

LATIN AMERICAN CRUDE OIL EXPORTS

The Battle for Market Share

Lisa Viscidi and Ramón Espinasa

The global map of oil production has been dramatically redrawn in recent years. Output from traditional Middle Eastern and African exporters like Iran and Libya has declined while North America has emerged as a major center not just of demand but also of supply. In the United States, the shale revolution and increased output from the Gulf of Mexico have fed a 75% rise in crude production since 2008, leading to an overall decline in imports.

Also significant for crude oil markets is Canada's steep rise in production, mainly from oil sands in Alberta. A surge in unconventional oil output, combined with pipeline expansions facilitating exports to US refineries on the Gulf of Mexico, is allowing Canada to increase its share of the US market. Facing growing competition for a shrinking US market, countries like Venezuela and Mexico – traditionally among the top four crude suppliers to the US – are being forced to seek new export markets.

As Asian energy demand continues to grow, crude oil flows from Latin America are increasingly moving east rather than north, though tapping markets outside of the US also brings a new set of challenges.

US Crude Oil Imports Decline Amid Shale Boom

The United States remains the world's largest net oil consumer and net importer, with China trailing behind. However, US crude oil imports have declined, after reaching a peak of 10.8 million barrels per day (b/d) in July 2005. Net imports have since fallen by 60% to 5 million b/d in 2014 amid increased domestic production and waning demand.¹

Over the last decade, US oil demand growth has slowed due to demographic trends, such as an aging population that drives less, technological advances like telecommuting and significant improvements in fuel economy. The average number of miles traveled by US drivers peaked in 2007 and has since been on a downward trend. Oil demand has fallen by 13% from a peak of almost 19 million b/d in 2005. According to the US Energy Information Administration (EIA) forecast, over the next 25 years, US demand for transportation fuels is expected to continue to decline as a result of decreased driving, more stringent fuel efficiency standards and the increasing use of electric vehicles and natural gas for transportation.²

Foreword

I am pleased to present “Latin American Crude Oil Exports: The Battle for Market Share” by Lisa Viscidi, Director of the Energy, Climate Change and Extractive Industries Program at the Inter-American Dialogue and Ramón Espinasa, Lead Oil and Gas Specialist at the Inter-American Development Bank.

The report, made possible with the generous support of the Inter-American Development Bank, highlights findings from a Dialogue-hosted workshop that convened a group of leading experts on crude oil markets in the Americas. It is the second in a three-part series on the impact of the North American energy boom on Latin American and Caribbean refined product, crude oil and natural gas markets.

The report examines the decline in Latin American crude oil exports to the United States and the shift in trade flows toward Asia, the impact of lower oil prices on crude oil trade within the Americas and the factors that will determine whether or not Latin American crude will increasingly move east rather than north.

This effort is a product of the Energy, Climate Change and Extractive Industries program, which informs and shapes policies that promote investment while encouraging economically, socially and environmentally responsible development of natural resources.

The views expressed in this report are those of the authors alone and are aimed at stimulating discussion about an important public policy issue.

MICHAEL SHIFTER
President

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At the same time, US crude production has risen from 5 million b/d in 2008 to 8.7 million b/d in 2014 and is expected to reach 9.6 million b/d by 2019, thanks mainly to the rise of shale gas production from tight formations.³

However, the medium and long term outlook for US shale is uncertain. The EIA forecasts that US oil output will drop after 2021 as tight oil production falls due to the geological constraints of shale oil resources. But the agency notes that the tight oil production peak is difficult to estimate, as shale drilling in the US started in earnest only a few years ago and operators are still improving their understanding of the resource. Production may vary depending on technological advances, corporate efficiencies and well productivity.

Fluctuations in global oil prices are also a key factor. Many analysts believe that the growth in shale oil production will halt only if prices remain below \$50 per barrel for a sustained period. Since the US benchmark West Texas Intermediate (WTI) plummeted to around \$50/barrel in late 2014, US shale producers have already

well as offshore Alaska, will also contribute to US output over the coming decades.

US oil imports are closely tied to domestic shale production. By 2016, net imports will equal only one quarter of US oil consumption, compared to 65% ten years ago. However, net imports will rise by 2040 as domestic shale production declines, according to the EIA.

African Imports Plummet while Americas Imports Remain Steady

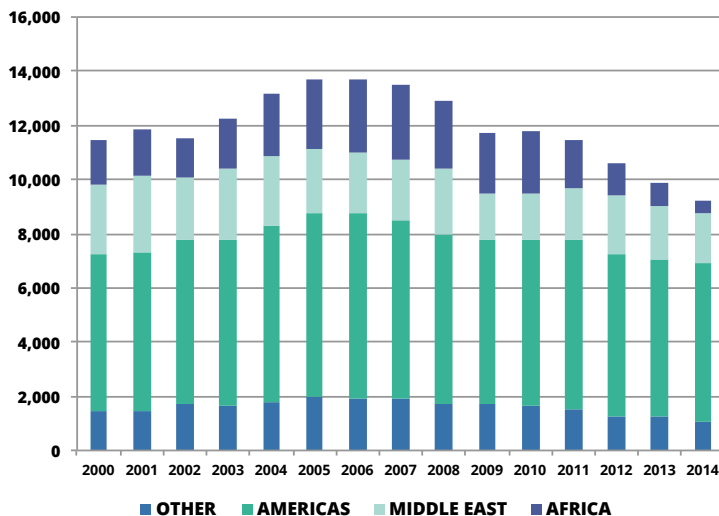
The decline in US imports has not affected all suppliers equally. Shale formations in the US produce lighter, sweeter oil than the average crude produced from other hydrocarbon resources. As US refiners run more of this domestic light oil, they need less imported light crude. Light crude imports fell to about 600,000 b/d in 2014 from over 2 million b/d in 2010.⁴ West African light oil producers have been hardest hit. Nigeria – previously one of the United States' top five producers – exported less than 100,000 b/d of crude to US refiners last year. In the coming years, the US crude output mix is expected to be increasingly made of lighter, sweeter oil as shale production grows.

While US imports of light crude are declining, refineries are importing more heavy crude to blend with light domestic barrels. Volumes from the Americas, which produce generally heavier grades, have remained steady and thus make up a growing share of total imports. Many US refineries are designed to process heavy crude, which is sold at a discount, creating strong incentives for refiners to seek heavy grades. US refineries in the Gulf Coast processed over 2 million b/d of foreign heavy oil imports in 2014 and volumes continue to rise.⁵ Within the Americas, Canada's share of the US market has increased dramatically, while Venezuela and Mexico have lost market share. Canada, which exports most of its crude oil production, now provides one third of total US imports.

The rise in domestic light oil production and heavier slate of imported crude have led to significant investments in fuel transportation infrastructure, including pipelines and rail, to bring light, sweet US oil and heavy, sour imported oil from Canada to refineries on the Gulf Coast.

FIGURE 1: US IMPORTS BY REGION OF ORIGIN (THOUSAND B/D)

Source: US Energy Information Administration



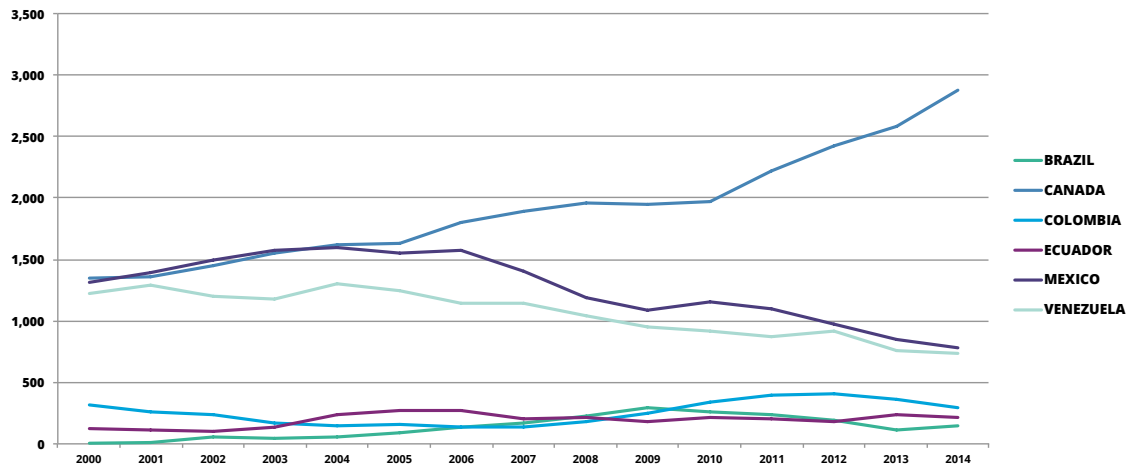
started to delay well completions and cut back investment plans. If oil prices remain low, many companies will redirect investment away from marginal exploration and into core tight oil plays in the Bakken, Eagle Ford, Niobrara, and the Permian Basin, which contribute the majority of US oil production growth. Production from other areas, such as the deepwater and ultra-deepwater Gulf of Mexico, as

Latin American Exports to the US Decline

Latin American exports to the US have declined significantly over the past decade, led by decreasing volumes from the two largest exporters, Mexico and Venezuela. Both countries have witnessed declining production over the last decade but have also lost share in the shrinking US market, leading them to increase shipments to alternative markets. Similarly, in Ecuador and Brazil, oil production growth has been weak, leading to deterioration in net exports. The exception is Colombia, where output and exports have soared in recent years, though oil production is now leveling off.

FIGURE 2: US IMPORTS BY COUNTRY OF ORIGIN (THOUSAND B/D)

Source: US Energy Information Administration



Mexico has traditionally exported about 90% of its crude to the US, but those volumes have dropped due mainly to declining production. Mexico’s output has dwindled as older fields go into decline and new fields have not come online quickly enough. Exports fell sharply between 2004 and 2009, though the decline has slowed since then. However, exports to the US have fallen more sharply than overall production, forcing Mexico to seek new markets. Over the past five years, Mexico’s crude production has declined by 160,000 b/d to 2.44 million b/d, but its exports to the US dropped by 260,000 b/d over the same period.⁶

Looking ahead, Mexico expects an oil production boom over the next decade as its energy reform opens the industry to private investment. The government forecasts that crude oil production could increase to more than 3 million b/d by 2018 and 3.5 million b/d by 2025. Round One, already underway, entails a series of five smaller bids, starting with 14 production sharing agreements for shallow water exploration, followed by extra-heavy crude, unconventional resources and Chicontepec, onshore fields and deepwater. These areas together have huge resource potential. Many promising shallow water fields were abandoned by Pemex due to its lack of capacity,

while Mexico’s deepwater alone is thought to hold some 30 billion barrels of oil. In addition, production costs in Mexico are relatively low, providing an advantage in a weak oil price environment. Production costs for existing fields average just \$10 per barrel, while the break-even point for developing new conventional onshore and shallow water fields in Mexico is less than \$40 per barrel.⁷

However, many independent analysts are less optimistic, arguing that with the first bid round set for 2015, oil production will not start to rise before 2020. The government has already revised the Round One contract terms in response to lower oil prices. The more costly and challenging projects, such as shale, will probably not be developed for several years. Multiple factors, such as oil prices, the political climate and other upstream opportunities around the world, will also impact how quickly oil production increases. Nevertheless, Mexican production will almost certainly grow in the coming years, leading to questions about what markets will absorb the additional oil.

Venezuela has also traditionally been a key supplier of crude oil to the US, but volumes are declining. In 2014, Venezuela remained the US’ fourth-largest supplier of

imported oil, but exports that year plummeted to 734,000 b/d - their lowest level since 1985 - compared to 1.34 million b/d in 2007.⁸

The decline is partially due to a drop in oil production. Estimates of Venezuela's production and exports are notoriously difficult to assess given the lack of reliable data. However, most estimates suggest that production has stabilized over the past five years, after plummeting earlier last decade following a major oil workers' strike in 2003. Production is ramping up very slowly from heavy oil fields in the Orinoco belt – home to the vast majority of Venezuela's 298 billion barrels of proved oil reserves, which are the largest in the world. After multiple delays due to infrastructure challenges and inadequate investment, new ventures awarded in 2009 and 2011 in the Carabobo and Junin areas are gradually coming onstream. These new heavy oil projects will partially compensate for the decline in production from mature fields, particularly in western Venezuela's Lake Maracaibo region, where output has dropped.

With lighter crude output from aging fields on the decline, Venezuela's crude export basket includes increasingly heavy grades, while it is importing growing volumes of light oil. Domestic demand is also rising rapidly, and may be as high as 800,000 b/d, cutting into exports.⁹

Given growing domestic demand, declining output from mature fields and delays in Orinoco production, Venezuelan oil output looks likely to decline gradually in the near term. However, US demand for Venezuelan oil seems to be declining more rapidly, and Venezuela will look to maintain exports to other countries.

The United States is also the top market for Colombian and Ecuadorian crude exports, taking in about two thirds of each country's exports. Colombia's oil production and exports have increased steadily since 2008, following improvements in security and reforms that promoted foreign investment and enhanced operations at state oil company Ecopetrol. The country's net exports more than doubled over five years, reaching 722,000 b/d in 2013.¹⁰

In contrast, Ecuador's production has been mostly stagnant in recent years as a result of its aging fields, operational difficulties and the lack of new exploration projects. However, the government gave the green light last year for state oil company PetroAmazonas to develop the giant Ishpingo-Tambococho-Tiputni (ITT) oil block in the Amazon despite protests over the social and environmental

impacts. The field has estimated reserves of about 900 million barrels and is scheduled to reach peak production of 225,000 b/d by 2019.

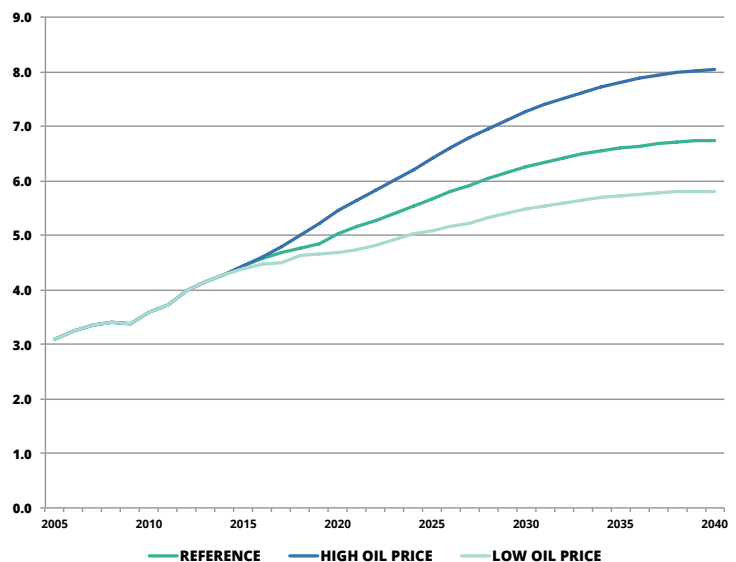
In contrast to Latin America's other major oil exporters, Brazil ships a minority of its crude exports to the United States. Brazilian crude oil exports have increased over the past ten years to about 500,000 b/d, with only one quarter reaching the United States.

Canada Projects Surge in Production

In contrast to Latin America, Canada is witnessing a boom in oil production and exports. The growing share of US imports from Canada is likely to continue as heavy crude production there rises. Canada's oil production is set to nearly double by 2030 to 6.4 million b/d, with most of the additional output coming from oil sands in the Western province of Alberta, according to the Canadian Association of Petroleum Producers (CAPP).¹¹ The oil sands hold the vast majority of Canada's 167 billion barrels of proven crude oil reserves – more than the proven reserves of Iraq or Iran, and behind only Saudi Arabia and Venezuela. Recent discoveries in Eastern Canada could also contribute to rising production over the next decade.

FIGURE 3: PROJECTIONS OF CANADIAN CRUDE OIL PRODUCTION (MILLION B/D)

Source: EIA International Energy Outlook 2014¹⁷



However, Canada's oil production is particularly vulnerable to price fluctuations. Canadian oil sands crude is particularly costly to produce because it has to be mined or pumped from the ground and then converted to lighter synthetic crude before being transported long distances by pipeline or rail to refineries. The most expensive oil sands projects break even at a US crude price of more than \$100/barrel. While most oil sands producers will not abandon projects that are already producing or under construction because of the sunk costs, some will curtail future development.¹² Short-term projections for capital spending and oil production in Canada's oil sands have been revised down since global oil prices collapsed.

Nevertheless, with crude supplies still expected to ramp up over the next decade, Canadian producers are looking to expand their sales to the US market to take advantage of the many existing refineries with capacity to process heavy crudes. The Midwest will remain Canada's largest export market, but Canadian producers are forecast to more than triple supplies to the Gulf Coast by 2020.¹³ On the US East and West Coasts, imports of Canadian crude are expected to double in the coming years.

By 2040, two out of every three barrels of crude oil traded internationally will be destined for Asia, up from less than one in two today, according to the International Energy Agency.

Recent and planned midstream investments will also facilitate Canadian oil exports to the US. Canada plans to add more than 3 million b/d of capacity from new oil pipelines and the expansion of existing lines, nearly doubling current pipeline capacity.¹⁴ A large share of this capacity would transport oil sands output to US refining markets and export terminals along the East, West and Gulf Coasts. Keystone XL is the largest pipeline proposal to move Canadian crude to US markets. The 830,000 b/d line, which has been under review since 2008, would connect producers in Alberta to the US pipeline network in Nebraska. However, regulatory delays and opposition by US environmental groups have derailed the project. US President Barack Obama vetoed a bill in February 2015 that would have

removed his authority to approve or reject the pipeline but has said he will make a final decision on the project before the end of his administration.¹⁵

As a result of inadequate pipeline capacity, other forms of transport, such as railways, barges and tankers, are moving increasing volumes of Canadian crude to the United States. The total amount of crude oil transported by rail in North America will reach 1.5 million b/d by 2015 or 2016, and rail will remain key to North American oil production over the long term, according to consulting firm IHS.¹⁶ Rail offers a flexible form of transporting oil with relatively low up-front costs, though pipeline advocates warn of rail congestion and the risk of accidents.

Latin American Producers Look to Diversify

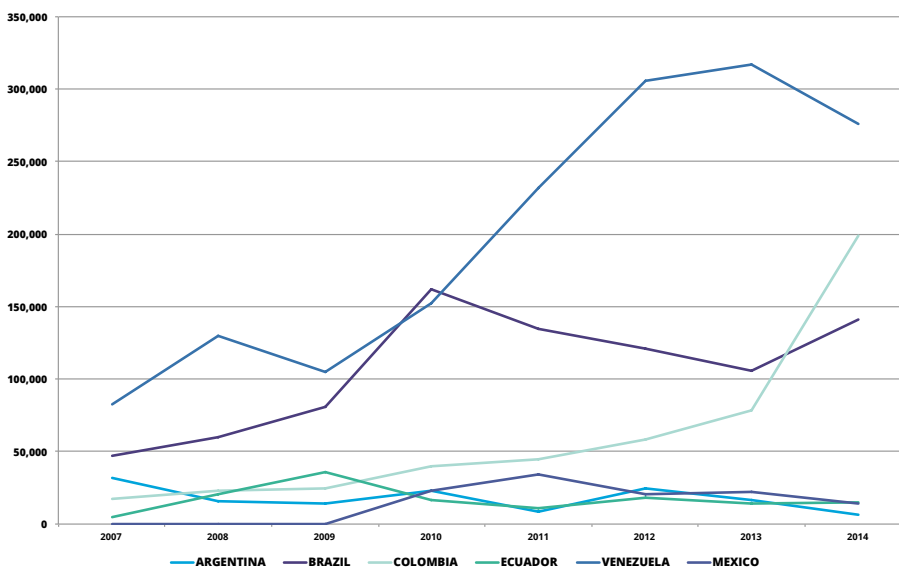
With US demand for imported oil declining and competition from Canada intensifying, Latin American oil producers are diversifying their exports. Between 2009 and 2014, Mexico doubled its exports to Europe and tripled those to Asia. Mexico's crude exports to Asia and Europe now account for more than a quarter of total exports, compared to just 11% in 2009.¹⁸ Venezuelan exports to Asia are also on the rise, with China and India receiving more than 277,000 b/d and 433,000 b/d respectively in 2014.¹⁹ Venezuela's oil minister said in November that the country will continue to boost oil exports to China and India to capitalize on their fast-growing economies. Colombia was the second largest Latin American crude oil exporter to China in 2014, shipping almost 200,000 b/d. Brazil, meanwhile, exported more than 40% of its crude to Asia in 2013. Japanese and South Korean imports from Latin America are also increasing.

A large share of Latin America's exports also lands in markets within the region. Since 2005, Venezuela has provided oil to many Central American and Caribbean countries under the Petrocaribe alliance, which provides favorable financing terms to member countries. Crude exports through Petrocaribe rose to 130,000 b/d in 2012 from 90,000 b/d in 2008.²⁰

From Asia's perspective, Latin America is also an increasingly important supplier, providing a growing share of total imports. China received more than 10% of its total crude oil imports from Latin American countries in 2013, while India is now receiving almost 20% of its imported oil from

FIGURE 4: CHINESE CRUDE OIL IMPORTS BY COUNTRY (B/D)

Source: Energy Intelligence Group, China's National Bureau of Statistics and General Administration of Customs



the region.^{21,22} For both countries, this is part of a broader strategy to diversify sources of imported oil and reduce reliance on the Middle East amid energy security concerns.

Oil demand growth in Asia, particularly for heavy crude, is the primary driver behind the increase in imports from Latin America. Asian oil demand grew by 61% between 2003 and 2013, and is projected to continue on an upward trend.²³ Latin American oil producers have also benefitted from Chinese and Indian refiners recently upgrading facilities to process heavier grades, which leads them to favor heavier discounted crudes that offer better margins. India, home to the world's largest refining complex, is Asia's top heavy crude consumer. China is also investing in new complex refineries.²⁴

In addition, Latin American countries enjoy an advantage over competitors selling to Asian markets thanks to the lower price of WTI compared to the global benchmark Brent, as most Latin American oil exports are priced off the US benchmark. To gain market share, Latin American exporters have even been willing to sell to Asian buyers when they receive weaker net revenues after discounting shipping costs.

Several Latin American countries are also exporting oil to China to pay back oil-linked loans. China has provided more than \$50 billion in loans to Venezuela since 2007, mostly in exchange for oil. Roughly half of Venezuelan oil exports currently serve as loan payments to China.²⁵

Brazil has also received substantial oil-backed loans from China. In 2009, China agreed to provide \$10 billion in loans to Brazilian state oil company Petrobras and \$800 million to Brazil's development bank. The loan terms required Brazil to ship 150,000 b/d of oil to China in 2009 and up to 200,000 b/d per year through 2019.²⁶ In April, Petrobras signed a new finance contract with the China Development Bank for \$3.5 billion, as a major corruption scandal kept it out of international bond markets.

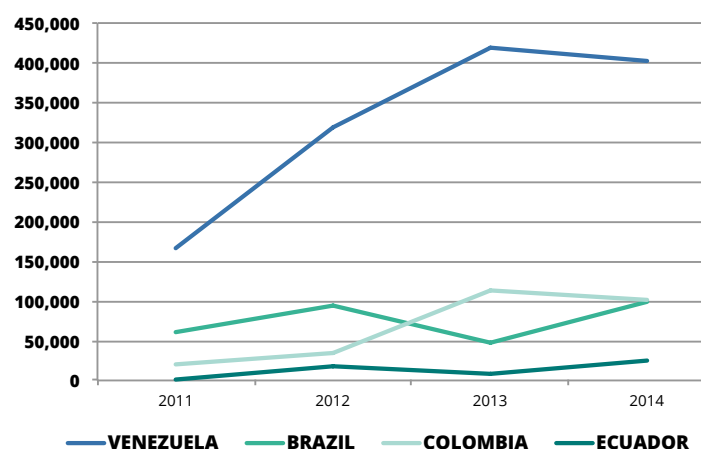
China has also committed more than \$12 billion in financing to Ecuador since 2009, with most of the loans tied to oil sales. Ecuador's oil sales

to China could well increase as its oil production grows due to the development of the ITT oil field.

Asia's increasing foreign direct investment in the Latin American oil and gas sector has also contributed to the rise in crude oil trade between the two regions. Chinese and Indian oil majors have acquired stakes in upstream assets across Latin America, entering into joint ventures for oil exploration and production in Venezuela, Brazil, Colombia, Ecuador and elsewhere.

FIGURE 5: INDIAN CRUDE OIL IMPORTS BY COUNTRY (B/D)

Source: Energy Intelligence Group, Indian customs data



Latin American Oil Exports to Asia Unlikely to Grow Substantially

Despite the growing ties, however, it is unlikely that Latin American oil exports to Asia will increase much further. The United States remains a large, attractive market for most of the region's oil producers. For Venezuela, exports to the United States provide a critical source of foreign currency. Venezuelan crude exports to China actually declined in 2014, as Caracas prioritized cash sales to aid the country's struggling economy.²⁷ Similarly, Venezuela cut shipments to Petrocaribe members by 15% in 2014 as it scrambled for cash.²⁸ In addition, Venezuela's ownership of the 750,000 b/d Citgo refining system in the United States preserves an important link to the US market. PDVSA, Venezuela's state oil company, will want to take advantage of the capacity at its three Citgo refineries and is thus unlikely to reduce exports to the United States much below this amount. Mexico too is closely linked to the US market through long-term supply contracts and its 50% stake in the Deer Park refinery in Texas.

Competition for new markets is also intense, with more crude oil coming onto the market from the US shale boom. The global crude oil glut tied to the US shale revolution has heightened competition for buyers all over the world. Middle Eastern suppliers are offering steep discounts to Asian buyers to maintain market share. In addition, the United States' decision to revise its crude export ban to allow the

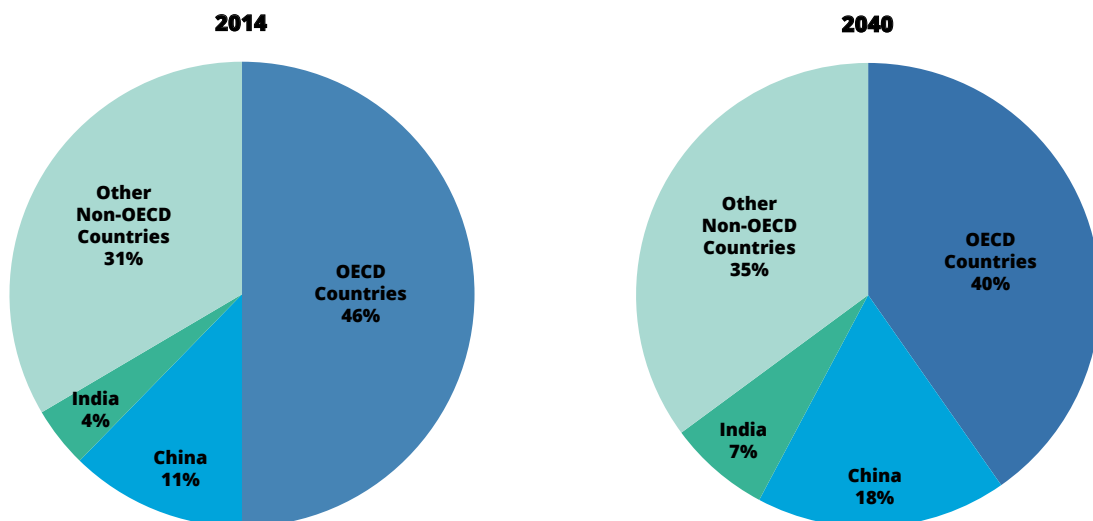
export of minimally processed light oil called condensate has put more light oil on the market. Shipments of US condensates have already started arriving in Asia. This has important implications for Mexico, where, according to government projections, heavy oil production will decline while light oil production will increase significantly.²⁹

At the same time, global oil demand growth is slowing. After growing at an average rate of 6% per year for a decade, Chinese oil product demand growth shrunk to 1.1% in 2014 due to its slowing economy, urbanization and structural shifts to lighter industry and a service economy.^{30,31} In Europe, oil demand is declining amid weak economic growth, and many refineries have closed their doors.³²

Longer distances and infrastructure bottlenecks also complicate efforts to shift exports to Asia. Cargoes from Venezuela to Asia travel 13,000 nautical miles, or 20 days, around the Cape of Good Hope compared to less than 2,000 nautical miles, or four days, to the US Gulf. Longer distances mean high shipping rates, cutting into returns on exports. The planned expansion of the Panama Canal will allow larger cargoes through, cutting down shipping times, but the expansion will not allow for the passage of Very Large Crude Carriers that are normally used for shipping oil from South America to Asia. Growing Asian demand, however, is leading to plans in several South American countries to reorient infrastructure toward Asia by expanding Pacific coast ports and building new road and rail linkages. If these plans materialize, South American oil exports to Asia are more likely to grow.

FIGURE 6: LIQUIDS CONSUMPTION BY REGION

Source: US Energy Information Administration



CONCLUSION

Global crude oil markets are currently well-supplied, creating intense competition among oil producers. Latin America faces a growing rivalry with Canada in its traditional markets for heavy crude in the United States. The region's biggest crude exporters, particularly Venezuela and Mexico, are responding with export diversification. But other regions like Asia and Europe are also seeing slowing demand and a supply surplus. Indeed, this global supply glut has led prices to tumble by 50% over the second half of 2014, and many analysts now believe the lower price environment will last for another year or longer until higher-cost producers are forced to take production offline or demand recovers.

Whether or not the shift toward increasing volumes of Latin American crude moving east rather than north will continue to expand depends largely on two questions:

1

WILL LINKS WITH THE US MARKET REMAIN OR FURTHER BREAK DOWN?

Venezuela has longstanding and critical links to the US oil market. Sales to the United States provide an important source of US dollars for Venezuela's ailing economy. However, the relationship between the two countries has deteriorated, with the United States recently introducing sanctions against seven Venezuelan officials in response to human rights abuses. Although the United States will almost certainly not extend sanctions to impact oil trade, the prickly bilateral relationship is one reason behind Venezuela's efforts to diversify to Asia. The potential sale of Citgo is another key factor. Last year, looking to generate cash, PDVSA enlisted a US investment bank to seek buyers for the refining system. Although the sale was later called off, Venezuelan officials seem to be in disagreement about the decision and may revisit a sale in the future. If Venezuela does divest its Citgo refining assets, its exports to the United States may drop further.

Mexico is also closely linked to the US market through long-term supply contracts and established infrastructure. As the country's energy reform brings fresh investment from international oil companies, new trade arrangements may appear. If US companies play a prominent role in oil production in Mexico, exports to the United States will likely be maintained. However, if companies from other countries invest, they may export more crude to other regions.

The United States' decision about the crude export ban is also a factor. If the ban is lifted, the WTI-Brent spread will narrow, undermining Latin America's advantage in exporting to Asia. However, if it remains intact, US refiners will have an incentive to convert their facilities to process lighter crude and demand for heavy crude could decline. That said, the many impacts that lifting the crude oil ban would have on global oil markets are under debate, but the move would certainly reshape crude markets in the Americas.

2

WILL POLITICAL AND ECONOMIC TIES WITH ASIA STRENGTHEN?

Latin America's political and economic ties with Asia have deepened in recent years, and oil trade and investment are a key component of the burgeoning relationships.

China has provided more than \$100 billion in loan commitments to Latin American countries and firms since 2005³³ and its FDI in the region totaled more than \$5 billion between 2009 and 2013, including a large stake in the oil and gas industry.³⁴ Trade between Latin America and India has also mushroomed.

Whether or not Latin America's political and economic ties with Asia develop further will have an important impact on crude oil trade between the two regions. Chinese and Indian companies have continued to increase their investments in Latin America's oil and gas industry, viewing the decline in oil prices as an opportunity to snatch up undervalued assets through mergers and acquisitions. Rather than backing away from partners with troubled economies, such as Venezuela, Ecuador and Argentina, China is doubling down on its investments while keeping a closer eye on how its loans are spent. In its most recent \$10 billion loan commitment to Venezuela, for example, China specified that half of the funds must be used to develop oil fields.

If China and India continue to expand financing and investment in Latin America, crude oil trade will likely increase in spite of the short term decline in Asian oil demand growth, infrastructure bottlenecks and competition from other regions.

FOOTNOTES

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