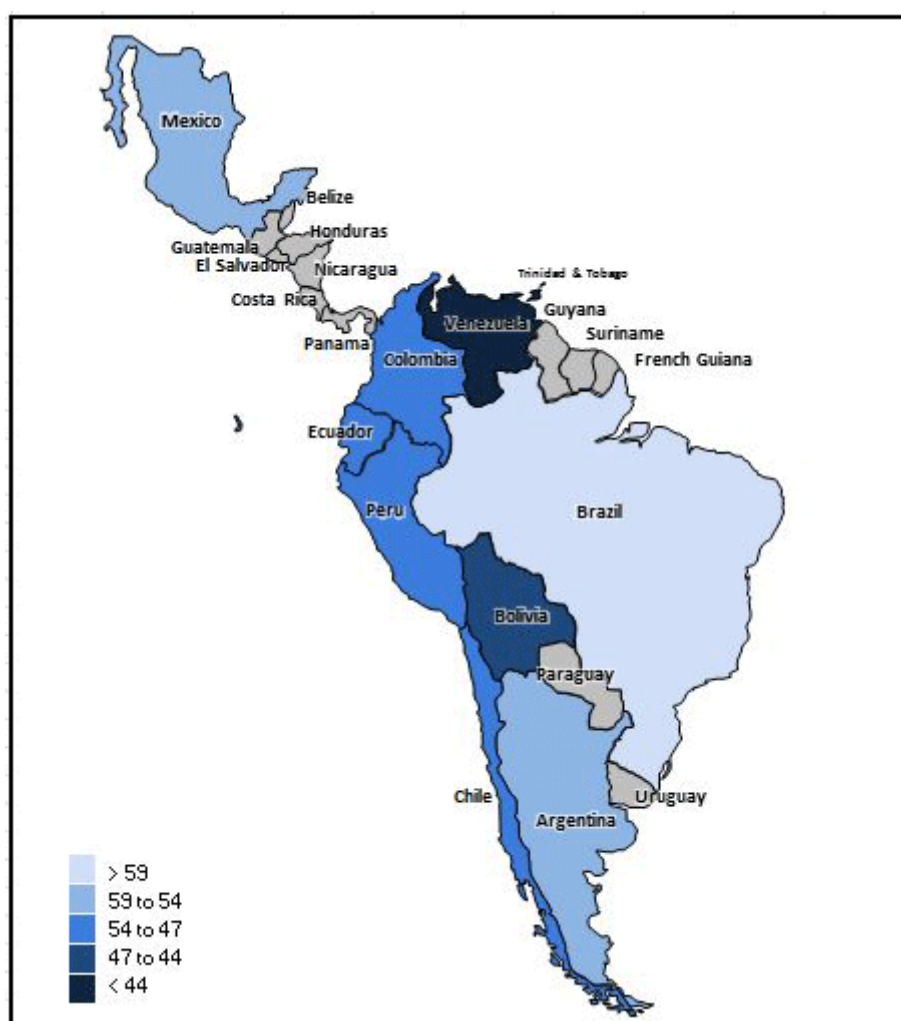
Risks	Royalties	Income Tax	License Type	Bureaucratic Environment	Legal Environment Risk	Industry Risks	Long Term Economic Risk Index	Short Term Economic Risk Index	Long Term Political Risk Index	Short Term Political Risk Index	Operational Risk Index	Country Risks	RISKS	RRI	Regional Rank	Global Rank
Brazil	44.0	40.3	42.5	23.9	73.1	44.8	61.2	56.0	71.6	23.1	46.3	50.7	46.0	67.7	1	4
Argentina	32.1	35.1	59.7	26.9	49.3	40.6	52.2	44.0	49.3	55.2	47.8	49.4	42.4	59.9	2	15
Mexico	44.0	49.3	71.6	64.9	58.2	57.6	68.7	80.6	53.7	29.1	58.2	58.1	57.7	56.3	3	24
Bolivia	89.6	70.9	13.4	14.9	23.9	42.5	59.7	47.0	25.4	20.9	26.9	34.5	40.9	54.9	4	27
Trinidad And Tobago	68.7	11.9	50.0	44.8	37.3	42.5	65.7	70.1	68.7	40.3	49.3	57.2	45.5	52.4	5	29
Peru	59.7	57.5	50.0	61.2	47.8	55.2	73.9	82.1	52.2	31.3	56.7	58.8	55.9	49.3	6	37
Colombia	7.5	70.9	71.6	70.1	41.8	52.4	67.2	64.2	47.8	44.0	53.7	55.1	52.9	47.2	7	40
Ecuador	19.4	80.6	5.2	38.8	40.3	36.9	55.2	53.7	22.4	19.4	50.7	42.0	37.9	38.3	8	56
Venezuela	0.0	11.9	5.2	7.5	1.5	5.2	3.0	0.0	14.9	4.5	11.9	7.7	5.7	34.0	9	61
Global Average	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	~	~
Regional Average	40.5	47.6	41.0	39.2	41.5	42.0	56.3	55.3	45.1	29.8	44.6	46.0	42.8	51.1	~	~

Note: Scores out of 100, higher score = better performance. Source: Fitch Solutions US RRI

Downstream Latam: Above-Ground Risks Undermine Regional Performance

Key View: Latin America underperforms in our Downstream Oil and Gas Risk/Reward Index as a result of strong state intervention and elevated political risk. Downstream progress will be held back by a lack of investment as NOCs direct funds to the upstream. Sizeable demand for fuel puts Brazil at the top of our index while a small market size pushes T&T to the bottom of the pack.

Brazil Still On Top
Heat Map of Latam Downstream RRI



Note: Scores out of 100; higher score = more attractive market. Source: Fitch Solutions RRI

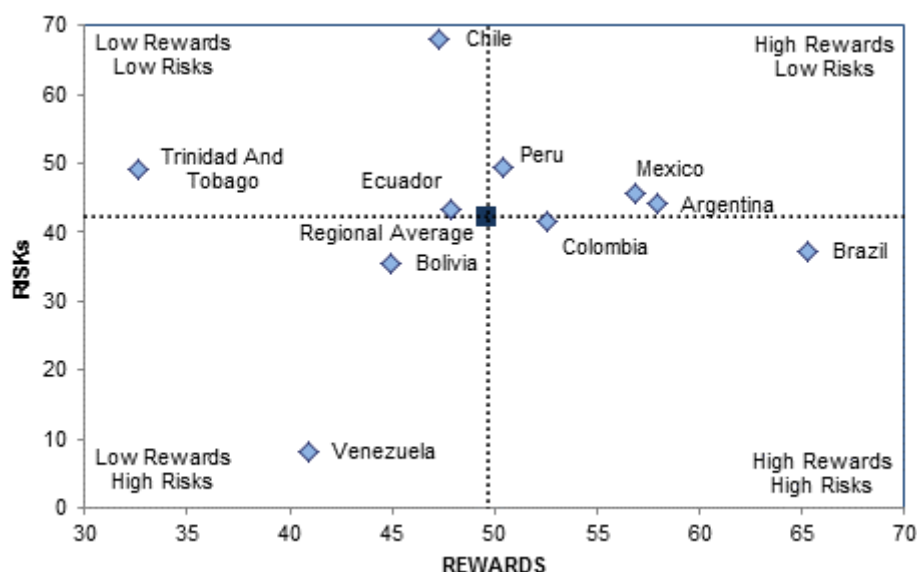
Main Regional Features & Latest Updates:

- Latin America (Latam) scores below the global average in our Downstream Risk/Reward Index (RRI) with a score of 48.7. This score reflects how the region's challenging above-ground environment undercuts its improving demand potential.
- Downstream rewards in Latam are slightly weaker than the global average at 49.4. Rewards are supported by sizeable refining capacity and favourable demand dynamics in a number of key markets. Downstream risks underperform at 42.3 due to elevated political instability and continued use of fuel subsidies in several countries in the region.
- Latam's downstream outperformers include its largest fuel consuming markets as well as those with a stronger political and economic risk profile. Brazil's large refining capacity and upbeat demand outlook put it at the top of our regional index, followed

by Mexico, due to a gradual move towards market-based fuel prices. Meanwhile, a limited downstream market put Trinidad & Tobago (T&T) at the bottom of our index, ranking 80 out of 88 countries, globally.

- A stronger focus on the upstream has reduced investment into the downstream throughout the region, a trend we expect to continue over the next several years. The few countries where state-led operators are investing in refining capacity, including Peru and Chile, are therefore likely to improve their scores in subsequent quarters.

Venezuela Far Behind
Latam Downstream RRI Scatter Plot



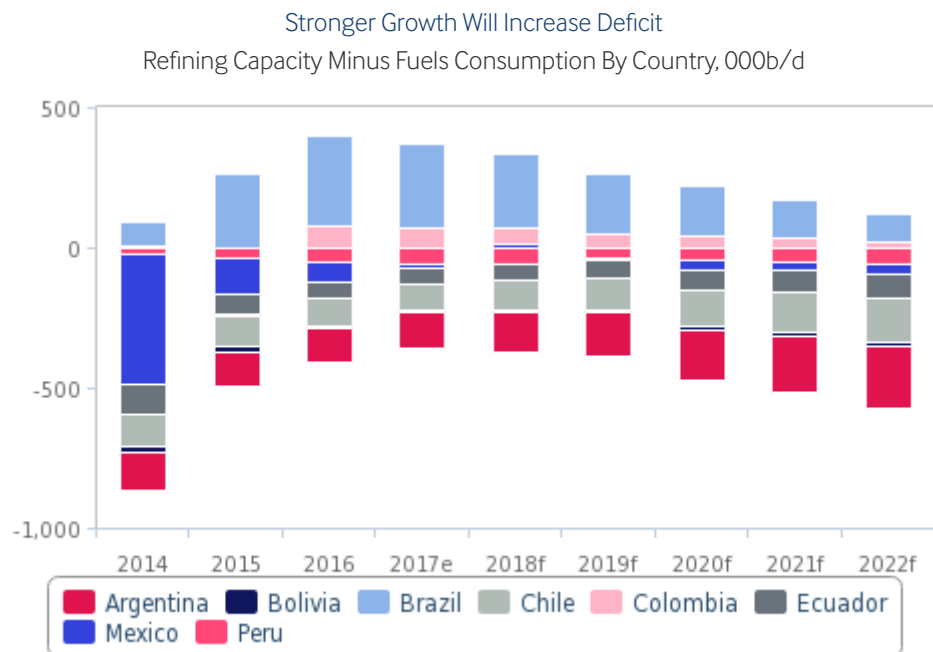
Note: Scores out of 100; Higher score = more attractive market. Source: Fitch Solutions RRI

Outperformers Boosted By Rewards

The downstream sector in Latin America is supported by its Industry Rewards segment at 49.4 points, which is just below the global average of 50.0. This category is held up by a substantial refining base and elevated domestic demand in a number of key markets.

This dynamic is demonstrated in our Downstream Rewards rankings, with Brazil, Argentina and Mexico outranking their peers in Latam. These countries also outperform the global average because of substantial theoretical net exports and a large domestic consumer base. Rewards are also supported by strong downstream infrastructure integrity relative to others within the region.

However, the top three were less successful across our global ranking. The countries ranked 12, 28 and 31 respectively, out of 88 countries. This illustrates the insufficient pace of downstream development relative to demand. Specifically, these countries suffer from elevated downstream risks with scores below 55.0 which contribute to the regional underperformance of this component at 42.3.



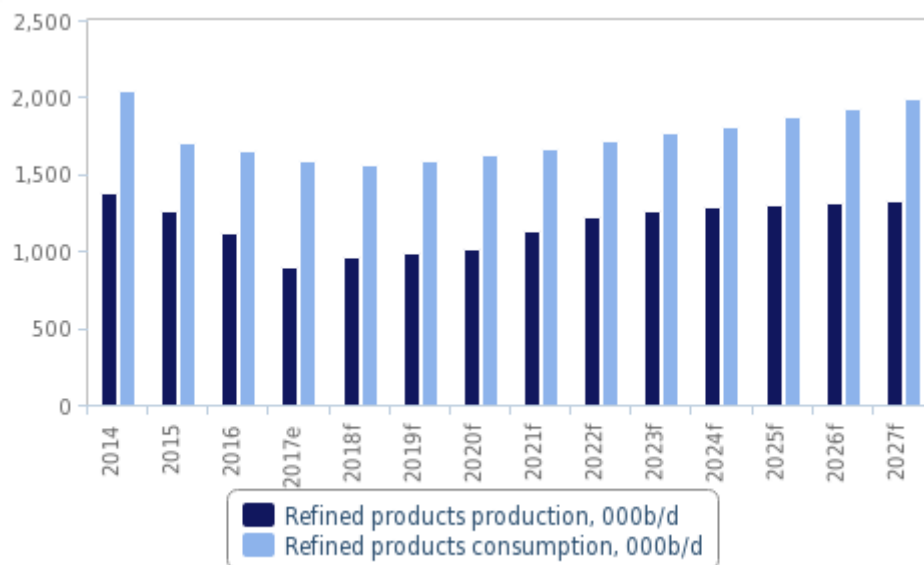
e/f = Fitch Solutions estimate/forecast. Source: National sources, Fitch Solutions

Upstream Focus Holds Back Downstream Potential

The continued dominance of state-owned companies within the region will stymie efforts to develop downstream. Having enacted ambitious refinery expansion plans earlier in the decade, the sharp fall in oil prices forced national oil companies (NOCs) to reassess investment strategies. This resulted in a sharp pullback in downstream capex across the region as companies shifted their focus to the upstream.

We therefore caution that a refining deficit will deepen in a number of regional markets through 2022. We expect a growing shortfall in Mexico where the positive impacts of sector liberalisation will not materialise for several years, leaving the burden of development largely on heavily-indebted NOC **Pemex** in the interim. President-elect Andres Manuel Lopez Obrador (AMLO) has vowed to renew the company's focus downstream, although these developments, if achieved, would not materialise until the back half of our forecast period, sustaining a domestic shortfall over the next several years.

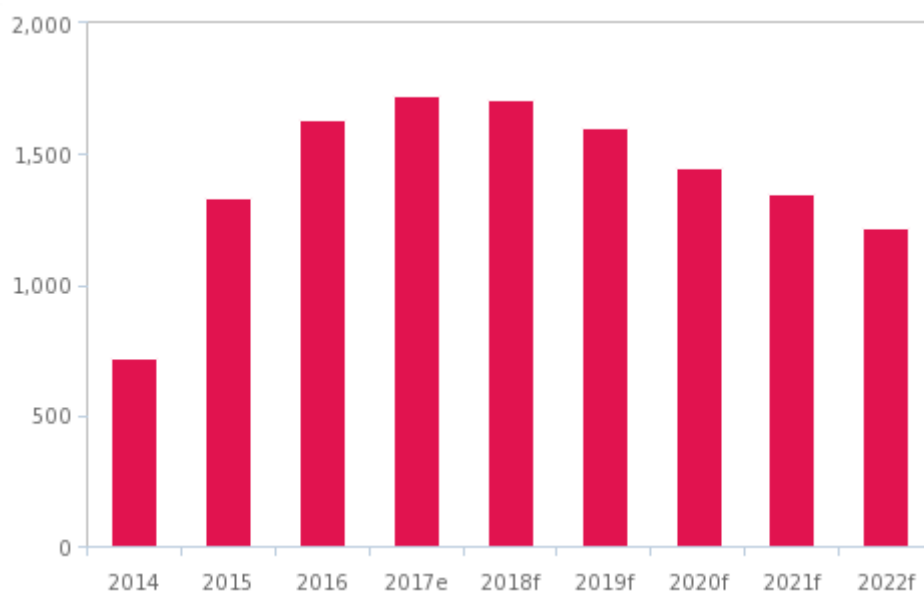
Shortfall Will Remain Intact
Mexico - Refined Fuels Supply & Demand



e/f = Fitch Solutions estimate/forecast. Source: SENER, Fitch Solutions

Several other countries in Latam will also struggle to meet fuels demand via domestic supplies, particularly as regional growth accelerates on the back of stronger commodity prices. However, growth will prove relatively modest in a number of countries, including Argentina, Chile and Peru - owing to lingering above-ground challenges. We therefore believe net fuels imports into the region will fall over the next five years from an estimated 1.7mn b/d in 2017 to just over 1.2 mn b/d by 2022.

Deficit On The Decline
Latam - Implied Net Fuels Imports, 000b/d



e/f = Fitch Solutions estimate/forecast. Source: National sources, Fitch Solutions

Latam Downstream RRI
Latam Downstream Risk/Reward Index

RRI	Industry Rewards	Country Rewards	REWARDS	Industry Risks	Country Risks	RISKS	RRI	Regional Rank	Global Rank
Brazil	66.7	59.4	64.5	28.2	42.5	35.3	61.6	1	12
Mexico	58.6	53.3	57.0	54.0	49.5	51.8	56.5	2	28
Argentina	58.0	55.9	57.4	38.8	41.3	40.0	55.6	3	31
Colombia	57.4	42.1	52.8	38.2	46.5	42.3	51.8	4	43
Peru	46.6	61.3	51.0	48.9	49.8	49.3	50.9	5	45
Chile	44.3	55.2	47.5	59.8	76.2	68.0	49.6	6	48
Ecuador	50.9	41.2	48.0	51.7	34.9	43.3	47.5	7	50
Bolivia	42.4	51.0	44.9	41.4	29.4	35.4	44.0	8	59
Venezuela	37.4	40.4	38.3	9.2	6.1	7.7	35.2	9	79
Trinidad And Tobago	37.6	20.5	32.5	50.6	48.5	49.5	34.2	10	80
Global Average	49.4	50.0	50.0	50.0	50.0	50.0	49.8	~	~
Regional Average	50.0	48.0	49.4	42.1	42.5	42.3	48.7	~	~

Note: Scores out of 100; higher score = better performance. Source: Fitch Solutions DS RRI

Downstream Risks
Latam Downstream Risk Index

Risks	Logistics Risk Rating	Fuel Subsidies	Industry Risks	Long Term Economic Risk Index	Short Term Economic Risk Index	Long Term Political Risk Index	Short Term Political Risk Index	Operational Risk Index	Country Risks	RISKS	RRI	Regional Rank	Global Rank
Brazil	34.5	21.8	28.2	54.0	48.9	59.8	19.0	36.8	42.5	35.3	61.6	1	12
Mexico	52.9	55.2	54.0	60.9	72.4	46.0	23.6	47.1	49.5	51.8	56.5	2	28
Argentina	39.1	38.5	38.8	43.7	39.7	42.5	46.0	37.9	41.3	40.0	55.6	3	31
Colombia	37.9	38.5	38.2	58.6	57.5	40.2	37.4	42.5	46.5	42.3	51.8	4	43
Peru	42.5	55.2	48.9	64.9	73.6	44.8	25.9	44.8	49.8	49.3	50.9	5	45
Chile	64.4	55.2	59.8	69.0	75.9	87.4	79.3	73.0	76.2	68.0	49.6	6	48
Ecuador	48.3	55.2	51.7	47.1	47.1	18.4	16.1	40.2	34.9	43.3	47.5	7	50
Bolivia	27.6	55.2	41.4	52.9	42.0	20.7	17.2	21.8	29.4	35.4	44.0	8	59
Venezuela	18.4	0.0	9.2	2.3	0.0	12.6	3.4	9.2	6.1	7.7	35.2	9	79
Trinidad And Tobago	46.0	55.2	50.6	57.5	63.2	57.5	34.5	39.1	48.5	49.5	34.2	10	80
Global Average	49.8	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	49.8	~	~
Regional Average	41.1	43.0	42.1	51.1	52.0	43.0	30.2	39.3	42.5	42.3	48.7	~	~

Note: Scores out of 100; higher score = better performance. Source: Fitch Solutions US RRI

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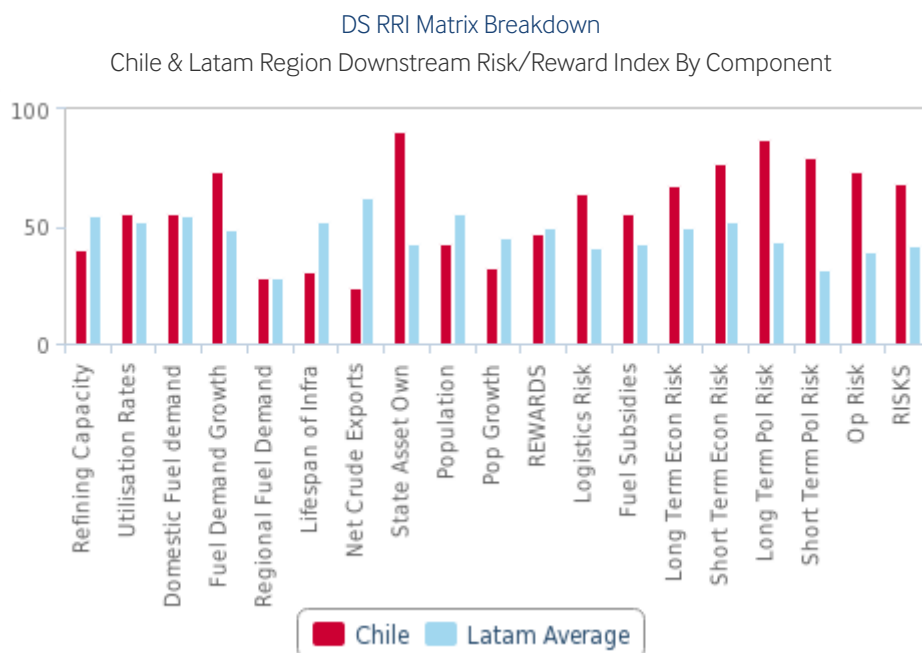
Downstream Rewards
Latam Downstream Rewards Index

Rewards	Refining Capacity	Utilisation Rates	Domestic Fuel demand	Fuel demand Growth	Regional fuel demand	Life span of infrastructure	Theoretical net crude exports	Industry Rewards	State asset ownership	Population	Population growth	Country Rewards	REWARDS	RRI	Regional Rank	Global Rank
Brazil	92.0	36.8	89.7	47.1	28.2	86.8	86.2	66.7	52.9	95.4	23.9	59.4	64.5	61.6	1	12
Mexico	86.2	29.9	83.9	40.2	28.2	58.0	83.9	58.6	14.9	90.8	54.0	53.3	57.0	56.5	2	28
Argentina	63.2	78.2	71.3	57.5	28.2	58.0	49.4	58.0	59.8	67.8	40.2	55.9	57.4	55.6	3	31
Colombia	56.3	74.7	57.5	59.8	28.2	47.1	78.2	57.4	21.8	71.3	33.3	42.1	52.8	51.8	4	43
Peru	40.2	87.4	48.3	70.1	28.2	15.5	36.8	46.6	72.4	58.6	52.9	61.3	51.0	50.9	5	45
Chile	41.4	56.3	56.3	73.6	28.2	31.0	23.0	44.3	90.8	42.5	32.2	55.2	47.5	49.6	6	48
Ecuador	34.5	47.1	43.7	56.3	28.2	69.5	77.0	50.9	17.8	41.4	64.4	41.2	48.0	47.5	7	50
Bolivia	24.1	49.4	25.3	36.8	28.2	75.3	57.5	42.4	52.9	33.3	66.7	51.0	44.9	44.0	8	59
Venezuela	80.5	13.8	52.9	0.0	28.2	1.1	85.1	37.4	8.6	56.3	56.3	40.4	38.3	35.2	9	79
Trinidad And Tobago	32.2	42.5	12.6	27.6	28.2	75.3	44.8	37.6	40.8	1.1	19.5	20.5	32.5	34.2	10	80
Global Average	50.0	50.0	49.4	49.4	50.0	50.0	50.0	49.4	50.0	50.0	50.0	50.0	50.0	49.8	'	'
Regional Average	55.1	51.6	54.1	46.9	28.2	51.8	62.2	50.0	43.3	55.9	44.9	48.0	49.4	48.7	'	'

Note: Scores out of 100, higher scores = better performance. Source: Fitch Solutions DS RRI

Chile Downstream Oil & Gas Risk/Reward Index

Key View: Chile's downstream score is supported by limited operational and political risk, as well as a favourable domestic demand outlook. The country ranks sixth in our regional index, weighed down by a smaller domestic market size.



Source: Fitch Solutions DS RRI, Fitch Solutions

Global And Regional Ranks:

- Regional rank (out of 10): 6th
- Global rank (out of 88): 48th

Key Features And Latest Updates:

- Chile's downstream strength is underpinned by its strong Country Risks score due to limited political and economic risks in the country. Its overall score of 76.2 is well above the regional average of 42.5.
- The country's downstream performance is also as bolstered by its Industry Risks score of 59.8. Chile's low logistical risk forms the base of this component but is offset by continued use of subsidies.
- The country's Industry Rewards score of 55.2 weighs down its overall score compared to a regional average of 48.0. Its weakest sub component is undermined by lack of exports and a smaller domestic market.
- We expect Chile will maintain a lower rank in the region over subsequent quarters given the limited size of the market and a lack of planned downstream expansions.

Limited Risks Boosting Score
Country & Industry Risks & Rewards



Source: Fitch Solutions DS RRI, Fitch Solutions

Market Overview

Chile Energy Market Overview

Relevant Government Ministries

The Chilean Ministry of Energy was created in 2009, breaking away from the mining and economy ministries. It oversees several subsidiary agencies that gather data on prices and energy demand, and encourage energy conservation.

However, the oil sector is essentially the exclusive preserve of national oil company National Oil Company (NOC) **Empresa Nacional del Petróleo** (ENAP). ENAP is responsible for the country's modest upstream activities and three oil refineries, but is beset with efficiency issues that require direct infusions of government capital.

Regulatory Bodies

The Comisión Nacional de Energía is Chile's energy regulator and is responsible for analysing prices, tariffs and technical standards for production, generation and transmission and distribution of energy within the country.

The Superintendencia de Electricidad y Combustibles (SEC) supervises and monitors energy firms operating in Chile, and ensures their compliance with laws and regulations. It has authority to impose penalties on firms in violation of such laws and regulations. The SEC also monitors the electricity markets, particularly with regards to firms' compliance with the national Grid Code.

National Oil Company

ENAP is the Chile's NOC, and is responsible for the country's modest upstream activities, three oil refineries and the sale of hydrocarbons and their derivatives. ENCAP, however, it is beset with efficiency issues that require direct infusions of government capital. ENAP was created by Law No. 9618, June 19 1950.

Investment Rounds

A 2010 licensing round for parcels in the southern Magallanes area received little interest. London-based agents **Stellar Energy Advisors** handled the by-invitation-only auction. All of the parcels are covered by basic law that requires bidders to partner with ENAP. **Geopark**, **YPF** and **Wintershall** were the successful bidders on five parcels, described in industry journals as older production areas containing smaller and depleted or declining marginal fields. The agent reported that the total investment for the five fields from the three companies was a modest USD145mn over five years.

Coalbed methane exploration is beginning in Chile, with ENAP signing an agreement with small Canadian independent **Galilee Energy**. The announcement in May 2014, outlined a six-month geological study of parts of the Magallanes Basin in southern Chile. The memorandum of understanding covers 7,200sq km of the basin, and the companies intend to drill one or two wells based on the results of studies. Equity and risk sharing has not been disclosed. The Canadian company also announced plans for independent analysis of other prospects in the region.

In August 2014, **ConocoPhillips** and ENAP agreed to jointly conduct geological and geophysical surveys of the southern Magallanes' potential for unconventional hydrocarbon production. ConocoPhillips will contribute technical expertise and technology to define potential areas of interest in the region, coupled with ENAP's own efforts to increase the region's overall producing capacity. In addition, Chile-based GeoPark is investing in the region with hopes of increasing long-term production rates of Chile's shale resources.

Given a lack of involvement from international partners in the wake of lower oil prices, in August 2015 ENAP submitted an environmental impact assessment to local authorities for the drilling of 60 exploration and/or development wells in the Magallanes region. The USD204mn project will be in the Arenal block targeting unconventional natural gas resources where ENAP is already active. This plan also includes the construction of related infrastructure to help facilitate the process. In January 2016, Chilean environmental authorities approved the plan, clearing an important hurdle for the state-run company.

Oil & Gas Infrastructure

OIL REFINERIES

Location	Project Name	Capacity -B/D	Capacity -TPA	Status	Construction-completion	Operator
Concepcion	BioBio (Hualpen)	116,000	5,776,800	Active	1966	ENAP (100%)
Magallanes	Gregorio	15,700	781,860	Active	1980	ENAP (100%)
Valparaiso	Aconcagua (Concon)	104,000	5,179,200	Active	1954	ENAP (100%)

Source: Fitch Solutions Global Refineries Database, Fitch Solutions

LNG TERMINALS IN CHILE

Name	Location	Status	Type	Capacity(mn tpa)	Capacity(bcm)	Owners	Start-Up Date
Mejillones LNG	Antofagasta (N)	Operational	Onshore	1.5	2.07	Engie(63){France}, Codelco(37){Chile}	2010
Quintero LNG	Valparaiso	Operational	Onshore	2.7	3.73	ENAP (40){Chile}, Empresa Nacional de Electricidad (Endesa)(20){Chile}, Metrogas(20){Spain}, Oman Oil Company{Oman}, Enagas{Spain}	2009
Quintero LNG (Expansion Phase I)	Valparaiso	Operational	Onshore	1.3	1.79	Oman Oil Company{Oman}, Metrogas{Spain}, Empresa Nacional de Electricidad (Endesa){Chile}, ENAP, Enagas{Spain}	2015
EOS LNG	Talcahuano	Proposed	FSRU	5	6.8	Eos Investment Group[Financier](50){United States}, CRI Investments[Financier](50){Chile}	2019
Penco Lirquen	Concepcion Bay	FID Taken	FSRU	0.011	0.015	Cheniere Energy, Inc{United States}, Australis Power{Chile}	2018
Quintero LNG (Expansion Phase II)	Valparaiso	Proposed	Onshore	1.3	1.79	Oman Oil Company{Oman}, Metrogas {Spain}, Empresa Nacional de Electricidad (Endesa){Chile}, ENAP Enagas{Spain}	2020

Source: Fitch Solutions LNG Projects Database, Fitch Solutions

Competitive Landscape

Chile Oil & Gas Competitive Landscape

Competitive Landscape Summary

Upstream

GeoPark Holdings is the largest crude oil producer in Chile, and is the operator of the Fell block in the Magallanes basin. The country's national oil company **Empresa Nacional del Petróleo** (ENAP) is responsible for all of Chile's natural gas output, to which its fields in the Arenal block, Magallanes, contributes.

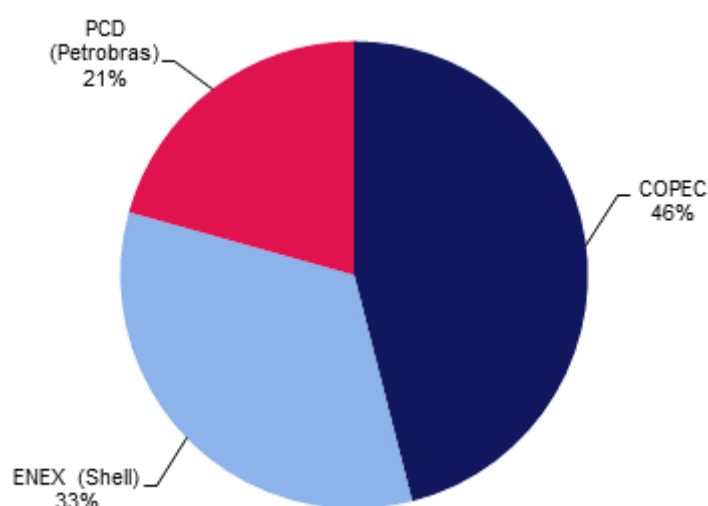
Downstream

ENAP is the only refiner in the Chile, fully owning and operating the country's three active oil refineries. ENAP has nameplate capacity of 235,700b/d.

Retail

Empresas Copec is the largest refined fuels retailer in Chile, operating a network of more than 600 service stations across the country. It is followed by **ENEX** and **PCD**, which are the retail arms of **Royal Dutch Shell** and **Petrobras**, respectively.

COPEC Dominates The Retail Space
% Share Of Retail Market



Source: Company sources

Company Profile

ENAP

Latest Updates

- In November 2016, Enagas purchased a 20% stake (USD197mn) in the Quintero LNG terminal from Gas Natural Fenosa. Empresa Nacional del Petróleo (ENAP) retains the right to a call option on 15% of the Quintero share held by Enagás via a separate agreement. The right is exercisable for a period of two years.
- In May 2017, ENAP issued a bond (USD250mn) on the local market which was 2.5 times oversubscribed. The bond matures after 10 years and carries a yield of 1.87%.
- In April 2018, ENAP announced the inauguration of an incremental offshore project in the Magallanes alongside YPF, its Argentine counterpart. The partners hope to boost natural gas output from 2.4Mcm/d to over 4.0Mcm/d and increase crude from 800 to 1,000cm/d.
- ENAP released its Q218 results in August 2018. Net income fell to USD2mn from USD40mn in Q217, while revenue rose by 26% y-o-y. The increase was mostly related to increased fuels sales. Total debt rose to over USD4.7bn compared to USD4.1bn in Q217. This increased the company's net debt/EBITDA ratio to 7.2.

SWOT Analysis

Strengths

- Controls all oil refineries in the country
- Major domestic oil producer
- Access to prime exploration acreage

Weaknesses

- Stagnant domestic oil production
- Substantial refinery investment programme
- Absent from domestic fuels segment
- Restricted operational and fiscal freedom
- Lack of expertise in unconventional development

Opportunities

- Growth of domestic energy market
- Corporate governance overhaul legislation
- Knowledge transfer from more experienced shale producers

Threats

- Changes in government energy policy
- Limited domestic resource base

Dominant in all parts of Chile's hydrocarbons sector with the exception of retail stations, ENAP is striving to internationalise its asset base and consolidate its domestic position to compete with international oil companies (IOCs) and prepare itself for eventual privatisation. The company plans to triple its annual investment to USD800mn and double hydrocarbon production to 32,000 barrels of oil equivalent a day (boe/d) by 2020.

The plans are part of the ENAP seven-pillar strategy for 2014-2025, under which the company plans to meet 100% of oil and gas demand for 20 years in the southern Magallanes region. ENAP supplies 60% of Chile's oil-based fuels and accounts for 40% of the country's energy demand. ENAP produces oil and gas, operates Chile's three refineries, and has investments in the country's hydrocarbons import and transmission pipelines. The company is also in charge of importing petrol products from abroad.

MAJOR ASSETS IN CHILE

Name	Location	Capacity
Biobío Refinery	Hualpén	116,000b/d
Quintero LNG Terminal	Quintero	15mcm/d
3,000km of wells	Magallanes	3,000b/d

Source: ENAP Company data, Fitch Solutions

KEY FINANCIAL DATA (USDMN)

	FY13	FY14	FY15	FY16	FY17
Revenue	11,211.5	9,837.9	6,351.1	5,217.4	6,420.0
EBITDA	678.3	621.2	742.3	678.1	665.2
Operating Margin	2%	2%	4%	4%	2%

Source: ENAP Company data, Fitch Solutions

Regional Overview

Latin America Oil & Gas Overview

Key View: *A national oil company-led emphasis on the upstream will boost crude and natural gas production in Latin America at the expense of refining capacity growth. Rising political risks threaten the pace of development in a number of producing countries as new administrations increase government intervention in the market.*

To highlight the key themes across our Latin America oil and gas forecasts, we have assessed countries based on the following indicators:

- Oil production
- Oil consumption
- Refining capacity
- Gas production
- Gas consumption

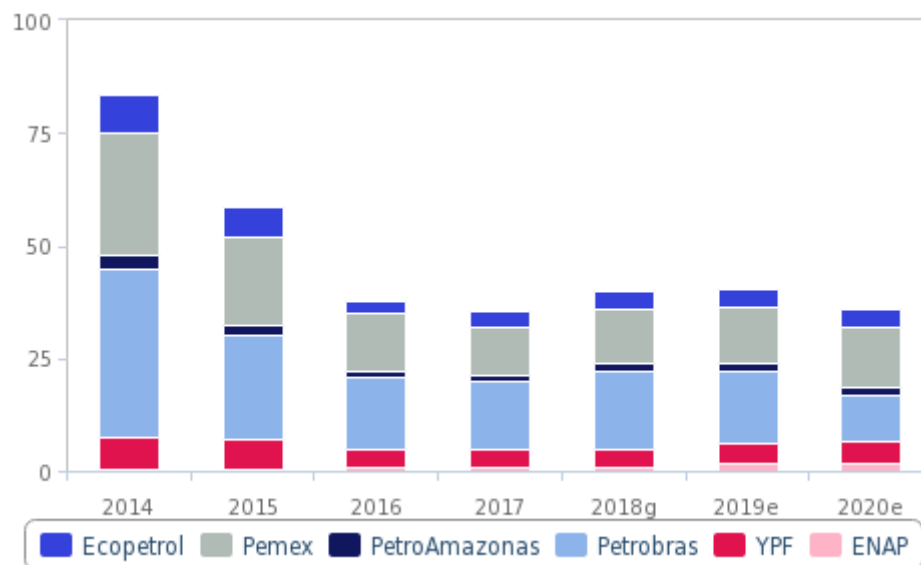
Our Latin America coverage includes Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Mexico, Peru, Trinidad & Tobago (T&T) and Venezuela.

Oil Production: Offshore Propelling Growth

The three largest oil producers in Latin America - Brazil, Mexico and Venezuela - represent nearly 73.0% of the region's total output. Reduced revenue generation among the region's national oil companies (NOCs) in the wake of lower oil prices sharpened their strategic focus on the upstream. NOCs across Latin America operate the vast majority of output in their respective countries, thereby shifting the output trajectory of the region as a whole.

An estimated 80-85% of NOC capex will be spent on exploration and production (E&P) through 2020 versus 50-60% of spending prior to 2015. This will support oil and gas production across the region, shifting midstream and downstream expansions onto the private sector.

Downstream Sacrificed In Capex Crunch
Latin America - NOC Capex, USDbn (2014-2020)

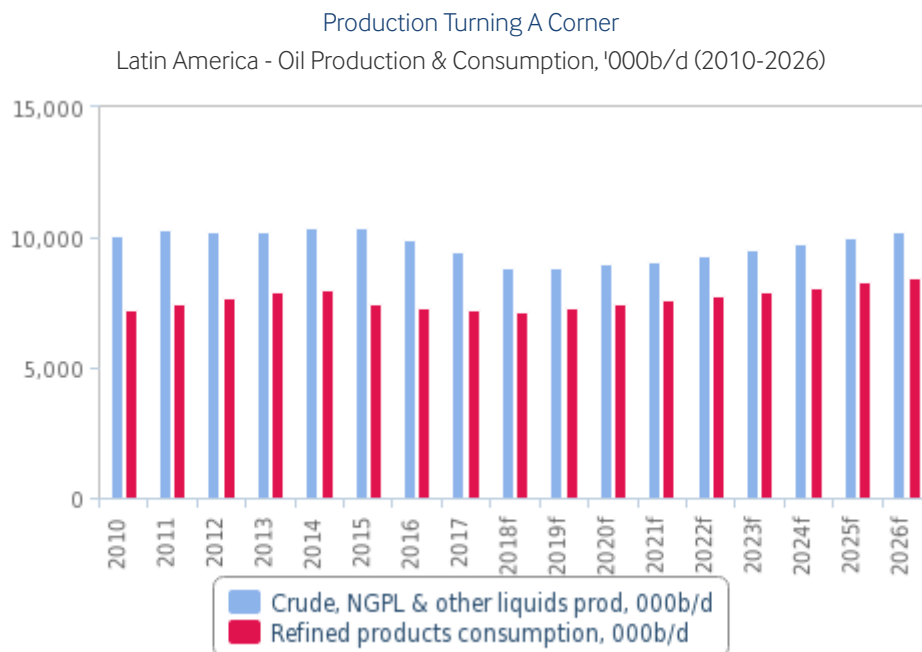


Note: g = company guidance; e = estimate. Source: Company data, Fitch Solutions

Sector liberalisation in Mexico will begin to stabilise the market in 2018. Following the start of the country's first privately owned development in late 2016, we believe new production from Round One licence areas will combine with greater stability at mature fields operated by **Pemex**. This will generate sustained positive production momentum, boosting liquids output from an estimated 2.1mn b/d in 2018 to 2.3mn b/d by 2022.

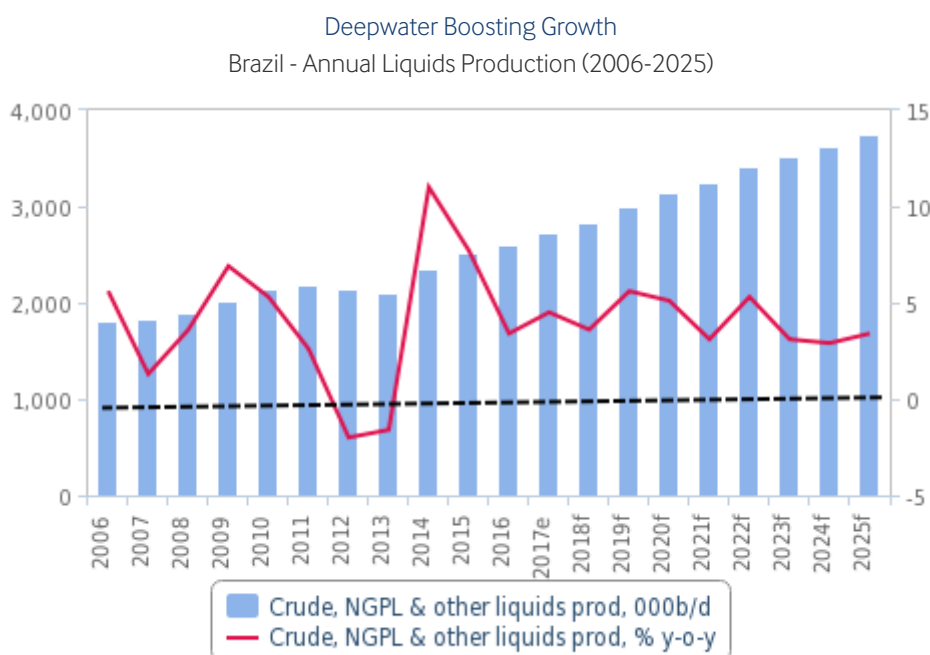
Two major risks will test the appeal of Mexico's untapped resources moving forward. First, we expect Andrés Manuel López Obrador's (AMLO) presidential victory on July 1 2018 will usher in a wave of nationalistic economic policies, promoting greater domestic control of oil and gas resources and a potential suspension of future hydrocarbon licensing rounds. We maintain that AMLO will be limited in his capacity to pass major legislation given that we do not expect his party, Morena, to pick up enough seats to roll back energy reforms codified in the Constitution. Second, the renegotiation of NAFTA could crimp US investment in Mexico. Specifically, the potential removal of the Investor State Dispute Settlement procedure would increase risk for US producers which rely on the measure to settle conflicts via international arbitrators rather than in local courts.

Brazil's share of the Latin American crude market will rise over the next several years as its deepwater project pipeline unfolds. As the largest oil producer in the region, Brazil will be responsible for an estimated 36.0% of Latin American liquids production by 2022 compared to 29% in 2017. This will come at the expense of Venezuela, where prolonged resource mismanagement by NOC **PdVSA** will undermine growth prospects for the foreseeable future.



f = Fitch Solutions forecast. Source: National sources, Fitch Solutions

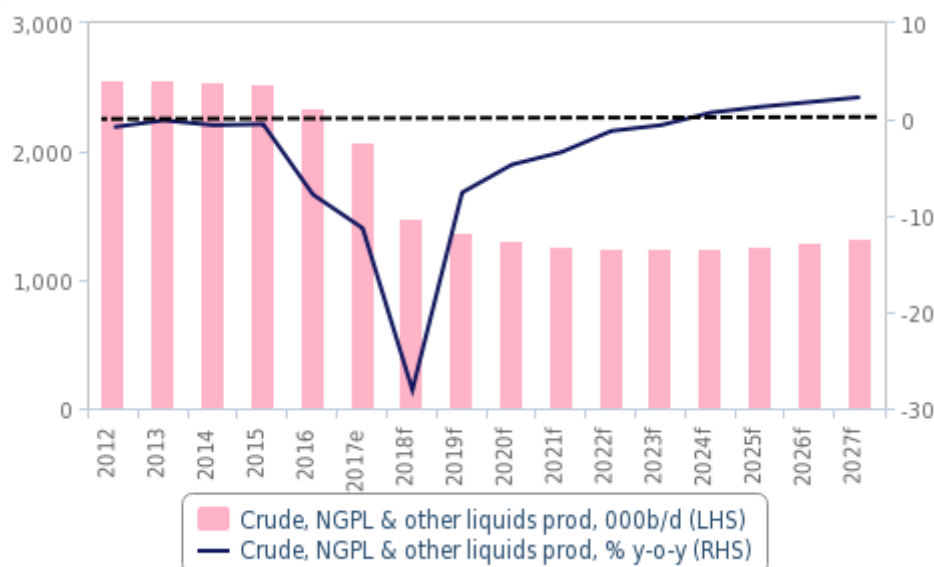
We acknowledge downside risk to our long-term production view in Brazil on the back of renewed government intervention in the oil market. Rising crude prices have undermined fuel price liberalisation efforts by NOC **Petrobras** and have stoked unrest ahead of presidential elections in October. The Temer administration's heavy hand with respect to diesel prices will force the NOC to divert funds into the downstream, thereby threatening its ability to develop future projects, particularly offshore. We do not expect a new administration will change course given the unpopularity of higher fuel prices and continued focus on broader spending adjustments.



e/f = Fitch Solutions estimate/forecast. Source: ANP, Fitch Solutions

Continued political and economic instability will also undermine E&P efforts by PdVSA as the company struggles under the weight of large debt repayments, a loss of skilled labourers and falling production. The country's share of regional crude output will decline through 2027, falling from 22% in 2017 to less than 13%. This compares to a 25% share of the region as recently as 2015. We believe long-term declines could be capped by a constructive change in the political landscape but caution that this is unlikely to materialise before 2020.

Further Declines Ahead
Venezuela - Total Liquids Production (2012-2027)



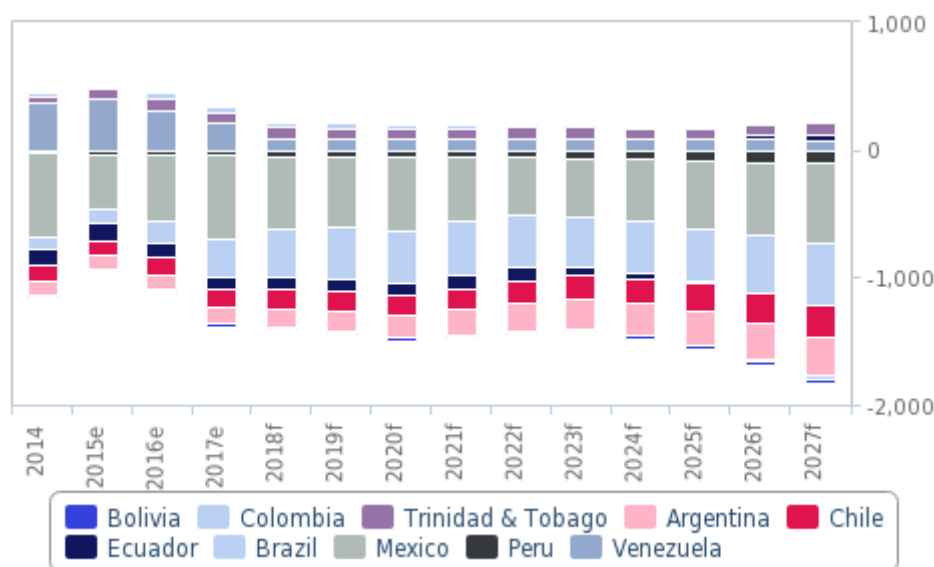
e/f = Fitch Solutions estimate/forecast. Source: OPEC, Fitch Solutions

Oil Consumption: Refined Imports Will Remain Elevated

Latin America's downstream surplus will shrink over the next decade despite refinery expansion and modernisation plans in a number of countries. Refined products consumption in Latin America will rise by an average rate of 1.6% y-o-y through to 2022, reaching 7.8mn b/d from 7.2mn b/d currently, owing to strengthening economies in key consumer markets. This compares to the region's total downstream capacity which we expect will reach 9.15mn b/d by 2022 up from 8.95mn b/d in 2017.

We believe refinery capacity gains will be limited to few countries over the next decade, the bulk of which will come from Ecuador and Brazil. Moreover, the low complexity and high residual oil production of many Latin American refineries will hit margins in the face of IMO low sulphur regulations, thereby limiting expansion efforts beyond 2020. A number of key consuming countries in the region will therefore remain dependent on refined fuel imports, including Mexico, Peru and Chile and Argentina.

Regional Fuels Deficit Is Growing
Latin America - Net Refined Products Exports, '000b/d (2014-2017)



e/f = Fitch Solutions estimate/forecast. Source: National sources, Fitch Solutions

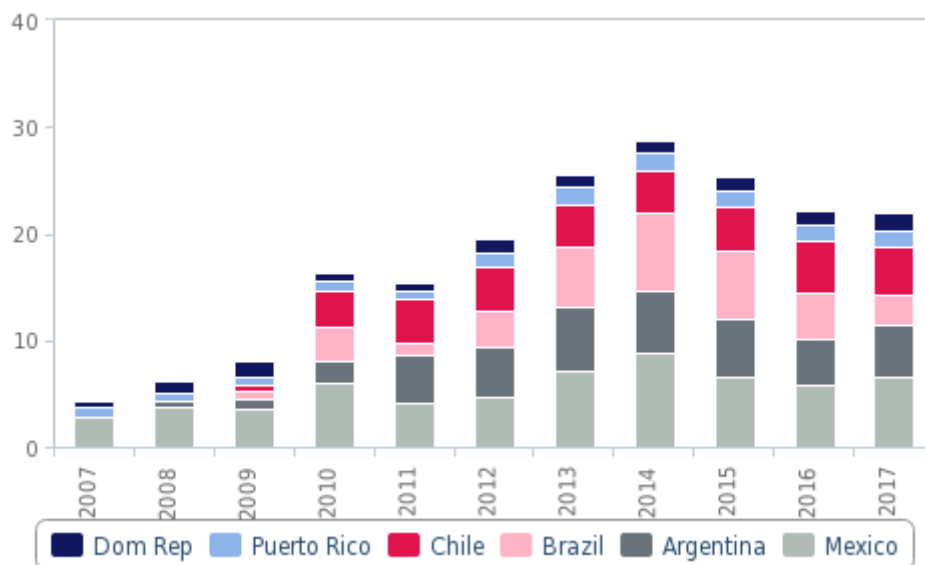
The largest regional refiners, Brazil, Venezuela and Mexico, have plans to increase refining capacity; however, we believe challenges relating to financing these projects will result in further cancellations and delays, thereby supporting our downbeat view.

Gas Production & Consumption: Power Demand Requires Additional Supply

Several countries in Latin America will increase their reliance on natural gas for power generation feedstock to diversify away from less consistent hydropower facilities. We therefore expect natural gas production in the region will rise in response, particularly in Brazil, Argentina and, to a lesser extent, Venezuela.

Output will fail to satisfy growing domestic demand, maintaining a dependence on both pipeline and liquefied natural gas (LNG) imports in Brazil, Chile and Colombia.

Chile Taking On Larger Share
Latin America - Annual LNG Imports By Country, bcm (2007-2017)



Source: Bloomberg, Fitch Solutions

Argentina's role in Latin America's gas sector will grow over the next decade. An improving regulatory environment, falling project costs and supportive gas prices will boost investment into the sector, solidifying y-o-y output growth over our forecast period. We expect natural gas output will rise from an average of 45.2bcm in 2018 to 50.6bcm by 2022. We do acknowledge downside risk to our forecast in the wake of a currency sell off and interest rate hikes by the central bank. However, we expect Argentina's stand-by arrangement with the IMF will help stabilise the economy and boost investor sentiment over the coming quarters.

Mexico fell to third place among gas producers in the region in 2017 behind Argentina and T&T. We forecast Mexican gas output will rise by 2.1% over the next five years, from an estimated 31.7bcm in 2018 to 32.4bcm by 2022. Stronger production growth will be undercut by the country's continued access to inexpensive pipeline imports from the US which the AMLO administration will be keen to leverage moving forward.

T&T will remain a key natural gas producer in Latin America, producing upwards of 41.0bcm by 2022 versus an estimated 36.0bcm in 2018. Its role as the largest exporter of LNG in the wider region will be challenged as US export capacity ramps up through 2021.

Oil & Gas Glossary

Term	Description	Term	Description
AOR	additional oil recovery	km	kilometres
APA	awards for predefined areas	LAB	linear alkyl benzene
API	American Petroleum Institute	LDPE	low density polypropylene
bbl	barrel	LNG	liquefied natural gas
bcm	billion cubic metres	LPG	liquefied petroleum gas
b/d	barrels per day	m	metres
bn	billion	mcm	thousand cubic metres
boe	barrels of oil equivalent	Mcm	mn cubic metres
BTU	British thermal unit	MEA	Middle East and Africa
Capex	capital expenditure	mn	million
CBM	coal bed methane	MoU	memorandum of understanding
CEE	Central and Eastern Europe	mt	metric tonne
CSG	coal seam gas	MW	megawatts
DoE	US Department of Energy	na	not available/ applicable
EBRD	European Bank for Reconstruction & Development	NGL	natural gas liquids
EEZ	exclusive economic zone	NOC	national oil company
e/f	estimate/forecast	OECD	Organisation for Economic Cooperation & Development
EIA	US Energy Information Administration	OPEC	Organization of the Petroleum Exporting Countries
EM	emerging markets	PE	polyethylene
EOR	enhanced oil recovery	PP	polypropylene
E&P	exploration and production	PSA	production sharing agreement
EPSA	exploration and production sharing agreement	PSC	production sharing contract
FID	final investment decision	q-o-q	quarter-on-quarter
FDI	foreign direct investment	R&D	research and development
FEED	front end engineering and design	R/P	reserves/production
FPSO	floating production, storage and offloading	RPR	reserves to production ratio
FTA	free trade agreement	SGL	strategic gas initiative
FTZ	free trade zone	Sol	statement of intent
GDP	gross domestic product	SPA	sale and purchase agreement
G&G	geological and geophysical	SPR	strategic petroleum reserve
GoM	Gulf of Mexico	t/d	tonnes per day
GS	geological survey	tcm	trillion cubic metres
GTL	gas-to-liquids conversion	toe	tonnes of oil equivalent
GW	gigawatts	tpa	tonnes per annum
GWh	gigawatt hours	TRIPS	Trade-Related Aspects of Intellectual Property Rights

Term	Description	Term	Description
HDPE	high density polyethylene	trn	trillion
HoA	heads of agreement	T&T	Trinidad & Tobago
IEA	International Energy Agency	TWh	terawatt hours
IGCC	integrated gasification combined cycle	UAE	United Arab Emirates
IOC	international oil company	USGS	US Geological Survey
IPO	initial public offering	WIPO	World Intellectual Property Organization
JOC	joint operating company	WTI	West Texas Intermediate
JPDA	joint petroleum development area	WTO	World Trade Organization

Oil & Gas Methodology

Industry Forecast Methodology

Our industry forecasts are generated using the best-practice techniques of time-series modelling and causal/econometric modelling. The precise form of model we use varies from industry to industry, in each case being determined, as per standard practice, by the prevailing features of the industry data being examined.

Common to our analysis of every industry is the use of vector autoregressions. Vector autoregressions allow us to forecast a variable using more than the variable's own history as explanatory information. For example, when forecasting oil prices, we can include information about oil consumption, supply and capacity.

When forecasting for some of our industry sub-component variables, however, using a variable's own history is often the most desirable method of analysis. Such single-variable analysis is called univariate modelling. We use the most common and versatile form of univariate models: the autoregressive moving average model (ARMA).

In some cases, ARMA techniques are inappropriate because there is insufficient historic data or data quality is poor. In such cases, we use either traditional decomposition methods or smoothing methods as a basis for analysis and forecasting.

We mainly use OLS estimators and in order to avoid relying on subjective views and encourage the use of objective views, we use a 'general-to-specific' method. We mainly use a linear model, but simple non-linear models, such as the log-linear model, are used when necessary. During periods of 'industry shock', for example poor weather conditions impeding agricultural output, dummy variables are used to determine the level of impact.

Effective forecasting depends on appropriately selected regression models. We select the best model according to various different criteria and tests, including but not exclusive to:

- R2 tests explanatory power; adjusted R2 takes degree of freedom into account;
- Testing the directional movement and magnitude of coefficients;
- Hypothesis testing to ensure coefficients are significant (normally t-test and/or P-value);
- All results are assessed to alleviate issues related to auto-correlation and multi-collinearity.

We use the selected best model to perform forecasting.

Human intervention plays a necessary and desirable role in all our industry forecasting. Experience, expertise and knowledge of industry data and trends ensure that analysts spot structural breaks, anomalous data, turning points and seasonal features where a

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purely mechanical forecasting process would not.

Sector-Specific Methodology

There are a number of principal criteria that drive our forecasts for each energy indicator.

Energy Supply

This covers the supply of crude oil, natural gas, refined oil products and electrical power, which is determined largely by investment levels, available capacity, plant utilisation rates and national policy. We therefore examine:

- National energy policy, stated output goals and investment levels;
- Company-specific capacity data, output targets and capital expenditures, using national, regional and multinational company sources;
- International quotas, guidelines and projections from organisations such as OPEC, the International Energy Agency (IEA), and the US Energy Information Administration (EIA).

Energy Consumption

A mixture of methods is used to generate demand forecasts, applied as appropriate to each individual country:

- Underlying economic (GDP) growth for individual countries/regions, sourced from our published estimates;
- Historic relationships between GDP growth and energy demand growth in an individual country are analysed and used as the basis for predicting levels of consumption;
- Government projections for oil, gas and electricity demand;
- Third-party agency projections for regional demand, from organisations such as the IEA, EIA and OPEC;

Extrapolation of capacity expansion forecasts based on company- or state-specific investment levels.

Cross Checks

Whenever possible, we compare government and/or third-party agency projections with the declared spending and capacity expansion plans of the companies operating in each individual country. Where there are discrepancies, we use company-specific data as physical spending patterns to determine capacity and supply capability. Similarly, we compare capacity expansion plans and demand projections to check the energy balance of each country. Where the data suggest imports or exports, we check that necessary capacity exists or that the required investment in infrastructure is taking place.

Source

Sources include those international bodies mentioned above, such as OPEC, IEA, and EIA, as well as local energy ministries, official company information, and international and national news, plus international and national news agencies.

Upstream Oil & Gas Risk/Reward Index Methodology

Our Upstream Oil & Gas Risk/Reward Index (RRI) quantifies and ranks a country's attractiveness within the context of the oil industry, based on the balance between the **risks** and **rewards** of entering and operating in different countries.

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We combine industry-specific characteristics with broader economic, political and operational market characteristics. We weight these inputs in terms of their importance to investor decision making in a given industry. The result is a nuanced and accurate reflection of the realities facing investors in terms of: 1) the balance between opportunities and risk; and 2) between sector-specific and broader market traits. This enables users of the index to assess a market's attractiveness in a regional and global context.

The index combines our proprietary forecasts and analyst assessment of the regulatory regime. As regulations and forecasts change, so the index scores change providing a highly dynamic and forward-looking result.

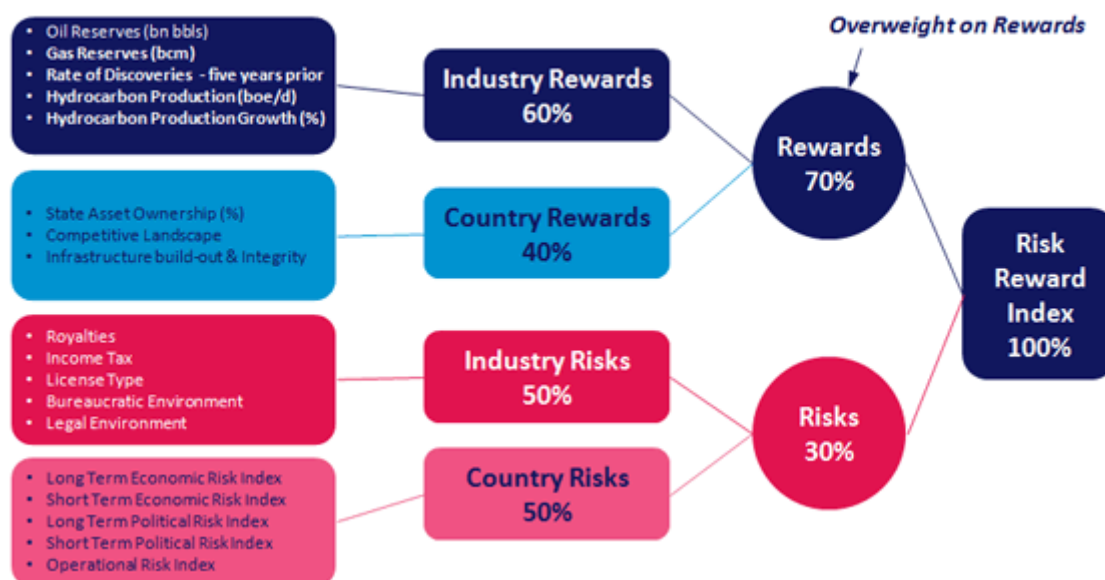
The Upstream Oil & Gas Risk Reward Index comprises **68 countries**.

Benefits of using our Upstream Oil & Gas RRI

- **Global Rankings:** A global table, ranking all the countries for upstream oil & gas from least (closest to zero) to most (closest to 100) attractive.
- **Accessibility:** Easily accessible, top down view of the global, regional or sub-regional Risk/Reward profiles.
- **Comparability:** Identical methodology across 87 countries for oil and gas allows users to build lists of countries they wish to compare, beyond the confines of a global or regional grouping.
- **Scoring:** Scores out of 100 with a wide distribution, provide nuanced investment comparisons. The higher the score, the more favourable the country profile.
- **Quantifiable:** Quantifies the rewards and risks of doing business in the upstream sector in different countries around the world and helps identify specific flashpoints in the overall business environment.
- **Comprehensive:** Comprehensive set of indicators, assessing industry-specific risks and rewards alongside political, economic and operating risks.
- **Entry Point:** A starting point to assess the outlook for the upstream oil & gas sector, from which users can access more granular forecasts and analysis to gain a deeper understanding of the market.
- **Balanced:** Multi-indicator structure prevents outliers and extremes from distorting final scores and rankings.
- Methodology is a combination of our proprietary forecasts, analyst insights and globally acceptable benchmark indicators (for example, World Bank's Doing Business Scores, Transparency International's Corruption Perceptions Index).

Weightings Of Categories And Indicators
Upstream Risk Reward Index

Oil & Gas Risk/Reward Index - Upstream



Source: Fitch Solutions

The upstream RRI matrix divides into two distinct categories:

Rewards:

Evaluation of an Industry's size and growth potential (**Industry Rewards**), and also macro industry and/or country characteristics that directly impact the size of business opportunities in a specific sector (**Country Rewards**).

Risks:

Evaluation of micro, industry-specific characteristics, crucial for an industry to develop to its potential (**Industry Risks**) and a quantifiable assessment of the country's political, economic and operational profile (**Country Risks**).

Assessing our Weightings:

Our matrix is deliberately overweight on Rewards (70% of the final RRI score for upstream markets) and within that, the Industry Rewards segment (60% of final Rewards score). This is to reflect the fact that when it comes to long term investment potential, industry size and growth potential carry the most weight in indicating opportunities, with other structural factors (demand outlooks and infrastructure integrity) weighing in, but to a slightly lesser extent. In addition, our focus and expertise in Emerging and Frontier Markets has dictated this bias towards industry size and growth to ensure we are able to identify opportunities in countries where regulatory frameworks are not as developed and industry sizes not as big (in USD terms) as in developed markets, but where we know there is a strong desire to invest.

INDICATORS - EXPLANATION AND SOURCES - UPSTREAM RRI

	Source	Rationale
Rewards		
<i>Industry Rewards</i>		
Oil Reserves (bn bbl)	Our data	Indicates size of the opportunity for oil developments
Gas Reserves (bcm)	Our data	Indicates size of the opportunity for gas developments
Discoveries Rate - last FIVE years	Our Calculation	Outlines the prospectivity and potential of the upstream
Hydrocarbon Production (boe)	Our forecast	Five-year forward looking indication of production volumes
Hydrocarbon Production Growth (boe, %)	Our forecast	Five-year forward looking indication of production growth
<i>Country Rewards</i>		
State Asset Ownership (%)	Our Calculation	Demonstrates the potential access and restrictions to resources
Competitive Landscape	Our Calculation	Divides resource base by the approximate number of companies operating to indicate the level of competition.
Infrastructure Integrity	Our Calculation	Calculates the extent and quality of oil and gas infrastructure, indicating ease of access and level of maintenance investment needed.
Risks		
<i>Industry Risks</i>		
Licence Type	Our Calculation	Outlines a country score based on whether oil and gas licenses are offered as concessions, production sharing agreements or service contracts.
Income Tax	Government Source	Outlines the relative tax rate incurred by oil and gas companies.
Royalties & Special Taxes	Government Source	Indicates further required payments (and supplementary taxes) beyond income tax.
Bureaucratic Environment	Our Operational Risk Score	Outlines the ease of business processes, with a particular emphasis on mitigating the risk of delay to project timelines.
Legal Environment Risk	Our Operational Risk Score	A second ease of business indicator, highlighting potential challenges with the transparency and effectiveness of rule of law.
<i>Country Risks</i>		
Long-Term Economic Risk Index	Our Country Risk Index	The LT ERI takes into account the structural characteristics of economic growth, the labour market, price stability, exchange rate stability and the sustainability of the balance of payments, as well as fiscal and external debt outlooks for the coming decade.
Short-Term Economic Risk Index	Our Country Risk Index	The ST ERI seeks to define current vulnerabilities and assess real GDP growth, inflation, unemployment, exchange rate fluctuation, balance of payments dynamics, as well as fiscal and external debt credentials over the coming two years
Long-Term Political Risk Index	Our Country Risk Index	The LT PRI assesses a country's structural political characteristics based on our assumption that liberal, democratic states with no sectarian tensions and broad-based income equality exhibit the strongest characteristics in favour of political stability, over a multiyear timeframe.

	Source	Rationale
Short-term Political Risk Index	Our Country Risk Index	The ST PRI assesses pertinent political risks to investment climate stability over a shorter time frame, up to 24 months forward.
Operational Risk Index	Our Operational Risk Index	The ORI focuses on existing conditions relating to four main risk areas: Labour Market, Trade and Investment, Logistics, and Crime and Security.

Source: Fitch Solutions

Downstream Oil & Gas Risk/Reward Methodology

Our Downstream Oil & Gas Risk/Reward Index (RRI) quantifies and ranks a country's attractiveness within the context of the downstream industry, based on the balance between the **risks** and **rewards** of entering and operating in different countries.

We combine industry-specific characteristics with broader economic, political and operational market characteristics. We weight these inputs in terms of their importance to investor decision making in a given industry. The result is a nuanced and accurate reflection of the realities facing investors in terms of: 1) the balance between opportunities and risk; and 2) between sector-specific and broader market traits. This enables users of the index to assess a market's attractiveness in a regional and global context.

The index combines our proprietary forecasts and analyst assessment of the regulatory regime. As regulations and forecasts change, so the Index scores change providing a highly dynamic and forward-looking result.

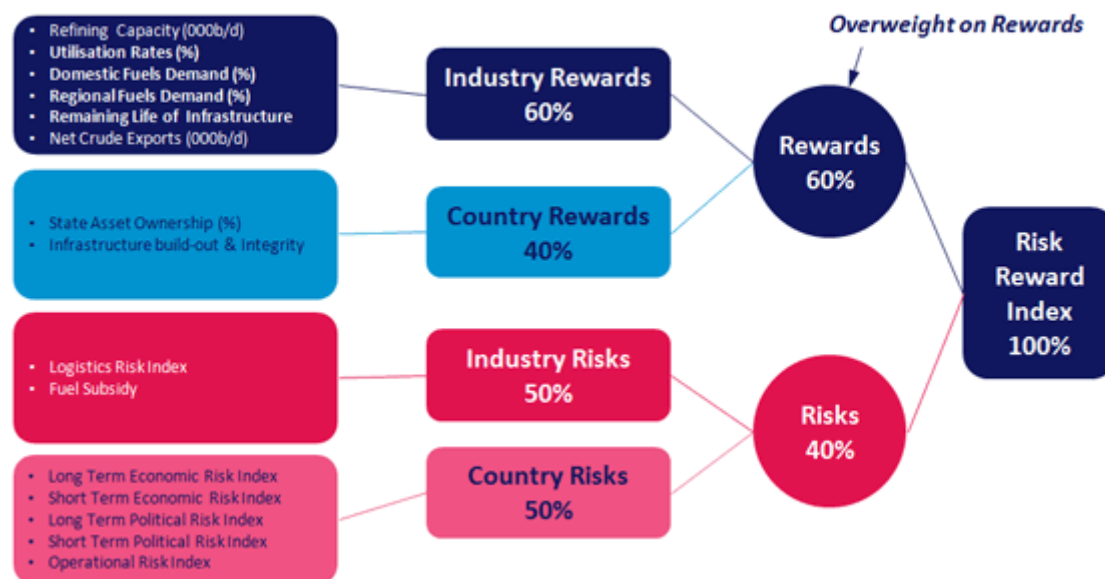
The Downstream Oil & Gas Risk/Reward Index comprises **88 countries**.

Benefits of using our Downstream Oil & Gas RRI

- **Global Rankings:** A global table, ranking all the countries for downstream from least (closest to zero) to most (closest to 100) attractive.
- **Accessibility:** Easily accessible, top down view of the global, regional or sub-regional Risk/Reward profiles.
- **Comparability:** Identical methodology across 87 countries for downstream oil allows users to build lists of countries they wish to compare, beyond the confines of a global or regional grouping.
- **Scoring:** Scores out of 100 with a wide distribution, provide nuanced investment comparisons. The higher the score, the more favourable the country profile.
- **Quantifiable:** Quantifies the rewards and risks of doing business in the downstream sector in different countries and helps identify specific flashpoints in the overall business environment.
- **Comprehensive:** Comprehensive set of indicators, assessing industry-specific risks and rewards alongside political, economic and operating risks.
- **Entry Point:** A starting point to assess the outlook for the downstream sector, from which users can access more granular forecasts and analysis to gain a deeper understanding of the market.
- **Balanced:** Multi-indicator structure prevents outliers and extremes from distorting final scores and rankings.
- Methodology is a combination of our proprietary forecasts, analyst insights and globally acceptable benchmark indicators (for example, World Bank's Doing Business Scores, Transparency International's Corruption Perceptions Index).

Weightings Of Categories And Indicators
Downstream Risk Reward Index

Oil & Gas Risk/Reward Index - Downstream



Source: Fitch Solutions

The downstream RRI matrix divides into two distinct categories:

Rewards:

Evaluation of an industry's size and growth potential (**Industry Rewards**), and also macro industry and/or country characteristics that directly impact the size of business opportunities in a specific sector (**Country Rewards**).

Risks:

Evaluation of micro, industry-specific characteristics, crucial for an industry to develop to its potential (**Industry Risks**) and a quantifiable assessment of the country's political, economic and operational profile (**Country Risks**).

Assessing our Weightings:

Our matrix is deliberately overweight on Rewards (60% of the final RRI score for a market) and within that, the Industry Rewards segment (60% of final Rewards score). This is to reflect the fact that when it comes to long-term investment potential, industry size and growth potential carry the most weight in indicating opportunities, with other structural factors (demographic, labour statistics and infrastructure availability) weighing in, but to a slightly lesser extent. In addition, our focus and expertise in Emerging and Frontier Markets has dictated this bias towards industry size and growth to ensure we are able to identify opportunities in countries where regulatory frameworks are not as developed and industry sizes not as big (in USD terms) as in developed markets, but where we know there is a strong desire to invest.

INDICATORS - EXPLANATION AND SOURCES - DOWNSTREAM RRI

	Source	Rationale
Rewards		
<i>Industry Rewards</i>		
Refining Capacity ('000b/d) - five-year average	Our Forecast	Quantifies the current size of the refining sector as a comparison to peer markets
Utilisation Rates (%) - five-year average	Our Calculation	Outlines the efficiency of the existing facilities, identifying over or under capacity
Domestic Fuels demand ('000b/d) - five-year average	Our Forecast	Shows the size of the domestic market demand as a comparison to peer markets
Fuel Demand (% Growth) - five-year average	Our Forecast	Identifies the domestic demand opportunity and trend in consumption patterns
Regional Fuel Demand - five-year average	Our Forecast	Shows the regional export market size to represent the opportunity for exports
Life Span of Infrastructure	Our Calculation	Approximate calculation of the life span of infrastructure to identify the need remaining operating life
Theoretical Net Crude Exports ('000b/d) - five year average	Our Calculation	Identifies spare capacity of domestic oil supply as a potential feedstock
<i>Country Rewards</i>		
State asset ownership (%)	Our Calculation	Indicates how much of the given market is open for private investment
Population	Our Operational Risk Index	A metric used to proxy the size of the domestic market
Population Growth	Our Operational Risk Index	A metric used to proxy the scale and pace of growth in the domestic market
Risks		
<i>Industry Risks</i>		
Logistics Risk Rating	Our Operational Risk Index	Offers a comparative indicator on ease of transport for feedstock supply, fuels distribution and import/export flexibility.
Fuel Subsidies	Our Calculation	Penalizes a market's score if fuels prices are sold at below market costs.
<i>Country Risks</i>		
Long-Term Economic Risk Index	Our Country Risk Index	The LT ERI takes into account the structural characteristics of economic growth, the labour market, price stability, exchange rate stability and the sustainability of the balance of payments, as well as fiscal and external debt outlooks for the coming decade.
Short-Term Economic Risk Index	Our Country Risk Index	The ST ERI seeks to define current vulnerabilities and assess real GDP growth, inflation, unemployment, exchange rate fluctuation, balance of payments dynamics, as well as fiscal and external debt credentials over the coming two years
Long-Term Political Risk Index	Our Country Risk Index	The LT PRI assesses a country's structural political characteristics based on our assumption that liberal, democratic states with no sectarian tensions and broad-based income equality exhibit the strongest characteristics in favour of political stability, over a multiyear

	Source	Rationale
Short-Term Political Risk Index	Our Country Risk Index	timeframe. The ST PRI assesses pertinent political risks to investment climate stability over a shorter time frame, up to 24 months forward.
Operational Risk Index	Our Operational Risk Index	The ORI focuses on existing conditions relating to four main risk areas: Labour Market, Trade and Investment, Logistics, and Crime and Security.

Source: Fitch Solutions



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