

8. "The Canadian Crude Market"  
3rd Annual Canadian Oil Sands Summit  
January 17, 2006
  
9. "Bigger is Better"  
4th Annual Oil Sands Forum – Oil Sands Market Overview  
July 6, 2006
  
10. "U.S. Market for Canadian Crude – Oil Sands Market Overview"  
Crude Oil Quality Group General Meeting  
November 9, 2006
  
11. "Future Markets for Canadian Crude"  
4th Annual Canadian Oil Sands Summit  
January 17, 2007
  
12. "Canadian Crude Market Outlook"  
3<sup>rd</sup> Annual Enbridge Mid-Continent Shippers Conference  
January 31, 2007
  
13. "New Market Outlook for Canadian Crude"  
42<sup>nd</sup> Annual Enbridge Jasper Conference  
June 6, 2007



CANADIAN ASSOCIATION  
OF PETROLEUM PRODUCERS

EXHIBIT NKE-2

REPORT

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# Crude Oil Forecast, Markets and Pipeline Expansions

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June 2007

## Background

The Canadian Association of Petroleum Producers (CAPP) represents 150 producer member companies that explore for, develop and produce natural gas, natural gas liquids, crude oil, oil sands, and elemental sulphur throughout Canada. CAPP member companies produce more than 95 percent of Canada's natural gas and crude oil. CAPP also has 130 associate members that provide a wide range of services that support the upstream crude oil and natural gas industry. Together, these members and associate members are an important part of a \$100 billion-a-year national industry that affects the livelihoods of more than half a million Canadians.

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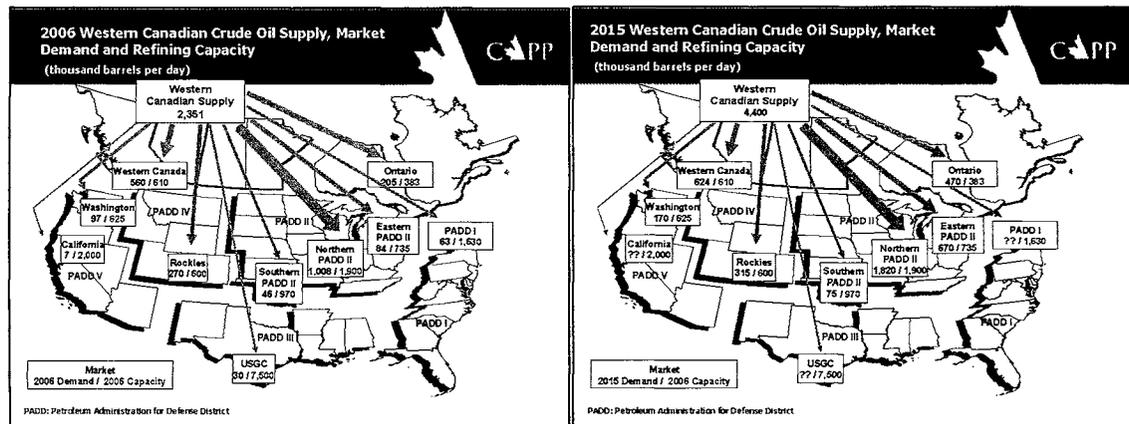
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# 1 EXECUTIVE SUMMARY

The Canadian Association of Petroleum Producers (CAPP) prepares an annual long-term forecast of Canadian crude oil production and supply. This year, CAPP's outlook also looks at the potential demand in various markets, and the proposed pipelines to these markets. CAPP has prepared two production and supply cases – the Pipeline Planning Case and the Moderate Growth Case. In the Pipeline Planning Case, western Canadian crude oil supply is projected to increase from 2.4 million b/d in 2006 to almost 5.3 million b/d in 2020 while in the Moderate Growth Case, supply rises to about 4.6 million b/d. The primary reason for the difference is that in situ projects ramp up at a more gradual pace in the Moderate Growth Case. In both Cases, however, oil sands growth is significant. Due to the maturity of the basin, conventional crude oil supply in western Canada continues to decline.

The expected growth in western Canadian crude oil supply will require additional pipeline capacity to meet demand from existing and new markets. To assess this requirement, CAPP surveyed refineries in traditional and some potential new markets. The survey results showed that demand for western Canadian crude oil by Canadian refineries is expected to rise from 765,000 b/d in 2006 to almost 1.1 million b/d in 2015, a 44 percent increase. As expected, the majority of the growth will be heavy crude oil and light synthetic. Over the same period, United States total refinery demand for western Canadian crude oil is projected to increase from about 1.6 million b/d to almost 3.1 million b/d, a 100 percent growth. Demand for heavy crude oil is by far the largest of the crude types.

The refinery survey results indicate that traditional markets (i.e. western Canada, Ontario, upper PADD II, PADD IV and Washington State) in Canada and the United States will continue to process large volumes of western Canadian crude oil. There is, however, potential for expansions into new markets such as Québec, eastern PADD I, southern and eastern PADD II, PADD III, California and Asia.



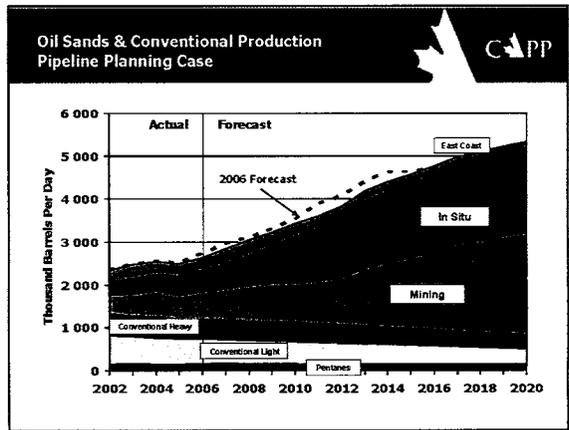
By 2011, western Canadian crude oil supply rises by almost 1 million b/d in the Pipeline Planning Case, and in the same year, it is expected that almost 1.3 million b/d of additional crude oil pipeline capacity will be available from western Canada. These crude

oil pipeline expansions will provide additional access to the core markets (e.g. Ontario, PADD II). Looking out past 2011, there are numerous crude oil pipeline proposals from western Canada to the U.S. Midwest, the United States Gulf Coast, the west coast of British Columbia and to eastern PADD I. In light of the expected growth in oil sands supply after 2011, industry will need to decide in the near future on the numerous crude oil pipeline options. The lead time to receive regulatory approvals and construct a new crude oil pipeline is at least four years.

## 2 CRUDE OIL PRODUCTION AND SUPPLY FORECAST

### 2.1 Introduction

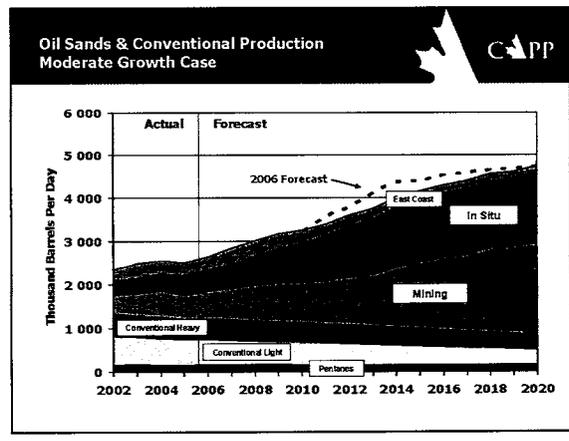
The CAPP forecast has been developed to provide industry with a long-term outlook of production trends and the types of crude oil that could be available to the market. In addition, the CAPP forecast is used to determine crude oil pipeline capacity requirements to handle the expected growth in western Canadian crude oil supply. CAPP has also prepared a forecast of offshore eastern Canadian crude oil production.



The forecast is based on the results of a survey of oil sands producers that was conducted in early 2007. CAPP has subsequently prepared two cases employing different constraints. The first case which is more aggressive is called the "Pipeline Planning Case" while the other is the "Moderate Growth Case". It should be noted that the surveys were completed by crude oil producers prior to the Federal Government's decision to eliminate the Accelerated Capital Cost Allowance, commencement of the Alberta Royalty review and announced Federal and Provincial climate change initiatives. These factors could conceivably result in reducing the crude oil production forecast.

#### 2.1.1 Canadian Crude Oil Production

Canadian crude oil production is comprised of western Canadian, which includes crude oil from the oil sands and conventional resources, as well as offshore production from the east coast of Canada. East Coast crude oil production is forecast to increase this year, however, in the long term, a gradual decline is expected. In 2006, East Coast offshore crude oil production of 305,000 b/d approximated 12 percent of total Canadian crude oil



production of 2.6 million b/d. Western Canadian crude oil production is projected to grow significantly over the forecast period due to the oil sands.

In the Pipeline Planning Case, Canadian crude oil production is forecast to grow from 2.6 million b/d in 2006 to about 4.6 million b/d in 2015 and to over 5.3 million b/d in 2020. The growth in the forecast is attributable to increasing production from the oil sands.

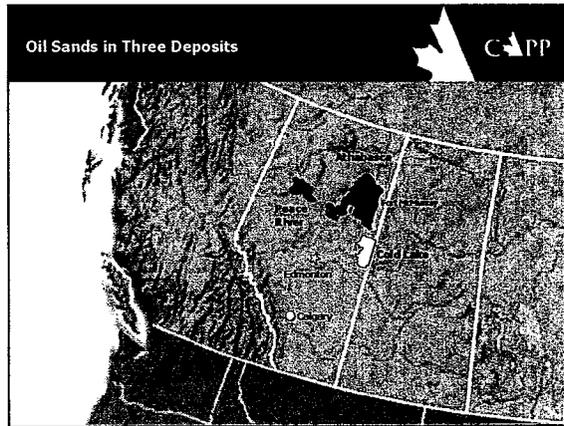
**2.1.2 Western Canadian Crude Oil Production**

Western Canadian crude oil production comes from conventional resources and the oil sands. Until recently, conventional crude oil production exceeded oil sands production; however, in 2006 oil sands production reached over 1.1 million b/d and surpassed conventional production for the first time. Total western Canadian crude oil production in 2006 was over 2.3 million b/d and is projected to increase to about 4.6 million b/d in 2020 in the Moderate Growth Case and to almost 5.2 million b/d in the Pipeline Planning Case.

	Million Barrels per Day			
	2006	2010	2015	2020
<b>Pipeline Planning Case</b>	2.3	3.1	4.4	5.2
<b>Moderate Growth Case</b>	2.3	3.0	3.9	4.6

**2.1.2.1 Oil Sands**

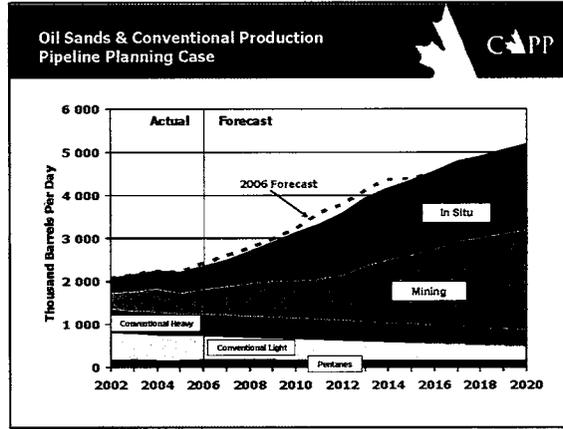
Bitumen is primarily extracted from the oil sands using either in situ or mining techniques. In areas where the oil is located near the surface, mining is the most efficient method; however, for oil that is located further below the surface, in situ production techniques such as Steam Assisted Gravity Drainage (SAGD) and Cyclic Steam Simulation (CSS) are employed. Mining currently accounts for more than half of the total oil sands production. The three main oil sands deposits are located in the Peace River, Athabasca and Cold Lake areas.



In the Pipeline Planning Case, output from in situ and mining projects is projected to increase four-fold by 2020. This Case assumes that the majority of the oil sands projects that have been proposed will proceed without significant delays to scheduled in service dates, and that the capacity of the projects will be achieved. The in situ and mining production forecasts are based on the results of the CAPP oil sands producer survey, however, adjustments to the survey results have been made to reflect historical performance trends of oil sands projects following start up. Historically, in situ projects require some time to ramp up to capacity while new mining projects typically require some fine tuning before capacity is maintained on a consistent basis.

Current oil sands production makes up roughly half of western Canada's total crude oil production, and is expected to grow from roughly 1.1 million b/d in 2006 to approximately 3.4 million b/d in 2015 and to about 4.4 million b/d in 2020 in the Pipeline Planning Case. Of the 1.1 million b/d of oil sands production in 2006 over 600,000 b/d was mined. Currently, the majority of mined bitumen is upgraded into synthetic crude oil as part of an overall integrated operation. This trend of upgrading mined bitumen is expected to continue throughout the forecast period.

The majority of in situ bitumen production is currently not upgraded prior transporting it to market. This trend, however, will change as more in situ production will be coupled with upgrading operations.



The integrated upgrading projects will be augmented by merchant upgrading projects of which there are several in various stages of planning and development. CAPP has included the contribution of merchant upgrading in its supply forecast which is discussed in the Western Canadian Crude Oil Supply section.

The Moderate Growth Case is based on the assumption that oil sands projects will be developed and brought into service at a more gradual pace. The majority of oil sands projects, particularly in situ, are executed in multiple phases and this Case projects that the timing between phases will be greater than the Pipeline Planning Case. There are many factors that could lead to more moderate growth in oil sands production, such as, cost increases and availability of labour and materials.

**2.1.2.2 Conventional Crude Oil Production**

Conventional crude oil production in western Canada has been declining gradually since the late 1990s as a result of the maturity of the basin. By 2020, total conventional crude oil production declines to about 670,000 b/d, almost 35 percent less than its current level of over 1 million b/d. Recent trends indicate that the year-over-year decline rate for conventional crude oil production has slowed somewhat due to high crude oil prices and in some areas, such as Saskatchewan and Manitoba, production is increasing modestly.

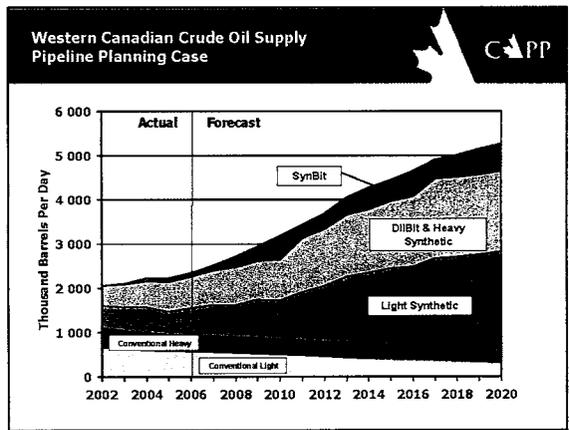
Last year, CAPP's conventional crude oil production forecast reflected a more aggressive decline. In 2006, however, Saskatchewan drilling completions increased almost 14 percent while Manitoba rose 75 percent. In Manitoba, the Sinclair field, newly designated in 2005, accounted for 20 percent of that province's crude oil production. It is the first major discovery in Manitoba in many years.

### 2.1.3 Western Canadian Crude Oil Supply

Heavy crude oil and bitumen must be blended with diluent to meet pipeline specifications for density and viscosity. Currently, the main source of diluent is natural gas condensates that are produced in western Canada. In the future, this diluent supply will not meet the blending needs of growing bitumen production. As a result, producers are considering imports of condensate by pipeline as well as the use of light synthetic crude oil. The blend of bitumen and diluent is referred to as “DilBit” while blending bitumen and synthetic crude oil is known as “SynBit”. The DilBit blend is typically made up of three parts bitumen and one part condensate. SynBit blend is comprised of roughly fifty percent synthetic and fifty percent bitumen.

DilBit blend continues to make up the majority of the blended heavy crude oil. As noted above, locally produced condensate is no longer sufficient and, in fact, producers are currently importing about 25,000 b/d of diluent into Alberta by rail. In addition to these railed imports, Enbridge is planning to construct a diluent pipeline from Chicago to Alberta. It is expected to be in service in the second half of 2010 and will provide the potential to supply up to 180,000 b/d of diluent to western Canada.

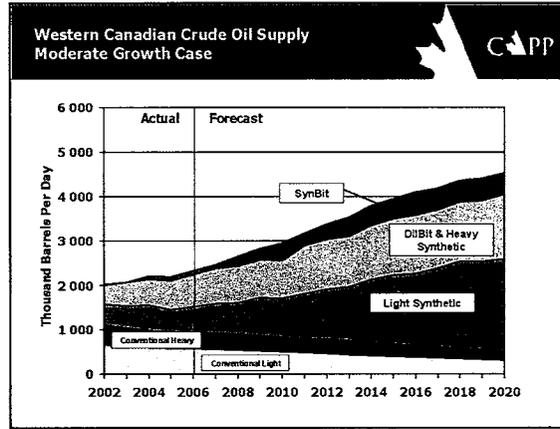
In the Pipeline Planning Case, supply of light synthetic crude oil is forecast to grow from about 600,000 b/d in 2006 to 1.7 million b/d by 2015 and 2.3 million by 2020. It is worth noting that a significant amount of synthetic crude oil is forecast to be blended as part of the SynBit supply. The supply of synthetic crude oil could increase in the event that additional amounts of diluent are imported which results in less SynBit available to the market. The amount of synthetic crude oil available to the market also includes heavy synthetic. However, heavy synthetic is included as part of heavy crude oil supply with the DilBit blend.



Heavy crude oil supply from the oil sands, including DilBit, SynBit and heavy synthetic grows from 800,000 b/d in 2006 to 2.0 million b/d in 2015 and up to almost 2.5 million b/d in 2020. It is assumed that growing bitumen production in this Case will require additional diluent imports by pipeline in 2017 which will result in an increase in DilBit supply.

In the Moderate Growth Case, there is less production of synthetic crude oil and bitumen resulting in lower blended heavy crude oil than the Pipeline Planning Case. In the Moderate Growth Case, light synthetic crude oil supply is projected to grow from about 600,000 b/d in 2006 to almost 2.1 million b/d in 2020.

In this Case, there is less demand for imported diluent and, therefore, less supply of DilBit. The Moderate Growth Case and the Pipeline Planning Case both include growing amounts of SynBit and DilBit supply. Heavy crude oil supply from the oil sands in the Moderate Growth Case is forecasted to increase from 800,000 b/d in 2006 to 1.7 million b/d in 2015 and to almost 2.0 million b/d in 2020. In 2020, this is about 500,000 b/d less than the Pipeline Planning Case.



	Million Barrels per Day			
	2006	2010	2015	2020
<b>Pipeline Planning Case</b>	2.4	3.2	4.4	5.3
<b>Moderate Growth Case</b>	2.4	3.0	4.0	4.6

## 2.2 Summary

In both Cases, CAPP projects significant growth in oil sands supply. In the Pipeline Planning Case, oil sands supply grows by 3.3 million b/d in comparison to an increase of 2.6 million in the Moderate Growth Case. On the other hand, conventional crude oil supply falls by 400,000 b/d in both Cases. East Coast crude oil production is forecast to increase this year, however, in the long term, a gradual decline is expected.

In summary, western Canadian crude oil supply will increase from 2.4 million b/d in 2006 to almost 5.3 million b/d in 2020 in the Pipeline Planning Case while in the Moderate Growth Case supply rises to about 4.6 million b/d. The primary reason for the difference is that in situ projects ramp up at a more gradual pace.

## 3 CRUDE OIL MARKETS

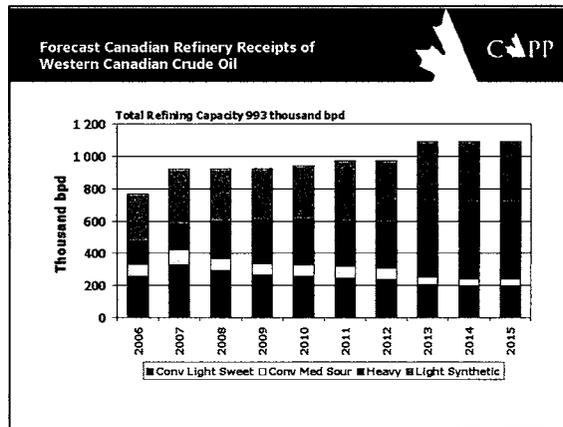
### 3.1 Introduction

In previous reports, CAPP provided a long-term forecast of western Canadian crude oil production and supply. CAPP is of the view that it is necessary to review the market potential to process the expected growth in oil sands supply. This assessment will, as well, assist industry in the development of adequate pipeline infrastructure. In this context, CAPP surveyed the majority of North American refineries (western Canada, Ontario, PADDs II and IV, and Washington) to obtain information on their ability or plans to process increasing volumes of western Canadian crude oil and, in particular, oil sands to 2015. The data was aggregated and analyzed, and are discussed in this section. CAPP did not put any constraints on the data submitted by refiners nor did it prepare any alternate cases. CAPP did not survey refineries located in Québec, eastern PADD I, PADD III or California, however, discussions with these refiners indicate that a significant potential exists, and this is supported by numerous pipeline proposals.

The CAPP refinery survey assessed four types of western Canadian crude oil. They are:

1. Conventional Light Sweet (30-40 API, less than 0.5%S) including condensates and pentanes plus;
2. Heavy (less than 27 API) and includes synthetic sour, DilBit, SynBit and DilSynBit);
3. Conventional Medium Sour (greater than 27 API and 0.5%S); and
4. Light Sweet Synthetic.

In 2006, available supply of crude oil from western Canada was over 2.3 million b/d. Domestic demand for western Canadian crude oil was approximately 765,000 b/d and the remaining supply of almost 1.6 million or 68 percent was exported. The primary markets for western Canadian crude oil are: British Columbia; the Prairie Provinces; Ontario; northern PADD II (i.e. Chicago, Twin Cities and Toledo); PADD IV; and Washington State. With the reversal of the Enbridge Spearhead pipeline and the ExxonMobil (Pegasus) pipeline in early 2006, western Canadian crude oil is delivered to the Cushing, Oklahoma hub and the United States Gulf Coast, respectively.

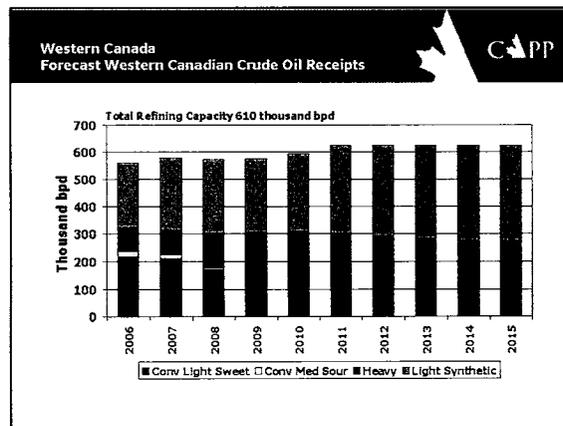


### 3.2 Canada

Canadian refineries that have access to western Canadian crude oil have a refining capacity of almost 1 million b/d. In 2006, these refineries processed about 765,000 b/d of western Canadian crude oil. The survey results project that this will increase to approximately 945,000 b/d in 2010 and with refinery expansions to almost 1.1 million b/d in 2013, a 40 percent increase from 2006.

#### 3.2.1 Western Canada

There are seven refineries located in western Canada with a total refining capacity of about 610,000 b/d, and they process exclusively western Canadian crude oil. In 2006, they refined about 560,000 b/d and this, according to the survey, is expected to increase to 578,000 b/d in 2007, and remain relatively flat through 2010. Subsequently, receipts are expected to rise to 624,000 b/d and remain at this level through 2015.



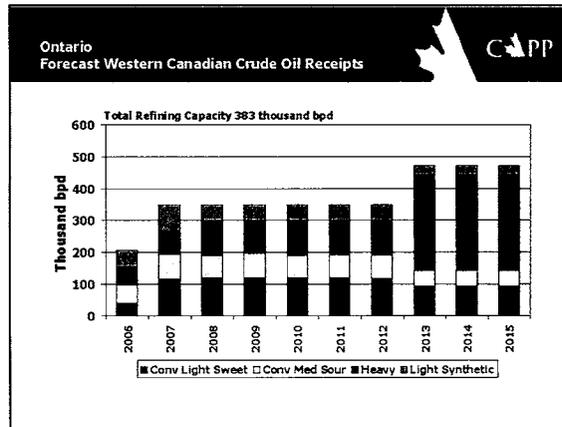
Receipts of conventional light sweet crude oil are expected to fall, in part, due to the maturity of the basin as well as, for example, a conversion of Petro-Canada's Edmonton refinery in 2008 to process 100 percent oil sands feedstocks. As a result, receipts of heavy and light synthetic crude oils are expected to increase throughout the forecast period. Consumers' Co-operatives refinery is currently assessing a 30,000 b/d expansion of its Regina refinery that could start up in 2011.

There are some proposals to upgrade bitumen at the mining projects as well as a number of merchant upgrader proposals located in Fort Saskatchewan, Alberta.

### 3.2.2 Ontario

There are four refineries (excludes Nova Chemicals' Sarnia facility) located in Ontario with a total refining capacity of almost 383,000 b/d. These refineries process both western Canadian crude oil as well as crude oil (imports and eastern Canadian crude oil production) that is received by tankers from the Portland-to-Montreal pipeline and, subsequently, the Enbridge Montreal-to-Sarnia pipeline (Line 9). Ontario refineries have, for a number of years, based their feedstock sourcing on both availability and pricing.

In 2006, Ontario refineries processed over 350,000 b/d of which almost 60 percent or about 205,000 b/d was from western Canada. Receipts of western Canadian crude oil in 2007 are projected to rise to 349,000 b/d or 90 percent of refining capacity, and should remain at this level through 2012. This will, however, depend on the economics of imported crude oil in



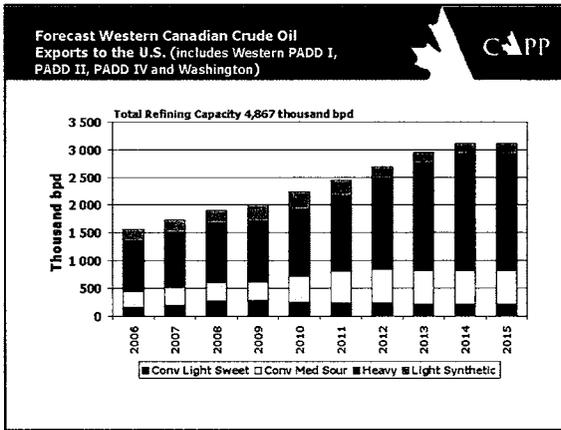
comparison to equivalent quality western Canadian crude oil. Subsequently, western Canadian crude oil receipts increase to 471,000 b/d. There are two reasons for this potential increase in 2013. First, Shell Canada is exploring a new 200,000 b/d refinery in Sarnia and, second, it appears that the Enbridge Line 9 would either be shutdown or possibly re-reversed, in fact, this could occur sooner than 2013. Enbridge forecasted in its application to the National Energy Board in April 2007 for tolls and tariffs that it expects a steady decline in throughput on Line 9 to 2012. It subsequently expects no throughput on Line 9.

### 3.2.3 Québec

The two refineries located in Montreal have a total refining capacity of 235,000 b/d, and a refinery in Québec City has a capacity of 215,000 b/d. The Montreal refineries process crude oil, eastern Canadian and foreign, that is received from the Portland-to-Montreal pipeline. If Enbridge's Line 9 pipeline is reversed, the Montreal market would provide western Canadian crude oil producers with another outlet for their production.

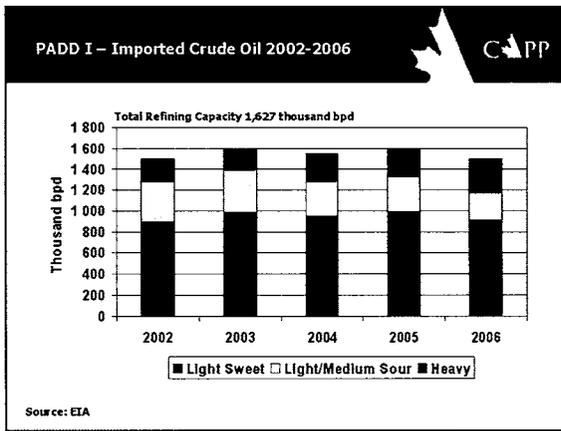
### 3.3 United States

The United States with a refining capacity of over 17 million b/d is Canada's largest market for crude oil exports and, in 2006, Canada was the largest exporter of crude oil supplying almost 12 percent of United States requirements, ahead of both Mexico and Saudi Arabia. In 2006, Canada exported almost 1.6 million b/d and the survey results show that this will grow to 2.4 million b/d in 2011 and to over 3.1 million b/d in 2015. The major growth is expected to be conventional medium sour and heavy crude oils. The rise in crude oil exports to the United States, in CAPP's view, reflects various drivers, such as; Canada's proximity to the United States; geopolitical stability; and security of supply for Canada and the United States.

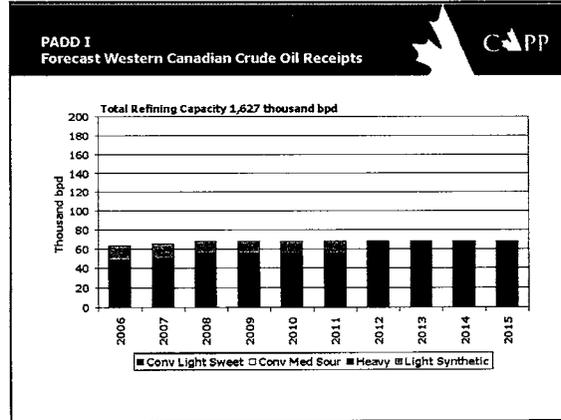


#### 3.3.1 PADD I

PADD I is located along the east coast of the United States with refineries in Delaware, New Jersey, Pennsylvania and West Virginia. There are 12 refineries with a total capacity of 1.6 million b/d. In 2006, refinery runs in this market consisted of 61 percent light sweet crude oil, 22 percent heavy crude oil and 17 percent medium sour crude oil.



In 2006, 14 percent of refinery runs in PADD I were Canadian sourced crude oil. Receipts of Canadian crude oil, including offshore East Coast, were 208,000 b/d with just over 30 percent or 63,000 b/d from western Canada. The bulk of these receipts were heavy crude oil delivered to the United refinery in Warren, Pennsylvania.

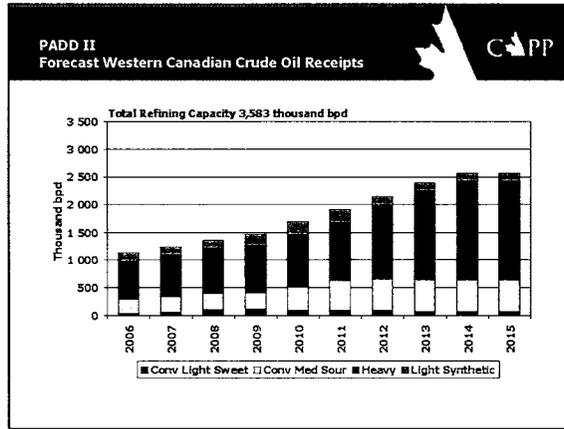


Without additional access to this market, western Canadian crude oil deliveries are expected to remain flat to 2015. PADD I refineries have a huge potential to process western Canadian crude oil by displacing

imports of foreign crude oil, in particular, light sweet crude oil. There are, in fact, pipeline proposals to serve this market with western Canadian crude oil.

### 3.3.2 PADD II

PADD II, located in the U.S. Midwest, is the largest market for western Canadian crude oil and it has a refining capacity of almost 3.6 million b/d. In 2006, PADD II processed over 1.1 million b/d of western Canadian crude oil and this is projected to grow to over 2.5 million b/d in 2015, an increase of about 125 percent. The forecasted receipts in 2015 equal about 70 percent of current refining capacity.

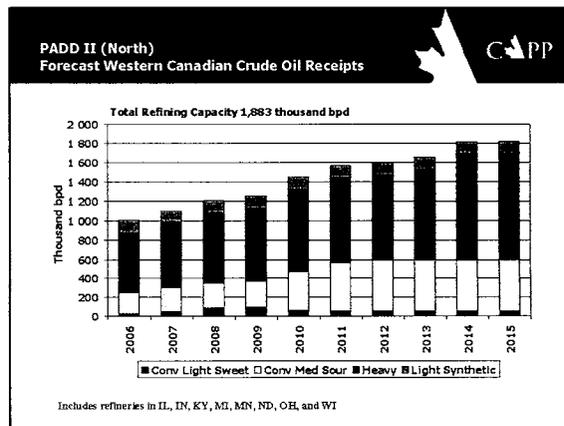


For purposes of this report, PADD II has been divided into north, east and south.

#### 3.3.2.1 Northern PADD II

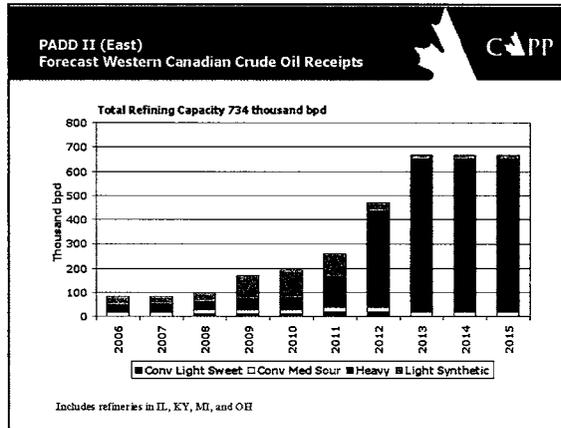
Northern PADD II has 12 refineries located in Illinois, Indiana, Minnesota, North Dakota, Ohio (Toledo) and Wisconsin and they run predominantly heavy crude oil which reflects the complexity of these refineries. Total refining capacity in northern PADD II is 1.9 million b/d, and the Illinois/Indiana area makes up 60 percent of the region's refining capacity followed by Minnesota with 19 percent.

In 2006, imports into northern PADD II were 1.1 million b/d and western Canadian crude oil accounted for 94 percent (1 million b/d) of those imports. Imports of western Canadian crude oil are expected to grow to over 1.4 million b/d in 2010 and to 1.8 million b/d in 2014, an 80 percent increase in comparison to 2006. Historically, western Canadian heavy crude oil was the feedstock of choice; and, in 2006, it approximated 636,000 b/d or 63 percent of total western Canadian crude oil refined in that area. Receipts of heavy crude oil are projected to rise up to 1.1 million b/d in 2014. Conventional medium sour crude oil is expected to grow from 222,000 b/d in 2006 to 547,000 b/d in 2012, and remain flat thereafter. The large growth in heavy and medium sour crude oils reflects refiners' expectations to add conversion capacity and reduce receipts of U.S. domestic or imports from the U.S. Gulf Coast. Conventional light sweet crude oil receipts are forecasted to rise slightly while light synthetic crude oil is projected to remain flat at about 123,000 b/d through 2015.



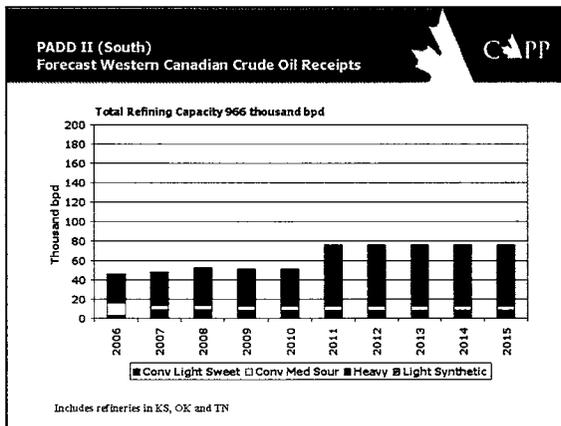
**3.3.2.2 Eastern PADD II**

Eastern PADD II is located east of Chicago and Patoka, but excludes Toledo, Ohio which is considered an existing market in northern PADD II. Eastern PADD II has a refining capacity of 734,000 b/d and, in 2006, western Canadian crude oil accounted for only 11 percent or 84,000 b/d of that capacity. Receipts of light synthetic crude oil are expected to increase from 2009 to 2011 and then decline significantly. Heavy crude oil deliveries are expected to grow from 33,000 b/d in 2006 to 126,000 b/d in 2011, and then jump to almost 400,000 b/d in 2012 with a further increase to about 633,000 b/d in 2013. Proposed expansions and conversions will significantly increase runs of western Canadian heavy crude oil by over 600,000 b/d in the next ten years.



**3.3.2.3 Southern PADD II**

The nine refineries in southern PADD II are located in Kansas, Oklahoma and Tennessee and have a total refining capacity of 966,000 b/d. With the reversal of the Enbridge Spearhead pipeline in March 2006, western Canadian producers are able to deliver up to 125,000 b/d of crude oil into Cushing, Oklahoma. Spearhead pipeline has been at capacity and, recently, Enbridge announced a successful open season to expand the capacity to 190,000 b/d in early 2009.



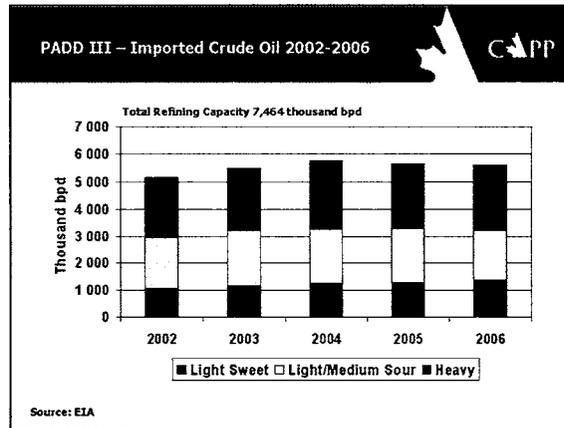
Access to the Cushing market offers western Canadian crude oil producers opportunities to penetrate other markets (e.g. PADD III) through existing pipelines. Recently announced refinery conversions in Southern PADD II provide opportunities to ship increased volumes of western Canadian crude oil. In 2006, this market processed about 46,000 b/d of western Canadian crude oil, and this is projected to rise to almost 76,000 b/d in 2011. The increase in demand will be heavy crude oil.

**3.3.3 PADD III**

PADD III, comprising of Alabama, Arkansas, Louisiana, Mississippi, New Mexico and Texas, is the largest and most complex refining district in the United States and has 49 refineries. Total refining capacity approximates 7.5 million b/d, of which a significant portion has heavy crude oil processing capabilities. In recent years, PADD III refineries have added six new cokers. These additions allow refineries to run heavier and more sour

grades of crude oil which are becoming increasingly more predominant in the world's oil production slate.

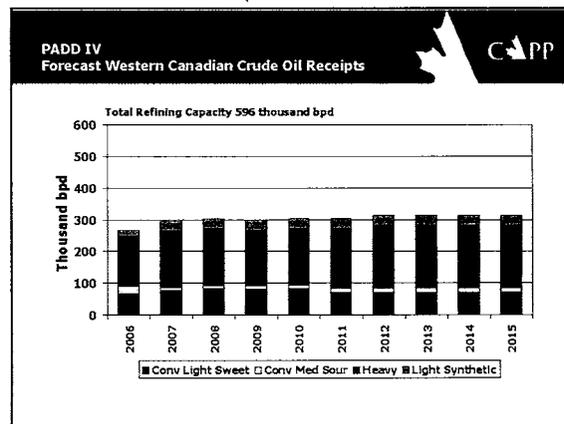
In 2006, PADD III refineries imported over 5.6 million b/d of crude oil, and almost 2.4 million b/d of that was heavy crude oil. It imports crude oil from Mexico (18 percent), Venezuela (13 percent), Saudi Arabia (10 percent) and Iraq (5 percent), and it also imported from 16 other countries. Deliveries of western Canadian crude oil commenced in April 2006 through the reversed ExxonMobil pipeline (Pegasus) from Patoka, Illinois to Corsicana, Texas. The pipeline is operating at its capacity of about 65,000 b/d.



Due to its size and ability to run heavy sour crude oil, PADD III is currently the largest untapped market for western Canadian crude oil. There are several pipeline proposals to access this market. New infrastructure would provide western Canadian crude oil producers opportunities to access this market. Although a number of the cokers in PADD III were originally dedicated to specific supply sources, such as Venezuela, these contracts are expected to expire in the near future providing western Canadian crude oil producers with a significant opportunity, particularly for heavier grades.

### 3.3.4 PADD IV

PADD IV which includes Colorado, Montana, Utah, Wyoming and Idaho is the smallest of the Districts, and accounts for about four percent of total crude oil consumption. It is comprised of 16 refineries located in four of the five states (there are no refineries in Idaho), and has a total refining capacity of 596,000 b/d. Although PADD IV is smaller than the other core markets, it has been a consistent market for western Canadian crude oil supply. Until recent domestic crude oil production increases in certain areas of PADD IV, it has increasingly processed western Canadian crude oil.



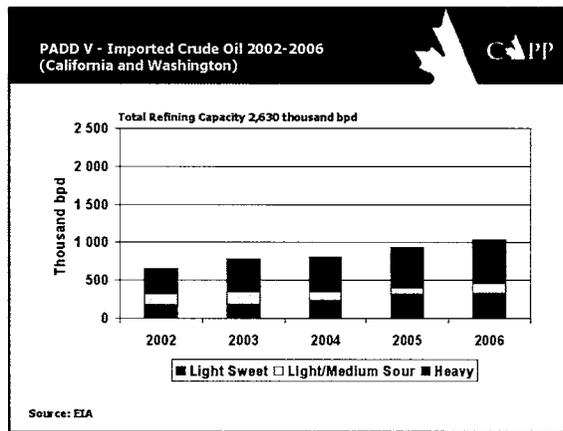
In 2006, PADD IV processed almost 270,000 b/d of Canadian crude oil or 45 percent of its feedstock requirements. There are no other crude oil imports into this market, outside of Canadian, due to the lack of alternative crude oil accessibility. In 2007, western Canadian crude oil receipts are forecasted to increase to almost 295,000 b/d and remain at this level through 2011, and then increase to about 313,000 b/d for the

remainder of the period. Conventional light sweet crude oil receipts increase from about 68,000 b/d in 2006 to almost 83,000 b/d in 2010, decline to 71,000 b/d in 2011 and remain flat through 2015. The growth occurs in heavy crude oil receipts and they increase from almost 158,000 b/d in 2006 to about 200,000 b/d in 2012.

Although PADD IV has experienced some recent demand growth, the lack of expected population growth, combined with the dispersed nature of the population provides for limited opportunities to increase western Canadian crude oil deliveries. Future opportunities for western Canadian crude oil will rely on the replacement of declining domestic supply combined with backfilling any small growth in refinery capacity.

**3.3.5 PADD V**

PADD V includes Alaska, Washington, Oregon, California, Nevada, Arizona and Hawaii. The majority of PADD V is geographically divided from the rest of the United States by the Rocky Mountains, and has very good access to tanker traffic, including proximity to Alaskan and offshore California crude oil production. It therefore results in the region being relatively independent from the rest of the country for its domestic sources of crude oil supply, and it imports over 35 percent of its requirements.



For purposes of this report, the PADD V has been divided into two market regions: Washington and California. These two states account for 80 percent of the 3.2 million b/d of refining capacity, and they represent both the current demand and future prospects for western Canadian crude oil.

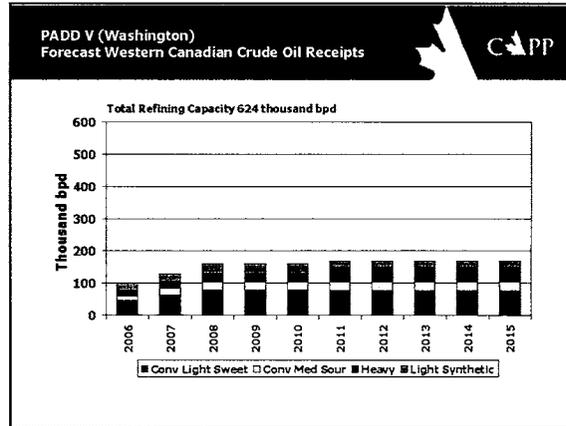
**3.3.5.1 Washington**

There are five refineries in Washington with a capacity of almost 624,000 b/d and they primarily process medium sour crude oil. These refineries have historically sourced their feedstocks from Alaska, and it currently accounts for approximately 70 percent of their runs. Washington has historically been a small but important niche market for western Canadian crude oil, particularly conventional light sweet. In 2006, western Canadian crude oil accounted for 16 percent of imports into Washington - the largest single import source. It imports the remainder of its requirements primarily from the Persian Gulf.

Receipts of western Canadian crude oil are estimated to increase by over 33 percent from 97,000 b/d in 2006 to almost 129,000 b/d in 2007 or about 21 percent of refining capacity. Conventional light sweet crude oil will continue to be the predominant feedstock growing from about 45,000 b/d in 2006 to 78,000 b/d in 2008 and remaining flat thereafter. Heavy crude oil demand is estimated to increase marginally from 18,000 b/d in 2006 to about 25,000 b/d in 2008, and then rise substantially to 48,000 b/d in 2011

and maintain that level through 2015. Conventional medium sour crude oil is also expected to rise marginally over the next few years. The growth in these crude oils reflects announced refinery conversion projects. Light sweet synthetic crude oil is forecasted to grow from 20,000 b/d in 2006 to 30,000 b/d in 2008 and remain flat through 2010, and then decline to 17,000 b/d through to 2015.

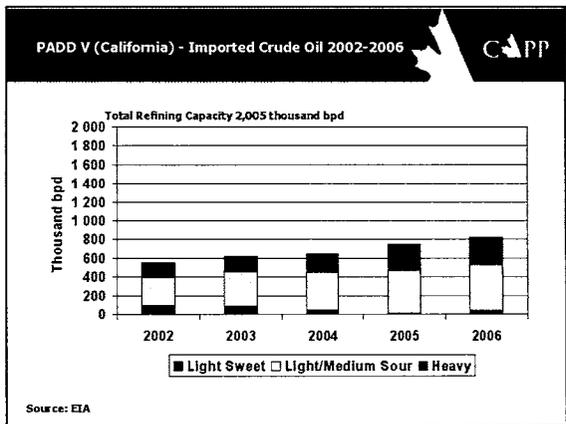
The Washington market has the potential to process additional volumes of western Canadian crude oil in view of the ongoing decline in Alaskan North Slope (ANS) crude oil production. The survey results show Canadian deliveries to Washington increasing from about 97,000 b/d in 2006 to 160,000 b/d in 2008. Pipeline constraints, however, may be an issue. Trans Mountain's TMX1 program will add about 75,000 b/d in late 2008, and based on the survey results it would leave almost 15,000 b/d of the incremental capacity for the remainder of Trans Mountain's shippers.



**3.3.5.2 California**

California has 20 refineries with a refining capacity of over 2 million b/d. Most of the refineries are located in two regions (Los Angeles and San Francisco) and account for approximately 95 percent of the state's refining capacity. California's refineries are highly complex with extensive upgrading capabilities, in part, due to having the strictest environmental requirements in the United States for refined petroleum products.

Refineries in California have primarily processed medium sour and heavy crude oils. Last year, California refineries received almost two-thirds of their supply from domestic sources, and ANS accounted for approximately 85 percent. The remainder is sourced from Saudi Arabia (12 percent), Ecuador (10 percent), Iraq (8 percent) and Mexico and Brazil (5 percent each) while Canada accounted for less than one percent.



California's traditional domestic crude oil supply sources are forecasted to fall by three to five percent per year and, as a result, it will become increasingly reliant on imports of foreign crude oil. Given Canada's proximity and forecasted growth in crude oil supply, this market represents a significant opportunity for western Canadian crude oil producers. Currently, however, pipeline capacity to the west coast of British Columbia is limited and there is no overland route available. However, there are proposals to serve this market.

### 3.4 Asia

The Asian market has attracted significant interest in the last few years because of its rising demand for energy and this is expected to continue. The United States Energy Information Administration (EIA) forecasts that demand will increase from 23.3 million b/d in 2004 to 32.7 million b/d in 2020, a 40 percent increase. It projects that demand in China will grow from 6.4 million b/d in 2004 to 11.9 million b/d in 2020, a rise of over 85 percent.

This market has the potential to process Canada's oil sands production. In fact, some of these countries are currently involved in oil sands development while others are considering acquisitions. In addition, some proponents are proposing pipelines to the west coast of British Columbia to serve this market.

### 3.5 Summary

Demand for western Canadian crude oil by Canadian refineries is expected to rise from 765,000 b/d in 2006 to almost 1.1 million b/d in 2015, a 44 percent increase. As expected, the majority of the growth will be heavy and light synthetic crude oils. Over the same period, exports to the United States are projected to increase from about 1.6 million b/d to almost 3.1 million b/d, a 100 percent growth. Demand for heavy crude oil is by far the largest of the crude types.

The refinery survey results indicate that traditional markets (i.e. western Canada, Ontario, upper PADD II, PADD IV and Washington State) in Canada and the United States will continue to process large volumes of western Canadian crude oil with the potential for expansions into new markets such as Québec, eastern PADD I, southern and eastern PADD II, PADD III, California and the Far East.

## 4 CRUDE OIL SUPPLY FORECAST AND MARKET DEMAND

The following three charts illustrates CAPP's western Canadian crude oil supply forecast in the Pipeline Planning Case in comparison to the CAPP refiner survey.

During the period from 2006 to 2011, inclusive, market demand for western Canadian light crude oil will exceed supply, and then market demand declines resulting in light crude oil supply exceeding demand. The opposite occurs for heavy crude oil supply and market demand. This reflects refiners' views that they expect to add upgraders at their refineries to process growing volumes of heavy crude oil supply. It is not expected that all of the proposed upgraders at the refineries will proceed as there are also proposals to build upgraders in the Fort Saskatchewan, Alberta area.

In total, CAPP's crude oil supply forecast is relatively close to the aggregated results of the CAPP refiner survey. However, as mentioned previously, CAPP did not survey all the refineries in North America that could conceivably process western Canadian crude oil.