3.0 SUPPLY AND MARKETS

This section provides oil supply and market information, including:

- a summary of the Western Canada Sedimentary Basin ("WCSB") oil supply;
- supply access at the Hardisty, Alberta hub;
- an overview of the United States Gulf Coast ("USGC") market for the Keystone XL Pipeline (the "Project" for the Canadian portion); and
- a summary of the findings of an independent supply and market assessment prepared by Purvin & Gertz, Inc. ("PGI"). A copy of the PGI assessment is provided in Appendix 3-1.

3.1 WCSB Supply Forecast

The primary source of supply for the Keystone XL Pipeline is the Alberta oil sands. The Energy Resources Conservation Board reports that there are 27.5 billion cubic metres ("m^3") or 173 billion barrels ("bbl") of remaining established reserves of bitumen in the Alberta oil sands. There are sufficient bitumen reserves in Alberta to sustain development of new oil sands projects for decades. Several projects currently under construction will add to supply and future export requirements.

In late 2008, there were announcements of the delay or cancellation of several proposed upgrader projects, due to both the high development costs in Alberta and the reduced differential between light and heavy crude oil prices. At this time, bitumen projects are more economic to develop than upgraded synthetic crude oil projects. This is expected to increase the supply of heavy crude in the next few years, which emphasizes the need to find new export markets for heavy crude oil. The Keystone XL Pipeline will be in a position to access new markets for crude oil supply, both for increased supply of heavy crude in the short term, and for future supply of light synthetic crude if the economics of upgrading projects in Alberta improve.

Several crude supply forecasts are presented in the PGI supply and market assessment that is discussed in Section 3.4. The Canadian Association of Petroleum Producers ("CAPP") published a report in June 2008 titled "Crude Oil Forecast, Markets and Pipeline Expansions" ("CAPP forecast"). The pipeline planning case in the CAPP forecast projects that Alberta oil sands production will increase by 345,000 cubic metres per day ("m^3/d") or 2.17 million barrels per day ("bbl/d") between 2007 and 2017. The growth in oil sands production is expected to more than offset declining conventional crude production. The CAPP forecast projects that overall WCSB crude oil supply will grow by 309,000 m^3/d or 1.94 million bbl/d over the same period.

CAPP prepared an interim WCSB supply forecast update in December 2008. The interim forecast projects a decline in the growth of light crude oil supply in comparison with the June 2008 forecast, due to the delay of several projects. However, the interim forecast continues to show significant growth in heavy crude oil supply and overall oil supply.

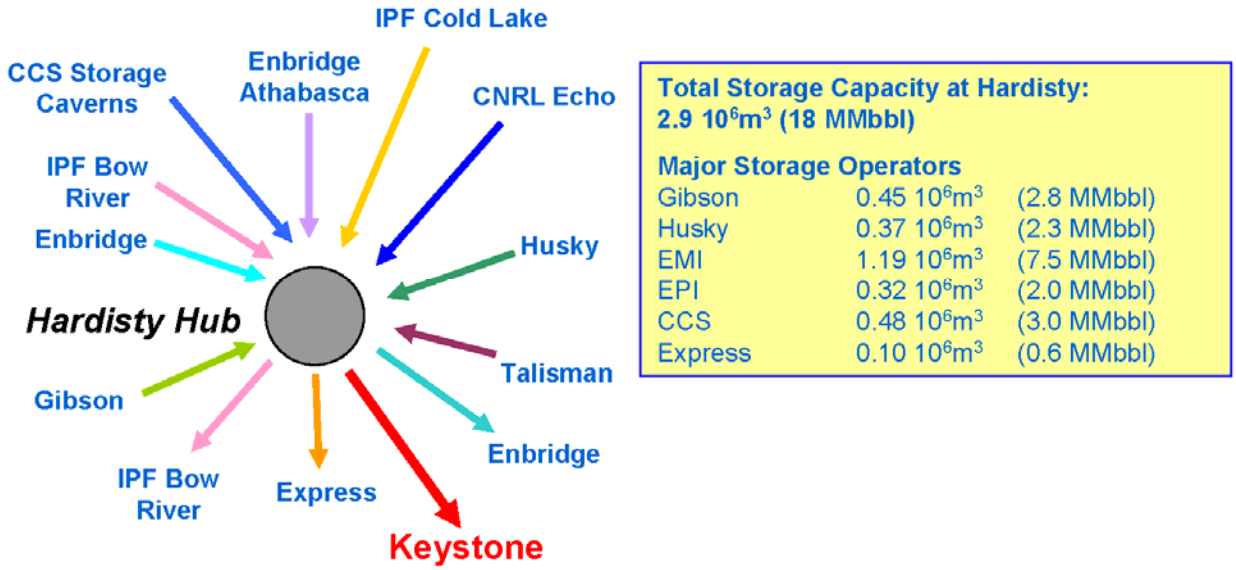
TransCanada Keystone Pipeline GP Ltd. ("Keystone") concludes that this supply growth will require access to new crude oil markets, underpinning the need for the Keystone XL Pipeline. As noted in the CAPP forecast, U.S. Petroleum Administration for Defence District ("PADD") III is the largest untapped market for western Canadian crude oil producers. Shippers approached Keystone to provide new capacity to the USGC market and have confirmed their desire to have the Keystone XL Pipeline completed expeditiously. Further, shippers have recently reconfirmed to Keystone, their desire for the Project to continue to proceed, consistent with the currently proposed Project schedule.

3.2 Hardisty Supply Access

Hardisty is a major hub for the western Canadian petroleum industry. It is connected to pipelines from Edmonton, Cold Lake, Lloydminster and Fort McMurray, Alberta. The

total inbound pipeline capacity to Hardisty of approximately 445,000 m^3/d (2.8 million bbl/d) is also supplemented by transportation of petroleum by rail and truck. In addition to significant receipt capability, the Hardisty area has a storage capacity of approximately 2.9 million m^3 (18 million bbl) (see Figure 3-1). This very liquid trading hub will provide the Keystone XL Pipeline with access to a wide variety of light and heavy crude supply for shipment to the USGC market.

Figure 3-1: Hardisty Terminal Area



3.3 USGC Market Overview and Outlook

The target market for the Keystone XL Pipeline is the USGC, located within PADD III, which is the largest refining market in the world. PADD III currently has 1.34 million m^3/d (8.4 million bbl/d) of crude refining capacity, mainly in Texas and Louisiana. Shippers have committed to Keystone for delivery of 60,400 m^3/d (380,000 bbl/d) to the USGC market.

The Keystone XL Pipeline is proposed to terminate in the Nederland, Texas area (near Port Arthur, Texas), with a planned extension to Houston, Texas. Existing pipeline

connections from the Nederland terminal area can provide access to Houston and Texas City, Texas and Lake Charles, Louisiana refineries via other pipelines. The total refining market directly accessible to Canadian crude via the Keystone XL Pipeline will be about 685,000 m^3/d (4.3 million bbl/d), as shown in Table 3-1.

Table 3-1: USGC Refining Market Available to the Keystone XL Pipeline

Refinery	m^3/d (x 1,000)	bbl/d (x 1,000)
Valero Energy, Port Arthur	45.9	289
Motiva Enterprises, Port Arthur	45.3	285
Motiva Enterprises Expansion, Port Arthur[1]	51.7	325
Total Petrochemicals, Port Arthur	36.9	232
ExxonMobil Corp, Beaumont	55.4	349
Subtotal: Port Arthur Area	**235.2**	**1,480**
Valero Energy, Houston	13.2	83
Houston Refining (Lyondell), Houston	43.1	271
Pasedena Refining, Pasedena	15.9	100
Shell Deer Park, Deer Park	52.5	330
ExxonMobil Corp, Baytown	90.1	567
Subtotal: Houston Area	**214.8**	**1,351**
BP, Texas City	76.0	478
Marathon Oil, Texas City	12.1	76
Valero Energy, Texas City	31.8	200
Subtotal: Texas City Area	**119.9**	**754**
Calcasieu Refining, Lake Charles	8.4	53
CITGO, Lake Charles	68.3	430
ConocoPhillips, Lake Charles	38.0	239
Subtotal: Lake Charles Area	**114.7**	**722**
Total Refining Market	**684.6**	**4,307**

NOTE:
[1]This expansion is planned to be complete by 2012.

The refining industry in PADD III has a large coking capacity. As a result, many refineries are capable of handling a variety of crude oils, including a significant amount of heavy crude oil.

Heavy crude runs for the target refineries in Table 3-1 are estimated by PGI at 227,700 m^3/d (1.43 million bbl/d) for 2007, nearly all of which were imported. Additionally, light crude runs in 2007 were estimated at 294,000 m^3/d (1.85 million bbl/d), of which 248,600 m^3/d (1.57 million bbl/d) were imported.

The Keystone XL Pipeline provides Canadian crude producers and USGC refiners with an opportunity to supply a portion of the total of 470,500 m^3/d (2.96 million bbl/d) of heavy and light crude imports into PADD III. Furthermore, shippers on the Keystone XL Pipeline have made binding long term commitments to connect Alberta production to the USGC market.

3.4 Supply and Market Assessment by PGI

Keystone engaged PGI to conduct an independent assessment of the supply and disposition of Western Canadian crude oil to markets in the U.S., including the Gulf Coast, and the price impact of connecting Canadian supply to this new market.

The PGI assessment considers:

- Western Canada crude oil supply;
- the U.S. crude oil market;
- Canadian crude oil disposition;
- the US Gulf Coast crude oil market;
- PADD II crude oil market;
- Canadian crude oil pricing impact; and
- pipeline capacity requirements.

The key findings of the PGI assessment, a copy of which is provided in Appendix 3-1, with respect to supply, markets, pricing impact and pipeline capacity, are discussed below.

3.4.1 Supply

There is a range of Western Canadian crude oil supply forecasts. From 2007 to 2017, crude supply is forecast to increase by as little as 247,000 m^3/d (1.55 million bbl/d) in the lowest case, to as much as 385,000 m^3/d (2.42 million bbl/d) in the highest case. These overall forecast increases are the result of growing production from the oil sands.

3.4.2 Markets

The Keystone XL Pipeline's target market, PADD III and specifically the USGC, is the largest refining market in the world with approximately 1.34 million m^3/d (8.4 million bbl/d) of crude capacity, mainly in Texas and Louisiana.

The Keystone XL Pipeline will provide pipeline access to approximately 685,000 m^3/d (4.3 million bbl/d) of refinery capacity in the Port Arthur, Houston, Texas City and Lake Charles areas.

The large PADD III market currently accesses very little Canadian crude oil. This access is currently limited to the Pegasus Pipeline, which provides only 10,300 m^3/d (65,000 bbl/d) of transportation capacity. Refineries in this market have a large coking capacity and can run significant amounts of heavy crude, which are similar to Canadian bitumen blends.

The production of crude in the U.S. continues to decline, and imports will increase due to rising demand by U.S. refineries combined with declining domestic supply. Traditional supply sources of heavy crude for the USGC, such as Mexico and Venezuela, are

declining and some USGC refiners are diversifying their supply sources by obtaining access to Western Canadian crude.

PGI expects that the USGC market could absorb at least an incremental 79,500 m^3/d (500,000 bbl/d) of Canadian crude, which represents approximately 12% of the crude capacity of the refineries in the Port Arthur, Houston, Texas City and Lake Charles areas.

3.4.3 Crude Pricing Impact

Existing markets for Canadian heavy crude, principally PADD II, are currently oversupplied, resulting in price discounting for Canadian heavy crude oil.

Access to the USGC via the Keystone XL Pipeline is expected to strengthen Canadian crude oil pricing in PADD II by removing this oversupply. This is expected to increase the price of heavy crude to the equivalent cost of imported crude. Similarly, if a surplus of light synthetic crude develops in PADD II, the Keystone XL Pipeline would provide an alternate market and therefore help to mitigate a price discount.

The resultant increase in the price of heavy crude is estimated to provide an increase in annual revenue to the Canadian producing industry in 2013 of US $2 billion to US $3.9 billion.

3.4.4 Pipeline Capacity

Based on the PGI forecast of heavy oil supply growth, it is projected that, without the Keystone XL Pipeline, heavy crude oil pipeline capacity from Western Canada will be fully utilized by 2014. Using the supply forecast in the CAPP interim update of December 2008, PGI concludes that capacity for heavy crude oil will be fully utilized by 2015.

3.4.5 Summary

Keystone has reviewed the PGI assessment and agrees with its conclusions. Shippers on the Keystone XL Pipeline have contracted for access to the USGC market for their oil sands production and refining needs. Not only will this directly benefit these shippers, it will also provide a benefit to all WCSB heavy crude producers by increasing the price they receive for their crude, as well as providing significant pipeline capacity to an alternative market.

APPENDIX 3-1

SUPPLY AND MARKET ASSESSMENT
PURVIN & GERTZ INC

WESTERN CANADIAN CRUDE SUPPLY AND MARKETS

Prepared for:

TRANSCANADA KEYSTONE PIPELINE GP LTD.

Prepared by:

PURVIN & GERTZ INC.

Buenos Aires – Calgary – Dubai – Houston
London – Los Angeles – Moscow – Singapore

February 12, 2009

T.H. Wise

ABOUT THIS REPORT

This report has been prepared for the exclusive benefit of TransCanada Keystone Pipeline GP Ltd. (Keystone) for the purpose of the facilities application to the National Energy Board (NEB) for the Keystone XL Pipeline. Any party other than Keystone and the NEB in possession of the report may not rely upon its conclusions without the written consent of Purvin & Gertz. Possession of the report by third parties does not carry with it the right of publication.

Changes in factors upon which the review is based could affect the results. All results are based on information available at the time of review. In preparing this report and the opinions recorded in this report, Purvin & Gertz relied upon data and information provided by reliable industry sources. Purvin & Gertz does not accept responsibility for errors or inaccuracies in information provided by others. Forecasts are inherently uncertain because of events or combinations of events that cannot reasonably be foreseen including the actions of government, individuals, third parties and competitors.

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INTRODUCTION

TransCanada Keystone Pipeline GP Ltd. ("Keystone") is planning the Keystone XL Pipeline project to deliver Canadian crude oil from Hardisty, Alberta to Nederland, Texas near Port Arthur and Houston, Texas at the U.S. Gulf Coast ("USGC") by late 2012. The pipeline will be able to deliver a range of crudes from light to heavy crude. It will provide incremental capacity to deliver 500,000 barrels per day ("B/D"), or 79.5 thousand cubic metres per day ("$10^3m^3/d$") to the USGC. Currently, there are shipper commitments for 380,000 B/D (60.4 $10^3m^3/d$) for the Keystone XL Pipeline, subject to regulatory approval.

Keystone is making a facilities application (the "Application") to the National Energy Board ("NEB") for the Canadian section of its pipeline from Hardisty to the U.S. border. Keystone retained Purvin & Gertz, Inc. ("Purvin & Gertz" or "PGI") to provide evidence regarding Western Canadian crude oil supply and the USGC market to be supplied by the proposed Keystone XL Pipeline. The topics discussed in this report include Western Canadian crude oil supply, the U.S. crude oil market, Canadian crude oil disposition, the USGC crude oil market, the U.S. Midwest crude oil market, Canadian crude oil pricing and pipeline capacity requirements. The Summary and Conclusions are at the end of the discussion.

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WESTERN CANADIAN CRUDE OIL SUPPLY

Western Canada has very large oil reserves due mainly to bitumen in oil sands. The Canadian Association of Petroleum Producers ("CAPP") estimated the remaining established reserves of conventional crude oil and pentanes plus in Western Canada at 585.8 million cubic metres (3.68 billion barrels) at December 31, 2006[1]. The Energy Resources Conservation Board ("ERCB") of Alberta estimated the remaining established reserves of crude bitumen in oil sands at 27.45 billion cubic metres (172.7 billion barrels) at the end of 2007[2]. At an annual bitumen production rate of 77 million cubic metres (484 million barrels) in 2007, the crude bitumen reserves are equivalent to 356 years of production. This figure would fall as bitumen production increases. Projects and plans are underway to develop the oil sands further and increase the production of bitumen and synthetic crude oil.

As a basis for this discussion, we have used the Purvin & Gertz 2008 forecast for Western Canadian supply in Table 1 which is provided at the back of this report. This includes conventional light and heavy crudes as well as synthetic crude oil and bitumen blends from the oil sands. Overall, the annualized average crude supply is forecast to grow from 2007 to 2013 by approximately 1.03 million B/D (164 10^3m^3/d). This is equivalent to 172,000 B/D (27.3 10^3m^3/d) each year. From 2013 to 2020, crude supply is forecast to grow by another 827,000 B/D (131 10^3m^3/d), equivalent to an annual growth rate of 118,000 B/D (18.8 10^3m^3/d).

Supply forecasts are uncertain but are necessary for forward planning of new facilities such as pipelines. In Figure 1 and Table 2, the Purvin & Gertz forecast is compared with other crude supply forecasts by CAPP in June 2008[3] and by Enbridge in October 2008[4]. CAPP's

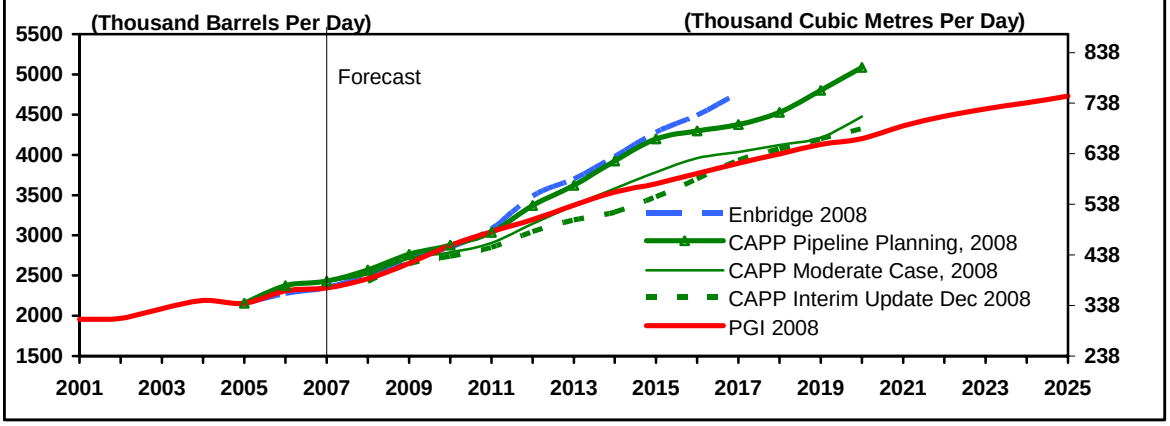
[1] CAPP Statistical Handbook, Section 2, Reserves, November 2007.

[2] ERCB, Alberta's Energy Reserves 2007 and Supply/Demand Outlook 2008-2017, June 2008.

[3] CAPP, Crude Oil Forecast, Markets and Pipeline Expansions, June 2008.

June 2008 forecasts include a Pipeline Planning Case and a Moderate Growth Case (the "Moderate" case). In December 2008, CAPP prepared a more recent forecast (the "Interim Update")[5] which is also included. The Enbridge and June CAPP forecasts are higher than Purvin & Gertz after 2013, although the CAPP Moderate Case is similar. The forecast in CAPP's December Interim Update is lower than Purvin & Gertz until 2016.

FIGURE 1
WESTERN CANADA CRUDE SUPPLY FORECAST COMPARISON



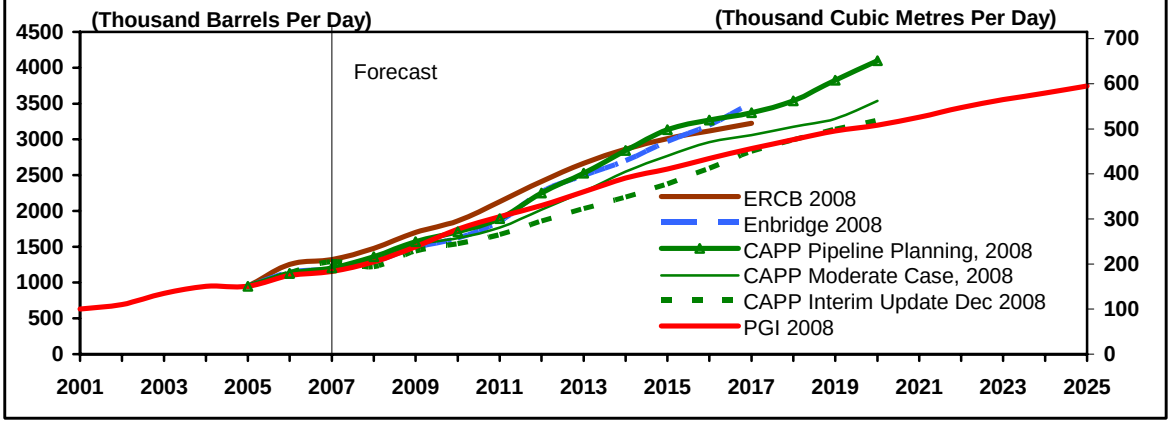
The supply in CAPP's Pipeline Planning Case is approximately 7 percent higher than in its Moderate Case in 2013 and it rises to more than 13 percent higher by 2020. The Pipeline Planning Case shows higher production and allows for pipeline operational flexibility. Over time, there can be planned and unplanned outages by pipelines, refineries and oil producers, including oil sands operators supplying bitumen blends or synthetic crude oil, so pipelines need additional capacity to sustain annual average throughputs. In a market environment where crude production is growing each year, supplies will be greater in the last half of a year compared with the first half, so annualized average throughput estimates are inadequate for pipeline planning.

[4] Enbridge, Liquids Pipeline Development, Enbridge Day Presentation, October 7 and 8, 2008.

[5] CAPP, Interim Update, 2008-2020 Western Canadian Crude Oil Forecast, December 11, 2008.

The forecast growth in Western Canadian supply is due to expected increases in oil sands production, both bitumen and synthetic crude from upgrading. Oil sands growth should more than offset the continuing declines in conventional crude production. Growth in oil sands production is expected from mining as well as in-situ projects. Oil sands production forecasts are compared in Figure 2. The 2008 forecast of the ERCB is also included[2]. Compared with the other 2008 forecasts, it has the highest outlook for oil sands production through 2014.

FIGURE 2
OIL SANDS PRODUCTION FORECAST COMPARISON



[2] ERCB, Alberta's Energy Reserves 2007 and Supply/Demand Outlook 2008-2017, June 2008.

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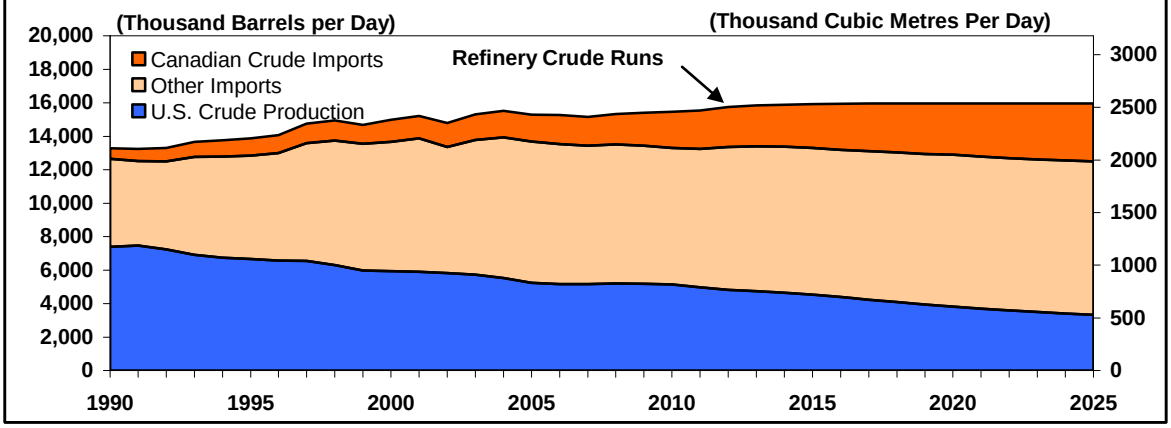
U.S. CRUDE OIL MARKET

The U.S. refining industry has a combined crude capacity of approximately 17.6 million B/D, or 2.8 million cubic metres per day ("$10^6m^3/d$"). In 2007, refinery crude runs were approximately 15.1 million B/D (2.4 $10^6m^3/d$). As shown in Figure 3, crude runs have been slowly rising. In the outlook from the Purvin & Gertz 2008 forecast, U.S. refinery crude runs are forecast to continue to rise modestly by more than 700,000 B/D (111 $10^3m^3/d$) by 2013.

The production of crude in the U.S. has been falling. In 2007, U.S. crude production was approximately 5.1 million B/D (811 $10^3m^3/d$). Further production declines are expected.

With U.S. crude production at 34 percent of refinery crude runs in 2007, crude imports to the U.S. reached 10.0 million B/D (1.6 $10^6m^3/d$). U.S. imports have been rising and further increases are expected due mainly to falling domestic production, as shown in Figure 3.

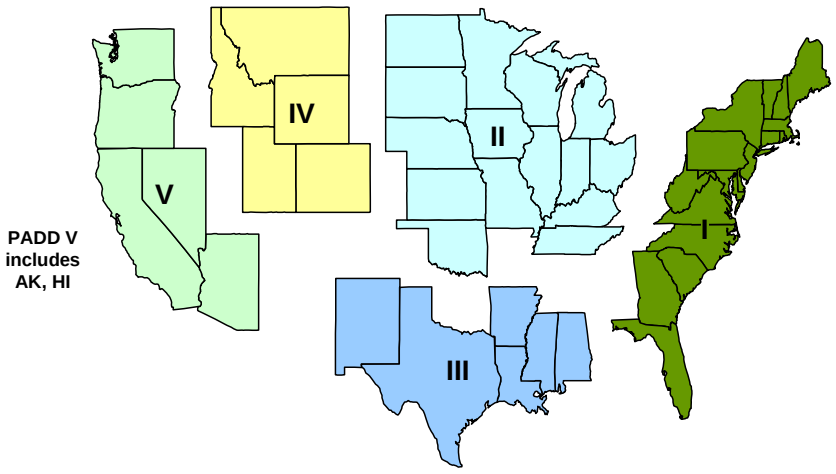
FIGURE 3
U.S. CRUDE OIL SUPPLY / DEMAND



Crude oil imports to the U.S. include Canadian crude. Due to its rising production and exports, Canada has become the largest single source of imported crude to the U.S., with approximately 1.9 million B/D (302 $10^3m^3/d$) in 2007, including East Coast crude. Canadian crude exports to the U.S. are expected to rise with growing production, assuming pipeline capacity continues to grow.

Canadian crude reaches many refining markets within the U.S. The U.S. is divided into five regions known as Petroleum Administration for Defense Districts ("PADDs"). These are shown on the map in Figure 4. PADD I is the East Coast; PADD II is the Midwest; PADD III is mostly the Gulf Coast; PADD IV is the Rocky Mountain region; and PADD V is the West Coast, including Alaska and Hawaii.

FIGURE 4
PETROLEUM ADMINISTRATION FOR DEFENSE DISTRICTS (PADDs)



CANADIAN CRUDE OIL DISPOSITION

The disposition forecast for Western Canadian crude is shown in Table 1. This includes deliveries to the Texas Panhandle and the USGC within PADD III. The USGC deliveries include Keystone XL Pipeline shipments of 380,000 B/D (60.4 $10^3m^3/d$) starting in 2013. Within PADD III, some of the Canadian crude is now being supplied to the Texas Panhandle via Cushing, Oklahoma, so is not available to the USGC. WRB Refining (formerly ConocoPhillips) is using Canadian heavy crude at its Borger, Texas refinery and has plans for a project to use more Canadian crude by 2013[6]. The existing Pegasus pipeline, owned by Mobil Pipeline, was reversed in 2006 to supply up to 65,000 B/D (10.3 $10^3m^3/d$) of Canadian crude to the USGC. In this report, it is assumed to operate permanently although its initial commitments were for five years (until early 2011) and it could shut down after Keystone XL Pipeline commences operations.

In addition, Table 1 and Figure 5 show Purvin & Gertz' 2008 disposition forecast for Canada and U.S. PADDs I, IV and V. Deliveries in Canada are to refineries in Western Canada and Ontario and the forecast allows for higher deliveries to Ontario, assuming the replacement of imports. Deliveries to PADDs I and IV are needed to meet local refinery demand. Deliveries to PADD V have been mostly to Washington state refineries. Overall, deliveries to these markets are forecast to rise.

[6] EnCana website: Downstream/Borger, October 2007.

FIGURE 5
WESTERN CANADA CRUDE SUPPLY/DEMAND FORECAST

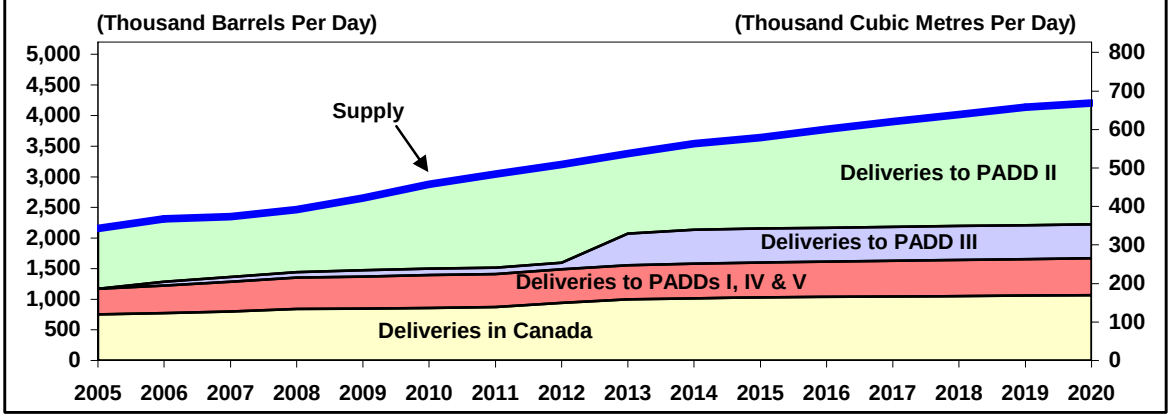
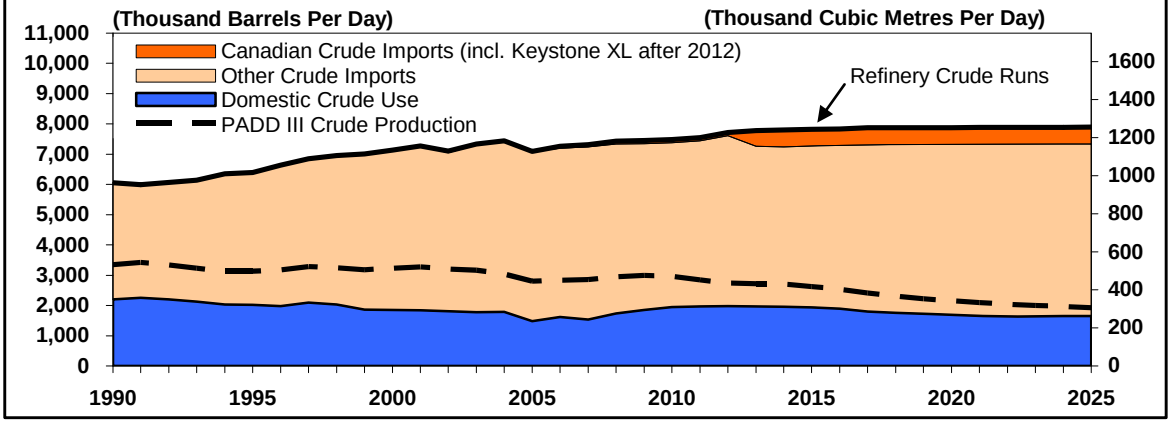


Table 1 and Figure 5 show the remaining volume of Canadian crude available for PADD II which is the largest market for Western Canadian crude. Canadian crude deliveries to PADD II are forecast to increase throughout the forecast period except for 2013, the year in which Keystone XL Pipeline comes onstream.

U.S. GULF COAST CRUDE OIL MARKET

The Keystone XL Pipeline is intended to deliver Canadian crude to the USGC in PADD III which includes states from New Mexico to Mississippi. PADD III has the largest refining system in the world with approximately 8.4 million B/D (1.3 10^6m^3/d) of crude capacity, mainly at the USGC in Texas and Louisiana. The refineries are listed in Table 3 with their current crude capacities. As shown in Figure 6, refinery crude runs have increased and reached approximately 7.3 million B/D (1.16 10^6m^3/d) in 2007. Crude runs in PADD III are projected by Purvin & Gertz to grow by over 500,000 B/D (79.5 10^3m^3/d) by 2020. The PADD III refineries run crude to produce refined products which are consumed in PADD III and other PADDs. Large volumes of refined products are shipped by pipeline to PADDs I and II. Future refinery crude runs will depend on U.S. demand for refined products and product trade and could be higher or lower than forecast.

FIGURE 6
PADD III CRUDE RUNS - BY SOURCE



PADD III crude production was approximately 2.8 million B/D (450 10^3m^3/d) in 2007. Production declines have been limited in recent years as growth in offshore Gulf of Mexico production has nearly offset the decline in onshore production. However, PADD III crude production is expected to decline in the long term.

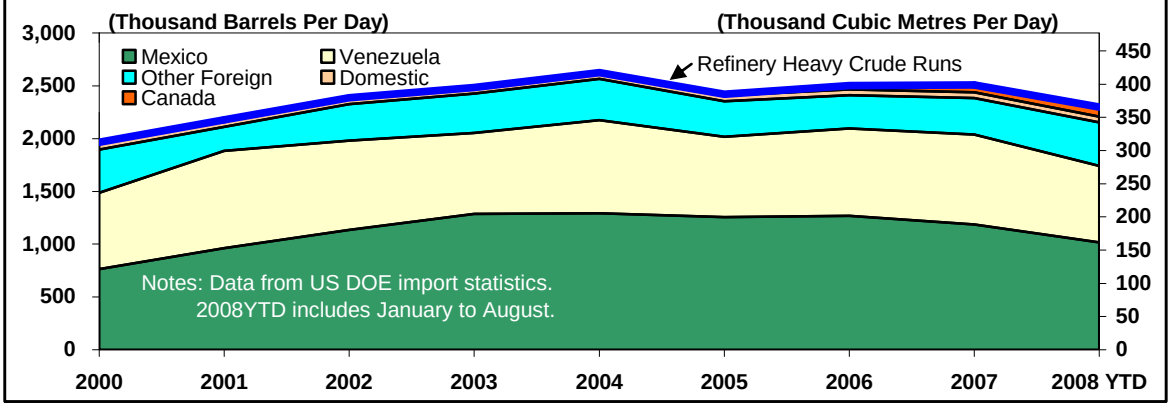
The use of domestic crude production by PADD III refineries is forecast to remain near current levels. Approximately 1.5 million B/D (238 10^3m^3/d) of the PADD III production, or 53 percent, was used by PADD III refineries in 2007. The remaining 1.3 million B/D (207 10^3m^3/d) of production was shipped by pipelines to refineries in other PADDs, mostly PADD II. PADD III crude transfers to PADD II are expected to decline as PADD II uses more Canadian crude leaving a higher proportion of the indigenous crude in PADD III.

Most of the crude used in PADD III is imported. Imports have grown to 5.6 million B/D (892 10^3m^3/d) in 2007 or 77 percent of crude demand. Imports are forecast to decline initially before 2010 as more of the domestic PADD III crude production is used in PADD III, and then to increase by over 600,000 B/D (95.4 10^3m^3/d) by 2020.

The refining industry in PADD III uses a wide variety of crudes including light sweet, medium sour, heavy sour, high acid heavy sweet, and others such as synthetic crudes from Venezuela. Many of the refineries have large coking capacity, so they can run significant amounts of heavy crudes which generally have an API gravity below 28.

In 2007, heavy crude runs were approximately 2.5 million B/D (397 10^3m^3/d) or 34 percent of total crude runs. Nearly all of the heavy crude used in PADD III is imported. Heavy crude runs fell from 2004 to 2007 due to reduced supply of heavy crude, especially from Mexico, as shown in Figure 7. In the first eight months of 2008, heavy crude supplies from Mexico and Venezuela fell another 300,000 B/D (31.8 10^3m^3/d) approximately. Heavy crude imports from other countries increased, but there was a net reduction in heavy crude use of approximately 200,000 B/D (31.8 10^3m^3/d). Some of the increased heavy crude was heavy sweet, high acid crude from Brazil and Angola. However, heavy sweet crudes are less desirable than heavy sour crudes for refineries which are designed for conventional heavy crudes similar to Canadian bitumen blends.

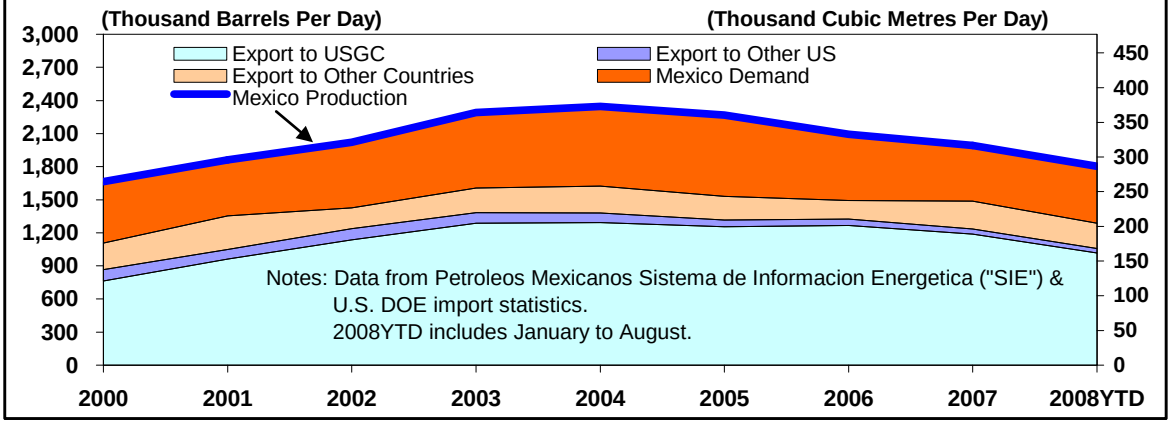
FIGURE 7
PADD III HEAVY CRUDE SUPPLY



Most of the heavy crude is used by refineries which employ coking technology to upgrade heavy vacuum residual oil. Based on the U.S. Department of Energy ("DOE")/Energy Information Administration ("EIA"), Petroleum Supply Monthly statistics, coker feed fell in the first eight months of 2008 to 1.078 million B/D (171 10^3m^3/d) from 1.152 million B/D (183 10^3m^3/d) in 2007, a drop of more than 6 percent. This is consistent with a reduced supply of heavy feedstock.

The production of heavy crude from Mexico has been falling as shown in Figure 8. USGC refinery crude runs of Mexican heavy crude have fallen by around 250,000 B/D (39.7 10^3m^3/d) since 2006 due to falling production. In particular, production from the offshore Cantarell field which produces most of the Maya heavy crude is falling rapidly. With limited restoration plans in sight, it appears that production from Mexico will continue to decline for several years. The International Energy Agency ("IEA") forecasts a decline in total crude production from Mexico of 1.1 million B/D (175 10^3m^3/d) between 2007 and 2015.[7]

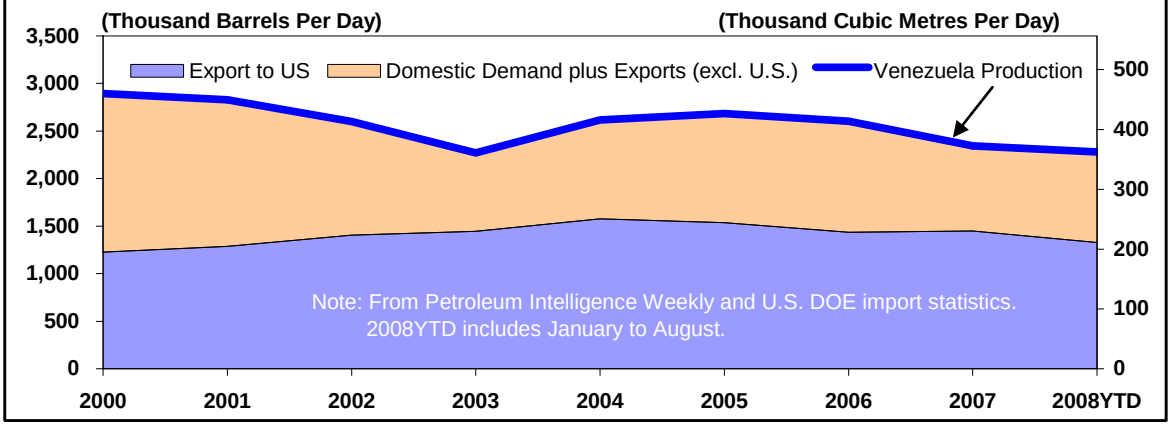
FIGURE 8
MEXICO HEAVY CRUDE BALANCE



[7] IEA, World Energy Outlook, 2008, page 267, Table 11-3.

Most of Venezuela's crude production is heavy crude. Over half of the production is exported to the U.S. Venezuela's total crude production increased between 2003 and 2005 but most of the incremental production was sold to markets outside of the U.S. as shown in Figure 9. Since the Venezuela refinery crude capacity[8] is approximately 1.3 million B/D (204 10^3m^3/d), and crude use outside of the U.S. has been less than this since 2002, Venezuela's exports to markets other than the U.S. have been relatively small. Since 2005, Venezuelan crude production has fallen, so refinery use in the U.S. and the other markets has also fallen. Venezuela has large reserves of heavy oil, but future supply will likely depend on commercial, market and political strategies which may oppose supplying U.S. refineries and favour exports to other markets.

FIGURE 9
VENEZUELA CRUDE BALANCE



Although traditional supplies of heavy crude have been falling, the USGC refineries as a group are increasing their capability to use more heavy crude, by adding coking capacity. For example, Motiva, a joint venture of Saudi Aramco and Shell, has commenced a large expansion project at Port Arthur[9] with 325,000 B/D (51.7 10^3m^3/d) of new crude capacity and 95,000 B/D

[8] Oil and Gas Journal, 2007 Worldwide Refining Survey, December 24, 2007.

[9] Shell website, Major Projects and Oil & Gas Journal Worldwide Construction Update, November 19, 2007.

(15.1 10^3m^3/d) of new coking capacity for a 2011 startup; with coking capacity at 29 percent of crude capacity, this should allow more heavy crude runs. Marathon has a project at Garyville, Louisiana[10], with a 180,000 B/D (28.6 10^3m^3/d) crude expansion and a 44,000 B/D (7.0 10^3m^3/d) coker which are under construction and scheduled for startup in late 2009. Total is building a 50,000 B/D (7.9 10^3m^3/d) coker[11] at its 232,000 B/D (36.9 10^3m^3/d) Port Arthur refinery for startup in 2011. Smaller coker expansions are underway at Hunt, Tuscaloosa, Alabama[12]; Valero, St. Charles, Louisiana[13]; Flint Hills, Corpus Christi, Texas[14], for startup in 2010.

In light of declining crude supplies from Mexico and Venezuela, some USGC refiners are attempting to diversify their sources by accessing Western Canadian supplies. For example, subject to regulatory approval, Valero Energy has agreed to participate as a prospective shipper on the Keystone XL Pipeline to Port Arthur, and has secured heavy crude oil from several Canadian oil producers[15]. Valero operates three coking refineries in the area around Houston and expects to be one of the largest recipients of heavy crude from the Keystone XL Pipeline. Canadian Natural Resources Limited ("CNRL") has committed 120,000 B/D (19.1 10^3m^3/d) to the Keystone XL Pipeline project, if approved, and also has agreed to supply 100,000 B/D (15.9 10^3m^3/d) of heavy crude to an unnamed, USGC refiner[16].

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[10] Marathon Press Release, November 7, 2006.

[11] Total website, Downstream 2006 and Downstream Segment 2007.

[12] Argus Petroleum Coke, Page 5, February 7, 2007.

[13] Valero Presentation, Lehman Brothers Energy/Power Conference, September 4, 2008.

[14] Flint Hills, Oil & Gas Journal Worldwide Construction Update, November 19, 2007.

[15] Valero News Release, July 16, 2008.

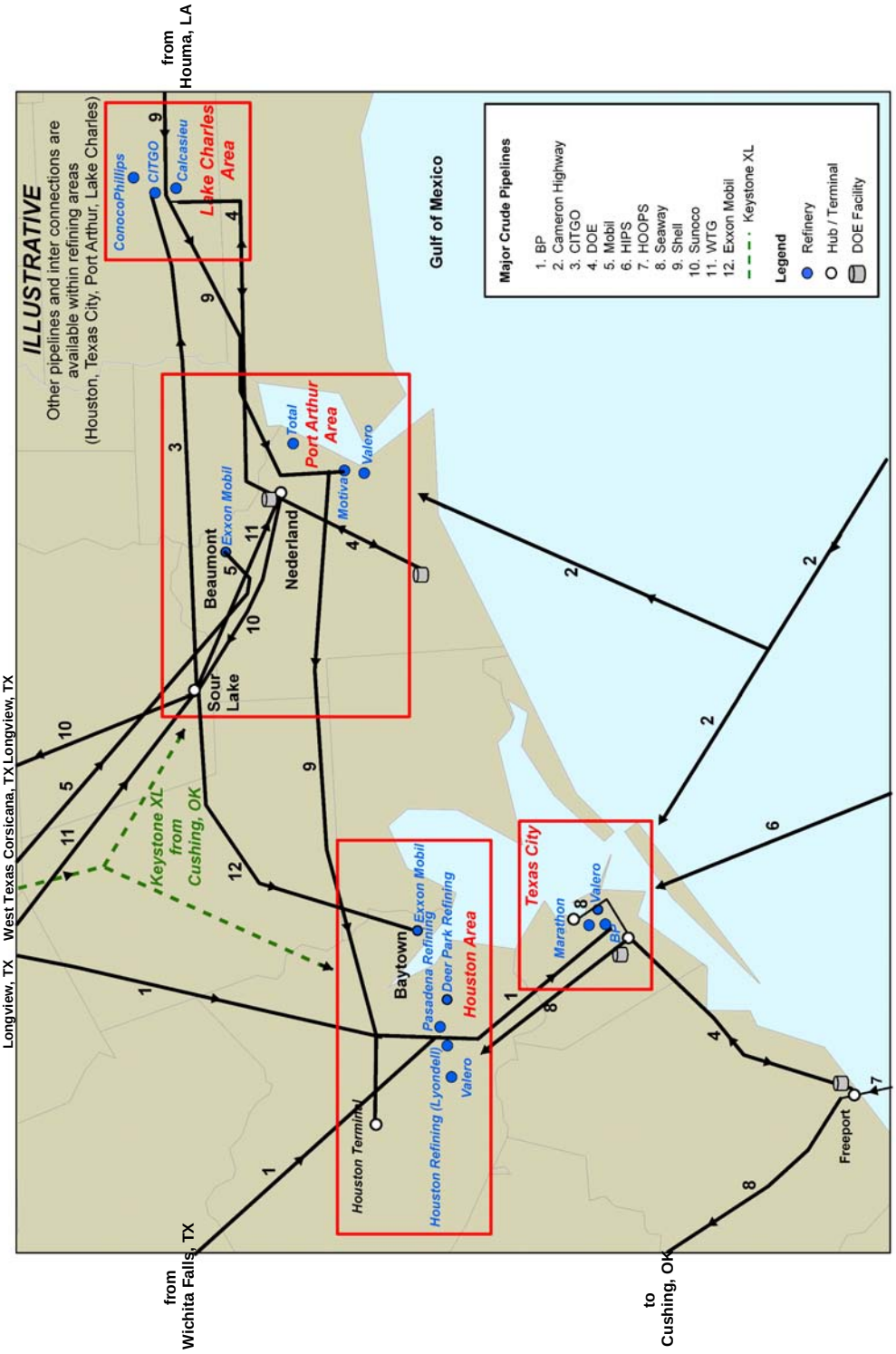
[16] CNRL 2008 Second Quarter Results, August 7, 2008.

Refineries Supplied By Keystone XL Pipeline

The proposed Keystone XL Pipeline would deliver up to 500,000 B/D (79.5 10^3m^3/d) of heavy and light Canadian crudes to terminals near Nederland and Houston. From these terminals, crude could be delivered on other pipelines to many refineries. There are 15 refineries which would have access to Canadian crudes delivered on the Keystone XL Pipeline. These are listed as Group 1 refineries in Table 3. They are situated near Port Arthur and Houston as well as Texas City and Lake Charles, Louisiana. Their combined crude capacity is 4.0 million B/D (633 10^3m^3/d), or nearly half of total PADD III refining capacity, and this is larger than the entire PADD II market. With the Motiva refinery expansion, the combined crude capacity will increase to 4.3 million B/D (685 10^3m^3/d). Purvin & Gertz estimates of the refinery crude runs for Group 1 are shown by type and source in Table 4 for 2007. Heavy crude use at these refineries is estimated at 1.4 million B/D (228 10^3m^3/d), nearly all of which was imported. Light crude runs in 2007 are estimated at 1.85 million B/D (294 10^3m^3/d) of which light sweet crude was 784,000 B/D (125 10^3m^3/d) and light sour crude was 1.07 million B/D (169 10^3m^3/d). The majority of the light crude (85 percent) was imported; imports are estimated at 661,000 B/D (105 10^3m^3/d) for light sweet crude and 904,000 B/D (144 10^3m^3/d) for light sour crude.

The refining area to be supplied by the Keystone XL Pipeline is shown in Figure 10, which shows the 15 Group 1 refineries and some of the major crude pipelines serving the refineries in the area as well as the proposed Keystone XL Pipeline to Nederland and Houston. There are many other crude pipelines and inter-connections within the four refining centres that are not shown.

FIGURE 10
KEYSTONE XL PIPELINE MARKET AREA



The four Port Arthur area refineries have a combined crude capacity of 1.16 million B/D (184 10^3m^3/d), which will increase to 1.48 million B/D (235 10^3m^3/d) after the Motiva refinery expansion. The three refineries in the vicinity of Lake Charles, Louisiana have a combined crude capacity of 722,000 B/D (115 10^3m^3/d) and Canadian crude delivered on the Keystone XL Pipeline would have to be supplied from the Port Arthur area on a CITGO pipeline from Sour Lake, Texas or a DOE line from Nederland, Texas.

The five Houston area refineries have a combined crude capacity of 1.35 million B/D (215 10^3m^3/d). Crude oil can be transported to the Houston area on a Shell pipeline from the Nederland area, and to Baytown, Texas (near Houston) on an ExxonMobil pipeline from Sour Lake. The three Texas City area refineries have a combined crude capacity of 754,000 B/D (120 10^3m^3/d). Canadian crude delivered on the Keystone XL Pipeline would have to be supplied to Texas City from the Houston area via existing pipelines such as the BP pipeline.

The Keystone XL Pipeline would be able to deliver light crude as well as heavy crude. In total, all the PADD III refineries used approximately 2.5 million B/D (402 10^3m^3/d) of light sweet crude including 1.57 million B/D (249 10^3m^3/d) of imports in 2007. The Group 1 refineries used only 784,000 B/D (125 10^3m^3/d) of light sweet crude. If there are low delivery volumes from the Keystone XL Pipeline, light sweet synthetic crude would compete with conventional light sweet crude. However, if synthetic crude deliveries are as high as 500,000 B/D (79.5 10^3m^3/d), synthetic crude would likely have to compete with conventional light sour crudes.

Purvin & Gertz expects that, if the Keystone XL Pipeline is constructed, the USGC market can absorb an incremental 500,000 B/D (79.5 10^3m^3/d) of Canadian crude, which represents around 12 percent of the crude capacity of the Group 1 refineries. The refinery crude capacity is expanding by another 325,000 B/D (51.7 10^3m^3/d) to 4.3 million B/D (684 10^3m^3/d) by 2011. Shipper commitments on the Keystone XL Pipeline are for 380,000 B/D (60.4 10^3m^3/d). Based on the import volumes in PADD III, the Canadian crude imports could be heavy crude or a combination of heavy and light synthetic crudes delivered on the Keystone XL Pipeline, assuming adequate distribution connections at the USGC.

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PADD II CRUDE OIL MARKET

The availability of Western Canadian crude oil to PADD II is part of the supply and disposition forecast in Table 1. In 2007, PADD II received approximately 1.1 million B/D (179 10^3m^3/d) of Canadian crude which was nearly 50 percent of the Western Canadian supply. As Canadian supplies grow, deliveries of Canadian crude to PADD II are also forecast to grow. Synthetic crude runs in PADD II should increase from relatively low levels. The use of Canadian bitumen blends should also increase in PADD II due to the current construction of several new coker projects at PADD II refineries; these projects include BP at Whiting, Indiana[17]; Marathon at Detroit, Michigan[18]; WRB Refining at Wood River, Illinois[19]; and Sinclair at Tulsa, Oklahoma[20].

PADD II encompasses 15 states in the Midwest from the Canadian border, south to Oklahoma and east-west between the Dakotas and Ohio. PADD II is a large market for crude oil with 27 refineries having a combined crude capacity of 3.7 million B/D (588 10^3m^3/d). Total crude runs in 2007 were around 3.2 million B/D (513 10^3m^3/d). Refinery runs of Canadian crude have increased to around one third of total runs and are expected to rise with increased Canadian supplies. The PADD II refineries also use U.S. domestic crudes produced mainly in PADD II, Texas and Louisiana, and they import crudes via pipelines from the USGC. As Canadian production grows, Figure 11, developed by Purvin & Gertz, shows that Canadian crudes are expected to displace some of the U.S. domestic crudes from PADD II as well as other imports which are delivered from the USGC. The Canadian crude supply to PADD II in the

[17] BP Press Release, September 20, 2006.

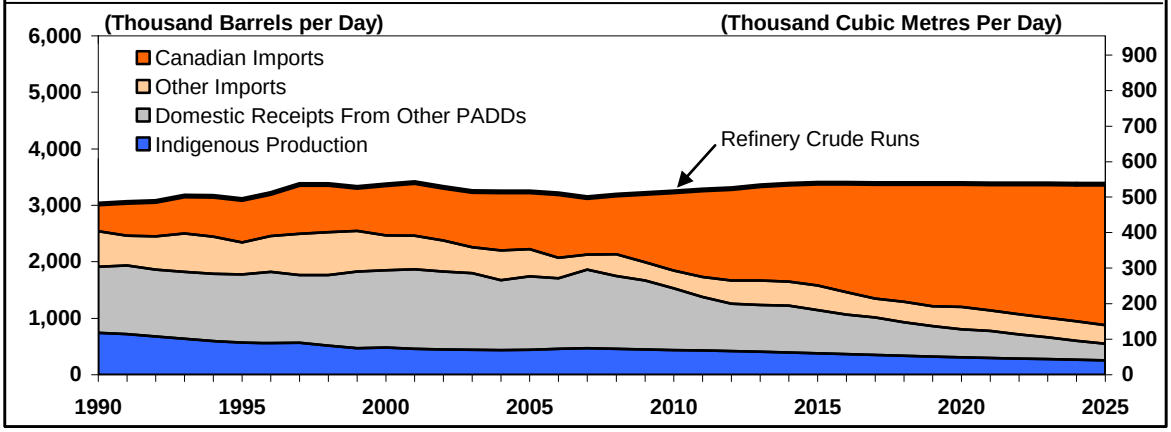
[18] Marathon 2007 Annual Report.

[19] EnCana 2007 Annual Report.

[20] Foster Wheeler Corporation News Release, September 11, 2006.

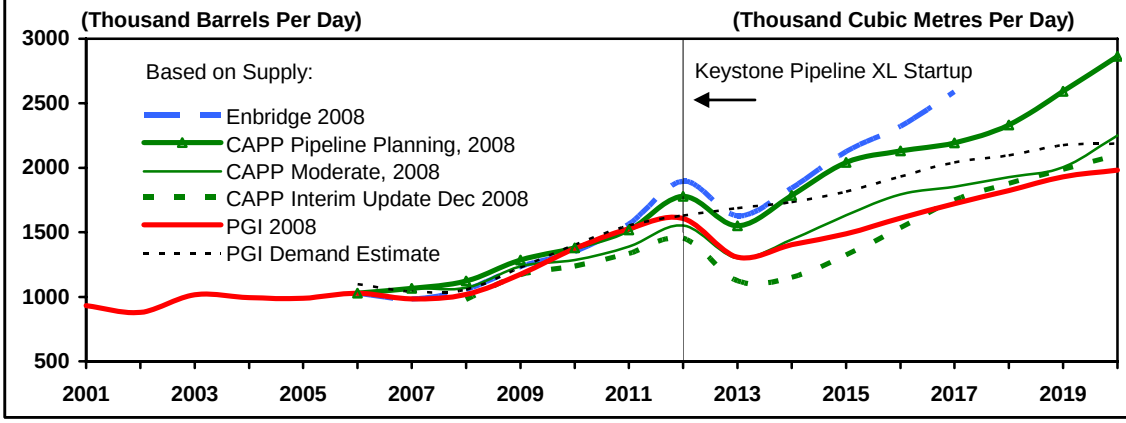
figure is estimated without deducting deliveries to the USGC via the Keystone XL Pipeline. The Canadian crude will likely continue to replace more of the domestic crudes and imports in northern PADD II as refineries add residual conversion capacity. In addition, more Canadian crude will likely move further south as pipelines expand within PADD II.

FIGURE 11
PADD II CRUDE RUNS - BY SOURCE



The volume of Canadian crude available for PADD II depends on the overall supply of Western Canadian crude. Several supply scenarios are considered in Table 2. Based on the Purvin & Gertz supply forecast, the Canadian crude available for PADD II would decrease in 2013 following the startup of Keystone XL Pipeline, but it would increase each year thereafter. Under the CAPP Interim Update supply forecast, crude for PADD II in 2013 would be similar to the forecast level for 2009, and would increase to the 2011 forecast level by 2015. The CAPP Moderate supply forecast is similar to the Purvin & Gertz forecast, so supply to PADD II would grow to a slightly higher level using this forecast. The CAPP Pipeline Planning supply forecast and the Enbridge supply forecast would provide the most crude to PADD II. Using these forecasts, deliveries to PADD II in 2013 would exceed 2010 forecast deliveries. The forecasts of deliveries to PADD II, which are based on the supply forecasts, are compared in Figure 12.

FIGURE 12
FORECAST COMPARISON OF CANADIAN CRUDE DELIVERIES TO PADD II



The figure also shows Purvin & Gertz' 2008 forecast of demand for Canadian crude in PADD II, consistent with Figure 11. In Figure 12, the demand is higher than the Purvin & Gertz forecast of deliveries because the latter calculates the availability for PADD II after deducting the Keystone XL Pipeline committed deliveries from the supply. With lower Canadian deliveries, PADD II refineries would need more domestic crude or other imports to sustain crude runs.

With higher Canadian crude deliveries based on CAPP's Pipeline Planning case or the Enbridge supply forecast, the deliveries would exceed the Purvin & Gertz demand forecast. This would satisfy additional refinery demand, if any, or require that more Canadian crude be directed to other markets. Potential refinery demand for Canadian crudes in PADD II may be higher than forecast, depending on the crude types available, since some PADD II refiners are developing projects to use more Canadian crude. If other markets are needed for additional crude supply, more pipeline capacity from Canada to those markets may also be needed.

The volume of Canadian crude available for PADD II also depends on the volumes delivered elsewhere. The deliveries to other markets could change from the forecast in Table 1. The volume delivered to the USGC would increase by another 120,000 B/D (19.1 10^3m^3/d) by 2014 if Keystone XL Pipeline delivers at 500,000 B/D (79.5 10^3m^3/d). This would decrease the availability in PADD II as shown in Table 2. On this basis, with the Keystone XL Pipeline at capacity and Pegasus Pipeline continuing to operate, the deliveries of Canadian crudes to PADD II in 2015 would be about the same as the 2010 deliveries using the Purvin & Gertz

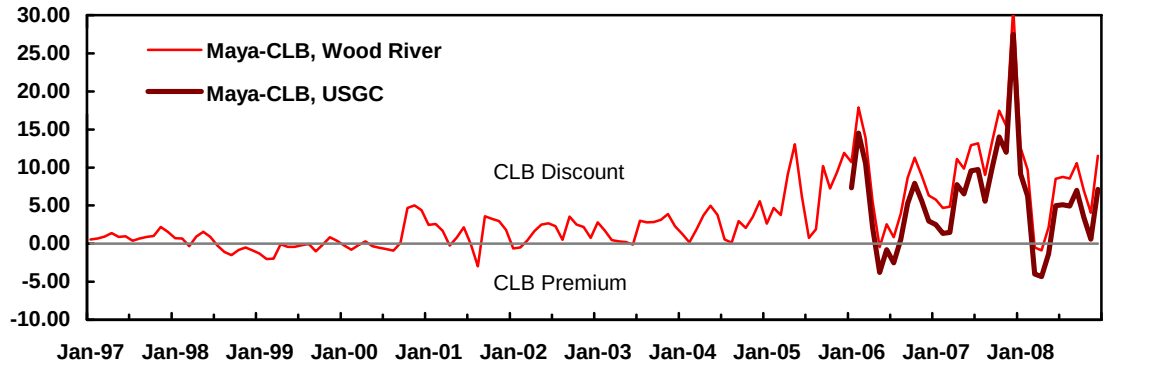
supply forecast, but higher than the 2010 deliveries using the June CAPP and Enbridge supply forecasts. Based on the CAPP Interim Update forecast, the deliveries of Canadian crude to PADD II in 2015 would be approximately the same as the 2009 forecast deliveries. All the supply scenarios lead to forecasts of growing deliveries to PADD II after 2013.

CANADIAN CRUDE OIL PRICING

Limited volumes of Canadian heavy crude has been delivered to the USGC on the Pegasus pipeline since early 2006. However, the price of Canadian heavy crude has been discounted at the USGC. Delivery of a large volume of Canadian crude on the Keystone XL Pipeline to the large USGC market is expected to strengthen the price of Canadian heavy crude at the USGC and in Alberta for reasons discussed below in this section.

Figure 13 compares the delivered price of Canadian Cold Lake bitumen blend ("CLB", also known generally as "DilBit") against the price of Mexican Maya heavy crude at the USGC[21]. The figure indicates a USGC discount on DilBit most of the time since 2006 as these crudes are similar in quality and have nearly equivalent values to refiners. This price discount suggests that the supply of Canadian heavy crudes has exceeded demand in their main markets north of the USGC. Up until 2000, the DilBit price was stronger and was equivalent to the Maya price around Wood River in the Midwest (as shown in the figure); DilBit was a "price taker" in the Midwest versus other crudes since supply did not exceed demand and other imports were needed.

FIGURE 13
COLD LAKE BLEND PRICING
(U.S. Dollars per Barrel)



[21] The prices and costs in this discussion are in U.S. dollars unless noted otherwise.

The Keystone XL Pipeline to the large USGC market would expand the market for Canadian heavy crudes and increase demand. This should allow the price of Canadian heavy crude to increase at least as far as USGC parity with Maya. The price for Canadian heavy crude could increase further if the Keystone XL Pipeline causes the available supply in the Midwest to be less than the demand, resulting in a price equivalent to Midwest parity with imported Maya crude, as it was before 2000.

At the USGC, the average price discount on Cold Lake Blend is estimated to have exceeded $5.00 (U.S.) per barrel versus Maya since 1996, as shown in Figure 13, when the Pegasus pipeline to the USGC started up. However, the prices have been volatile; the monthly discount has been much higher and occasionally there has been a small premium at the USGC. More recently in 2008, the average discount at the USGC was approximately $3.24 per barrel. To be conservative for discussion purposes, we have assumed a price discount of $3.00 per barrel, recognizing that the average discount was higher in 2006 and 2007. By increasing market access for Canadian heavy crudes, the $3.00 per barrel discount should be avoided in the future. The price increase should apply to all of the Canadian heavy crude supply, not just the volume shipped on the Keystone XL Pipeline.

The market price received from refiners in other markets such as the Midwest would not necessarily be the same as the price received from USGC refiners for the DilBit which is shipped to the region under ship-or-pay commitments. The vast majority of the Western Canadian crude (89 percent in 2013 based on Table 2) would be delivered to refineries in markets other than the USGC. This crude would be supplied at a price which is determined by competition in the market. This should establish a market price for the Canadian crudes other than the committed volume which is shipped on the Keystone XL Pipeline. The market prices of offshore crudes delivered to PADD II are higher than the USGC prices because these crudes are delivered north from the USGC by pipeline, and this adds to the delivered crude cost. Removing volumes from the PADD II market could cause PADD II demand to exceed the available supply. Purvin & Gertz expects that PADD II would be the competitive market for Canadian crudes after the

Keystone XL Pipeline startup since the PADD II refiners would have demand for the crude which exceeds the available supply that Purvin & Gertz has forecast in Table 2.

The Midwest heavy crude prices are affected by the pipeline tolls between the Midwest and the USGC. Using current pipeline tolls, the Midwest price of imported heavy crude at Patoka, Illinois delivered from the USGC is $2.27 per barrel higher than the USGC price, based on the Capline toll[22] from St. James, Louisiana to Patoka. If it is not surplus to PADD II, Canadian heavy crude supply would not move from PADD II to the USGC and would not incur the toll of $1.28 per barrel[23] on the Mobil Pegasus pipeline from Patoka to Beaumont, Texas. Based on the combined tolls, the increase in the Canadian heavy crude price at Patoka would be $3.55 per barrel over USGC parity. In this scenario with Midwest price parity against Maya, Midwest demand for Canadian heavy crude would exceed the available supply and the market price of Cold Lake Blend would be approximately $6.55 per barrel above the 2008 price level at Patoka.

If the available supply for PADD II exceeds PADD II demand, the market price would likely fall to parity elsewhere. If so, sufficient pipeline capacity would be needed to deliver the Canadian crudes to other markets so that price discounting does not re-occur. There may be other events that affect the DilBit price which were not considered in this report if not related to the Keystone XL Pipeline.

Synthetic crude oil may also move to the USGC market as production grows. If so, the price of synthetic crude could drop to USGC parity with conventional light crudes. However, as for heavy crudes, ship-or-pay commitments on a pipeline to the USGC could mitigate potential price discounts for synthetic crude and allow a market price which is equivalent to parity with light crude in PADD II.

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[22] FERC Tariff 34, Amoco Capline for viscosity of 417 SUS.

[23] FERC Tariff A-1171, Mobil Pipeline for heavy crude.

Higher crude prices resulting from the Keystone XL Pipeline would increase revenues for the Canadian producers of heavy crude blends. A Canadian heavy crude producer is expected to realize an increase in the heavy crude price of approximately $3.00 per barrel by avoiding a discount at the USGC, as discussed earlier. Although the price comparison is specifically for Cold Lake Blend versus Maya, the same level of discounting is generally applicable to all the other Canadian heavy crude blends including other DilBit, conventional heavy crudes and blends such as Western Canadian Select ("WCS"), since prices for Canadian heavy crudes track each other more than the Maya price. If deliveries on the Keystone XL Pipeline relieve the oversupply of Canadian heavy crudes, a price discount at the USGC should not be necessary. By 2013, Purvin & Gertz estimates the total supply of all the Canadian heavy crude blends to be 1.84 million B/D (293 10^3m^3/d). Based on eliminating an average discount of $3.00 per barrel on this volume of heavy crude, the annual revenue to the Canadian producing industry would increase by approximately $2.0 billion (U.S.).

Additional producer revenues are possible if the Keystone XL Pipeline also relieves the oversupply situation in the Midwest. As discussed earlier, the market prices of Canadian heavy crudes should rise in the Midwest and in Western Canada by another $3.55 per barrel. The Midwest market price would impact the price of 1.46 million B/D (231 10^3m^3/d) which is all of the Canadian heavy crude supply, except the Keystone XL Pipeline volume of 380,000 B/D (60.4 10^3m^3/d). Based on a further price increase of $3.55 per barrel versus the USGC, the annual increase in revenue for 1.46 million B/D (231 10^3m^3/d) would be another $1.9 billion approximately for the Canadian producing industry in 2013.

For the USGC Midwest price parity impacts, we have used heavy crude since its price has been impacted in recent years. In the future, the impacts could also apply to light synthetic crudes if supply exceeds demand in the Midwest.

Following the startup of the Keystone XL Pipeline, the increased revenues should be expected to continue until Canadian supply overtakes demand. Other events which were not considered here could alter producer revenues.

The positive revenue gains available to the Canadian producing industry may be partially offset by other costs. These might include additional pipeline costs and potential impacts on crude oil netback prices which might temporarily arise from toll changes on other pipelines. In our opinion, these costs would be less than the expected revenue gains, so the net benefit to the Canadian producing industry should be positive.

In summary, if the Keystone XL Pipeline causes the USGC price discount to be eliminated, the annual revenue increase to the Canadian producing industry is estimated at $2.0 billion (U.S.). In addition, if the Keystone XL Pipeline causes the Midwest price to rise above USGC parity, the annual revenue could increase by another $1.9 billion to reach approximately $3.9 billion (U.S.). The increased revenue could apply for several years as long as refinery demand and pipeline capacity exceed Canadian heavy crude supply. The large refining capacity at the USGC should allow producers to avoid a price discount below USGC parity as long as sufficient pipeline access exists for Western Canadian crude.

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PIPELINE CAPACITY REQUIREMENTS

The estimated pipeline capacity for 2011 to export Western Canadian crude oil is shown in Table 5 including pipeline expansions and projects. The pipelines include Enbridge, Trans Mountain Pipeline ("TMPL"), Milk River, Rangeland, Express and Keystone Phase 1 to Patoka with the Cushing extension. Estimated capacities for light crude and heavy crude service are provided. Overall, the pipeline capacity for total crude is estimated at 3.76 million B/D (598 10^3m^3/d) of which 1.63 million B/D (260 10^3m^3/d) is for light crude and 2.12 million B/D (338 10^3m^3/d) is for heavy crude.

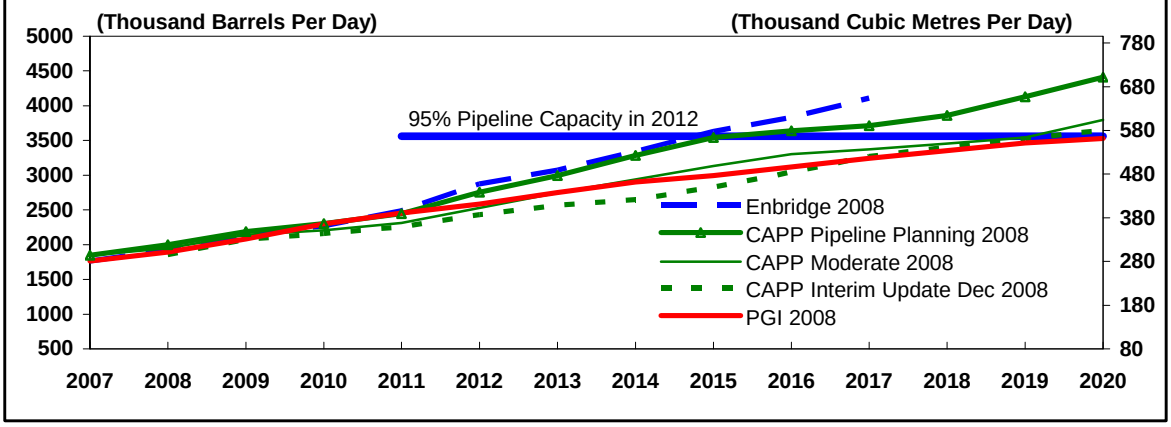
For the following analysis, we have used an annualized service factor of 95 percent for the total pipeline capacity. Although pipelines operate at 100 percent in some months, each individual line generally does not operate at full capacity every day of the year. Not only do pipelines have outages, but crude oil producers and refineries have planned and unplanned outages which cause pipeline deliveries to change, so the available capacity of each individual pipeline cannot be fully utilized 365 days per year. Pipeline capacity depends on the properties of the commodities being shipped. Compared with light crude capacity, heavy crude reduces the pipeline capacity. There can be times when there is spare capacity for light crude on one line, but another heavy crude line is operating at full capacity. For instance, the NEB Transportation Assessment[24] notes that Enbridge operated at 88 percent of capacity in the first quarter of 2008 even though many of its individual lines were fully subscribed or operating at capacity. Also, the TMPL line operated at 80 percent of capacity in the first quarter of 2008 even though it had apportionment in January 2008. For the overall pipeline industry, there are times when shippers may prefer to ship to one market rather than another; they would then choose one pipeline over another, so they need operational flexibility within the overall pipeline network. Although each pipeline system and each line likely has a service factor incorporated

[24] NEB Canadian Pipeline Transportation System: Transportation Assessment, June 2008.

with its nameplate capacity, the overall pipeline industry will likely continue to operate below 100 percent of total capacity to avoid disruptions to its shippers.

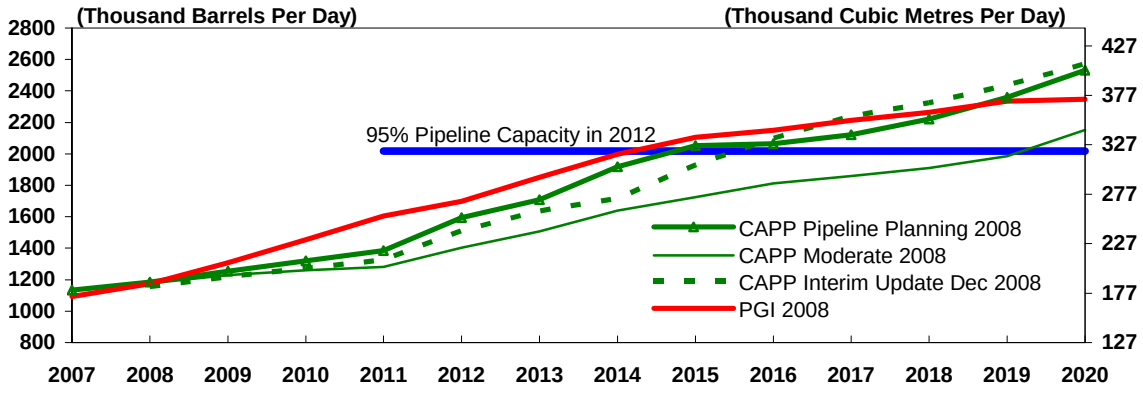
Five throughput forecasts for exports of total crude from Western Canada to the U.S., Ontario and offshore are shown in Figure 14. These export forecasts are based on the crude oil supply forecasts minus the disposition forecast for Western Canada, as shown in Table 2. In the figure, the throughput forecasts are compared with 95 percent of the pipeline capacity from Table 5. Based on total crude throughput, the CAPP Pipeline Planning case and the Enbridge case would require additional pipeline capacity by 2015. Using the Purvin & Gertz supply forecast and other CAPP forecasts for total crude, more capacity would not be needed until around 2020.

FIGURE 14
TOTAL CRUDE EXPORTS VS PIPELINE CAPACITY



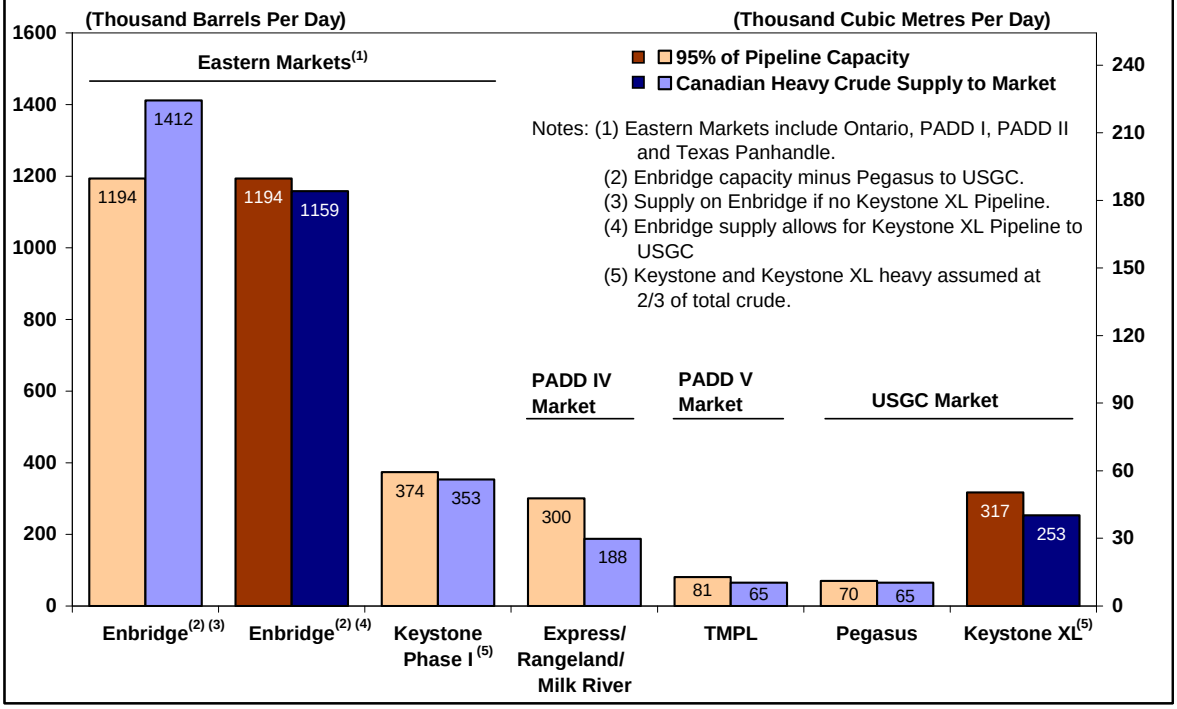
However, for heavy crude oil, pipeline capacity would be needed sooner. The Purvin & Gertz 2008 heavy crude supply and disposition forecasts are shown in Table 6. The CAPP heavy crude supply forecasts are compared in Table 7. An Enbridge forecast of heavy crude supply was not available. The table shows the forecasts of heavy crude exports from Western Canada. Figure 15 compares the pipeline throughput forecasts with 95 percent of the heavy crude pipeline capacity from Table 5. For heavy crude, the Purvin & Gertz and CAPP Pipeline Planning Case heavy crude supply forecasts are similar. In both cases, additional heavy crude pipeline capacity would be needed by 2014. CAPP's Moderate Case has less supply of heavy crude, so more capacity would not be needed until 2019. CAPP's Interim Update supply forecast would require more pipeline capacity for heavy crude by 2015.

FIGURE 15
HEAVY CRUDE EXPORTS VS PIPELINE CAPACITY



The forecast disposition of heavy crude to different markets is compared with pipeline capacities in Figure 16. For this comparison, the Eastern Markets are those supplied by Enbridge and future Keystone (Phase 1) pipelines and include refineries in Ontario, PADD I, PADD II and the Texas Panhandle around Borger, Texas. The figure shows that the Enbridge pipeline would be short of heavy crude capacity in 2015 if the Keystone XL Pipeline is not in service since the pipeline capacity is less than the heavy crude supply. If the Keystone XL Pipeline is in service, and delivering 253,000 B/D (40.2 10^3m^3/d) of heavy crude, then the Enbridge pipeline would be near capacity at that time, as indicated by the darker areas on the figure. The figure shows the small existing pipeline capacity to the USGC versus the large capacity to the Eastern Markets. Although the Keystone XL Pipeline would increase the capacity to the USGC, Canadian heavy crude supply to the Eastern Markets would still be much greater. By committing volumes to the Keystone XL Pipeline, Canadian shippers are indicating a strategy to supply a market which has had little access to their crude.

FIGURE 16
HEAVY CRUDE OIL PIPELINE CAPACITY VS DISPOSITION: 2015



In summary, more pipeline capacity for heavy crude appears to be needed by 2014-2015. The Keystone XL Pipeline would serve a large market which now has very limited access to Canadian crudes, while allowing existing pipelines to operate near their capacity for heavy crude by 2015.

SUMMARY AND CONCLUSIONS

Canadian crude oil delivered on the Keystone XL Pipeline ultimately would have pipeline access to 15 USGC refineries with a combined crude capacity of approximately 4.3 million B/D (685 10^3m^3/d) after expansion of 325,000 B/D (51.7 10^3m^3/d) by 2011. This large refining market would be capable of absorbing an incremental 500,000 B/D (79.5 10^3m^3/d) of Canadian crude which is around 12 percent of the refining capacity. This market uses around 1.4 million B/D (223 10^3m^3/d) of heavy crude, nearly all of which is imported. Some USGC refiners are expanding their heavy crude capabilities but heavy sour crude supplies from Latin America are declining. This market also uses approximately 1.9 million B/D (302 10^3m^3/d) of conventional light crudes. Depending on the delivered volumes, Canadian light synthetic crude might have to compete with both light sweet and light sour crudes. Shipper commitments on the Keystone XL Pipeline are for 380,000 B/D (60.4 10^3m^3/d). Most of this could be absorbed by refinery expansion alone.

The supply of Western Canadian crude oil is forecast to rise due to growth in oil sands production. If 500,000 B/D (79.5 10^3m^3/d) of Canadian crudes are delivered to the USGC by the Keystone XL Pipeline, deliveries to PADD II refineries should still continue to rise due to increasing supply, except for the pipeline startup year. The PADD II refineries should be able to use the crude, based on the Purvin & Gertz supply forecast. With higher supply forecasts such as those of CAPP and Enbridge, additional pipeline capacity to various markets might be needed.

Pricing of Canadian heavy crudes has been weak due to oversupply. The access to the large USGC market to be provided by the Keystone XL Pipeline should help to strengthen the market price of Canadian heavy crude by reducing the oversupply in PADD II. Similarly, if a surplus of light synthetic crude develops, the Keystone XL Pipeline should also help to mitigate potential price discounts. The annual increase in revenue for the Canadian producing industry

in 2013 is estimated to be in the range of $2.0 to $3.9 billion (U.S.) if the Keystone XL Pipeline relieves the oversupply of heavy crude and causes heavy crude prices to strengthen.

More pipeline capacity for Canadian heavy crude appears to be needed by 2014-2015. The Keystone XL Pipeline would deliver crude to the USGC market which now has limited access to Canadian crude, while allowing existing export pipelines to operate near their capacity for heavy crude.

TABLE 1
WESTERN CANADIAN CRUDE SUPPLY AND DISPOSITION

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
							(Thousand Barrels Per Day)								
Supply [1]	2,313	2,348	2,463	2,653	2,877	3,046	3,202	3,379	3,540	3,643	3,776	3,903	4,019	4,138	4,206
Disposition															
Western Canada [1]	562	586	570	572	579	593	616	628	640	651	655	661	666	672	677
Ontario [1]	212	217	273	274	278	282	328	373	377	380	383	386	387	388	390
Subtotal, Canada	774	803	843	846	857	875	944	1,002	1,017	1,031	1,038	1,046	1,054	1,060	1,067
PADD I	65	59	63	63	63	63	63	63	63	63	63	63	63	63	63
PADD IV	278	295	305	311	306	311	325	336	350	352	357	362	368	375	381
PADD V	109	132	143	152	172	164	157	151	152	153	154	155	156	157	157
Subtotal PADDs I, IV, V [1]	452	487	510	526	540	538	545	550	565	568	573	580	587	594	602
Texas Panhandle (PADD III) [2]	1	11	26	40	40	40	40	75	110	110	110	110	110	110	110
USGC (PADD III) [3]	57	65	65	65	65	65	65	445	445	445	445	445	445	445	445
Subtotal PADD III	58	76	91	105	105	105	105	520	555	555	555	555	555	555	555
Total (except PADD II)	1,285	1,365	1,445	1,478	1,502	1,518	1,594	2,072	2,137	2,154	2,167	2,181	2,195	2,209	2,223
Available for PADD II	1,029	983	1,019	1,175	1,375	1,529	1,608	1,307	1,404	1,489	1,609	1,722	1,824	1,929	1,983
							(Thousand Cubic Metres Per Day)								
Supply [1]	367.7	373.3	391.6	421.8	457.4	484.3	509.1	537.3	562.9	579.2	600.4	620.5	639.0	657.9	668.6
Disposition															
Western Canada [1]	89.3	93.1	90.7	91.0	92.0	94.2	98.0	99.9	101.7	103.5	104.2	105.0	105.9	106.8	107.6
Ontario [1]	33.8	34.5	43.4	43.5	44.2	44.9	52.1	59.3	60.0	60.5	60.9	61.3	61.6	61.8	62.0
Subtotal, Canada	123.0	127.6	134.1	134.5	136.2	139.1	150.1	159.2	161.7	163.9	165.1	166.3	167.5	168.5	169.6
PADD I	10.4	9.4	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
PADD IV	44.2	47.0	48.5	49.5	48.6	49.4	51.7	53.5	55.6	55.9	56.7	57.6	58.5	59.5	60.6
PADD V	17.3	21.0	22.7	24.2	27.3	26.1	24.9	24.0	24.2	24.3	24.5	24.6	24.7	24.9	25.0
Subtotal PADDs I, IV, V [1]	71.9	77.4	81.1	83.7	85.9	85.5	86.6	87.5	89.8	90.2	91.2	92.2	93.3	94.4	95.6
Texas Panhandle (PADD III) [2]	0.2	1.7	4.2	6.4	6.4	6.4	6.4	11.9	17.5	17.5	17.5	17.5	17.5	17.5	17.5
USGC (PADD III) [3]	9.1	10.3	10.3	10.3	10.3	10.3	10.3	70.7	70.7	70.7	70.7	70.7	70.7	70.7	70.7
Subtotal PADD III	9.3	12.0	14.5	16.7	16.7	16.7	16.7	82.7	88.2	88.2	88.2	88.2	88.2	88.2	88.2
Total (except PADD II)	204.2	217.0	229.7	234.9	238.8	241.3	253.4	329.4	339.7	342.4	344.5	346.8	349.0	351.2	353.4
Available for PADD II	163.5	156.3	161.9	186.9	218.6	243.0	255.6	207.9	223.2	236.8	255.9	273.7	290.0	306.7	315.2

Notes: (1) Source: PGI estimates in proprietary market analysis, April 2008.
(2) For WRB Refining at Borger, Texas.
(3) Via Pegasus and Keystone XL Pipelines

TABLE 2
WESTERN CANADIAN CRUDE SUPPLY AND DISPOSITION SCENARIOS

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
						(Thousand Barrels Per Day)								
Supply Scenarios:														
PGI 2008 [1]	2,313	2,348	2,463	2,653	2,877	3,046	3,202	3,379	3,540	3,643	3,776	3,903	4,019	4,138
CAPP Moderate, 2008 [2]	2,373	2,431	2,516	2,712	2,786	2,906	3,146	3,372	3,580	3,785	3,961	4,034	4,124	4,214
CAPP Pipeline Planning, 2008 [2]	2,373	2,431	2,567	2,762	2,880	3,036	3,372	3,621	3,923	4,196	4,297	4,375	4,528	4,802
Enbridge 2008 [3]	2,280	2,350	2,500	2,710	2,850	3,080	3,490	3,700	3,980	4,280	4,490	4,770		
CAPP Interim Update Dec 2008 [4]			2,425	2,649	2,739	2,851	3,047	3,194	3,288	3,478	3,702	3,930	4,073	4,196
Demand Scenario with Keystone XL at 380,000 B/D														
Total (except PADD II)	1,285	1,365	1,445	1,478	1,502	1,518	1,594	2,072	2,137	2,154	2,167	2,181	2,195	2,209
Including USGC	57	65	65	65	65	65	65	445	445	445	445	445	445	445
Available for PADD II, based on supply:														
PGI 2008	1,029	983	1,019	1,175	1,375	1,529	1,608	1,307	1,404	1,489	1,609	1,722	1,824	1,929
CAPP Moderate, 2008	1,088	1,066	1,071	1,234	1,284	1,388	1,552	1,300	1,443	1,631	1,794	1,853	1,928	2,005
CAPP Pipeline Planning, 2008	1,088	1,066	1,123	1,284	1,378	1,519	1,778	1,549	1,787	2,042	2,130	2,194	2,333	2,593
Enbridge 2008	995	985	1,055	1,232	1,348	1,562	1,896	1,628	1,843	2,126	2,323	2,589		
CAPP Interim Update Dec 2008			980	1,171	1,237	1,333	1,453	1,122	1,151	1,324	1,535	1,749	1,878	1,987
Demand Scenario with Keystone XL at 500,000 B/D														
Total Demand (except PADD II)								2,072	2,257	2,274	2,287	2,301	2,315	2,329
Including USGC								445	565	565	565	565	565	565
Available for PADD II, based on supply														
PGI 2008								1,307	1,284	1,369	1,489	1,602	1,704	1,809
CAPP Moderate, 2008								1,300	1,323	1,511	1,674	1,733	1,808	1,885
CAPP Pipeline Planning, 2008								1,549	1,667	1,922	2,010	2,074	2,213	2,473
Enbridge 2008								1,628	1,723	2,006	2,203	2,469		
CAPP Interim Update Dec 2008								1,122	1,031	1,204	1,415	1,629	1,758	1,867
Export Scenarios [5]														
Western Canada Demand	562	586	570	572	579	593	616	628	640	651	655	661	666	672
Export Scenario based on Supply														
PGI 2008	1,751	1,762	1,893	2,081	2,299	2,454	2,586	2,751	2,901	2,992	3,121	3,242	3,353	3,466
CAPP Moderate, 2008	1,811	1,846	1,946	2,140	2,207	2,313	2,530	2,743	2,940	3,134	3,305	3,374	3,457	3,542
CAPP Pipeline Planning, 2008	1,811	1,846	1,997	2,190	2,301	2,444	2,756	2,993	3,283	3,545	3,642	3,714	3,862	4,131
Enbridge 2008	1,718	1,764	1,930	2,138	2,271	2,487	2,874	3,072	3,340	3,629	3,835	4,109		
CAPP Interim Update Dec 2008			1,855	2,077	2,160	2,258	2,431	2,566	2,648	2,827	3,047	3,269	3,407	3,524
						(Thousand Cubic Metres Per Day)								
Supply Scenarios:														
PGI 2008	367.7	373.3	391.6	421.8	457.4	484.3	509.1	537.3	562.9	579.2	600.4	620.5	639.0	657.9
CAPP Moderate, 2008	377.3	386.5	400.0	431.2	442.9	462.0	500.2	536.0	569.1	601.8	629.7	641.4	655.6	669.9
CAPP Pipeline Planning, 2008	377.3	386.5	408.2	439.1	457.9	482.7	536.1	575.7	623.7	667.1	683.2	695.5	719.9	763.5
Enbridge 2008	362.5	373.6	397.5	430.8	453.1	489.7	554.8	588.2	632.8	680.4	713.8	758.3		
CAPP Interim Update Dec 2008			385.5	421.1	435.5	453.3	484.4	507.8	522.7	552.9	588.6	624.8	647.5	667.1
Demand Scenario with Keystone XL at 380,000 B/D														
Total Demand (except PADD II)	204.2	217.0	229.7	234.9	238.8	241.3	253.4	329.4	339.7	342.4	344.5	346.8	349.0	351.2
Including USGC	9.1	10.3	10.3	10.3	10.3	10.3	10.3	70.7	70.7	70.7	70.7	70.7	70.7	70.7
Available for PADD II, based on supply:														
PGI 2008	163.5	156.3	161.9	186.9	218.6	243.0	255.6	207.9	223.2	236.8	255.9	273.7	290.0	306.7
CAPP Moderate, 2008	173.0	169.5	170.3	196.2	204.1	220.7	246.8	206.6	229.4	259.4	285.2	294.6	306.6	318.7
CAPP Pipeline Planning, 2008	173.0	169.5	178.5	204.2	219.1	241.4	282.7	246.3	284.0	324.7	338.7	348.8	370.9	412.3
Enbridge 2008	158.3	156.6	167.7	195.9	214.3	248.4	301.4	258.8	293.1	338.0	369.3	411.6		
CAPP Interim Update Dec 2008			155.8	186.2	196.6	212.0	231.0	178.4	183.0	210.5	244.1	278.0	298.5	315.9
Demand Scenario with Keystone XL at 500,000 B/D														
Total (except PADD II)								329.4	358.8	361.5	363.6	365.8	368.1	370.3
Including USGC								70.7	89.8	89.8	89.8	89.8	89.8	89.8
Available for PADD II, based on supply:														
PGI 2008								207.9	204.1	217.7	236.8	254.6	270.9	287.6
CAPP Moderate, 2008								206.6	210.4	240.3	266.1	275.5	287.5	299.6
CAPP Pipeline Planning, 2008								246.3	265.0	305.6	319.6	329.7	351.8	393.2
Enbridge 2008								258.8	274.0	319.0	350.3	392.5		
CAPP Interim Update Dec 2008								178.4	164.0	191.5	225.0	259.0	279.5	296.8
Export Scenarios [5]														
Western Canada Demand	89.3	93.1	90.7	91.0	92.0	94.2	98.0	99.9	101.7	103.5	104.2	105.0	105.9	106.8
Export Scenario based on Supply														
PGI 2008	278.5	280.2	301.0	330.8	365.4	390.1	411.1	437.4	461.1	475.7	496.2	515.4	533.1	551.1
CAPP Moderate, 2008	288.0	293.4	309.3	340.2	350.9	367.8	402.2	436.1	467.4	498.3	525.5	536.4	549.6	563.1
CAPP Pipeline Planning, 2008	288.0	293.4	317.5	348.1	365.9	388.5	438.2	475.8	522.0	563.6	579.0	590.5	614.0	656.7
Enbridge 2008	273.2	280.5	306.8	339.8	361.1	395.4	456.9	488.3	531.0	577.0	609.6	653.3		
CAPP Interim Update Dec 2008			294.9	330.1	343.5	359.0	386.5	407.9	421.0	449.5	484.4	519.8	541.6	560.3

Supply Sources:

(1) PGI proprietary market analysis, April 2008
(2) CAPP, Crude Oil Forecast, Markets and Pipeline Expansions, June 2008
(3) Enbridge, Liquids Pipeline Development, Enbridge Day Presentation, October 7 and 8, 2008
(4) CAPP, Interium Update, 2008-2020 Western Crude Oil Forecast, December 11, 2008
(5) Export from Western Canada includes shipments for Ontario

TABLE 3
PADD III REFINERY CRUDE CAPACITY: 2008 [(1)]

	Thousand Barrels per Day	Thousand Cubic Metres per Day
Group 1 - Coastal Refineries - Direct Pipeline Access to Canadian Crude		
Motiva Enterprises LLC; Port Arthur, TX	285	45.3
Total Petrochemicals; Port Arthur, TX	232	36.9
Valero Energy Corp.; Port Arthur, TX	289	45.9
Exxon Mobil; Beaumont, TX	349	55.4
Pasadena Refining; Pasadena, TX	100	15.9
Houston Refining (Lyondell); Houston, TX	271	43.1
Valero Energy Corp.; Houston, TX	83	13.2
Deer Park Refining; Deer Park, TX	330	52.5
Exxon Mobil; Baytown, TX	567	90.1
BP; Texas City, TX	478	76.0
Marathon Oil; Texas City, TX	76	12.1
Valero Energy Corp.; Texas City, TX	200	31.8
Calcasieu Refining; Lake Charles, LA	53	8.4
CITGO; Lake Charles, LA	430	68.3
ConocoPhillips; Lake Charles/Westlake, LA	239	38.0
Sub-Total Group 1	3,981	632.9
Group 2 - Coastal Refineries Requiring Pipeline / Water Transfer of Canadian Crude		
Hunt Refining Co.; Tuscaloosa, AL	35	5.6
ConocoPhillips; Belle Chasse, LA	247	39.3
Exxon Mobil; Baton Rouge, LA	503	80.0
Valero Energy Corp.; Krotz Springs, LA	80	12.7
Valero Energy Corp.; St. Charles, LA	185	29.4
Marathon Oil; Garyville, LA	256	40.7
Chalmette Refining; Chalmette, LA	193	30.7
Murphy Oil; Meraux, LA	120	19.1
Motiva Enterprises LLC; Norco, LA	236	37.5
Motiva Enterprises LLC; Convent, LA	235	37.4
Placid Refining; Port Allen, LA	56	8.9
Shell Chemical; Saint Rose, LA	55	8.7
ChevronTexaco; Pascagoula, MS	330	52.5
ConocoPhillips; Sweeny, TX	247	39.3
CITGO; Corpus Christi, TX	156	24.8
Valero Energy Corp.; Three Rivers, TX	96	15.3
Flint Hills Resources; Corpus Christi, TX	288	45.8
Valero Energy Corp.; Corpus Christi, TX	142	22.6
Sub-Total Group 2	3,460	550.1
Group 3 - Inland PADD III Refineries with Possible Pipeline Connection to Canadian Crude		
Navajo Refining; Artesia, NM	84	13.4
WRB Refining; Borger, TX	146	23.2
Valero Energy Corp.; Sunray/McKee, TX	171	27.2
Alon USA; Big Spring, TX	67	10.7
Delek; Tyler, TX	58	9.2
Sub-Total Group 3	526	83.6
Others Without Access		
Sub-Total Other	449	71.4
PADD III GRAND TOTAL	8,416	1,338.0

Note: (1) Source: U.S. Energy Information Administration (EIA), Refining Capacity, 2008.

TABLE 4
PADD III REFINERY CRUDE TYPES AND SOURCES

	Estimated 2007 Crude Runs [1]				2008
	Light Sweet	Light Sour	Heavy [2]	Total	Crude Capacity
Thousand Barrels per Day					
Group 1 Refineries [3]					
Domestic Crude	124	161	37	322	
Imports [1]	661	904	1,395	2,959	
Total Crude to Group 1	784	1,065	1,432	3,281	3,981
Total PADD III [4]					
Domestic Crude	930	848	50	1,828	
Imports [1]	1,596	1,530	2,452	5,578	
Total Crude to PADD III	2,525	2,378	2,502	7,406	8,416
Thousand Cubic Metres per Day					
Group 1 Refineries [3]					
Domestic Crude	19.7	25.7	5.9	51.2	
Imports [1]	105.0	143.6	221.8	470.5	
Total Crude to Group 1	124.7	169.3	227.7	521.7	632.9
Total PADD III [4]					
Domestic Crude	147.8	134.9	7.9	290.5	
Imports [1]	253.7	243.3	389.9	886.8	
Total Crude to PADD III	401.5	378.1	397.7	1,177.3	1,338.0

Notes: (1) Estimated crude runs from DOE import data as well as PGI estimates of refinery crude runs and domestic crude use.
(2) Heavy includes High TAN crudes.
(3) 15 Group 1 refineries from Texas City to Lake Charles, LA as listed in Table 3.
(4) PADD III includes Group 1 refineries.

TABLE 5
CAPACITIES OF EXPORT PIPELINES FOR CANADIAN CRUDES: 2012

	(Thousand Barrels Per Day)			(Thousand Cubic Metres Per Day)		
	Light	**Heavy**	**Total**	**Light**	**Heavy**	**Total**
Enbridge [1]						
Line 1 [a]	77		77	12.2		12.2
Line 2 [b]	440		440	70.0		70.0
Line 3 [b] [c]	500		500	79.5		79.5
Line 4 [b]		880	880		139.9	139.9
LSR [d]	186		186	29.6		29.6
Clipper [b]	-	450	450	-	71.5	71.5
Subtotal [e]	1,203	1,330	2,533	191.3	211.4	402.7
Express [2]	94	188	282	14.9	29.9	44.8
TransMountain [3]	85	85	170	13.5	13.5	27.0
Milk River [4]	5	113	118	0.8	18.0	18.8
Rangeland/Aurora [4]	50	15	65	7.9	2.4	10.3
Keystone [5]						
Phase 1-A & B	197	393	590	31.3	62.5	93.8
Total	1,634	2,124	3,758	259.7	337.7	597.5
95% of Total	1,552	2,018	3,570	246.7	320.9	567.6

Notes: (1) Enbridge sources below. Crude capacities ex Cromer, Manitoba.
(a) Enbridge Pipeline System Configuration, March 2006 for total capacity = 237,000 B/D (37.6 10^3m^3 /d).
Crude capacity is reduced by delivery of refined products and natural gas liquids assumed at 160,000 B/D (25.4 10^3m^3 /d).
(b) Enbridge Appendix 14 in Reponse to Information Request 14 of Communications, Energy & Paperworkers Union (CEP) at NEB hearing OH-4-2007, re Clipper.
(c) Source (b) includes change in Line 3 service from heavy crude to light crude
(d) Enbridge Facility Application for Southern Lights Vol. 1. pg 2-3, February, 2007 (NEB hearing OH-3-2007)
(e) Enbridge subtotal assumes sufficient takeaway capacity from Superior to Chicago and Marysville.
(2) Source: Kinder Morgan website\business\Canada for total crude capacity. Express heavy crude assumed = 2/3 of tota crude.
(3) Source: Terasen Pipelines Inc. Facility Application for Trans Mountain Pipeline Anchor Loop, pg 2-4, Feb. 17, 2006.
for total capacity = 300,000 B/D (47.7 10^3m^3 /d). Export capacity is reduced by domestic delivery of light crude and refined products assumed at 130,000 B/D (20.7 10^3m^3 /d). TransMountain crude capacity assumed at half light crude for Washington.
(4) Purvin & Gertz estimates
(5) Keystone heavy assumed at 2/3 of total crude.

TABLE 6
WESTERN CANADIAN HEAVY CRUDE SUPPLY AND DISPOSITION

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
							(Thousand Barrels Per Day)								
Supply [1]	1,117	1,171	1,263	1,398	1,565	1,727	1,822	1,978	2,127	2,236	2,282	2,348	2,400	2,474	2,487
Disposition															
Western Canada [1]	87	77	87	91	111	124	125	127	129	131	132	134	136	137	139
Ontario [1]	71	61	102	123	125	126	137	149	165	167	168	168	169	170	202
Subtotal, Canada	158	138	189	214	236	250	262	276	294	297	300	302	305	307	342
PADD I	37	36	37	37	37	37	37	37	37	37	37	37	37	37	37
PADD IV	144	138	158	162	166	168	174	179	183	188	189	191	193	195	196
PADD V	31	47	62	74	88	79	71	65	65	65	65	65	65	65	65
Subtotal PADDs I, IV, V [1]	212	221	257	273	291	284	283	281	285	289	291	293	295	297	298
Texas Panhandle (PADD III) [2]	1	11	26	40	40	40	40	75	110	110	110	110	110	110	110
USGC (PADD III) [3]	57	65	65	65	65	65	65	331	331	331	331	331	331	331	331
Subtotal PADD III	58	76	91	105	105	105	105	406	441	441	441	441	441	441	441
Total (except PADD II)	428	435	537	592	632	639	650	962	1,020	1,028	1,032	1,036	1,041	1,045	1,081
Available for PADD II	689	736	726	806	933	1,088	1,172	1,016	1,107	1,208	1,250	1,311	1,360	1,429	1,407
							(Thousand Cubic Metres Per Day)								
Supply [1]	177.6	186.1	200.8	222.3	248.8	274.6	289.7	314.5	338.1	355.5	362.8	373.2	381.6	393.3	395.5
Disposition															
Western Canada [1]	13.8	12.2	13.9	14.5	17.7	19.6	19.9	20.2	20.5	20.7	21.0	21.3	21.6	21.8	22.1
Ontario [1]	11.2	9.8	16.2	19.6	19.8	20.0	21.9	23.7	26.3	26.5	26.6	26.8	26.9	27.0	32.2
Subtotal, Canada	25.1	22.0	30.1	34.1	37.5	39.7	41.7	43.8	46.7	47.3	47.7	48.1	48.5	48.9	54.3
PADD I	5.8	5.7	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9
PADD IV	22.9	22.0	25.2	25.8	26.4	26.8	27.7	28.4	29.1	29.8	30.1	30.4	30.7	31.0	31.2
PADD V	4.9	7.5	9.8	11.7	14.0	12.6	11.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3
Subtotal PADDs I, IV, V [1]	33.7	35.2	40.8	43.3	46.2	45.2	44.9	44.6	45.3	46.0	46.3	46.6	46.9	47.1	47.4
Texas Panhandle (PADD III) [2]	0.2	1.7	4.2	6.4	6.4	6.4	6.4	11.9	17.5	17.5	17.5	17.5	17.5	17.5	17.5
USGC (PADD III) [3]	9.1	10.3	10.3	10.3	10.3	10.3	10.3	52.6	52.6	52.6	52.6	52.6	52.6	52.6	52.6
Subtotal PADD III	9.3	12.0	14.5	16.7	16.7	16.7	16.7	64.5	70.1	70.1	70.1	70.1	70.1	70.1	70.1
Total (except PADD II)	68.0	69.2	85.4	94.1	100.4	101.6	103.4	153.0	162.2	163.4	164.1	164.8	165.5	166.1	171.8
Available for PADD II	109.5	116.9	115.4	128.1	148.4	173.0	186.4	161.5	176.0	192.1	198.7	208.5	216.2	227.1	223.6

Notes: (1) Source: PGI estimates in proprietary market analysis, April 2008.
(2) For WRB Refining at Borger, Texas
(3) Via Pegasus and Keystone XL Pipelines

TABLE 7
WESTERN CANADIAN HEAVY CRUDE SUPPLY AND DISPOSITION SCENARIOS

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
							(Thousand Barrels Per Day)								
Supply Scenarios:															
PGI 2008 [1]	1,117	1,171	1,263	1,398	1,565	1,727	1,822	1,978	2,127	2,236	2,282	2,348	2,400	2,474	2,487
CAPP Moderate, 2008 [2]	1,213	1,211	1,263	1,321	1,372	1,404	1,527	1,634	1,768	1,855	1,944	1,994	2,046	2,123	2,291
CAPP Pipeline Planning, 2008 [2]	1,213	1,211	1,272	1,345	1,431	1,508	1,719	1,836	2,047	2,182	2,196	2,255	2,357	2,497	2,671
CAPP Interim Update Dec 2008 [3]			1,244	1,311	1,384	1,450	1,635	1,764	1,845	2,058	2,231	2,374	2,461	2,572	2,711
Demand Scenario with Keystone XL at 380,000 B/D															
Total (except PADD II)	428	435	537	592	632	639	650	962	1,020	1,028	1,032	1,036	1,041	1,045	1,081
Including USGC	57	65	65	65	65	65	65	331	331	331	331	331	331	331	331
Available for PADD II, based on supply:															
PGI 2008	689	736	726	806	933	1,088	1,172	1,016	1,107	1,208	1,250	1,311	1,360	1,429	1,407
CAPP Moderate, 2008	785	776	726	729	741	765	877	671	748	828	912	957	1,005	1,078	1,210
CAPP Pipeline Planning, 2008	785	776	735	753	800	868	1,069	874	1,027	1,155	1,164	1,219	1,317	1,452	1,590
CAPP Interim Update Dec 2008			707	719	752	811	985	802	825	1,030	1,199	1,338	1,420	1,527	1,630
Demand Scenario with Keystone XL at 500,000 B/D															
Total Demand (except PADD II)								962	1,104	1,112	1,116	1,120	1,125	1,129	1,165
Including USGC								331	415	415	415	415	415	415	415
Available for PADD II, based on supply															
PGI 2008								1,016	1,023	1,124	1,166	1,227	1,276	1,345	1,323
CAPP Moderate, 2008								671	664	744	828	873	921	994	1,126
CAPP Pipeline Planning, 2008								874	943	1,071	1,080	1,135	1,233	1,368	1,506
CAPP Interim Update Dec 2008								802	741	946	1,115	1,254	1,336	1,443	1,546
Export Scenarios[4]															
Western Canada Demand	87	77	87	91	111	124	125	127	129	131	132	134	136	137	139
Export Scenario based on Supply															
PGI 2008	1,030	1,094	1,176	1,307	1,454	1,604	1,697	1,851	1,998	2,105	2,150	2,214	2,265	2,336	2,348
CAPP Moderate, 2008	1,126	1,134	1,176	1,230	1,261	1,280	1,402	1,507	1,639	1,725	1,812	1,860	1,910	1,986	2,151
CAPP Pipeline Planning, 2008	1,126	1,134	1,184	1,254	1,320	1,384	1,594	1,709	1,919	2,052	2,064	2,121	2,222	2,359	2,532
CAPP Interim Update Dec 2008			1,157	1,220	1,273	1,326	1,510	1,637	1,716	1,927	2,099	2,240	2,325	2,435	2,572
							(Thousand Cubic Metres Per Day)								
Supply Scenarios:															
PGI 2008	177.6	186.1	200.8	222.3	248.8	274.6	289.7	314.5	338.1	355.5	362.8	373.2	381.6	393.3	395.5
CAPP Moderate, 2008	192.9	192.5	200.8	210.0	218.2	223.2	242.8	259.7	281.0	295.0	309.1	317.0	325.3	337.6	364.2
CAPP Pipeline Planning, 2008	192.9	192.5	202.2	213.9	227.6	239.7	273.3	291.9	325.5	346.9	349.2	358.5	374.8	397.0	424.6
CAPP Interim Update Dec 2008			197.8	208.4	220.0	230.5	259.9	280.4	293.3	327.2	354.7	377.4	391.3	408.9	431.0
Demand Scenario with Keystone XL at 380,000 B/D															
Total Demand (except PADD II)	68.0	69.2	85.4	94.1	100.4	101.6	103.4	153.0	162.2	163.4	164.1	164.8	165.5	166.1	171.8
Including USGC	9.1	10.3	10.3	10.3	10.3	10.3	10.3	52.6	52.6	52.6	52.6	52.6	52.6	52.6	52.6
Available for PADD II, based on supply:															
PGI 2008	109.5	116.9	115.4	128.1	148.4	173.0	186.4	161.5	176.0	192.1	198.7	208.5	216.2	227.1	223.6
CAPP Moderate, 2008	124.9	123.3	115.4	115.9	117.7	121.6	139.5	106.7	118.9	131.6	145.1	152.2	159.8	171.4	192.3
CAPP Pipeline Planning, 2008	124.9	123.3	116.8	119.8	127.2	138.1	170.0	138.9	163.3	183.6	185.1	193.7	209.3	230.8	252.8
CAPP Interim Update Dec 2008			112.4	114.3	119.6	128.9	156.6	127.4	131.2	163.8	190.6	212.7	225.8	242.8	259.2
Demand Scenario with Keystone XL at 500,000 B/D															
Total (except PADD II)								153.0	175.5	176.7	177.4	178.1	178.8	179.5	185.2
Including USGC								52.6	66.0	66.0	66.0	66.0	66.0	66.0	66.0
Available for PADD II, based on supply:															
PGI 2008								161.5	162.6	178.7	185.3	195.1	202.8	213.8	210.3
CAPP Moderate, 2008								106.7	105.5	118.3	131.7	138.9	146.5	158.1	179.0
CAPP Pipeline Planning, 2008								138.9	150.0	170.2	171.8	180.4	196.0	217.5	239.4
CAPP Interim Update Dec 2008								127.4	117.8	150.5	177.3	199.3	212.4	229.4	245.8
Export Scenarios[4]															
Western Canada Demand	13.8	12.2	13.9	14.5	17.7	19.6	19.9	20.2	20.5	20.7	21.0	21.3	21.6	21.8	22.1
Export Scenario based on Supply															
PGI 2008	163.7	173.9	186.9	207.8	231.1	255.0	269.9	294.3	317.7	334.7	341.7	351.9	360.1	371.4	373.3
CAPP Moderate, 2008	179.1	180.3	186.9	195.5	200.5	203.6	222.9	239.5	260.6	274.2	288.1	295.7	303.7	315.7	342.0
CAPP Pipeline Planning, 2008	179.1	180.3	188.3	199.4	209.9	220.0	253.5	271.7	305.0	326.2	328.2	337.2	353.2	375.1	402.5
CAPP Interim Update Dec 2008			183.9	193.9	202.4	210.9	240.1	260.3	272.9	306.4	333.7	356.1	369.7	387.1	408.9

Supply Sources:

(1) PGI proprietary market analysis, April 2008
(2) CAPP, Crude Oil Forecast, Markets and Pipeline Expansions, June 2008
(3) CAPP, Interium Update, 2008-2020 Western Crude Oil Forecast, December 11, 2008
(4) "Export" from Western Canada includes shipments for Ontario