

## **The Keystone XL Pipeline: OPEC's Trojan Horse?**

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September 2011

### **Abstract**

The proposed Keystone pipeline expansion, which would move oil from the Canadian tar sands to the US Gulf, has been defended on the basis of energy security. Proponents assert the increased oil supply from Canada will displace less secure imports from other foreign sources. This paper examines the claim and finds it incorrect. Careful economic analysis reveals the new pipeline will allow refiners and foreign suppliers to drive a wedge between the prices of oil produced in the United States and oil produced in areas such as Africa or the Middle East. This wedge could exceed \$20 per barrel. The lower price will prompt firms exploring for oil and gas to curtail activities in the United States and Canada, forcing North American output lower than might otherwise obtain if Canada chose a more logical outlet for its crude: a port in British Columbia. The fact that Keystone will likely decrease US energy security makes it unclear why the United States government should endorse the project.

TransCanada, the Canadian oil pipeline company, is proposing to build two additions to its existing Keystone pipeline. The firm describes the project, sometimes called the Keystone XL pipeline, as follows:

The proposed Keystone Gulf Coast Expansion Project is an approximate 2,673-kilometre (1,661-mile), 36-inch crude oil pipeline that would begin at Hardisty, Alberta and extend southeast through Saskatchewan, Montana, South Dakota and Nebraska. It would incorporate a portion of the Keystone Pipeline (Phase II)

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through Nebraska and Kansas to serve markets at Cushing, Oklahoma before continuing through Oklahoma to a delivery point near existing terminals in Nederland, Texas to serve the Port Arthur, Texas marketplace.<sup>1</sup>

Figure 1 shows the proposed routes for the pipeline additions.

The XL pipeline's proponents assert that it will reduce US dependence on imported oil by replacing insecure foreign supplies with "secure" Canadian supplies. These advocates neglect to note that Canada, under the Trudeau administration thirty years ago, has been the *only country in the world* to limit hydrocarbon exports to the United States. They also fail to note Canadian government policies that to this day constrain foreign investment in Canada or acquisition of some Canadian firms.

In truth, the pipeline is being proposed because it is far easier for Canada to send oil south to the United States rather than west to Vancouver. Failure to construct the pipeline to the south will keep much of the crude held in Alberta's tar sands in the ground for years, perhaps forever, because Canadian law makes it difficult to build pipelines west across Native American lands and protected areas of British Columbia. Thus the Canadian solution is to ship the oil south, effectively dumping the oil into the US. (Here the word "dump" is a technical term used by trade negotiators.<sup>2</sup>)

As explained here, Canada's dumping via Keystone will drive down crude prices in almost all the United States, extending the current Cushing depression to prices paid for Gulf oil. Price

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<sup>1</sup> See [http://www.transcanada.com/project\\_information.html](http://www.transcanada.com/project_information.html).

<sup>2</sup> In economics, "**dumping**" is any kind of predatory pricing, especially in the context of international trade. It occurs when manufacturers export a product to another country at a price either below the price charged in its home market or in quantities that cannot be explained through normal market competition. See [http://en.wikipedia.org/wiki/Dumping\\_\(pricing\\_policy\)](http://en.wikipedia.org/wiki/Dumping_(pricing_policy)).

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spreads between world markets and the US could exceed the current \$27-per-barrel difference between Brent and WTI (see Figure 2). Exploration and production investment in the United States will likely decline from levels that might have prevailed. This will happen as firms exploring for oil realize the Canadian dumping will drive a permanent wedge between world and North American crude prices. As a result, the Keystone XL's construction, ironically, will reduce US energy security.

### **Canada's Problem**

Canada confronts an opportunity and a problem. The opportunity comes from development of techniques to produce crude from Alberta's tar sands (oil sands), which creates a potentially large oil supply outside of OPEC. As can be seen from Figure 3, the IEA projects Canadian production to rise from 3.4 million barrels per day in 2010 to 4.7 million barrels per day by 2016.<sup>3</sup>

The problem stems from the oil being landlocked. The existing pipeline infrastructure was built more than fifty years ago. It was designed to move a much smaller volume of oil to refiners in eastern Canada and the upper US Midwest. Historically, Canada imported oil to supply refineries located in Montreal while moving Alberta production east across Minnesota, Illinois, and Michigan to refineries in Ontario. These lines also supplied US refineries in those three states.

Those pipelines cannot absorb the increased production from Canada, especially since companies in the United States have simultaneously boosted output from the Bakken Shale in North Dakota. As a result, Canadian logistics professionals have had to look for other means of moving oil from the tar sands in northern Alberta.

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<sup>3</sup> IEA, *Medium-Term Oil and Gas Markets*, June 2011.

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Under current circumstances, the logical choice for the Canadian government would be constructing a pipeline west from Alberta to British Columbia. There the crude could be transferred to ships for export to refiners in the western United States (Washington or California) or in Japan, China, and India. One pipeline firm, Enbridge, has proposed building such a line, called the Northern Gateway, from Bruderheim, Alberta to Kitimat, British Columbia.<sup>4</sup> The initial capacity for the proposed twin pipelines is approximately 525,000 barrels per day.<sup>5</sup> At Kitimat, the oil could be loaded on very large crude carriers (VLCCs) for export.

The Enbridge proposal faces a number of obstacles. First, an informal ban has prohibited large tanker movements through the waterways around Kitimat and Prince Rupert island, the alternative outlet, since 1972. Government studies conducted since then conclude the ban should remain in effect.<sup>6</sup> Obviously, the proposal cannot go forward absent the pipeline getting the green light.

Northern Gateway must also cross lands belonging to forty separate First Nations (Native American) bands. None of the First Nations groups has agreed to the blandishments offered by Enbridge despite the promise of billions. Their objections also make the pipeline's construction difficult. As Hoberg and Rivers explained, "Few treaties have been signed with the First Nations in British Columbia and the pipeline passes through areas where disputes over lands remain unsettled."<sup>7</sup> These legal uncertainties could delay the pipeline for years.

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<sup>4</sup> See [http://www.northerngateway.ca/files/RouteMaps/03-243-000\\_REV1.pdf](http://www.northerngateway.ca/files/RouteMaps/03-243-000_REV1.pdf).

<sup>5</sup> See [http://www.northerngateway.ca/files/ENB\\_NGP\\_BrochureOct26.pdf](http://www.northerngateway.ca/files/ENB_NGP_BrochureOct26.pdf).

<sup>6</sup> See [http://en.wikipedia.org/wiki/Enbridge\\_Northern\\_Gateway\\_Pipelines](http://en.wikipedia.org/wiki/Enbridge_Northern_Gateway_Pipelines).

<sup>7</sup> George Hoberg and Andrea Rivers, "Should Canada Approve the Construction of a Pipeline from the Oil Sands to the West Coast of Canada? The Enbridge Northern Gateway Case," A Case Document for ISES 2011, International Student Energy Summit, Vancouver, BC, May 31, 2011, UBC Department of Forest Resources Management—see

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Another problem for Enbridge is that it suffers from a checkered environmental record. As Hoberg and Rivers noted, Enbridge pipelines have had a number of spills. One of these occurred in Michigan, where the cleanup cost will reportedly exceed \$700 million.<sup>8</sup>

With regard to the Northern Gateway idea, producers in Alberta face the risk that much of their oil would not be produced in a timely way, given Enbridge's poor environmental record, concerns over spills in the ocean waters off British Columbia, and potential legal objections from First Nations groups, who might be granted authority to prevent pipeline construction by the courts. As an alternative, producers and pipelines have looked to move oil south to the United States. The Keystone XL project now appears to be the best alternative to the western route.

## **The Energy Security Myth**

As mentioned above, the Keystone XL backers have chosen not to explain Alberta's desperation to find a market when they push the project. They have advanced their proposal instead by relying on US energy security concerns. In their documents, they make this assertion:

Even with new technologies, oil discoveries, alternative fuels, and conservation efforts, the US will remain dependent on imported energy. Therefore, initiatives which improve the stability and security of imports are important both to the economy and to national security.

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<http://www.studentenergy.org/images/downloads/ISES%202011%20Northern%20Gateway%20Pipeline%20Case.pdf>

<sup>8</sup> Jeff Barber, "Enbridge Says Estimated Costs of 2010 Michigan Pipeline Spill May Jump 20%," Platts, September 26, 2011.

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Given that the US cannot produce sufficient energy to meet domestic needs, energy security is essentially the ability to obtain necessary imported energy from sources that are stable and friendly to US interests.<sup>9</sup>

The statement falls back on the vacuous pursuit of energy security by US politicians from Richard Nixon to Barak Obama. The claim certainly appeals to many, though, particularly those who back drilling and exploration in the United States.

Of course, the proponents neglect to note that Canadians have not always been friendly to US interests and may, in the future, find that their interests conflict with ours. Under the National Energy Program instituted by the Trudeau administration, exports to the United States were taxed by Canada and limited. In addition, US assets in Canada in the oil sector were effectively expropriated.<sup>10</sup> Tax benefits offered to Canadian oil companies were denied to foreign-owned (principally US) companies to encourage the latter to leave Canada. On top of that, the Foreign Investment Review Agency was directed to block any attempts by foreign companies to take over Canadian firms.<sup>11</sup>

Canadians would argue that the policy of the government has changed. However, the government's refusal to sanction BHP's acquisition of the Potash Corporation (PotashCorp) of Saskatchewan in 2010 demonstrates that Canada is no more trustworthy than Venezuela today. In that episode, BHP Billiton attempted to purchase PotashCorp. The acquisition was blocked because the Saskatchewan government operates a cartel in potash, holding prices well above the

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<sup>9</sup> See [http://www.transcanada.com/project\\_information.html](http://www.transcanada.com/project_information.html).

<sup>10</sup> See [http://en.wikipedia.org/wiki/National\\_Energy\\_Program](http://en.wikipedia.org/wiki/National_Energy_Program).

<sup>11</sup> David Milne, *Tug of War: Ottawa and the Provinces under Trudeau and Mulroney* (Toronto: James Lorimer, 1986), p. 83.

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market clearing level.<sup>12</sup> Politicians, however, point to the Foreign Investment Review Board's explanation of this action: the acquisition of PotashCorp by an Australian firm would have given Australia a competitive advantage in its export battles with Canada.<sup>13</sup>

Based on Canada's history of stealth protectionism, including its response to the BHP bid for PotashCorp, the best one can conclude is that Keystone XL would substitute a single insecure source of crude imports, Canada, for imports from a diverse set of suppliers, ranging from Angola to Saudi Arabia. Assuming no change in the level of US imports, this substitution would increase Canada's concentration (market power) over the US market. Put another way, the economic theory of competition as followed by the Federal Trade Commission and other regulatory bodies suggests this could give greater market power to Canadian exporters. In the past, these exporters have been perfectly willing to exercise such power. Indeed, BHP's takeover of PotashCorp was denied in part because the deal threatened to decrease potash prices and thus reduce Canada's income.

The concentration effect can be measured today using the Herfindahl-Hirschman Index (HHI). The Department of Justice and other competition regulators use HHIs to measure the ability of buyers or sellers to sustain prices above competitive levels. Our analysis suggests the Keystone pipeline expansion would raise the concentration of imports into the United States' key refining areas, the Gulf Coast and Midwest, from 1,200 to 1,600. These levels are classified as moderately concentrated (1,600 borders on highly concentrated). They indicate that oil exporters

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<sup>12</sup> Phred Dvorak and Scott Kilman, "BHP Roils Potash Cartel," *The Wall Street Journal*, August 25, 2010.

<sup>13</sup> "Canada Lets Slip One Reason for Blocking BHP Bid," Reuters, November 4, 2010—see <http://www.reuters.com/article/2010/11/04/us-potashcorp-idUSTRE69S47P20101104>.

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would have market power. The calculation suggests that the Keystone's completion would make the United States' energy supply less secure.

The pipeline's real threat, however, is to crude oil producers in the United States and Canada. The pipeline creates an opportunity for crude buyers to drive prices down. It occurs because crude oil cannot be exported from the United States. This means that additional oil shipped south from Canada could collect in the Gulf, lead to higher inventories, and decrease prices unless imports are reduced. However, as explained below, importers may have no reason to cut back their shipments to the United States, especially since products from US refiners can be exported and sold at world prices.

This last statement means that a country such as Saudi Arabia will be able to export volumes of Arab Heavy, which today at best are worth \$90 per barrel at a marginal refinery, to the refineries it owns in the Gulf and transform the crude into products worth \$110 per barrel. For Saudi Arabia, the Gulf presents the opportunity to earn an incremental \$20 per barrel on its crude and receive roughly \$110 per barrel whether it charges its refinery \$90 or \$10. All Saudi Arabia needs to do to achieve this income is to set its crude price at a level that causes its refinery operator to choose its crude, not Canadian crude. The economics are the same for Venezuela and Mexico.

Oil exporters outside North America have every incentive, then, to make sure their crude rather than Canadian crude is processed at US Gulf refineries, provided they participate in the extra refining margin. Oil exporters, other than Canada, have a second incentive as well. By discounting their crude price, these countries can reduce the incentive for investors to fund oil

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exploration programs in the United States and Canada. As this occurs, US dependence on imported oil will increase above levels that would otherwise obtain.

In short, construction of the Keystone pipeline might be considered a Trojan Horse, a “gift” by oil-exporting countries to the United States and Canada, a “gift” that will cause US and Canadian production to fall short of predicted levels, leaving a larger global market for OPEC. This issue is explored in more detail below.

### **Analysis: Keystone XL as Trojan Horse**

The **Trojan Horse** is a tale from the Trojan War, as told in Virgil's Latin epic poem *The Aeneid*, also by Dionysius, Apollodorus and Quintus of Smyrna. The events in this story from the Bronze Age took place after Homer's *Iliad*, and before his *Odyssey*. It was the stratagem that allowed the Greeks finally to enter the city of Troy and end the conflict.

In one version, after a fruitless 10-year siege, the Greeks constructed a huge wooden horse, and hid a select force of 30 men inside. The Greeks pretended to sail away, and the Trojans pulled the horse into their city as a victory trophy. That night the Greek force crept out of the horse and opened the gates for the rest of the Greek army, which had sailed back under cover of night. The Greek army entered and destroyed the city of Troy, decisively ending the war.

In the Greek tradition, the horse is called Δούρειος Ἴππος, *Doúreios Híppos*, the “Wooden Horse,” in the Homeric Ionic dialect. Metaphorically a “Trojan Horse” has come to mean any trick or stratagem that causes a target to invite a foe into a

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securely protected bastion or space. It is also associated with “malware” computer programs presented as useful or harmless to induce the user to install and run them.<sup>14</sup>

As noted, the pipeline company TransCanada has proposed building pipeline extensions from Alberta south across the American Midwest to Houston. The company explains the reason behind this project on its website:

The US \$13 billion Keystone pipeline system will play an important role in linking a secure and growing supply of Canadian crude oil with the largest refining markets in the United States, significantly improving North American security supply.<sup>15</sup>

The president of the National Petrochemical & Refiners Association, not necessarily a disinterested party, made the security point in a May 11 letter to Congress, noting that “by replacing OPEC crude with a more stable source from Canada, the risk premium inherent in supplies from less stable parts of the world would be reduced.”<sup>16</sup> Two former energy security advisers to the US State Department and the Department of Energy, David Goldwyn and Lucian Pugliaresi, testified to Congress to the same effect, arguing that the pipeline would reduce US dependence on the Middle East.<sup>17</sup> The president of the American Petroleum Institute affirmed

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<sup>14</sup> See [http://en.wikipedia.org/wiki/Trojan\\_Horse](http://en.wikipedia.org/wiki/Trojan_Horse).

<sup>15</sup> See <http://www.transcanada.com/keystone.html>.

<sup>16</sup> Letter from Charles T. Drevna, President, NPRA, to Chairman of the House Energy and Commerce Committee, May 26, 2011—see

[http://www.npra.org/cmsRelatedFiles/05\\_26\\_11\\_NPRA\\_Response\\_to\\_House\\_EC\\_re\\_Keystone\\_Pipeline\\_final.pdf](http://www.npra.org/cmsRelatedFiles/05_26_11_NPRA_Response_to_House_EC_re_Keystone_Pipeline_final.pdf)

<sup>17</sup> Reuters, “Importance of Keystone Pipeline Discussed by US House of Representatives and Leading Experts,” April 1, 2011—see <http://www.reuters.com/article/2011/04/01/idUS201511+01-Apr-2011+MW20110401>.

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this view in a letter to Secretary of State Clinton, stating the pipeline would “enhance our national security.”<sup>18</sup>

In one sense, those claiming the pipeline would increase US national energy security were correct. The line will help the United States diversify its crude oil sources. However, most of the commentators assert that the US will replace oil imports from OPEC countries, particularly Venezuela, Saudi Arabia, or Iraq, with exports from Canada. On this second point, they are probably wrong. Instead, as noted here, imports from these sources will likely continue as long as those countries keep pricing their oil competitively to the United States. If the exporters, particularly Venezuela and Saudi Arabia, do this, then crude oil prices in the United States will drop relative to prices in the rest of the world.

It is suggested here that this discount could rise to \$20 or \$30 per barrel for all crude produced in the United States east of the Rockies, as well as for crude produced in Canada. Thus, some US crude could sell for \$60 per barrel when international crude was quoted at \$90. Prices for oil from Canada and North Dakota would be depressed further. In extreme circumstances, the discounts could be even larger.

The discounts caused by the Keystone XL pipeline will likely slow exploration spending in the Gulf of Mexico and in shale areas such as Eagle Ford in Texas and Bakken in North Dakota. In addition, the price suppression will slow or stop investment in oil sands projects in Alberta. The result will be non-OPEC production in 2020 that is lower than it might have been otherwise and greater world dependence on OPEC.

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<sup>18</sup> Letter from Jack Girard, President, API, to the Honorable Hillary Clinton, Secretary of State, June 6, 2001—see [http://www.api.org/Newsroom/upload/API\\_XL\\_SDEIS\\_Comments\\_6\\_6\\_11.pdf](http://www.api.org/Newsroom/upload/API_XL_SDEIS_Comments_6_6_11.pdf).

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This conclusion was arrived at through the following analysis.

First, the supply-and-demand balance for crude oil and products within PADD II and PADD III<sup>19</sup> will shift radically over the next eight years, with demand for petroleum falling and indigenous supply increasing. As a result, the region's deficit, excluding additional supplies from Canada, will decline 1.4 million barrels per day (18 percent).

Second, concentration among independent refiners on the Gulf Coast is increasing. One company, Valero, will shortly have the market power to squeeze crude producers. At the same time, much of Gulf Coast refining capacity is owned by integrated companies that have long-term supply arrangements. This will leave independent producers vulnerable, creating the possibility of duplicating the situation now observed in Cushing.

Third, the competitive pricing strategies of oil-exporting countries will facilitate the efforts of independent refiners to squeeze producers. In particular, Saudi Arabia's market-based pricing program will allow the Kingdom to maintain—or build—its market share.

Fourth, a US policy that permits product exports but effectively prohibits crude oil exports, combined with a lack of crude oil export facilities, will further strengthen the hand of independent refiners.

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<sup>19</sup> PADD stands for Petroleum Administration for Defense District. PADD III covers five southernmost states, from New Mexico to Alabama, plus Arkansas. PADD II covers states in the Midwest north of PADD III, east of Montana, Wyoming, and Colorado, and west of the Atlantic states, including West Virginia—see [http://205.254.135.24/pub/oil\\_gas/petroleum/analysis\\_publications/oil\\_market\\_basics/paddmap.htm](http://205.254.135.24/pub/oil_gas/petroleum/analysis_publications/oil_market_basics/paddmap.htm).

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Finally, market power has been exercised often in the oil market. Should Gulf Coast refiners use market power as described, they will continue a trend that dates back at least thirty years and a practice that can be traced back 100 years.

### Supply-and-Demand Balance: More Oil for a Shrinking Market

Planners conceived the Keystone XL pipeline as a means to close a gap between petroleum consumption and supply in the US midcontinent, the area extending from the Gulf Coast to the Canadian border. Historically, this area has been a net crude importer. These imports rose substantially from 1990 to 2010, as can be seen from Figure 4. In 2010, imports accounted for approximately 70 percent of the region's refining inputs, up from 50 percent in 1990.

Crude oil from Canada accounts for one-sixth of the region's imports. The remaining volumes come from a wide variety of countries (see Table 1).

Keystone proponents assert that increased capacity from Canada would displace declining production from Mexican fields, as well as insecure and decreasing supplies from Venezuela. Advocates also assert that the line would reduce dependence on supplies from the politically unstable Middle East.<sup>20</sup>

A paper prepared by refining consultants Purvin & Gertz for the pipeline proponents paints a very healthy picture for the project. This "Rosy Scenario" presumes increased refinery throughput (and presumably consumption) in the upper Midwest (PADD II) and on the Gulf Coast. Midcontinent refining runs are projected to remain constant at three million barrels per

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<sup>20</sup> As noted earlier, Canadian proponents conveniently neglect to note that Canada has been the most insecure supplier to the United States over the last half century. Exports were limited and prices raised by the government of Pierre Eliot Trudeau during the first half of the 1980s.

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day, while the area's crude production is expected to drop to essentially zero. Gulf Coast refining runs are projected to rise from seven million barrels per day to nine million barrels per day by 2015 as the region's crude output drops from two million barrels per day to one million barrels per day.<sup>21</sup>

These projections present a truly Rosy Scenario for the pipeline and Canada, suggesting a large and growing market. However, they are also in the tradition of a Rosy Scenario—a term first applied to the budget forecasts offered by Ronald Reagan's Office of Management and Budget Director David Stockman. Stockman projected that budget deficits would be cut by the strong growth he forecasted for 1982 and 1983. In fact, economic growth slumped due to the high-interest regime imposed by Paul Volker. Budget deficits widened when the rosy economic scenario failed to materialize.

Purvin & Gertz's optimistic forecast for TransCanada is rather like the Stockman projections. It has at least three key deficiencies:

1. The forecast fails to account for the decline in US petroleum consumption.
2. The forecast makes no allowance for increased US output from nontraditional sources such as the Bakken in North Dakota and Eagle Ford in Texas.
3. The forecast makes no allowance for renewable fuels capturing a significant share of the petroleum market by 2015 and an even greater share later.

The Purvin & Gertz projection is compared with a more likely outcome in Table 2. This table shows two views of projected crude runs in the region, two views of domestic production, and, in

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<sup>21</sup> Purvin & Gertz, "Western Canadian Crude Supply Markets," report submitted to the National Energy Board by TransCanada, February 2009.

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the case of PKVerleger LLC, an estimate of product exports. Note that the full size of the market identified by Purvin & Gertz for Canadian crude is eight million barrels per day. This is the volume Purvin & Gertz anticipates will need to be imported in 2015 or so if refiners in PADD II and PADD III process crude at its projected levels.

PKVerleger LLC sees a much smaller four-million-barrel-per-day market, assuming US Gulf Coast refiners can export two million barrels per day of products, primarily gasoline and diesel fuel. Under this optimistic assumption, refiners will need four rather than eight million barrels per day. The difference in the projected requirement results from recent shale production developments and our expectation of lower crude runs. The greatest difference is on the crude supply side. The Purvin & Gertz study was prepared before the dimensions of the oil shale revolution were understood.

The Purvin & Gertz study also failed to allow for the possible penetration of renewable fuels in PADD II. The Energy Independence and Security Act of 2007 (EISA 2007) requires 1.3 million barrels per day of renewable fuels to be used in 2015 and 2.3 million barrels per day in 2020. These amounts are written into law. They must be satisfied by marketers absent a legislative change or an EPA grant of short-term waivers. (The current law prohibits long-term waivers.) By 2015, petroleum marketers will not be able to meet the EISA 2007 requirements by solely marketing a mix of ten-percent ethanol and ninety-percent gasoline. The problem could become critical long before 2015 if total gasoline use continues to fall.

PKVerleger LLC expects marketers will meet the standard by boosting the E85 volume sold. E85 is an 85:15 mix of renewable fuels and gasoline. In the October 2010 *Petroleum Economics Monthly*, it was suggested that the prices offered for Renewable Identification Numbers (RINs)

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will rise to where marketers will profit by offering E85 for essentially nothing to gain access to the RINS created by EISA 2007. In some case, E85 may sell for \$1 per gallon while conventional gasoline retails for as much as \$5. E85 sales are expected to surge, particularly in the Midwest where renewable fuels are readily available.

The increase in Midwest ethanol used will reduce PADD II refining runs and, quite possibly, cause one or two refineries to close. The most vulnerable units are likely the Wood River refinery in Roxana, Illinois, which used to be Shell's and now belongs to ConocoPhillips and Cenovus Energy, and Citgo's Lemont (Illinois) facility.

Gulf Coast refiners may be protected from the projected falloff in petroleum use by the growth in export markets. These refiners are already significant exporters of gasoline and distillate fuel oil. As can be seen from Figure 5, the growth in exports is a relatively new phenomenon. Further export increases to other countries and other parts of the United States should occur over the next decade. For example, Gulf refiners may continue to supply the Midwest with significant diesel fuel volumes, particularly if PADD II refineries close due to the area's declining gasoline use. The Gulf refiners will also become increasingly important to consumers in Europe and Latin America.

The increase in product exports should allow Gulf refiners to continue operating at high utilization rates, particularly if they enjoy access to discounted crude oil supplies from US and Canadian sources. The basis of these discounts is explained below.

Demand for crude imports will be much lower in the PADD II/PADD III region, however, if US refiners cannot continue to boost exports. By late in the decade, the region's demand for imports

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could drop as low as two million barrels per day—not the eight million barrels per day projected by Purvin & Gertz—if the product export market is closed.

In summary, by mid-decade the market for imported crude in the combined PADD II/PADD III areas will likely be much smaller than calculated in 2009. Demand for imports will be diminished by a decline in petroleum consumption in the relevant areas due to improved efficiency and renewable substitution. The surprising increase in crude output in the region from shale will also cut demand for imports.

### Refiner Market Power on the Gulf Coast

Construction of the Keystone XL pipeline will feed an increasingly concentrated independent refining sector on the Gulf Coast. The pipeline's proponents no doubt believe refiners are price takers, that is, economic agents that cannot influence the price of the commodity being purchased. Such views are not surprising because refiners have historically been just that: price takers. It is not surprising, then, that consulting firms such as Purvin & Gertz preparing studies for TransCanada make similar assumptions, apparently failing to understand the more nuanced nature of concentrated markets.

Keystone's proponents list a number of refineries in Texas and Louisiana that would be likely buyers of Canadian crude. The Purvin & Gertz report states that Gulf Coast refiners with refining capacity of almost eight million barrels per day could be potential buyers for oil shipped through the pipeline.

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The lower refining capacity compared to Keystone's initial capacity suggests that buyers will lack the ability to exercise market power against those shipping crude on the pipeline. This may not be the case.

Refiners are not always price takers. Today refiners located in the upper Midwest provide a vivid illustration of how crude buyers can exercise market power. As of this writing, cash WTI traded at a discount of \$25 per barrel to Dated Brent despite the fact it would trade at a slight premium if it could reach the market. Indeed, WTI has been at a significant discount to Brent for months now, as can be seen from Figure 2 above. The large discount is explained, of course, by one refining company blocking reversal of the Seaway Pipeline between Cushing and Houston. The large discount has occurred despite midcontinent refiners' apparent lack of market power.

The exercise of market power by refiners in the case of Cushing is far from the first example of such action. To the contrary, such behavior is more the norm than the exception. In the early 1980s, Gulf Coast refiners exercised market power to drive down prices for the heavy sour crudes from Venezuela and Mexico. Then, as now, those heavy crudes could only be converted into viable products through coking, a process that breaks the oil into feedstocks that can be blended into distillate and gasoline. At the time, refiners owning coking capacity tended to limit heavy crude purchases, sometimes operating facilities at less than capacity. Through this action, they reduced demand for heavy sour crude while boosting residual fuel oil supply. This in turn forced the price of heavy sour crudes down relative to sweet crudes. In effect, refiners that owned coking capacity used their market power to make heavy crude producers accept less.<sup>22</sup> In

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<sup>22</sup> See James L. Bressler and Philip K. Verleger, Jr., "Strategies for Maximizing the Value of Heavy Crude," *Journal of Energy and Development* 7, No. 2 (Spring 1982), pp. 271-287.

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this case, the refinery buyers had no obvious market power. Nevertheless, they squeezed exporters because the latter needed access to cokers.

Venezuela and Mexico overcame this exercise of market power. Mexico bought a portion of Shell's Deer Park refinery in Texas and financed the construction of a large battery of advanced cokers. Mexico and Shell now jointly operate the facility. Venezuela purchased the US refining company Citgo after Occidental divested it and then constructed large cokers at Citgo's Lake Charles refinery. Citgo also entered joint agreements with Hess, Conoco, and Mobil with regard to refineries in Louisiana and the US Virgin Islands. Cokers were constructed at each facility. In this manner, Venezuela built a market for its heavy crude.

Saudi Arabia has taken similar steps to build a market for its heavier crude. Saudi Aramco and Shell, for example, own a refinery in Louisiana through their joint venture Motiva. In addition, the two companies are building new facilities in Port Arthur, which, when completed in 2012, will have capacity to process more than 600,000 barrels per day of Arab Heavy.

Recently Shell, Saudi Arabia's partner in the refinery, announced it was constructing a 900,000-barrel-per-day pipeline from Louisiana to Texas.<sup>23</sup> The pipeline would presumably allow Saudi crude, probably Arab Heavy, to move from the Louisiana Offshore Oil Port (LOOP) to Houston. The LOOP can receive VLCC shipments. By connecting the LOOP to Port Arthur, the Saudis can reduce the cost of shipping crude to their Texas refinery.

The advantages to the Saudis of shipping Arab Heavy in this manner occur because the new refinery will convert Arab Heavy into a mix of high-value products that can then be sold at world

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<sup>23</sup> Matthew Cook, "Shell Proposes New Louisiana-Texas Crude Pipeline," Platts, September 14, 2011.

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prices to US customers or in world markets. As explained in Box 1 (page 15), the Saudis will be relatively indifferent as to the price of the crude supplied to the refinery because they realize a large portion of the refining revenues.

The examples offered above illustrate how refiners have been able to exercise market power and the reaction of oil producers. In addition, they indicate how Gulf Coast refiners might be able to use market power to drive down crude prices.

**The best example of a refiner's exercise of market power, though, occurred in 1982.** In that year, Arco, a firm with refining and marketing activities on both US coasts, exercised a unique opportunity to boost profits by capturing market share from other refiners in California. The opportunity came about through the company's ownership of Alaskan crude production and US regulations that required Alaskan oil to be processed domestically. In 1982, Alaskan production, 1.7 million barrels per day, exceeded the needs of West Coast refiners. As a result, significant volumes of Alaskan oil, 560,000 barrels per day, had to be transported from Alaska to the US Gulf via the Panama Canal.

Initially all three Alaskan producers—Arco, Exxon, and BP—shipped oil to the Gulf. Arco, however, recognized that it could raise profits if it forced other refiners to move their oil to the Gulf while keeping its own oil on the West Coast.

The export prohibition created a financial opportunity for Arco. Alaskan oil competed freely with foreign oil in Gulf markets. According to our records, the cost of transporting oil from Alaska to the Gulf on the required US flagged ships was roughly \$8 per barrel. In contrast, the

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cost at the time of moving Alaskan oil from Alaska to Los Angeles was \$3 per barrel. The West Coast had a \$5-per-barrel advantage, one that became known as the Arco advantage.

In 1982, Arco began to pass its cost advantage through to consumers. It did this by canceling its credit card program on the purported basis that it could reduce prices by doing so. It also asserted that it had become more efficient. The truth was that Arco had a lower cost of crude than its two main competitors, Unocal and Chevron. Arco's program boosted market share by fifteen percent within six months.<sup>24</sup> Within two years, the firm was the largest gasoline marketer on the West Coast. Arco's two key competitors, Chevron and Unocal, saddled with imported crude, were unable to match Arco's lower prices and lost market share.

Arco's advantage ended in 1996 when Alaskan production declined, eliminating the need to ship production to the Gulf. At that point, markets equilibrated. However, by then Arco had established its leadership position.

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### **Box 1 The Motiva Port Arthur Refinery: Exclusively for Saudi Crudes**

Motiva is a fifty-fifty joint venture between Shell and Saudi Aramco. The firm owns three refineries, which will have capacity to process more than one million barrels per day when the expansion of the Port Arthur facility is complete in 2012. Shell and Saudi Arabia have invested more than \$10 billion in the development. (Some industry observers put the total at \$12 billion.) The project has been supervised by Bechtel, which is recognized as one of the world's leading engineering construction firms and the most expensive.

The rebuilt Port Arthur refinery will be able to convert the heaviest of Saudi Arabia's crudes, Arab Heavy, into more valuable light products that meet the tightest environmental standards. While few details on the refinery's capacity have been made public, one can assume it has been designed to maximize production of the most valuable light products sold in the market today: ultra-low-sulfur diesel fuel (ULSD) and gasoline blend stocks containing essentially no sulfur. Data have, however, been released on another new facility being built in Yanbu, Saudi Arabia as a joint venture between Saudi Aramco and Sinopec. That facility will yield 22.5-percent gasoline and 66-percent ULSD.<sup>25</sup> Using those numbers, one can

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<sup>24</sup> Thomas C. Hayes, "Gasoline Discounts Lift Arco Sales," *The New York Times*, August 3, 1982.

<sup>25</sup> "Saudi Aramco Yanbu Refinery," Hydrocarbons-Technology.com, March 2011—see <http://www.hydrocarbons-technology.com/projects/aramco-yanbu/>.

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calculate that the Port Arthur facility will increase the value of the products derived from Arab Heavy by 14 percent compared to the value of products produced from a topping refinery (see the table below).

For Saudi Arabia, though, the benefit is even greater because it will allow the Kingdom to increase production of heavy sour crude without depressing the residual fuel oil price. In addition, as the editors at Hydrocarbons-Technology.com have noted, many world refineries are not equipped to process Arab Heavy.

One should expect Port Arthur to process Arab Heavy exclusively. This will allow the Kingdom to boost production of Arab Heavy, possibly cutting output of lighter crudes. Certainly, Saudi Arabia did not invest billions in Port Arthur to refine Canadian crude!

Once the refinery is operational, one can anticipate that Saudi Arabia will realize prices for its Arab Heavy close to the value of the products produced from the crude at Port Arthur. These prices will be close to world market prices because Gulf product prices closely track world product prices, unlike some domestic crude supplies. Of course, Gulf products track world levels because Gulf refiners have become significant product suppliers to world markets.

Saudi Arabia could realize world market values for the volumes processed at Port Arthur in one of two ways. First, the crude could be sold to Port Arthur under a netback contract, where the price paid is determined by product prices. Petroleos de Venezuela (PDVSA) uses such contracts with its various US facilities. Alternatively, Saudi Aramco could price the crude competitively with other crudes sold on the Gulf and capture the added value in Motiva's profits. Whichever method is selected, one can be fairly certain that no Canadian crude will make it to the Motiva facility.

Hypothetical Calculation of Value of Products Produced from Arab Heavy  
from a Topping Refinery and an Advanced Refinery Such as Port Arthur

Product	Spot Price (\$/bbl)	Refinery Yield (%)		Value of Products (\$/bbl)	
		Topping	Port Arthur	Topping	Port Arthur
Naphtha	102.00	4.6		4.70	0.00
Gasoline	105.00	14.0	22.5	14.70	23.60
Low-Sulfur Diesel	118.00	20.0	65.8	23.70	77.90
Residual Fuel Oil (4.5%)	91.00	55.0	5.0	50.10	4.60
Total				93.15	106.05

Source: PKVerleger LLC.

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Arco's actions, as well as steps taken by refiners owning cokers, illustrate how refiners have exercised market power in the past. Gulf Coast refiners can be expected to do the same if and when the Keystone expansion is completed. They will be able to do this because one firm,

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Valero, has significant market power. Its market power is being strengthened by Shell's potential construction of a 900,000-barrel-per-day pipeline from St. James, Louisiana, to Houston.<sup>26</sup>

The Keystone pipeline could allow Gulf Coast refiners to exercise the type of market power Arco used in California against other gasoline markets and the owners of coking facilities used against Venezuela and Mexico. Gulf Coast refiners could do this simply by allowing inventories to build. The stock increase would force the Gulf market into contango as the cash price of crudes such as Light Louisiana Sweet (LLS) or Mars dropped to large discounts relative to forward prices. Over time, forward prices of these crudes could fall relative to the forward price of internationally traded oils such as Brent and Dubai.

The refiners could increase stocks by continuing to import crude even as the flow from the north increases. In such circumstances, the additional imports or the oil from the north would need to go into storage.

The key to the strategy lies in the work of Holbrook Working, Michael Brennan, and Jeffrey Williams. These authors have shown that spreads measured as the difference between forward and cash prices correlate positively with inventory levels.<sup>27</sup>

The existence of forward and futures markets for crude would facilitate such a strategy. A refiner accumulating inventories would be able to sell the supplies forward into the market if the market were in contango. Of course, the firms bringing in the added imports would actually be pushing the market into contango unless producers in Canada or other parts of the US responded by

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<sup>26</sup> "Shell Proposes New Louisiana-Texas Pipeline," *Platts on the Net*, September 14, 2011.

<sup>27</sup> See, for example, Jeffrey C. Williams, *The Economic Function of Futures Markets* (Cambridge, England: Cambridge University Press, 1986), or Jeffrey C. Williams, "Commodity Futures and Options" in Bruce L. Gardner and Gordon C. Rausser (eds.), *The Handbook of Agricultural Economics* (New York: Elsevier, 2001).

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cutting production. To be blunt, Gulf Coast refiners will be able to create the contango that will boost refining profits just by accumulating additional crude volumes.

Many will be quick to criticize this argument, asserting that such a strategy would be costly.

They will say that companies importing the oil will have to pay higher prices for the imported crude that goes into stocks. They could be correct. Even if this were the case, though, a Gulf refiner with sufficient market power might be willing to pay a higher price for imports if the purchases reduced the price of US and Canadian crude. A refiner processing LLS would profit if it could cut its average crude costs from \$112 to \$96 per barrel by importing twenty percent of its crude from abroad at \$120 per barrel, assuming the imports created a surplus of US and Canadian crude that caused LLS to fall from \$112 to \$90.

However, Gulf Coast refiners do not need to make such sacrifices because many oil exporters price the crude they export to the United States off a US benchmark such as the Argus Sour Crude Index (ASCI). The price of Saudi Arabian exports to the United States is determined by the ASCI about the time the imports arrive. *Thus, at essentially no incremental cost, a Gulf Coast refiner could build inventories that would increase contango and drive down crude prices in the US relative to the world market.* To make the strategy work, the refiner need only accumulate additional stocks.

The crude volume required to implement this exercise of market power is not extremely large. As can be seen from Figure 6, PADD II crude stocks have ranged between 140 and 200 million barrels. An addition of 30 to 40 million barrels would likely drive markets into deep contango.

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Gulf Coast refiners receive added support from US government regulations that prohibit the export of US-produced crude. Under current circumstances, it takes a special license to export crude oil from the United States, including to Canada. Caldwell et al. reported that such licenses are granted only in very limited circumstances.<sup>28</sup>

The regulatory block to oil exports means that the oil coming to the Gulf Coast will back up unless it is processed. In the last year, refiners have learned they can drive down the price of WTI by allowing crude inventories to build in Cushing. It would be utterly astounding if they did not do the same on the Gulf Coast.

The ability to exercise market power is enhanced by the emergence of a single large independent Gulf Coast refiner: Valero. Valero will own and control 1.5 million barrels per day of refining capacity in Texas and Louisiana once it completes its acquisition of Murphy's 130,000-barrel-per-day Louisiana refinery.<sup>29</sup> This represents eighteen percent of total Gulf Coast refining capacity.

Valero's market power is higher, though, because roughly half the refining capacity located on the Gulf Coast is owned and controlled by three integrated companies: Citgo, Shell (Motiva) and ExxonMobil. These firms own 3.2 of the region's 8.2-million-barrel-per-day refining capacity. Independents own approximately five million barrels per day of capacity.<sup>30</sup> Valero accounts for thirty percent of the capacity owned by independent firms.

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<sup>28</sup> Charles Caldwell, Cathy Lewis, Larry Nettles, and William Vigdor, "United States," in Craig Spurn (ed.), *Oil Regulation in 28 Jurisdictions Worldwide, 2009* (London: Getting the Deal Through, 2009) – see <http://www.velaw.com/uploadedFiles/VEsite/Resources/UnitedStates.pdf>.

<sup>29</sup> The acquisition was announced September 1 and received antitrust clearance September 13.

<sup>30</sup> A larger Texas City refinery owned by BP is included in this latter category because BP has indicated it would sell the asset. The buyer will presumably be an independent.

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Excluding the integrated companies is appropriate in assessing the market power of crude buyers in the Gulf because the integrated companies typically operate with firm long-term supply arrangements. The refineries jointly owned by Shell and Saudi Aramco through Motiva will likely process primarily Saudi Arabian crude. The Shell/Pemex Deer Park facility will process heavy Mexican crude if available, only buying from other suppliers such as Shell Oil if Mexican supplies are inadequate. Citgo, a wholly owned Venezuelan company, will presumably process Venezuelan crude. ExxonMobil will presumably continue to process Middle Eastern crude at its three Gulf Coast refineries. This implies that the market for Canadian and other US crude oils shipped to the Gulf will be independent refiners such as Valero.

The market power of these independent refiners can be gauged using the Herfindahl-Hirschman Index (HHI). As noted earlier, HHIs are regularly used by antitrust regulators to determine the ability of merging firms to control prices. The HHI for independent refiners in Louisiana and Texas following the closure of the Murphy transaction rises to 1,500, a level defined as moderately concentrated by the Department of Justice in its *Merger Guidelines*. Within the state of Texas, the HHI for independent refiners is 2,000. Ordinarily, such a high value would permit competition regulators to investigate any merger.

However, competition regulators are clearly not concerned by Valero's refinery acquisitions. This disinterest likely results from petroleum product markets being very competitive, which makes it very difficult for any refiner to manipulate *product prices*. Competition regulators apparently have few concerns regarding the payments received by crude oil producers.

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### **OPEC's Opportunity**

Construction of the Keystone XL pipeline offers oil-exporting countries a chance to flood the US Gulf Coast with crude and drive down crude prices relative to world levels, thus transferring significant sums to refining profits and quite probably slowing exploration and development efforts in North America and the world. This raises a question: Will oil-exporting countries take advantage of the opportunity?

Most oil market commentators will say of course not. Oil exporters will send their oil to the highest value market. Commentators making such statements can be excused for their naivety, for their failure to grasp the dynamic as opposed to static nature of commodity markets.

Sophisticated executives of oil-exporting countries, on the other hand, will recognize the gift presented by the Keystone. They will understand that Canada's inability to build lines west through British Columbia gives them a chance to drive a significant wedge between their prices and those paid for crude produced in Canada, the US Midwest, and the Gulf of Mexico. They will also understand that they can widen the difference by providing a modest amount to oil to buyers in the United States such as Valero. They will recognize that the volumes of oil will push down US and Canadian oil prices, effectively slowing expansion of non-OPEC oil. Finally, they will be aware that the out-of-pocket cost of the strategy will be relatively modest, probably less than one half of one percent of a year's income.

Perhaps a few executives in oil-exporting countries will recognize that the United States used the same strategy to drive down oil prices in the 1980s in order to bankrupt the Soviet Union.

Bluntly, the Keystone pipeline provides key oil-exporting nations with a unique opportunity to reduce oil prices in the United States and Canada relative to world prices. The lower prices will

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slow the expansion of oil supplies from these areas. Consequently, historians may indeed call Keystone a true Trojan Horse.

### **Investor Considerations**

Analysts at Wood Mackenzie, an energy consulting firm, have recognized this trend. In late September, Wood Mackenzie's Alan Gelder, Vice President of Downstream Oil, referred to Motiva's Port Arthur facility as an export machine, noting that it would add 325,000 barrels per day of high-value products to the world market.

Gelder also predicted that WTI would continue to trade at a discount to Brent for the next "ten to fifteen years." While not saying it, he clearly implied that other US crudes would also move to a discount to world crudes with Keystone's completion, the point made here. He concluded with these thoughts:

What you've got effectively in the US is a hydrocarbon industry which is being much more competitive based on the feedstocks and new technologies such as oil shale fracking.... The US refining industry is become increasingly competitive on a global perspective and adding capacity at a time that domestic demand is not growing.<sup>31</sup>

Certainly firms such as Valero and PBF have noticed these developments. In the coming years, one can expect to see the processing industry grow on the Gulf, quite probably at the expense of producers in the United States and Canada.

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<sup>31</sup> Robert Perkins, "European Refiners Facing New Supply Threat from US Gulf: Wood Ma," Platts, September 26, 2011.

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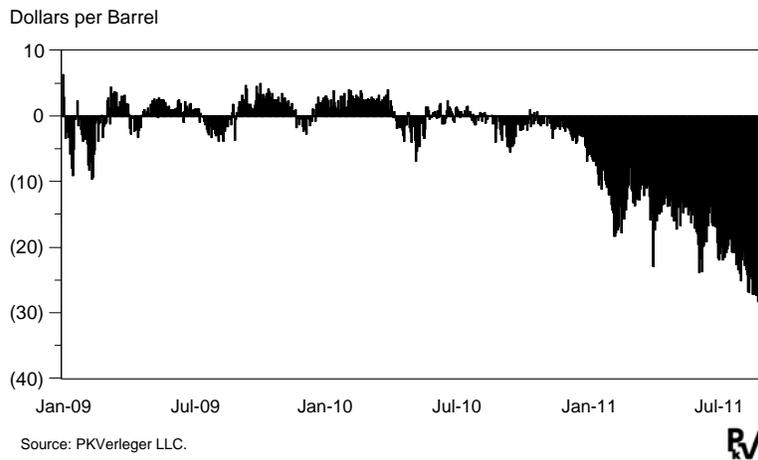
In a recession or period of slower growth in global oil use, one can imagine a situation developing where world crude trades for \$90 per barrel, US crudes oils trade at a discount of \$30 to world crude, effectively fetching \$60 per barrel, and Canadian crude oils sell for around \$45 per barrel. If and when that situation arises, the true nature of the Keystone pipeline as a Trojan Horse will become obvious. If and when these conditions arise, one can expect Canadians to recognize the need to find another outlet for their crude oil.

Figures and Tables

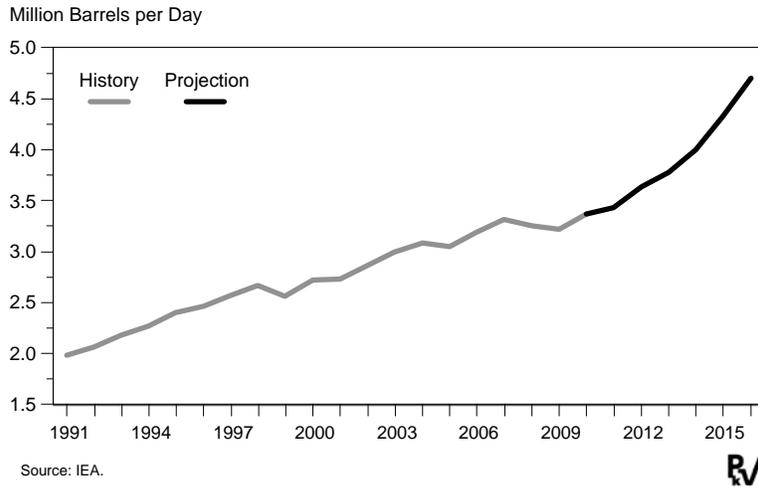
**Figure 1**  
**Current Keystone Pipeline and**  
**Proposed Keystone XL Pipeline**



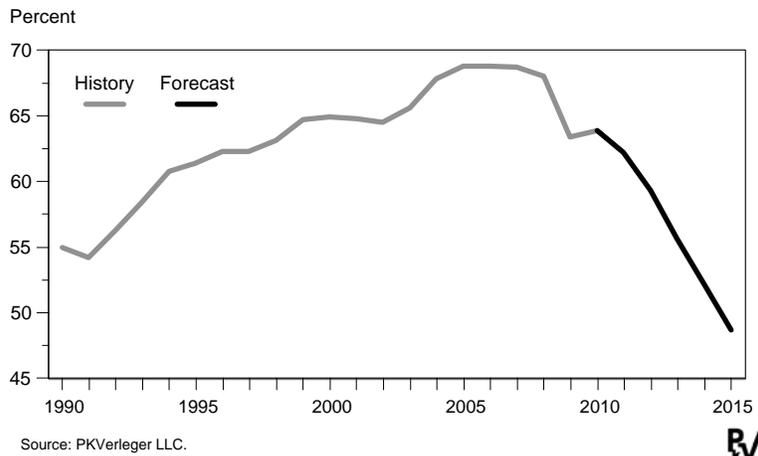
**Figure 2**  
**Daily WTI/Brent Spread — Cash WTI less Dated Brent,**  
**January 2009 to September 2011**



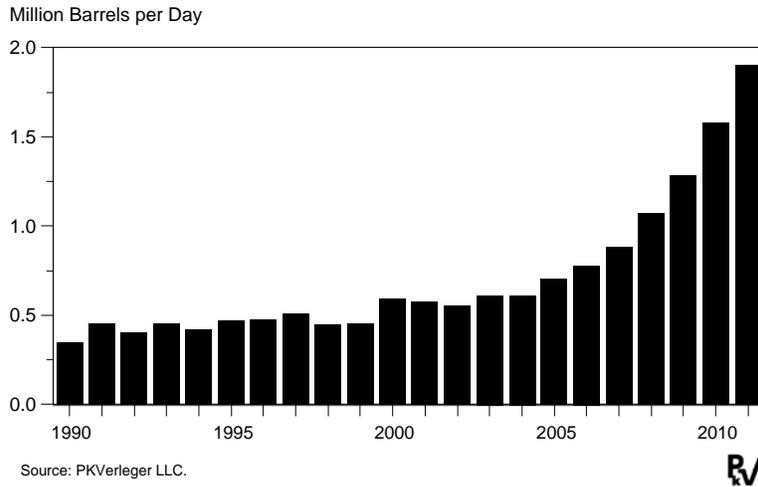
**Figure 3**  
**Canadian Crude Oil Production — History and Forecast**



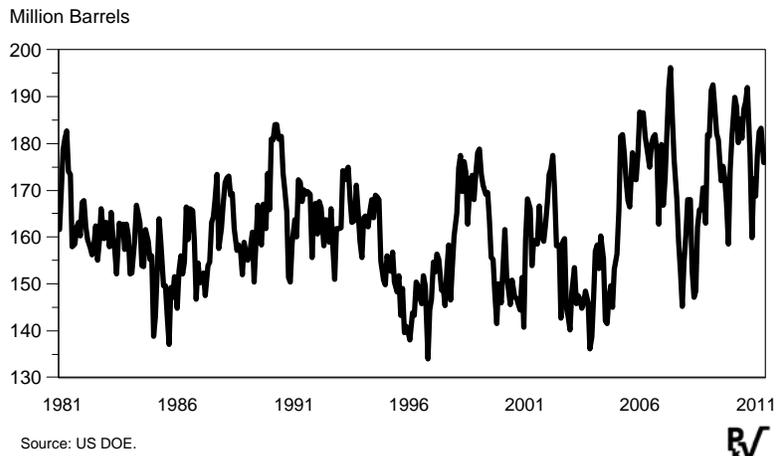
**Figure 4**  
**PADD II and PADD III Crude Imports as a Percentage of PADD II and PADD III Refinery Runs — History and Forecast**



**Figure 5**  
**Exports of Finished Products from PADD II, 1990-2011**



**Figure 6**  
**Crude Oil Inventories Held in PADD II Private Facilities at the End of the Month, January 1981 to June 2011**



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Table 1. Crude Imports into PADDs II and III by Country of Origin, June 2010 to June 2011 (Thousand Barrels per Day)

<u>Country</u>	<u>Crude Imports</u>
Total	6,590
Canada	1,414
Mexico	1,145
Venezuela	877
Saudi Arabia	794
Nigeria	563
Colombia	285
Algeria	261
Iraq	233
Angola	179
Kuwait	170
Brazil	166
Russia	141
Others	363

Source: PKVerleger LLC.

Table 2. Purvin & Gertz "Rosy Scenario" for Canadian Crude Market vs. More Likely View Given Increased US Oil Production, Declining Consumption, and Renewable Fuels Requirements (Million Barrels per Day)

	<u>Purvin &amp; Gertz Scenario</u>	<u>Likely Scenario</u>
Refining Crude Runs in PADDs II and III	10.5	9.5
Crude Production in PADDs II and III	2.5	5.5
Likely Market	8.0	4.0
Volume of Product Exports	n/a	2.0

Source: PKVerleger LLC.