



LATIN AMERICA
& CARIBBEAN PROGRAM
ENERGY, ENVIRONMENT, & SUSTAINABILITY

THE UNIVERSITY OF TEXAS AT AUSTIN
JACKSON
SCHOOL OF GEOSCIENCES

Energy Issue Brief

August 2014

The Possible Loss of Venezuelan Heavy Crude Oil Imports Underscores the Strategic Importance of the Keystone XL Pipeline

By Jorge R. Piñon

Recent press reports indicate the possible sale by state-owned Petr leos de Venezuela, S.A. (PDVSA) of its U.S. based wholly-owned and joint venture refining assets. This potential sale reflects in part Venezuela's urgent need for crude oil in order to satisfy required payments for various loans-for-oil agreements with China.

These sales could also provide PDVSA much needed cash for upstream investments and avert the role that these assets could play in possible U.S. sanctions recently proposed by Congress against Venezuela in response to civil rights violations by the administration of President Nicolas Maduro.

For the U.S., that could mean the loss of a significant amount of Venezuelan heavy crude, making reliance on Canadian heavy crude oil more significant, and the approval of the Keystone XL pipeline even more crucial to U.S. energy security. The pipeline is currently in limbo, waiting on approval from the White House.

PDVSA's U.S. refining assets include the wholly-owned Citgo Petroleum Corp., a 750,000 barrel per day (mbd) refinery system as well as two joint ventures: the 192 mbd Chalmette Refining, L.L.C. with partner ExxonMobil, and the 168 mbd Merey-Sweeny L.P. facility with partner ConocoPhillips.

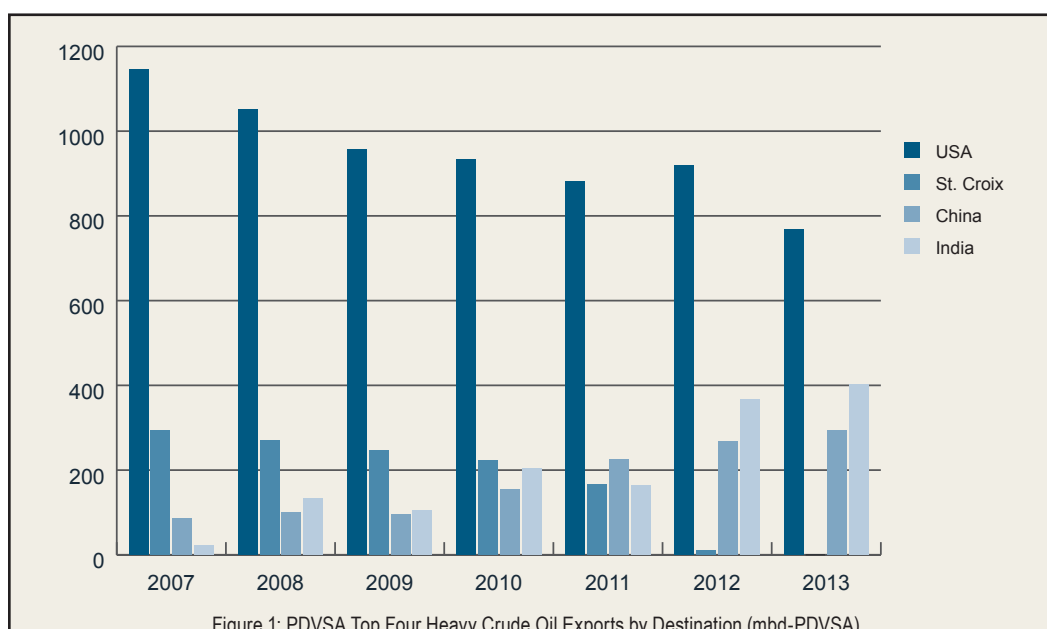
The sale of Citgo's refining system could be less contentious than the Chalmette or Sweeny joint ventures, as they are part of ongoing contractual disputes as a result of the Venezuelan government's 2007 expropriations of ConocoPhillips' Petrozuata-Hamaca and ExxonMobil's Cerro Negro Orinoco Belt heavy oil projects.

Divestment of PDVSA's wholly owned and joint venture refining U.S. assets could eventually free up to 375 mbd, or approximately fifty percent, of current total U.S. imports of Venezuelan heavy crude oil. That assumes no long-term Venezuelan heavy crude oil supply contract is agreed upon with potential refinery buyers.

Venezuela's exports of heavy crude oil to the U.S. (including St. Croix, U.S. Virgin Islands) have fallen dramatically over the last seven years, halved from 1.4 million barrels per day in 2007 to a current level of approximately 700 thousand barrels per day. Meanwhile, deliveries of crude oil and petroleum products by Venezuela to energy-hungry giants India and China have increased proportionally.

Major U.S. Importers of Venezuelan Crude Oil

Citgo Petroleum Corp. was acquired by PDVSA from the Southland Corp. through a series of joint



venture transactions from 1986-1990. Citgo owns and operates three refineries: a 167 mbd refinery in Lemont, Illinois; a 425 mbd plant in Lake Charles, Louisiana and a 165 mbd refinery in Corpus Christi, Texas. It has more than 3,500 employees and distributes its branded fuels, specialty products and lubricants through three wholly-owned and six joint venture pipelines, forty-eight terminals, and nearly 6,000 independent dealer-owned retail locations.

Valero Energy Corp. is the largest non-equity partner importer of Venezuelan crude into the U.S. It owns 15 refineries across the U.S. and in the U.K., including a number of complex high conversion refineries which allow it to process Venezuela's heavy, sour crude oil: a 310 mbd refinery in Port Arthur, Texas; a 270 mbd refinery in St. Charles/Norco, Louisiana; a 325 mbd Corpus Christi, Texas, and a 170 mbd refinery in Benicia, California.

Phillips66 was spun off from ConocoPhillips, which had with PDVSA a 50 percent interest in Merey Sweeny, L.P., a limited partnership which owns a 58 mbd delayed coker and a 110 mbd vacuum

distillation unit at the 247 mbd plant in Sweeny, Texas. Defaults by PDVSA of its supply of crude oil to the Sweeny refinery gave ConocoPhillips the right to acquire PDVSA's 50 percent ownership interest in MSLP; the matter is still under litigation. However, Phillips66 is still processing Venezuelan Merey 16 ° crude under a supply contract at its Sweeny facility.

Chevron's net Venezuelan equity crude oil production averaged 61 mbd in 2013. Chevron holds a 39.2 percent interest in Petroboscan, a joint venture with PDVSA, which averages 26 mbd, and owns 25.2 percent of Petroindependiente, which operates in Venezuela's Lake Maracaibo with a net production of 1 mbd. Chevron also has a 30 percent stake in Petropiar, S.A., a joint venture with PDVSA in Venezuela's Orinoco Belt, of which daily oil production in 2013 averaged 25,000 barrels of synthetic crude oil and 9,000 barrels of extra-heavy crude oil. In 2013, Chevron processed a total of 66 mbd of Venezuelan crude oil imports in its Pascagoula, Mississippi and El Segundo, California refineries.



LATIN AMERICA
& CARIBBEAN PROGRAM

Energy Issue Brief

Chalmette Refining is a 50/50 192 mbd refining joint venture between ExxonMobil and PDVSA, with ExxonMobil serving as the operating partner. According to PDVSA financial reports, the refinery is supplied by about 45 mbd of reduced crude from the 150 mbd Petromonagas (formerly owned by Exxon/PDVSA Orinoco Belt Cerro Negro joint venture) extra heavy crude upgrader, operated today by PDVSA and Russian oil company Rosneft.

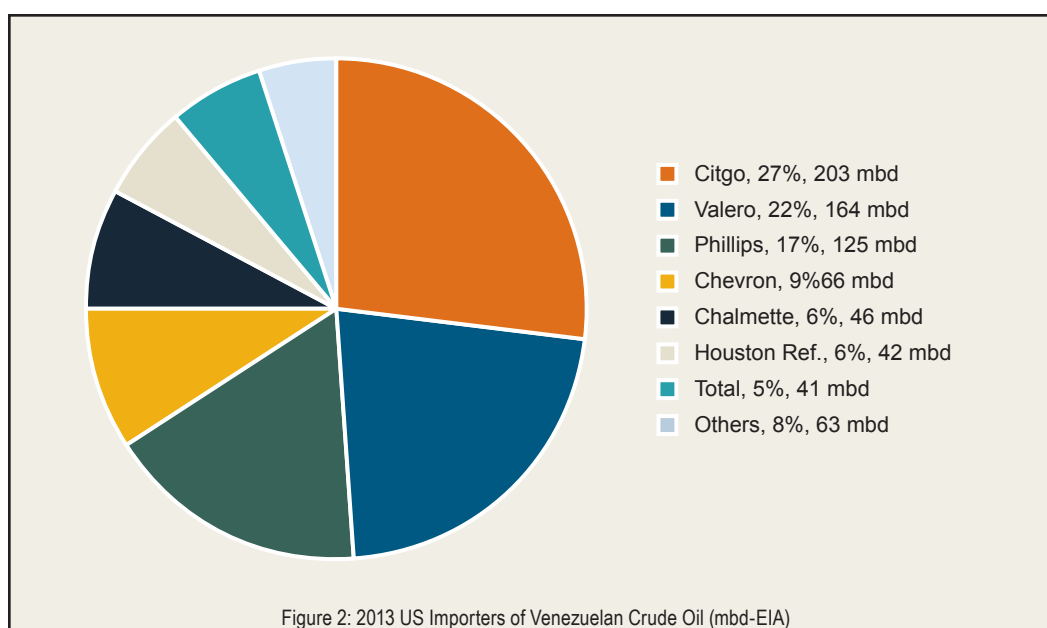
Houston Refining is a wholly owned subsidiary of LyondellBasell and operates a 268 mbd high conversion refinery in Houston, Texas. From 1993 to 2006 it was a joint venture between LyondellBasell and Venezuela's Citgo Petroleum Corp. until LyondellBasell bought Citgo's share in 2006. In 2013 Houston Refining processed approximately 42 mbd of heavy Venezuelan crude oil.

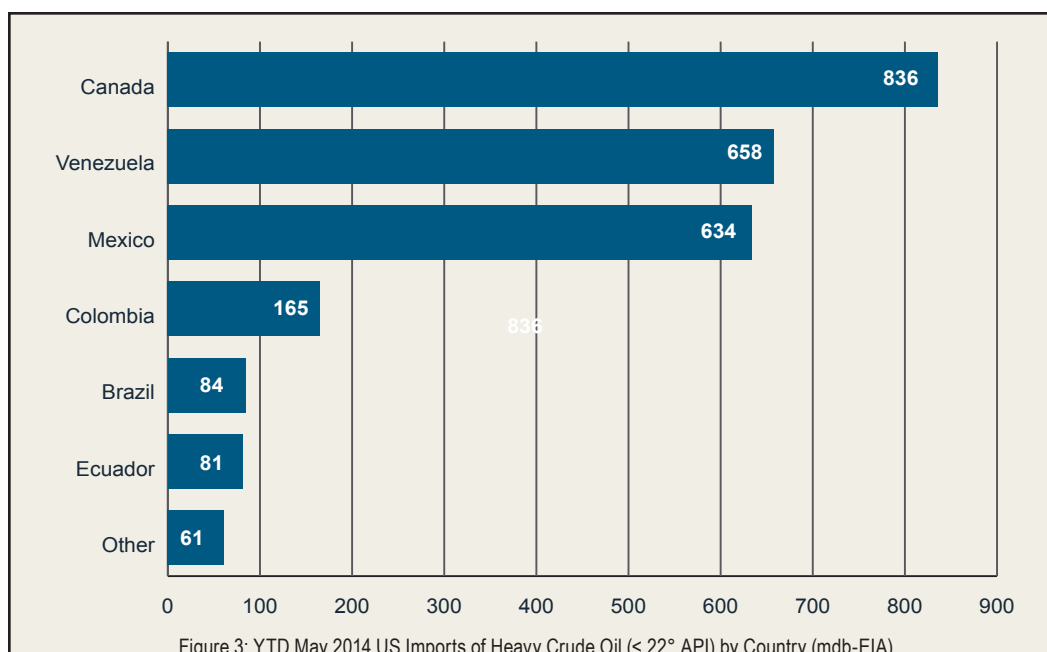
Total of France built a 50 mbd coker, a sulfur recovery unit, a vacuum distillation unit and other related units at its Port Arthur refinery in 2008. The \$2.2 billion project increased the facility's deep conversion capacity. Also in 2008, the Venezuelan

government reduced Total's interest in the Sincor extra-heavy Orinoco Belt project from 47% to 30% and renamed it PetroCedeño. Total received crude oil for the value of its 17% lost equity interest. Year to date May 2014 it has processed an average of 30 mbd of Venezuelan crude oil.

Other spot importers of Venezuela heavy crude oil include Shell, Motiva, Marathon and Axion, which in February 2014 purchased the San Antonio-Texas based NuStar Energy asphalt business, which it acquired from Citgo in 2008 and included the 77 mbd Paulsboro, New Jersey refinery.

Hovensa is a 1998 50/50 joint venture between Hess Corp. and PDVSA on a 495 mbd refinery located in St. Croix, U.S. Virgin Islands, but the facility closed down in February 2012 due to poor economic performance. Before then, Venezuelan heavy crude oil deliveries averaged approximately 225 mbd. The Energy Information Administration does not include the Hovensa-St Croix volumes in their United States data, even though the Virgin Islands are U.S. territory and more than 70 percent of the joint





venture petroleum products output was shipped to the continental U.S.

YTD U.S. imports of Heavy Crude

Generally accepted industry practice categorizes crude oil in four categories according to its density and sulfur content ranges: light-sweet, medium, heavy-sour and extra heavy-sour.

Typically North Sea, North and West Africa, Far East and some North American crude oils are classified as light to medium-sweet grades; heavy-sour crude oil grades are found mostly in the Middle East, North America and South America.

Heavy-sour crude oils, such as those found in Venezuela, generally sell at a discount to light-sweet crude oil because they require additional processing and conversion to produce a higher yield and quality of high value transportation fuels such as gasoline, diesel and jet fuel. That discounted price creates an economic advantage for U.S. Gulf Coast refiners.

U.S. crude imports share of heavy crudes have increased from 37 percent in 2008 to nearly 50 percent in 2013, according to the EIA, while the share of imported sweet crude has decreased from 52 percent to 41 percent during the same period – the result of increased domestic sweet crude oil production from tight-oil formations.

May 2014 year-to-date crude oil import data, as reported by the EIA, shows heavy crude oil (<21°API) U.S. imports of 2.518 million bd (34%) from total U.S. crude oil imports of 7.352 million bd during the period.

Ninety-eight percent of heavy crude oil imports originated from Western Hemisphere countries, with Canada representing 33 percent of total followed by Venezuela and Mexico, each with approximately 25 percent of total. Other volumes reflect spot cargoes from Guatemala, Peru, Kuwait and Iraq.

U.S. current and future reliance on Canadian heavy crude oil, then, becomes evident and more significant



LATIN AMERICA
& CARIBBEAN PROGRAM

Energy Issue Brief

as a result of the possible loss of approximately 350 mbd of Venezuelan heavy crude oil by PDVSA's reported possible refinery asset sales.

With the exception of Canada, and possibly Brazil, very limited near term increased production or supply of heavy crude oil could be expected from Mexico, Colombia and Ecuador to cover any possible supply shortfall as a result of the loss of Venezuelan heavy crude oil. The current geopolitical situation in the Middle East also makes long term heavy crude oil supplies from the region less certain.

Meanwhile a number of Western Canada crude oil pipeline projects, including the Keystone XL pipeline, which could bring an additional 2 million bd of new capacity to U.S. Gulf Coast refineries, are mired in political limbo, and awaiting approval from the White House.

“Reliable, long-term energy supplies from Canada are critical to U.S. energy security at a time when global supplies are often found in geopolitically unstable regions of the world and in countries that aren't concerned with US best interests,” said Karen A. Harbert, president of the U.S. Chamber of Commerce's Institute for 21st Century Energy, testifying earlier this year before the U.S. Senate Foreign Relations Committee.

Yet while uncertainty around approval of the Keystone XL pipeline continues, Canada, much like Venezuela, is starting to look to India and China as markets for its heavy crude oil production. Speaking in Calgary, Zhang Junsai, China's ambassador to Canada said his country is prepared to “deepen” ties with Canada on infrastructure development to help

move the country's oil and natural gas to the West Coast for export.

References:

Petróleos de Venezuela, S.A. Y Sus Filiales (PDVSA) Estados Financieros Consolidados: 2006, 2007, 2008, 2009, 2010, 2011, 2012, and 2013. <http://www.pdvs.com/>

Petróleos de Venezuela, S.A. (PDVSA) Informe de Gestión Anual: 2008, 2009, 2010, 2011, 2012, and 2013. <http://www.pdvs.com/>

U.S. Department of Energy, Energy Information Administration, Petroleum & other Liquids, Data and Statistics. <http://www.eia.gov/petroleum/data.cfm>

Chevron, Citgo, Exxon, Hess, LyondellBassell, NuStar Energy, Phillips66, Total and Valero Annual Reports and Financial Statements and Supplemental Information Reports.

Argus Media; PdV Retains Bank in Bid to Sell US Refinery Stake, July 25, 2014.

Oil & Gas Journal; Witnesses Disagree on Keystone XL's Potential US Security Impacts, Nick Snow, March 15, 2014.

Financial Post; China Looks to ‘Deepen’ Energy Ties with Canada, Ambassador Says, Jeff Lewis, May 30, 2013.



**LATIN AMERICA
& CARIBBEAN PROGRAM**
ENERGY, ENVIRONMENT, & SUSTAINABILITY

THE UNIVERSITY OF TEXAS AT AUSTIN
JACKSON
SCHOOL OF GEOSCIENCES

The Latin America and Caribbean Program
The University of Texas at Austin
Jackson School of Geosciences
2275 Speedway
Austin TX, 78712

Ph: 512-232-9510

www.jsg.utexas.edu/lacp
Twitter: @utlacp